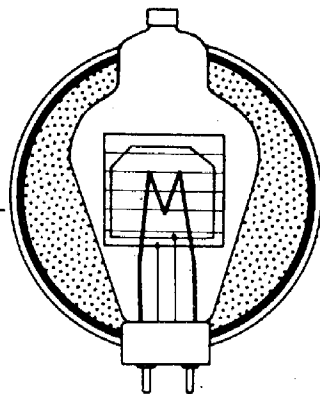


# RESTRICTED



# SIGNAL CORPS Technical Information Letter No. 15

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL OFFICER

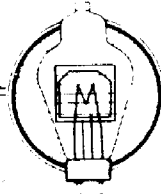
WASHINGTON, D.C.



FEBRUARY 1943

# SIGNAL CORPS

## TECHNICAL INFORMATION LETTER



NUMBER 15

FEBRUARY 1943

### RESTRICTED

This document contains information affecting the national defense of the United States within the meaning of the Espionage Act (U.S.C. 50:31, 32). The transmission of this document or the revelation of its contents in any manner to any unauthorized person is prohibited.

WAR DEPARTMENT, HEADQUARTERS, SERVICES OF SUPPLY  
OFFICE OF THE CHIEF SIGNAL OFFICER  
EXECUTIVE OFFICE, SPECIAL ACTIVITIES BRANCH

SIGNAL CORPS TECHNICAL INFORMATION LETTER

Signal Corps Technical Information Letter (SCTIL) is issued monthly for the 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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The Chief Signal Officer

A STATEMENT OF POLICY

This war can and will be won only by the full and complete cooperation of our Army, our Navy, the civilian departments of our government, and private industry, all acting in concert with the governments, the armed forces and the peoples of the United Nations.

Internecine rivalries between any of these groups are destructive of our common goal. Their elimination is a MUST if we are to crush the enemy. This can best be accomplished by DISREGARDING as unimportant any matters not related to the Signal Corps' responsibilities to our army; by CONCENTRATING on the goal of VICTORY and the WILL TO WIN, and by the application of all our energies toward the ACHIEVEMENT of those objectives.

I feel very keenly about this subject because the load on us all is very heavy in its purely military aspects, and I want to go on record as being determined that on any subject that comes before us our attitude will be: "How does it affect the winning of the war?"

Therefore, let us of the Signal Corps be constantly on our guard to avoid being drawn into any controversy that detracts from the war effort.



Dawson Olmstead,  
Major General,  
Chief Signal Officer of the Army.

Military Training

## II

TEAM TRAINING

The Chief Signal Officer has received notice that two training battalions, namely, the 847th and 848th Signal Service Battalions, will be activated during the month of January. The primary objective of these two battalions is to take trained specialists and weld them into trained teams of the various types listed below:

Installation and Local Maintenance Platoon	Corps Signal Repair Section
Teletypewriter Operation Platoon	Message Center Platoon
Construction Platoon (Signal Battalion)	Radio Operation Platoon
Repair and Maintenance Section	Telephone Operation Platoon
Mobile Direction Finder Section	Operation Section
Portable Direction Finder Section	Intercept Section
Telephone and Telegraph Section	Control Section
Automatic Switchboard Installation Team	Wire Laying Section
Carrier Eqmt Operation Maintenance Platoon	Storage and Issue Section
1 KW Fixed Radio Station Team	Radio Repair Section
300 W Fixed Radio Station Team	Wire Repair Section
VHF Installation & Maintenance Team	10 KW Fixed Radio Station Team

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COMBINED U. S. - BRITISH RADIOTELEPHONE PROCEDURE

FM 24-9, Combined United States-British Radiotelephone (R/T) Procedure, has been published, dated December 28, 1942. Recommendation has been made that this procedure become effective as follows:

a. Within the United States Army:

- (1) In continental U.S.\* - February 15, 1943.
- (2) Elsewhere - April 15, 1943, unless practicable to employ earlier upon order of senior U. S. Army commander in area.

b. For joint U.S. Army-Navy Communication:

- (1) In continental U.S.\* - February 15, 1943.
- (2) Elsewhere - April 15, 1943, unless practicable to employ earlier upon order of senior U.S. officer in area.

c. For combined United States-British Communication - April 15, 1943, or sooner, if practicable upon order of theater commander.

\* Continental U.S. is defined to include Alaska, Sea Frontier, Caribbean Area, and Panama.

Military Training

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PUBLICATIONS

The following new field manuals and technical manuals have been published and may be obtained through regular Adjutant General channels:

FM 24-9, Combined United States-British Radiotelephones (R/T)  
Procedure, December 28, 1942.

TM 1-472, Army Air Forces Radio Equipment, December 3, 1942.

TM 11-200, Radio Sets SCR-AF-183, SCR-AG-183, SCR-AH-183, SCR-AJ-183, SCR-AK-183, SCR-AL-183, SCR-AN-183, SCR-AL-283, and SCR-AN-283, October 31, 1942.

TM 11-800, Radio Transmitters BC-191-A, BC-191-B, BC-191-C, BC-191-D, BC-191-E, and BC-AA-191, November 12, 1942.

TM 12-250, Administration, October 10, 1942.

Cl, TM 11-332, Telephone Central Office Set TC-4, December 14, 1942.

TRAINING FILMS

The following new training films will be released at an early date:

TF 11-691, Description and Use of the Converter M-209-A.

TF 11-871, Message Center Procedure - Part I, Outgoing Messages.

TF 11-1064, Message Center Procedure - Part II, Incoming Messages.

The motion picture, "Organization of the Army," originally produced by the Office of Strategic Services in conjunction with the Deputy Chief of Staff, will be released through the Signal Corps as Training Film 25-670. This film will be shown through the enlisted and commissioned personnel and to new personnel within the first 30 days of active duty. In addition, it will be shown to all enlisted men while students in officer candidate schools.

PIGEONS DONATED TO THE SIGNAL CORPS

Approximately twenty thousand pigeons were donated to the Signal Corps by patriotic civilian pigeon fanciers residing in the continental limits of the United States during January, 1943. Especially generous contributions came from fanciers in the following cities:

Baltimore, Md.	900
Cleveland, Ohio	3,000
Columbus, Ohio	1,000
Toledo, Ohio	1,000
Philadelphia, Pa.	1,200

These racing homing pigeons were obtained without solicitation or cost to the United States Government.

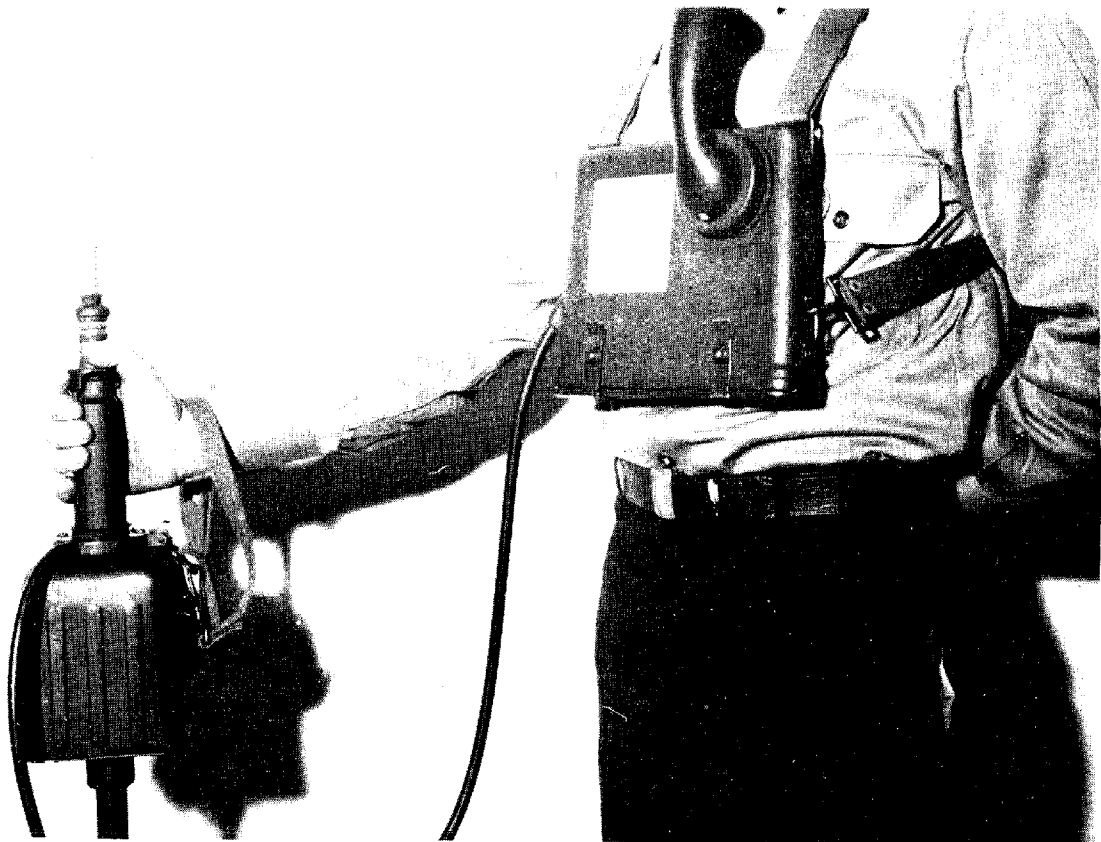


THE 511 IN THE FIELD

The SCR-511, originally designed as a light-weight Cavalry set to be carried as a guidon staff, has been applied in many other ways in the field. It is mounted or carried in jeeps and other open vehicles, as well as in amphibious crafts. Troops also carry it by hand or mount it on the ground.

One word of caution comes back from the field. Some men repose so much faith in the sturdiness of the equipment that they have tried to slam the base of the staff into hard ground. The tubes were not meant for that kind of treatment. The equipment should be handled with more care.

