# Antiaircraft JOURNAL

SEPTEMBER-OCTOBER, 1952

# HONOR ROLL

## *Original Honor Roll*

***88th AAA Airborne Bn***
*Lt. Col. R. B. Barry, Jr.*
***228th AAA Group***
*Col. T. H. Pope*
***107th AAA AW Bn (M)***
*Lt. Col. E. R. McIver*
***305th AAA Group***
*Col. John S. Mayer, N. Y.*

## *Separate Commands*

**Army AAA Command**
Lieut. Gen. J. L. Lewis
**Third Army Training Center**
Brig. Gen. C. H. Armstrong
**East AAA Command**
Brig. Gen. F. L. Hayden
***Central AAA Command***
Col. D. J. Bailey
**West AAA Command**
Brig. Gen. R. W. Berry
**Hqs. Far East AAA Spec. Sch.**
Lt. Col. W. H. Nicolson

**Guided Missile Dept.**

**AA & GM School**
Col. F. M. McGoldrick
**Officer Candidate School**
Col. K. R. Kenerick
**AAA Repl Training Center**
Col. E. W. Heathcote

## *Brigades*

**32nd AAA Brigade**
Col. M. W. May, Jr.
**34th AAA Brigade**
Brig. Gen. R. R. Hendrix
**35th AAA Brigade**
*Brig. Gen. Homer Case*
**38th AAA Brigade**
Brig. Gen. W. E. Waters
**40th AAA Brigade**
Brig. Gen. James G. Devine
**47th AAA Brigade**
Col. G. C. Gibbs
**51st AAA Brigade**
Col. H. P. Hennessy
**56th AAA Brigade**
Brig. Gen. H. F. Meyers
**103rd AAA Brigade**
Brig. Gen. R. Y. Moore
**104th AAA Brigade**
Brig. Gen. V. P. Coyne, Mass.
**105th AAA Brigade**
Brig. Gen. A. H. Doud, N. Y.
***107th AAA Brigade***
Brig. Gen. J. W. Squire, Va.
**111th AAA Brigade**
Brig. Gen. Chas. G. Sage, N. Mex.
**112th AAA Brigade**
Brig. Gen. J. W. Cook, Calif.
**114th AAA Brigade**
Brig. Gen. G. W. Fisher

## *Groups*

**1st Composite Group**
Col. T. H. Leary
**4th AAA Group**
Col. L. A. Bonifay
**6th AAA Group**
Col. W. J. Wuest
**7th AAA Group**
Col. M. J. Martin
**10th AAA Group**
Col. G. R. Carey
**11th AAA Group**
Lt. Col. L. S. Allen
**13th AAA Group**
Col. W. A. Cauthen
**14th AAA Group**
Col. H. E. Michelet
**16th AAA Group**
Lt. Col. G. E. Brown
**19th AAA Group**
Col. D. D. Martin
**65th AAA Group**
Col. B. E. Cordell
**142d AAA Group**
Col. J. Snead, Ala.
**197th AAA Group**
Col. A. S. Baker, N. H.
**200th AAA Group**
Col. C. M. Woodbury, N. Mex.
**205th AAA Group**
Lt. Col. J. H. Pindell
**207th AAA Group**
Lt. Col. R. G. Irish, N. Y.
**208th AAA Group**
Col. F. J. Zeller
**211th AAA Group**
Col. G. F. Lineham, Jr., Mass.
**214th AAA Group**
Col. J. G. Johnson, Ga.
**216th AAA Group**
Col. W. E. Johnson, Minn.
**218th AAA Group**
Col. V. P. Lupinacci, Pa.
**220th AAA Group**
Col. D. MacDuff
**224th AAA Group**
Col. E. W. Thompson
**226th AAA Group**
Col. John D. Sides, Ala.
**227th AAA Group**
Col. P. L. Wall, Fla.
**233rd AAA Group**
Col. W. T. Stone, Calif.
**250th AAA Group**

**260th AAA Group**
Lt. Col. G. V. Selwyn, D. C.
**302nd AAA Group**
Col. John M. Welch, Ohio
**313th AAA Group**
Col. A. F. Hoehle
**326th AAA Group**
Col. M. D. Meyers, Pa.
**374th AAA Group**
Col. T. F. Mullaney, Jr., Illinois
**515th AAA Group**
Col. F. G. Rowell, N. Mex.

## *Battalions*

**1st AAA Training Bn**
Lt. Col. H. E. Graham
**2nd AAA AW Bn**
Lt. Col. J. L. Butler
**2nd AAA Training Bn**
Lt. Col. J. H. Doyle
**3rd AAA AW Bn**
Lt. Col. J. P. Goettl
**3rd AAA Tng. Bn.**
Lt. Col. A. S. Naylor
**4th AAA AW Bn (M)**
Lt. Col. R. J. Connelly
**4th AAA Training Bn**
Maj. C. M. Smith
**5th AAA Training Bn**
Maj. F. R. Whitehead, Sr.
**6th AAA Training Bn**
Lt. Col. G. L. Crawford, Jr.
**7th AAA AW Bn**
Lt. Col. S. J. Paciorek
**8th AAA Training Bn**
Maj. M. D. Kert
**9th AAA Training Bn**
Maj. W. E. Osburn
**10th AAA Training Bn**
Lt. Col. V. T. Terribile
**11th AAA AW Bn**
Lt. Col. J. E. Wales
**11th AAA Training Bn**
Lt. Col. A. O. Chittenden
**12th AAA Training Bn**
Maj. L. E. Marlowe
**14th AAA Gun Bn**
Maj. H. C. Lorck
**15th AAA AW Bn (SP)**
Lt. Col. B. H. Johnson
**21st AAA AW Bn (SP)**
Lt. Col. J. W. Dry
**32nd AAA AW Bn**
Maj. Wm. A. Bobo
**34th AAA Gun Bn**
Lt. Col. H. B. Reubel
**36th AAA Gun Bn**
Lt. Col. G. W. Best
**37th AAA Gun Bn**
Maj. R. G. Duncan
**38th AAA Gun Bn**
Lt. Col. S. R. Kelley
**39th AAA AW Bn (M)**
Lt. Col. P. J. Lacey, Jr.
**41st AAA Gun Bn**
Lt. Col. C. F. Chirico
**50th AAA AW Bn**
Lt. Col. J. T. Hennessy
**53rd AAA Gun Bn**
Maj. J. M. Rutledge
**56th AAA Gun Bn**
Lt. Col. M. A. Selsor, Jr.
**60th AAA AW Bn**
Lt. Col. Wm. D. Ward
**62nd AAA AW Bn (SP)**
Lt. Col. C. E. Meadows
**63rd AAA Gun Bn**
Lt. Col. C. F. Coffey
**64th AAA Gun Bn.**
Lt. Col. D. B. Nye
**65th AAA Gun Bn**
Lt. Col. H. C. Brown
**66th AAA Gun Bn**
Lt. Col. C. M. Brown
**68th AAA Gun Bn**
Lt. Col. R. H. Stephens
**69th AAA Gun Bn**
Lt. Col. M. G. Meyer
**71st AAA Gun Bn**
Lt. Col. E. G. Orrick
**73rd AAA AW Bn**
Lt. Col. P. W. Pedrotti
**74th AAA Gun Bn**
Maj. L. A. Waple
**76th AAA Gun Bn**
Lt. Col. J. D. Gemmell
**77th AAA Gun Bn**
Lt. Col. W. P. Wright, Jr.
***79th AAA Gun Bn***
Maj. R. A. Boaz
**80th AAA Airborne Bn**

**82nd AAA AW Bn**
Lt. Col. H. K. Clark
**91st AAA AW Bn**
Lt. Col. R. A. Clafee
**97th AAA Gun Bn**
Lt. Col. W. F. Corcoran
**120th AAA Gun Bn**
Lt. Col. H. C. Gray, N. Mex.
**123rd AAA Gun Bn**
Lt. Col. I. E. Dominguez, P. R.
**126th AAA AW Bn**
Lt. Col. R. C. Carrera, Mass.
**127th AAA AW Bn (SP)**
Lt. Col. H. G. White, N. Y.
**133rd AAA AW Bn**
Lt. Col. E. J. Modjeske, Illinois
**137th AAA AW Bn**
Lt. Col. L. B. Tipton
**140th AAA AW Bn**
Lt. Col. E. S. Mathes
**144th AAA AW Bn**
Lt. Col. R. T. Dunn
**150th AAA Gun Bn**
Lt. Col. L. O. Ellis, Jr., N. C.
**256th AAA AW Bn**
Lt. Col. R. W. Hoag, Minn.
**259th AAA Gun Bn**
Maj. L. T. Darcy
**336th AAA Gun Bn**
Lt. Col. A. A. White
**340th AAA Gun Bn**
Lt. Col. G. V. Selwyn, D. C.
**398th AAA AW Bn**
Lt. Col. L. B. Dean
**443rd AAA AW Bn (SP)**
Lt. Col. B. A. Spiller
**450th AAA AW Bn**
Lt. Col. B. N. Singleton
**459th AAA AW Bn**
Maj. M. W. Johnson
**464th AAA AW Bn**
Lt. Col. R. E. Glasgow
**502nd AAA Gun Bn**
Lt. Col. P. G. Brown
**507th AAA AW Bn**
Lt. Col. J. M. Carson
**552d AAA Gun Bn**
Lt. Col. L. N. Rieman
**678th AAA AW Bn**
Maj. J. B. Crayton, S. C.
**685th AAA Gun Bn**
Lt. Col. P. O. Franson, Mass.
**697th AAA AW Bn**
Maj. W. C. Thompson, N. Mex.
**698th AAA Gun Bn**
Lt. Col. F. Monico, Illinois
**708th AAA Gun Bn**
Lt. Col. F. F. Quist
**710th AAA Gun Bn.**
Capt. T. T. Chisman
**711th AAA Gun Bn**
Lt. Col. N. J. Walton, Ala.
**712th AAA Gun Bn**
Maj. F. N. Buchanan, Fla.
**716th AAA Gun Bn**
Lt. Col. Joe R. Stewart, N. Mex.
**717th AAA Gun Bn**
Lt. Col. E. D. Pelzer, N. Mex.
**718th AAA Gun Bn**
Lt. Col. J. J. Loughran
**720th AAA Gun Bn.**
Lt. Col. G. A. Duke, Calif.
**726th AAA Gun Bn**
Lt. Col. C. F. Arnold, N. Mex.
**730th AAA Gun Bn**
Lt. Col. C. D. Halliday, Calif.
**736th AAA Gun Bn**
Lt. Col. F. T. Lynch, Dela.
**745th AAA Gun Bn**
Maj. E. Mountain, Conn.
**747th AAA Gun Bn**
Lt. Col. J. F. Kane, Mass.
**764th AAA Gun Bn**
Lt. Col. E. D. Wynsted
**772nd AAA Gun Bn**
Col. F. S. Grant, Mass.
**773rd AAA Gun Bn**
Lt. Col. G. F. Slavin
**804th AAA AW Bn (M)**
Maj. S. N. Caudill, N. Mex.
**867th AAA AW Bn**
Maj. S. M. Arnold
**903rd AAA AW Bn**
Lt. Col. F. J. Petrilli
**933rd AAA AW Bn**
Lt. Col. R. M. Huston
**950th AAA AW Bn**
Lt. Col. J. P. Wallis, Ga.
**951st AAA Gun Bn**
Lt. Col. W. G. Babbitt
**30th AAA Lt. Btry**
Capt. W. A. Brant
**Btry A, 37th AAA Gun Bn**
Lt. A. B. Whitesides

*(Continued on page 28)*

THE UNITED STATES
ANTIAIRCRAFT
ASSOCIATION



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

**The JOURNAL prints articles on subjects of professional and general interest to personnel of the Antiaircraft Artillery 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 Department of the Army.**

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

PUBLICATION DATE: October 1, 1952

# Antiaircraft JOURNAL

**FOUNDED in 1892**
**Published from 1892 until 1922 as**
**THE JOURNAL OF THE UNITED STATES ARTILLERY**
**Published from 1922 until 1948 as the**
**COAST ARTILLERY JOURNAL**

VOL. LXXXXV SEPTEMBER-OCTOBER, 1952 No. 5

## CONTENTS



**COLONEL CHARLES S. HARRIS, Editor**
**LIEUTENANT COLONEL RICHARD W. OWEN, Associate Editor**
**M Sgt Fred A. Baker, Business Manager**
**Sgt 1cl James E. Moore, Jr., Editorial Assistant**

Published bimonthly by the United States Antiaircraft Association. Editorial and executive offices, 631 Pennsylvania Avenue, N.W., Washington 4, D. C. Terms: $3.00 per year. Foreign subscriptions, $4.00 per year. Single copies, 75c. Entered as second-class matter at Washington, D. C.; additional entry at Richmond, Va., under the Act of March 3, 1879. 

# SUPPLY: WORLD WAR II

## To The South Pacific — Fall 1942

### By LIEUT. GEN. LEROY LUTES

Continued from the July-August issue

In October 1942, General Lutes flew to the Southwest Pacific to initiate action toward reducing congestion in shipping, to trouble shoot the over-all logistical setup and to coordinate pertinent logistical activities with the Navy. En route he made stops in Honolulu, Christmas and Canton Islands, Fiji Islands and Lieut. Gen. Harmon's South Pacific Headquarters at Noumea, New Caledonia. He then continued on to confer with General MacArthur at his Headquarters in Brisbane and also to find Admiral Calhoun and continue the coordination with the Navy.

AT General MacArthur's headquarters I had inquired about Admiral Calhoun, Naval officer with whom I was supposed to settle joint logistical matters in the Pacific, and who was supposed to have joined me in Hawaii. He had been in Brisbane a few days before my arrival and had moved down the coast to Sydney. So, I borrowed a small Australian plane and flew from Brisbane to Sydney to find such a happy surprise. It was quite a bustling place, modern buildings and residences, with an air of Chicago.

I proceeded at once to the American headquarters of General MacArthur's Service Forces, with Major General Richard Marshall in command, and explored immediately into his requirements. Among other shortages they needed some 130 sets of jungle equipment for the 60,000 troops in New Guinea; jeeps were needed more than any other motor vehicle; and small coastwise shipping was going to be in heavy demand for future supply and amphibious operations along the Australian and New Guinea coasts. I would have to coordinate this with the Navy, because they were also heavy procurers of small crafts and barges.

Lt. Col. E. W. Leibacher, the Allied petroleum officer, appeared to be a very able man. He was not only planning properly for the supply of General MacArthur's forces but was looking ahead toward the rehabilitation of refineries in Java in case we had the opportunity to recapture them. The Central Petroleum Committee computed the requirements of the Army and Navy of both United States and Australia; Australia bought the oil and gas, then sold it to the local oil companies; we then contracted with the Australian Army for our oil and gas for ground forces. A report was sent to the Aviation Petroleum Assignment Committee in Washington for our Air Force gas requirements for a period three months ahead. Distribution of aviation gas was handled by the American Air Force in Queensland and New Guinea. The RAAF distributed in other areas; i.e., to all Air Forces in that area. Each drew its own requirements from the Pacific ocean pool. The Area Petroleum Officer, Colonel Leibacher, coordinated all requirements and supervised oil storage —in fact, he supervised the entire oil operations in the Southwest Pacific.

General Marshall and I discussed the manpower shortage in New Zealand and Australia, which affected the planting of crops and in turn reduced the amount of food available for both the Australian and American troops. Lack of crops in Australia meant that we would have to ship more food from the United States, which would require more ship tonnage for this purpose, and we were already short of shipping for combat supplies. Therefore, it would be advantageous to the Allied Forces to increase the crops in Australia and New Zealand. I made arrangements to have various seeds suitable for growing crops in Australia sent out from the States without delay; also some fertilizer. I found the Australians were constantly thinking of postwar matters just as the British did on the other side of the world. In growing food for the American Forces, they feared that we might throw a lot of it back on the market at the end of the war. It was necessary that they receive guarantees from the United States that we would take a definite quantity of food each year so that they would be willing to go into an expanded produce and canning program. The War Department General Staff would have to make a firm prediction concerning the strength of our forces in that area during the following year in order that firm requirements for food purchases and crop expansion could be made.

One of the great difficulties in the Southwest Pacific was the lack of manpower and transportation. The supply of General MacArthur's troops in New Guinea was seriously handicapped by the lack of proper rail communication between southeastern and northeastern Australia. The railroads were on different gauges in each province, which required that freight be transferred at each borderline between provinces, which in turn made the delivery of supplies to the north interminably slow.

We also studied the possibility of manufacturing some military equipment in Australia. The Australians were ambitious to embark upon a tank building program. I told Marshall that we would much rather see them standardize their railroad and manufacture more railroad equipment. It was believed that would have a more far reaching improvement on our combat operations in the north than an attempt to manufacture tanks. However, for some reason the Australians were most desirous of diverting steel and labor from railroad equipment into tanks. General MacArthur felt that this was not for him to interfere with, and I fully understood his rather delicate position as Allied Commander over

American, Australian, and Dutch Forces.

I looked carefully through the Port of Sydney where they showed me their port operations, and particularly their setup for repair and construction of small boats. They had commandeered practically every small boat that could be bought from the Australians and had contracted for the construction of over 300 barges and other small craft. We travelled from spot to spot where these craft were either being repaired or constructed. They were to be used in amphibious operations in the north mainly.

GENERAL MARSHALL also located Admiral Calhoun for me and I was able to sit down and discuss a few problems with him in Sydney, such as the consumption of drum gasoline and the provisions for procurement of meat and perishables in New Zealand and Australia for use of the American forces in the South Pacific Area (Guadalcanal Area). However, I was quite amused that Admiral Calhoun would not discuss any immediate problems pertaining to the South Pacific or Guadalcanal areas while in Australia. He stated that he could not talk about these matters as long as he was over in General MacArthur's theater and that he was not empowered to talk to me about official supply problems in the South Pacific until he got back 800 miles across the ocean to New Caledonia. This was difficult for me to understand. When I asked him when I could see him in New Caledonia, he replied that he had no way of getting over there for a while. This garrulous, robust sailor seemed more interested in enjoying the dog and horse races in Australia than worrying about war. When I explained my necessity to hurry and how anxious we were to improve the joint logistical support of our forces in that area; he agreed to return with me to New Caledonia, and I informed him that I would hold my plane in readiness in Brisbane on October 31 and would expect him to join me up there.

Admiral Calhoun did inform me that the Navy was building additional storage space in Brisbane and setting up shore supply bases in Melbourne, Sydney, and Brisbane. The Navy supply system was different from ours since their San Francisco organization was under the control of the fleet commander in the Pacific, whereas the Army operations in San Francisco were under the control of the Army in Washington. However, this was not an unsurmountable difficulty. I thought we should be able to get the Navy and Army representatives in the San Francisco Port to cooperate on any plan that we devised for distribution in the Pacific. I told Admiral Calhoun that we should try to settle the question of priorities within the Navy and within the Army, and priorities between the Army and Navy in order to stop the uncoordinated movement of ships out of San Francisco into the South Pacific area where they had become congested in the harbor of New Caledonia. However, he adhered to his previous statement; i.e., that he would discuss these matters first on his ship in Noumea harbor, New Caledonia, and nowhere else.

THE labor situation in Australia was bad in that labor was so bound by their union rules and so indifferent to the demands of war. For example, at the slightest drop of rain, under union rules

**Native labor unloads gas in New Guinea.**

the stevedores walked off the docks and ceased unloading ships. Since our troops were actually in combat with the Japs to the north, it was necessary that not a minute be lost in unloading ships and turning them around for return to the United States. Consequently, we had to take combat soldiers in Australia to unload, while Australian labor sat on the docks and watched, and—strange as it may seem—drew pay for the unloading without doing a "lick of work." We needed more port battalions, particularly for the northern areas. It required about 12,000 service troops to operate a large port.

THE ordnance spare parts situation was critical; so, I tried to find where the maldistribution was because the San Francisco records showed that shipments had been made. No doubt many were bogged down on unloaded ships.

It appeared that the three principal eastern Australian ports could take care of 36 ships at one time. I was interested in Townsville, which had five berths and two coasting berths. However, they had only one jetty which made a bottleneck. It would have required a double track road on this jetty to carry supplies to sorting warehouses in the interior. I was informed, however, that we should not try to take Townsville as a base as it would "ruin the sugar industry." However, General MacArthur planned on using Townsville as a holding and reconsignment point for water transportation. The main difficulty was the shortage of local labor to expand the port. There was sufficient tonnage going into Moresby and Milne Bay to support 70,000 ground troops and a suitable air force.

I was quite satisfied with the way the Allied Supply Council in Australia was operating. We had a very able representative on that council, a Colonel Jenks, Finance Department. The Allied Supply Council consisted of four members of the Australian cabinet and our representative, Colonel Jenks. However, the voting power was equally divided, one vote for America, and one for Australia, which enabled Jenks to hold his own. The actions of the council had to be approved by the Australian Prime Minister, but these matters seemed to be running quite smoothly. General MacArthur was an excellent diplomat as well as soldier and maintained a popularity with the Australians as he had in the United States.

The Australians gave General Marshall's staff complete access to all the records of their standing committees who worked with the formulas and requirement data for the Australian and American troops. However, in the case of reverse lend lease, Colonel B. W. Johnston, our general purchasing agent, informed me that he had to accept Australian figures. I found procedures well set up to follow through with the Australian agencies in insuring that the items we purchased from Australia on reverse lend lease were actually received by the American troops. We certainly had an excellent representative in Colonel Johnston. He was on the job.

Although the operations in Australia and New Guinea were far flung I found that every effort was made to keep proper stock control records on the receipt of equipment from the United States. For example, rifles might be received in three or four different ports in Australia but eventually the port commanders reported in Sydney the quantities received and warehoused for future issue.

One difficulty our troops were having overseas was incurred by lack of up-to-date information on changes in tables or organization and basic allowances made back in the States. These changes should have been gotten to them more rapidly in order that they might know what they were supposed to receive in the way of equipment. The Air Forces kept their own records on the status of their supplies, but I was glad to know that they also submitted their reports to headquarters of MacArthur's SOS.

One sour note was the plaint of our staff officers that Australians were pilfering post exchange and commissary supplies to such a degree that it was necessary to supplement the American ration by giving the soldier sixpence to procure food from Australian or American exchange stores. This was a sad state of affairs. The Australians had not been able to meet all their contracts in furnishing all components of our B ration. However, this situation was improved in New Guinea by taking over from the Australians the distribution of supplies in that area.

The hospital facilities of the civilian population in Australia were very limited. Therefore we were required to build our own. I took time to visit three of these.

LST beaches supplies in Dutch New Guinea.

IN general, repairs to motors were made by contract with the Australian General Motors Company.

I found that four-wheeled drive vehi-

cles would be needed in New Guinea due to lack of roads. Also, we would have to pack supplies over mountains in that area. We were compelled to build a general depot at Para Matta, to meet our storage situation for both the Army and the Navy, since the Australians wanted their own warehouses for wool. Construction was made with an asbestos fiber base and galvanized iron sides and roof.

I determined to take action to improve the loading of vehicles on our shipping back in the States. Careless loading and unloading were damaging too many vehicles. Also, there was a failure to block vehicles properly on vessels. Our overseas garrisons were being plagued by the pilfering of tools on the ships. Vehicles loaded on decks arrived with their tools missing, although records showed that tools were properly loaded with the vehicles.

There were some stock piles of raw rubber in Australia and I found Goodyear ready to make tires for us down there. This would save that much shipping. Some of these activities would have to be in Sydney, since Brisbane was more short of manpower than Sydney.

This side trip to Sydney gave me an opportunity to become personally acquainted with all the key officers in General MacArthur's supply staff, and enabled me to establish direct relations with them for their future operations.

I departed from Sydney at 9:30 A.M. on the 30th of October and arrived at Brisbane at 2:30 P.M. Final conferences were held with General MacArthur and his chief of staff, General Sutherland, at which time we again discussed the broad strategic concept of the campaign in the South Pacific, particularly with view to logistics support after the American Forces under MacArthur in the Australia and New Guinea area merged somewhere east of New Guinea. Also, I discussed with General MacArthur the question of establishing close logistical relationships with Admiral Halsey and General Harmon over in the South Pacific area with view to exchanging supplies and equipment when necessary. For example, if one were over in some items and the other area short, arrangements could be made to support one another. Also, the question of procurement of some items in Australia for the Halsey-Harmon forces over in the South Pacific area was discussed as well as the procurement in New Zealand of some items for the MacArthur troops in Australia.

Much to my surprise, Admiral Calhoun showed up at Amberley Field on time the next morning, and we departed at 8:22 A.M., arriving at Tontouta Field, New Caledonia at 1:30 P.M. I checked in with General Harmon, commanding general of the American Ground and Air Forces, and explained to him my conversation with Admiral Calhoun. Also, I took Admiral Calhoun to General Harmon's office and introduced them. Admiral Calhoun requested that we attend a conference on his supply ship, the *Whitney*, in the fleet in Noumea Harbor later in the afternoon.

A naval battle was in progress north and west of Espiritu Santo and two damaged ships were in the harbor being repaired as we went out to the *Whitney*. I soon found out why Admiral Calhoun had not desired to talk to me until we returned to the South Pacific Area, because he pulled from his pocket papers that had promoted him to Vice-Admiral. Apparently he had been informed that this promotion was en route, and probably thought it wouldn't hurt if when he came to do business with me he were then senior to me. The weather that afternoon was misty and rainy. We sat around a green cloth topped table in Admiral Calhoun's cabin with Admiral Halsey's Chief of Staff, and the supply staff of the fleet. General Harmon, General Breene (Harmon's G-4) and I represented the Army.

OUR first discussions were in generalities, such as agreements that the Army would continue to furnish dry food to the Navy in the area; the Navy to furnish bulk fuels and lubricants as well as fresh provisions to the Army. I discussed the methods of obtaining requirements and found that the Navy gets the Army's oil and gas requirements separately from the various bases in the Pacific. I suggested that these requirements should be screened and coordinated through General Harmon's staff and not obtained by the Navy directly from bases occupied by the Army. The Navy computed their requirements for dry food stores and informed their own base commanders in New Zealand and San Francisco, who in turn informed the Army's purchasing officers and port officers in New Zealand and the Port Commander at San Francisco. There was only sufficient refrigerator space in the Navy base at New Caledonia for 22 days and although the Navy claimed to share their refrigerated produce with

**Army vehicles: Tools were pilfered in Australia . . .**

the Army, the Army claimed that they got the small end of the deal. The Navy stated that they could improve supply of refrigerated stores to the Army if we could build up more cold storage ashore. The Navy lived out of their own refrigerator ships, and lack of storage ashore was preventing the Army from getting an adequate supply. I had arranged in Australia for General MacArthur and General Marshall to send the Army one refrigerator ship a month from Australia and frozen beef from New Zealand. Also, I sent a message to the States inquiring about the availability of portable storage plants and sections.

I discussed the question of the Island of Efate. It seemed to me that this island was too far to the rear to become an important base and I suggested that we not throw supplies and materials into that base for the build-up. Admiral Calhoun did not agree. Also, he thought that Noumea would always be a base until we captured Rabaul. However, it seemed to me that Espiritu Santo would be sufficient with Noumea to back it up, until we captured Rabaul. Also, Vice Admiral Calhoun explained the Navy plan to build up tremendously at Noumea in New Caledonia. But I pointed out that, whereas there were fine harbor accommodations for the fleet, the Navy's program and the Army's program were going to conflict ashore in either the leasing or building of adequate storage; that docks for unloading were inadequate; that we would have to conduct large lightering operations, and therefore it was highly essential that the Navy and Army carefully coordinate each step in building up their bases in New Caledonia.

I agreed on the development of Fiji and Espiritu Santo. It was agreed that Admiral Halsey and General Harmon's staffs would work out programs for joint construction at both Espiritu Santo and Noumea based on their relative requirements. Also, we agreed on an 1800-foot extension to the dock of the Nickel Plant in Noumea harbor. I agreed to make every attempt to get more stevedores, tugs, and lighters for harbor operations as well as movable cranes. Also, I agreed to take a message and impress upon Admiral Horne upon my return to Washington how badly the Navy needed additional tugs and lighters.

ALTHOUGH I outlined carefully the reasons why we should form a joint logistical staff of the Army and Navy in the South Pacific area, the Navy seemed suspicious of the move. I pointed out to them that if the Army and Navy staffs could agree upon the respective priorities of items within the Army and Navy and the Joint Staff or Board then agreed upon the priorities *between* the Army and Navy requirements, ships in the United States could be loaded accordingly, and be brought into the South Pacific area on call, their arrival to be timed in such a way as to avoid congestion and confusion in the port. I pointed out that the seventy-odd cargo ships then at anchor in the Port of Noumea formed a beautiful bombing target and moreover that they were tying up in idleness ship tonnage that was badly needed in other areas. Both Army and Navy staffs ruefully admitted that such was the case and it was agreed that some of Admiral Halsey's supply staff would move ashore and effect closer coordination in their supply and logistical activities with those of the Army.

We departed from Admiral Calhoun's ship at about 6:30 P.M., and went ashore. At General Harmon's quarters we were joined by Generals Patch, Nate Twining, and Sebree, for dinner. Also, General Thompson arrived from Fiji for conferences with General Harmon. I had some further discussions with Breene concerning the elimination of duplications, and improvement of the supply organization at the staff and base levels. The whole organization was badly mixed, however, due to the Army-Navy components utilizing jointly various island bases in the area. It was a difficult problem.

I departed from Tontouta Field at 8:54 A.M. for the Island of Efate, and arrived there to find a battle in progress at sea somewhere north of Espiritu Santo as well as land fighting on Guadalcanal. They had an excellent general hospital with approximately 500 beds located on the Island of Efate, and wounded men were arriving by air on the field at the same time I arrived, and were being moved very promptly from the field by ambulances. The commanding officer of the island was General Neal Johnson.

