

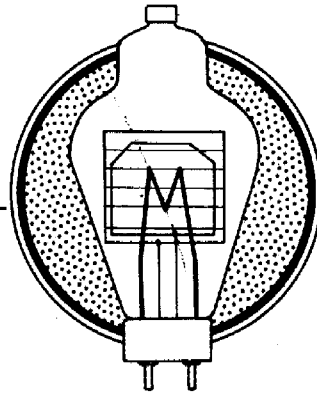
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# SIGNAL CORPS

# Technical

# Information

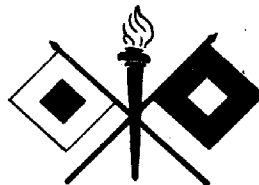
  

# Letter No. 14

War Department • Office of the Chief Signal Officer

DECLASSIFIED

C.



January, 1943

Authority *EO 10501*  
By *CB* NARA Date *1-20-11*

## SIGNAL CORPS TECHNICAL INFORMATION LETTER

Signal Corps Technical Information Letter (SCTIL), issued monthly, goes into an improved format with this issue. By the use of a reproduction process which permits the display of photographs and other illustrations, it is hoped that this Letter will better achieve its purpose of keeping officers in charge of field activities informed on the newest training methods, operational procedures, equipment under development, standardization or procurement, and other pertinent information as coordinated in the Office of the Chief Signal Officer.

This Letter is compiled largely from information available in the divisions and branches of the Office of the Chief Signal Officer. All Signal Corps training centers and other agencies are invited to submit items of general interest. Such items should reach the Office of the Chief Signal Officer (SPSAY) not later than the 20th of each month for inclusion in the Letter of the following month.

Distribution of the Letter is made to army, corps and division signal officers; commanding officers of signal companies and battalions; service command and department signal officers; post, camp, and depot signal officers; the signal officers of bases and task forces; Signal Corps inspection zones, procurement districts, training centers and laboratories; directors of Signal Corps ROTC units; signal officers of Army Air Forces and Army Ground Forces headquarters and major commands; overseas headquarters; signal officers of bases and task forces; units of the Office of the Chief Signal Officer and of Headquarters, Services of Supply. If any such activity is now receiving a number of copies either insufficient or excessive for its present needs, a memorandum addressed to the Chief Signal Officer (SPSAY) will serve to correct the mailing list.

This Letter is for information only. Requisitions for new types of equipment will not be submitted on the basis of data contained in this Letter.

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Military Training

## I. MANEUVER LESSONS IN SECURITY

The recent Southern maneuvers have revealed a serious need for better training in security -- both the physical security of personnel and equipment, and the signal security of tactical messages and the information contained in them.

Security is a matter of primary concern to all arms of the service. Men must always be taught to avoid unnecessary casualties or captures. But to communications personnel of the Signal Corps, proper training in security is even more important than it is to men of other branches. Breaches of signal security -- the interception of messages, the compromise of codes -- may react far beyond the individual responsible for the error.

For these reasons constant training in security principles must be maintained throughout the career of Signal Corps troops. This training is not easy, largely because the individual guilty of a violation of signal security principles may remain unaware of the remote consequences of the violation. The need for physical security, which is attained by active measures to prevent capture of personnel, documents and equipment, is obvious; the results of failure to train personnel in protection measures are immediately apparent. On the other hand, losses resulting from failure to give proper training in signal security may never be associated with their own neglect by those responsible, and the individuals making the errors may unwittingly continue to sacrifice their comrades by giving information to the enemy.

Physical Security:

High speed mechanized warfare, with the additional threat of parachutists dropping far behind the front lines, has brought the necessity for knowledge of physical security to every individual in the combat zone, regardless of his function or physical location with respect to the so-called "front." Required training includes use of weapons and camouflage, defense against air, gas, and mechanized attacks, and, for signal communication personnel, protection of code books, signal operation instructions, and other important papers against capture. Recommended schedules and references for such training may be found in mobilization training programs MTP 11-1, MTP 11-2, and MTP 11-3, and in TM 11-450, Training of Signal Communication Personnel. Training films and film strips as well as field manuals and technical manuals are available.

## Signal Security

Signal security is the safeguarding of friendly communications so that they will not be available or intelligible to unauthorized persons. An alert enemy continuously attempts to intercept and analyze message traffic in order to gain knowledge of the disposition of units, location of command posts, and probable plans of action, and to use such information to his own advantage. Only by vigorous training in the proper use of radio procedure and cryptographic devices can careless acts be avoided which unintentionally give valuable information to the enemy. Rules for achieving a high degree of signal security may be found in AR 380-5, FM 24-5 and FM 11-5. The necessity for observing these rules must be impressed on all personnel making use of signal communication.

### A Few Fundamentals

A few things are so fundamental and important to both physical security and signal security that they warrant repetition here. They are:

1. Important papers must not be given to more persons than actually require them, and those persons entrusted with such papers must be prepared to protect them or to destroy them if necessary.
2. Use of radio must be minimized, and the greatest possible use made of means having higher security.
3. When radio is used, precautions must be taken to prevent the enemy from obtaining information in time for it to be of use to him. Written messages must be suitably cryptographed. Radiotelephone conversations may be conducted using prearranged meanings for words and phrases, or otherwise so conducted that the correspondents will understand each other without disclosing information of value to anyone intercepting the transmission.
4. Authenticator systems must be used in accordance with instructions to prevent acceptance of false messages and receipts. Reliance cannot be placed on normal characteristics, such as recognition of a voice.

Observations at maneuvers have revealed instances of signal operation instructions being captured, false messages being accepted, radio operators "chattering" over the air, use of voice radio as if it were a private telephone, improper use of cryptographic systems, and other examples of lax training in security. These would have serious consequences in combat, and

indicate a lack of appreciation of the seriousness of the situation on the part of those concerned. It is the responsibility of every individual to be sure that none of his actions will assist the enemy. To this end, all who are charged with the supervision of training must be familiar with the subject of security, and make provision in their programs for suitable instruction.

## II. SAFEGUARDING MILITARY INFORMATION

Under date of December 4, 1942, War Department Training Circular No. 99 has been issued under the title "Safeguarding Military Information." This circular contains thought-provoking material suitable for use in lectures to troops and in other ways to call attention to the causes for the compromise of military information.

The circular points out four psychological factors which, unless counteracted, may lead to the inadvertent disclosure of military information by persons who have no deliberate intention to injure the interests of the United States. These factors are listed, in order of importance, as conceit, faith in the person to whom the information is given, enthusiasm for the importance of one's job or for the prospect of action, and ignorance of the manner in which the enemy intelligence service works.

Under the heading of conceit, the circular contains some pointed paragraphs. The following are quoted because they can bear frequent reiteration:

"Conceit is the most common cause of leakage. Ninety percent of indiscretions are the result of it, and 99 percent of us are vulnerable to it.

"Why do we boast? Most of us to impress a woman. That is understandable enough. Everyone tends to 'hand out a line' when out with a girl. There is little harm in it, and providing you leave the service out of it, you can go ahead. The Army really isn't too much concerned about the fact that a corporal is able to persuade his girl that he gave up \$50,000 a year when he joined the Army or that he would have been a senator if it hadn't been for the war as long as his 'line' doesn't include service matters.

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"We may be on secret duties. We may know what is in the wind for future operations, or the date of departure of a convoy about to sail, or the names of the ships. If that is so, we must remember that these are the Army's secrets, and that we have no right to share them with anyone.

"There will always be a temptation to boast when you know a lot more than the other people you are with, especially if they themselves are 'handing out a line' about the inside information that they have. It is admittedly very hard to pretend you know nothing when in point of fact you know everything; and in order to try to satisfy your conceit without giving much away, you may find yourself just hinting at all you know. That is fatal. If a thing is secret, you must not even hint at its existence.

"The trouble about this boasting is that it is so contagious. A man boasts to his girl friend of what he is doing just to impress her, and she in her turn boasts to all of her friends about the importance of her boy friend just to impress them. It becomes a vicious circle with everybody trying to outdo everybody else in the magnitude of the secret information which they can impart.

"No one is easier to 'pump' than the man who is 'handing out a line.' Always remember that. It is only necessary to pretend not to believe him, and he will get so indignant that he spills a lot more; or to pretend to be lost in admiration of him, and he will get so pleased with himself that he will keep right on talking for as long as you care to let him. Women know this; it is the first thing they learn. 'Feed the brute' is not their Golden Rule for catching a man, it is 'Flatter him. A popular girl is a good listener; so is a spy.

"But 'line-shooting' is not always as simple as this. There are other reasons for it. A lot of people today are worried about their war effort. They feel they are not pulling their weight, or else they worry because they believe that other people may think them slackers. And so they talk a lot about their work in order to convince people that they really are doing their bit, and if they are on anything secret they talk about it all the more."



III

A LESSON FROM MILITARY HISTORY

1 message + 2 systems = 1 MESS

## *how it happens -*

"On March 11, 1918, the Germans began the general use of a new code of which the Allies had no knowledge .... It was regarded as a forerunner of the long-expected German offensive. On March 13, we received a copy of a message in the new code. The answer was in an old code which we could read. It was a request that the first message be repeated in the old code as the new code books had not been received. A few minutes later a message from the first station in the old and known code was received. It was compared with the first message and found to correspond in every particular. This not only gave the meaning of every code group in the first message, but indicated the system used." ("Military Intelligence in the A.E.F.," by Major General D.E. Nolan, U.S.A.)

## *why it happens -*

When the Germans changed from one system to another (or even from one key to another), they cryptographed identical plain-text messages in both systems (or in both keys), and thus compromised both systems.

## *therefore -*

NEVER REPEAT A CRYPTOGRAPHED MESSAGE IN A CODE OR CIPHER SYSTEM OTHER THAN THAT IN WHICH IT WAS ORIGINALLY TRANSMITTED.

IV. WESTERN SIGNAL CORPS SCHOOL

The establishment of a new Signal Corps School in California was authorized on November 22, 1942, by the Commanding General, SOS. The school will be located at the California Agricultural College of the University of California, at Davis, California. The location is fourteen miles west of Sacramento, which makes the facilities convenient for coordination with the Signal Corps Replacement Training Center at Camp Kohler, twelve miles north of Sacramento. The new school and the SCRTC will be combined to form the Western Signal Corps Training Center under the command of Brigadier General Stephen H. Sherrill, who has been commanding general of the Replacement Training Center at Camp Kohler.

The capacity of the Western Signal Corps school was established at 1,000 students. The full student capacity, however, will not be obtained prior to February 6, 1942. The following is a list of specialties to be taught at this installation together with scheduled capacities:

	Capacity
Radio Operator, Slow Speed Continuation Course . . .	56
Radio Operator, High Speed . . . . .	140
Radio Repairman, Ground. . . . .	170
Teletype Installer Repairman . . . . .	170
Repeaterman. . . . .	130
Radio Repairman, Aircraft Equipment. . . . .	<u>334</u>
	1000

An allotment of 30 officers has been requested to provide for staff and faculty. 244 enlisted overhead has been requested for the same purpose.

It is proposed to obtain the necessary classroom and housing facilities by lease. The Signal Corps will supply the necessary instructional equipment. It is proposed that the contract for these facilities will provide that the University of California may retain sufficient space and facilities to continue research on experimental farms now being operated. Students at the agricultural school will complete their present semester's studies during January prior to the commencement of full operations by the Western Signal Corps School.

Final accomplishment of contract will depend on results of further inspection by a representative of the Chief of Engineers and a representative of the Chief Signal Officer, preferably from the SCRTC, Camp Kohler, California. Arrangements for the lease will be made by the Commanding General, 9th Service Com-

mand. The proposal to use the Davis Campus originated in October when, under the direction of General Sherrill, Captain F. G. Sanning of Camp Kohler made a survey of facilities within 200 miles of that camp. General Sherrill's recommendation was transmitted to the Chief Signal Officer early in November, and the action was approved shortly thereafter.