A report from an island somewhere in the South Pacific pays tribute to the dependability and performance of the 511. The same staff officer who says that all types of Signal Corps equipment — both photographic and radio — are "holding up fine." He adds: "Wire W110-B and W130 are doing a swell job, as are the sound powered telephones." He emphasizes the need of plentiful supplies of rubber tape.



RADIO SET SCR-511

LESSONS OF FIELD MANEUVERS

Further analysis of observers' reports from the recent maneuvers in Tennessee indicates that more rigorous training is necessary in signal security. One observer reported:

"Call signs were changed with sufficient frequency, but use of plain text in messages nullified the value of the changes . . . Officers and enlisted men are only slightly cognizant of the dangers from enemy direction finding and analysis . . . Many operators have never even heard of an authentication system."

One Signal Radio Intelligence Company intercepted a total of 603 messages during a single maneuver problem. By the use of an SCR-255 direction finder, it obtained excellent bearings on advanced elements of the opposing force, indicating probable lines of enemy advance and the location of his units. The direction finder, placed on a high hill with a flat summit, was instrumental in verifying many assumptions of the Signal Intelligence Section and in indicating probable lines of attack, and even succeeded in establishing the location of a Corps Command Post.

Brevity codes were easily deciphered. Messages of extreme tactical importance were sent in the clear and gave the intercepting side an opportunity to counter the impending moves. Such messages as the following were intercepted:

"TAKE STATION SOUTH SIDE OF WOODS FERRY"

"HUNTERS POINT UNDER ARTILLERY FIRE AND ENGINEERS EQUIPMENT  
DESTROYED PERIOD IMPOSSIBLE TO BUILD BRIDGE"

"WOULD LIKE TO KNOW IF THERE ARE ENEMY CONCENTRATIONS AT POINT  
10 WALNUT HILL SUITABLE FOR DIVE BOMBING".

Interception of the last message from a bombing unit meant that any "enemy concentrations" which might have been "suitable" for dive bombing at the time the message was sent had ample warning to change their location in case the bombing was attempted. Other serious violations of radio security were noted.

Observers concluded that more intensive training in security measures is essential. It was also pointed out that the utmost realism in maneuver communications must be introduced so that commanding officers will be aware of the time factor involved in enciphering and deciphering messages in the scheduling of all operations.

## AS CLEAR AS DAY

"During the Battle of Gettysburg, General Meade decided to withdraw from the field. This decision was made by him on the evening of the second day. He accordingly wrote up the message ordering the retreat, but just as he was about to post it, a cavalry officer arrived with a dispatch which had been taken from a captured Confederate. The dispatch was "in clear" from President Davis to General Lee, informing Lee that it was impossible to assemble another Confederate army to threaten Washington. Meade then knew that Washington could not be threatened and that the only Confederate forces he had to contend with were Lee's. Accordingly, he canceled his order for a Union retreat. If the dispatch from Davis to Lee had been in cipher or code, which would have delayed the decipherment one to two hours, the order would have gone forth, and perhaps the whole course of the war would have changed.

From "The Use of Codes and Ciphers in the World War and Lessons to Be Learned Therefrom" by Wm. F. Friedman.

## YET AS VITAL AS LIFE!

CRYPTOGRAPH ALL MESSAGES CONTAINING INFORMATION WHICH MAY AID THE ENEMY. AND REMEMBER - - - SEEMINGLY UNIMPORTANT FACTS MAY BE JUST WHAT THEY NEED.

## KEEP SECURITY THE KEYWORD.

Camp Murphy

VI

SOUTHERN SIGNAL CORPS SCHOOL

The close of 1942 completed approximately eight months of active training of radar personnel in the Florida camp which carries on the work of the AW school originally established at Fort Mommouth in 1941.

The transition of what can best be described as a game preserve, where everything from rattlers to quail could be found, into an efficiently running Army camp and school, all in a period of less than 90 days, is a tribute to wholehearted cooperation between civilian and military personnel.

Ground for the present site of the Signal Corps Radar School was broken on Thursday, the 12th of March, 1942, thus avoiding -- although Signal officers are not superstitious -- the coincidence of day and date of the following day. Soon afterward the machine-gun-like chatter of hundreds of hammers and the sing-song whine of the power saws blended into a harmonious accompaniment to the rise of scores of school, barracks, and administration buildings.

Interruptions in construction were few. Dedication exercises were held in the Post Theatre on July 5th, about three and one-half months after the first soil was turned. A notable gathering of Army officers and local civilian personnel listened to the addresses of Brigadier General Milliken, Colonel Sarnoff, Colonel Mitchell, Colonel Cox, and others.

But the construction of buildings and the starting of courses did not complete the school. There still remained a good deal to accomplish, especially in camouflaging. In this connection the fertile muck of the Everglades and the native foliage did noble duty. Extensive replanting of bamboo, southern pine, palmetto, and other tropical vegetation was carried out. Thanks to abundant rainfall, the numerous school and camp buildings soon were masked by tall trees and an abundance of leaves. All in all, a high order of color dispersion was attained and it can be said that the school and camp are well camouflaged.

Birthplace was in Riviera

The actual birthplace of the Signal Corps Radar School in Florida was not the present site. Rather it was a rambling corrugated-steel warehouse shed, several hundred feet long, and an ice house, both located on Lake Worth, at Riviera. This was in April, 1942. The warehouse shed was the school and camp administration building and also served as the mess and signal property office. The ice house was the school administration building. Surrounding the latter was a tent camp for the 801st Signal Training Regiment.

To start operations, accessories were needed. Desks, typewriters, chairs, papers, pencils, and hundreds of other items needed by the school were borrowed or bought from local suppliers. It was but a few days after the arrival of the first contingent that the embryo Camp Murphy and Signal Corps Radar School was

a beehive of activity. In addition to setting up the military organization, it also was necessary to procure the civilian personnel required to carry on the myriad administrative functions.

Concurrently with these operations, work was going on at the main camp at Hobe Sound. By the middle of June gradual evacuation of the Riviera establishment was under way. This was completed in July.

The school at Riviera started with about 20 students. Today the student body and the graduates are numbered in the thousands.

The curriculum includes every phase of radar including operation and maintenance. Many of the students are graduates of civilian radio schools where they received their basic radio training, whereas others secured pre-radar radio knowledge right on the grounds. This training consists of theoretical study accompanied by laboratory work. Each man can advance as rapidly as his capabilities permit, but all must finish in a prescribed period.

#### Courses in Tower Erection

Courses were recently started in tower erection, embracing the different types of towers used in radar installations. Each day, men can be seen gaining experience in tower erection by actually doing the work under competent instructors. As part of this training each rigger is taught how to read and interpret blue prints.

#### Obstacle Course

Construction of an obstacle course was started about November 1, 1942, when officer students awaiting orders cut down trees to clear a rifle range and used the trees in building the course.

The course is approximately 300 yards long and contains 19 obstacles, varying from an 8-foot crawl-through to a rope-swing across a water-filled ditch 15 feet wide. Other interesting obstacles are hurdles, high walls, zig-zag runs, and fences of different heights. The course is run in an average time of about 4 minutes, the record so far being 2 minutes 28 seconds. Slowest time to date was 8 minutes.

Men are conditioned for this course by a week of drill, a week of the manual of arms, and a week of heavy calisthenics. On their first trip they are led through the course; thereafter they go through on their own with minimum time the objective. Progress through the preliminary training is in classes of 40 students. They go over the course in groups of 4. Up to this writing approximately 500 men have passed through this preliminary training.

#### Officers' Courses

A Radar Officers Common Subjects course was started early in October and has handled thirteen groups, each consisting of about 50 men. The pur-

pose of the course is to indoctrinate the officers with the fact that we are at war and that it is a tough one. Once a week, visiting field officers and other experts lecture to the student group.

Training of the body as well as the mind is important. Accordingly, an officers' physical training course has been instituted. This course lasts 4 weeks and is given for 2 hours each day for 5 days per week. This course is correlated with the training for the obstacle course.

Radar officers also receive training in subjects which are not strictly radar, although they may be undoubtedly a part of such operations. Among these are sanitation, first aid, chemical defense, map reading, demolition, camouflage, and other military subjects.

#### Gasoline and Diesel Maintenance

Much of the equipment studied in the Signal Corps Radar School employs gasoline and Diesel apparatus. Correct operation and successful maintenance of these units is vital in the field. Accordingly, a course in these subjects was started late in October. It is intended for the enlisted men personnel and all graduates are given PFC ratings. The original class started with about 50 men, but present classes total closer to 150. The course is of 4 weeks' duration.

WESTERN SCRTC

Consummating four months of planning, experimentation, and construction, the Western Signal Corps Replacement Training Center at Camp Kohler, California, swung over to full-scale production on January 11 with the inauguration of technical training in the specialist schools. The first group of trainees had already completed four weeks of Basic. The specialist schools provide for complete training on the west coast to prepare men for combat assignments.

Specialist schools planned their openings to correlate with the completion of the post building program and the ultimate change over in the introductory schedule from Basic school to Unit training. The WSCRTC now has the responsibility of producing finished signal men from the ranks of all basics who start their course at Kohler, with the exception of a selected few who are sent to civilian or Signal Corps technical schools.

Since December 14, 1942, Camp Kohler has had the added task of giving communication training to Army Air Forces soldiers who came to this camp at the completion of their own basic training in order to receive the experience they will later need in handling the nerve systems of aerial warfare.

The Training Division has announced the schedule for 14 advanced courses of varying lengths, after the 4 weeks of Basic. The curriculum includes Truck Driver - 6 weeks; Switchboard Operator, Local Battery - 8 weeks; Switchboard Operator, Common Battery - 9 weeks; Radio Operator, Low Speed - 9 weeks; Pole Lineman - 9 weeks; Personnel Clerk - 6 weeks; Stock Control Clerk - 6 weeks; Supply Clerk - 6 weeks; Clerk, Typist - 6 weeks; Message Center Clerk - 8 weeks; Messenger - 8 weeks; Code Clerk - 9 weeks; Cook - 9 weeks, and Non-specialist - 2 weeks.