I left Efate immediately and flew for Guadalcanal. But we couldn't land; the field was under artillery fire and part of it so damaged that only fighter planes could land there. We returned to Espiritu Santo and found that the activities at the landing field there were very hot too. Bombing operations were being conducted northward from the field. With planes moving in and out each two-minute period, we circled the field for a while and then took our chances in getting on the ground. We finally made the landing and I visited the Army commander, Brigadier General Rose, and staff, to go over their supply problems of the moment. The Transport *President Coolidge* had struck a mine in the harbor the previous day and had sunk, with all equipment and supplies on board. The troops on board had got-

U.S. Army Photo

**Native canoes formed a link in the supply chain . . .**

ten ashore, but were now shivering around under the trees without proper blankets, tentage, and what was more important and dangerous, without weapons. The commander, General Rose, told me that his island was certainly vulnerable to capture until he could be re-equipped, that if the Japs came in any force he had no armed infantry to withstand a landing attack and only one battery of 155 guns and a small amount of antiaircraft weapons. Fortunately the Japs did not realize the situation and did not move around Guadalcanal but stayed there for a finish fight.

Espiritu Santo was a striking example of the need for coordination between the Navy and the Army. Both the Army and the Navy were building airfields on the island, both were cutting these fields out of coconut groves utilizing engineer equipment (bulldozers, tractors, etc.); both were utilizing service troops; both were building roads, and with it all, I could not find any commander or agency who had laid down the priorities between the two. The Army staff and troops were somewhat embittered because the Navy had utilized some of their tonnage for large quantities of coca cola and beer, whereas the Army had felt that tonnage could not be spared for this purpose. The Navy had a large number of Seabees equipped with modern equipment working ashore to build a shore base and as stated before this base included land based aviation. The mud at this time was very deep on the island and there was no doubt both Army and Navy needed the roads that were being constructed, but duplication of construction, troops and equipment was apparent.

THE time had arrived for me to start back to the United States. I went to Nandi, Fiji, to check in at that point, re-gas and start north. We decided to make a night flight, bypassing Canton and shooting directly for Palmyra. We took off from the airfield at 6:16 P.M., November 2, 1942.

I had picked up Captain Charles Mason, whose ship the Carrier *Hornet* had been shot out from under him at the last naval battle of Santa Cruz. He had lost his wallet and all of his clothes and was travelling with one pair of trousers and the shirt on his back. He had had very interesting experiences and a very close call. He told me, however, that he was more worried about his flight with me than having been shot at by the Japs and thrown into the ocean. He had commanded an airplane carrier which was sunk by Jap suicide planes which had plunged directly into the ship, but he said he had never travelled in a plane where he had smelled gasoline fumes so strongly and where the gasoline equalizer system had to be adjusted by hand valves every few hours. He literally sat on the edge of his seat all the way to Palmyra for fear we would be blown up. Until then I had not worried about the plane, because I knew no better, but he threw a few fears into me. I began to remember our early difficulties with the plane. However, pretty soon I strapped myself in my seat and slept until morning. We crossed the international dateline during the night, so the next morning it was still November 2, 1942.

We arrived at Palmyra at 8:50 A.M., had breakfast, and departed for Hickam Field, Oahu, to arrive that afternoon, where I was again met by General Holmes.

WE had a drizzling rain that day in Honolulu. After depositing my baggage at Fort Shafter, I reported to General Emmons to briefly summarize the trip south. Again General Emmons discussed the advantages of the extension of his controls further south, particularly with view to being in better position to logistically support General Harmon. I thoroughly agreed that the supply-logistical setup in the Pacific was unsound, for the simple reason that the assets available to General Harmon and General Emmons were not flexible; i.e., could not be readily exchanged between the two. General Emmons did not know exactly what General Harmon had in the way of equipment and supplies and vice versa. General Emmons agreed with me that a general depot should be built up in Fiji capable of supporting combat operations in that area in case Fiji was cut off from Australia, and by the same token, that depot stocks should be built up either in New Caledonia or Espiritu Santo to support operations in that area in case Fiji was cut off. Also, he agreed with me that it would be far better if we could have one logistical supply service covering the Pacific.

In this respect, the Navy had the advantage over us. Upon Admiral Nimitz' staff was Vice Admiral Calhoun in charge of all naval supply in Mid-Pacific and South Pacific areas, whereas supply logistics operations of Generals Harmon (South Pacific) and Emmons (Central Pacific) were definitely separate. However, I saw small chance of the Navy consenting to this change, although I decided I would recommend something to Admiral Nimitz. I asked General Emmons to arrange for a conference for me with Admiral Nimitz' headquarters for the next day.

Holmes complained to me that the Navy had been importing labor to Hawaii at the rate of 800 laborers monthly, whereas General Emmons had been ordered not to import any labor and to return to the mainland those whom he had previously imported (another reason for some better coordination between the Army and the Navy). Also, General Emmons was quite worried because he could not engage in a permanent construction program, whereas the Navy was proceeding with some permanent construction.

ON November 3rd, I was received by Admiral Nimitz. He agreed to all the arrangements that had been made in the South Pacific. He agreed that Noumea should be our joint Army-Navy base to be built up at that time until the future was more predictable; also, that Fiji should be a reserve base. He stated that he thought Hawaii ought to continue as a reserve base for the Pacific and that he should have on his staff a deputy commander or high ranking Army officer who could represent the Army's views and advise him on Army matters. He stated that although General Emmons was perfectly acceptable to him to act in that capacity, General Emmons' authority did not extend throughout the Pacific but was confined to the Hawaiian Department and a few satellite islands. I informed him that I would discuss the matter with authorities in Washington, although it was not one under the jurisdiction of the Services of Supply. General Emmons agreed with Admiral Nimitz and stated that he was embarrassed in that he had only local control. He stated that he was sending supplies by air to Harmon and

also reserve supplies to Harmon's command by ship, and yet he had no control over the ground and air forces to the south. Admiral Nimitz thought that one officer should be in a position to issue directives to all Army troops in the Pacific area.

Following this private conference with Admiral Nimitz, he invited us to remain while he had a staff conference and received reports on the Battle of Santa Cruz. The carrier commander whom I had brought up with me from the South Pacific gave a very interesting and full report to Admiral Nimitz and his staff concerning his part of the battle and his views of what had transpired. *Of particular interest to me as an old antiaircraft artillery officer was his praise of the antiaircraft gunners who had accounted for so many Jap planes during the attack on his carrier. He stated that antiaircraft fire would have completely protected the carrier had not the Kamikaze or suicide planes plunged directly into the ship. He described how one of these planes dove straight at the bridge and barely missed it, and how another had crippled the steering gear of the ship by hitting directly near the stern, and how a third had ricocheted down from the superstructure, plunging through the upper deck to the lower decks before exploding.*

AFTER that meeting I discussed with Admiral Nimitz again the possiblity of establishing a joint logistics board on his level similar to the one that had been recommended to General Harmon and Admiral Halsey in the south. Admiral Nimitz was receptive to this idea, but stated that he would have to get authority from the Navy Department in Washington to carry it out. He admitted it would be highly desirable to have a joint logistics board on his staff to screen joint requirements of the Army and Navy for shipping and supplies, and to assist in joint logistical planning to support combat operations. He also pointed out to me that our systems ashore were different, that considerable coordination would be needed at the San Francisco Port. I informed him that I fully realized this and intended to go into the matter on my return to the States.

On my final conference with Admiral Nimitz and the staff of General Emmons, we discussed priorities of ships, priorities of loading, rate of flow of shipping, priorities of food for the civilian population, etc.

After a very pleasant dinner with General Holmes and General Emmons, I departed for Hickam Field, with plans to take off for the mainland of the United States early in the evening if possible. The weather was overcast. I found the crew all set and ready to go. Remembering that we had run out of gasoline due to trouble with one of our gas tanks on our last hop between the U. S. and Hawaii, I questioned the crew as to what they thought of our fuel situation this time. All laughed and said they would certainly not run out of gasoline on this last leg of the journey.

WE took off at 8:13 P.M., and within a few seconds I noticed the portholes were splashed outside with liquid, and I made the remark that I supposed we had run into our usual rainstorm, which seemed to follow us on our take-offs and landings. The sergeant engineer looked somewhat puzzled and dubious but said nothing. Within a few minutes liquid began to drop slowly, and then faster, through the asbestos from the compartment in the roof of the plane behind the pilot. The sergeant stepped up and took some of this liquid on his fingers, turned around quickly, opened all portholes, and stated that it was gasoline. Within a few minutes we had a small stream of gasoline trickling down the center of the plane and the asbestos padding around the compartment behind the pilot was soaked. The sergeant took this padding away from the compartment roof to the tail of the plane, and disposed of it. All passengers were notified in no uncertain terms that there would be no smoking in the plane and that we would have to fly throughout the night with open portholes, which would make the plane rather cold. I had been accompanied on this trip by Colonel Meyer of the Transportation Corps. He engaged in a card game with two young flyers whom we had picked up in the South Pacific. These young men had been with MacArthur on Bataan and were returning to the States with a long combat record. They found the "no smoking" orders very difficult and would be caught occasionally during the evening reaching for their lighters and cigarettes.

We arrived safely at Hamilton Field, California, the next morning in fine bright weather. However, the fog bank around San Francisco was very thick. Where the fog cut off from the clear weather was sharply noticeable. Hamilton Field was well chosen to be out of the fog area. We were met by the commanding officer of the field and taken to breakfast at the officers' club. In the course of the conversation there, I found out that two of the first ten planes of the model we had used on this trip had blown up, or at least one had definitely blown up and one had suddenly discontinued radio communication in a South Atlantic flight and since nothing further was heard from it, it was assumed that it had blown up also. The gasoline distribution system in the plane was found to be faulty and all of this model were being recalled for modification. Under these circumstances, I felt that we had had a very fortunate trip covering 20,000 miles.

AT San Francisco I contacted Major General Gilbreath, the Port Commander, and discussed with him and with Admiral Cross of the Navy, who handled shipments of Navy supplies and equipment, some of the problems encountered during my trip throughout the Pacific areas. With General Gilbreath and Admiral Cross I established an agreement that they would create their own local board to cooperate with the Army and Navy commands of the Pacific in priorities of ships, priorities of loading, the rate of flow of ships into the Pacific, procurement of food for the civilian populations, and priorities therefor. (Later I was to find that this did not work out so well, but at least we made a great improvement, particularly in regulating the flow of shipping into congested harbors in the South Pacific.)

I contacted General Somervell in Washington by long distance and gave him a brief report of my arrival and informed him that I was coming on to Washington.

In the last issue we announced by error that this would conclude General Lutes' series. Not so at all! In the next issue we hope to give you his story of the supply build-up for D Day and the invasion of Europe.—Ed.

# The SP Platoon Supports A Combat Patrol

**By CAPTAIN B. B. SMALL**

THE type action to which the AAA AW platoon has been committed in Korea during the "sitting war," is reasonably well illustrated by an action in which 1st Lt. Joseph Kotch, formerly platoon leader, First Platoon, Battery A, 82d AAA AW Battalion (SP), participated last winter. It is at any rate, a possible indication of the kind of service which may be expected of the SP AAA AW unit by infantry commanders, who after all, usually make the basic tactical decisions for the small SP unit supporting them in their ground actions.

At the time, Lt. Kotch's platoon was supporting the 23d Infantry Regiment of the Second (Indianhead) Division. Kotch was then a veteran of ten months service in Korea, having been assigned to the 82d while that unit fought in the Second Division's famous holding action before Wonju in January 1951, the subsequent February battles at Hoensong and Chipyong-ni, north of Wonju, the "May Massacre" (Battle of the Soyang River), and the "Bloody Ridge" and "Heartbreak Ridge" campaigns of the early fall of 1951.

From the middle of October following the "Heartbreak" campaign, until the middle of December, the infantry regiments of the Second Division went into Eighth Army reserve for replacements and the inevitable training. As usual, the division artillery remained on the line, continuing to work by giving direct and general support to other X Corps units engaged in the limited offensive being prepared to cross the Pukhan River, which occurred in mid-November 1951. The AAA which had been used in support of infantry tasks was turned over to the field battalions or sent to "castle guard" posts well in the rear, where they remained, also "resting" until the end of the reserve period.

In mid-December, the infantry was called out of reserve and committed in the Kumhwa area of Central Korea, somewhat west of their previous sector, covering the front previously held by the 25th Infantry Division. The 23d Regiment replaced the 27th (Wolfhound) Regiment which had been in place for some three months. As a result of this relief, the 23d assumed responsibility for a front of some 6000 meters along the fringe of the foothills facing the immense enemy-held mountain, Hill 1062, which dominates the area known in an earlier phase of the war as the "Iron Triangle."

ENEMY activity since July 1951, had consisted of small three to five man sorties against our OP's or exposed main line positions, with an occasional probe of platoon size or smaller. These occurring, almost without exception, during the hours of darkness. Sporadic artillery fire, usually of 75, 76.2, 105, and 122 millimeter calibers, were received as the principal, but irregular, daytime opposition. The industry of the enemy had not been fully exploited until the Second Division Artillery entered the area in the middle of December and began turning its observers loose on bunker destruction missions. After being shelled most of the day, it was found that the Chinese could work most of the night repairing the day's havoc, and this became the pattern of life for the CCF "Volunteers" facing the Second Division before Kumhwa.

Thus, since July, the sector had been quiet, but the day the 23d took over, incoming artillery began for the first time in three weeks, giving further credence to the hard-luck reputation earned by the Indianhead Division. Several days later additional evidence developed to confirm further this reputation. Colonel Adams, the commanding officer of the 23d Regiment was inspecting his front-line positions with 2nd Lt. G. H. Vonderschmidt, whose AA platoon was supporting the 23d, when some dozen or so rounds of enemy artillery fire came in, wounding both officers. These rounds were identified by fragments to be U. S. type projectiles, somehow obtained by the Chinese. This was Vonderschmidt's first day and first hour of combat. It was nearly two months later that he returned to duty with the 82d.

Following Vonderschmidt's injury, Lt. Kotch, who had been battery executive officer, was placed in charge of all M16 half-tracks assigned to support the 23d Regiment. This meant the eight M16's in his platoon (he had no M19's), plus the six additional M16's organic to the infantry regiment. These organic M16's had been specially authorized in Korea because of the great successes with them in the early stages of the war, and were assigned to the regiments' heavy weapons companies at the rate of two each. As a point of interest, these weapons were a continual headache to the regiments as far as crewing and repair were concerned. Eventually, in the Second Division, maintenance of the tracks was made the responsibility of the regimental tank companies, but still there remained many problems which could not be handled by the regiments, and the AAA battalion was frequently called upon for help in training and the actual performing of mechanical adjustments and repairs.

The positions on the line for all fourteen of these tracks were selected with minimum regard for AA fields of fire, but with maximum grazing ground coverage. Assigned sectors were calculated to overlay adjacent tracks and each weapon was assigned a prearranged firing direction in the regimental FPL fire plan. In view of the M16's contributing the greatest volume and effectiveness to the FPL fire, the regimental S3 received recommendations from Lt. Kotch, but under the regimental commander's authority, picked the firing positions himself.

Kotch made his headquarters at the regimental CP, where he would be easily available to the regimental commander, leaving his widely dispersed tracks under the control of the local infantry company commanders. Each morning Kotch attended the regimental commander's briefing, hearing the staff reports, making one himself if appropriate, and receiving the colonel's orders for the day. During the remainder of the daylight

hours, the time was spent checking and inspecting his tracks and their crews along the line. During darkness, friendly movement was held to a minimum, so he usually had a good night's sleep in his hexagonal arctic tent back at the regimental CP—unless there was some action being planned which required his presence in organizing.

As far as day-to-day living conditions, the crewmen of Lt. Kotch's tracks did not have it quite so comfortable in comparison. Their posts were occupied twenty-four hours a day and the tracks usually stayed on the line as long as, or longer than the infantry company they were supporting. Periodically, with no assurance of regularity, the tracks would be pulled out of the line to rotate in jobs such as guarding the field artillery positions, which was reasonably safe and meant three hot meals per day. On the line they usually ate two hot meals carried up by the infantry company messes in insulted cans, and the third—"C" rations. Their positions were dug in within 1000-1500 yards of the enemy's positions which were on much higher ground. They were periodically shelled during daylight, and occasionally probed during the night. While the infantrymen had the dubious comfort of a bunker from which to fight, the AA crewman had, as always, only the open-top bucket of his carriage as scant protection and a big target from which to do his work.

Enemy activity permitted only sporadic firing until the 23d of December. On this date, Gen. Haydon L. Boatner, assistant Second Division commander, who had temporarily assumed command of the 23d RCT after Colonel Adam's evacuation, directed two combat patrol actions be performed.

Essentially the plan proposed sending two simultaneous platoon-sized groups against two enemy outpost positions, each held by some unknown, but small-sized group of CCF, probably less than a platoon in either case. These objectives were Hill 400 and "Gillis Island." (See Figures 1 and 2.) The mission of each patrol was to overrun its objective, kill or capture the defenders, destroy as many bunkers as possible and then to return. One platoon of tanks from the 23d Tank Company was scheduled to support each of these two raids. In the action on "Gillis Island," five tanks were to carry the infantry within small arms' range of the objective and

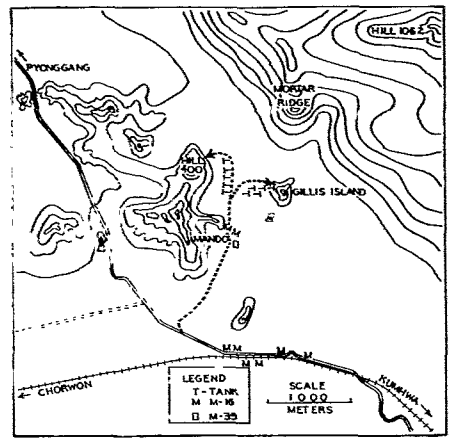



Figure 1

then to precede the foot soldiers onto the "island" where they would combine again to carry out their mission.

Over to the west, an infantry platoon from a second company was to carry out the same operation on the top of Hill 400. From the map of Figure 1 the reader will see the closeness of this hill to the friendly outpost which held the knob just northwest of the village of Mando and approximately 900 meters south of Hill 400. In spite of this proximity and continuous artillery bombardment, the enemy continued to man Hill 400, resisting the artillery pounding which had pulverized their position, by taking refuge in deep cave-like shelters which led off from the bottoms of their firing trenches. The platoon going up "400" had the more difficult assignment both as was anticipated and as it turned out.

The mission of the AA was to furnish continuous AW fire on the general area of "Mortar Ridge" in order to interdict enemy observation and direct firing of SA and AW weapons from certain bunkers which dominated the two objectives and their approaches. The plan ordered Lt. Kotch to displace two M16's to the end of the long hooked nose of no-man's land just north of the village of Mando in order to bring his tracks into effective firing and observing ranges. Although no friendly troops were within 800 yards of the tracks' position, they were strongly and securely situated because of the presence of the infantry raiding parties to the front and right front, and the existence of the friendly outpost on the hill to the left. The tracks were under good friendly observation from the rear and that direction was secure. The remaining tracks, from their positions along the MLR, were to deliver heavy harassing fires on the same target area on call. Several of these tracks did displace from positions far down on the east flank, where they would otherwise be incapable of firing, parking along the road paralleling the railroad to deliver their fires from ranges of 2000 yards or more.

The action was to be carried out at dawn coincident with a diversionary armored thrust up the valley to the west, to be made by elements of the divisional tank battalion. This thrust was not under the control of the 23d and was not phased in any way to the raids except that it was to begin at the same time. This tank force had the independent

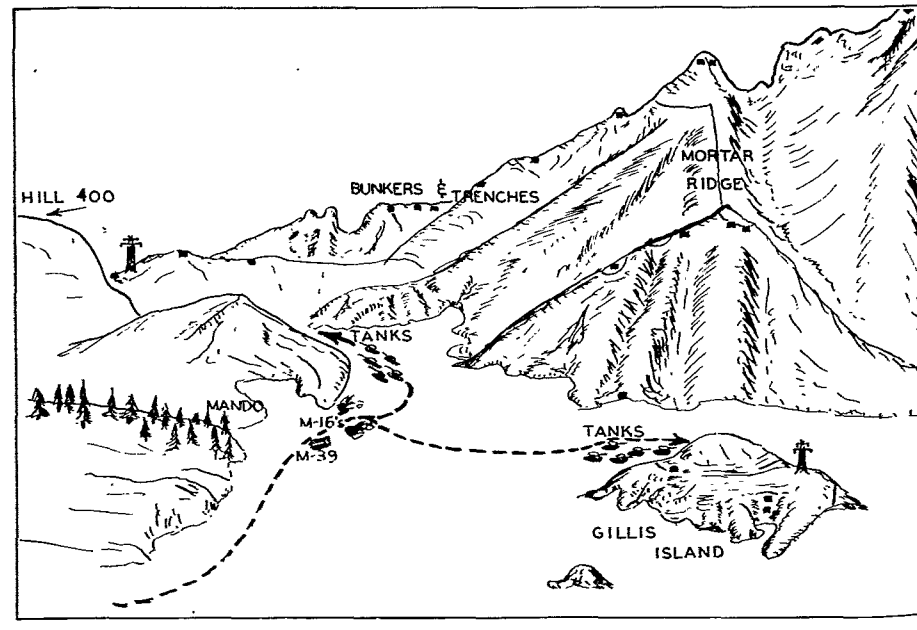



Figure 2

mission of its own to push a few kilometers up the road leading toward Pyonggang, firing on such targets as appeared on the hills northwest of Hill 400, doing as much damage as possible and returning. No infantry accompanied this force.

Just before dawn, the 23d Regiment tanks pulled out of their assigned main line positions, and without any preliminary assembling, headed out the road to Mando. As it became light, the five tanks proceeded well out into the valley, stopping occasionally to fire their 76's and machine guns for their own cover. Eventually, they jockeyed into a rough line facing Hill 400 from the east as indicated in Figure 1. The platoon of infantry was meanwhile moving past the hooked nose to the north of Mando in order to approach its objective from the northeast, the men in a long single file, well separated. To ascend the hill from this direction, the reader will see that the force had to turn their backs on the enemy MLR and the interlacing fires from a score of bunkers. It was the AA's job to neutralize these bunkers by a continuously heavy volume of searching and traversing quad—.50 fire.

The other half of the operation, the "Gillis Island" raid, also began at dawn, with the infantry scrambling on the sides and backs of five other tanks which proceeded northward and then eastward to the edge of their objective. The tanks were to maneuver behind "Gillis Island" and then sweep roughly southward over it while the infantry followed, gathering all the Chinese willing to surrender and killing all others. This group also was liable to receive AW and long range SA fire from positions higher up on the enemy hills behind them.

Lt. Kotch had operational control of all the tracks along the line through the use of the SCR 508 radio in his command vehicle. He gave instructions to them to fire overhead covering fire at known enemy OP's and strong point areas from their ML positions. Ranges of some of these targets approached 3000 yards. Although this is a great distance for fire to be adjusted accurately, API ammunition loads in various combinations were used, making the problem not so difficult as it might seem. The API bullet bursts upon striking rocks or other hard surfaces, and adjustments were easily made from these impact flashes.

In view of the importance of the forward position for two of his tracks, Kotch displaced with them, despite the presence of the bulk of his tracks back on the main line. He took his M39 with him, controlling his entire unit by radio from his forward position.

As other elements of the first task force went out, Kotch formed up his three tracks and trailed the last tank to his firing positions, where he broke trail, parking his M16's in the open field beside the hooked nose, as indicated in the figures. By this time, the second force of tanks bearing the "Gillis Island" infantry passed through the M16's. A short time later after both patrols were well removed toward their objectives, the enemy placed moderately heavy mortar fire of mixed 60mm and 81/82mm calibers, on and around the AA position. No casualties resulted in this initial barrage, although it was extremely close to the tracks. One round of 60mm mortar fell within 15 yards of the M39, but fortunately, Kotch was standing beside one of the M16's directing its fire, and the other passengers of the M39 were carrying ammunition from it to one of the tracks. The bulk of the rounds fell behind the hook-nosed hill, from two to four hundred yards from the tracks. The enemy evidently thought the area was being used as an assembly point and that additional troops might emerge. There were no other troops in the draw, however.

Lt. Kotch's tracks began firing sometime before 0800 hours and continued until approximately 1030 hours. During this time the entire platoon placed over 100,000 rounds of .50 caliber on the Chinese positions. No difficulties arose which were not routine in the operation of any machine gun. Ammunition was resupplied to the forward M16's by the M39 which was taken out fully loaded and which made one trip back during the action. Ammunition for tracks firing from the rear positions was stocked in advance in anticipation of the operation.

During the firing, target designation was handled two ways. First, by voice commands given at each track and secondly, by tracer from the single caliber .50 mounted on the M39. Kotch moved from one track to the other during the engagement, adjusting the fire by voice and hand signals. The radio was used to control the fire of the tracks to the rear. For these, targets were designated by reference to terrain features using the popular names developed by the infantry as a convenient code for most of the prominent enemy-held points. (These names were handed down from the 27th Regiment in the beginning and were added to as necessary.) It was decided in advance that the time for opening fire of the tracks in the rear was to be on order and was then to be continuous harassing coverage until cease fire was given.

The quantitative results of the AA portion of the operation could not be evaluated since the infantry objectives were not into the areas where the AA coverage was laid. Qualitatively, the action was deemed successful. Both friendly groups reached their objectives, and although no prisoners were captured, nearly twenty enemy were claimed killed by the assaulting squads, including two on Hill 400 who clutched exploding grenades to their bodies rather than submit to capture. Friendly casualties totaled eight—considered light in view of the aggressiveness of the operation. Three friendly tanks became bogged down in a ravine on the north end of "Gillis Island" and were abandoned when the troops pulled back. Two of these tanks were recovered several days later in subsequent operations.

It is certain that the AA portion was adequately handled, when the entire operation is considered. The nature of ground support teamwork demands that we not attempt to evaluate independent successes. In the ground support role, the AAA AW units are part of the combat team, and the success of the team is also ours, and so it was in this case.

Actions such as Lt. Kotch's, perhaps involving a greater number of tracks on different terrain, against NKPA rather than CCF enemies, presenting more vigorous resistance or less, or in some other ways slightly different, can be multiplied by the number of SP platoons in Korea, but essentially the mission of the SP AA in any ground support remains the same—to provide an easily movable base of fire, around which, or under which, the infantry will most certainly be enabled to move.

This multitude of small tight battles has made the AAA AW soldier in Korea, like no other artilleryman, excepting the forward observer and his party, accepted by the infantry as an equal partisan, into which fraternity, the AA man can enter with a clear conscience.

## Journal Merger Proposal

THE proposal to merge the ANTIAIRCRAFT JOURNAL with the *Combat Forces Journal* is up again. The discussions have been conducted entirely on an informal basis; however, they have already led almost to a complete agreement between the two association councils.

Lieutenant General Lyman L. Lemnitzer, Association Vice-President, has headed up the discussions for us. He has been assisted by Col. N. E. Hartman, Lt. Col. F. X. Bradley, and Major J. E. Calkins, members of the Executive Council, and also the following association members:

Maj. General Wm. F. Marquat, GSC
Brig. General Homer Case, 35th AAA Brigade
Col. C. M. Boyer, Executive Director, ROA
Col. Joe D. Moss, GSC
Col. O. Thomas Forman, GSC
Lt. Col. G. V. Selwyn, 260th AAA Gp. DCNG

Two years ago the Infantry and the Field Artillery Associations merged to form the Association of the U. S. Army and in August 1950 began the publication of the *Combat Forces Journal*, as a voice for the Army as a whole and particularly for the combat forces. Their invitation to all components, branches and services to join in the undertaking resulted in favorable response and splendid progress.

Although the Antiaircraft and Armor Associations declined to merge in 1950, our council did not slam the door. In fact, the subject continued to attract primary attention at every meeting. Mindful of the splendid history and prestige of our JOURNAL since 1892, and its very definite contribution to the spirit and high standards of the Coast Artillery and Antiaircraft, none of the council were willing to discontinue it unless and until equitable terms for a genuine merger in a combined journal were worked out. However, weighing all considerations the council concluded then that if the provisions for a genuine merger could be worked out harmoniously, it would serve to further teamwork and esprit in the Army and that the over-all advantages to be gained would outweigh all others.

Added impetus was given to the merger proposal in August when General John E. Hull, Army Vice Chief of Staff, assembled representatives of Armor, Antiaircraft, and U. S. Army Associations together and pointed to the need for the Army to have a strong association and a journal devoted to the Army as a whole. The Navy, the Marine Corps, and the Air Force each do have such an association and a journal, and to their advantage.

Seeking voluntary action only, Gen. Hull invited the associations to negotiate with a view toward solidifying and strengthening the support behind the Association of the U. S. Army and its monthly magazine, the *Combat Forces Journal*.

As a result our Executive Council has almost reached an agreement with the Executive Council of the Association of the U. S. Army on merger terms which appear to provide for an equitable and harmonious merger.

Among other things the terms provide that:

*All members of our Association become full members of the Association of the U. S. Army.*

*(Continued on page 23)*

# BALLOT

## UNITED STATES ANTIAIRCRAFT ASSOCIATION

**The President and three members of the Executive Council are to be elected on this ballot, to replace officers whose terms of office expire December 31, 1952.**

**Please record your vote by making an "X" in the appropriate square or indicate your choice by writing the name of your candidate. Ballots received with signatures, but with no individual votes recorded, will be considered proxies for the President of the Association.**

**Each candidate was considered in connection with the geographic location of his residence. The Constitution of the Association requires that at least five members of the Council reside in the Washington area, and that at least three of them be on active duty, in order to facilitate the transaction of business.**

**Ballots received after December 31, 1952, cannot be counted.**

**Use the ballot below or prepare one to indicate clearly your vote. Mail to the ANTIAIRCRAFT JOURNAL, 631 Pennsylvania Avenue, N.W., Washington 4, D. C.**

### FOR PRESIDENT (1953-1954)

☐ Lieutenant General John T. Lewis,
Commanding General,
Army AA Command.

☐ _____

### FOR MEMBERS OF THE EXECUTIVE COUNCIL

#### From National Guard (One Member)

☐ Brigadier General Charles G. Sage,
Adjutant General, New Mexico.

☐ _____

#### From Organized Reserve (One Member)

☐ Brigadier General H. Russell Drowne,
Commanding, 300th AAA Brigade, ORC,
New York.

☐ _____

#### From Regular Army (One Member)

☐ Lieutenant Colonel George W. Best, Jr.
Commanding, 36th AAA Gun Bn.