#### Camp Kohler Expansions

Unit type training was instituted at the Replacement Training Center on December 14. The Basic Branch, which had been instructing trainees in basic military subjects, was disbanded. Now each company handles the entire training program for its members. The transformation from group instruction to unit type training is being made gradually so that the training program will not be delayed in any way. The shift will be complete by January 6. More individualized instruction, with particular emphasis on weak subjects, will be possible under the new system.

Camp Kohler's Signal Communications Branch was scheduled to open December 14, with initial instruction for pole linemen, low speed radio operators, and common battery telephone switchboard operators. First trainees were members of the Army Air Forces, who are now being trained by the Signal Corps.

#### V. INTERNATIONAL MORSE CODE TRAINING KIT

As announced in War Department training circular No. 85, November 12, 1942, a kit for training personnel in basic International Morse Code has been prepared and is available through the Army Institute. The kit was especially designed for use where other instructional facilities are lacking. Phonograph records and the basic radio kit include complete instructions for learning the code. These instructions are followed by practice signals which enable the student to increase his operating speed to 6, 8, 10, 12, 16, and 20 words per minute. The kit includes, in addition to the records, an adequate supply of practice forms and other stationery, and an instructor's manual. The course has been so designed that it can be taught by persons who are not themselves expert radio operators. Students can listen to the records either through headphones or through an ordinary phonograph.

Consolidated orders for the kits may be placed with the Commandant, Army Institute, Madison, Wisconsin, by division or separate unit commanders. Until further notice, requests for these code practice kits will be limited to fifteen sets per division and single sets for smaller isolated units.

## VI. EXPANSION OF THE PIGEON SERVICE

The Pigeon Breeding and Training Center at Camp Crowder, Neosho, Missouri, is the main pigeon installation of the Signal Corps, and will maintain approximately 6,000 homing pigeons in the newly completed lofts at that station. Ten buildings, consisting of eight lofts each, were completed during December, 1942. Thirty portable lofts have been received and will be used to concentrate and house young birds for newly activated pigeon companies. The training center operates a pigeon school, where an average of 85 pigeoneers are receiving instruction. Upon completion of the ten-week course, these pigeoneers will be assigned to the several pigeon companies and similar units.

The Pigeon Section at Fort Benning, Georgia, where approximately 200 homing pigeons were formerly maintained, is being expanded to include a total of 1,200 breeder pigeons. It is anticipated that at least 3,000 young homing pigeons will be produced during 1943 for shipment to combat detachments and companies.

Twelve portable lofts have been shipped to Fort Sam Houston, Texas, to augment those now being maintained by the Pigeon Section at that station. It is anticipated that approximately three thousand youngsters will be produced during 1943, and they will be supplied to tactical pigeon organizations as they are required.

## VII. FILM BULLETINS

Attention is invited to War Department training circulars No. 71, October 16, 1942, and No. 82, November 7, 1942, concerning War Department film bulletins.

Film bulletins are designed to inform military personnel of current activities and developments in the war effort. It is desired that training officers employ these bulletins as an orientation medium and aids to instruction whenever possible.

Film bulletins are distributed to service command central film libraries and post sublibraries on the same basis as training films and are available both in the 16-mm and 35-mm size.

To date, 47 film bulletins have been prepared and approved for release.

Film bulletins of interest to Signal Corps personnel include the following:

Film Bulletin No. 4.

Part a, Wire Thrower, RL-37-T2 (Tests) (Demonstrating wire throwing, wire laying, and recovery), is especially recommended for laboratory personnel in the development and test of wire throwing equipment.

Part b, Camouflage Net (Demonstration of the standard flat top camouflage net), is of general interest to all tactical Signal Corps units and is of value in camouflage training.

Film Bulletin No. 9: Landing Operations.

Landing operations by the First Division in North Carolina are shown. This bulletin is of special value in training of all troops in loading and unloading operations in connection with any landing maneuvers, and it is recommended that it be shown to all Signal Corps personnel as part of their general training.

Film Bulletin No. 22: Amphibious Force.

A day with the 9th Division at Fort Bragg, N. C., showing division in training as an amphibious force. Landing operations from mock-up ships and river crossings in rubber boats.

This film bulletin is applicable only to Signal Corps tactical units to be employed in any amphibious force operation.

Film Bulletin No. 42: Training Under Fire.

"Training Under Fire," which is part b. of this bulletin, shows scenes of the use of live ammunition in a training area to impress upon all personnel the necessity of proper camouflage cover and their taking advantage of terrain to protect themselves from direct fire. It is recommended that all tactical Signal Corps personnel view this film during their basic training.

Film Bulletin No. 43: Lessons from New Guinea.

Part b. of this bulletin is entitled "With the Australians in New Guinea." It is recommended that all tactical Signal Corps personnel to be employed in tropical, mountainous, and jungle terrain review this film while undergoing their training prior to arrival in the staging area. This film is valuable in demonstrating the necessity for camouflage and thorough physical training to fit the combatant soldier for duties which he may expect.

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Film Bulletin No. 44: Close Combat Firing.

This film bulletin is recommended for all personnel being trained in pistol and rifle marksmanship. It is of special value to troops employed in jungle areas or similar conditions where direct aiming is not possible. Scenes show the proper position and crouch for the panel firing of the pistol, revolver, rifle, automatic rifle, and light machine gun.

Film Bulletin No. 45: In the Aleutians.

This film bulletin is only recommended for tactical Signal Corps personnel who are being trained for employment in northern climates.

# "Detection of Booby traps"



"PREPARING A HOT SEAT"



"SETTING FIELD BOOBY TRAP"

TF-25-394: "DETECTION OF BOOBY TRAPS" - Running time: 18 minutes.

News from North Africa emphasizes the importance of training in the detection of anti-personnel mines, commonly known as "booby traps." A British film on this subject has been converted by the Signal Corps for American use and has been recommended for showing to all troops. The stills and captions on this page were adapted from a display prepared by Film Distribution and Utilization Branch, Army Pictorial Division, to call the attention of all training officers to this film, which may be obtained from service command film libraries and sub-libraries. The film emphasizes to its viewers that in dealing with these weapons left behind by a retreating enemy:

"YOU CAN MAKE ONLY ONE MISTAKE."



"SUSPECT AND INSPECT"



"TOUCH THAT PIANO - AND PLAY A HARP"

Procedures Coordination

## IX. U. S. - BRITISH RADIOTELEPHONE PROCEDURE

Combined action of United States and British forces in the field has brought about numerous problems, some of which directly concern the Signal Corps. Of particular importance was the formulation of satisfactory procedures for intercommunication between these forces by voice transmission. After several months of intensive study, the Combined Communications Board, an agency of the Combined Chiefs of Staff, has succeeded in producing a radiotelephone procedure to be used in combined U. S. and British operations. It is anticipated that this procedure also will be adopted for use within the United States Army and between the United States Army and the United States Navy. A manual covering this procedure (the British call it R/T procedure) is now ready for publication and it is contemplated that distribution will be effected within the near future.

There were many difficulties incident to the adoption of voice procedure, one of which was the production of a uniform phonetic alphabet and a standard method for the pronunciation of numerals. The requirements of a suitable phonetic alphabet included the selection of words of a high degree of intelligibility under conditions of intense noise. It was also necessary to choose a group of words brief enough to insure speedy communication, and yet sufficiently long to provide positive identification for the initial sound. A prime consideration in formulating such an alphabet is that no two of the words shall sound alike. In the preparation of the phonetic list, studies conducted by the Psycho-Acoustic Laboratory of Harvard University proved to be valuable.

The adoption of a satisfactory method for the phonetic pronunciation of numerals offered no serious problems and an agreement was reached after relatively short deliberation. In the preparation of both the phonetic alphabet and the numeral pronunciation procedure, it was necessary to consider the speech variations existing between the United States and the United Kingdom.



The New Phonetic Alphabet

The details regarding the approved phonetic alphabet and phonetic pronunciation of numerals were set forth in War Department Training Circular No. 94, dated November 26, 1942. The new phonetic alphabet is as follows:

<u>Letter</u>	<u>Spoken as</u>	<u>Letter</u>	<u>Spoken as</u>
A.....	ABLE (AFIRM*)	N.....	NAN (NEGAT*)
B.....	BAKER	O.....	OBOE (OPTION*)
C.....	CHARLIE	P.....	PETER (PREP*)
D.....	DOG	Q.....	QUEEN
E.....	EASY	R.....	ROGER
F.....	FOX	S.....	SUGAR
G.....	GEORGE	T.....	TARE
H.....	HOW	U.....	UNCLE
I.....	ITEM (INTERROGATORY*)	V.....	VICTOR
J.....	JIG	W.....	WILLIAM
K.....	KING	X.....	XRAY
L.....	LOVE	Y.....	YOKE
M.....	MIKE	Z.....	ZEBRA

<u>Numeral</u>	<u>Spoken as</u>
----------------	------------------

0.....	ZERO
1.....	WUN
2.....	TOO
3.....	THUH-REE
4.....	FO-WER
5.....	FI-YIV
6.....	SIX
7.....	SEVEN
8.....	ATE
9.....	NINER

\* Where the United States Navy General Signal Book is used, these names will be used in lieu of those contained in the above phonetic alphabet.

This phonetic alphabet becomes effective in the continental United States 0001Z, January 1, 1943, and in other areas as stated in the training circular.

Transmission Endings

One of the more important features of the approved voice procedure is that of transmission endings. Only two are now used: "OVER" and "OUT." The adoption of these two words is expected to clarify the procedure considerably, since a receiving operator hearing "OVER" will know that he is expected to transmit, whereas if he hears "OUT," he will know that no response is expected. Also included in the procedure is the phrase "I say again" (meaning "Repeat") a term with which U.S. forces are not as yet familiar. As indicated in the manual, the word "Repeat" was avoided because of its use by the British artillery in fire control. This also necessitated the use of an alternative for the expression "Repeat back." After considering phrases such as "Send back," "Say back," "Say again," and "Reiterate," the phrase "Read back" was adopted.

Since it is a cardinal rule to hold all radio transmissions to an absolute minimum, all procedure phrases were made as short as possible consistent with clarity. In addition, readability and signal strength reports have been curtailed. It will be found that "Hullo," spelled with a "u," is optional at the beginning of transmissions.

The Combined Communications Board has also formulated a radiotelegraph procedure for combined U.S. - British use, and it is expected that this procedure will be available for distribution shortly. Technical Manual TM 11-454, The Radio Operator, is to be revised accordingly. Further details on this subject will be presented in the next Information Letter.

Equipment Coordination

## X. THE PROCESS OF STANDARDIZATION

The Equipment Coordination Branch in the Communication Coordination Division, OCSigO, makes studies to determine what type of equipment is needed to fulfill a communication need. When a request for a type of equipment is received, equipments of a similar nature that are now standard are examined to see if they will fill the need. If the need is urgent, commercial equipments are examined to see if they could be used as stop-gap equipment to fully fill the need or to select those that come nearest to filling the need.

Studies are going on continually to effect a reduction in the number of types of similar equipments to the end that equipments in the field will be interchangeable, and ultimately it is expected that component parts of similar equipments will be interchangeable.

Military regulations require that a number of steps be taken, in coordination with various agencies, between the time an idea for an item of signal equipment takes form (usually in terms of "military characteristics") until the equipment is standardized through the Signal Corps Technical Committee. This standardization, when approved by higher authority, clears the item for procurement. Among the agencies involved in these steps are the using arm, the Commanding General, Services of Supply (including the SOS Requirements and Resources Divisions), and the Commanding General of either the Army Air Forces or the Army Ground Forces, depending on the using arm involved.