Most interesting feature of the Non-specialist course is the physical education program, designed to harden the soldier for immediate strenuous action in field duty. Not included among the 14 specialist courses, but unique in its instruction methods, is the Special Training unit which handles the basic schedule for illiterate and non-English speaking trainees. During the 8-week course of this special unit, the soldier not only learns basic military subjects but also acquires a working English vocabulary as well as an elementary grasp of reading and writing.

The first cycle of basic training in companies was completed on January 12th, just three days after the last class of trainees attended the final lecture marking the close of the former Basic School. No lag in a full program of instruction was permitted in spite of the change of organization, the shifting of training aids, and makeshift post facilities.

All eight companies of the 1st and 5th Battalions now have full quotas of troops receiving training within their own units. The total number of basics in camp has dropped, for the moment at least, to permit the influx of soldiers learning specialist jobs.

During December, 71 recent graduates of Fort Monmouth's Officer Candidate School arrived to fill vacancies in the Training Staff. Two new service branches were added to the Training Division to facilitate that organization's correlation of instruction in each unit. The Training Aids Branch produces devices making signal instruction more graphic. The Orientation Lecture Branch, through the medium of lectures and daily news broadcasts, furnishes trainees with a comprehensive picture of the background of the war, developments of the global fighting fronts, and their individual roles as Signal Corps soldiers.



Signal Troops

## VIII

SIGNAL UNITS CONSTITUTED

Effective as of December 16, 1942, the 1st, 2d, 3d and 4th VHF Installation Crews are constituted and will be activated at the Eastern Signal Corps Training Center, Fort Monmouth, New Jersey, by the Commanding General thereof, each with an authorized strength of one officer and fourteen enlisted men. Upon activation, the units are assigned to the Second Service Command and placed under the control of the Chief Signal Officer for training.

The 5th Signal Radio Installation Team (Type B) and the 6th and 7th Radio Installation Teams (Type A) were constituted as of December 18, 1942, and will be activated at Fort Devens, Massachusetts, by the Commanding General, First Service Command. The 5th Signal Radio Installation Team (Type B) will be organized with an authorized strength of three officers and twenty-seven enlisted men. The 6th and 7th Signal Radio Installation Teams (Type A) will be organized with an authorized strength of one officer and eleven enlisted men. Upon activation, the units are assigned to the First Service Command and placed under the control of the Chief Signal Officer for training only.

The 931st Signal Battalion, Air Support Command, is constituted, assigned to the II Air Support Command, and will be activated on January 15, 1943, at the Army Air Base, Esler Field, Louisiana.

SIGNAL UNITS TRANSFERRED

Under date of December 18, 1942, the Commanding General, Desert Training Center, was ordered to issue the necessary instructions to transfer the 2d Armored Signal Battalion from Camp Young, Indio, California, to Fort Ord, California. The Commanding General, Desert Training Center, was authorized to retain temporarily one platoon of the construction company and an additional detachment of not to exceed fifty-nine enlisted men of this battalion at the Desert Training Center. These detachments will be transferred to Fort Ord, California, at such time as will be mutually agreed upon between the Commanding General, Desert Training Center, and the Commanding General, II Armored Corps. This is a permanent change of station. Upon arrival at Fort Ord, California, this unit is relieved from assignment to the Desert Training Center and is assigned to the II Armored Corps.

Fort Ord, California, present station of the units listed below pursuant to orders of Commanding General, II Armored Corps, is announced and confirmed as temporary station of those units.

Company C, 58th Signal Battalion  
Company C, 99th Signal Battalion

These units will not return to Camp Roberts, California, their present permanent station, but will be ordered to a new permanent station to be announced.

NEW DESIGNATIONS

The Signal Corps installations at places indicated are designated as follows:

<u>Designation</u>	<u>Location</u>
Central Signal Corps Training Center	Camp Crowder, Missouri
* Central Signal Corps School	Camp Crowder, Missouri
* Central Signal Corps Replacement Training Center	Camp Crowder, Missouri
* Central Signal Corps Mail Training Center	Camp Crowder, Missouri
Western Signal Corps School (California Agriculture College)	Davis, California
Western Signal Corps Replacement Training Center	Camp Kohler, California
** Southern Signal Corps School	Camp Murphy, Florida
* The installations at Camp Crowder hereby designated as "Central" were formerly designated "Midwestern."	
** Formerly Signal Corps Radar School.	

PHOTOGRAPHIC BRANCH IN THE WEST

The Hollywood Liaison Office, Office of the Chief Signal Officer, is redesignated as the Western Branch, Signal Corps Photographic Center.

Mail intended for this office will be addressed as follows:

Officer in Charge  
Western Branch, Signal Corps Photographic Center  
370 N. Camden Drive  
Beverly Hills, California

Detachment D, 827th Signal Service Company, is redesignated as the 844th Signal Service Company, without change in authorized strength and grades, station or assignment.

PORT PHOTOGRAPHIC LABORATORY

A Signal Corps port photographic laboratory was established at the New Orleans Port of Embarkation, as of January 6, 1943. The laboratory is classified as an installation under the control of the Commanding General, New Orleans Port of Embarkation.

SIGNAL UNITS ACTIVATED

By War Department letter dated January 4, 1943, Company D, 829th Signal Service Battalion, will be activated at the Signal Corps Training Center, Fort Monmouth, New Jersey, by the Commanding General, Second Service Command, on January 10, 1943, with an authorized strength of three officers and eighty-five enlisted men. The unit will be prepared for functional duty and movement at the earliest practicable date. Upon activation and prior to movement the unit is assigned to the Second Service Command and is placed under the control of the Chief Signal Officer for training only.

The Commanding Generals, Second Army and Desert Training Center, will activate at the earliest practicable date in January 1943, the following units of the 196th Signal Photographic Company, in accordance with T/O 11-37, dated April 1, 1942:

<u>Unit</u>	<u>Station</u>
1st Newsreel Asgmt Unit . . . . .	.Fort Benning, Ga.
1st Identification Unit . . . . .	.Fort Benning, Ga.
1st General Asgmt Unit. . . . .	.Camp Young, Calif.
2d General Asgmt Unit . . . . .	.Camp Young, Calif.

The Commanding General, Second Army, will transfer the personnel and equipment of one newsreel assignment unit and one identification unit of the 161st Signal Photographic Company, now at Fort Benning, Georgia, to the newly activated units at Fort Benning.

The Commanding General, Desert Training Center, will transfer the personnel and equipment of general assignment units, G-7 and G-8 of the 161st Signal Photographic Company, now at Camp Young, California, to the newly activated units at Camp Young, California.

Concurrently with the actions taken above, units of the 161st Signal Photographic Company listed therein are inactivated.

TABLES OF EQUIPMENT

The following tables of equipment were forwarded to Distribution Division, Services of Supply, for distribution:

810th Signal Service Battalion  
 5th Signal Radio Installation Team (Type B)  
 6th and 7th Signal Radio Installation Teams (Type A)  
 2d Signal Radio Service Section (Psychological Warfare Unit)

Military Personnel

17

PERSONNEL ON SINGLE CHANNEL RADIO TELETYPE CHANNELS

Lieutenant Colonel R. R. Kilgore, Enlisted Section, represented Military Personnel Branch at a conference held for the purpose of discussing personnel and training on Single Channel Radio Teletype Channels. Others present at the conference included Colonel Parker, Major Bagnall, and Major St. Clair from the Plant Branch; Lt. Col. Rooks and Captain Steele, Military Training Branch; representatives from Signal Security Branch, Army Air Forces, and the Secretary of War's office. Following are the results of the conference:

(1) The Single Channel Radio Teletype equipment will be operated and 1st and 2d echelon maintenance conducted by the Army Air Forces. Installation of the equipment and major maintenance work will be performed by the Signal Corps.

(2) Plant Branch, Office of the Chief Signal Officer, is now working on Tables of Organization for four service companies to include all personnel required for this program. These tentative Tables of Organization are being submitted to War Plans Branch to have the units approved and authority obtained for activation. It is believed that the radio and teletype maintenance personnel can be trained in normal courses given by the Signal Corps schools with additional unit training in the organizations upon activation. A small percentage of personnel in these organizations will need special training on equipment to be employed between the radio transmitter and the teletypewriters.

(3) Plans have been made by Military Training Branch to establish a course with the American Telephone and Telegraph Company for the training of approximately five Signal Corps officers, ten Signal Corps enlisted men, and ten Army Air Force personnel. It is planned that the initial personnel upon completion of their training with the A.T. & T. will be assigned to the four service companies as a training cadre for the remainder of the personnel required.

PERSONNEL TO MAINTAIN RADIO SONDE EQUIPMENT

A conference to discuss personnel and training for radio sonde equipment to be used in the various weather regions throughout the world was held in the office of Major Manson, Directorate of Planning. Also present were Lieutenant Colonel Duffey, Air Corps Liaison Officer on weather equipment with the Signal Corps; Captain Steele, Military Training Branch; Captain Merry, Research and Development Division; and Lt. Colonel R. R. Kilgore, Military Personnel Branch. Primary interest to the Military Personnel Branch is to furnish personnel qualified to perform the higher echelon maintenance required on this equipment. A course of instruction is now being conducted by the Director, Signal Corps Ground Signal Service at the Eatontown Signal Laboratory for the initial personnel required. This class includes 30 Signal Corps enlisted men, 10 Signal Corps civilians, 9 Air Corps enlisted men, 3 Air Force officers.

There are to be 20 weather regions throughout the world, although it has not been definitely ascertained whether or not all of these regions will be manned. Each region will require four repairmen, making a total requirement of 80 enlisted men. In addition to the 30 Signal Corps enlisted men now undergoing instructions, arrangements have been made for the Central Signal Corps School to send 40 enlisted men qualified as radio repairmen, ground equipment, SSN 174, to the Eatontown Signal Laboratory on February 15, 1943. This will make a total of 70 Signal Corps enlisted men who will be qualified to maintain this equipment. Lt. Col. Duffey stated at this meeting that these 70 men would meet all the future requirements for enlisted men to the school at the Signal Corps Laboratory.