☐ _____

Signature _____

Rank & Organization _____

Address _____

5-52

# With The Seventh Division In Korea

**By LT. COL. JAMES M. MOORE**

THE 15th AAA AW Battalion (SP) has had wide battle experience since it "hit the beach" at Inchon, Korea on September 15, 1950. Always on the move, our flak wagons have contributed potent fire power to many an infantry maneuver, either on the offensive or in tactical withdrawal. This has been a war of constant movement for all United Nations Forces; whether chasing the North Koreans to the Yalu River, beating a hasty withdrawal from the threatening Chinese Communist Forces, or re-liberating South Korea during the more recent offensives.

Operations have changed from a fluid to a static, defensive nature. Because of this situation, the 15th AAA AW Battalion (SP) finds itself performing a unique mission within the Infantry-Armor-Artillery team of the Seventh Infantry Division.

At the date of this writing on June 24, 1952, our role is, as usual, a dual one. On one hand, the battalion provides antiaircraft and ground defense for vital Seventh Division and Seventh Division Artillery installations and units. Since the enemy has not yet demonstrated its full air power in the conflict, the platoons that are performing these most important rear area security duties also allot extensive time to training for their eventual front-line assignments, which they share periodically with other platoons in the battalion. This battalion maintains both an M16 and an M19 automatic weapons ground firing range. The ranges have been constructed, as realistically as possible, to simulate actual terrain features and enemy fortifications forward of the main line of resistance in the Seventh Division sector. Enemy type bunkers, communications trenches, patrol routes and observation posts, plus theoretical targets of opportunity, at distances from the weapons approximating those on the front lines, are presented to our gun crews. These ranges promote training of maximum usefulness to the gun crews in their eventual employment in the ground role.

In addition to antiaircraft and ground defense, the battalion is rendering direct ground support to the infantry. Three platoons are presently engaged in this assignment. Our quad fifties are emplaced upon the MLR, in fortified positions. The gun crews live side-by-side with their infantry comrades.

The close and effective overhead covering fire contributed by our M16's, in support of numerous patrol actions, mine laying and clearing details, and raids for the attainment of limited objectives by the infantry, is responsible for the ever-increasing confidence in the capabilities of these weapons. In addition to this close support mission on the front lines, our M16's are delivering daily harassing and interdiction fire, the effect of which is to deny the enemy access to mine laying routes, main supply routes, and to reduce bunker building activities in the impact zone. Since commencement of the direct support and the harassing and interdiction missions by the battalion, covering a period of two months, approximately two million rounds of caliber .50 ammunition have been expended. The logistical problem of ammunition supply, spare parts, and the replacement of barrels becomes self-evident.

Recently, units of this organization engaged in ground support missions have been called upon to participate in typical Infantry-Armor-Artillery operations. These are limited in nature and consist of raids on enemy-held outposts by reinforced infantry platoons and companies. The purpose is to capture prisoners, in order to obtain information which will substantiate the identification of enemy units in contact with us, and to destroy as many enemy bunkers and installations as possible.

Although limited in nature, these operations require detailed planning and coordination with other participating branches such as:

*Route and Area Reconnaissance*

1. Whenever possible, two ground reconnaissances are made, one prior to the initial briefing and one afterward. Prior to the initial briefing, a hasty ground reconnaissance is undertaken by the battery commander, platoon leader and platoon sergeant. The purpose is to determine the accessiblity of vehicles to tactical positions, to choose fields of fire, and to determine our ability to accomplish the assigned mission.

2. After the initial briefing, a second ground reconnaissance is made to confirm previous decisions and to check any changes that are made.

3. Whenever the position reconnoitered is under observation, a minimum amount of time is spent at the position with as few personnel as is feasible.

4. Use of routes of approach to be used during the operation is coordinated with the infantry and all supporting units, particularly armor. Assembly areas are chosen with consideration given to movement from the area after darkness. All units near an assembly area are informed as to the time, place and nature of movement of our units around this area.

5. Movement from assembly area to firing position is coordinated with the movement of other units. Likewise, routes of withdrawal are chosen, and the time and order of withdrawal carefully planned and coordinated with other supporting units.

*Selection of Targets, Fields of Fire.*

1. Whenever possible, definite targets are selected in advance and individual squad leaders briefed on the spot as to their primary and secondary targets.

2. All personnel should thoroughly understand the necessity for maintaining continuous fire when it becomes necessary to reload. To accomplish this, crews, prior to the operation, practice covering fire for a track that is reloading. Automatic weapons must be placed with a purpose, not merely to deliver a high rate of fire.

*Communication*

1. Where firing positions are stationary and the tactical situation permits, wire communication, in addition to radio communication, is mandatory.

2. Wire and radio communications are established so that either method of communication can become the primary method. In each operation one form of communication is designated as the primary form, and the alternate or secondary form is so established as to enable it to become the primary means of communication, if necessary.

3. During the initial and final reconnaissance, wire routes are chosen. Consideration in choosing routes is given to establishing a two wire line communication system throughout, with lines at least 50 yards apart. Also, routes are chosen where a minimum of traffic will cross wire. In places where vehicles do cross the wire, both lines are buried. If security conditions permit, one line is strung overhead and one line buried.

4. Radio communication is coordinated with the operations commander in order to assure the proper use of radio frequencies, call signs, code words, and procedures. Close coordination prevents confusion of frequencies with tanks and other units which transmit almost continuously and entirely by radio.

5. All radios are checked twenty-four to forty-eight hours prior to the operation; and use of radios is held to an absolute minimum in order to eliminate confusion and to protect the security of the operation.

*Ammunition Supply, Resupply*

1. Ammunition supply is based not only upon the estimated number of rounds to be expended during the period of time called for in the operation order, but sufficient ammunition is also kept on hand to be used as cover fire for withdrawal of units, removal of casualties, and enemy counterattacks.

2. After loading all tracks to the maximum capacity, a resupply of ammunition is stored at the firing position, when conditions permit. In any event, a resupply of ammunition is stored at the forward control point or similar location. A jeep and trailer or command vehicle is kept in readiness at the forward control point to transport ammunition as needed.

*Briefing of Personnel*

1. It is mandatory that the platoon sergeant, section leaders, and squad leaders be completely and thoroughly briefed both as to the over-all plan and the duties of each unit. Questions are asked each man to be sure that he understands completely his duties and responsibilities.

2. Every man who participates in the operation is thoroughly briefed by his respective leader. Each man is then checked by the platoon leader and platoon sergeant.

*Weapons in Reserve*

1. Whenever M16 or M19 vehicles are performing a vital role, at least one other weapon of the same type is held in reserve and is ready for immediate commitment either to supplement the weapons already employed or to replace inoperative weapons that have been withdrawn.

2. In the event that a weapon becomes inoperative or completes its assigned mission, it is, upon receiving proper clearance, withdrawn in order to prevent undue exposure of equipment and personnel to enemy fire.

*Location of Forward CP*

The location of the forward CP is based on the following considerations:

- A maximum number of weapons and points of impact should be capable of being observed.
- Facility in accomplishing wire and radio communications.
- Facility in accomplishing ammunition resupply.

*Miscellaneous Preparations*

A supply of spare parts is stored on each track. These parts include such items as barrels, asbestos gloves, completely assembled bolts, etc. Additional spare parts are kept at the forward CP.

During these operations, the fire support rendered to the infantry by this battalion has been accomplished with a high degree of success. We realize fully that the principles we must follow to assure the success of our phase of these operations are basic. Although automatic weapons have proven themselves capable of providing effective close support for infantry, their capabilities and limitations must be kept in mind when planning their employment. Plans, based on reconnaissance, must include provisions to offset their limitations.

# THE SHELLING REPORT

**By CAPTAIN B. B. SMALL**

PROBABLY every combat soldier is aware of the shelling report, or "shelrep" as it is popularly known—and its purpose. However, at the risk of being repetitious, it might be a good idea to make sure before going ahead.

The shelrep is a standardized Army procedure for reporting enemy artillery and mortar fires, which also attempts to furnish information useful to friendly artillery agencies in locating the hostile weapons so that their fire may be returned and the enemy pieces destroyed or neutralized.

To insure completeness and to expedite the collection and transmission of the information, the Army has adopted a form, which is the same in every theater. A sample of one of these forms which was used in Korea appears here as Figure 1.

One of these forms should be carried in the pocket by each combat leader at all times he is "in the line." The AA-man, especially if he is in the divisional SP Battalion, will spend a good part of his time within enemy mortar and artillery range, and if he wants to do something about such fires, he must have an intimate knowledge of the shelling report and its techniques.

Division and corps artillery headquarters carry personnel and equipment to handle this problem of counterfire against enemy weapons. Division artillery is responsible for the countermortar effort in its own zone, and corps artillery, because it has available the heavier artillery, handles the counterbattery artillery program. The intelligence sections of these headquarters have available many sources of counterfire data, among these are: the interpretation of aerial photographs, flash and sound teams of the field artillery observation battalions, artillery battalion radars, infantry counterfire platoons, the interrogation of prisoners of war and line crossers, and most important—shelling reports.

The heart of the shelling report is its column "C"—the azimuth read by the observer from his position to the gun. Corps and division take these azimuths, plot them on grid sheets or specially prepared maps. Several such azimuths, taken from different locations, will tend to intersect at the coordinates of the enemy weapon when they are plotted. These headquarters keep on this special map, or on an overlay attached to it, all the known and suspected hostile weapons' positions as determined from all the information sources mentioned above. Whenever shelling reports come in, they are plotted and their information compared to previous data. If necessary, additional collective effort is applied (such as aerial observation), or other observers alerted. In this manner, locations of the enemy weapons are deduced and furnished to operations for counterfire action. Thus, the shelling report is the way the front-line soldier gets help when the enemy heavy weapons become active.

The shelling report form can be used as a message blank, being filled out and sent to the rear by messenger. Most frequently, however, it is used as a guide for a verbal report over the radio or telephone. When the form is followed verbally, it is necessary in the transmission to merely state the letter designation above each column instead of giving the entire heading written there. For example, on the telephone your message might be: *"This is Red Dog One, I have a Shelrep—ABLE: Red Dog One; BAKER: 632481; CHARLIE: 5800 mils grid sound; DOG: 1630 Item; EASY: Continuing; FOX: Same as Baker; GEORGE: 4 Howitzers, estimate 76.2 Mike Mike; HOWE: Harassing; ITEM: 8 HE; JIG: Unknown; KING: None; LOVE: None.*

It may be of interest to outline each of the shell report columns, giving possible entries with their meanings, and to point out the intelligence value of these entries, aside from their immediate counterfire value.

Column "A"—is for the purpose of identifying the origin of the report so that if additional information is desired, the proper contact may be made. It is especially necessary in relayed reports.

Column "B"—is necessary in the event a "sound" or "flash" azimuth ray is given. It will be the origin of such a ray. The coordinates should be as exact as possible, so that any plots of the azimuth will be correspondingly accurate. The

SHELREP, MORTREP, BOMREP (State which) DA-TC-6 FEB 51

| A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FROM (unit, use current call-sign or code-name) | POSITION OF OBSERVER (map reference preferred (code if map reference is used) | GRID OR MAGNETIC (state which) BEARING (or azimuth of flash or sound or groove of shell (state which) in mils or degrees (state which) (omit for aircraft) | TIME FROM | TIME TO | AREA SHELLED MORTARED OR BOMBED (clear map reference preferred) | NUMBER AND NATURE OF GUNS, OF MORTARS, OR AIRCRAFT | NATURE of FIRE (registration, bombardment, harassment, etc.) (omit for aircraft) | NUMBER AND TYPE OF SHELLS BOMBS, etc | TIME OF FLASH TO BANG (omit for aircraft) | DAMAGE | REMARKS |
| 發 送 者 及 時 間 | 觀測者의 地 圖 位 置 | 彈 種 方 位 角 | 開 始 時 間 | 終 結 時 間 | 砲 擊 의 地 域 | 火砲迫擊砲의 種類及數 | 射 擊 의 種 類 | 彈丸의 口徑種類及數 | 破裂閃光의 發見時間 | 被 害 | 備 考 |

Figure 1—Shelling Report Form

use of survey methods can seldom be followed in combat, but the observer should get his coordinates by close inspection to accurately located map points such as bench marks, road junctions, bridges, etc.

Column "C"—has three distinct parts to consider. First, is the azimuth "grid" or "magnetic"? Artillerymen's compasses are usually declinated and read *grid* mils, while the infantrymen's usually read *magnetic* degrees. Second, is the azimuth given derived from the *flash* of the gun, the *sound* of the gun firing (or the sound of the projectile in flight), or is it the result of an inspection of the crater, that is, *groove*? To avoid confusion in this column, the type of azimuth must be specified (*flash, sound,* or *groove*), whether it has been measured from map or magnetic North (*grid* or *nagnetic*), and the third point cleared up, that is, the type of measurement used (*mils* or *degrees*). As far as the type of the azimuth, the "sound" is the most common. Weather, terrain, and battlefield noises tend to change the direction ascribed to the sound and it is therefore not too accurate. It has one advantage however, in that the observer need not expose himself unduly to secure it. It is therefore the most common initial report. The "groove" azimuth can be read with much greater accuracy, but requires venturing into the impact area in order to be obtained. It is therefore delayed in collection until the shelling is finished in most cases, although some hardy reporters, enjoying the acrid powder smell of a hot crater, get there quickly enough to tell of fuzes and fragments "too hot to hold."

Columns "D" and "E"—should be accurately given according to the standard time so that one shelling report may be tied in with another taken from a flanking position. If shelling is particularly heavy in the sector, the exact time may be required to discriminate between different shellings.

Column "F"—is self-explanatory in so far as the information desired is concerned, but it can be very important from an intelligence point of view. The information given in Column "F" may tell whether or not the enemy is using observation to adjust his fire; it may indicate that he himself is using shelling counterfire techniques; it may show his dependence upon map data rather than observation; or an analysis of the areas shelled may reveal preparations for an attack or the checking of defensive concentrations, or many other things. It may give an idea of the importance the enemy attaches to certain types of targets (and accordingly which of our operations have inflicted the most serious damage on him). It may tell something of the availability of supply of his artillery or mortar ammunition. A close study of areas shelled is always most rewarding.

Column "G"—can be determined by the time between bursts which have come in. If several rounds come in almost simultaneously, a count may reveal the number of weapons firing. The caliber of the guns may be determined by the experience of having heard that type of explosion before, or best, by identification of the fragments taken from the crater. The usual initial identification if one is uncertain is to specify a class and caliber, but to state that it has been "estimated."

Column "H"—is entered with descriptive classes of fire; "area," "counterbattery, -OP, etc.," "registration," defensive," "interdiction," "harassing," "precision destruction," "screening," "contamination," "time," etc.

Column "I"—the several types of shells which might be numbered are: high explosive (HE), white phosphorus (WP), smoke, propaganda, or perhaps the CBR series. Fuze data should also be included here, i.e., time, or variable time (VT), and fuze quick or delay, if known. The type shell being used by the enemy may tell what he is trying to accomplish by the shelling. For instance, if the initial round is smoke, followed by HE, it is a good guess that the enemy is using observed fire and the observer is at such a distance that it is difficult to see his target. The number of shells used may indicate the degree of importance the enemy lays to a particular target and even the amount of ammunition available to him.

Column "J"—is used only when the flash of the gun firing has been picked up and a time to the sound of the explosion has been measured. This can be used to calculate the distance from the observer to the gun. The rule is: Time elapsed "flash" to "bang" multiplied by 400 equals the range in yards to the piece. Such a distance and an azimuth can definitely fix a location by the polar coordinate system. (Note: the time "bang" to "bang," that is, from the detonation of the piece to the explosion of the projectile, has too many variables to be of much use. It should be collected if available, though, since it may serve to distinguish between weapons which may fire on the same area at some succeeding time, or it may discriminate between a low and a high velocity weapon. It cannot, however, be used to determine the distance to the piece firing unless exact (and unavailable) information concerning the muzzle velocity and trajectory of the weapon in question is known.)

Column "K"—gives a shelling report priority. The more damage being done to friendly forces, the faster the report is acted upon and the more friendly artillery that is fired in the counter program.

Column "L"—is for remarks of any sort. It usually includes information about the friendly activity going on at the time the shelling occurred, any sequence or order to the shelling, or any other information which might contribute to the understanding and analysis of the shelling and its effect.

Getting back to directional azimuths, the "flash" azimuth is not frequently obtained except during darkness or conditions of little light. In Korea, the enemy has refrained from firing excessively at night for the reason that it does give away his positions. If seen, flashes may be of two sorts: "pinpoint" (i.e. muzzle blast) and "sky glow" (the diffused, reflected and refracted illumination seen above the terrain mask behind which the gun is firing). Flash azimuths are measured best with oriented observing instruments, but can be handled with ordinary compasses if the flash is referred to some well-defined feature.

It is often impossible to see or hear enough during a shelling to get either a flash or a sound direction, so it is fortunate that there is yet another method. This is the "groove" azimuth. The groove azimuth is a directional obtained by deduction, using as a basis for consideration, the physical traces left on the ground and nearby objects when the shell bursts. The groove azimuth has certain advantages over the other two

and has intermediate accuracy between the sound and the flash techniques. First, the groove analysis can be deferred until after the shelling has ceased, since the traces of the craters remain for sometime providing they are not tampered with or weathered away. Shelled areas may therefore be systematically covered and a larger number of directionals obtained. This is important in view of the enemy's frequent practice of firing on a target from several different positions at the same time, in order to confuse our sound equipment and locating techniques. Secondly, aiming circles and other azimuth instruments can be used for more accurate readings.

There are also some disadvantages in the groove technique, the principal one being that the information obtained is old and the enemy may have moved or taken other passive defensive action with respect to the position. Another disadvantage is that the basis of the crater azimuth measurements is the assumption that shell bursts follow a typical pattern. There are innumerable conditions which influence the appearance of a shell crater, and only an experienced and open mind can read their true meaning.

Assuming normal conditions of soil, vegetation and terrain, there are only several rules to apply to read a direction from a crater, however. First, the pattern of any burst depends upon the terminal speed of the projectile and its angle of impact. For example, assume that an artillery shell is exploded while lying at rest on its side. The long cylindrical shape causes most of the fragments to be shattered sidewards and the principal scarring effect on the ground will be to the sides, with smaller damage to the front and rear. This same projectile, exploded upon impact with the ground while being in rapid motion, will show a burst pattern altered proportionally to the two factors mentioned above, i.e., the speed of travel and the aspect of the projectile with reference to the impact surface at the moment of the explosion. As the speed of the projectile increases, the side spray from the projectile tends to be thrown forward by the flight inertia of the shell, and the more "V"-shaped becomes the effect pattern. See Figure 2.

The angle of impact has the same effect. The nearer the angle of impact to 90 degrees, the less forward motion along the impact surface is given to the bursting fragments, and consequently the less pronouncedly "V"-shaped will be the side spray. When the projectile falls exactly perpendicularly, the crater should become perfectly round. This is seldom the case, so most craters are ovals with the longer diameter of the crater perpendicular to the line of flight.

It is this forward motion pattern, reflected in damage to vegetation, scarring of the ground, or the throwing out of blackened powder residue (especially noticeable on snow cover), which is used to determine crater azimuths. When weapons are fired at high angle, the projectile's impact explosion pattern becomes oval and direction cannot be determined from any side spray. However, advantage can be taken of the oval shape by noting that the shorter diameter of the oval points along the axis of the shell and that this also indicates the direction of flight.

The traditional system of crater analysis instruction divides the craters into four cases as a convenience in reading azimuths from them. These are: *ricochet, fuze quick, fuze delay,* and *mortar* craters. The four cases and some information on how to handle them appear in the diagrams of Figures 3a to 3d. FM 6-130 is the original source of these diagrams and should be consulted for additional information.

Many craters, because of ground conditions, do not result in the typical pattern and it is often not possible to read an azimuth from the spray pattern, making it necessary to choose another crater or to use another technique. The best of these alternate techniques is the analysis of the location of the nose fuzes of artillery shells and the nose fuzes and tail fins of mortar rounds.

In the case of the artillery nose fuze, it is a good idea to determine azimuths from the center of the burnt inner crater to the *entrance* of the fuze tunnel rather than where the fuze is found, or rather than using the fuze tunnel itself. There is always the chance that the fuze has drifted off in the direction of rotation as it passes through the ground, making its final resting position not in line with the actual line of flight.

Sometimes a visual inspection of the crater will tell several interesting things about the shelling and such an examination should be the first step in any analysis. Definite conclusions may be specious if based upon just one factor, but confirmed by other indications, the following points can sometimes be useful.

One, the depth of a crater is proportional to the velocity of the shell, the penetrability of the impact surface, the angle of impact, the amount of explosive delivered, and whether or not a delayed fuze was used. This assumes common HE-type shells not employing the device of the shaped charge which gives craters disproportionately deep in the direction of focus. The most important proportionality here is that relating to fuze selection. Craters less than half as deep as they are wide, are probably the result of quick fuzes. Craters that are very nearly as deep as they are wide are probably delay.

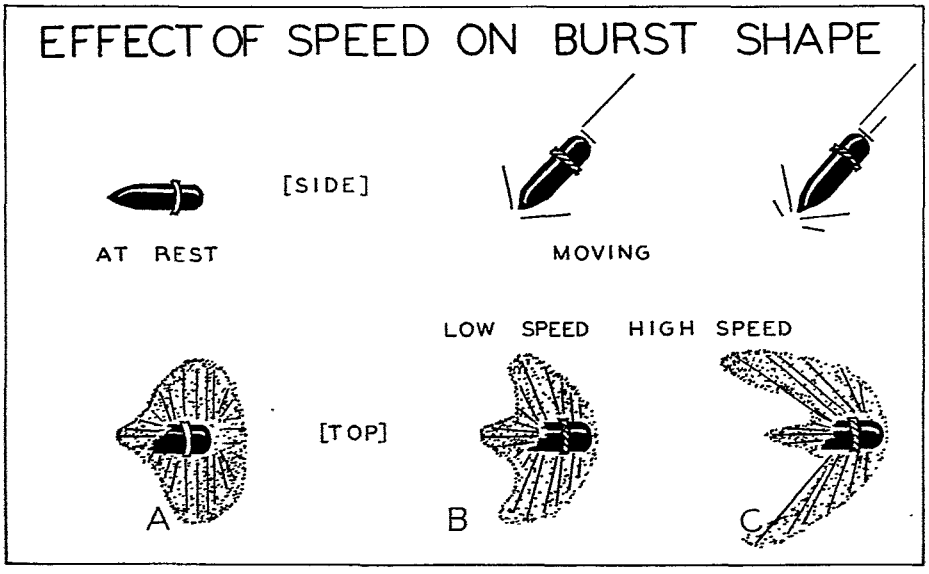



Figure 2—Effect of Speed on Burst Pattern

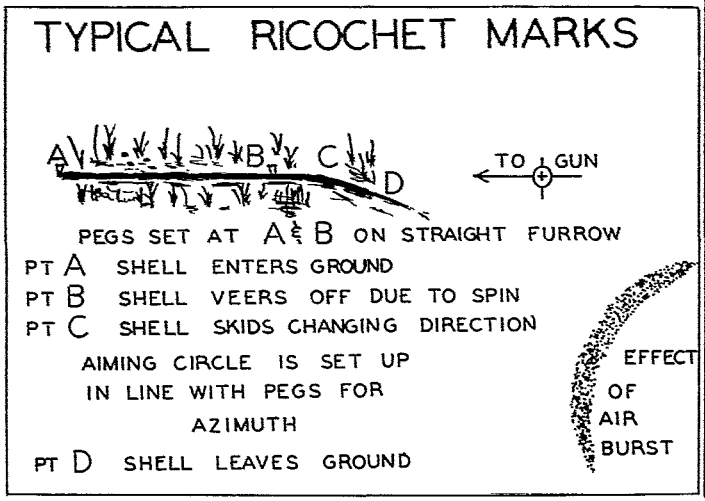



Figure 3a—Typical Ricochet Markings

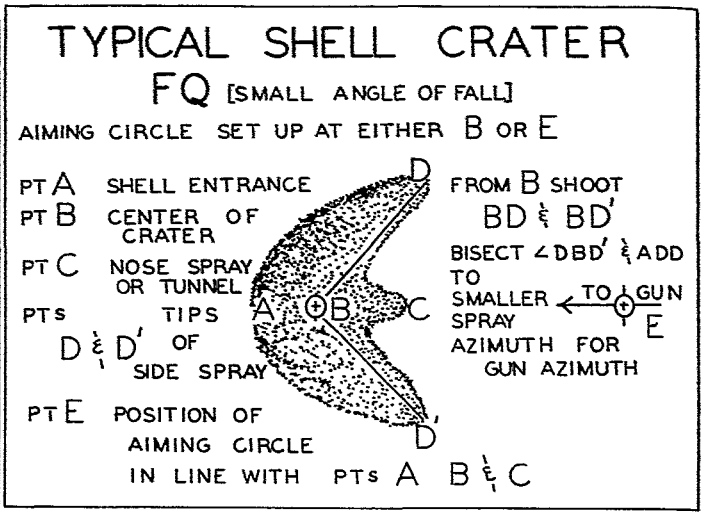



Figure 3b—Typical Shell Crater (FQ)

Two, the width of a crater is proportional to the amount of explosive and thus also the caliber of the weapon. The nature of the ground has a great deal to do with the size of the crater, but in normal ground craters approximating a yard or less in width are probably the result of light weapons (57mm, 75mm, 76mm, 76.2mm artillery or 81mm or 82mm mortars or smaller). Craters from one to two yards wide fall in the range of 105mm, 122mm, or 155mm calibers of artillery and the 4.2 inch, 107mm and 120mm mortars.

The only certain method of determining caliber is by identifying fragments taken from the crater. Here again there are some general rules but these are not 100 per cent indicators. The best rule is to be ready to be proved only by the weight of several confirming indicators.

First, the size of fragments: Long slender fragments are typical of artillery. Fragmentation is somewhat dependent upon the quality of the metal used as well as the efficiency of the explosive. Artillery shells tend to have better metal in United States manufacture, as compared to foreign types; this causes the U. S. types to fragment into smaller pieces in general. Soviet and Chinese mortar casings are made of coarse grainy castings (or have been in Korea) which tend to fragment in chunks rather than slivers. Generally the thickness of fragments will give a rough indication of caliber when dealing with artillery. Fragments around three-eighths inch thick are probably in the 75mm class; fragments a half-inch to five-eighths inch, probably of the order of 105mm; fragments seven-eighths inch or more, 155mm or larger. Mortar fragments do not appear to follow this thickness rule.

The number of fragments: The larger the caliber, the larger the number of fragments to be found in and around the crater.

The curvature of fragments: Determination of the caliber from curvature of the fragments is almost impossible in the case of artillery fragments since they are usually viciously distorted in detonation. Some foreign mortar casings are made of cast metal and tend to break apart rather than splinter. Sometimes these pieces will retain their original shape on their surfaces. Measurement of these fragments, if a piece can be found exemplifying the maximum diameter of the shell, can sometimes give excellent results.

Keying underneath the rotating band: Both on the underside of the rotating

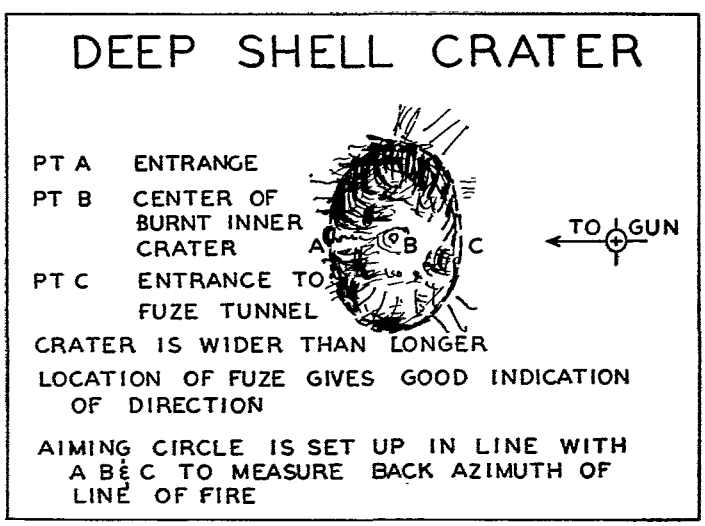



Figure 3c—Deep Shell Crater

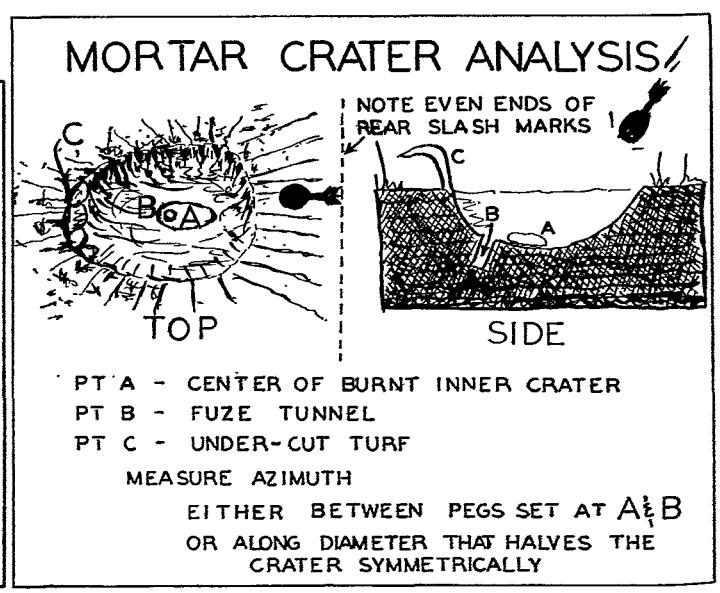



Figure 3d—Mortar Crater Analysis

band itself and on the body of the shell will be found a peculiar keying marking used to keep the rotating band from slipping about the shell as it is fired through the tube. This marking consists of small lugs, teeth, grooves, wavy lines, cross-hatch marks and indented or raised marks of many sorts. These marks are usually distinctive for the different types of shells and can be used as a definite indicator of caliber. See Figure 4.

Width of rotating band and land and groove marks: The width of the rotating band is usually a reasonable corollary of the caliber. Most frequently this band is not found in large pieces and it usually is distorted beyond any measurement. When available, however, the marks of the lands and grooves appearing on it can be used to identify the caliber and may also tell whether the projectile was fired by a howitzer or a gun. The gun usually having more lands and grooves than the howitzer of the same caliber. Lacking other identifying marks, the height, width and number of the lands and grooves may identify the caliber of the weapon, but this is usually a job for the Ordnance Technical Intelligence Detachments. The left or right-handed twist of the barrel can be determined and is an aid in identification.