A number of agencies within the Office of the Chief Signal Officer, including the Distribution Division, Materiel Division, Research and Development Division, the Signal Corps Technical Committee, and the Army Communications and Equipment Agency, also must be contacted in order that each will know what is going to be procured and how this affects its responsibilities. The Equipment Coordination Branch undertakes to minimize the time required for coordination and concurrences for all agencies involved so that when an item is presented to the Signal Corps Technical Committee for action, all differences usually have already been ironed out and the final recommendation can usually be transmitted to the Commanding General, Services of Supply, for approval within a very few days.

Many of the items which are shown in the following pages as "approved by Commanding General, SOS, upon recommendation of the Signal Corps Technical Committee," actually were sent up to the SOS by the SCTC within the same period covered by this report; in a number of cases the recommendation by Equipment Coordination Branch to the SCTC also was made during the very same period.

Those readers who follow this monthly Technical Information Letter carefully will have noticed that in previous issues the same item of new or proposed equipment was listed as having been recommended during the month by Equipment Coordination Branch, again as having been forwarded by the Signal Corps Technical Committee to the SOS, and still again as having been finally approved by the Commanding General, Services of Supply. All three actions, in those cases, were rushed through within a single 30-day period. Henceforth, in order to conserve space in this publication as well as the time of the reader, we will list only the final stage through which an item has passed during the period covered by the monthly report.

Thus the reader will note in this issue a considerable number of items for which military characteristics, standardization, or other action have been approved by the SOS on recommendation by the Signal Corps Technical Committee, together with a smaller number of additional items which have been recommended by the SCTC to the SOS, or by the Equipment Coordination Branch to the SCTC. It should be understood that all the items on which final action has been taken were previously processed by both the SCTC and Equipment Coordination Branch. The fact that earlier stages on most of them are omitted in these reports is a reflection of the speed with which actions are now moving through the various necessary stages required prior to the initiation of procurement.

#### Observer Reports Analyzed

Equipment Coordination Branch acts in effect as a clearing house for the coordination of matters pertaining to equipment. If units in combat areas or units in training, particularly in the maneuver stage, will submit communication problems through channels, it will be possible to take into consideration the difficulties encountered under service conditions when equipment is recommended for adoption.

Reports of observers from all maneuvers and from overseas units regarding difficulties encountered due to equipment being inadequate or of incorrect type, or because no type was available to do a particular job, are sent to the Equipment Coordination Branch to follow up and see that the necessary action is taken

to iron out the difficulties. This is accomplished through the Army Communication and Equipment Coordination Agency. This agency is a Board of Officers composed of outstanding communication experts of the various using arms. The roster of the personnel of this Agency is as follows:

Brigadier General D. M. Crawford, Chairman  
 Col. C. W. Lewis, SigC  
 Capt. J. V. Murphy, USN  
 Col. W. B. Hough, AAF  
 Col. S. A. Beckley, FA  
 Col. H. W. Grant, AAF  
 Lt. Col. H. R. Statham, Inf.  
 Major D. A. Kellough, RCCS  
 Col. H. G. Holt, AF  
 Col. D. E. Washburn, SigC  
 Col. D. G. McBride, Cav  
 Col. W. L. Barker, QAC  
 Lt. Col. F. P. Townsley, SigC  
 Lt. Col. J. P. North, R.Sigs

The Equipment Coordination Branch builds up the data and makes recommendations upon which this Agency makes finding which, when approved, become a directive to the Army on communication problems. Lt. Col. F. J. Magee, S. C., is Chief of the Equipment Coordination Branch, which is divided into five sections as follows:

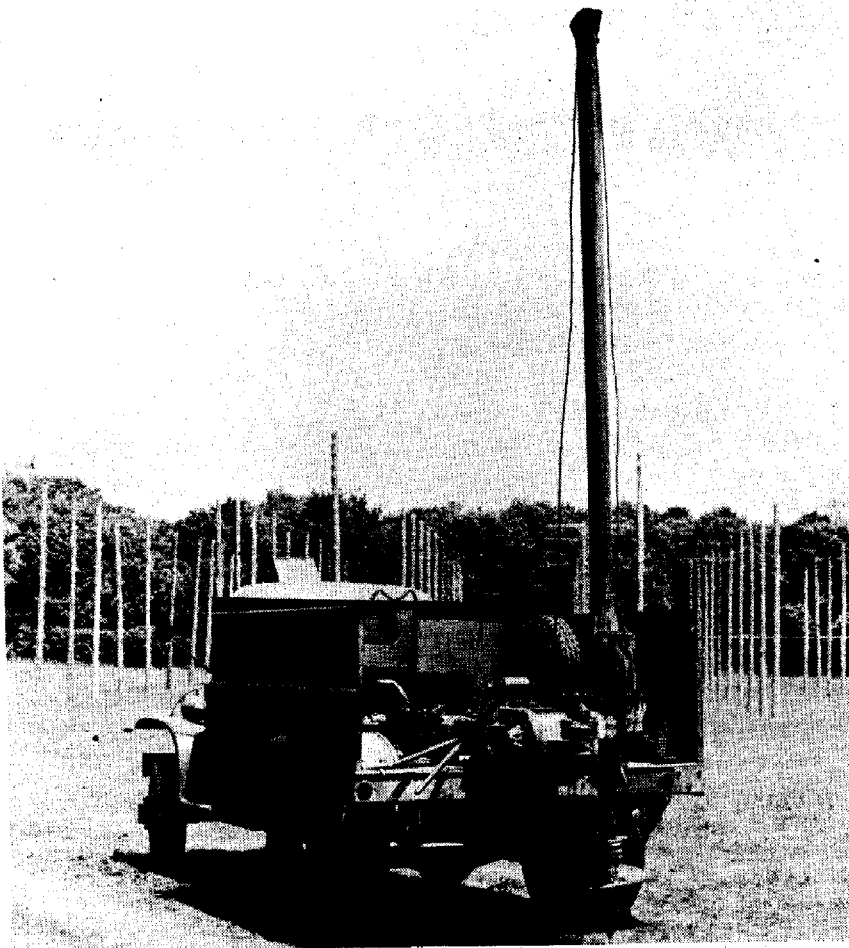
Radio Section.....Maj. L. O. Lowdermilk  
 Telephone & Telegraph Section.....Lt. Col. M. Hammond  
 Standardization & Equipment  
 Control Section.....Maj. H. W. Dettmer  
 Air Force Section.....Maj. R. E. Lamar  
 Special Signal Equip. Section.....Maj. J. C. Brumbaugh

Each Section handles problems peculiar to its own field of communications. The Special Signal Equipment Section handles the many problems which are not strictly the responsibility of the other sections. During the last month, for example, several systems of rapid overhead construction for outside line were examined and a method of rapid construction has been adopted. Manuals are now being written on the new method which will be available for use in the field at an early date.

#### Eliminating the Non-essential

Studies are constantly under way in the Equipment Coordination Branch to effect an expeditious procurement of the correct

equipment to fulfill communication needs. One study in the past month was a review of all Signal Corps units Tables of Basic Allowances, in order to recommend to the Army Air Forces and Army Ground Force, the deletion of any items that were not considered essential to the unit in the performance of their regular routine duties. It was recommended to the Directorate of Planning that a system of supply be set up in which highly specialized equipment such as the K-44 Earth Borer, K-36, K-37, and K-38 (special vehicles), as well as the carrier equipment, be carried in stock at the next higher echelon of supply or depot. This equipment would be made available to the unit



TRUCK K-44 EARTH BORER

upon requisition rather than having it part of an organization's equipment as at present. It was felt that this would reduce the total number of equipments which industry is called upon to produce in the highly specialized field and also would relieve units of responsibility for the equipment except at the times when they need it.

Studies on highly specialized equipment for use in other than tactical units are in progress. In this connection, the services of high grade specialists commissioned from civilian life, particularly from laboratories of communication corporations, are available for recommendations.

#### Cable Burying Plow

A light plow LC61-( ) (Cable) capable of burying cable up to one inch in diameter, as well as field wire, is in the process of being standardized. This plow weighs approximately 1,500 pounds as compared with 3,600 pounds for the similar type of equipment now standard in the Bell System. It is expected that this plow will be available in quantities in about ninety days. The plow will either bury wire or cable from a reel carried in the truck or will bury wire or cable lying on the ground without interrupting existent communications.

A new repeater has been standardized, Repeater Set TC-29-( ) (4-wire, voice frequency), which will permit the use of wire 110B under normal conditions up to distances of approximately forty miles. A new 44 millihenry loading coil (C334) has been adopted and will soon be available for use in the field. This loading coil is about two inches in diameter, four inches long, is sealed in a rubber jacket and has pigtails for splicing of about six feet in length. The coil is rugged waterproof and intended for use on the present standard types of wire as well as on a new wire now under development which is expected to have high transmission characteristics and to replace or supplement wire 110B in the field.

#### Batteries for Cold Weather Tests

Recent studies and investigations indicate that the operation of various communication equipments and other high specialized apparatus in extremely cold temperatures are not entirely satisfactory. In general, the performance of the primary cell (dry cell) although adequate for operation at normal temperatures, was entirely inadequate at low temperatures. In view of this factor arrangements are being made to procure a substantial number of low temperature dry cell batteries, representative of general types of Signal Corps batteries, and have these tested by organizations stationed in localities where extreme low temperatures are encountered.

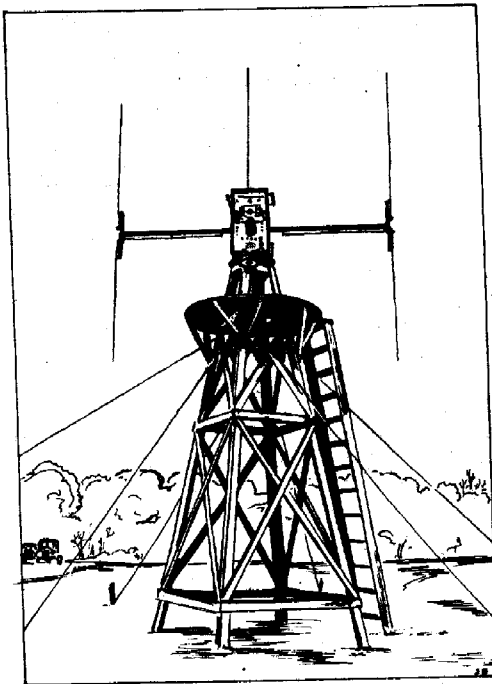
## XI. SIGNAL CORPS TECHNICAL COMMITTEE

Approvals by SOS

1. The Commanding General, Services of Supply, has approved recommendations submitted by the Signal Corps Technical Committee as indicated below:

a. That Military Characteristics for the following items be adopted:

RADIO SET SCR-551-( ): This is a radio direction finder with frequency range of 2 to 20 megacycles and is used for tracking of friendly aircraft and for radio intelligence purposes. The equipment is transportable in trucks, open trailers or aircraft.