#### OFFICER CANDIDATE SCHOOL CAPACITY

Military Personnel Branch, prepared and forwarded a detailed study to Military Personnel Division, Services of Supply, showing the estimated requirements of Signal Corps officers for 1943. A schedule was made on the status of officer procurement through the Officer Candidate School presenting comparison of requirements as previously submitted by SOS, and figures as compiled by Military Personnel Branch. The result of the comparison indicates a need for a procurement of 3,862 officers as of the 3rd quarter, 1943. In view of this fact, Military Personnel Branch has requested that authority be given to maintain the Signal Corps Officer Candidate School at its presently planned capacity of 3,000 Officer Candidates through December 31, 1943.

#### A.T. & T. PERSONNEL FOR THE SIGNAL CORPS

In a conference with Mr. Hughes, Vice President, American Telephone and Telegraph Company, and Mr. Hannaford, Long Lines Division, A.T. & T., Lt. Colonel R. R. Kilgore, Enlisted Section, Military Personnel Branch made arrangements whereby all telephone employees scheduled to be inducted under Selective Service will be reported to the Chief Signal Officer in sufficient time prior to their induction so that their assignment to the Signal Corps may be requested. Both Mr. Hughes and Mr. Hannaford agreed that this was an excellent way to insure that a large portion of the telephone personnel called into the Service will be used for the type of work for which they are best trained. Mr. Hughes agreed to contact all telephone companies in the Bell System by letter requesting that proper information be furnished to the Chief Signal Officer. Mr. Hughes requested that a report be given to him at the end of six months showing the approximate number of telephone employees assigned to the Signal Corps under this plan. This report will be prepared by the Enlisted Section for Mr. Hughes at the proper time.

#### CAMOUFLAGE COURSE AT FORT BELVOIR, VIRGINIA

Military Personnel Branch issued orders on five Signal Corps officers to attend the two weeks Camouflage Course at the Engineer School, Fort Belvoir, Virginia, beginning January 3, 1943. Two officers were from Camp Crowder, two from Fort Monmouth, and one from Camp Kohler.

X

SIGNAL CORPS PROMOTIONS

The following promotions have occurred among Signal Corps personnel during the period from December 18, 1942, to January 21, 1943, inclusive:

Lieutenant Colonel to Colonel (Temporary)

Allsopp, Clinton B.	Ellis, Walter Carroll
Auchincloss, Samuel Sloan	Hayes, William Paul
Bixby, Harold Oakes	Heath, John Montgomery
Bohannon, Robert Critchfield	Maymon, Victor Hugo
	Moore, John Tardy

Promoted to Lieutenant Colonel (Permanent)

Bullock, Frank W.  
Hammond, Elton F.  
Lubbe, Albert J.  
Nelson, Donald H.

Major to Lieutenant Colonel (Temporary)

Atwell, William Fred	Jordan, Harold Russell
Bagnall, Vernon Bernard	Joyce, William Arthur
Baldwin, James Wallace	Kaler, Oscar Anderson
Bean, Richard Barker	Kilgore, Richard Randolph
Borgeson, Carl Anders	Lewis, Meredith Townsend
Brown, Walter Birdsall	Lord, Robert
Brownell, George Thane	Manson, David Desire
Butler, Herbert Harriss	Medford, William Taylor
Chace, Myron D.	Monroe, Harlan Becker
Crapo, Isaac Arthur	Moore, Lucius Lisk
DeMarr, James Donald	Ord, John Allyn
Elmore, Reginald James	Parker, Harry Cone
Evans, James B.	Patche, Clinton John
Fell, Charles Francis	Plumer, Richard Charles
Ferrick, James Hamilton	Presnell, Robert Richard
Fields, Leon	Pumphrey, Fred Homer
Freeland, William Harvie	Purcell, James N.
Gadler, Steve	Schukraft, Robert Earl
Gonseth, Jules Emmable, Jr.	Speir, Wilbert August
Griffin, David Tice	Stephenson, Andrew D.
Gronseth, Ingvald Halvorsen	Stephenson, Gordon
Hauck, George Fred	Sultzzer, Morton
Hodges, Duncan	Swede, Allen Gordon
Hornung, Herbert Karl	Taylor, Herbert C.
Howard, Clifton Meryl	Wheeler, Leonard
	Willey, William Edward

Captain to Major (Temporary)

Allen, Charles LaVerne	Leonard, John Dunbar
Aurell, Verner Christensen	Lerner, Gerald Preston
Bartig, Victor Carl	Lewis, Gomer
Behm, Ludwig Frederick	Loveman, David Bernard, II
Belieu, Kenneth Eugene	Lovering, Stanley Hutchinson
Bickwit, Leonard	Maibaum, Richard Walter
Bowen, Francis Copass	Matthews, Charles William
Bradford, John Pomeroy	McDavid, John Arthur
Brittingham, Louis Ward	McGuire, Brutus Clay
Burrus, Joe Howard, Jr.	McTernan, William R.
Cahill, Frank Edward, Jr.	Mitchell, Thomas Douglas
Callen, Hamilton Harris	Nash, John Marshall
Childs, Allison Franklin	Nestlerode, Howard Ellis, Jr.
Conkling, Wesley Blithe	O'Shea, Michael Vincent
Daily, James Albert	Osmundson, Wayne O.
Davis, Jefferson Clark	Palik, Ted Joseph
Disney, Robert	Patterson, Eugene Roberts
Diuguid, John Hampton	Pope, Ezra Tobey
Downs, Walter Wellman	Price, Harold Graves
Duncan, Donald Robert	Pyle, William Alexander Faries
Dunlap, Clarence Raphael	Quigley, Quentin Samuel
Elser, Fred Johnson	Redburn, Ralph Albert
Ensmann, Bernard	Reeves, Louis Paul
Ernst, John Mack	Richardson, John William
Evans, Neal Thomas	Riley, Albert Segraves
Faust, Carl Willard	Robinson, Vernon Roy
Frame, William Edgar	Sanning, Francis Gerald
Freeman, Grover Cleveland	Scott, Frank Ewell
Friedrich, Victor Louis	Shaw, Ralph Benjamin
Fox, Virgil Flynn	Sheetz, Lawrence Cutright
Gray, Alanson McDowell, Jr.	Shives, Leo Sigel
Green, Hugh Waldo	Shull, Lester Allison
Hammond, Thomas Aaron	Silvernail, William Irving
Hampton, George E.	Smith, Howard H.
Harold, Orville Vincent	Smith, Somers Scull
Hazeltine, Allen Voorhees	Sprankle, Dane Catman
Hoban, Charles Francis, Jr.	Stenger, Edgar Jay
Hogan, Joseph Michael	Thomas, Herbert Cushing
Horney, Daniel James	Thompson, William Frederick
Horning, Edward William	Timmerman, Harold Edgar
Huston, Vincent George	Welden, Clark Denson
Jacobs, Lawrence Pierce	Wilby, Carlton, Jr.
Kettring, Leon Clinton	Wildermuth, John Lebius, Jr.
Knapp, Robert Elery Livingston	Williams, Harold G.
Kohlerman, Frank Louis, Jr.	Williams, Winthrop Walker
Kuehlthau, Wm. Anthony	Winkler, Frank Chester

COMMUNICATIONS IN THE JUNGLE

A restricted booklet entitled, "Fighting on Guadalcanal," has been issued by the Chief of Staff. It is a verbatim report of comments made by commissioned and non-commissioned officers of the Marines and the Army on their experiences in fighting the Japs on Guadalcanal. The comments were made to Lieutenant Colonel Russel P. Reeder, Jr., of the Operations Division of the War Department General Staff, who went to Guadalcanal as personal representative of General Marshall. The entire booklet is well worth reading. For those who do not have access to it, we quote here the references made in it to the problems of communications in the jungle country of Guadalcanal.

It will be noted that some of the comments and recommendations of the individual officers and non-commissioned officers take differing viewpoints on what is the best means of maintaining signal communication in a theater like Guadalcanal. No attempt is made here to reconcile those viewpoints. They are presented "in the raw," just as the veterans of 1942 combat told them to Colonel Reeder.

CORPORAL F. R. MC ALLAN, Company L, Fifth Marines: "Sometimes the information doesn't get down to us and then we are really in the dark. When we get the orders and information, we can get in there and pitch better..."

MAJOR LOU WALT, C.O. 2nd Battalion, Fifth Marines: "... In the attack we always use the telephones from Regiment to the Battalion. The jungle is thick, but the wire can be made to keep up. The wire is supplemented by the TBX radio. If we get held up, the wire goes right out to the companies from the Battalion."

COLONEL AMOR LE R. SIMS, C.O. Seventh Marines, 1st Marine Division: "... Concentrate on communications. We depend to a large extent on wire communications. It is tough work, but it can be done. I have had to loan the Communications Regimental Section men to help carry wire through tough places, but I want communications. Your information has to be timely and properly evaluated..."

LIEUTENANT COLONEL L. B. PULLER, C.O. 1st Battalion, 7th Regiment, U.S. Marines, First Marine Division: "... To HELL with the telephone wire with advancing troops. We can't carry enough wire. We received an order. 'The advance will stop until the wire gets in.' THIS IS BACKWARDS! ..."

PLATOON SERGEANT GEORGE E. AHO, Company F, Fifth Marines: "... Bring back the signal flags; needed badly..."

LIEUTENANT COLONEL N. H. HANNEKAN, C.O. 2nd Battalion, Seventh Marines: "... This idea may sound strange to someone who may read your notes in an office far away, but it is a very practical means of controlling a march on a winding trail in this hot country. Marches here in the tropical jungle, where the air is hot and so steamy that there seems to be no air, takes a



lot out of the men. The weak ones will say, when the march gets tough, 'hold it up!' As a result this will be passed on up to the front and the column will stop when you don't want it to. So, as a result, we use the letter 'H' plus a numeral meaning to halt. The leaders and the point know what numeral we will use, and we change the numeral. For example, we will use 'H2' the first two hours; then 'H7', etc..."