As far as the width of the band is concerned, a three-quarters inch or wider band will usually be found on shells of 105mm or larger. A band one-half inch or so wide is probably in the 75mm class. The band width is usually proportional to caliber. This rule breaks down in the case of high velocity gun projectiles, where to achieve the greater velocities, high pressures must be sealed against, and wider rotating bands are used. Some foreign high velocity projectiles use double bands to achieve the better seal. In ordinary howitzers this rotating band to caliber proportionality does hold.

Mortar tail fins: In and around the majority of mortar craters (excepting the spin-stabilized types), the round's tail fin will be found. Or at least parts of it will be, and usually lying in plain sight. In view of the low speed of the mortar round, this tail fin is seldom damaged to any great extent. Since the tail fins are constructed to guide the round through the tube in firing, a measurement of their maximum spread will usually give the caliber of the mortar in the event the fins are not of a common type recognizable from their general appearance.

Nose fuzes: The nose fuze is very helpful in identifying projectile classes, but since the same fuze (with or without adapters) can be used in several projectiles, it is not a sure way to determine caliber. Lot numbers and other markings on fuzes can reveal important intelligence data. Fuzes should be collected even though identification of the projectile is possible without them. In digging out the fuze, the initial crater azimuth can be verified and so the sometimes tedious work is worthwhile. It is to be noted that nose fuzes can be of many materials. U. S. types tend to be of aluminum and brass; Chinese of brass and sometimes plastic; Soviet, usually of steel.

Shelling reporting has many sources of errors but they all eventually rest upon the susceptibility of humans to arrive at incorrect conclusions. Several, however, should be emphasized. One, indistinct spray patterns may cause improper selection of direction indicators. Careful inspection and prohibition of tampering by unauthorized persons will help here. Two, the substitution of rationalized data for actual fact sometimes causes errors. For example, in World War II, every European Theater soldier wounded by artillery was certain he was hit by an "88." In Korea, the *idee fixe* was the "SP" or perhaps the "120 mortar." It is surprising how many soldiers can identify the "SP" without ever seeing the weapon's carriage. Close questioning of the reporter will usually straighten out such classifications. Three, the best information is that obtained quickly. Unfortunately, when the observer is being subjected to artillery fire, his ability to assemble and report information quickly is somewhat affected by certain personal interests of his own. Few initial shell reports are completely accurate. Whoever is receiving the information in the rear can encourage the reporter by asking specifically for the missing information. The use of the shell report blank at both ends helps here. And last, the old bugbear, map reading, often causes disastrous errors in reported locations. Connected with this, slowness in handling the compass may cause errors in interpolating between swings of the needle. Both of these points usually solve themselves after a little while in the field.

Figures 3a to 3d give some pointers

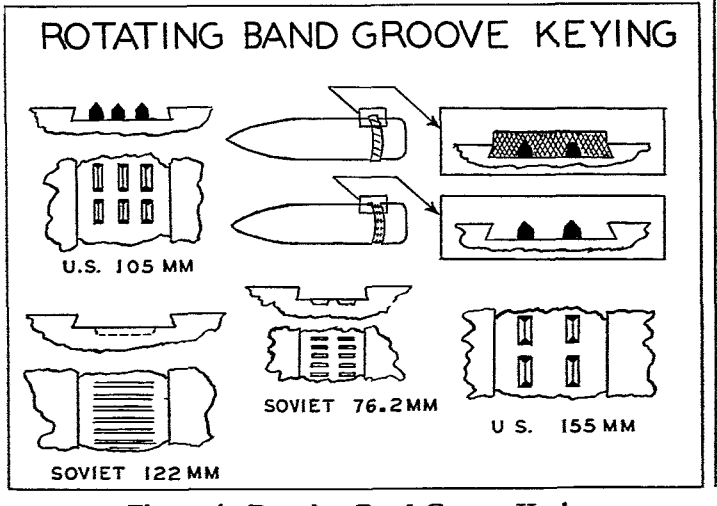



Figure 4—Rotating Band Groove Keying

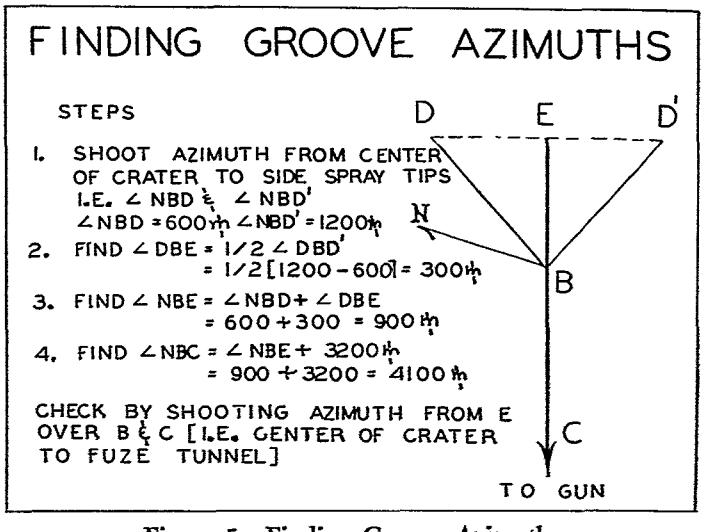



Figure 5—Finding Groove Azimuths

about reading crater azimuths from the four typical crater types, but may require some few additional details to make the procedure exactly clear. Azimuths to the gun are obtained by staking the ends of the side spray at their tips and in the center of their density, and shooting from the center of the crater, azimuths to each of these side spray tips. By subtracting the lesser from the greater azimuth, one can find the number of mils in the "V" outlined by the side sprays. Since this "V" points directly toward the hostile gun, taking one half of this "V"-angle and adding this value to the lesser of the two spray azimuths (or subtracting from the greater) will give the direction of fire. Adding 3200 mils to this will give the azimuth to the gun. See Figure 5.

If time is pressing and all you can spare is a hasty shot, line yourself up at the nose end of the crater even with the ends of the side sprays and look toward and over the crater's center. Adjust your position until you form the center of the base of the "arrowhead" and shoot an azimuth over the center of the crater, (i.e. to the "point" of the "arrowhead").

Accurate shelling analysis and reporting requires not so much information and intelligence as it does interest and industry. The rules are commonsense and very simple, but it is often safer and more comfortable staying put after or during a shelling. For reasons of terrain, weather, vegetation, mines or the enemy, it may be difficult to get to craters. Cold, souvenir hunters, lack of interest, human errors, ignorance, and every conceivable difficulty combine to make shelling analysis a triumph whenever an enemy gun is destroyed because of shelling reports. But it is successful, and is another example of the possibilities of training and teamwork.

# Integrated Education Of Artillery Officers

Pentagon Officials now announce a stepped up pace in the integrated training for field artillery and antiaircraft officers.

The Integrated Artillery Officers Advanced Course will be conducted this year at Fort Sill and Fort Bliss in the same manner as last year.

An Integrated Artillery Battery Officers Course will be initiated, portions of which will be conducted at Fort Sill and Fort Bliss.

The students originally selected to attend the Artillery Officers' Advanced Course are now attending it. Tentative plans to the contrary were cancelled. The first integrated Artillery Battery Officers' Course began as a 32 week, September 2 with 51 students.

The assignment of students to the Integrated Advanced and Battery Officers Courses will be limited to Regular Army officers and to those career reservists who have indicated through past service and present category statements that they intend to remain on active duty.

## Transition Courses

In addition to the foregoing courses, transition courses will be conducted at both Fort Sill and For Bliss for periods of 8 to 10 weeks each.

The purpose of the transition courses is to train officers below the grade of colonel in that type of artillery to which they will be assigned but in which they have not received previous training.

Both Regular Army officers and also reserve officers who have previously served on extended active duty are eligible for this instruction.

Successful completion of a transition course, in lieu of the current stipulation requiring completion of an associate course, will be considered as meeting the training requirements specified for the preparation for overseas shipment of officers above the grade of second lieutenant.

The limited 24 month period of active service performed by officers of the reserve components will, in general, preclude integrated school training for this type of personnel. Moreover, training in both types of artillery on the part of officers of the civilian components who are serving on inactive status will be the exception rather than the rule. They, and reserve component officers serving short term active duty contracts, will usually be required to continue specialization in their chosen type of artillery. On the other hand, the FY 1953 ROTC program will be modified to include orientation instruction in the additional category of artillery.

Career reservists with long term contracts will be considered in the same category as Regular Army officers, most of whom, in due course of time, will receive integrated instruction.

The Department of the Army is hopeful that transition courses will be utilized to the maximum extent consistent with meeting operational requirements, and that, whenever practicable, graduates will immediately be assigned to a corresponding type of artillery unit or training facility, even if on a temporary basis.

# RADAR OPERATORS

**By LT. COLONEL LEONARD M. ORMAN**

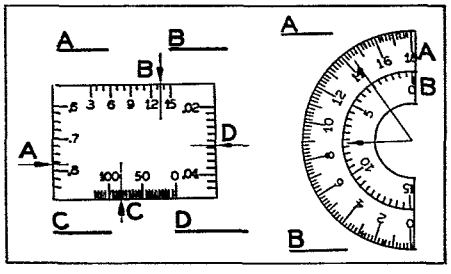
THE following information on selection of radar operators, effect of radar operation on operators, optimum period of operation and degree of illumination required in radar operation was taken from National Defense Research Committee reports. Although the studies were conducted primarily on Air Force, Navy and Signal Corps long range radars, the information presented here will be of use in the training of AA radar operators.

*Selection of Radar Operators.* Operators need a visual acuity of 20-20. Their eyes should be balanced in both the horizontal and vertical planes. They should have normal intropupillary distance and a good depth perception. Age under thirty is preferable. A score of not less than 55, aptitude area one test is almost mandatory. It is desirable that the person wants to become a radar operator and has emotional stability, a calmness under stress and quickness of action. The careful selection of operators prior to the training is desirable. Two aspects of the problem are significant:

*First,* selection relative to the visual requirements and *Second,* selection on the basis of specific psychological aptitude for the task. Three tests were found to be good predictors of performance. These were the Plot Reading, Scale Reading and Polar Grid Coordinate tests. The main utility of these tests lies in the elimination of potentially poor operators or in the selection of prospective trainees with potentially high aptitude for the task. It is recommended that whenever possible, two or more of these tests be given and that elimination of men be based on poor performance in at least two of the tests.

These tests were designed to measure, prior to training, some of the factors which are of importance in radar operation. Among other things, the tasks require speed and accuracy of perceptual discrimination, alertness, persistence and the ability to make quick judgments.

*Scale Reading Test.* Forty-eight different scale settings were presented in drawings representative of different types of meters which are typical in radar and other service equipment. Some were easy; others, difficult. Some read in decimals; others, in fractions. Samples are shown in the figures below. The




task was to read, in terms of the scale units, the precise setting of a hair line or meter needle. The test was designed to give a measure of capacity to read scales quickly and accurately, to make spatial judgments or estimations and to record numerical results in terms of appropriate scale units.

*Plot Reading Test.* Fifty points were located on a rectangular grid. The task was to read the grid coordinates for each point. Radar operators frequently are required to plot and read grid coordinates and in some PPI sets read grid coordinates of targets directly from the screen.

*Polar-Grid Coordinate Test.* A large circle scaled in azimuth and range represented a PPI screen. Rectangular grid coordinate lines were superimposed on the circle. The task of the examinee was to locate within the circle the point represented by a pair of polar coordinates and then to determine the grid coordinates of the point. This test simulated in part the task of reading grid coordinates directly from a PPI screen. Incidentally, it is expected that all AA radars will be eventually furnished with a grid which may be superimposed on PPI scopes to allow direct coordinate readings.

*Effect of Operation on Operators.* Tests were conducted to ascertain whether radar operation has a permanent effect on the eyes of the operator. Results showed that there were no significant differences on any of the tests, which included measures of visual acuity, vertical and lateral muscle balance, depth perception and color vision. It was concluded that radar operation does *not* have a deleterious effect upon vision. It was found that operators with substandard visual acuity (near) and excessive over-convergence (near) were rated significantly lower than those with normal vision.

The results of this study, showing that continued oscilloscope operation does not impair visual capacities, are believed to be highly important in combating pernicious rumors which spring up among radar operators. It is believed that the rumors spring principally from boredom and dissatisfaction with the task to be done. An occasional operator with defective vision may experience real visual difficulties and subjective symptoms of distress. The presence of such a man in an operating station might well favor the growth of rumors that scope operation has a deleterious effect on vision. Such men might well be detected by visual examinations such as those indicated and be relieved of scope duties or be given adequate visual corrections by means of glasses.

*Degree of Illumination.* The question of the degree of illumination to be tolerated in radar rooms or in the vicinity of radar scopes led to this study. Three levels of ambient illumination and three levels of trace brightness were used. The effect was measured in terms of operator proficiency in detection of weak signals. No loss in efficiency of detection ability could be demonstrated except with maximum ambient illumination and minimum trace brightness, conditions which are not typical in radar operating rooms. It was concluded that illumination sufficient for reading and manipulating controls on radar equipment could be used without detriment to detection ability.

*Optimum Period of Operation.* A study has been conducted of the optimum period which a radar operator may function. Efficiency was measured in terms of signal detection ability, ac-

curacy of azimuth determination, and variability of performance. Eight men previously trained to a high level of proficiency in the task were required to operate four hours daily for 17 days. It was found that loss of efficiency is related to length and repetition of operating periods. It was concluded that operating periods, if repeated a few times daily, should be forty minutes or less in duration. Occasional operating periods of longer duration (as much as four hours) may be tolerated without marked loss of efficiency, if separated by an intervening day of rest.

# SCR 584 RADAR TIPS

**By CAPTAIN FLOYD H. BJORKLUND**

*Radar Officer, 40th AAA Brigade*

UNLIKE radio communication equipment, radar sets cannot be checked by observation alone to determine whether or not their performance is satisfactory. In the case of a radio receiver, satisfactory reception of the set can be readily determined by merely listening to its tone and by observing the extent the volume control must be advanced to obtain sufficient volume.

In the field of radar, however, reliance on visual observation to judge the range capabilities and data accuracy of the radar set has been found to be inaccurate and completely valueless. Tests on radar sets in the field strongly emphasize this fact. Numerous sets were carefully measured with test equipment of known accuracy. In each case, the set under test was thought, by the radar personnel concerned, to be in normal operating condition. The checks revealed that maximum range of many of the sets was only half the maximum range possible, had the equipment been operating at peak efficiency. Some sets were found to be operating at less than ten percent of their possible maximum range. Since such poor performance as this may have serious military consequences, measurement of performance is of utmost importance in radar work.

A large number of signal radar maintenance units are not making maximum use of available test equipment. The use of calibrated test equipment to determine the operating efficiency of gun laying radars cannot be overemphasized.

Many AAA units have experienced difficulty in adjusting SCR 584 radars to obtain tight tracking on sleeve targets. Performing field adjustments outlined in TM 11-1524 will not necessarily give desired tracking results on a sleeve target. The radar must meet the performance standard of 177 dbs. The radar performance data sheet shown outlines a method by which qualified radar maintenance men can determine the operating efficiency of the radar. References

RADAR PERFORMANCE DATA SHEET

RADAR SET _____ SER. NO. _____ TEST EQUIPMENT _____

OBSERVER _____ SER. NO. _____

DATE _____ SER. NO. _____

_____ SER. NO. _____

RADAR DATA

1. Radar Pulso Repetition rate _____pps
2. Duty cycle (SCR 584 28.6 db AN/TPL-1 34 db) TM 11-759 Fig. 3. Page 13 _____db
3. Radar Pulse Width _____m/s

TRANSMITTER AVERAGE POWER

4. Test Equipment Indication _____dbm
5. Padder & Cable attenuation _____db
6. Test point coupling loss _____db
7. Measured Pav (dbm) (Items 4 & 5 & 6) _____dbm
8. Rated Pav (dbm) SCR 584 53.4 bm AN/TPL-1 48.4 dbm TM 11-759 Fig. 2 Page 12 _____dbm
9. Difference (Item 7-8) _____db

TRANSMITTER PEAK POWER

10. Measured Pav (dbm) (Item 7) _____db
11. Duty Cycle (Item 2) _____dbm
12. Measured Ppk (dbm) (Item 10 & 11) _____dbm
13. Rated Ppk (dbm) (Item 2 & 8) _____dbm
14. Difference (Item 12-13) _____dbm

FREQUENCY MEASUREMENTS

15. Transmitter Frequency _____mc
16. Local Oscillator freq. _____mc

RECEIVER MINIMUM DISCERNIBLE SIGNAL PWR.

17. Test Equipment Indication TM 11-2657 Sec. IV par. 15 b _____dbm
18. Cable Attenuation _____db
19. Test point Coupling less _____db
20. Measured Pm (dbm) (Item 17 & 18 & 19) _____db
21. Rated Pm (dbm) (SCR 584 & AN/TPL-1 95 dbm) Sig Corps Repair Standards 15 March 51 Page 11 Par 3h _____dbm

RADAR PERFORMANCE

22. Difference (Item 20-21) _____db
23. Measured Ppk (dbm) Item 12 _____dbm
24. Measured Pm (dbm) Item 20 _____dbm
25. Measured Radar Performance _____db
26. Rated Radar Performance (Item 13 & 21) SCR 584 177 db AN/TPL-1 177.4 db _____db
27. Difference (Item 25-26) _____db
28. Equivalent Available Percentage of Maximum Range TM 11-759 Page 45 Fig. 15 _____%

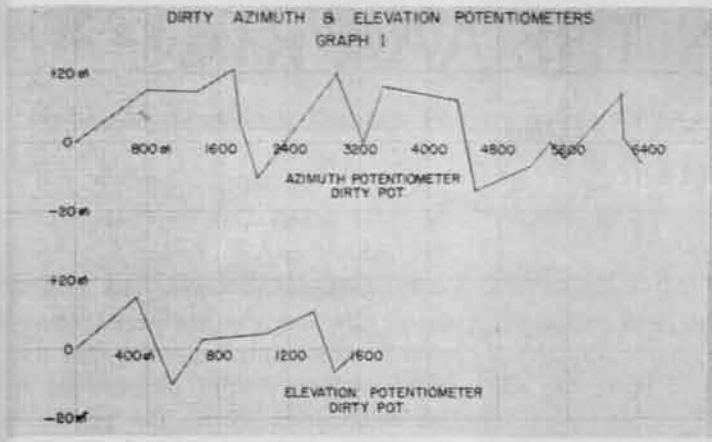
ADDITIONAL MEASUREMENTS

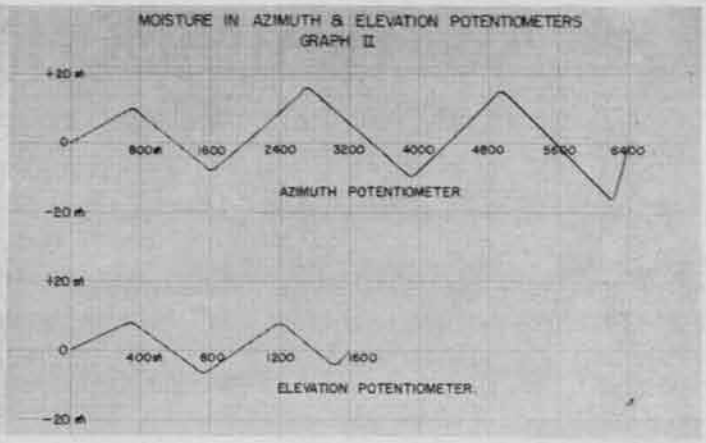
29. Radar Recovery Time (330 yds) TM 11-1524 par 294g _____yds
30. Ring Time _____yds
31. Local Oscillator Pwr (should be 13-18 db) TM 11-759 Fig. 2 Page 12 _____db

RADAR RANGE VS. RADAR PERFORMANCE

| Performance down in db | Percentage of tatal Effective Range |
|---|---|
| 0 | 100% |
| — 1.5 | 92% |
| — 3 | 84% |
| — 5 | 75% |
| —10 | 58% |
| —15 | 42% |
| —20 | 32% |
| —25 | 24% |
| —30 | 18% |
| —35 | 13% |
| —40 | 10% |
| —45 | 7.5% |
| —50 | 6% |

32. Type Magnetron _____
33. Magnetron Peak Voltage _____kv
34. Magnetron current _____ma



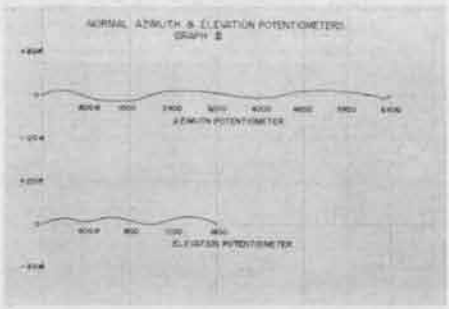




are also included to assist maintenance personnel in accomplishing these tasks.

The SRMU unit has the equipment and the personnel required for these tests, and should assist the battery personnel. The tests should be made at least twice monthly.

Unsatisfactory target practices are fired because important phases in the preparation for fire are neglected or improperly conducted. Checking the radar azimuth, elevation and range potentiometers is one phase often neglected, during preparation for fire. Radar potentiometers, over a period of time, collect dirt and moisture. Dirty or damp potentiometers cause erratic output data. Conducting synchronization histories in accordance with appendix III, page 460, FM 44-4 dated November 1950, will reveal the condition of the radar poteniometers. A large number of AAA units are not aware of the importance of conducting equipment synchronization histories. Making graphs of the synchronization history results will enable battery officers and radar repairmen to intelligently analyze the condition of the potentiometers. "How can we determine the corrective action to be taken in the event synchronization history results are unsatisfactory?" is a question often asked by battery officers.

For the purpose of illustration and discussion, synchronization history results of the azimuth and elevation potentiometers only will be considered. Graphs I and II illustrate typical results to be expected from damp and dirty potentiometers. Dirty potentiometers are often turned in as unserviceable. This procedure results in the radar being out of action for a period of time. In most cases this condition can be corrected by radar maintenance personnel. Graph I illustrates dirty potentiometers. This condition can be recognized by the erratic graph of the potentiometers output data. Cleaning the contacts and removing the sludge which collects in the potentiometer housing will correct this condition. Graph II illustrates the behavior of damp potentiometers. Damp potentiometers will generally produce a graph in the form of a sine wave. This condition can be corrected by cleaning and drying the potentiometers. Graph III illustrates the normal results to be expected from potentiometer output data. Extremely large errors in potentiometer data indicate a malfunction of the electrical components. Such errors are generally caused by a burned-out 10,000 ohm resistor or cracks in the sine and cosine cards. If the recommended maintenance procedures will not correct the erratic output data of the potentiometers, then it is reasonable to assume that the potentiometer is unserviceable.



For best results in SCR 584 radar accuracy, the batteries accomplish the following religiously:

a. In addition to performing radar adjustments outlined in TM 11-1524, unit repairmen insure that the radar is operating at a minimum standard of 177 db.

b. Include synchronization histories as a *must*, during the preparation of fire.

c. Before turning in radar potentiometers for replacement, insure that unit repairmen have performed the required maintenance on the potentiometers.

## Journal Merger Proposal

*(Continued from page 12)*

*All subscriptions to our* JOURNAL *will be extended for a like period with the* Combat Forces Journal.

*All of our Executive Council members become members of the new Council.*

*A qualified AAA Officer will serve as an associate editor on the* Combat Forces Journal.

*The* Combat Forces Journal *will carry on adequate coverage in the technical and professional fields pertaining to antiaircraft and guided missiles.*

As soon as an agreement is reached, the Executive Council plans to submit the proposal to a vote by the membership.

Meanwhile we continue the ANTIAIRCRAFT JOURNAL without any letup until the decision is made. If it is decided to close out the JOURNAL, we still wish to make the last issues among the better ones. More than that, we shall want to line up some top drawer antiaircraft and guided missile articles for the first issue of *Combat Forces* after the merger. There our authors will have for their story a much bigger audience.

We urge our loyal supporters to send in both articles and subscriptions with their usual enthusiasm. Our circulation is now above 8,000 and we wish to make it still higher. That will have effect on our influence and space in the combined *Journal*.

# AW TRAINING IN THE AAA RTC

**By CPL. ROBERT L. FLORA**

*I&E Sect. AAA RTC*

THE chattering machine guns sent streamers of tracers into the air and onto their aerial target, yet not a single spent shell was in evidence anywhere, nor was a single round of ammunition fired.

As the gunner stepped down from his perch, he scanned his score sheet showing exactly how many rounds he had fired, and how many hits he had scored.

This is the technique that the Special Devices Unit of the Antiaircraft Artillery Replacement Training Center uses in its training on the Mark I machine gun trainer and the 40mm gun devices, for trainees now undergoing 16 weeks of intensive combat training.

Colonel Earl W. Heathcote, commanding officer of the AAA RTC, Fort Bliss, Texas, indicated that RTC Trainees "fire" an estimated 2,344,790 rounds per month with the Mark I, 50 caliber machine gun trainers alone.

The Special Devices Sub-Section of the AAA RTC S3 was formed in March 1952 for the purpose of improving the training in automatic weapons. Through the use of these special devices, such as the Mark I machine gun trainer and the 3-D14 K 40mm trainer, antiaircraft trainees get the feel of the weapons they will be firing in the field, improving their accuracy and gaining experience without the expense of firing live ammunition.

In November 1951, a group of six men were selected from the AAA RTC to be among a group of Army personnel to attend a school at 1st Naval District, Boston, Massachusetts.

Upon completion of the course, they returned to Fort Bliss to activate the Special Devices Section which now consists of ten men who operate and maintain two Mark I machine gun trainers and four 3-D14 K Units.

The Mark I machine gun trainer special device utilizes an M55 power operated fifty caliber machine gun and automatically records the number of rounds fired and hits made.

A 35mm motion picture projector provides a photo of an airplane target which flies across the screen. Through the use of a complex electronic system, the correct lead zone is established, although invisible to the operator. When the device is fired, tracer projectors go into action, showing the line of fire in correct relation to where the gun is aimed. By the use of special glasses worn by the gunner and a special projection system, a third dimensional effect is obtained, giving the gunner a perception of distance exactly as seen when firing live ammunition at actual targets.

To further simulate actual firing conditions, the gunner hears both the sound of the attacking aircraft and the guns firing. The device is so realistically built that the gunner even feels the jolt of the recoil.

The 3-D14 K 40mm device uses a dual 16mm motion picture projector. A lead marker, in the form of a small white dot, is shown on the screen with the plane.

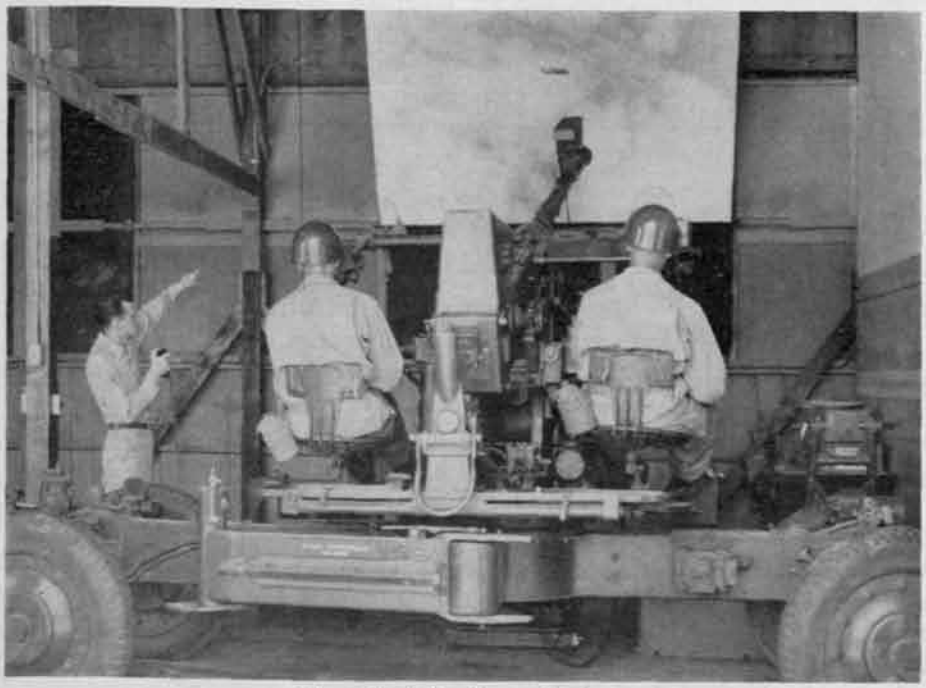
In operation, the trainee is guided, during the first few courses, by the lead dot on the screen as well as a beam of light, called the line of sight beam, projected from the barrel of the gun.

During successive firing runs, the lead dot is made invisible to the human eye through the use of an infrared filter, leaving the trainee-gunner only the line of sight beam from the gun to rely upon for guidance.

The last run is made without the aid of either device. The lead dot or the line of sight beam is not used. The gunner depends entirely upon his speed ring sights and experience from previous courses.

Both the Mark I machine gun trainer and the 40mm antiaircraft weapon devices used by AAA RTC, were designed by the Navy. The 3-D14 K 40mm trainer is a modified version of the 3-A2 trainer used by the Navy during World War II with the 20mm gun.

These special devices were carefully designed to simulate actual combat firing conditions as closely as possible. They are one of the many methods used by today's Army to cut costs by eliminating considerable live ammunition, and by giving trainee-gunners the feel of the weapons before actually firing live ammunition in the field.



The 3-D14 K 40mm Trainer

# FORT BLISS NEWS

## New Commanding General

MAJOR General Stanley R. Mickelsen assumed his new duties as Commanding General of the Antiaircraft Artillery and Guided Missile Center, Fort Bliss, on July 19.

He was formally welcomed to his new post with military honors on Noel Field on the morning of July 21. After the courtesies, he met the press briefly in the commanding general's conference room at post headquarters and then went to the Officers' Mess to meet with key officers. Later in the day he visited various departments of the Antiaircraft and Guided Missiles Branch of The Artillery School and its laboratory facilities.

The first week of the general's command of Fort Bliss was occupied with orientation visits and get-acquainted conferences on post activities.