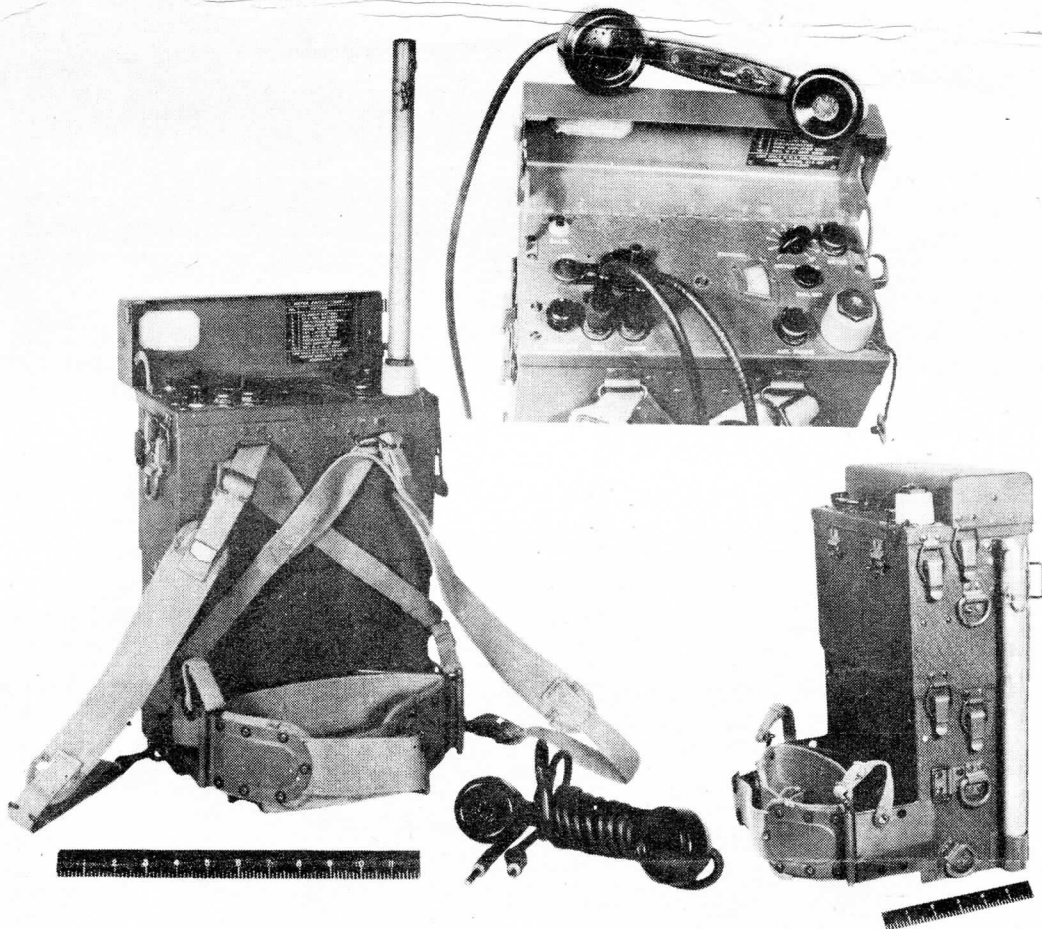
RADIO SET SCR-551-( )

PANEL SET AP-50: This set includes a signaling panel 12' x 2'4" which is white on one side and fluorescent cerise colored on the other. The panel will be fitted with 10 detachable tying cords six feet long and is contained in a carrying case suitable for troops in the front line. The fluorescent coloring doubles the visibility range. In observation from an airplane the older panels blended into the landscape, whereas the fluorescent cerise panel can be seen at 10,000 feet.



FLASHLIGHT TL-194: This is a small, lightweight flashlight using one standard battery. It is intended for individual use in jungle operations.

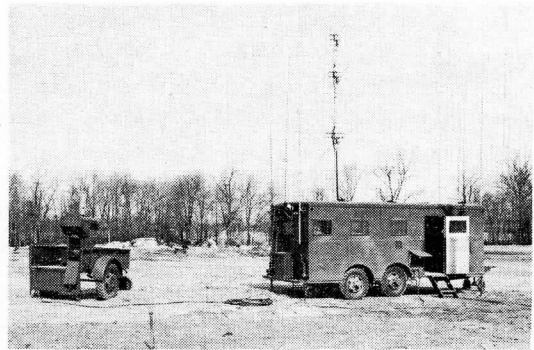
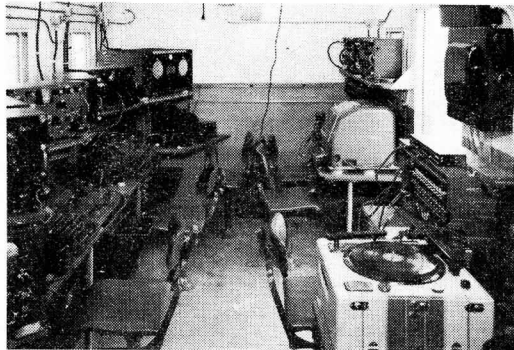
MAINTENANCE EQUIPMENT ME-40-( ): This equipment comprises spare accessories, tool equipment and miscellaneous items for testing and adjusting standard Radio Set SCR-300-( ). The major components of this equipment are standard Signal Corps items on the parts lists of other maintenance equipments or radio sets, all of which are packed in one chest.



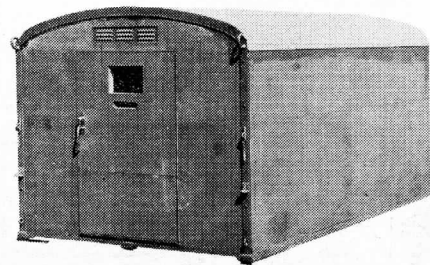
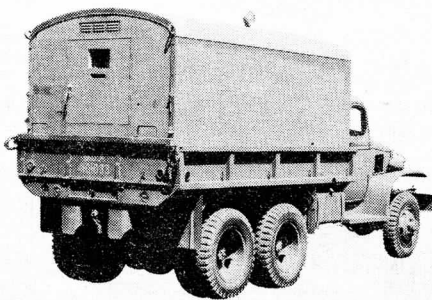
RADIO SET SCR-300-( )

RESTRICTED

PLYWOOD SHELTER HO-17-( ) TO BE USED IN PLACE OF TRAILER TO HOUSE  
RADIO INTERCEPT CENTRAL TC-9 AND RADIO DIRECTION FINDER CENTRAL TC-8



Photographs above show interior and exterior views of Radio Intercept Central TC-9 as housed within a trailer. Revision of military characteristics provides for replacement of this trailer by two or more shelters of the type HO-17-( ). The same type of shelter will replace a trailer for housing Radio Direction Finder Central TC-8. Below is shown the mobile shelter HO-17-( ) mounted on a truck and on the ground. Military characteristics were adopted several months ago for this lightweight portable slip-in body, which can be used on a standard  $2\frac{1}{2}$ -ton 6 x 6 cargo truck or half-track trucks of the same



size, or on the ground, eliminating Signal Corps requirements for several special types of trucks. In addition to the uses listed above, the new shelter will provide housing for powerful mobile and vehicular radio sets, telephone centrals, repair and maintenance establishments, message centers and meteorological installations.

tionary from a power supply furnished by an auxiliary motor generator or from a commercial source when available.

RADIO INTERCEPT-CENTRAL TC-9: This is used by the Signal Radio Intelligence Company to facilitate performance of its mission of interception of radio signals. This action is taken so that shelters of the type of Shelter HO-17-( ) may be used rather than a trailer. Two or three such shelters will be necessary to house the equipment now part of Radio Intercept Central TC-9. The unit consists of radio receivers, panoramic receivers, antenna systems, recorders, standard telephone switchboard and other equipment and is intended to operate only when stationary from a power supply furnished by an auxiliary motor generator and arranged to use commercial source of power when available.

c. That the following items be Standardized:

PANEL SET AP-50: As above described.

FLASHLIGHT TL-194: As above described.

MAINTENANCE EQUIPMENT ME-40-( ): As above described.

d. That the following items be reclassified from Standard to Limited Standard:

HYGROGRAPH ML-16-( ): This is a recording, hair type hygrometer for meteorological purposes. No further military requirement exists for this item.

REGISTER ML-103-( ): This item records wind speed and direction on a cylindrical chart which rotates at the rate of one revolution in six hours. The Army Air Forces have indicated that no further requirement exists for the item.

RADIO SET SCR-210: This is a vehicular receiving set for use in tanks, combat cars and scout cars. The major component of this set is either Radio Receiver BC-189 or Radio Receiver BC-312. Other standard radio sets fulfill the military requirements for this item at the present time.

INTERPHONE EQUIPMENT RC-44-( ): This is a vehicular equipment for use in but not a part of medium Tanks M-2 and M-2-A1, except when tanks are equipped with Radio Sets SCR-508, SCR-528 and SCR-538. The tanks for which this set is used are no longer procured and those on hand are used for training purposes only.

WIRE THROWER RL-37-( ): This is a gasoline engine-driven, mechanical device intended to project field wire from 2 to 50 feet from a moving vehicle. Further procurement of this item will be stopped pending study concerning its tactical employment.

RADIO COMPASS SCR-242: This is an aircraft radio compass covering a frequency band of 150-1500 kc and employed in aircraft where only a single control is required and a 12-14-volt battery supply is available. No further procurement of this equipment is contemplated.

RADIO COMPASS SCR-246: This is a single engine aircraft radio compass with a frequency range of 195 to 400 kc used for homing only. It has a non-directional antenna 8-inch fixed loop and a 14-volt battery as power supply. No further procurement is contemplated.

RADIO COMPASS SCR-263: This is an aircraft radio compass covering the frequency band 150-1500 kc and employed in aircraft where only a single control is required. A 12-volt power supply is used. No further procurement of this equipment is contemplated.

RADIO COMPASS SCR-273: This is an aircraft radio compass, covering a frequency band of 150-1500 kc. It has a 9-inch loop, a mechanical remote control and position indicator. This item uses a 12-volt power supply. No further procurement is contemplated.

RADIO COMPASS SCR-276: This is a single-engine aircraft radio compass with a frequency range of 195 to 410 kc in one band and used as a homing device or as a radio range and weather broadcast receiver. It operates from a power source from 24 to 28 volt dc. No further procurement is contemplated.

e. That the following items be reclassified from Standard to Obsolete:

RADIO COMPASS SCR-279-( ): This radio compass is the 12-volt equivalent of Radio Compass SCR-269. It has been replaced by other standard radio compasses.

CARRIER FM-32: This is a side loading metal pack frame for use with Phillips pack saddle of the Field Artillery cargo type for transporting Radio Set SCR-194. The Ordnance Department now furnishes materials to the Field Artillery for fabrication of these items.

FRAME FM-33: This is a top loading metal pack frame for use with a Phillips pack saddle of the Field Artillery cargo type for transporting Radio Set SCR-194. The item was formerly furnished by the Signal Corps for the Field Artillery. The requirement for this item as standard for issue to the Field Artillery no longer exists as the Ordnance Department now furnishes materials to the Field Artillery for the fabrication of this item.

f. That the following items be classified as Limited Standard as no further procurement is contemplated:

RADIO COMPASS SCR-280: This is an aircraft, navigational receiver with remote control covering a frequency range of 200 to 1750 kc in three bands. It is powered with 12 to 14-volt dc source.

RADIO COMPASS SCR-282: This item is similar to Radio Compass SCR-242 described above except that 24-volt primary power supply is used.

g. That the following items be reclassified from Limited Standard to Obsolete:

RADIO SET SCR-189: This is a receiving and transmitting set for use in slow tanks. It has been replaced by standard Signal Corps radio sets.

RADIO SET SCR-190: This radio receiving set for use in slow tanks has been replaced by standard Signal Corps radio sets.

RADIO SET SCR-199: This vehicular set used in armored cars has been replaced by another standard radio set.

RADIO SET SCR-213: This radio receiving and transmitter set for mine planter use has been replaced by commercial equipment.

RADIO SET SCR-185: This medium power observation set for use in aircraft has been replaced by Radio Set SCR-238 and other standard radio sets.

RADIO SET SCR-192 (Aircraft): This is an aircraft receiving set with frequency range from 224 to 7850 kc. No further military requirement exists for this set.

RADIO COMPASS SCR-186: This equipment is for use

in aircraft and gives visual indication of direction of origin of either unmodulated or modulated signals. Provision for aural monitoring or receiving signals is included. It covers the frequency range of 200 to 1500 kc. No further procurement of this equipment is contemplated.