COLONEL MERRITT A. EDSON, Commanding Officer, Fifth Marines: "... In the Raiders we adopted the custom of dropping all rank and titles. We used nicknames for the officers. All ranks use these nicknames for us. We did this because the Nips caught onto the names of the officers and would yell or speak in the night, 'This is Captain Joe Smith talking. A Company withdraw to the next hill.' So we adopted nicknames as code words. Captain Walt became 'Silent Lou.' My nickname was 'Red Mike.' An example of the use of these nicknames as code words is: One night the Japs put down smoke and they yelled 'gas.' We were green at that time and two of our Companies withdrew leaving A Company exposed on its two flanks. In this instance I was a Battalion Commander. Captain Walt called me on the voice radio to inform me of the situation. He was cautious and used the nickname as follows: He said, 'Who is speaking?' and I said, 'Red.' He said, 'What name do you identify with 'Silent?'' I said, 'Lou.' He said, 'That is correct.' So, we both knew that we were talking to each other and were not talking to the enemy. He explained the situation to me. At the end of his conversation, a voice broke in and said in perfect English, 'Our situation here, Colonel Edson, is excellent. Thank you, Sir.' This was the enemy speaking."

CONFERENCE with three 2nd Lieutenants and 5 old NCO's of the 2nd Battalion, Seventh Marines: "... We have developed signals in our Battalion which are not recorded in any text book. I recommend that your troops do the same.... We have two American Indians we use as 'talkers' on the telephone or voice radio when we want to transmit secret or important messages..."

SERGEANT D. L. GOLDEN, Company F, 164th Infantry: "... I have been on 20 patrols in the last 40 days, and in most all of these patrols we went out from 2 to 5 miles. Getting communications back to the gun position is an awful problem. Can you help us?"

## XII

SIGNAL CORPS TECHNICAL COMMITTEEApprovals 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 COMPASS SCR-639-( ): This is an automatic bearing indicating radio compass, operating from 115-volt, AC power supply. It provides aural reception of modulated radio signals, automatic loop orientation, and loop azimuth indication in degrees. This radio compass will cover the frequency range of 100-1750 kilocycles.

PUBLIC ADDRESS SET PA-5-( ): This is a 20-watt combination record player, amplifier, loud speaker and microphone built into one case and designed to operate from 6-volt DC or 115-volt AC. It is intended for use by all arms and services for lectures and demonstrations, to simulate battle noise, to control range firing and for other purposes. For portability, this equipment is suitable for mounting on a standard quartermaster  $\frac{1}{4}$  ton, 4 x 4 truck.

PANEL SET AP-36: This is an identification panel approximately 4 x 5 feet with fluorescent markings. It can be identified on moving vehicles by an observer in an airplane from a height of 1500 feet.

CHEST, FRAME AND ACCESSORY EQUIPMENT TE-110: This consists of suitable chests, frames and accessory equipment readily mountable and demountable on a standard Quartermaster Truck, 2 $\frac{1}{2}$ -ton cargo, without the use of special tools and without drilling holes in the truck. It is intended for use by Signal Company Division, Signal Company Motorized Division, or other organizations having need for field wire construction trucks. It will enable the construction team to transport and make best use of tools, apparatus, wire and other equipment required for rapid construction of field wire lines.

AUTOMATIC WEATHER STATION SCM-17: This equipment is to be installed at isolated points for unattended operation and is to be capable of sending out limited meteorological data as to pressure, temperature and, if possible, humidity. The station is to be semipermanent and battery operated, and is to have a range from 100 to 300 miles. It should operate for one month without attention and should transmit data every three hours.

AUTOMATIC WEATHER STATION SCM-18: This equipment has characteristics similar to Automatic Weather Station SCM-17 described above. It is to be planted by a parachute from the air. This station is to have a range from 35 to 100 miles, a service life of about one week and means for transmitting data every three hours.

AUTOMATIC WEATHER STATION SCM-19: This equipment is to be a semipermanent station capable of sending out complete data including pressure, temperature, humidity, wind velocity, sky condition (sunshine) and, if possible, rainfall, present precipitation, ceiling height and visibility. This station should have a range from 200 to 500 miles and be capable of reliable unattended operation for three months up to twelve months, if possible. Reports should be sent every three or ten hours and provision is desired for transmission in answer to impulse from a remote control device at a receiving station.

RECORDING EQUIPMENT RC-199-( ) (High Fidelity): This will consist of a portable recorder reproducer unit and a portable transcription unit, each of which will be contained in a case provided with lugs for mounting on a table, bench or vehicle. This equipment is intended for field or fixed station and for interceptor organizations for continuously recording and transcribing radio telephone signals, particularly when speeded up, inverted or scrambled. It will also be used for other wide band interceptor units. The recorder-reproducer shall be provided with standard Signal Corps headset and means of input and output monitoring. Both units shall operate from 115-230 volt, 50-60 cycle power sources and shall be operable when tilted 10 degrees from horizontal in any direction.

PANORAMIC ADAPTOR BC-1031: Through the use of this instrument, the attendant is provided with a visual indication on a cathode ray tube screen of radio communication channel activity from 20 to 500 KC on either side of the frequency being monitored. Radio channel activity is indicated by an inverted "V" trace immediately above a reference frequency scale on the face of the cathode ray tube. Panoramic Adaptor BC-1031 is a separate unit which may be used in conjunction with any standard Signal Corps receiver employing a nominal intermediate frequency of 450 KC.

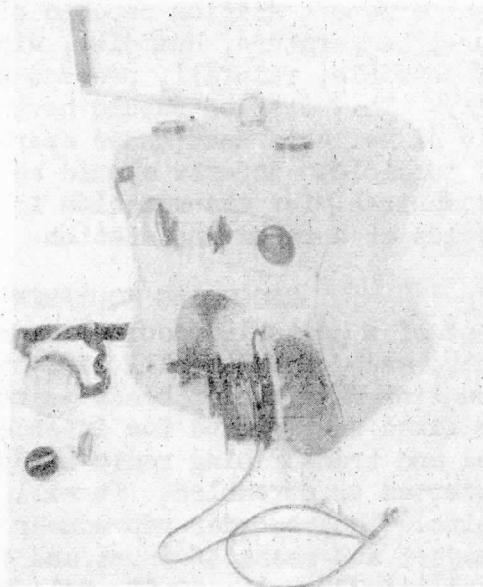
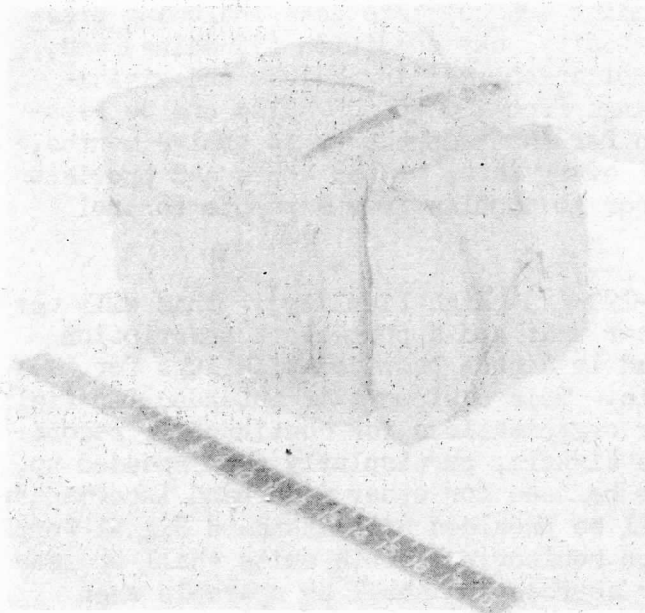
PANORAMIC ADAPTOR BC-1032: This is an instrument similar to Panoramic Adaptor BC-1031 described above, arranged for operation with any superhetrodyne receiver employing an intermediate frequency of 5.25 MC.

b. That the following items described above be classified as Service Test Type:

AUTOMATIC WEATHER STATION SCM-17  
 AUTOMATIC WEATHER STATION SCM-18  
 AUTOMATIC WEATHER STATION SCM-19

c. That Military Characteristics be revised for:

RADIO SET SCR-578: This is a waterproof radio transmitter, powered by an integral hand-driven generator capable of remaining afloat for four hours in sea water. It may be carried in aircraft and dropped by parachute over water without damage. Construction provides for manual and automatic keying of radio transmission but for manual keying only of the signal light transmission. Military characteristics have been revised to allow for a greater weight (35 pounds rather than 25 pounds), made necessary by a shortage of lightweight metals, and to provide an increase of duration of the automatic keying SOS from 15 seconds to 20 seconds.



d. That the following items described above be Standardized:

PUBLIC ADDRESS SET PA-5-( )  
 PANORAMIC ADAPTOR BC-1031  
 PANORAMIC ADAPTOR BC-1032

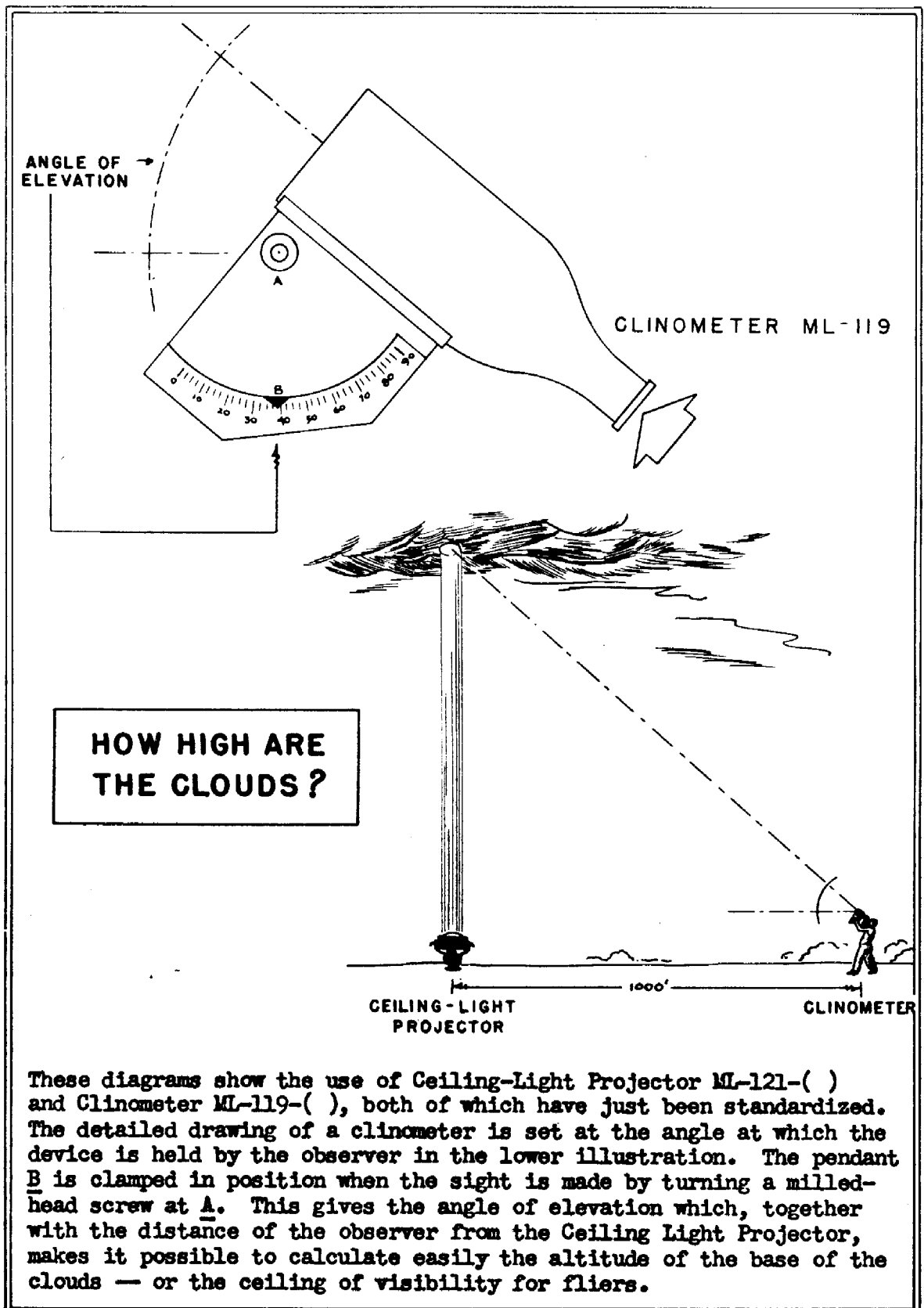
e. That the following items for current supply and now being furnished also be Standardized. This action has been taken to clarify the records.

CLINOMETER ML-119-( ): This is a device used to measure the angular elevation of a spot of light projected on the base of a cloud layer by the Ceiling Light Projector ML-121-( ).

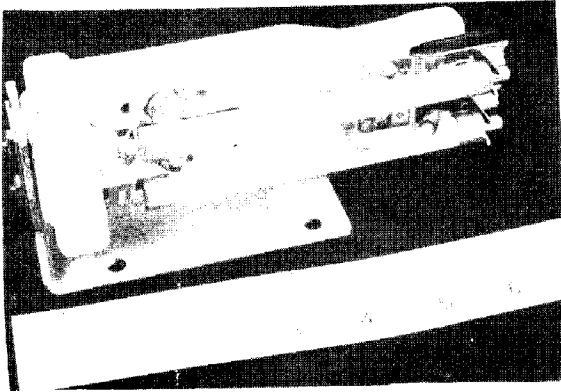
TRIPOD ML-78: A tripod used to support Theodolite ML-47.

INDICATOR ML-117: This device indicates wind direction to 16 points and wind velocity in miles per hour by means of lights and a buzzer. It is housed in a drum shaped receptacle approximately 10" in diameter and 4" deep and is equipped to operate on 110-volt AC or low voltage DC.

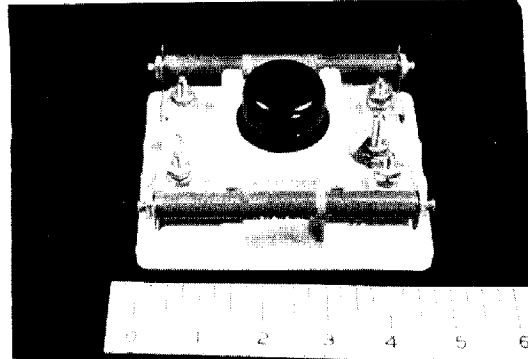
CEILING LIGHT PROJECTOR ML-121-( ): This device, used out of doors at night, projects a beam of light to the base of the cloud layer for the purpose of determining the "ceiling."



PROTECTOR AR-6: This item is for installation in telephone substations for preventing damage by lightning or abnormal currents. It consists of two tubular fuses, a lightning arrester and porcelain mounting.



PROTECTOR AR-6 (Cook)



PROTECTOR AR-6 (Western Electric)

WIND VANE ML-73: An 8-inch, portable, trench type, spread tail pattern wind vane. It consists of the vane, wind direction arms with indicating letters and a sectional rod support.

TERMINAL BLOCK TM-70: A three-connection terminal block consisting of bakelite base 6 inches long by 1 inch wide by 1 inch thick on which are mounted 3 wing-nut binding posts 2 inches apart.

FRAME PH-9: A 5" x 7" frame used for photographic printing.

f. That the following items be removed from the Parts List of equipment and authorized for separate issue:

MAINTENANCE EQUIPMENT ME-11: Deleted from parts list of Telephone Central Office Set TC-4.

MAINTENANCE EQUIPMENT ME-30: Deleted from parts list of Telephone Central Office Set TC-12.

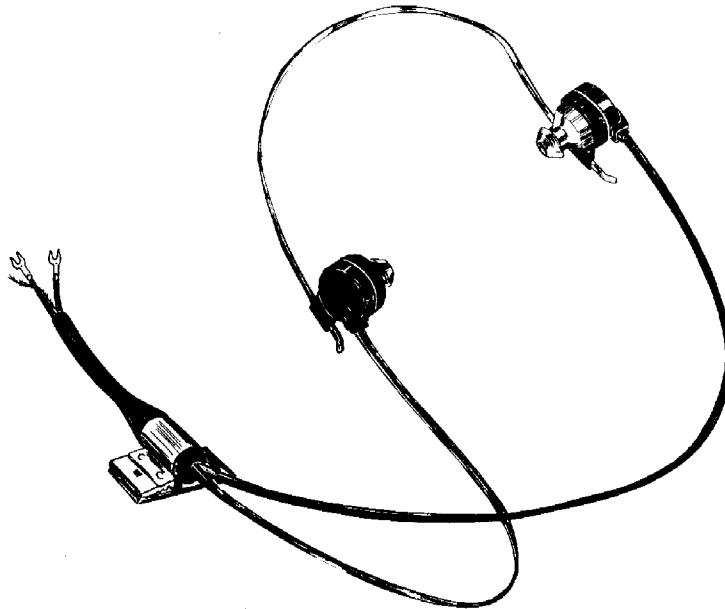
g. That the following items be reclassified from Standard to Limited Standard:

POWER UNIT PE-52-( ): 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-A: This is a low impedance telephone consisting of a chest unit, cushioned receivers, head band and other necessary

equipment. This item is reclassified for the same reason stated above in regard to Head and Chest Set HS-17.

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 item will be replaced by Headset HS-30 with Chest Sets TD-1, TD-2 or TD-3.



HEADSET HS-30

h. That the following item be reclassified from Standard to Obsolete:

PANELS AL-119 and AL-120: These are Infantry marking panels of cotton fabric, one and one-half feet square. One is white and the other is black, the color being chosen for contrast with the background. A more satisfactory panel has been developed and is now available for such signaling purposes.

i. 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: A high impedance headset for outdoor use, worn with a hat or old type steel helmet.

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

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

HEADSET HS-22-( ): This consists of 2 receivers each equipped with a special cap and a cushion which are attached to a strap to fit over the wearer's head.

HEADSET P-23: A high impedance set for use in cabin type planes.

j. That the following head and chest sets be reclassified as Limited Standard as they will be replaced by Headset HS-30 with Chest Sets TD-1, TD-2, or TD-3:

HEAD AND CHEST SET HS-19: A low impedance set with push-button output for Field Artillery units.

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

k. That the following item be reclassified from Limited Standard to Obsolete:

RADIO SETS SCR-132 and SCR-132-A: These radio sets are for ground use in receiving and transmitting and provides communication by phone MCW and CW. There is no further requirement for the equipment.

l. That the following items be classified as Obsolete:

TELEPHONE EE-66: A local battery portable instrument for use on the ground at the winch of a captive balloon. It was formerly designated "Balloon Winch Telephone." This equipment provides telephone communication between the ground and a balloon when used in conjunction with Telephone EE-67. There is no further requirement for this item.

TELEPHONE EE-67: A local battery portable instrument for use in a balloon, formerly designated "Balloon Basket Telephone." There is no further requirement for this item.