The new commander came from Washington, D. C., where he was Assistant Chief for Special Weapons, Army Research and Development Division, Deputy Chief of Staff G3 for research and requirements. This is his second tour of duty here; he commanded the Antiaircraft Artillery Training Center for approximately a year during World War II, between tours of duty overseas.

**Maj. Gen. Stanley R. Mickelsen charges down to first base in Bliss Brass-Allied Officer game. Lt. Howie Vie of Canada making the catch. The home team won.**

## General Hayden Departs

To the accompaniment of an 11-gun salute, with ruffles and flourishes from the 65th Army Band, Brig. Gen. and Mrs. Frederic L. Hayden left, July 25, for his new assignment as commanding general of the Eastern Antiaircraft Command at Stewart Air Force Base, New York.

General Hayden had served at Fort Bliss most of the time since 1948—as brigade commander, as assistant commandant of the School, and since last April as the Commanding General.

Flags, guidons and color guards, identifying the units stated at Fort Bliss, lined both sides of the street just inside the Pershing Gate where General and Mrs. Hayden stopped their car to receive the farewell honors and wishes of their friends.

Maj. Gen. and Mrs. Stanley R. Mickelsen were among the large group present to wish the Haydens farewell.

## General Hewett

Brig. Gen. Hobart Hewett assumed his new duties as Assistant Commandant of the Antiaircraft and Guided Missiles Branch, The Artillery School, on July 29, succeeding Brig. Gen. F. L. Hayden.

**Col. Krueger was honored by farewell review on the eve of his departure. Seated: Gen Mickelsen and guests. Background: New OCS Class witness the formation.**

General Hewett achieved a wide reputation as an antiaircraft instructor in the Coast Artillery School in the early 1930's. Since that time he has been closely connected with antiaircraft research and development, school and troop activities.

During the War he commanded the 31st AAA Brigade in the Mediterranean Theater and later served in Algiers on General Eisenhower's staff.

Following the War, as Deputy Chief of the Development Section, Army Field Forces, he exerted a strong influence on the army wide program for development and modernization of weapons.

After a tour of duty in Hawaii he returned to Fort Lewis, his last station, to command once more the 31st AAA Brigade.

He comes to the school well fitted for the important work there in Antiaircraft and Guided Missiles.

### To Far East Command

Colonel Robert H. Krueger, director of the Antiaircraft Artillery Officer Candidate School at Fort Bliss since its opening in the Fall of 1951, has left for a new assignment in the Far East Command.

Col. Kreuger served as Antiaircraft Officer for General George Patton in North Africa and with General Omar Bradley during the invasion of Sicily. He landed in Southern France with the initial American Forces and, after the end of the European conflict, brought back the 52nd Antiaircraft Artillery Brigade to the United States and deactivated the unit.

He came to Fort Bliss in 1950 and served as Coordinator of Training in the AA and GM Branch, TAS, until he took over as OCS director last fall.

### New OCS Director

Colonel Kenneth R. Kenerick, commanding officer of the 38th AAA Brigade at Fort Bliss since December, 1951, on August 18 became new Director of the Antiaircraft Artillery Officer Candidate School.

During World II Colonel Kenerick served in the Office of Strategic Services in Washington and later in the Army Service Forces Headquarters. Since the war he has served as an associate professor at West Point and as assistant G4 in Hawaii prior to coming to Fort Bliss in 1950.

### New G3

Colonel Roy K. Kauffman has recently returned from duty with the Tenth Corps and the 3rd Logistical Command in Korea to become the new Assistant Chief of Staff, G3, in the AA & GM Center. He is now serving his fifth tour of duty at Fort Bliss, the first having been in 1940 with the 39th AAA Brigade and the Antiaircraft Artillery Training Center.

Colonel Robert A. Turner, former G3 has departed to attend the Army War College at Carlisle Barracks.

### National Guard Camp

Approximately 1500 officers and men of the New Mexico National Guard, under Brig. Gen. C. G. Sage, arrived at Fort Bliss, August 17, to begin a 15-day intensive program of summer training.

Units attending the summer encampment included the 111th AAA Brigade, 515th and 200th Groups, the 120th AAA Gun Battalion, the 804th and 697th Automatic Weapons Battalions, the 44th Army Band, the 3631st Ordnance Company, an RCAT unit, service troops and Headquarters and Headquarters Detachment, New Mexico National Guard.

Additional units of the New Mexico Guard are now in active Federal service or have just been released from a tour of Federal duty and will not attend the training camp at Fort Bliss.

The training schedule for the Guardsmen emphasized the firing of the 90-millimeter guns and automatic weapons.

### Official Visits

General John R. Hodge, Chief, Army Field Forces, on July 16 and 17 made his first official visit since assuming command of the Field Forces in May of this year.

General Hodge, who is responsible for all field training for the Army, inspected various phases of training at the post, including the firing ranges where he witnessed medium, heavy and light antiaircraft artillery in action against aerial targets and also the employment of AAA in close support of infantry.

From the firing ranges, General Hodge went to White Sands Proving Ground, N. M., for a short visit.

Major General Hobart R. Gay, Deputy Army Commander, Fourth Army, made a one-day inspection of the ROTC Summer Camp and training at Fort Bliss on July 2.

After inspecting the camp area in Logan Heights, he visited the Oro Grande ranges to witness training in the field bivouac and on the firing ranges.

He was accompanied by Col. F. T. Folk, Deputy Chief of Staff, and Lt. Col. L. F. LaVoie, chief of the ROTC Branch, G3, Fourth Army.

### French Defense Team

Sixty-two French officials, members of a civilian-military French National Defense Institute Team, paid a one-day visit to Fort Bliss, June 23. The team members, who were on a tour of United States Army installations and manufacturing centers, are directors of France's defense program on a national level.

They were studying the United States rearmament program and how defense activities are integrated into a peacetime program, as well as American manufacturing technique and high productivity.

Included were top civilian technical and administrative personnel of the French Government and a number of military leaders. Lt. Gen. Olivier Poydenot, president of the Institute of Advanced Studies for National Defense, was head of the group. Jean Essig, Inspector General of Finances and vice-president of the National Defense Institute, was also in the party.

The French leaders made a tour of the AA and GM Center, the Replacement Training Center, the School, and the First Guided Missile Group area. They also visited the AAA Officer Candidate School and the Replica of Old Fort Bliss.

### Educators Make Study

A team of noted civilian educators and technicians arrived August 17, to make a survey study of the Antiaircraft and Guided Missiles Branch of The Artillery School.

The group came through cooperation of the Human Resources Research Office, George Washington University, the Office of the Chief, Army Field Forces, and the Department of the Army's Human Relations and Research Branch.

Heading the party were: Dr. Wil-

liam J. Micheels, professor of vocational education, University of Minnesota, Vocational Education expert; Prof. George F. Corcoran, chairman of the Electrical Engineering Department, University of Maryland, Vocational Education expert in Electronics; Dr. Hobart C. Osburn, research psychologist, personnel research section of the Adjutant General's Office, expert in Tests and Measurements; Dr. Mitchell Dreese, Dean, College of General Studies, George Washington University, expert in teaching methods; and Mr. Wilson W. Taylor, production director of Creative Arts Studio, Inc., expert in the preparation and use of Graphic Aids.

A trio of other well-known educators assisting in the survey work were: Dr. Judson S. Brown, professor of psychology, Iowa State University; Dr. Donald J. Lewis, research scientist, Human Resources Research Office; and Dr. Kenneth W. Spence, slated to become Assistant Director, Training Methods Research, in the Human Resources Research Office.

The team's visit is expected to yield suggestions and advice regarding improvements in current teaching methods in the AA & GM School.

### Maintenance Classes

The Department of Electronics in the School continues to turn out a class each month on maintenance of each of the AAA Fire Control Systems and to conduct the Guided Missiles Fire Control System Maintenance Courses.

All AAA FCS Maintenance courses now include a two-week course on the functioning and maintenance of the Army's new surveillance radar AN/TPS-1D. This two-week course is actually a subcourse of the regular maintenance courses and is not given separately.

Military personnel desiring lesson plans of this course for personal use may purchase them through the Book Department, AA & GM Branch, TAS, Fort Bliss, Texas. Units desiring lesson plans and trouble shooting booklets should request them from the Department of Non-Resident Instruction.

### To New Assignment

Colonel Peter Schmick, director of the Department of Tactics and Combined Arms in the Antiaircraft and Guided Missiles Branch of The Artillery School, has left Fort Bliss for his new assignment as deputy commander of the Eastern Antiaircraft Command, Middletown, New York, where he will be assistant to Brig. Gen. F. L. Hayden.

### New CO For Missilemen

New commanding officer of the 1st Guided Missile Group at Fort Bliss is Lt. Col. Oren Swain, a native of Texas, and graduate USMA 1936. Colonel Swain served in Korea with X Corps Artillery and took part in the Inchon Landing in September 1950.

### Leaves 1st Composite Gp.

Colonel Thomas H. Leary, who has commanded the 1st Composite Group at Fort Bliss since its activation in November 1950, departs for the Far East Command in November.

During the past 22 months, this group has supervised the training not only of AW and gun units but also of such service units as signal construction battalions, military police companies, transportation truck companies, ordnance battalions, and engineer construction battalion, RCAT units, AAA operations detachment, and signal radar maintenance units.

In all, 33 units have been attached for various periods and missions. Twenty-three have departed on permanent change of station, three were reassigned, seven are presently attached and one was deactivated.

### Completes AA Training

Having successfully completed its antiaircraft training, the 137th AAA AW Battalion (SP) departed Fort Bliss, August 11, for Camp Polk, Louisiana, where it rejoined its parent unit, the 37th Infantry Division.

The 137th Battalion, an organic unit of the 37th Division, Ohio National Guard, was federalized on January 15 of this year and arrived at Fort Bliss on January 22. It was attached to the 1st Composite Group for training.

Successful completion of the required Army Training Test on July 26 marked the close of the unit training period and the battalion prepared to depart. Major Frank P. Nairn is the commander.

### Army Field Forces Board No. 4

Army Field Forces Board No. 4 has lost its Deputy President, Col. Charles E. Shepherd, who sails for FECOM about October First. Following his duty as Assistant Military Attaché in Moscow, Col. Shepherd joined the Board in 1949 and has served since then, directing the research and development activity in antiaircraft and guided missiles.

Col. William A. Weddell served as the Deputy President until Col. Arthur H. Bender arrived late in September. Col. Bender had served as the Deputy Commander of the Eastern Army AA Command in Middletown, New York, since it was activated in 1950.

Col. Jacob G. Reynolds, Board Executive, has left to attend a 3-month course in Harvard School of Business Administration and then to FECOM.

The British Liaison Officer, Lt. Colonel John H. F. Mermagen, returned to England in September. He will be succeeded by Lt. Colonel A. R. Colquhoun.

Lt. Colonel Tom Caulfield, head of the Heavy AAA Group, is leaving to take command of a guided missile battalion. . . . Majors Lee Jones and Charles Wilson, both of the Heavy AAA Group, and Captains John Sadler of the Light AAA Group and Eugene Pfauth of GM Section, are to attend the Advanced Artillery Course at Fort Sill, Okla. . . .

Captain Gregory M. Dillon is returning to his civilian job with the DuPont Company. . . . Capt. Herbert Bassett, Lt. C. A. Brandariz, Lt. Col. Cohen B. Byrd, Lt. Martin E. Carmody, and Lt. Robert A. Rach are all leaving for Far East Command. . . . Lt. Col. Carl Fernstrom has left to take the 90th AAA Gun Battalion, Fort Bliss.

Among the new arrivals are Lt. N. D. Reid, Capt. O. T. Duggan, Lt. Walter W. Whitbread, Capt. Charles Mugford, Lt. E. S. Robertson, Lt. L. P. Ferguson, Capt. Don Gower, Lt. R. F. Anlauf, and Lt. F. P. Skerkowski.

Lt. Col. C. C. Young has returned after a year on TDY.

---

### History of 383rd AAA AW Bn.

*The Hot Loop*, an informal history of the 383rd AAA AW Battalion in World War II, is available to former members of the unit at $5.00 per copy. Some fifty members paid for their copies while the unit was still overseas and left no forwarding address upon return to the ZI. Mr. Oral Bullard of 7509 Mary Ave., N.W., Seattle 7, Washington, publisher of the history, will forward the book to those who have failed to receive one and will fill new orders for the few remaining copies.

# STATUS OF TRAINING LITERATURE

**By MAJOR B. G. OBERLIN**

THE Department of Nonresident Instruction, AA & GM Br, TAS, is preparing a revision of the Book Department Catalog for distribution this fall. Lesson plans and manuscripts used in resident instruction at the School will be listed and priced both individually and in packets. The catalog will also list special texts and training aids which may be ordered from the Book Department.

Changes in matériel and the adoption of new matériel are responsible for increased activity in the preparation of new instructional material. Distribution of a number of new manuals and training circulars is planned for this fall.

## Field Manuals

FM 44-38, Service of AA Directors M9, M9A1, M9A2, and M10, is in the hands of the printer and distribution is expected in October. This manual will supersede FM 44-38 published in November 1944. It will also supersede ST 44-38-1.

FM 44-33A, Service of AAFCS M33, is being written to parallel FM 44-33, Service of AAFCS T33, which was printed and distributed in November 1951. The new manual will not supersede FM 44-33 because the M33 is equipped with a different type of acquisition radar.

FM 21-80, Recognition Training, has been delayed pending the outcome of studies to determine the most effective methods of training personnel in the recognition of aircraft. Comments and suggestions from unit commanders were solicited recently by means of a letter inserted in the Special Distribution List. This manual probably will not be published before next summer.

A new manual, Service of the T141, will describe the twin 40mm gun T141. It is in the last stages of preparation and will be forwarded for review and printing in November.

## Technical Manuals

TM 44-225, Orientation for Artillery, has been forwarded to the printer, and distribution is expected this fall. This manual contains up-to-date information on surveying and the theory and use of grid reference systems.

TM 44-234, AAA Service Practice, is also in the hands of the printer. Distribution should be made by the first of next year.

## Training Circulars

A training circular, Fire Control and Gunnery T69, is now in the hands of the printer and will be distributed this fall.

Circulars on Service of the AN/TPS-1D and Safety Precautions for Guided Missile Training are in preparation and will go to OCAFF for review this fall. A circular on MTQ-1 AAOC is in preparation for distribution next year.

## Changes

C1 to FM 44-4, AAA Guns, is in the hands of the printer and will be distributed within the next few months. This change will bring FM 44-4 to date by adding information on the VT fuze, the use of fire unit analyzers, and the principles of surface gunnery. C2 to FM 44-4 is under preparation and will be forwarded for review this fall. This change will incorporate the employment of the AA fire control systems T33 and M33.

C1 to FM 44-2, AAA Automatic Weapons, will incorporate the principles of surface firing in close support of infantry and will contain firing exercises to train personnel in close support tactics. This change is currently being reviewed at OCAFF.

C2 to FM 6-40, Field Artillery Gunnery, will describe indirect fire methods for AAA and has already been sent to OCAFF for review.

## Army Training Tests

ATT 44-8, ATT for AAA Battalions (Light, 75mm Mobile) is in the hands of the printer and will be distributed this fall.

ATT 44-5, AAA Brigade (Group) has been forwarded to OCAFF for review.

Changes have been prepared for ATT 44-1, AAA Gun Battalion (90mm); ATT 44-2, AAA AW Battalion (Mobile and Semimobile); ATT 44-3, AAA AW Battalion (Self-propelled); and ATT 44-4, AAA Gun Battalion (120mm). These changes cover chemical, biological, and radiological situations and have been approved by OCAFF and forwarded to DA.

## Training Films

Six training films have been made and are being reviewed for final comment before distribution, which is expected this winter. The six films are Light AAA with the Infantry (Armored) Division, Light AAA in Close Support of Infantry, Emplacement of M33 Trailer, March Order of M33 Trailer, Emplacement of M33 Acquisition Radar, and March Order of M33 Acquisition Radar.

Scenarios are being prepared for four additional training films; Trial Fire AAFCS T33, Start-Stop Procedure AAFCS T33, Orientation and Synchronization AAFCS, T33, and Operational Techniques with the T33.

---

## Honor Roll

*(Continued from Cover 2)*

### *Operations Detachments*

**115th AAA Opns. Det.**
Maj. E. F. DeLeon
**131st AAA Opns. Det.**
Maj. J. L. Welling, S. C.
**142nd AAA Opns. Det.**
Maj. B. D. Boyett, Ala.
**177th AAA Opns. Det.**
Maj. W. F. Hale, Va.
**181st AAA Opns. Det.**
Capt. C. Geek
**186th AAA Opns. Det.**
Maj. Wm. S. Wall, Calif.
**286th AAA Opns. Det.**
Capt. J. B. Stopyra, Dela.
**327th AAA Opns. Det.**
Maj. F. W. Smith
**506th AAA Opns. Det.**
Capt. J. J. Niehoff
**510th AAA Opns. Det.**
Maj. R. H. Moser
**511th AAA Opns. Det.**
Capt. M. J. Healy

## Your Address

Somewhere your JOURNAL is following you around trying to catch up with that new address you forgot to send in. Mail it today and help us solve the problem of getting your magazine to you on time!

# 1952 AAA ROTC SUMMER CAMP

**By CAPT. ROY P. ROGERS**

On 21 June 1952, 1100 ROTC Cadets from thirty colleges and universities throughout the United States and Puerto Rico descended upon the Logan Heights area of Fort Bliss for their six weeks summer encampment. They were met by a cadre which had been present and functioning as an organization for eleven days under Col. Evans R. Crowell of Texas Western College, deputy camp commander. As a result the cadet processing was smooth, fast and uninterrupted. The entire 1100 went through their physicals in a matter of six hours; and clothing was issued at the rate of 300 cadets per hour, including all necessary alterations.

The cadets were organized into two battalions of four batteries each. The First Battalion was under the command of Lt. Col. T. C. Malone of the University of California, while the Second Battalion was commanded by Lt. Col. A. L. Outland of Texas Western College. Camp administration was efficiently handled by Major Barton J. Mallory of Georgia Institute of Technology.

If the cadets were unhappy with the rocky, hot, dust-blown slopes of Logan Heights, they were not given time to realize it. Following the opening ceremonies on Monday, 23 July, the training began in earnest. One battalion moved out to the County Fair demonstration of the latest in antiaircraft weapons and equipment. The other battalion moved to the Preliminary Rifle Instruction Circle to brush up on their techniques of taking positions, sighting and aiming, breath control, and trigger squeeze with the .30 caliber carbine.

The remainder of the week found the cadets moving to the 1000-inch range for familiarization firing, and from there to the known-distance range for record firing. In the qualification firings Cadet Joe A. Deckert of Texas Western fired a scorching 254 out of the 260 possible.

Sunday, 29 June, marked the mass migration of the entire camp to Camp Oro Grande for four weeks of extensive field training with both the AW and guns. The First Battalion initially took over the gun range, while the Second Battallion trained on the automatic weapons. The following week saw the cadets putting into practice the principles they had mastered the preceding week by firing on towed targets and radio controlled aircraft targets.

At the conclusion of the second week, the battalions rotated; those who had trained and fired on the guns, moved to the AW range and vice versa.

A special event of the first week on the Oro Grande ranges was the inspection of training by Maj. Gen. Hobart R. Gay, deputy commander of the Fourth Army. General Gay was accompanied on his inspection by Col. F. T. Folk, deputy C of S, Fourth Army, and Lt. Col. L. F. LaVoie, then G3, ROTC, Fourth Army. At the conclusion of the inspection, Col. Crowell received a letter of commendation from General Gay on the conduct of the camp and the training.

During the fourth week of Oro Grande, the camp was again inspected. This time the inspectors included Maj. Gen. Stanley R. Mickelsen, commanding general AAA and GM Center; Maj. Gen. H. M. Milton, executive for ROTC Affairs, Office of the Secretary of the Army; and officials from twelve of the thirty colleges and universities represented by cadets in camp. All expressed enthusiastic approval of all phases of the training.

The Oro Grande encampment broke up on 25 July, and it was a weary group of cadets who detrucked at Logan Heights, but with the resiliency characteristic of their age, they bounced right back into their class A uniforms for the graduation formal. The dance was held at the main post officers' club, and featured a full floor show staged by the cadets themselves. The entertainment was just slightly short of riotous, and fea-

Swing Your Partners: Cadets and dates at the Graduation Formal.

Pearl divers: Cadets Primera, Elias, Agee, Brannon, and Brandon, all of Texas Western College.

tured some really first-class talent of professional quality.

On Monday, 28 July, the cadets began their final phase of training which consisted of a tactical field exercise, designed to test their grasp of all the fundamentals they had learned, both on the campus and at summer camp. The problem, labeled *EL PAROT* for El Paso Reserve Officer Training, was written by Lt. Col. O. M. Boerner (Inf.) of the Houston (Texas) High Schools, and Lt. Col. J. A. Rogers of Utah State Agricultural College. Due to a highly aggressive Aggressor force, the cadets learned a stiff lesson in local security. The exercise was concluded Tuesday night, 29 July. Wednesday was devoted to a critique of the problem and a county fair at the Guided Missile Center.

Thursday, 31 July, saw the final parade and review featuring an address by Maj. Gen Stanley R. Mickelsen and the awarding of reserve commissions to sixty-two new second lieutenants who had successfully completed the four years of ROTC on the campus, and the six weeks encampment at Fort Bliss. Other awards presented at the final parade and review included a large loving cup to Cadet Andrew C. Wettlaufer, judged best cadet in 1952 Camp. Small cups were awarded to Stephen J. Dukkony, best cadet First Battalion; and Joe M. McMullin, best cadet Second Battalion. Cups were presented to the following, judged best in their batteries: Eduardo Cartagena, James A. Carbonetti, Gerald T. Olson, Michael I. Kingery, and James K. Ardrey. Belt buckles were awarded to those cadets rated best in each platoon.

Marksmanship medals were awarded to Joe A. Deckert, William A. Mais, and Samuel E. Montgomery who fired top scores in the carbine firing.

An unusual and valuable phase of training was tried at the camp this summer with much success. It consisted of having each cadet prepare and deliver a fifteen-minute lecture on a previously selected subject on short notice. Break times, and other such periods were utilized for this purpose so that it did not interfere with the training schedule.

Training at the 1952 summer camp was under the direction of Lt. Col. F. L. Wellenreiter of the University of Cincinnati, who was assisted by Lt. Col. H. S. Ingraham of the University of Maine. Director of training for guns was Lt. Col. J. M. Cochran, University of California, assisted by Maj. G. K. Anderson, University of Delaware. Automatic weapons training was under the direction of Lt. Col. J. M. Bowman, Northwestern State College of Louisiana, assisted by Maj. S. R. Marconi, University of Illinois, while instruction in common subjects was under supervision of Lt. Col. O. M. Boerner.

Despite the terrific pace set by the cadets in their training, the camp afforded a lot of fun, too. A full program of recreation and athletics was planned and executed. Trips to the swimming pool at White Sands from Oro Grande were enjoyed by the more aquatic cadets, while the landlubbers burned up their excess energy in the round robin volleyball and softball tournaments. Weekly boxing and wrestling bouts between cadets, and featuring Fort Bliss personnel were the events for Thursday nights, while movies under the stars were shown on Mondays, Tuesdays, and Wednesdays.

Side trips to Carlsbad Caverns and the bullfights at Juarez were enjoyed by large numbers of cadets. Two dances, including the Graduation Ball, saw capacity attendance. Capt. A. E. Baenziger of Fort Bliss kept the entire camp informed on world events through an elaborate bulletin system established in the Post Exchange. The weekly newspaper, the *Desert Rat*, edited by the cadets, enjoyed extensive circulation; and the *Cannoneer*, the pictorial history of the 1952 camp, was purchased by 900 cadets.

Due to the tremendous and continuous activity, and the well-planned program for the cadets' spare time, morale at the camp was maintained at an extremely high level. Much credit for this should go to Col. A. C. Ramsey, Fort Bliss Quartermaster, who supervised the preparation and serving of food that was plentiful and of top quality. The cream of the Fort Bliss mess personnel—cooks, bakers, and stewards—was skimmed to provide personnel for the camp. Every cadet interviewed on the subject expressed amazement at the amount and quality of the food; and despite the high desert temperatures and the busy schedules, the majority of the cadets returned home with a few pounds gained as well as deep suntans.

The cadet reaction to the camp? All were enthusiastic in regard to the training, food, and recreation. The only unfavorable feeling was toward the terrain. The New Mexico state slogan "Land of Enchantment" received a tremendous amount of varied treatment. Perhaps the attitude was best summed up by the cadet from Florida A. & M. who sadly shook his head and was heard to remark, "I ain't never seen so many miles and miles of just miles and miles."

**ANNUAL COAST ARTILLERY PARTY**

**The officers and ladies, still cherishing happy memories of the Coast Artillery, continue the tradition of an annual social party in Washington.**

**The family reunion will be held this year at the Fort Leslie J. McNair Officers' Club, 22 November at 7:00 P.M.**

- ***Steak Dinner Sabatini***
- ***Orchestra from the U. S. Army Band***

**Those who can arrange to be in Washington on that date should notify the Journal Editor.**

# ON-SITE PHYSICAL TRAINING

**By 1st LT. DONALD E. HARKINS**

*Aide-de-Camp 56th AAA Brigade*

EACH battery of the 56th AAA Brigade occupying on-site positions has recently completed the construction of a strength course designed to incorporate physical fitness testing events, combative type exercises and other muscle building exercises in one package.

This type of strength course was utilized with gratifying results at replacement training centers during World War II. Subsequent to the war, the course was abandoned except at a few stations.

The photograph of brigade headquarters personnel utilizing the strength course depicts the strength course in operation. The course consists of an Indian War Club station; chinning bar station; a strap station where the strap is placed around the heads of two individuals and used in a tug-of-war fashion; push-up platform; rope skipping platform; Roman chair station; bar-bell station; twist and grip station; two stations for competitive exercises between two individuals and a three hundred yard sprint course. The physical training manual FM 21-20, pp. 144-147, contains instructions for constructing the Indian War Club, Roman chair, barbell, and the twist and grip. The entire strength course can be constructed by troop labor using salvaged materials.

The strength course occupies little area, which makes it possible for one individual to supervise the participants from a centrally located platform.

After battery personnel have become accustomed to the rigor of the conditioning exercises a minimum of two minutes is spent at each conditioning station. Participants move on the double to the next station upon hearing the whistle of the individual in charge. The entire course can be completed by the end of a twenty to thirty minute period.

To accommodate battery personnel in an expeditious manner, one strength course consisting of four Indian War Club stations, four chinning bar stations, two strap stations, four push-up platforms, four rope skipping platforms, four Roman chair stations, four bar-bell stations, two stations for competitive exercises between two individuals, and a three hundred yard sprint course should be constructed at each on-site position.

Utilization of the strength course five days a week in conjunction with seasonal sports presents a physical training program at on-site positions predicated on building muscle and endurance.

The course reaches its maximum value where the exercises, the equipment, and the interest among the men are such as to attract the men voluntarily during off-duty hours.

**Ten stations of the 56th AAA Brigade's PT course. 1. Indian War Club. 2. Chinning bar. 3. Strap. 4. Push-up. 5. Instructors. 6. Rope Skipping. 7. Individual contest. 8. Roman chair. 9. Bar-bell. 10. Twist and grip.**

All members are urged to note the Association Ballot prepared by the Nominating Committee and published on page 12 and to **VOTE.**

# THE DEVELOPMENT OF HEAVY ANTIAIRCRAFT ARTILLERY*

**Part 2**

**By COL. *WILLIAM J. WUEST***

THE American development of antiaircraft artillery had, prior to 1917, been confined almost exclusively to the task of designing and constructing fixed antiaircraft guns for our coast fortifications. It was naturally expected that it would be at those points that we would first, if ever, have to meet an attack from the air. Very little attention had been paid to mobile artillery of this sort.

Before April 1916, the Ordnance Department had designed a high powered 3-inch antiaircraft mount for the fixed emplacements at coast fortifications. The gun on this mount fired a 15-pound projectile with a muzzle velocity of 2,600 feet per second using shrapnel and 2,800 feet per second firing high explosive shell. This gun and mount will be described later.

Our antiaircraft artillery program of manufacture in the United States involved five separate projects or developments.

*Improvised Mounts*—By the end of 1916 it was apparent that it would be necessary to provide antiaircraft artillery of a mobile type as part of the equipment for any field force that might be sent abroad.

Since that contingency seemed entirely possible at that time, and as it appeared to be impossible to provide a suitable design in time for proper consideration and test, it was decided to improvise a simple structural steel design that would permit quick construction and on which a 75mm field gun, that was already in production, could be mounted.

The first project, therefore, was the construction of improvised mounts. The design was completed 1 May 1917 and an order was placed with the Builders Iron Foundry of Providence, R. I., for fifty mounts. Deliveries on these were made during the fall of 1917. The mounts were at once shipped to France for equipment with 75mm French model 1897 field guns with Puteaux recuperators that had been procured for the purpose. These mounts were known as improvised antiaircraft carriage, model of 1917.

The emplacement for the mount involved digging a circular excavation for the carriage 109 inches in diameter and 67 inches in depth. The carriage was of the base ring type, built in three sections to facilitate transportation, and the principal support for the carriage consisted of two commercial channels spanning the excavation.

In transportation the gun was carried upside down on a trailer designed for it. Two weeks were required to properly prepare the position and then mount the equipment in the field! About thirty of these mounts were installed and manned at the time of the Armistice. They were used for rear area defense.

*75mm AA Truck Mount*—The second project consisted of fifty-one 75mm antiaircraft truck mounts. A U. S. model 1916 field gun with a special type of hydrospring recoil system with throttling valves cut into cylinders, was placed on an offset swivel mount attached to the chassis of a White truck. The gun was carried with the breech directly behind the drivers seat, but as the length of recoil was 33 inches, the firing was limited to such horizontal position of the mount as would permit the recoil of the gun

*Extracted from Col. Wuest's book, "History of Heavy AA Fire Control and Matériel."