Further Recommendations by SCTC to S.O.S.:

2. In addition to the actions listed above as approved, the Signal Corps Technical Committee has recently made further recommendations to the Commanding General, Services of Supply, as indicated below:

a. That Military Characteristics for the following item be adopted:

RADIO COMPASS SCR-639-( ): This is an automatic bearing-indicating Radio Compass which operates from a 500 cycle, 115-volt ac power supply. It provides aural reception of modulated radio signals as an ordinary 100 to 1750 kilocycle radio receiver. It provides automatic loop orientation; and it provides loop azimuth indication in degrees.

b. That the following items be reclassified from Standard to Limited Standard:

POWER UNIT PE-52-( ): This is a 3 kva, 115-volt, 60-cycle, single-phase gasoline-driven, self-contained, and enclosed power unit. Power Unit PE-75 is similar to PE-52 and has been supplied for some time as part of several radio sets and telephone central office sets. This action is taken to reduce the number of standard types.

HEAD AND CHEST SET HS-17: This is a complete double-head receiver and transmitter, connected together for use with telephones. Receivers are equipped with soft rubber cushions. The headband is designed so that it can be worn under a hat or steel helmet. This action is taken as the item will be replaced by Headset HS-30 and Chest Sets TD-1, TD-2 and TD-3.

HEAD AND CHEST SET HS-17-A: This is a low impedance telephone composing a chest unit, cushioned receivers, headband and other necessary equipment. This action is taken for the same reason as stated above in regard to Head and Chest Set HS-17.

c. That the following headsets for use with radio sets or telephone sets of various types be classified as Limited Standard as they will be replaced by Headset HS-30 with Cord CD-605:

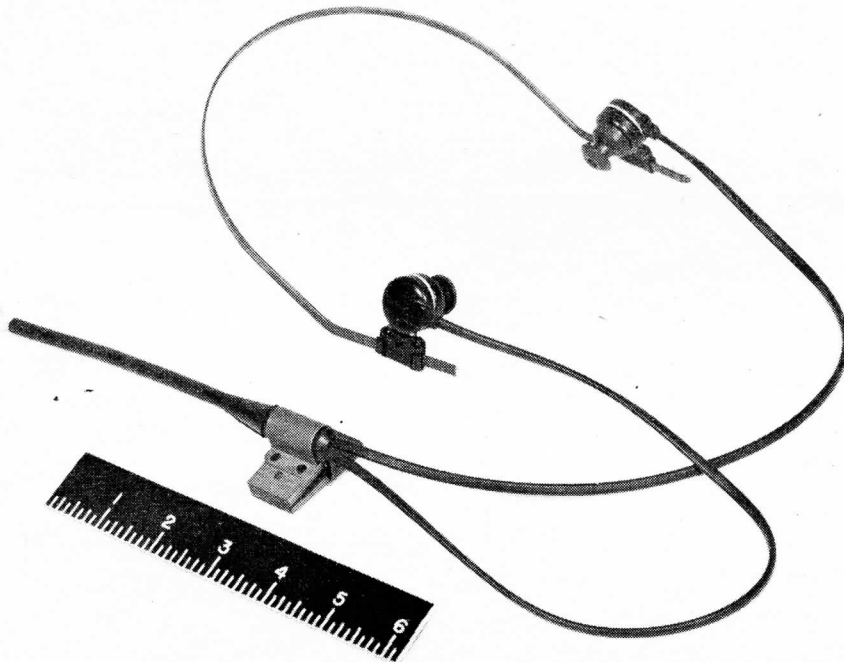
HEADSET P-18: This is a high impedance headset for outdoor use and is constructed so that it may be worn with a hat or old type steel helmet.

HEADSET P-19: This is a high impedance headset with rubber ear cushions and is used in vehicles and other noisy places.

HEADSET P-20: This is a high impedance headset for indoor use, intended for cabin type aircraft.

HEADSET P-23: This is a high impedance set for use in cabin type planes.

HEADSET HS-22-( ): This equipment consists of 2 receivers, equipped with a special cap and a cushion attached to a strap to fit over the wearer's head. It also has a leather strap below adjustable to fit the wearer by means of a sliding sleeve which may be locked in place.



HEADSET HS-30-( )

d. That the following Head and Chest Sets for use with radio sets or telephone sets of various types be reclassified as Limited Standard as they will be replaced by Headset HS-30 with Chest Sets TD-1, TD-2 and TD-3:

HEAD AND CHEST SET HS-19: This is a low impedance set with push-button cutout to Field Artillery units.

HEAD AND CHEST SET HS-27-( ): This is a low impedance set comprising a head band, two receivers and a chest plate with terminal block and switch assembly. It is used with a throat microphone.

Further Recommendations by Equipment Coordination Branch to SCTC:

TEST EQUIPMENT LE-19: Test Equipment LE-19 was submitted for standardization. This test equipment is for use in testing and adjusting Radio Sets SCR-522-( ) and SCR-542-( ). The test equipment can be used when the radio sets are installed in the airplane.

RADIO SET SCR-291: A request for standardization of Radio Set SCR-291 was submitted. This equipment is a semi-fixed radio direction finder, transportable by air, to operate over a frequency range of 2 to at least 10 megacycles, using a fixed Adcock type antenna and giving visual instantaneous bearing indications on an oscilloscope.



Case Records

## XII. THE SIGNAL CORPS BOARD

Reports of the Signal Corps Board on the following cases have been approved by the Chief Signal Officer during the past month. Full reports can be made available to officers especially concerned with particular items involved if specific reasons for access to these reports are stated in their request to the Chief Signal Officer. The reports, as approved by the Chief Signal Officer, are summarized as follows:

Signal Corps Board Case No. 484, Part C - Service Test of Telephone Repeater ~~EE-99-T3~~ - Use of Loading Coil C-334. Approved November 11, 1942.

The Signal Corps Board was directed to service test Loading Coils C-334 to find the possible increase in range obtained by loading on Wire W-110-B without repeaters. This case is an outgrowth of Case No. 361 -- Rubber Encase Loading Coils for Field Wire -- wherein the Board recommended further procurement and test of Rubber Encased Loading Coils and that these coils be made with an inductance of 88 millihenries.

Computations in connection with these tests showed the 44 m.h. coil to be better suited for the purpose intended than the 88 m.h. coil.

The approved recommendations are that:

a. Coil C-334 be modified as indicated below and that the modified coil be standardized for use in place of existing Coil C-114. The modifications to be applied to Coil C-334 are:

(1) The inductance per coil to be reduced from .088 henrys to .044 henrys; the resultant coil resistance not to exceed 5 ohms.

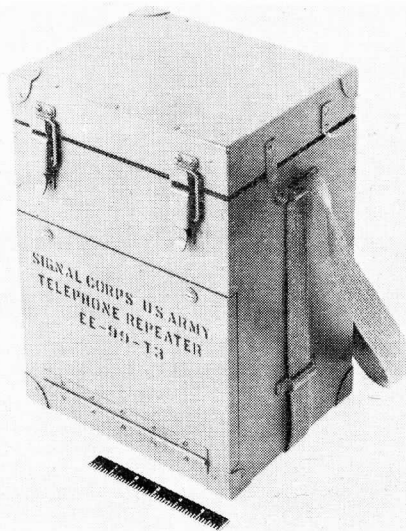
(2) The seals at the points where the conductors enter the jacket to be improved and made moisture-proof.

b. Existing stocks of Coil C-114 be used up and manufacture of this coil be discontinued.

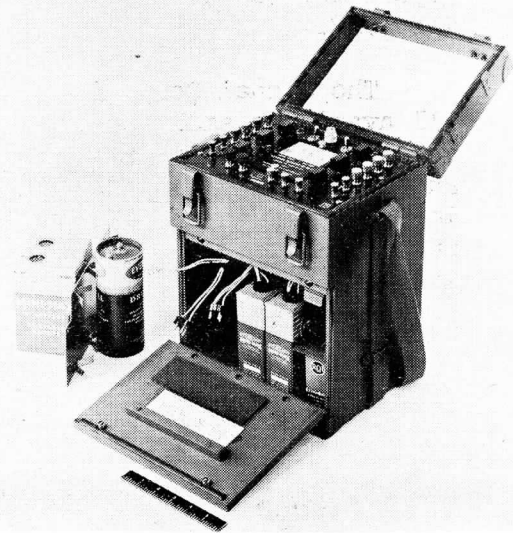
c. Basic Field Manual FM 24-5, Signal Communication, be modified to indicate that:

(1) Loaded two-wire circuits made up of Wire W-110-B

## TELEPHONE REPEATER EE-99-T3



PACKED FOR TRANSPORTATION

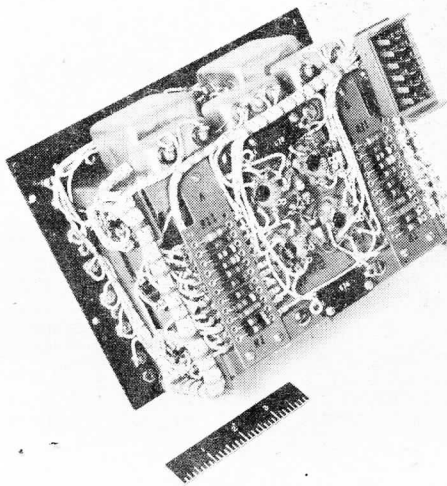


COVERS OPEN

are not suitable for use in conjunction with two-wire telephone repeaters.

(2) Wire W-110-B when loaded with Coil C-114 is suitable for use on a non-repeated two-wire basis or on a two-wire basis with terminal amplifiers, but not on a four-wire repeated basis.

(3) Wire W-110-B when loaded with Coil C-334 (Modified) is suitable for use on a non-repeated two-wire basis, or on a two-wire basis with terminal amplifiers; it is also suitable for use on a four-wire repeated basis.



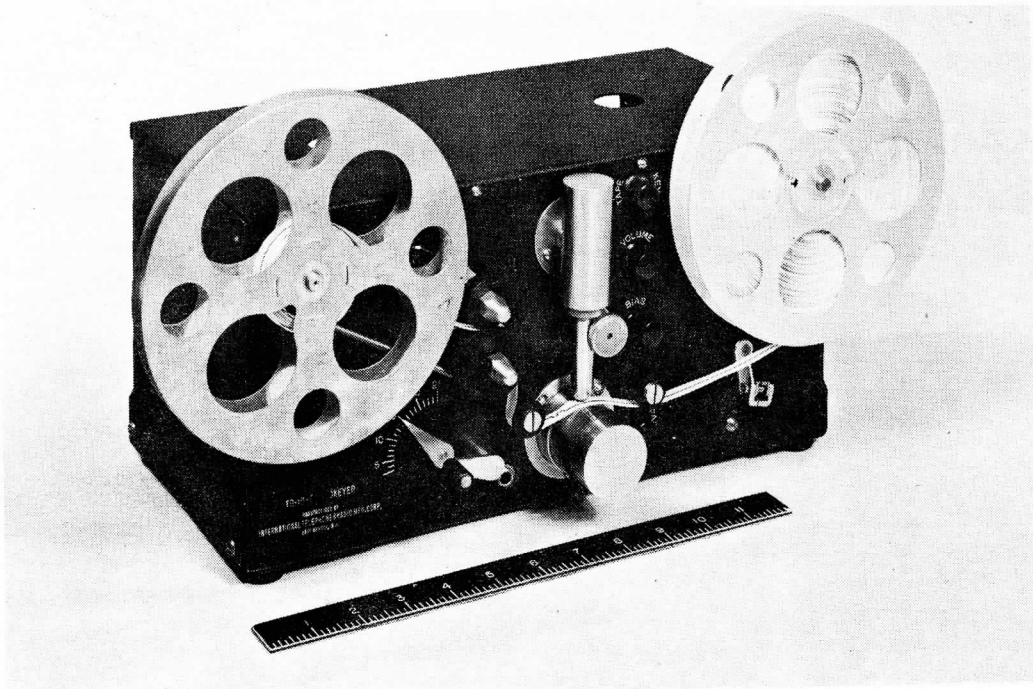
BOTTOM VIEW OF CHASSIS

d. Boom Equipment LC-60-( ), as covered in Signal Corps Board Case No. 485, be modified in that the sheave blocks, through which the wire passes, be changed to a type known as "snatch blocks."

e. That construction personnel when using Coil C-334 (Modified) be instructed to splice one coil to the outer end of Wire W-110-B on each full Reel DR-5 in advance of the actual laying of the wire, so as to reduce construction time to a minimum.