#### Further Recommendations by SCTC to SOS

2. The Signal Corps Technical Committee has recently made recommendations to the Commanding General, Services of Supply, as indicated below:



a. That Military Characteristics be adopted for:

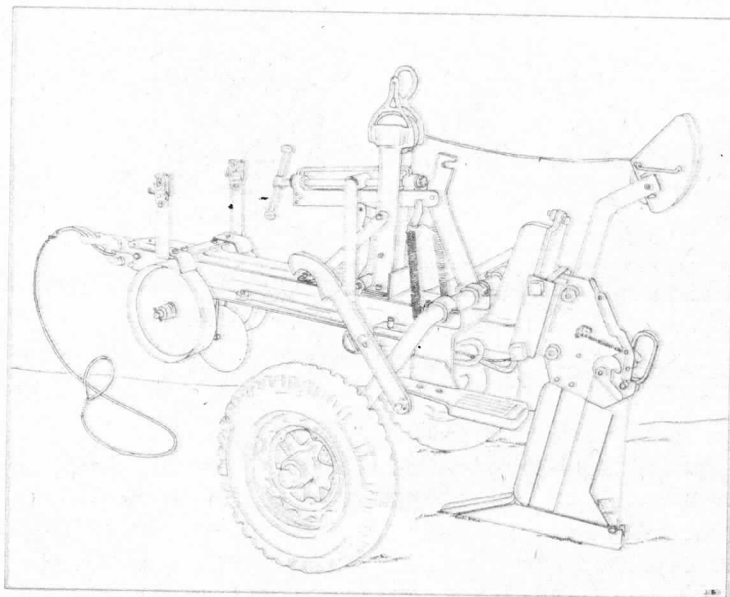
RADIO EQUIPMENT RC-208-( ): This equipment consists of two electromagnetic relays and two matching transformers with appropriate connecting cords. It is designed to provide for automatic two-way retransmission through two standard radio sets of the 500, 600, 700 and 800 series. This equipment may also be used to provide one-way transmission through a set of the above series and any other having a transmitter arranged for push-to-talk operation, such as Radio Sets SCR-177, SCR-188, SCR-193, SCR-245, SCR-299, SCR-510 and SCR-610. Universal retransmission equipment is also to be developed under these military characteristics. It is anticipated that this latter equipment will provide two-way automatic transmission using any radio set operating on a frequency between 2 and 50 megacycles either FM or AM and that it will probably take the form of a special radio receiver including necessary relays and cords.

COIL C-334: This is a rubber incased loading coil of 44 millihenry inductance for use on field wire lines. The purpose of this equipment is to provide a loading coil of the proper mechanical and electric characteristics to effect improvement in the transmission efficiency by adding lumped inductance. This coil is intended to replace Coil C-114, the principal difference being that Coil C-114 has an 88 millihenry inductance.

b. That the following item be Standardized:

COIL C-334: As above described.

FLOW LC-61 (Cable): A plow which can be pulled by a 2½-ton, 6 x 6 truck, a tractor or winch line; capable of burying either cable or



insulated wire in one operation. Burying is to be done either directly from reels or after facilities are in service on the ground surface. Used with but not part of 2½-ton truck, or a tractor. The Bell Telephone Laboratories, Inc., was awarded a development contract for a cable plow which would meet the requirements of the Signal Corps. Plow LC-61 (Cable) was developed, based upon the design of the Kellefer "Mole-Drainer."

CABLE PLOW LC-61

MAKING THE BEST USE OF OUR EQUIPMENT

Studies have been going on in Equipment Coordination Branch to determine what equipment, if any, should be pooled and made available upon requisition rather than be carried with an organization wherever it goes in combat. The materiel under consideration is highly specialized equipment, used to do a particular job rather than the ordinary routine duties of the organization. If this plan proves feasible, it will result in cutting down the procurement program considerably and will make more units of this type of equipment available where needed. It will also relieve units of the responsibility for the property except when they are using it. It will cut down shipping tonnage and stocking of maintenance parts. The field will be notified when and if such a plan is contemplated to go into effect.

Considerable study has been made on Tables of Basic Allowance for Signal Corps units with a view of recommending a substantial reduction of equipment and transportation, particularly of special type vehicles. It is also proposed to recommend that certain items which now appear in tables and are only required for use periodically be deleted from the tables and be made available for use when required at Signal depots.

Studies are being continually carried on to effect a consolidation of types where possible. This will cut down the number of types and reduce the maintenance parts necessary to service equipment.

Work is progressing in the reclassification of Signal Corps equipment which is obsolete or no longer required, but is still carried in the Signal Corps catalog.

Items Requiring Excessive Maintenance

A proposal is being made to the Commanding General, Services of Supply, Commanding General, Army Air Forces, and the Commanding General, Army Ground Forces, that cards be sent to all units no matter where serving so that simply by checking entries on these cards, items that require excessive maintenance or excessive replacement of parts can be called to the attention of this Branch. Action can then be implemented either to change the design of the equipment or to increase the flow of the parts where necessary to the end that maintenance factors on component parts will be expedited in their supply to the using arms.

Observers' Reports

Reports of observers on maneuvers and in theaters of operation are routed to the Equipment Coordination Branch. All items reported on are submitted to the appropriate agency for corrective action. A consolidation of the reports is periodically made to indicate what corrective action is necessary on equipment troubles encountered in different climatic conditions and on different types of units.

Certain German and Italian signal equipment captured in the Libyan campaign and forwarded from the Middle East Headquarters in Cairo, Egypt, has been examined and reported on.

Manuever reports on the use of Spiral-Four Cable by the 2nd and 3rd Armies were received, and the various points brought out in the reports investigated.

#### Display of Equipment

A display of United States and British signal equipment is being set up by Equipment Coordination Branch in the Pentagon Building, Washington, D. C. Files showing comparative characteristics will be available. The object of this display is to aid in effecting standardization among the United Nations.

#### Sound Powered Telephones

Sound powered telephones of the EE-108 type (similar to TP-3T-1) were submitted to the Mountain and Winter Warfare Center at Camp Carson, Colorado, for testing. A request was made that the investigation of sound powered telephones be enlarged to include their performance under tropic and sub-tropic temperatures.

#### Cable Flow LC-61

Authority has been secured to purchase 20 of the newly developed cable plows to fill immediate needs of task forces. Standardization of Flow LC-61 has been recommended by the SCTC. (See page 31.)

#### Camouflage for Copper Wire

Samples of copper line wire, treated with a sulfide or oxide coating to eliminate the "shine" on new copper wire, have been examined by Equipment Coordination Branch and Ground Signal Equipment Branch. The purpose of such treatment is to render aerial copper circuits less conspicuous to the enemy. It was ascertained that the facilities available are far below the requirement for treating all copper wire used for military purposes. For the present, its use would probably be confined to bare copper antenna wires.

#### Universal Line Pole

Signal Corps Board Case No. 515, subject: "Universal Line Pole," has been initiated. The Universal Line Pole is a device used to connect to any two wires in a lead without climbing the pole.

#### Service Test of 2-Wire Telephone Repeater EE-89-T3

Repeater EE-89-T3 is a simple, dry cell operated, 21-type repeater, suitable for operation in the middle of a 20-mile field wire line. A maximum of 2 repeaters may be used in a line, located one-quarter of the distance from each end. The repeater utilizes the inherent balance between the line

sections rather than balance between the line and network, as in the case of a 22-type repeater. Service tests are being conducted under different climatic conditions in order to obtain a background on the conditions under which the repeater will prove most useful. The repeater is to be classified as "substitute standard," and procurement initiated in order to fill urgent needs.



TELEPHONE REPEATER EE-89-T3

Repeater Set TC-18 (Terminal) and TC-19 (Intermediate)

Repeater Sets TC-18 (terminal) and TC-19 (intermediate) are being considered for standardization. These repeaters are for the transmission of manual telegraph or teletypewriter signals on field wire or open wire lines. By their use, the range of transmission over wet field wire can be increased from about 30 miles to 50 miles with the terminal repeaters TC-18 only, and if the intermediate repeater TC-19 is used in the middle of the line, the range will be increased to about 80 miles. Both repeaters will operate on the same power supply as the associated teletypewriter equipment. The repeater is capable of operating on 12-volt storage batteries or dry cells if it is desired to leave it unattended. The main use of these repeaters will be in providing a single long distance communication circuit on field wire in the shortest possible time. A circuit of this kind may also find applications as a possible alternate or stand-by circuit for Spiral-Four cable.

Teletypewriters with Weather Keyboards

Teletypewriter Sets EE-102, EE-103, and TC-16 are being considered for standardization. This equipment is identical with the corresponding items designated as Teletypewriter Sets EE-98-A, EE-97-A and TC-16, except that weather keyboards are provided instead of communication keyboards. The weather keyboard was designed for the transmission of weather data in as compact a form as possible. Such keyboards, however, are usable for general traffic, since the lower case characters are identical with those of the communication keyboard machines and only a few punctuation marks are lost in the upper case. Accordingly, the Signal Corps Teletypewriters with weather keyboards have been arranged to contain the same remotely controlled "stop" feature as communication keyboard machines, in order that the machines may be used interchangeably in the field if necessary. It is hoped to gradually extend the use of weather keyboard machines until eventually only a single type may be used.

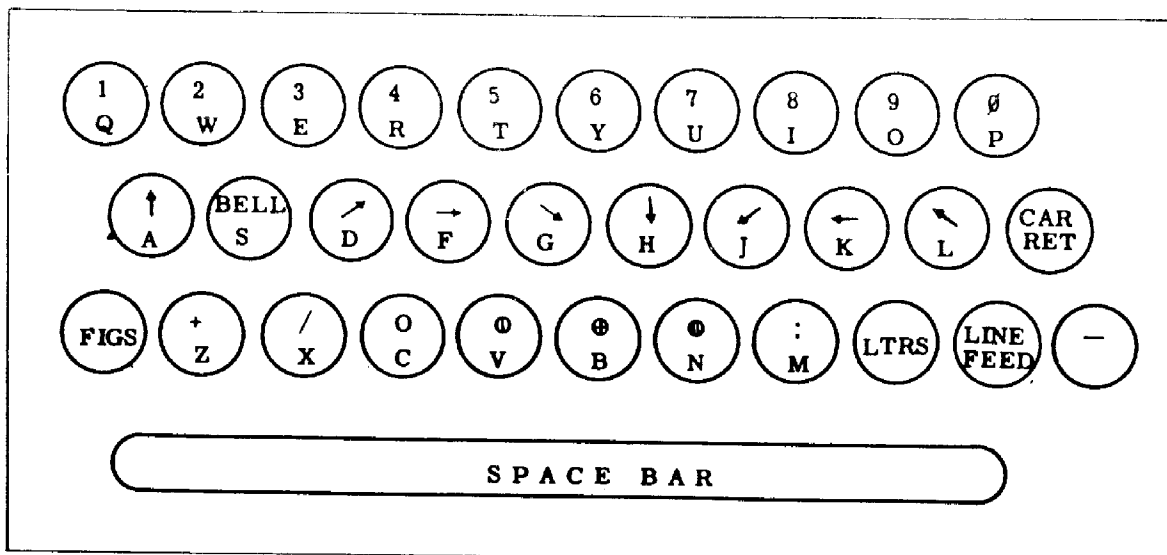
Alarm MC-420 (Cease Firing)

The Alarm MC-420 (Cease Firing) is a commercial motor compressor unit capable of operation on 115 volt, 60 cycle A. C. power supply. The device was tested by the Antiaircraft Artillery Board for use as a warning device when it is desired to cease firing immediately. It was determined that the device was considered satisfactory and that the Signal Corps should secure a sufficient quantity to provide one per Antiaircraft Artillery range, to become a part of the permanent facilities for Antiaircraft ranges.