Figure 1—75mm improvised mount

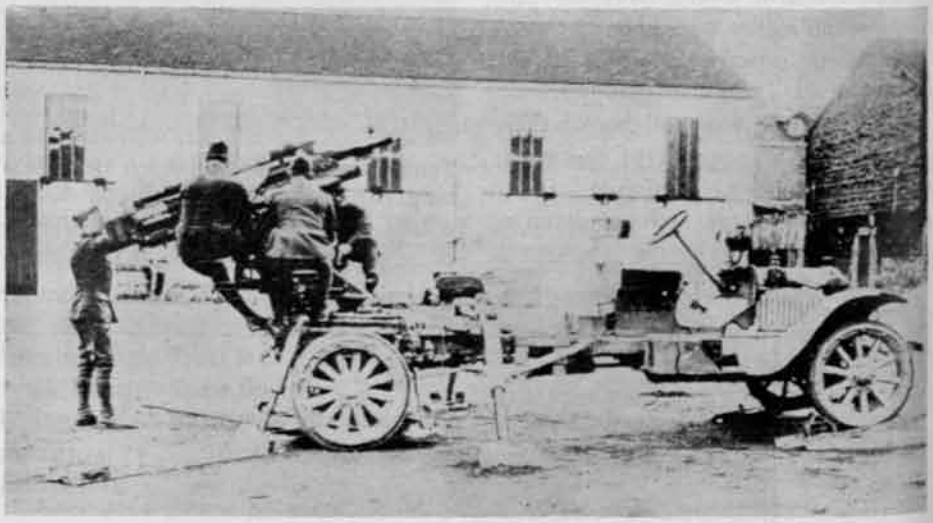


Figure 2—75mm AA truck mount

clearing the sides or rear of the truck. The breechblock was semiautomatic. It was necessary to stabilize the truck by means of jacks before firing.

This gun had a muzzle velocity of 1,828 feet per second and fired high explosive or shrapnel with a 20-second maximum time fuze for each. The guns were manufactured at Watervliet Arsenal except for the pilot model which came from Rock Island Arsenal. The recoil mechanisms were made by the New Britain Machine Co. of New Britain, Conn., who also assembled the complete equipment on the White 1½-ton truck.

The gun was pointed by means of a sight. The limits of elevation were 31 to 82 degrees. The traverse was 240 degrees.

There were numerous defects in this mount. The gun could not be depressed below 31 degrees and was so unstable during firing that the crew had difficulty staying on it. Its traverse of 240 degrees left a 120-degree dead space. The instruments, not properly designed, could not be kept set. The elevating and traversing mechanism jammed frequently, preventing proper following of the target. The mount was so encumbered by heavy channel irons and angle irons, intended to stabilize it, that it was by no means mobile; particularly was this true over poor roads. The low muzzle velocity of the gun made the flight of the projectile too long.

It was realized that the field guns with which these mounts were equipped did not have the power or range that the war experience was showing to be necessary. The only reason that the field guns of 75mm caliber were used in this way was because they were the guns most quickly available and because the French were already using them for this purpose.

The gun, not used during the war, was used for National Guard training during the 1920's.

*3-inch AA Gun Model 1918 On Trailer Mount Model 1918.* The third project included what was known in the Ordnance Department as the 3-inch antiaircraft auto trailer model 1918. On this model, the main antiaircraft effort was made in World War I and almost two decades later this gun and mount were still in use. The gun was of the ballistic design of the 3-inch, 15-pounder, model

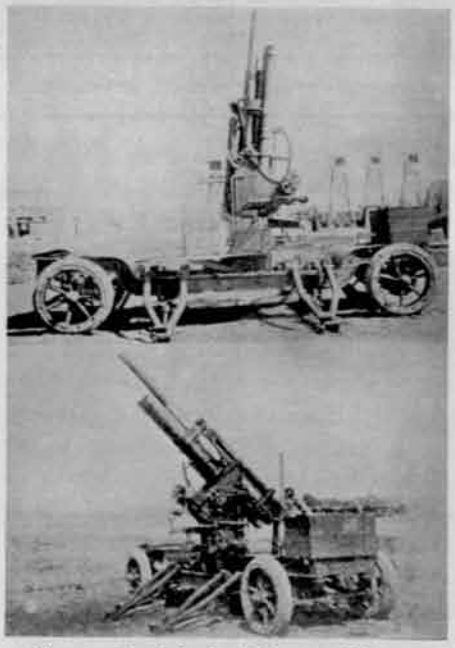


**Figure 3—3-inch AA gun M1918**

1898 seacoast gun, with an adaptation of the U. S. model field gun breechblock of the drop block type.

The gun was mounted on the model 1918 trailer mount. The gun was built up of nickel steel forgings consisting of a tube, jacket, and breech ring. It had a length of bore of 40 calibers and was rifled with an increasing right hand twist of from one turn in fifty calibers to one turn in 25. Chambered to use M1918 fixed ammunition, it developed 2,400 feet per second with shrapnel and 2,600 feet per second with high explosive. Gun and mount weighed 9,115 pounds.

The breechblock was opened by hand. It closed automatically when a round of ammunition was thrown into the breech. A variable, hydrospring recoil system was provided which varied the recoil from forty inches at ten degrees elevation to sixteen inches at 85 degrees.

Most of the M1918 mounts were equipped with sights and Case 1½ pointing equipment, transmission of firing data by telephone being employed. (Case 1½ pointing involved pointing the azimuth and elevation sights at the target and causing the gun barrel to diverge laterally and vertically from this line by the lateral and vertical angles through which the target moved during time of flight of the projectile.)

In operation, the sight was directed at the target. Lateral deflection, received by telephone from the data computer, was set on the lateral deflection scale. This moved the sight off the target. When the sight was again directed at the target the gun was pointed ahead, laterally, at the future position of the target. Vertical deflection was set in a similar manner.

The firing platform was unsteady during firing despite the use of outriggers and stability jacks on the mount. The counterrecoil mechanism functioned irregularly. Loading at high angles of elevation was very difficult. The mount was not capable of being hauled over all kinds of terrain. The bracket fuze setter M1916 was employed to set fuzes manually to the value of fuze range received by telephone from the data computer.

Although the M1918 guns had these defects, in the hands of well-trained troops the accuracy of this gun was satisfactory. Since it was produced in quantity, these guns were issued to ROTC units in colleges and to National Guard Coast Artillery units after the war. As late as 1935, it was expected, if war should come, that these guns would be issued to troops until sufficient quantities of the 3-inch AA gun (standardized in 1928) had been produced.

Chalkis Manufacturing Co., Detroit, Mich., manufactured the gun; Grant Motor Car Corp., Cleveland, Ohio, manufactured the trailer; the mounts and assembly by New Britain Machine Co., New Britain, Conn.; and the telescopes by Kollmorgan Optical Corp., Brooklyn, N. Y.

*3-inch AA Gun Model 1917 On Mount M1917*—The fourth project was concerned with 160 3-inch antiaircraft guns, M1917 with seacoast mounts. These were fine and powerful weapons, arranged with 12-inch recoil and designed to be mounted on a solid concrete base about 2½ feet thick and 18 feet in diameter. These guns were designed prior to the entrance of the United States into the war and were intended for seacoast defense and for the defense of depots. The guns were made by Watervliet Arsenal; 22 of the mounts by Bethlehem Steel Co. and the balance by Watertown Arsenal. A total of 159 guns and mounts were eventually produced and distributed in the United States and the Canal Zone.

The gun had a length of bore of 55 calibers and was rifled with an increasing right hand twist of one turn in fifty

calibers to one turn in 25 calibers. Eventually a uniform twist of one turn in forty calibers became standard.

M1917 fixed ammunition was used. Shrapnel developed 2,600 feet per second; high explosive shell 2,800 feet per second. In recoil the cartridge case was ejected and the breech remained open.

Traverse was 360 degrees; elevation zero to 90 degrees.

The mount was of the barbette type. Most of the mounts were equipped with sights and Case 1½ pointing equipment, transmission of firing data by telephone being employed. A sighting system similar to that on the M1918 gun was used. Fuzes were set manually on the bracket fuze setter M1916. The weight of the gun and mount was 15,280 pounds.

*4.7 AA Gun Model 1918*—The fifth project had to do with a 4-7-inch antiaircraft gun, although it can hardly be said to have reached the stage of a project. The desire for a 4.7-inch gun on a split trail carriage was first expressed by General Pershing on September 6, 1917 in a cablegram to the War Department. He called attention to the need of a larger caliber than 3-inch for effective antiaircraft work.

On 27 September, Ordnance cabled General Pershing notifying him that a larger caliber gun had been started and requested recommendations as to ballistics.

General Pershing replied, recommending guns with a muzzle velocity of 2,300 feet per second, high explosive shell, weight forty pounds, rate of fire ten rounds per minute, and automatic loading.

The project finally settled down in January 1918 to a 4.7-inch gun mounted on a caterpillar tractor with jacks and outriggers, known as 4.7-inch antiaircraft gun M1918 on antiaircraft trailer model E. It had an elevation of zero to 80 degrees, 360 degrees traverse, length in calibers -40, muzzle velocity of 2,400 feet per second, a 45-pound high explosive projectile with time fuze for maximum altitude of 10,000 meters at eighty degrees and a maximum horizontal range of 15,000 meters. The total traveling weight was 35,000 pounds.

The order for the gun was placed with Watervliet Arsenal, for an experimental recoil system with New Britain Machine Co., and with the Holt Manufacturing Co. of Peoria, Ill., for the caterpillar trailer.

Practically all details were settled at the time with the exception of those pertaining to the request for the automatic loading. Attempts were made to obtain the details relating to the Schneider loading device, which had been developed by the French for their 105mm antiaircraft gun. This loading device apparently had been developed successfully after two years of work and thus would be available immediately. General arrangement drawings of this device were received, but not details, and finally a loading device was designed in the United States.

The caterpillar trailer was shipped to New Britain on 18 June 1918 but the gun was not in readiness until October. Construction of the automatic loading attachment and work on a sighting device prevented the completion of the experimental unit prior to the Armistice.

In this article we have traced the five antiaircraft gun projects of the United States in World War I. The next article will cover the fire control equipment used with these guns.

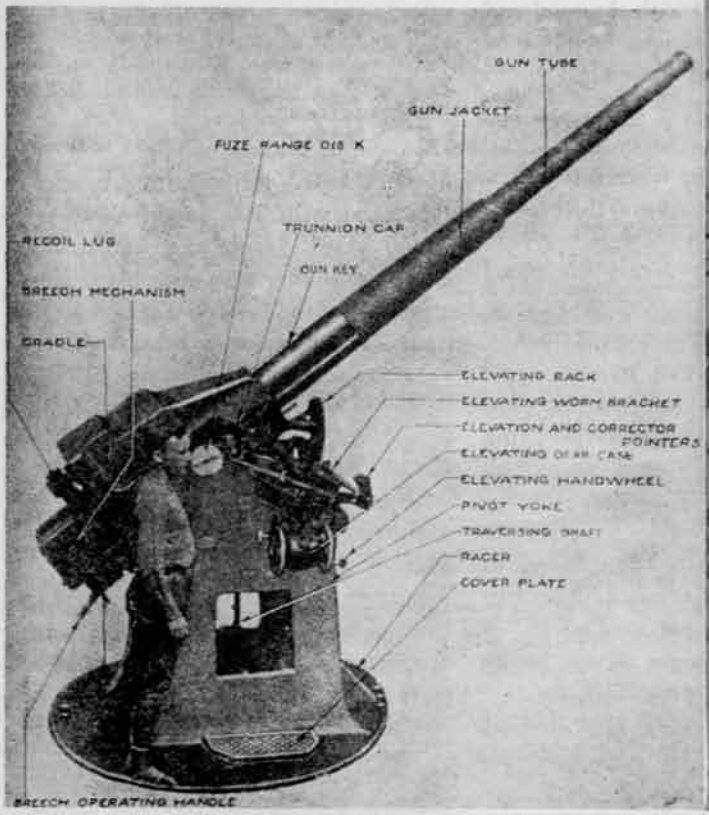



Figure 4—3-inch gun M1917

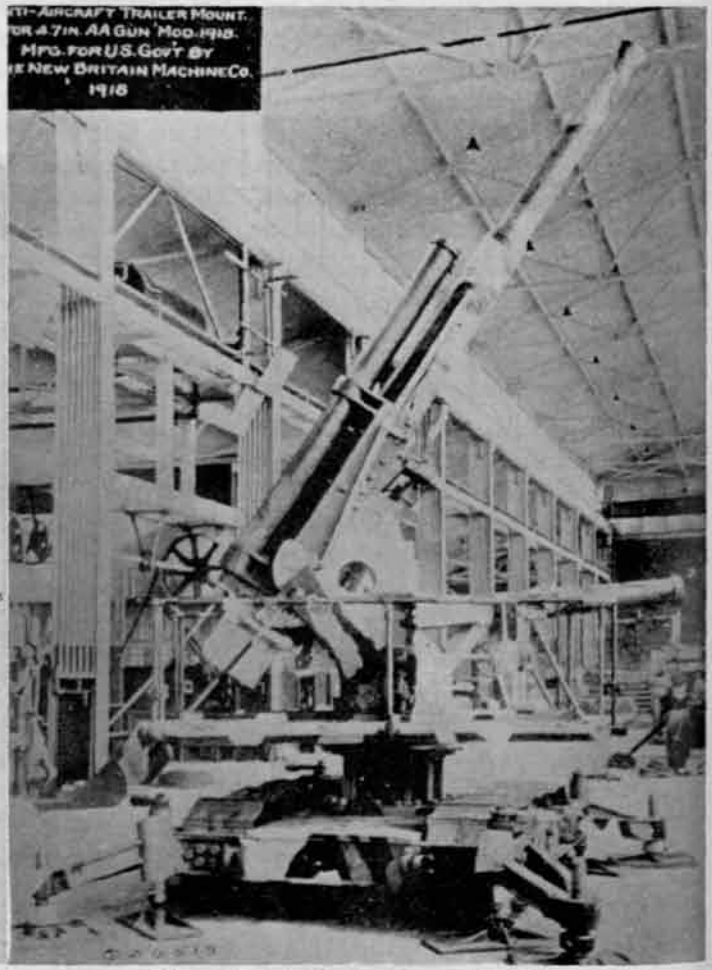



Figure 5—4.7-inch AA gun M1918

Soldier's guide to GUIDED MISSILES 2

# Guided-Missile Propulsion

Captain Patrick W. Powers

## WHY WE USE JET ENGINES

THE tremendous ear-splitting roar and spew of smoke and hot gases that occur when a guided missile is launched represent the tremendous motive power required to lift the missile. To get this kind of power and resulting supersonic speeds the jet engine is used exclusively. The first article in this series described how and why guided missiles fly, as well as some of the effects of supersonic flight. This article is to acquaint the soldier with the jet engines used in missiles and some of their operating characteristics. Since the use of guided missiles will become increasingly important in the very near future, a basic understanding of their operation is essential. Let's examine the principles of jet propulsion and then look at two types of engines: rocket jet and atmospheric jet engines.

## How Jet Engines Propel

JET propulsion is a method of producing motion by ejecting matter from the propelled body to create momentum. The matter ejected is composed of burning gases which have a very high temperature and velocity. Momentum is the product of the mass of the gases and their velocity. The creation of momentum develops a force called thrust which produces the motion of the body. This force is measured in pounds. As an example: The German V-2 rocket-propelled weapon developed 50,000 pounds of thrust; 50,000 pounds of thrust when traveling at 3,750 miles per hour is equivalent to 500,000 horsepower! (Note: 1 pound of thrust equals 1 horsepower at 375 mph.)

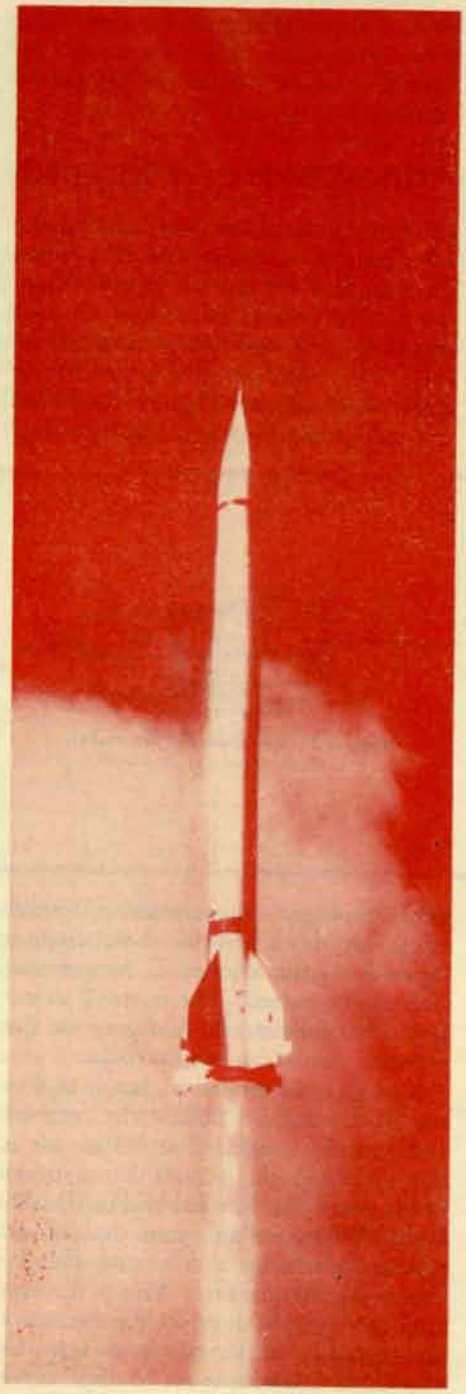
The principle upon which every jet engine is based is Newton's Third Law of Motion which states that for every action there is an equal and opposite reaction. One of the best ways to illustrate this is to show that a rocket works like a shotgun, as in Figure 1. When the trigger of a shotgun is pulled and the shell exploded, the shot—possessing a definite weight or mass—rushes out of the muzzle with a high velocity. The momentum thus created produces an action. The equal and opposite reaction occurs as the recoil of the weapon.

A rocket behaves in the same manner. When the propellant in the combustion chamber is ignited, the hot burning gases—possessing a certain mass—rush out the nozzle with an extremely high velocity. Thus, again we have created an action. The reaction which we called recoil before is now termed thrust. This is the force that produces the motion of the missile. From this illustration we can see that a rocket's exhaust gases do not push against the air to achieve the necessary thrust; the necessary force is obtained from the reaction principle, which means a rocket can operate just as well in a vacuum as in the air.

Jet engines must supply large quantities of gas under high pressure and temperature to achieve the required thrust. To accomplish this, they must have the following components, as shown in Figure 2:

A combustion chamber
A fuel supply system (propellant charge)
A nozzle or exhaust pipe

Large quantities of high-pressure and high temperature gases are produced by the chemical reaction of a fuel and oxidizer in the chamber. These gases are expelled through the nozzle to the outside air to cause a thrust force. Now that some of the fundamentals of jet propulsion have been covered, their application to the four types of jet engines will be discussed.



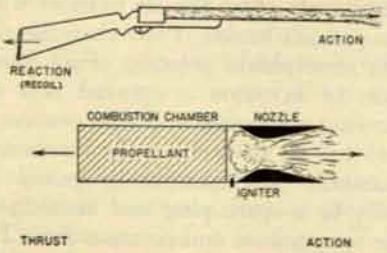



Figure 1. *A rocket works like a shotgun.*

## Rocket Jet Engine

A ROCKET jet engine contains its own supply of fuel and oxidizer which in combination is called a propellant. Rockets are classified as to the type of propellant that they carry, that is, solid or liquid. The solid propellant rocket is shown in Figure 2. It is characterized by the way the propellant

Reprinted from the *Combat Forces Journal* July 1952 issue.

Captain Patrick W. Powers, Artillery, is an instructor in the Guided Missiles Department of the Antiaircraft and Guided Missiles Branch of TAS at Fort Bliss, Texas.

burns, that is, in a restricted or unrestricted manner. The restricted burning type at the top of the figure burns like a cigarette from the end of the propellant charge or grain that is nearer the nozzle, down to the forward end. This type of burning usually takes place in about five to forty seconds. The unrestricted burning rocket burns not only on the end surface but also on the outside and inside of the surfaces of the long propellant charge. Thus this rocket burns only for .05 to five seconds. The solid-propellant rocket is very simple in construction, may be stored easily in the field like an artillery shell, and is ready to fire at a moment's notice. Two disadvantages are: a large, heavy combustion chamber is needed for the propellant, and sometimes the propellant grain fails to burn properly at extreme temperatures. The restricted burning solid rocket has been used in JATO units while the unrestricted type is used in

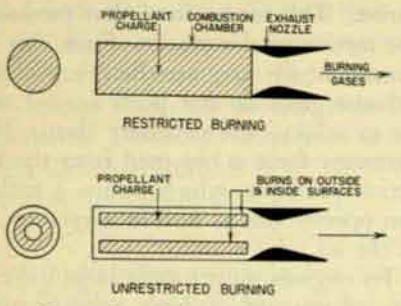



**Figure 2.** ***Solid-propellant rocket.***

artillery rockets and booster units for missiles.

THE liquid-propellant rocket is shown in Figure 3. The fuel and oxidizer are actually liquids such as liquid oxygen and alcohol. These two liquids were used as the propellant in the German V-2 rocket. In order to get the liquids into the combustion chamber where they will burn, a pressure feed system is used for smaller rockets and a pump feed system for the larger ones. The pressure system shown uses compressed air or some inert gas to force the fuel and oxidizer into the combustion chamber. This type of feed system is very simple and is much lighter in weight for smaller rockets than the pump type, which uses turbine-turned pumps to force the propellant into the combustion chamber. The main advantage of the liquid-propellant rocket is that it can be turned on and off as thrust is required and that it will have a longer burning time than the solid-propellant type. However, the handling of the liquids is always a problem because they are often acids or liquids that must be kept at extremely low temperatures, such as liquid oxygen at minus 200 degrees Fahrenheit. This presents a problem of storage and handling.

In general, rockets have almost unlimited speed, a high rate of propellant consumption—the V-2 consumed 20,000 pounds of propellant in 65 seconds—and they can operate above the earth's atmosphere where conditions approach a vacuum.

## Atmospheric Jet Engines

IN contrast to rockets, the atmospheric jet engines carry only fuel and obtain the necessary oxygen for burning from the air. In general, they have a longer operating time and better economy of fuel. They operate on a cycle like an automobile engine. That is, they have an intake, compression, combustion, and exhaust phase. The amount of power or thrust developed in these engines depends on the amount of compression that can be gained. The types of jet engines that fall into this category are the pulsejet, ramjet, and the turbojet.

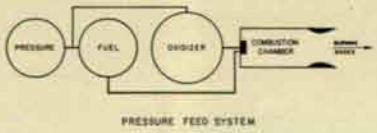



**Figure 3.** ***Liquid-propellant rocket.***

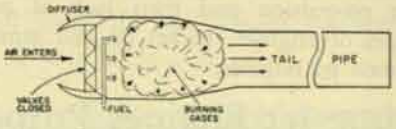



**Figure 4.** ***Pulsejet engine.***

The pulsejet engine is shown in Figure 4. In order to follow the combustion process, imagine that the engine is flying through the air and that a stream of air enters the forward end or the diffuser. When the air enters the diffuser section its velocity is decreased, thereby increasing the pressure. This is the first step then in building up the necessary compression. As the air flows into the engine, it enters a series of flap valves which only allow the air to enter when the pressure inside is less than the outside atmospheric pressure. Fuel in the form of kerosene is sprayed into the entering air stream and this mixture of fuel and air then enters the combustion chamber. The mixture is ignited initially by a spark plug and immediately the temperature and pressure rise. This increased pressure closes the flap valves and causes the burning mixture to rush out the tail pipe with a high velocity, creating the action whose reaction is thrust. Now, since the burning mixture of gas and air has left the combustion chamber, the pressure inside is lower than that of the outside air. Hence the flap valves will open again and admit a fresh charge of air and fuel; also, some of the burning gases that do not quite leave the tail pipe will be sucked back into the combustion chamber. When these small bits of hot gases come in contact with the fresh air and fuel mixture, they ignite it and the process is started all over again. For a large-size pulsejet engine this process occurs forty or fifty times per second and gives a characteristic buzzing sound which gave the name "Buzz Bomb" to the German V-1 pulsejet missile. The fuel consumption for the pulsejet is generally about 1/16 that of the rocket. In addition, the pulsejet is a very simple engine and uses a readily available kerosene-type fuel. However, it is a subsonic engine—top speed about 450 mph—and its altitude is limited to about 10,000 feet. At the present time it is being used as a training engine, to power drone aircraft, and recently, to turn the blades of helicopters.

THE ramjet (Figure 5) is the most promising of all of the jet engines, because it can give supersonic speeds with a very simple design and low manufacturing costs. Again imagine that this ramjet engine is flying somewhere in the atmosphere and let us examine its operating characteristics. The air that enters the forward part of the ramjet passes through a series of shock waves that are formed around the cone projected from the ramjet body. The shock waves are pressure disturbances that always occur on leading edge surfaces at supersonic speeds. As the air goes through this series of shock waves its velocity is decreased and the pressure is increased. This conical body and the outer walls of the ramjet comprise the

diffuser for this engine. The diffuser merely acts as a mechanism that slows down the air, increasing the pressure for the compression phase in the combustion chamber. The air picks up fuel and then this mixture of fuel and air goes through a meshlike device known as a flame-holder. The flame-holder maintains the flame that is started by the ignition cone and prevents the flame from being blown out of the rear of the ramjet body. Actually the flame-holder's function corresponds to that of the perforated metal skirt around the wick of a Zippo lighter. If this "fence" were not there the flame would be blown out. Now the mixture of fuel and air is ignited by the ignition cone and burns in the combustion chamber where the pressure is again increased. It is interesting to note that at this point there appears to be nothing to keep the burning mixture from going out of the front end of the ramjet instead of out of the rear end. However, the pressure in front of the flame-holder is higher than that of the outside air. This is caused by the action of the diffuser in slowing down the air. The burning mixture will not flow to a region of high pressure but will flow to a region of low pressure which exists in the outside air. Hence the burning gases exhaust through the nozzle and expand into the outside atmosphere, creating the necessary thrust force. The ramjet has no moving parts, is very light in weight, and simple to manufacture. Since it operates at supersonic speeds using only kerosene as a fuel, it is ideal for use as a guided-missile power plant. At the present time the ramjet is not very flexible in operation and always must be boosted up to its operating speeds. This type of engine, since it gets its oxygen from the atmosphere, is limited to a maximum operating altitude of nearly 60,000 feet.

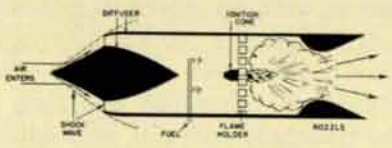



Figure 5. *Ramjet engine.*

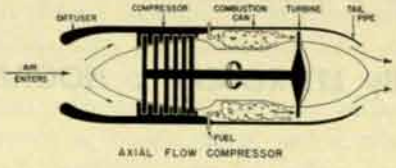



Figure 6. *Turbojet engine.*

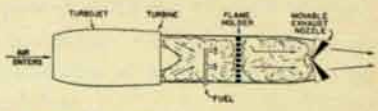



Figure 7. *Turbojet with afterburner.*

THE turbojet engine is the most common jet engine in use today. It powers most of our high-performance aircraft and is continually being improved to give enough thrust for supersonic speeds. The turbojet engine differs from the pulsejet and ramjet in that it uses a mechanical air compressor to obtain the high pressures necessary for the combustion process. There are two types of turbojet engines classified by whether they use a centrifugal or axial-flow air compressor. Of the two types the axial flow shown in Figure 6 is being used most extensively in this country. In operation, the entering air stream increases its pressure by means of a diffuser and enters the axial-flow compressor where it is further compressed to more than four times atmospheric pressure. It is then ducted to the combustion can. As the air enters the combustion can it picks up fuel in the form of kerosene and this mixture burns with a very high temperature and pressure. This hot burning mixture is then forced through turbine blades and is exhausted to the atmosphere through the tail pipe. The turbine that is turned by the hot gases is connected directly to the compressor, so that the gases must have enough energy to turn both the turbine and the compressor and be able to provide enough thrust to the missile. A limitation on the performance of the turbojet is the temperature that the turbine blades can withstand: we have to use critical materials in order that the gases can reach at least 1,500 degrees Fahrenheit. However, this temperature is much lower than that in the combustion can because the gases are cooled by air that has been ducted around the combustion can and which has joined the hot gases just in front of the turbine blades. Only fifteen of 100 parts of the air are burned. The turbojet is the most reliable and the most complicated of the jet engines. It uses fuel very economically compared to the other jet engines and with the addition of afterburning will give our missiles supersonic speeds. The afterburner shown in Figure 7 is actually a ramjet attached to the rear of a turbojet engine. By burning additional fuel in the turbojet exhaust, greater thrust can be obtained.

## Summary

WE have examined briefly the power-packed jet engines which are necessary to fly guided missiles at supersonic speeds. A force called thrust, a measure of the power needed, is obtained by creating high temperature and pressure gases which are forced to rush out through a nozzle at very great speeds —even as high as 4,500 miles per hour! The rocket jet engine using a solid or a liquid propellant provides the most thrust of all the jet engines and thus can fly at greater supersonic speeds. However, it has a high rate of propellant consumption so that the propellant burns up in a short length of time. The solid rocket can be handled with relative ease by troops in the field while the more complicated liquid rocket requires special equipment and handling techniques.

The atmospheric jet engines combine the oxygen in the air with a kerosene or gasoline type fuel for combustion. Consequently, the problem of maintenance and handling procedures is much simpler. The pulsejet engine is a subsonic power plant, too slow for use in missiles but used in training and with drones and helicopters. The ramjet has the best characteristics of any of the jet engines because it will give us supersonic speeds with low cost and simple design. However, it must be boosted to operating speeds and is limited to flight in the atmosphere. The last engine covered was the turbojet which powers most of our high-performance aircraft. This is the most complicated and expensive jet engine and the most reliable. With economical fuel consumption it gives supersonic speeds by the addition of an afterburning apparatus.

The final article in this series will examine methods of guiding missiles.

Lt. Elmer Faust, TAC Officer of "A" Battery, observes Officer Candidate Liam C. O'Reilly as he holds a discussion class on new developments.

Inspection in ranks is a daily duty of the tactical officer: Lt. Daniel B. Foland returns a carbine to Officer Candidate William L. Watkins of B Battery.