Signal Corps Board Case No. 351, Supplement I - Portable Keyers for Use with Code Practice Equipment. Approved November 18, 1942.

The Signal Corps Board was directed to obtain models of all available small portable keyers and to make a study and test these keyers to determine if any of them are considered to be a suitable replacement for Keyer TG-10 (now used with Code Practice Equipment EE-94, EE-95, and EE-96) with respect to their output, ruggedness, and other characteristics as well as for operation as a separate unit for training on transports and at overseas



KEYER TG-10-( )

The Signal Corps is preparing to procure in the near future, approximately 25,000 Keyers TG-10. While in the first stages of this proposed procurement, a small portable keyer was brought to the attention of this office. The procurement of the small portable keyer as a replacement for Keyer TG-10 will effect saving in both critical and strategic materials.

The following recommendations were approved:

- a. The model of the Waters Conley small model keyer as submitted, after incorporating therein the features and changes enumerated in the Board's report, be included on the parts list

of Code Practice Equipments EE-94, EE-95, and EE-96 as replacement for Keyer TG-10. Keyer TG-10 will have the status of a limited standard article and will not be replaced except where necessary for troops going outside the continental limits of the United States.

b. The Signal Corps General Development Laboratory be directed to prepare specifications for a small model keyer, incorporating the design features of the Waters Conley small model keyer modified in accordance with the provisions of the report in order to insure the procurement of a satisfactory article and interchangeability of component parts.

c. The Signal Corps General Development Laboratory be directed to determine those parts which will require most frequent replacement, such as tape drive rollers, tubes, rubber drive ring, drive belts, etc., and that a three months' supply of these spare parts be packaged and supplied with each keyer.

d. The Signal Corps General Development Laboratory be directed to prepare a list of parts to be procured and retained in Depot stocks in sufficient quantity for one year's maintenance of the total number of small model keyers procured.

Signal Corps Board Case No. 463 - Distribution of Shaft Drive Motorcycles (New Type). Approved November 27, 1942.

The Signal Corps Board was directed to make any required tests on Shaft Drive Motorcycles (New Type) supplied by the Quartermaster General and also to reconsider so much of the recommendation of the report previously submitted on Case No. 365 as pertains to the issue of motorcycles to Signal Corps units other than in the Armored Force.

In January, 1941, the Signal Corps Board was directed to service test a Truck,  $\frac{1}{4}$ -ton, 4 x 4. This test was known as Case No. 365. The Board submitted its report on May 9, 1941, and the approved recommendations were that:

a. Current Tables of Basic Allowances covering motor vehicles for Signal Corps Tactical organizations be amended to eliminate Motorcycles, Solo, Motorcycles with Side Cars and Motor Tricycles from all Signal Corps tactical units with the exception of those in the Armored Force.

b. The recommendations of the Armored Force Board be obtained anent the question whether or not motorcycles and tricycles now appearing on Tables of Basic Allowances for Signal Corps tactical organizations forming an organic part of the

Armored Force should be amended to substitute  $\frac{1}{2}$ -ton, 4 x 4 trucks, in whole, or in part, for the motorcycles and motor tricycles now assigned these organizations.

This case covers the test of Shaft Drive Motorcycles (New Type) and the "Servi-Cycle". This "Servi-Cycle" is a bicycle powered with a one cylinder gasoline engine. These vehicles were used in and around Fort Monmouth in messenger service and for field problems.

The Signal Corps Board concluded that:

a. The use of motorcycles of Signal Corps personnel other than Signal Corps units attached to the Armored Force is not desirable.

b. The inherent design weaknesses of the Servi-Cycle motor-driven bicycle, together with the undesirable features applicable to motorcycles in general, are such as to render unwarranted the consideration of this type of machine for the use of the Signal Corps.

It was recommended that:

a. No further consideration be given, at this time, to the use of motorcycles by Signal Corps units other than those attached to the Armored Force.

b. No further consideration be given, at this time, to the motor-driven bicycle, "Servi-Cycle," by the Signal Corps.

Signal Corps Board Case No. 492, Part E - "Ray Lite" Flashlight. Approved November 28, 1942.

The "Ray Lite" Flashlight submitted to this office by Mr. Wm. B. Sachs of Jamaica, Long Island, New York, was sent to the Signal Corps Board for examination.

The "Ray Lite" essentially consists of two major assemblies: (1) plastic-moulded 2-cell battery case containing a switch assembly, and (2) plastic-moulded reflector holder assembly, so formed that the narrow portion is guided and slides over the outside diameter of the battery case, thereby operating the light switch.

The Signal Corps Board recommended that no further consideration be given to the "Ray Lite" Flashlight.

Signal Corps Board Case #492, Part D - "Clix Signalite" Flashlight. Approved November 28, 1942.

The Signal Corps Board was directed to determine if the "Clix Signalite" Flashlight has sufficient merit to recommend its adoption for military use.

The "Clix Signalite" essentially consists of two parts: (1) a plastic-moulded, three-cell battery case, containing a switch assembly, (2) a plastic-moulded reflector holder assembly that is screwed on to the battery case. The principal feature contained in the reflector holder is a signal switch device that makes possible the movement of a green filter, a clear white (no filter), and a red filter in front of the light beam. These three positions and two colors make possible the use of the flashlight as a signaling light or as a safety or traffic light for use in blackout conditions.

The Board recommended that no further consideration be given to the "Clix Signalite" Flashlight.

Signal Corps Board Case No. 497, Supplement I - Replacement of Telephone Central Office Equipment TC-4 by one or more Telephone Central Office Equipments TC-12. Approved November 30, 1942.

The Signal Corps Board was directed to review the parts list of Maintenance Equipment ME-11 (used for maintenance of Telephone Central Office Equipment TC-4) to determine what equipment was included therein and not included in Maintenance Equipment ME-30 (used for maintenance of Telephone Central Office Equipment TC-12) that is absolutely essential to the proper maintenance of field wire lines.

In May, 1942 the Signal Corps Board was requested to consider the feasibility of replacing Telephone Central Office Equipment TC-4 by one or more Telephone Central Office Equipments TC-12. One of the objections which the Signal Corps Board had to this substitution was that Maintenance Equipment ME-30 did not contain all the essential tools and equipment necessary for proper maintenance of field wire lines. This case is a review of this problem.

The Chief Signal Officer approved the following recommendations:

a. The additional parts listed in paragraph 5a of the report be added to the Parts List for Maintenance Equipment ME-30 in order to provide adequately for the maintenance of Telephone

Central Office Set TC-12, except that the item, Test Set EE-65-A, will be changed to read "Test Set EE-65-( )."

b. The Signal Corps General Development Laboratories be directed to design a new chest or case of satisfactory ruggedness and of sufficient size to contain all of the articles listed in the Parts List for Telephone Central Office Set TC-12, Parts List for Maintenance Equipment ME-30, as amended in accordance with recommendations in paragraph a above, and Extra Apparatus and Tools in accordance with paragraphs E-23a and E-23b, sheet No. 13, Specification No. 71-1312.

Signal Corps Board Case No. 492, Part B - Generator Type Flashlight. Approved December 2, 1942.

A Monarch "Flashmaster" mechanical flashlight was forwarded to the Signal Corps Board for examination to determine if generator type flashlights have sufficient merit to warrant adoption for military use. This flashlight was powered by a hand-operated generator.

The battery-operated flashlight is unsatisfactory for use in sub-zero and tropical climates. Battery output falls off rapidly below 0° F and is negligible at -40° F. Battery life is short in tropical climates due to adverse chemical and temperature effects. It is believed that a military necessity exists for a mechanical flashlight to overcome these battery difficulties. Electrically, low temperatures could have no harmful effect on a mechanical flashlight. Through proper varnish treatment of coils and proper choice of construction materials, moisture would not affect it electrically or mechanically. Although lubrication would be affected by low temperatures this difficulty can be surmounted.

It is recommended that no further consideration be given to the Monarch "Flashmaster" mechanical flashlight.

It was also recommended that:

a. The Signal Corps General Development Laboratory be directed to design a mechanical flashlight along the lines suggested in the Board's report, and having the following specific characteristics:

(1) Light output shall be constant to within plus or minus 10 percent at approximately 10 operating strokes per minute but at not exceeding 30 strokes per minute.

(2) The accoustical noise produced as a result of the normal operation of the device shall not be perceptible to a nor-

mal ear at a distance of more than 30 feet under quiet conditions.

(3) The device shall not produce radio interference so as to preclude its operation in the vicinity of radio sets.

(4) Satisfactory operation:

- (a) At temperature down to  $-60^{\circ}$  F.
- (b) At temperature of  $130^{\circ}$  F and 95 percent humidity.

(5) High mechanical efficiency.

(6) The device be designed as an adapter to Flashlight TL-122-A, if feasible, but in any case, to make use of Flashlight TL-122-A reflector assemblies, lamps, lenses and lens rings except that a 0.150 ampere, 2.5 volt, flange-base, pre-focused lamp will be acceptable.

b. A model of the mechanical flashlight designed by the Signal Corps General Development Laboratory be submitted to the Signal Corps Board for test.

c. Further investigation be made by the Laboratories to determine if a more satisfactory type of commercially available flashlight, for use under conditions where dry cell operated flashlights are not satisfactory, can be secured with a view to procurement and issue until a generator type flashlight can be developed which is considered to be suitable for military use.

Signal Corps Board Case No. 510 - Miller Flexible Tools.  
Approved December 5, 1942.

These tools consist of a flexible shaft which will permit the application of torque to the handle to be transmitted around corners and into relatively inaccessible places with the least amount of effort.

Tests were conducted on all types of fastenings generally used in communication and light engine equipment in order to determine the utility and the practicability of the Miller Flexible Shaft Socket Set and the Screwdriver.

The Signal Corps Board recommended that no further consideration be given to the Miller Flexible Shaft Socket Set and Screwdriver.



Signal Corps Board Case No. 475 - Equipment for Meter Repair. Approved December 5, 1942.

In the past the repair of electrical meters and instruments has been accomplished for the Signal Corps largely by the various instrument manufacturers, through the return of defective units. This was a practical peacetime procedure because Army units remained at more or less fixed locations, the number of instruments requiring repairs was small, and the services of highly skilled instrument repairers were readily available in the various manufacturers' plants. The situation today for obvious reasons does not, in many instances, permit the return of meters requiring repairs to the original manufacturer. Furthermore, most instrument manufacturers are so overburdened with wartime production requirements that the factory repair of damaged instruments can be accomplished only through a reduction of new equipment output. The result is that the repair of electrical instruments has become an important function of the Signal Depot Company.

The Signal Corps Board was directed to prepare a list showing the tools and equipment necessary for the repair of electric meters in the Signal Depot Company.

The study made by the Board was based on the assumption that spare parts for the repair of meters would be available in the field when the tools and other equipment proposed in this report become available to the using organizations.