# THE MOST DIFFICULT JOB IN THE ARMY?

**By LT. ROBERT L. HOGAN**

MILITARY leadership has been defined in various ways by many outstanding commanders. Each in his own way is convinced that his definition of leadership is the best. From the objective viewpoint it is probable that any definition of leadership from such a military commander must be valuable. It is the interpretation and implementation of these definitions that make the work of the OCS tactical officer one of "The most difficult jobs in the Army."

The term Tactical Officer has been adopted from the United States Military Academy. This title is carried by those officers at the Military Academy whose duty it is to counsel and advise the cadets during their years at West Point. It is their example and guidance which have consistently produced the fine young officers who have risen to some of the highest positions this country can provide. It is their counterpart, the OCS tactical officer, who must do the same job in twenty-two weeks rather than the four years allowed at West Point. In this short time the tactical officer must discover those men who will not meet the fundamental standards of leadership. From an initial group of forty to fifty candidates the tactical officer must weed out the weaklings, the obvious misfits, and then rate those left according to their leadership adaptability.

At the Antiaircraft Artillery Officer Candidate School, this process has been developed to a fine art by its tactical officers. Colonel Robert H. Krueger, while director of the Department of OCS, has specifically directed that tactical officers be chosen from the best available.

The tactical officers at this school possess a notable cross section of military schooling and education. Graduates of the United States Military Academy are: Lts. John V. Hemler, Barry M. Harris, James R. Pitts, and Robert W. Milburn. Lieutenants Horace L. Hunter, Thomas E. Weber, Raymond C. Giesecke, Daniel P. Gray, W. R. Cornish, Garland W. Headley, Carl H. Hagan and Billie D. Richards represent the ROTC units of Oklahoma A & M, University of Missouri, Texas A & M, Purdue, Virginia Polytechnic, and VMI. Graduates of officer candidate schools represent nearly all of the combat arms. Lts. Elmer F. Faust, Ernest C. Felts, Norman F. Bradshaw, Raymond J. Babinsky, Philip W. Inman, Jack A. Johnson and Robert W. Smith are from the Army Officer Candidate School at Fort Riley. Lt. Robert L. Hogan, from the Infantry Officer Candidate School at Fort Benning; Lts. John L. Dailey, Peter F. Burns, Daniel W. Foland, Chester C. Getty and T. S. Ransom from the Artillery Officer Candidate School at Fort Sill. From other diversified sources can be included Capt. Robert L. Greer, who is a graduate of the Air Force Cadet program during World War II, and Lt. George A. Keller, graduate of the Special Associate Basic Course during 1949; Lt. Charles C. Rowland, recipient of a battlefield commission, and Lt. Thomas M. Lawler, Jr. of direct commission.

Lt. Hogan, former instructor in the Electronics Department, was a tactical officer of Class Number 1, OCS Department. He is now stationed in Alaska.

with Lt. Richard Wetzell, a National Guard officer, completing the roster. With this background among his tactical officers, the average candidate of the AAA OCS receives his commission feeling he has been given a varied and instructive example of leadership during his twenty-two weeks.

Many will not agree with the premise that the OCS tactical officer has a difficult job and it is the purpose of this article to present reasons valid enough to justify the title, "The Most Difficult Job in the Army?"

The tactical officer meets his group within twelve hours after their reporting date. The first drill formation is known as the "sizing" formation at which the candidates are grouped into their respective platoons. The tactical officer, who also acts as the platoon instructor, assumes control of his platoon and immediately begins to evaluate his group. Just as cream inevitably rises to the top of a bottle of milk, the men with outstanding leadership qualities are readily discernible to the experienced tactical officer. It is these men on whom he relies a great deal during the opening weeks of the class. It is these candidates whom the tac officer, during the first weeks, places in various platoon and battery command positions in which they assume actual command responsibilities. Tests of leadership qualities may develop hidden flaws which are not readily apparent in a man's personality. If flaws are noted, the tac officer makes written observation of such, and plans to concentrate a little later on these signs of weakness to see how deep they penetrate.

A certain amount of mental and physical pressure, coupled with an immediate high standard of discipline, is applied to the platoon from the very first. The tac officer uses this pressure to squeeze out those candidates who applied for the school more for the purpose of evading the same kind of discipline in their former unit rather than an intense desire to earn a commission. These men usually request relief within the first two weeks. Before they resign, the tac officer counsels and advises that the pressures which they obviously cannot stand, are minor, compared to the possible combat pressures facing the officer on the battlefield.

Usually, by the first four weeks, the tac officer knows his best men and has been relieved of his very worst. Then comes the difficult work. He must decide, out of the remaining twenty or thirty, how many of these will make good leaders. Of course, during this time, academic failures are taking their toll. Many men have left the OCS due to academic failures who also have a high degree of leadership ability. This cannot be helped, for one of the important adjuncts of the good leader is knowledge of his job.

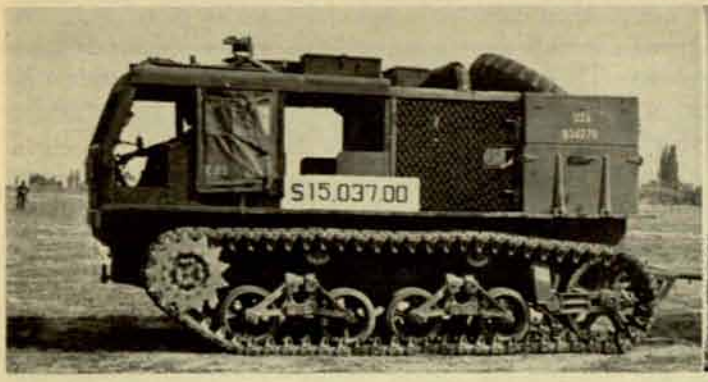
By this time, the tac officer has rated his platoon according to their leadership adaptability. The candidates have completed the first student rating within their sections. This is more properly known as "buddy rating" and in which each candidate rates his fellow candidates according to their leadership personality. It is these ratings which help to tell the tac officer if a man is as good a follower as he is leader, whether his personal habits are above standard and whether he adapts himself to group living.

From these first leadership ratings the tac officer must now concentrate on the bottom group to see if they have the qualities desired. At the same time, he must constantly evaluate the others, searching for weaknesses and flaws. The bottom may consist of two or three candidates, or as many as ten candidates. It is at this time that the tac officer must exercise the epitome of judgment and perception. The primary decision is up to the tac officer which may cause a particular candidate to receive his commission or not.

It is this decision—based on such intangibles as personality, attitude, mental and physical stamina, command ability, to mention just a few, which is the primary reason why the job is considered difficult. Decisions in themselves are difficult enough, but it is more difficult when one makes a decision which may shatter completely a man's ambition for an honorable career.

Though the primary decision to release a candidate for lack of leadership qualities lies in most cases with the tac officer, it is only fair to add that the decision is not completely his. The senior team instructor of the candidate battery has also been evaluating the candidates from a higher level. The recommendations of the senior team instructor, plus those of the tac officer, are then forwarded to the Officer Candidate Board, who carefully review the evidence. This is passed on to the Director of the OCS Department, who then makes recommendations as to the disposition of the candidate.

The work of the tac officer is best summed up in the remark made by Major Forrest I. Rettgers, former senior team instructor of Class Number 1 of the AAA OCS, about his tac officers of A Battery, when he said, "My tac officers are not running for any popularity contest, their job is to produce leaders—not buddies. They will be best known in the field by the well rounded officer they produce." This statement is best borne out by the many graduates of OCS who probably remember their particular tactical officer as being the most rigid and strict disciplinarian they have known. The tac officer who rates this honorable accolade has performed his duty in a highly conscientious manner but, it has been . . . difficult.




Photos Courtesy of Capt. Ward Crowell

# Cost Consciousness In The 34th AAA Brigade

**By MAJOR THEODORE WYCKOFF**

HAVE you ever stopped to wonder about the cost of this vast and complicated equipment that we in the AA have to work with? I'm sure you have. But did you ever get the real facts—the real dollars and cents values of these items—these guns, directors, generators, radios and radars—these tracks, half-tracks, trucks and tractors—which are an artilleryman's tools?

Let me just take you on a short tour around the U. S. Zone of Germany on a visit to several units of the 34th AAA Brigade. I'd like to show you some of the equipment our units have, with price tags affixed, and as we ride up the autobahn, I'll quote to you a few figures that I know will surprise you. If you're a battery commander maybe you'll want to post some of my photographs on your bulletin board, and perhaps you'll want to jot down some of my statistics to repeat to your men.

Let's talk about guns for a few minutes. We'll go to see Lt. Col. John P. Tawes, who commands the 67th AAA Gun Bn. Did you know that one 90mm gun M2 costs $53,396, that a director M9 costs $29,380, a generator M18 $4,524, and a radar SCR 584 costs *one hundred and thirty five thousand* dollars? Those are just a few of the outstanding items—how about some of the "smaller" items? Did you know that the IFF equipment which goes with the SCR 584—the RC 184—costs $8,129, that an AN/GRC-9 radio costs $1,413, and the little power unit that goes with it, the PE 162—$479? The ten binoculars you have in a battery cost $1,290 altogether, and at $599.66 for each .50 caliber machine gun, and $191 for each M63 mount you have in a battery, your nine M63's assembled are worth $7,115.94. In your motor pool your special armored forces tool set, company, costs $726.48 and your tool set, second echelon, No. 1, is priced at $392.40. This is not even to mention your M4 tractors which are worth $15,037 apiece, your new 2½ ton Reo trucks which now cost $7,026 apiece, and your new jeeps which cost $2100. Why the 1½ ton trailer alone which your 2½ tows costs $1,105! I could go on for two more pages, but enough is enough.

Let's take a quick look at some automatic weapons. Let's say hello to Lt. Col. Charlie P. Meadows, who is the CO of the 62d AAA AW Bn. The 62d is a self propelled battalion. There's the M16, at $17,937 and over there is the M15, at $25,218. Across the street are some M19's and they cost *ninety-four thousand, seven hundred and forty-three* dollars! That's almost as bad as the vehicle tank recovery, M32, which sports a price tag of $95,565. Again these are the big items. What about the "small" ones?

Ammunition? 37mm ammo is $6.25 p per round, and at over 100 rounds per minute, that's over $625 per minute! How about some other "minor" items? A CP lamp is quoted at $100, while a hundred M2 carbines at $35.50 apiece, by my figuring, add up to $3,500. Quartermaster sells its items at a somewhat more nominal figure that Signal or Ordnance: a CP tent complete with pins and poles is only $121.65 and a plastic bugle is only $3.21, but a three-unit field range is $477.78, and one of those insulated "Marmite" cans costs $37.76.

Now let's turn around and go back to Karlsruhe, where Col. Chester J. Diestel commands the 12th AAA Group. Down around his "Kaserne" they're talking about the prices of everyday items in terms of a soldier's income tax. Did you know that the price of a standard non-portable ten inch carriage typewriter is equivalent to the income tax deducted from the pay of a Pfc over a period of ten months? Did you know that a BD-72 switchboard was equivalent to 38 months' income tax from a Pvt E-2? This unique method of illustrating that members of the armed forces are paying for the items of equipment they use drives home the important fact that every soldier has a financial stake in the army.

Well, this will give you just an idea of some of the items that Cost Consciousness in the 34th AAA Brigade has turned up. Add to this some of the other figures that we in the 34th Bri-

Major Wyckoff has certainly nailed down the first objective. However, some further steps may be appropriate, too. We can stop pleading for more vehicles, more equipment. Better still, we can cut down sharply on what we have.

We require of course, accurate, powerful, and costly weapons and fire control. That is no place for foolish economy. However, even there, the lid isn't off. If we think Colonel Tawes' radars are expensive, we should consider some of the later models, and seriously ask are we spending wisely?—*Ed.*

gade deal with—the several thousand dollars it costs to move a battalion by rail to a firing range or the expense of procuring twenty-four $2,350 RCAT's a year to fly for a battalion on the range—and you see where it doesn't take long before defense adds up to millions.

What good does all this cost consciousness do you? The money has already been spent for the tools we have today. We can't unspend it. But we can make sure that not a dollar's worth of equipment is wasted through carelessness, and we can make darn sure that through high quality training, every dollar's worth of equipment we have gives us 100 cents of value when the time for the payoff comes.

# 53rd AAA BRIGADE

**By LT. LOREN F. SCHMIDTBERGER**

The history of the 53rd AAA Brigade dates back to 11 July, 1941, when it was activated at Hickam Field, Territory of Hawaii. It served in the Hawaiian defenses until 1944 when it was assigned to the Tenth Army. Under command of Brig. Gen. M. C. Handwerk, the brigade landed with the assault force on Okinawa and served there till it was inactivated 30 January, 1946.

On 13 May, 1952, it was activated under the command of Brigadier General Robert J. Wood, at Swarthmore, Pennsylvania. Lieutenant Colonel James W. Roy is the Executive Officer; Major Carl O. Loos, S1 and S2; Major Thomas G. Worley, S3; and Major David T. Coiner, S4.

The brigade has the Central Pacific and Ryukyus campaign streamers.

The 53rd Brigade replaced the 108th AAA Brigade, Georgia National Guard, under Brigadier General Joseph B. Frazer when the 108th returned to its home station, Savannah, in May.

Assigned the mission of providing AA defense of Philadelphia and Pittsburgh, the 53rd Brigade consists of two groups: the 24th AAA Group commanded by Colonel Arthur C. Peterson, and the 18th AAA Group commanded by Colonel Cecil E. Spann, Jr.

The 150th AAA Gun Bn under Lt. Col. Louis O. Ellis, Jr., Wilmington, N. C., and the 337th under Lt. Col. Joseph H. Valliere are still active in the defenses.

Likewise the 74th under Lt. Col. Millard H. Roesser and the 182nd under Lt. Col. George R. Higginbotham are busily engaged in improving their positions.

Lt. Col. Charles F. Arnold now commands the 19th AAA Gun Bn. Lt. Col. Frederick F. Quist commands the 708th. Lt. Col. Charles E. Roden is executive, 24th AAA Group, and Lt. Col. Roy W. Horton is the 18th Group executive.

Early in July the brigade was visited by Lieut. Gen. John T. Lewis, Army Antiaircraft commander, and Brig. Gen. William M. Hamilton, then Eastern Army Antiaircraft commander. On 29 August, Brig. Gen. Frederic L. Hayden visited installations in the Philadelphia area early after he had replaced Gen. Hamilton.

The brigade has vigorously promoted good will between civilians and the military. The conducting of guided tours and the holding of "open houses" are means successfully used to gain the public's friendship. A recent "open house" at a battery position was attended by approximately 700 people.

Typifying the civilian attitude towards army units stationed in their "back yards" was a letter received by General Wood from eight year old Peter Sullivan who lives in the neighborhood of one of the sites. Wrote Peter, ". . . We are glad to have them in Collingdale. To show how glad we are we would like to invite one of them to our house for dinner. Could we do this?"

General Wood's affirmitive reply began a friendship between Peter and members of the battery which reached its culmination with a front page picture of Peter and battery members in a leading Philadelphia newspaper.

GEN. LEWIS VISITS 209TH GROUP

GENERAL LEWIS VISITS BATTERY D, 708TH AAA BN.

Brig. Gen. Robert J. Wood, left; Col. Eugene J. Welte, CO 209th AAA Group; 2nd Lt. Ralph Mella, battery commander; Brig. Gen. William M. Hamilton and Lieut. Gen. John T. Lewis.

# GENERAL LEMNITZER — THREE STARS

## *General Marquat — Decorated*
## *Colonel Cardwell — B. G.*

### General Lemnitzer Promoted

*Assigned as Army Deputy Chief of Staff*

Major General Lyman L. Lemnitzer, Vice-President of the U. S. Antiaircraft

Association, was promoted to the grade of lieutenant general on August 1st as he took over his new assignment as the Army Deputy Chief of Staff for Plans and Research. The promotion ceremony was held in General Collins' office in the Pentagon where the Chief of Staff presented to General Lemnitzer the three-star insignia and the flag of a lieutenant general. In his new assignment Lt. Gen. Lemnitzer replaced Lt. Gen. Charles L. Bolte, who took command of the Seventh Army in Germany.

General Lemnitzer has just returned from Korea where he commanded the 7th Division. A few months ago he was awarded the Silver Star for gallantry in action in that division.

At the time of his departure he was awarded the Distinguished Service Medal with one OLC for his forceful leadership in that command.

General Lemnitzer was thrust into national prominence in October 1942 when he participated in the secret submarine mission to North Africa with General Mark Clark preparatory to the allied invasion. He was the anchor man on that diplomatic-intelligence venture. As we recall one incident not so amusing at the time, he saved the day in one escapade where General Clark lost his pants.

After serving on General Eisenhower's staff during the invasion, he returned to command the 34th AAA Brigade in Tunisia and in Sicily where he was General Patton's AAA commander.

In Italy he served first as deputy and later as chief of staff to Sir Harold Alexander, Supreme Allied Commander, Mediterranean.

Following the war he held several important assignments in Washington, the last one of which was as Director of the Office of Military Assistance in 1949-50. Following that he qualified as a parachutist and commanded the 11th Airborne Division for a year before going to Korea.

### Gen. Cardwell

Brig. Gen. Eugene F. Cardwell was awarded his promotion to that grade on August the first in the same ceremony with Lieut. General Lemnitzer. General Collins awarded to him the one-star insignia and the flag of a brigadier general.

General Cardwell left immediately to take command of the 31st AAA Brigade at Fort Lewis, Washington. His previous assignment was as Acting Chief of the Service Division, Army G4 Office, Pentagon.

General Cardwell came to extended active duty at Fort Bliss, Texas in 1940 with the famous Chicago Antiaircraft Regiment, 202nd CA (AA) Ill. N. G. As the S4 of the first AAA regiment on Logan Heights, Cardwell and Lt. Col. Frank McConnell, unit instructor (now Brigadier General), were very active in shaping up the camp and the Oro Grande Firing Range.

General Clark presents the second Oak Leaf Cluster to the Distinguished Service Medal to Major General William F. Marquat as the latter departed from Tokyo to become the Army Chief of Civil Affairs and Military Government in Washington. Gen. Marquat also received and treasures just as warmly from the Boy Scouts of Japan their highest award.

Gen. Cardwell served during the war in Iceland and in Europe where he became Chief of the Enemy War Materials Branch on SHAEF.

Following duty tours as G4 Panama Canal Department and student, Armed Forces Industrial College, he returned again to Fort Bliss to serve with troops and later as Chief of Staff of the Center until ordered to Washington in 1950.

## 52d AAA Brigade

*Ft. Wadsworth, N. Y.*

Commanded By
BRIG. GEN. LEGARE K. TARRANT

During the past few months, the 52d AAA Brigade, commanded by Brig. Gen. Legare K. Tarrant, has been busy taking over the AA Defense of New York City from the 102d AAA Brigade, New York National Guard, which was returned to inactive status. General Legare K. Tarrant, Brigade Commander, has been reorganizing his staff and making frequent inspections of the many tactical sites occupied by the Brigade's units. Col. Arthur L. Sanford, Jr., is Brigade Executive.

In July, the 66th AAA Gun Battalion, Lt. Col. Charles M. Brown, was added to the defense, and the 98th AAA Gun Battalion under Lt. Col. J. J. Kelley, Jr., also became a member of the family in August. These battalions took the place of the 245th AAA Gun Battalion and the 369th AAA Gun Battalion, New York National Guard, which reverted to inactive status.

The past three months have been very active ones for this command. During the period 19-28 July, the Brigade participated in a command-wide JADX called "Exercise Signpost."

Major General John M. Lentz, Inspector of Artillery, Office of the Chief, Army Field Forces, made a staff visit to the 52d on 30 July 1952.

General Frederic L. Hayden, who recently assumed command of the Eastern Army Antiaircraft Command, inspected the Brigade and tactical sites during the period 21-23 August.

Losses have been occurring rapidly since the new staff was formed. Major Robert E. Randolph, Brigade S4, Captain Leo B. Long, Assistant S4, Captain George J. Lahey, Assistant S3, and CWO William B. Stirling, Assistant S2, have received orders for overseas.

A big turnover in officer personnel is taking place in all units. Colonel Frank H. Shepardson is expected to arrive about 24 September and will probably assume command of the 11th AAA Group. Colonel Richard S. Spangler will arrive about 15 October and will be assigned command of the 16th AAA Group. Lt. Col. Robert W. Molloy has been assigned to the 526th AAA Gun Battalion and will arrive about 10 September. Major Benjamin Bell, a recent arrival, has been assigned to the 34th AAA Gun Battalion as the Executive Officer under Lt. Col. Harry B. Reubel, commander. Captain Eugene R. Williamson, formerly Brigade Assistant S3, has been assigned duty as Brigade S4.

Lieut. Col. Gerhard E. Brown commands the 16th AAA Group with Lt. Col. John M. Rossnagel as his Executive. Lieut. Col. Leonard S. Allen now commands the 11th AAA Group since Col. Bruce Logan left for collegiate study at Syracuse University and later assignment to comptroller duty. Major Lawrence T. Darcy took command of the 259th AAA Battalion.

Col. Clarence H. Schabacker is expected soon to replace Col. Fred J. Wood as Post Commander at Fort Hancock. Col. Wood goes to FECOM.

Col. Archibald L. Parmelee is still the post commander at Fort Wadsworth and Col. Robin B. Pape still commands the 80th AAA Group.

## 56th AAA Brigade

Brig. Gen. Harry F. Meyers still doubles in brass, commanding both the 56th AAA Brigade and also Fort Devens. The staffs however are clearly separated. Colonel Harmon E. Broyles is the post executive, having relieved Colonel Edward B. McCarthy who is now undergoing treatment in the station hospital.

The Army Security Agency School at Devens is one of the activities of interest.

Colonel Kenneth J. Woodbury has now served for almost a year as the brigade executive. Likewise Major Worth Connor is an old hand as the brigade S1 and S4.

Lt. Col. Paul A. Harmon is the brigade S3.

To command the 15th AAA Group, relieving the 197th Group in the Boston defenses, Colonel Seneca W. Foote is due to arrive. Lt. Col. John J. Guy is the executive.

Lt. Col. Paul D. Franson commands the 685th AAA Gun Bn. Lt. Col. Carl Fraser, former commander, has departed for assignment in EUCOM.

Major Earle Mountain commands the 16th AAA Gun Bn until Lieut. Col. Paul A. Vogatzis arrives.

Lt. Col. F. J. Roddy commands the 704th AAA Gun Bn. 1st Lieut. Robert J. Hutten, commanding the 515th Opn. Det., is in the process of relieving the 173rd AAA Opn. Det., which soon reverts to inactive status.

Colonel Charles G. Patterson has departed from Camp Edwards to attend the National War College, and has been relieved of command of the 2nd AAA Group by Colonel Adam S. Buynoski.

The 398th AAA AW Bn is due for change of station. Lt. Col. Louis B. Dean, commander fo this battalion, will soon revert to inactive status.

Lt. Col. Kenneth E. Tiffany commands the 44th AAA Battalion. Lt. Col. John M. Walker has departed for the C & G S College and Lt. Col. Benjamin Perry has relieved him in command of the 380th AAA Gun Bn. Lt. Col. Addison M. White commands the 336th AAA Gun Bn. The 336th and the 380th were engaged in furnishing weapons and assistance on the Wellfleet firing range to the First Army Guard and Reserve Units in summer camp.

## 32nd Brigade Aids In U. S.-British Blood Drive

Antiaircraftsmen of the 32nd AAA Brigade, commanded by Col. Metticus W. May, in England, joined with U. S. Air Force personnel and their British neighbors in a highly successful joint blood donation drive recently.

American and British medics with British nurses manned the mobile unit that toured U. S. installations and English communities in a well publicized two-day operation which yielded more than a pint of blood per minute for the period.

The British Broadcasting Company and newsreel cameras with representatives of the British press covered what was described as an outstanding example of good Anglo-American relations, while an attractive American girl, dressed as a nurse, drove an Army sedan to all AAA gun positions to appeal for blood donations and transported donors to the dispensary.

The plasma obtained was made available to U. S. and British hospitals.

# HAIL AND FAREWELL

**By SGT. WILLIAM J. TOBIN**

ONE of the oldest antiaircraft artillery units in the country has been returned to state control after two years of active duty, and in its place has been activated a young battalion under the command of a young but experienced leader.

In colorful ceremonies at Fort George G. Meade, Md., on July 28, the 736th AAA Gun Battalion was relieved of its assignment with the 35th AAA Brigade and the Eastern Army Antiaircraft Command. In its place was activated the 89th AAA Gun Battalion under the command of Lieutenant Colonel Thomas H. Barfield, who recently returned from the Far East Command.

Leaders of the 35th AAA Brigade and of the 261st AAA Brigade of the Delaware National Guard, of which the 736th now is a part, participated in the review. Details of deactivation and activation of the two units were broadcast over a public address system to the hundreds of persons who attended the ceremonies.

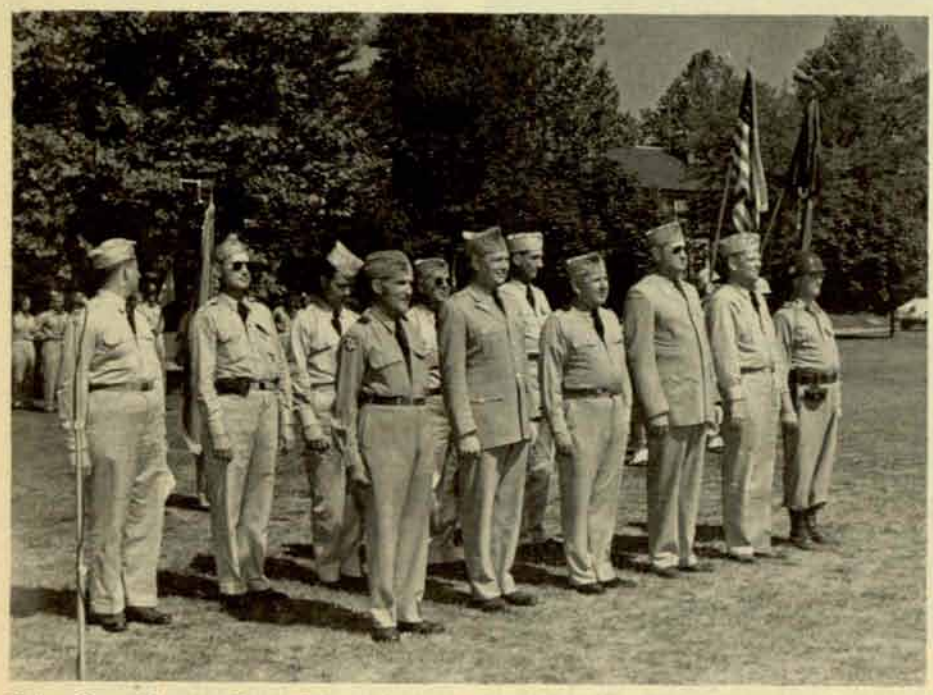
Lieutenant Colonel Frank T. Lynch, who had commanded the 736th as "The First Regiment of The First State" since its call to active duty in August, 1950, led the Battalion in its return to state control. Brigadier General Homer Case, commanding general of the 35th Brigade, praised the Battalion in an address before the review, and said it was "with deep regret" that he returned the unit to Delaware.

The battalion was accepted back to state control by Brigadier General John J. Scannell, State Adjutant General. "The people of Delaware," he said, "share with me a great pride in this unit and its men. Two years ago, at the outbreak of the Korean crisis, I had the sad duty of ordering them to active duty. Now I am proud to welcome them again upon their return home."

General Case, in his statement, traced the 91-year history of the 736th, and paid tribute to its service since 1950. "Only eight officers, three warrant officers, and 58 enlisted men are returning with you today," General Case said. "More than one hundred of your men have gone overseas, and all but one have returned. It thus behooves us to pay particular respect to the memory of First Lieutenant William Tawes, who was killed in action in Korea last year."

Lieutenant Tawes, a Delaware native, was killed in November, 1951, while serving as an artillery forward observer.

Colonel Barfield came forward to receive the 89th AAA Gun Battalion colors bearing the motto of, "With Fire and Sword." General Case welcomed the 35-year-old commander and his new unit to the 35th Brigade.



Brig. Gen. Homer Case, CG, 35th AAA Brigade with Brig. Gen. John J. Scannell, Delaware's Adjutant General and Brig. Gen. John B. Moore, CG, 261st AAA Brigade, Delaware National Guard take the review of the departing 736th AAA Gun Bn. Lt. Col. Frank T. Lynch, battalion commander, right.

### Delaware Guard Brigade Trains With 35th

*By Major Earl L. Matz*

Devoting its annual fifteen-day training period to side-by-side operations with the 35th AAA Brigade, commanded by Brig. Gen. Homer Case, at Fort Meade, Md., the 261st AAA Brigade, Delaware National Guard, under Brig. Gen. John B. Moore, participated in Exercise Metro which was launched during the summer period.

Prior to the arrival of the guardsmen on 20 July their regular weekly staff meetings had been preparatory for working with their Regular Army staff opposites during the program, and clearances for secret information had to be obtained for the Guard personnel who would receive comprehensive instruction on classified AAA information.

With the mornings of the first week devoted to classroom training, members of Gen. Moore's brigade teamed with appropriate staff sections of the 35th for on-the-job experience during the afternoons. Trips were made into the field to visit operational training sites and a study was made of the latest methods and equipment used in the AAA defenses of Washington and Baltimore.

That the program was regarded as a complete success was indicated by General Moore's statement, "I sincerely believe that, in this operation, we have found the means to fill that which has been a serious gap in the training of our reserve components at this level."

# News and Comment

## 226th AAA Group

Forty-one National Guardsmen of the 226th AAA Group returned to their homes in Mobile on September 3d after spending two years on active duty.

The 226th came to active Federal service shortly after the outbreak of hostilities in Korea and spent sixteen months at Fort Bliss, Texas, training antiaircraft units for deployment to continental and overseas stations, and eight months on duty with the Western Army Antiaircraft Command—with the primary mission of protecting the city of Seattle, Washington against air attack.

Colonel John D. Sides has commanded the group throughout its active service. His staff includes Lt. Col. Robert M. Handy, Major Clarence H. Jones, Captains John P. Fonde, Eugene P. Kilcullen, Paul F. Leonard, Wm. M. Wise, and 1st Lt. Jack M. Yerkes.

Lt. Gen. John T. Lewis, commanding general of the Army Antiaircraft Command, complimented the group on the quality of its performance while on active duty in a recent letter to Colonel Sides, in which he thanked them "for a job superbly done."