The approved recommendations are that:

a. No instrument repairmen, electrical, (338) be included in mobile or base radar repair crews, this personnel being replaced, if required, by radar repairmen having suitable qualifications, and that Table of Organization 11-107 and Field Manual 11-20 be modified accordingly.

b. All electrical instrument repair functions of a Signal Depot Company be consolidated into a single unit of the base repair platoon to be known as the electrical instrument repair section.

c. The instrument repairmen, electrical, (338) now assigned to the mobile and base radar repair sections of the Signal Depot Company repair platoon be re-assigned to a separate base electrical instrument repair section of the repair platoon and that Table of Organization 11-107, and Field Manual 11-20 be modified accordingly.

d. Field Manual 11-20 be further modified to direct that

wherever possible, separate, dust-free quarters be provided for the electrical instrument repair section.

e. The Signal Corps General Development Laboratory be directed to determine specific quantities and types of manufacturers' repair parts as indicated in the list appended to the report as Inclosure No. 6.

f. (1) Signal Corps Shop Branch, Research and Development Division, in coordination with the Maintenance and Test Section, Camp Cole Signal Laboratory, reconsider the list of apparatus and equipment for testing, calibrating and electrical adjustment of electrical meters (Inclosure 2 to the report) for the purpose of reducing the meter requirements to the minimum essential for this work.

(2) Meter shunts, multipliers, power equipment, etc., (Inclosure 2 to the report as amended after study) shall be mounted on a suitable panel or panels to facilitate their use and to prevent loss.

(3) Material included in Inclosures 3, 4 and 5 to the report, be approved as a guide in the preparation of a list of material to be issued for meter repair.

(4) All equipment, materials, etc., be included in a kit and placed in the Table of Basic Allowances for the Signal Depot Company.

Signal Corps Board Case No. 469 - Black Light Hand Lamps.  
Approved December 7, 1942.

It has been frequently suggested, especially by commercial interests, that fluorescent materials and black light be used to obtain security during blackouts. By the exercise of ingenuity, it is possible to obtain illumination of any surface by the use of fluorescent chemicals and black light.

The Signal Corps Board was directed to determine whether a military need exists for fluorescent printed matter and if so, whether there would be a need for the Blackout Hand Lamp submitted by the Continental Lithograph Corporation, Cleveland, Ohio.

The Signal Corps Board concluded that fluorescent materials and black light hand lamps are of limited value to the field forces because:

a. Fluorescent materials produce a low level of illumina-

tion although high intensities of incident black light are employed.

b. Auxiliary equipment is required to excite fluorescent materials and the efficiency of such equipment is low compared to usual light sources.

c. Fluorescent materials lack stability when exposed to sunlight and moisture.

d. Strategic materials, especially in the light producing source, are required.

e. Equivalent legibility can be obtained with considerably less weight and cost of equipment by using ordinary methods of illumination.

f. Each article to be read by this kind of light must be treated with fluorescent compound, whereas many such articles have already been procured in large quantities without such treatment.

g. If a black light hand lamp is supplied, it is not useful for any of the common purposes for which Flashlight TL-122-( ) is employed.

h. The security under blackout conditions, while improved because the black light is not visible to the unaided eye, is nevertheless not complete because devices have been developed to make such emission visible.

It is recommended that, in view of the present state of development of the art, no further consideration be given, at the present time, to the employment of fluorescent materials and black light hand lamps in the Signal Corps.

Resources

## XIII. ACETYLENE BLACK FOR DRY BATTERIES

Acetylene black is a black powdered substance created basically from carbon and lime. Carbon plus lime produces calcium carbide, which with water yields acetylene. The burning of acetylene with insufficient oxygen produces acetylene black. Further minor treatment of this substance results in so-called Shawinigan black. Shawinigan black is used principally in bulk proportions for the construction of dry-cell batteries. The principal reason for utilizing this material is that it offers higher initial voltage and longer cell life. The physical properties of acetylene black are better than any other grade of carbon black available.

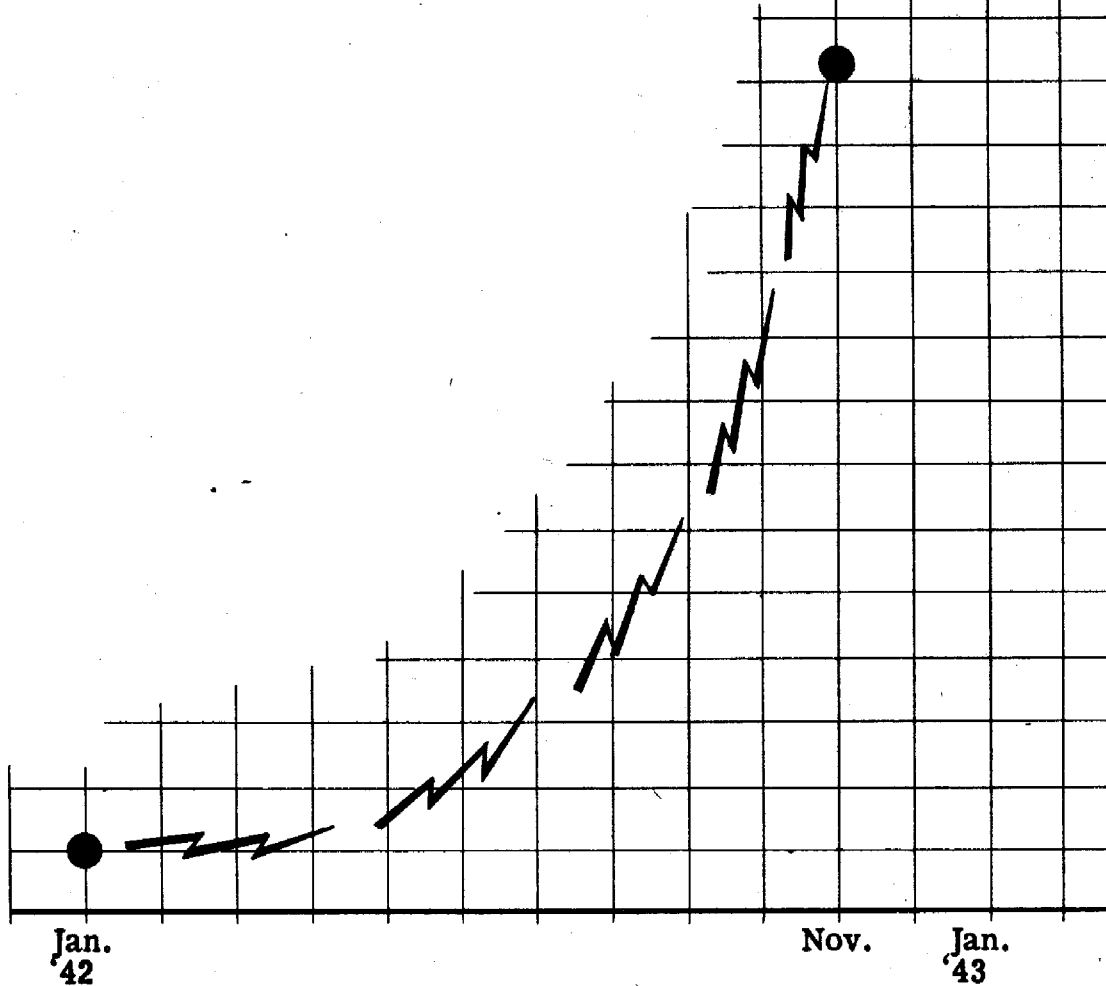
The conductivity characteristics of this material have caused it also to be used extensively in the construction of rubber tires for mobile vehicles employing radio communications and for rubber heels and soles for shoes in industries where spark hazards are undesirable. The conductivity characteristics of this material allow the electrostatic charges to be passed off to ground potential with no resulting sparking to cause either radio interference in the first case or possible explosions in the second case.

Due to the increasing procurement rate of dry-cell batteries for the armed services, with a subsequent increased drain upon the supply of acetylene black, it has been deemed desirable to restrict the use of acetylene black to military batteries and only those civilian batteries used in hearing-aid equipments. Steps are being taken at the present time to eliminate insofar as possible the use of acetylene black in rubber goods and it is expected that an official order from the War Production Board will be issued shortly covering this phase of acetylene black consumption.

Several years ago a program for commercializing the process of thermal cracking of petroleum hydrocarbons to acetylene was initiated by one of the larger development corporations. This process would eliminate the present bottleneck of calcium carbide. By the middle of 1943 it is expected that beneficial results will have been obtained from this program together with expansions now under way for the production of calcium carbide.

**SIGNAL CORPS DELIVERIES INCREASE 1328%  
IN FIRST 10 MONTHS OF 1942**

The War Department announced on December 12 that the delivery of Signal Corps equipment had scored an increase in dollar volume, between January and November of 1942, of 1328 per cent. In the percentage of increase, the Signal Corps led all other components of the Services of Supply. The total increase of S.O.S. deliveries for the same period was 337 per cent. From October to November of 1942, S.O.S. deliveries as a whole increased by 13.5 per cent. The percentage of increase in Signal Corps items was 30.5 per cent.



## XV. OFFICERS

### Requirements

A detailed study showing estimated officer requirements was prepared by Military Personnel Branch, Office of the Chief Signal Officer, and submitted to Military Training Division, Services of Supply. It was pointed out that from estimates of officer requirements for the remainder of 1942 and for 1943, there appears to be a considerable need for officers of advanced grades. The figures of the preliminary 1943 troop bases for the Army Air Forces and Army Ground Forces indicate that their minimum needs for 1943 will be: 597 Captains, 130 Majors, 148 Lieutenant Colonels, and 16 Colonels. It is apparent that this need cannot be met from the two available sources of officers, i.e., the Signal Corps Officer Candidate School and from civilian appointments. There exists, likewise, a shortage of senior officers under allotted or T/O figures in both the Army Ground Forces and the Army Air Forces. To fill these vacancies, a considerable number of the officers promoted should receive advanced training to qualify themselves. It was recommended, therefore, that the Commanding Generals of the Army Ground Forces and the Army Air Forces be urged to concur in a program of advanced training for senior officers. Quotas of officers would be assigned to the Army Air Forces and to the Army Ground Forces on alternate months beginning with December and ending next May until a total of 600 Signal Corps officers had received advanced training and qualified themselves for positions of higher grades.

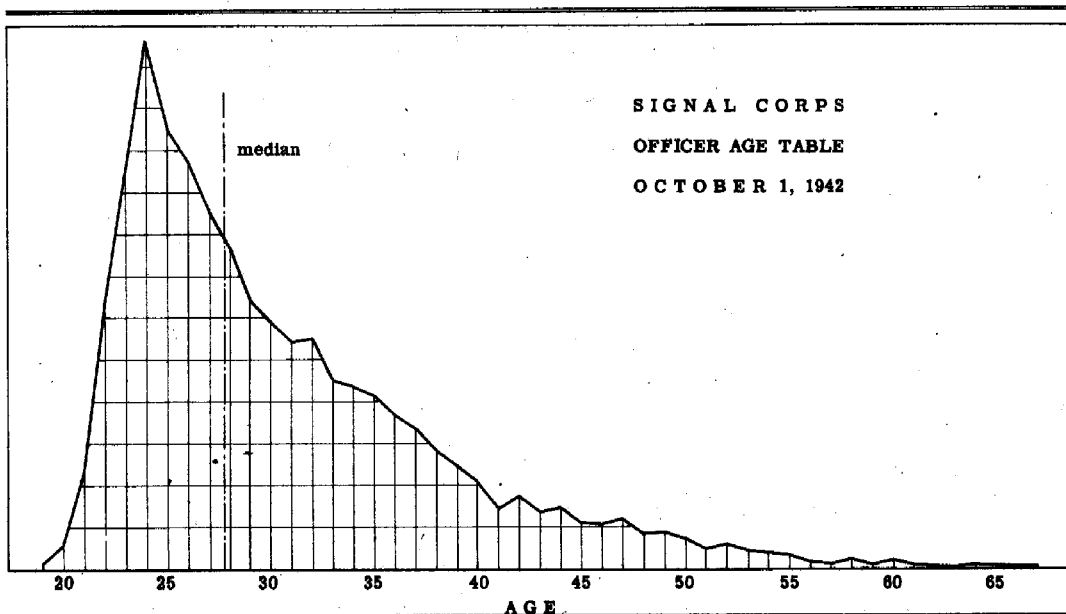
### Ceiling on Positions in Washington

A recommendation was submitted to Military Personnel Division, Services of Supply, by Records Section, Military Personnel Branch, in which the proposal was made that the ceiling on officers in Washington in the Office of the Chief Signal Officer be reduced to 690 officer positions from the present ceiling of 754 positions. The point was stressed that this reduction should not be accompanied by a reduction in the allotment of officer positions to the Signal Corps, because this reduction is being accomplished by transferring functions out of Washington to field installations. It was further pointed out that another reason which makes the retention of the present overall total allotment to the Signal Corps necessary, is that new functions have been undertaken by the Chief Signal Officer without any increase being made in the officer allotment to the Signal Corps, and indications are that there will be further increased requirements for officer positions in the future. While the pres-

ent allotments will be insufficient to carry on these activities at full scale, adjustments can be made within the present allotment to the Signal Corps so that these activities may be started on a reduced scale.