The group will be re-established as the senior headquarters of the AAA in the Alabama National Guard at its armory in Mobile.

All men returning with the group, plan to continue as members in its National Guard status.

## 3d AAA Bn. Strafes Reds

The oldest artillery battalion in the Eighth Army celebrated the 177th anniversary of the U. S. Artillery on July 21 by firing another mission against the Communists in Korea.

The unit, with a history dating back to 1794, is the 3d AAA AW Battalion (SP) commanded by Lt. Col. Otho A. Moomaw.

In 1794, exactly nineteen years after Congress made the artillery a separate branch of the Army, two "companies" of artillery and engineers were established. These two were named after their commanders, Captains Kaltieson and Mitchell, and are now Batteries B and D of the 3d AAA Bn.

The battalion has seen action in every major military campaign the U. S. has been committed to, including the Boxer Rebellion in China at the turn of the century.

Since arriving in Korea, it has fought to the Yala river and through the evacuation at Hungnam. After the spring offensive of 1951, it was the first mobilized unit to re-cross the Han river.

The unit has been credited with 3,000 enemy casualties, scores of enemy bunkers and observation posts and 79 Communists captured.

A total of nine Silver Stars for gallantry, 24 Bronze Star Medals for heroism and 57 Purple Hearts for wounds received in action have been awarded to men of the battalion.

It is assigned to the 3d Infantry Division, Eighth Army.

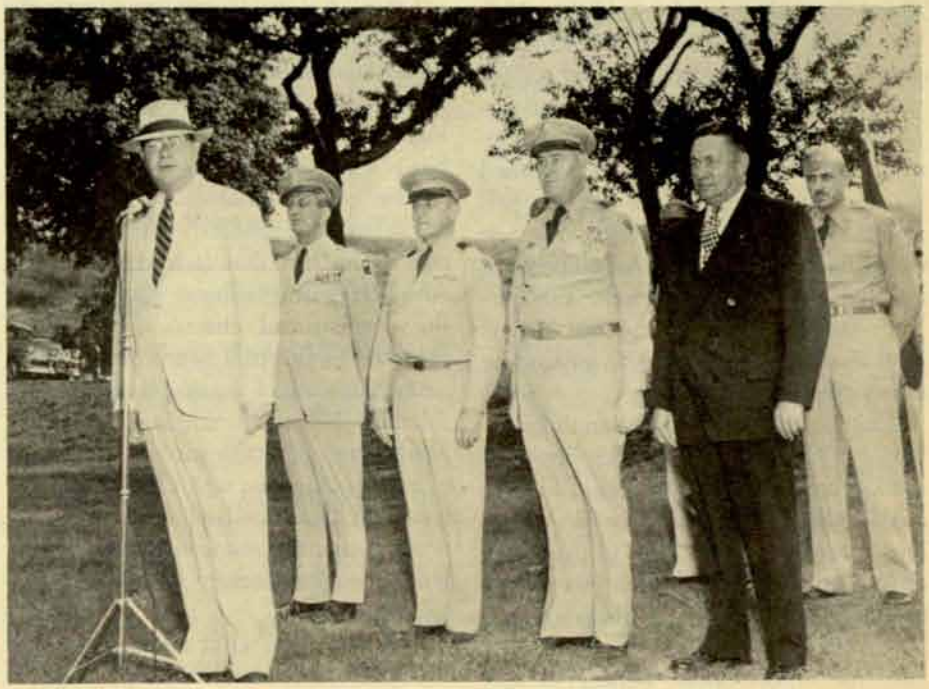
## 197th AAA Group

The return of the 197th AAA Group to state control as a New Hampshire Guard organization was marked by a colorful ceremony at Fort Banks, Massachusetts on August 11th.

Parading in honor of the 197th was a composite battalion composed of troops of the 15th AAA Group, 685th, 704th and the 16th AAA Gun Battalions. Colonel Albert S. Baker, commander of the 197th took the parade accompanied by Acting Governor Blaylock Atherton of New Hampshire, Mayor Shelby O. Walker of Concord, N. H., Maj. Gen. Chas. F. Bowen, State Adjutant General, and Brig. Gen. Harry F. Meyers, commanding the 56th AAA Brigade.

As the highlight of the ceremony Colonel Baker presented the 197th AAA Group colors to Governor Atherton, who addressed the troops briefly referring to the splendid record of that organization. Mayor Walker, General Bowen, and General Meyers also spoke briefly praising the service and esprit of the 197th.

A number of distinguished citizens of Concord attended the ceremony with their families and partook of the refreshments served at the officers club immediately thereafter. Also in attendance were a number of officers of the brigade, group and battalions and their wives.



Hon. Blaylock Atherton, Acting Governor of New Hampshire, addressing troops at Fort Banks, Mass., upon return to State control of the 197th AAA Group. Left to right: Maj. Gen. Charles F. Bowen, Adjutant General of New Hampshire; Brig. Gen. Harry F. Meyers, CG, 56th AAA Brigade; Col. Albert S. Baker, CO, 197th AAA Group; Hon. Shelby O. Walker, Mayor of Concord, N. H.; and (rear) Maj. Worth Conner, Adjutant of the 56th AAA Brigade.

## To the Editor

It is a pleasure to report the results of a recent ANTIAIRCRAFT JOURNAL subscription drive. The drive was conducted without pressure of any kind—the JOURNAL had to speak for itself; and believe me, it did a good selling job. The 65th AAA Group obtained from its personnel 197 new subscriptions.

My main selling point to units of the 65th AAA Group was a promise that I would write to you personally and let you know that we of the AAA down here in Panama support *our* JOURNAL without reservation. In fact, we are proud of our service, our command, and our JOURNAL; and we want other AAA commands to realize that the AAA defending the Panama Canal is wide awake, alert, and prepared. We know the JOURNAL will help us to maintain our present high standard and that our subscriptions help assure a better JOURNAL.

We launched the campaign by requesting the subordinate unit commanders to acquaint all personnel with the ANTIAIRCRAFT JOURNAL and to encourage new subscriptions, not only among officers but enlisted personnel also.

The organization commanders, Lt. Colonel Frank J. Petrilli, 903rd AAA AW Bn.: Lt. Colonel Elton D. Winstead, 764th AAA Gun Bn (120mm); Major Robert S. Gruhn, 506th AAA Operations Detachment; and Lt. Melvin Holst, 38th RCAT Detachment; passed the good word to every officer and enlisted man in their units, and distributed sample copies. When personnel realized that this magazine, published for and supported by the ack-ack personnel, carried not only the newest technical ideas written by AA officers and enlisted men, but also news and pictures of their buddies in the four corners of the world, it was easy to gather the subscriptions.

The 903rd AAA AW Battalion obtained 132 new subscriptions—tops for the Group and possibly a record for any AA battalion. 1st Lt. Bruce W. Moseley, commanding Battery C of the 764th AAA Gun Battalion, which is attached to the 903rd AAA AW Battalion, reported 45 new subscriptions; and now has 36% of the entire Battery as subscribers and readers of the ANTIAIRCRAFT JOURNAL.

BEN E. CORDELL
Colonel, Artillery
Commanding, 65th AAA Group

*Both of these battalions operate as composite units. The 903rd at Fort Clayton has attached to it Batteries C and D of the 764th. Likewise Batteries C and D of the 903rd are attached to the 764th at Fort Davis.*

*Both battalions celebrated their ninth anniversary on September 15th, both having been activated in the Panama Canal Zone in 1943.*

## To the Editor

The new trial shot chart presented by Lt. Col. Currie in the May-June issue of the JOURNAL denotes considerable change from the conventional chart now in use.

The new method locates the TSP with coordinates of $D$ and $E$ instead of the conventional $H$ and $R$ by rotating the LOP into the horizontal plane. This rotation places the $\phi$ line approximately in the vertical plane.

Correspondingly in some cases this rotation facilitates measurements along the LOP and $\phi$ lines by use of the graph lines on the paper. In the example illustrated in the article, the ideal TSP with $D$ equal to 5000 yards was chosen, making the $\phi$ line graduations fall beautifully on the graph lines. Any random length of $D$ will throw the mil graduations of the $\phi$ line conspicuously off the graph lines.

I think Colonel Currie exaggerates the difficulty of constructing the conventional trial shot chart in his Table 1. His trial shot chart shows original thinking. Its concept is worthy of thought, but is it worthy of use?

The conventional chart has several advantages to consider. The most obvious is the fact that it *is* conventional. Also the true graphical picture which the conventional chart shows is most valuable in the trial fire problem. The new chart's use of the graph lines is considerably lessened when $D$ is not at the ideal range of 5000 yards. The effort in constructing the new chart is slightly less than that involved in the conventional chart, but the conventional chart is far more satisfactory for the trial fire solution itself.

Pick your own $D$ at random and see.

JOHN L. ROSS
1st Lt., Btry A, 95th AAA Gun Bn
Sandhofen, Germany

## Retired—Reassigned

Colonel Charles W. Higgins will retire in Washington, D. C., for age after more than 35 years of service, on October 31st. He is now on duty with the Adjutant General in the Career Records Analysis Branch. Colonel and Mrs. Higgins will make their home on Oakmore Farm, Tabb, Virginia.

Colonel William J. McCarthy will retire at Fort Bliss, Texas, for age after 38 years of service, on October 31st. He is now the Post Inspector General.

Colonel Olaf Kyster, Jr., has arrived in Germany to take command of the 8th AAA Group. He writes that he was taking off immediately for extended field maneuvers.

Colonel Donald C. Tredennick is now serving with G3 EUCOM.

Colonel Parmer W. Edwards has returned from his duty with the Military Advisor Group in London to take up his new assignment with the faculty of the National War College.

## Army Obtains Body Armor For Troops In Korea

The Army arranged with the U. S. Marine Corps to secure 25,000 of its Navy-developed body armor for use in Korea. Combat experience there has established that both the Army and Marine Corps body armor is extremely effective against fragments of mortar shells, hand grenades and other types of low-velocity missilies which cause the majority of battlefield wounds.

Both types of armor are designed to protect the upper torso and are the results of research by the Navy and the Army, including the exchange of experimental models and test data.

The Marine Corps body armor, developed by the Navy Bureau of Medicine and Surgery, and utilizing rigid fiberglas plates curved to fit the contours of the body, is standard equipment for the Marine Corps and has been in production on a volume basis since October 1951.

The Army-type body armor made of 12 layers of flexible, spot-laminated nylon duck, was developed by the Army and has been produced thus far only on a limited experimental basis.

The Army has decided to procure the Marine body armor for issue to troops now in Korea because of its immediate availability from industry on a quantity basis, but will also continue the development and test of its own Army type.

# ARTILLERY ORDERS

DA Special Orders Covering July 1, 1952 through August 31, 1952.
Promotions and demotions not included.

### COLONELS

Bender, A. H., 4053rd ASU AFF Bd #4 Ft Bliss, Texas
Cardwell, E. F., 31st AAA Brigade, Ft Lewis, Washington
Kreuger, Robert H., Far East Command, Yokohama
Lawlor, Robert J., Joint Staff OJCS 8485th AAU, Washington, D.C.
Leary, T. H., Far East Command, Yokohama
Lind, Henry D., 28th AAA Group, Ft Lewis, Washington
Peterson, Arthur C., 224th AAA Group, Fort Dix, NJ
Porter, Twinn U., 4052nd ASU AAA & GM Cen., Ft Bliss, Tex
Rude, Walter A., W Army AA Comd., 8577th AAU Hamilton Air Force Base, California
Sawyer, John A., OCAFF, Ft Monroe, Va.
Schabacker, Clarence H., 1235th ASU, Ft Hancock, NJ
Schmick, Peter, E Army AA Comd 8577th AAU Stewart Air Force Base, NY
Shepherd, Charles E., Far East Command, Yokohama
Woods, Fred J., Far East Command, Yokohama

### LIEUTENANT COLONELS

Brightman, John Y., Far East Command, Yokohama
Burkett, Leo B., Far East Command, Yokohama
Bursley, H. C., Far East Command, Yokohama
Cole, Norman E., 550th AAA Gun Bn, Cp Stewart, Ga.
Graham, H. E., Far East Command, Yokohama
Hines, C. C., Far East Command, Yokohama
Jacks, Fred W., Jr., 28th AAA Group, Ft Custer, Mich.
Lambert, Harry F., XVIII Abn Corps Arty., Ft Bragg, NC
Nanney, D. Y., Far East Command, Yokohama
Rossnagel, John M., Far East Command, Yokohama
Stricklen, Wm. A., Jr., 23rd AAA Group, Cp McCoy, Wisc.
Swain, Oren, 1st GM Gp, Ft Bliss, Texas
Williams, Albert C., 531st AAA Gun Bn, Cp Stewart, Ga.
Young, Claude C., Fort Bliss, Texas

### MAJORS

Burrell, W. E., Far East Command, Yokohama
Conlyn, Andrew G., 71st AAA Gun Bn, Ft Belvoir, Va.
Gardner, Robert P., USA Alaska, Ft. Richardson
Hodgkins, Alonza C., 4052nd ASU AA & GM Cen., Ft Bliss, Tex
Knight, Robert I., Far East Command, Yokohama
Nicholson, Frank A., 369th AAA Gun Bn, Ft Hancock, NJ
Rutherford, R. D., Far East Command, Yokohama
Wall, Wm. S., Far East Command, Yokohama

### CAPTAINS

Ackerson, Wm. H., 345th AAA Gun Bn, Miller Field, NY
Anderson, G. K., Far East Command, Yokohama
Briggs, John C., Far East Command, Yokohama
Brown, Michael J., 53rd AAA Brigade, Swarthmore Station, Philadelphia, Pa.
Daggett, Lyle E., USA Alaska, Ft. Richardson
Dorian, Robert A., 504th AAA Gun Bn, Ft Custer, Mich.
Erdman, G. W., Far East Command, Yokohama
Feaster, Burnes L., 4052nd ASU AAA RTC, Ft Bliss, Tex
Griffith, Wm. R., Far East Command, Yokohama
Guffey, Clarence L., USA Alaska, Ft. Richardson
Hickey, E. J., Jr., Far East Command, Yokohama
Jones, W. L., Far East Command, Yokohama
Kanof, Irving L., 80th AAA Group, Ft. Totten, NY
Kenneman, Jack R., USA Alaska, Ft. Richardson
King, W. F., Far East Command, Yokohama
Kruse, Lee G., Far East Command, Yokohama
Lincoln, Abraham S., Stu Det AA & GM Br TAS, Ft Bliss, Tex
Lipscomb, Ira H., 34th AAA Gun Bn, Ft Totten, NY
Lown, James M., Stu Det AA & GM Br TAS, Ft Bliss, Tex
Lupkey, Francis D., 4052nd ASU AAA & GM Cen, Ft Bliss, Tex
May, Joseph A., Far East Command, Yokohama
Mayer, Merle W., Far East Command, Yokohama
Mielke, John W., Far East Command, Yokohama
Mosher, K. A., Far East Command, Yokohama
Myers, Wm. R., Far East Command, Yokohama
Owens, Cleo H., 698th AAA Gun Bn, Ft Custer, Mich.
Philopena, Raymond C., 104th AAA Gun Bn, Ft. Banks, Mass.
Pilkington, Joseph, 80th AAA Group, Ft Totten, NY
Rose, Paul E., Far East Command, Yokohama
Sealander, M. W., EUCOM, Bremerhaven
Simon, Lincoln E., Far East Command, Yokohama
Smith, Grady T., Far East Command, Yokohama
Snow, M. H., Far East Command, Yokohama
Taylor, Harry J., Jr., Stu Det AA & GM Br TAS, Ft Bliss, Tex
Thornton, Rozler, L., 459th AAA AW Bn, Ft. Cronkhite, Calif
Toms, Galen E., Far East Command, Yokohama
Twigg, James H., Jr., 35th AAA Brigade, Ft Meade, Md.
Wayne, R. P., Far East Command, Yokohama
Werner, John A., Far East Command, Yokohama
Westwood, Lyle, 4052nd ASU AA & GM Cen, Ft Bliss, Tex
Willard, Robert, 337th AAA Gun Bn, Ft Dix, NJ

### FIRST LIEUTENANTS

Albrecht, Erwin F. Jr., USA Alaska, Ft Richardson
Anderson, Theophilus, USA Alaska, Ft Richardson
Brandariz, C. A., Far East Command, Yokohama
Branscombe, James H., 4052nd ASU, AAA & GM Cen, Ft Bliss, Tex
Butler, Fred W., EUCOM, Bremerhaven
Casso, T. A., EUCOM, Bremerhaven
Davis, Hubert L., EUCOM, Bremerhaven
Engstrom, John G., 7th AAA AW BN, Cp Stewart Ga.
Feinberg, Joseph G., 711th AAA Gun Bn, Ft Custer, Mich.
Garcia, Ventura V., 369th AAA Gun Bn, Ft Hancock, NJ
Gibbons, Wm. J., XVIII Abn Corps Arty, Ft Bragg, NC
Glogowski, Lawrence E., 35th AAA Brigade, Ft Meade, Md.
Hogan, Robert L., USA Alaska, Ft Richardson
Kennedy, George R., Stu Det AA & GM Br TAS, Ft Bliss, Tex
Lawler, T. M., Far East Command, Yokohama
Lewis, Addison L., Stu Det AA & GM Br TAS, Ft Bliss, Tex
Lipscomb, Robert L., EUCOM, Bremerhaven
Lopez, C. A., Far East Command, Yokohama
Marshall, Leonard J., 80th AAA Group, Ft Totten, NY
Martin, Francis H., 4052nd ASU AA & GM Cen, Ft Bliss, Tex
Naegele, Eugene L., Stu Det AA & GM Br TAS, Ft Bliss, Tex
O'Quinn, William S., USA Alaska, Ft Richardson
Shealy, John R., 151st AAA Opns Det, Swarthmore Station, Philadelphia, Penna.
Shelburne, George L., 4054th ASU AA & GM Br TAS, Ft Bliss, Tex
Standish, H. H., EUCOM, Bremerhaven
Standridge, Acy W., Far East Command, Yokohama
Vermeul, J. E., Far East Command,, Yokohama
Warner, Albert L., 4052nd ASU AA & GM Cen, Ft Bliss, Tex
Whitfield, Patrick H., Jr., 35th AAA Gun Bn, Ft Meade, Md.

### SECOND LIEUTENANTS

Alemanni, Joseph J., 4052nd ASU AA & GM Cen, Ft Bliss, Tex
Anderson, Joseph B., Far East Command, Yokohama
Andrews, Preston H., USA Alaska, Ft Richardson
Atkinson, Frank W. Jr., 59th AAA Gun Bn, Cp Stewart, Ga.
Bahr, Henery J., 685th AAA Gun Bn, Ft Devens, Mass.
Barrick, Richard O., 531st AAA Gun Bn, Ft Bliss, Tex
Bell, James D., 4052nd ASU AAA & GM Cen, Ft Bliss, Tex
Berrier, Jerry A., 35th AAA Brigade, Ft Meade, Md.
Billingsly, Robert P., EUCOM, Bremerhaven
Brantley, P. H., Far East Command, Yokohama
Brewster, Ralph E., EUCOM, Bremerhaven
Burk, Robert A., EUCOM, Bremerhaven
Cade, Alfred J., 209th AAA Gp., Indiantown Gap, Penna.
Catts, Elmer P., Jr., 704th AAA Gun Bn, Ft Banks, Mass.
Clark, Chapin D., 711th AAA Gun Bn, Ft Custer, Mich.
Corbishley, C. R., 22nd AAA Group, Ft Custer, Mich.
Cristoffersen, Phil, Far East Command, Yokohama
Damron, Jody W., 4052nd ASU AAA RTC, Ft Bliss, Texas
DeGasperis, John V., 245th AAA Gun Bn, Miller Field, NY
Desroaches, Bernard H., USA Alaska, Ft Richardson
Dughl, Charles H., 35th AAA Brigade, Ft Meade, Md.

Early, Irvine B., Jr., EUCOM Bremerhaven
Edmonds, G. F., EUCOM, Bremerhaven
Edwards, H. E., EUCOM, Bremerhaven
Erickson, A. B., 504th AAA Gun Bn, Ft Custer, Mich.
Evans, J. C., 4052nd ASU AA & GM Cen, Ft Bliss, Tex
Evans, W. K., 4052nd ASU AA & GM Cen, Ft Bliss, Tex
Ewing, George E., Far East Command, Yokohama
Falconer, W. J., 459th AAA AW BN, Ft Cronkhite, Calif.
Fauber, Robert S., 4052nd ASU AA & GM Cen, Ft Bliss, Tex
Flint, J. R., Jr., Far East Command, Yokohama
Forbes, R. W., Far East Command, Yokohama
Friend, D. F., 708th AAA Gun Bn, Indiantown Gap, Pa.
Galloway, James D., III, USA Caribbean, Ft Amador, CZ
Geller, Wm. A., 531st AAA AW BN, Ft Bliss, Tex
Giesecke, R. C., Far East Command, Yokohama
Glover, B. B., Far East Command, Yokohama
Goldman, Fred, 369th AAA Gun Bn, Ft Hancock, NJ
Gottsche, J. S., 459th AAA AW BN, Ft Cronkhite, Calif.
Gray, Daniel P., USA Alaska, Ft Richardson
Hampton, D. R., Far East Command, Yokohama
Hanak, E. P., 708th AAA Gun Bn, Indiantown Gap, Penna
Harris, A. J,, Jr., Far East Command, Yokohama
Harriss, B. M., Far East Command, Yokohama
Haynes, Ward M., EUCOM, Bremerhaven
Henderson, Wm. J., Jr., 709th AAA Gun Bn, Ft Sheridan, Ill.
Henley, Joseph T. Jr., EUCOM, Bremerhaven
Hickman, Robert F., 4052nd ASU AAA RTC, Ft Bliss, Tex
Hollender, Andrew C., Jr., USA Alaska, Ft Richardson
Hone, Edward W., Far East Command, Yokohama
Horne, Jasper C., Jr., 38th AAA Gun Bn, Cp Stewart, Ga.
Houston, Lyle A., USA Alaska, Ft Richardson
Hubbard, Rufus D., Far East Command, Yokohama
Huffman, Stanley A., Jr., EUCOM, Bremerhaven
Hughes, Dan A., EUCOM, Bremerhaven
Hughes, D. J., Far East Command, Yokohama
Hylton,Irvin L., 10th AAA AW BN, Ft Sill, Okla
Hyne, M. E., Far East Command, Yokohama
Jenkins, Wallace F., 531st AAA AW BN, Ft Bliss, Tex
Johnson, R. A., Far East Command, Yokohama
Jones, Lynn W., II, 20th AAA Gun Bn, Ft Lewis, Wash.
Kenz, Herbert W., 698th AAA Gun Bn, Ft Custer, Mich.
Lacey, W. S., Far East Command, Yokohama
Lafayette, J. E., EUCOM, Bremerhaven
Langley, J. D., EUCOM, Bremerhaven
Letourneau, J. A., 504th AAA Gun Bn, Ft Custer, Mich.
Littlejohn, James N., 41st AAA Gun Bn, Ft Hancock, NJ
Lopez, Gilbert, Far East Command, Yokohama
Lopf, Gilbert, Far East Command, Yokohama
Lunsford, L. R., 709th AAA Gun Bn, Ft Sheridan, Ill
Margraf, John A., 224th AAA Group, Ft Dix, NJ
Markley, R. E., 708th AAA Gun Bn, Indiantown Gap, Penna
Maxwell, Fred L., Jr., Far East Command, Yokohama
Milburn, R. W., Far East Command, Yokohama
Miles, Edgar G., 716th AAA Gun Bn, Ft Bliss, Tex
Miller, Bruce M., 504th AAA Gun Bn, Ft Custer, Mich.
Miller, N. L., Far East Command, Yokohama
Motta, Paul R., Stu Det AA & GM Br TAS, Ft Bliss, Tex
Murray, C. E., Far East Command, Yokohama
Myers, S. D., Far East Command, Yokohama
Niethamer, Ronald W., 337th AAA Gun Bn, Ft Dix, NJ
Nobel, Edwin L., Jr., 31st AAA Brigade, Ft Lewis, Wash.
Noel, James S., 708th AAA Gun Bn, Indiantown Gap, Penna.
Noyes, Richard W., Far East Command, Yokohama
Opel, Donald M., 526th AAA Gun Bn, Ft Totten, NY
Orr, Carson D., 708th AAA Gun Bn, Indiantown Gap, Penna.
Palmer, J. H., Far East Command, Yokohama
Pepoon, Donald W., EUCOM, Bremerhaven
Pittard, William G., Far East Command, Yokohama
Pitts, J. R., EUCOM, Bremerhaven.
Ponton, John W., 773rd AAA Gun Bn, Ft Hamilton, NY
Prince, I. R., Jr., 709th AAA Gun Bn, Ft Sheridan, Ill.
Rallis, John, USA Alaska, Ft Richardson
Redd, Mark H., EUCOM, Bremerhaven
Reece, Carroll K., 10th AAA AW BN, Ft Bliss, Tex.
Reed, Edward M., 4052nd ASU AA & GM Cen, Ft Bliss, Tex
Riddick, Mills A., 224th AAA Group, Ft Dix, NJ
Roach, Robert M., 245th AAA Gun Bn, Ft Wadsworth, NY
Rogers, Jonathan W., 34th AAA Gun Bn, Ft Totten, NY
Ross, E. E., 504th AAA Gun Bn, Ft Custer, Mich.
Savage, John M., Far East Command, Yokohama
Scherer, Arvel E., Stu Det AA & GM Br TAS, Ft Bliss, Tex
Schloss, C. M., 22nd AAA Group, Ft Dix, NJ
Schrack, Neil W., Stu Det AA & GM Br TAS Ft Bliss, Tex
Senna, Josef F., 56th AAA Gun Bn, Cp Stewart, Ga.
Sherman, A., Jr., 5th AAA Group, N. Richland, Washington
Simms, G. E., Jr., 44th AAA Gun Bn, Cp Edwards, Mass.
Smith, C. W., Jr., EUCOM, Bremerhaven.
Snow, John G., Far East Command, Yokohama
Stamper, Archie L., Far East Command, Yokohama
Steinport, George L., 22nd AAA Group, Ft Custer, Mich.
Stowell, Douglas B., USA Alaska, Ft Richardson
Sullivan, A. W., 504th AAA Gun Bn, Ft Custer, Mich.
Szwalwinski, Ambrose A., 4052nd ASU AA & GM Cen, Ft Bliss, Tex
Thompson, R. H., 44th AAA Gun Bn, Cp Edwards, Mass.
Tilley, James R., 4052nd ASU AA & GM Cen, Ft. Bliss, Tex.
Verlautz, Sidney J., 531st AAA Gun Bn, Ft Bliss, Tex
Wagnon, Wm. M., Jr., 38th AAA Gun Bn, Cp Stewart, Ga.
Wehr, A. J., Jr., 5th AAA Group, N. Richland, Wash.
Werner, D. R., 509th AAA Group, Indiantown Gap, Penna.

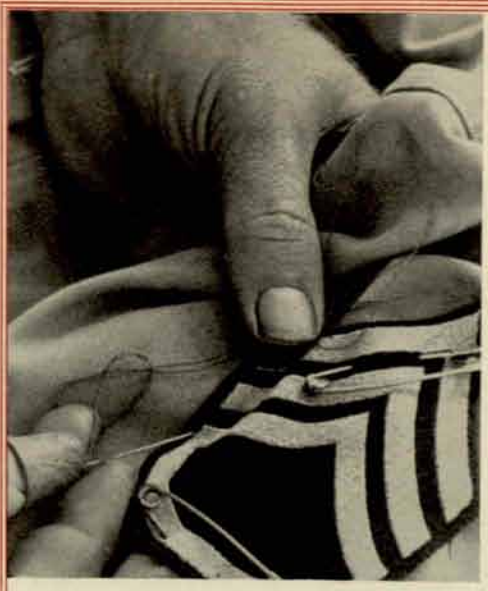
## Col. Redd Decorated at Ft. Lewis

Lt. Col. Lemuel B. Redd, of Blandings, Utah, was presented with the Bronze Star Medal here recently for outstanding achievements to the military service in Korea.

Colonel Redd was given the Bronze Star Medal for distinguishing himself by meritorious service as assistant supply officer, with the X Corps in Korea from August 31, 1950 to February 10, 1952.

He recently assumed command of the newly activated 20th Antiaircraft Gun Battalion at Fort Lewis.

The Bronze Star Medal was presented to Colonel Redd by Brig. Gen. Hobart Hewett, former C. G. 31st AAA Brig.



# *Handbook and Manual for the* NONCOMMISSIONED OFFICER

For the man in this picture, and for those who intend to be noncoms, here is a new kind of book, written *for* the key men of the Army.

Here is the book that tells the noncom what to do—if he doesn't already know—how to do it, when to do it, and why to do it. And all this in clear, direct, exact language that is easy to read and leaves no room for doubt.

This book has been designed to help the man who *is* a noncom, to instruct the soldier who hopes to become a noncom, and to inform the officer who must advise, instruct, and check on his assistants. There is absolutely no padding in this big book, and every bit of information in it has been completely checked by experts for accuracy, clarity, and timeliness.

*Handbook and Manual for the NONCOMMISSIONED OFFICER* covers such vital topics as Leadership, Orders, How to Teach, How to Study, Social Conduct, Spit and Polish, Military Justice, Relationships with Your Men, How to Train Your Men, Promotions and Reductions, Things Your Men Will Ask You, Personal Affairs, and much more.

Order your copy today to be sure of the latest and best information.

Cloth, $3.50 Paper, $2.50

---

# *There Had To Be* BATTERY DUTIES

By LT. COL. ROBERT F. COCKLIN, Arty-NGUS, and MAJOR MARK M. BOATNER, III, Inf.

*Company Duties* has sold in the thousands—it *is* the book which tells where every man fits into the company and how he can do the best job possible.

Artillerymen clamored for the same book, tailored to fit Artillery needs. At last it is ready—the book that every battery officer, every artillery noncommissioned officer and every battery office needs.

Written colloquially, written from experience, and written so it can be understood, *Battery Duties* is the answer to the eternal question in the battery organization—who does what, and *how.*

Cloth $2.50 Paper $1.50

ORDER FROM

## Antiaircraft Journal

**631 Pennsylvania Avenue, N.W.** · **WASHINGTON 4, D. C.**