Assignment and Reassignment in AUS

Authority was delegated to the Commanding General, Eastern Signal Corps Training Center, Fort Monmouth, New Jersey, and to the Commanding General, Midwestern Signal Corps Training Center, Camp Crowder, Missouri, to assign and reassign individual officers of the Army of the United States, in accordance with The Adjutant General's Memorandum S605-17-42, subject, "Delegation of Authority to Assign and Reassign Individual Officers of the Army of the United States," dated November 12, 1942.



## Efficiency Records of Regular Army Officers

A tabulated listing of Regular Army Officers on duty with the Signal Corps has been prepared by Classification Section, Military Personnel Branch, for the purpose of checking the file of Regular Army Officers' efficiency records. This check has disclosed a large number of cases where other Arm of Services have failed to furnish this office with the efficiency records of Regular Army Officers transferred to the Signal Corps. Action has been taken by Classification Section to secure the missing records to complete the file.

### Officer Candidate School

Records Section, Military Personnel Branch, prepared and forwarded a report to Military Personnel Division, Services of Supply, on the size and frequency of the Officer Candidate School classes to be enrolled subsequent to January 1, 1943, and the proposed reallocation of the officer allotment for the staff and faculty of the Officer Candidate School. It was pointed out that the part of the allotment which will be available for reallocation will be transferred to the staff and faculty of the Enlisted Men's School and the Officers School, as well as to new and expanded Signal Corps activities for which allotments have been requested but which have not been issued because of the limitations placed on the total number of officer positions available for the entire SOS overhead.

## ENLISTED MEN

### Basic Training at Replacement Training Centers

The Chief Signal Officer has been directed by the Commanding General, Services of Supply, to reorganize the basic training of enlisted men at the Signal Corps Replacement Training Centers into training platoons and companies. This procedure will require that, upon completion of basic training, all personnel in each training unit must be moved out of the Replacement Training Center immediately in order to provide housing and training facilities for the incoming trainees. In view of difficulties encountered, Enlisted Section, Military Personnel Branch, forwarded a memorandum to the Director of Military Personnel Division, Services of Supply, in which a plan was pro-



posed whereby more Class IV and V personnel may qualify as specialists by permitting more training time without disrupting the training schedule in the Replacement Training Center. Military Personnel Branch proposed that Services of Supply authorize the transfer of sufficient housing at Camp Crowder from that now allotted to the Second Army, to the Midwestern Signal Corps Training Center in order to accommodate 2,000 trainees. Housing thus made available would be utilized to give additional training to a portion of the trainees requiring it upon completion of the normal training cycle without interfering with the company training program. Military Personnel Branch further suggested that SOS authorize The Adjutant General to assign those enlisted men reported as available by the Replacement Training Center and classified as basically trained only, to units scheduled to receive personnel direct from Reception Centers. Low priority units receiving such personnel from reception centers will have sufficient time to give additional training to the men, and enable them to qualify in some specialty.

#### Assignments of Graduates of Radar Classes

A review was made by Military Personnel Branch of the assignments of recent graduates of the radar classes. It was learned that better than 90 percent of the airborne radar school graduates have gone to Air Warning units. Colonel Greene of Camp Murphy advises that the output of the airborne radar school will average 50 per week after the December 5th class; this will take care of 1943 requirements.

#### WOMEN

#### Use of WAAC Personnel with the Signal Corps

Captain K. E. BeLieu, Auxiliary Corps Section, Military Personnel Branch, has returned from an inspection trip to Camp Crowder, Missouri. Captain BeLieu's purpose in making the trip was to conduct a survey to ascertain the needs of the Midwestern Signal Corps Training Center for WAAC personnel. The survey was made in cooperation with WAAC 3rd Officers Ruth W. Brainerd, and Muriel A. McCall, WAAC Headquarters. Based on the data compiled by the surveying officers, a requisition was obtained for 444 WAAC's — exclusive of the necessary officer and overhead personnel — and it is planned that these WAAC's will replace 363 combat eligible enlisted men within six weeks after the arrival of the WAAC's. The difference of 81 between 363 and 444 represents position vacancies.

RESTRICTED

The results of this trip were most satisfactory and it was recommended by Captain Belieu that further inspection trips to various other Signal Corps installations be made with a view of using WAAC's to replace combat eligible enlisted men. It was further recommended that immediate steps be taken to establish the "Signal Corps policy" concerning WAAC's assigned to various arms and services (that all WAAC's assigned to duty with an arm or service will be controlled by and identified with said arm or service). For, in view of the extreme adaptability of WAAC's to many Signal Corps duties, unless this policy soon becomes effective, the Signal Corps faces the potential loss of control of a large group of personnel performing the duties for which it is responsible.

## XVI. SIGNAL CORPS PROMOTIONS

The following promotions have occurred among Signal Corps personnel during the period from November 13, 1942, to December 17, 1942, inclusive:

Brigadier General to Major General

Code, James A., Jr.  
Ingles, Harry C.

Colonel to Brigadier General

Crawford, David McL.  
King, Henry L. P.  
Meade, Frank C.  
Moran, Richard B.

Lieutenant Colonel to Colonel (Temporary)

Brewer, John Henry	Kidwell, Francis E.
Carlsten, Chester Arthur	Larew, Walter Byron
Hamlin, William D.	McNamee, Roland William
Hogle, Albert F.	Van Voorst, Marion
Irwin, Gordon Cogswell	White, Edwin Lee

Promoted to Lieutenant Colonel (Permanent)

Allen, William I.	Jervey, William W.
Banks, Clyde G.	McNamee, Roland W.
Bolt, James L.	Messer, Herbert G.
Carter, Wiley V.	Mickelsen, Arthur E.
Chadwick, Maurice P.	Neal, Paul L.
Clarke, Carter W.	Pulsifer, Arthur
Curtis, Frank H.	Shaw, Robert M.
Daw, William J.	Stice, Kenneth S.
Elder, Eugene V.	Sullivan, Allan F.
Hayes, William P.	Van Voorst, Marion
	Wooley, George F., Jr.

Major to Lieutenant Colonel (Temporary)

Brice, William Arden	Meyer, Richard John
Bullock, Edmund Theodore	Miller, Robert Beauchamp
Burke, Hugh Elliott	Moody, Marlin S.
Cook, Earle Fremont	Nicholls, Harold Calude
Davis, Sidney Sloan	Nicholls, Russell E.
Poster, Andrew Paul, Jr.	Olin, Charles Lind
Frost, Robert F.	Phillips, Dexter Wilson
Garrison, Dwight	Putnam, Thomas R.
Given, William James	Sawyer, Brooke Eltinge
Jeffe, Ephraim Franklin	Sweeny, William Smith
Kalisch, Bertram	Swift, Robert Gray
Knowlton, Charles Faulkner, Jr.	Truax, Alfred Floyd
Large, Raymond Emet	Wagner, Herman Henry
Mandelbaum, Albert Joseph	Watters, John Edward
Mathews, John B.	Williams, Henry Wiley
McCrary, Arthur Alfred	Young, John Livingston Hopkins

Captain to Major (Temporary)

Arnold, William Otto	Griffin, Arnold R.
Bailey, Wilbur Winston	Crosstephan, Arthur Rudolph
Blair, Thomas Wray	Haffa, Robert Penn
Bowman, Clair Ferguson	Hamilton, William Wright
Bush, Sterling Champ	Hills, Norman Reginald
Carton, Joseph Donald	Hocker, Otis Beverly, Jr.
Coffin, Edward Chester, Jr.	Hoyt, Kennard A.
Cole, Ross Robert	Hutson, Ben Watkins
Corbett, Paul Francis	Jarrell, Robert Lee
Corr, James, Jr.	Jennings, William Edwin
Crabtree, David Montgomery	Johnson, Edwin Kimball
Craig, Joseph Frederick	Johnson, John Palmer
Danford, Edward Coyle	Johnson, Joseph S.
Dettmer, Herman William	Kaylor, Robert Lafayette
DeWolf, John Walbridge	Keigher, Clinton Thomas
Dillinger, Wellington Dallas	King, Richard McLaury
Dolle, Walter Charles	Knecht, Walter Grote
Dow, Lowell Jordan	Lahr, Ross Vernon
Dupree, James Elbert	Lanham, Oswald Morris
Eason, Robert Kelton	Lantz, Arthur Leslie
Egnor, William Donald	Leask, George Dowell
Fairchild, Harlan Grant	Leva, Francis Leon
Frederick, Harry	Lindley, Roger M.
Gable, Joseph William	Mailman, Henry LeRoy
Gannon, William Joseph	McCormick, Harold Donovan
Garson, Arthur Julius	McKeever, Daniel Axford, Jr.
Gold, Kenneth Monroe	McKinlay, Duncan E.
Greene, Porter Claude	McNitt, James Rollo

ContinuedCaptain to Major (Temporary)

Metcalf, Herbert Edmond  
Mony, Anthony Joseph  
Moore, Thomas James, Jr.  
Needham, John Addison  
O'Hern, Wayne Laverne  
Peppersack, Barney Robert  
Phipps, Charles Henry, Jr.  
Post, Perkins G.  
Quarrier, Fitzhugh  
Redmond, Lury Brant  
Reeves, George Asa, Jr.  
Richcreek, Harry G.  
Richey, LeRoy Milburn  
Rider, John Francis  
Rigby, Linden Gordon

Roderick, Harry Edward  
Rottner, John Samuel Gray  
Rowley, Ralph M.  
Russell, Willard Pitkin  
Sansweet, Samuel  
Sheppard, Hubert A.  
Silverberg, Morton  
Smith, James Carter  
Stiegman, Fred Martin  
Underwood, Gerald Vincent  
Weisenberger, George Adam  
Wester, John Archambeau  
White, Hoyt Edward  
Wood, William I.  
Woodman, Charles Merrill

Signal Troops

## XVII. REDESIGNATION OF UNITS

The following affiliated units are redesignated as indicated:

<u>Present Designation</u>	<u>New Designation</u>
301st Signal Battalion	301st Signal Operation Battalion
302nd Signal Battalion	302nd Signal Operation Battalion
303rd Signal Battalion	303rd Signal Operation Battalion
304th Signal Battalion	304th Signal Operation Battalion
305th Signal Battalion	305th Signal Operation Battalion
308th Signal Battalion	308th Signal Operation Battalion
309th Signal Battalion	309th Signal Operation Battalion

The following Signal Service Regiments are redesignated as indicated:

<u>Present Designation</u>	<u>New Designation</u>
15th Signal Service Regiment	15th Signal Training Regiment
800th Signal Service Regiment	800th Signal Training Regiment
801st Signal Service Regiment	801st Signal Training Regiment
802nd Signal Service Regiment	802nd Signal Training Regiment
803rd Signal Service Regiment	803rd Signal Training Regiment
804th Signal Service Regiment	804th Signal Training Regiment