Viewer PH-419 (16 mm)

A recommendation has been submitted to the Signal Corps Technical Committee for standardization of Viewer PH-419 (16 mm). This is a 16-mm film viewer which can be used with Film Repair Equipment PH-206 or Rewinder PH-416 (16 mm). A definite need exists for such equipment to edit and repair 16 mm film and it will be issued to film libraries.

SPECIAL WEATHER KEYBOARD FOR THE  
TELETYPEWRITER



LEGEND:

- Less than 1/10 of sky covered by clouds.
- ⊙ Scattered clouds, up to 5/10 sky covered.
- ⊕ Overcast, sky completely covered by clouds.
- ⊖ Broken clouds, 5/10 to complete overcast.
- + Thick or dense as applied to clouds.  
Heavy as applied to fog, rain, or snow.
- Thin as applied to clouds.  
Light as applied to fog, rain, or snow.
- / Over 9,751 feet as applied to clouds.  
Also used to separate groups of figures.

## XIV

ARMY COMMUNICATIONS BOARD

The Army Communications and Equipment Coordination Agency, whose functions were referred to in the last issue of the SCTIL, has been reconstituted under the name of the Army Communications Board as a supporting agency of the Chief of Staff. Major General Dawson Olmstead, as Chief Signal Officer, is ex officio the President of the Board and has been authorized to appoint an Executive and prescribe his duties.

The duty of the Army Communications Board, as set forth in War Department Circular No. 23, issued January 18, 1942, will be "to take such action as may be necessary to coordinate, for the Army as a whole, communication methods, procedures, operations, equipment (including the recommendations for the coordination of research, development, procurement, and allocation to meet operational needs), and all communication matters applicable to the United States Army. It will formulate directive recommendations on Army communication policies which will be forwarded to the Chief of Staff through the Assistant Chief of Staff, G-4, War Department General Staff."

The announcement further stated that the Board was to consist of not more than five members from each of the three major commands, to be appointed by the Chief of Staff upon recommendation of the Commanding Generals, AGF, AAF, and SOS. Full-time liaison officers may be ordered to duty with the Board by the Navy, the Marine Corps and approved friendly nations, after concurrence in each instance by the Chief of Staff, United States Army.

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:

SIGNAL CORPS BOARD CASE No. 503, Part A

Cable Plow

The Signal Corps Board was directed to investigate the use of a cable plow for burying Cable Assembly CC-358. The Board concluded that military need exists for a plow to bury important cable facilities for maximum protection against hostile observations, traffic hazards, etc., and that the Killefer Plow, designated as Plow LC-61-( ) (Cable), should be adopted after slight modifications without further service tests.

A recommendation by the Signal Corps Technical Committee on standardization of this item is listed on page 31 of this issue.

SIGNAL CORPS BOARD CASE No. 507 (Preliminary Report)

Investigation of Fault Location Equipment

The Signal Corps Board was directed to determine if a need exists for fault location equipment and to determine apparatus and methods, necessary charts and records to be made.

The present decade Wheatstone bridge, Test Set I-49, does not have facilities, nor can it be easily adapted, for locating open circuits in cable or wire. The need for an open circuit location method is accentuated by the tendency to bury wire and cable, if conditions permit, where it would otherwise remain exposed. Preferences have been indicated for portable voltohmmeters in place of or as supplementary to other equipment available, such as Test Set EE-65, on the grounds that results of sufficient accuracy for Signal Corps use could be obtained with considerably less skilled personnel.

Consequently, an investigation was made to determine what types of fault location equipment would be most suitable for field use to obtain quick and satisfactory results in fault location. The following equipment has been considered in this study:

Capacity Bridge, Type 1A - Western Union Telegraph Company  
 Exploring Apparatus - Western Union Telegraph Company  
 Fault Locating Test Set D162599 - Bell Telephone Laboratories, Inc.  
 Exploring Apparatus - Bell Telephone Laboratories, Inc.  
 Compass and Battery for use in locating short circuits  
 Voltohmmeter KS8455 - Western Electric Company  
 Test Set I-48 (Megger)  
 Test Set 1017-E with Exploring Coil - Western Electric Company



Test Set EE-65  
 Test Set I-118  
 Westinghouse Model PM-32 Test Unit  
 Weston Model 564 Voltohmmeter

This preliminary report covers only an investigation of the various instruments available at the present time. Specific recommendations as to types of equipment to be adopted, with what types of wire or cable to be used, basis of issue, displacement of present equipment, methods of test, etc., will be included in the final report which has not yet been submitted by the Board to the Office of the Chief Signal Officer.

The Signal Corps Board concluded that:

a. Location of faults in line facilities used by the Signal Corps can best be accomplished by means of:

(1) Fault Locating Test Set DL62599 as submitted by Bell Telephone Laboratories, Inc., after modification.

(2) Western Electric Company Voltohmmeter KS8455, after modification.

Pending determination of the basis of issue which is to be included in the final report, it was recommended that:

a. The Signal Corps Ground Signal Service be directed to modify one of the existing Fault Locating Test Sets DL62599, as follows:

(1) Improve the weather seal of the box and cover.

(2) Make arrangements for the use of two BA-59 Batteries.

(3) Provide means for connecting a telephone and two pairs of wires simultaneously to the instrument with a means provided for testing either line with the instrument or for signaling on either line with the telephone.

(4) Minor changes in scale arrangement of the sizes of the window over the dial.

b. The Signal Corps Ground Signal Service be directed to prepare specifications for the Fault Locating Test Set DL62599 as submitted by Bell Telephone Laboratories, Inc., after modification.

c. The Signal Corps Ground Signal Service determine the possibility of incorporating the following modifications in Western Electric Company Voltohmmeter KS8455:

(1) Redesign to utilize a 45-volt standard Signal Corps battery.

(2) Modify the circuit so that the resistance sensitivity button divides the ohm scale by 100 instead of by 10.

(3) Change the 100-volt scale to read 200 volts and provide a button to be associated with this scale in such a way that the scale readings will be divided by 4, providing a 0 to 50 volt scale.

(4) Other minor changes in marking of the panel and redesigning the case.

SIGNAL CORPS BOARD CASE NO. 481, Revised

Mobile Telephone Central Offices for Divisions

The Signal Corps Board was directed to prepare plans relative to the construction and operation of mobile telephone central offices. These plans were to include the installation of Telegraph Central Office Set TC-3, Telephone Central Office Set TC-4 and Telephone Central Office Set TC-12, in both 1½-ton standard trucks and provide for their operation both in daytime and under blackout conditions.

In order to fill an existing need, all Division Signal Companies have improvised mobile telephone central offices by permanently installing Switchboard BD-14 and associated equipment in cargo trucks. These installations require a great deal of thought and effort, lack uniformity, and in some cases are unsatisfactory.

At present, the following telephone central office sets are suitable for installation in standard 1½-ton or 2½-ton cargo trucks:

Telephone Central Office Set TC-4 (or Switchboard BD-14); one or two Telephone Central Office Sets TC-12. Telephone Central Office Set TC-4 was standardized for use by both Ground Forces and Air Forces units. The Telephone Central Office Set TC-12 has since been adopted for use by the Army Air Forces, to replace the TC-4 now issued.

A plan submitted by the Board has been approved by the Chief Signal Officer and is now in the process of being prepared prior to publication.

SIGNAL CORPS BOARD CASE NO. 511, Part A

Splicing Methods for Field Wire and Field Cable

The Signal Corps Board was to review, and if necessary, test the expedient splice proposed by the Midwestern Signal Corps School and to coordinate this study with the Eastern Signal Corps School.

There will be many instances, when cable is rendered unserviceable at field locations, where it will be impossible to affect a vulcanized splice and immediate repairs must be made to place the circuits effected back in service with a minimum of delay. It is possible to make temporary repairs to the damaged conductors in the field and render the cable again reasonably waterproof without the use of electric vulcanizing equipment. This may be accomplished with the materials and tools carried by any field line-man.

The following three methods of splicing Cable WC-534 and Cable WC-535 were examined in this case:

a. Method outlined in Training Pamphlet entitled, "Installation and Maintenance of Cable Assemblies CC-345 and CC-355-A," published by

authority of the Chief Signal Officer, dated January 30, 1942. (Splice is known as "Standard Expedient Splice")

b. Lesson Plans No. 30, Supplement I, of the Midwestern Signal Corps School, Enlisted Men's Department. (Splice is known as "Midwestern Expedient Splice")

c. Lesson Plans of the Eastern Signal Corps School. (Splice is known as "Modified Standard Expedient Splice")

Tests were conducted at the Eastern Signal Corps School at Fort Monmouth, in which the three splices mentioned above were tested against time. A brief resume of these tests is as follows:

#### 5 Pair Cable WC-345

OPERATION	Time in Minutes and Seconds		
	Midwestern Expedient Splice	Standard Expedient Splice	Modified Standard Expedient Splice
Remove jacket from both ends.	3:30	3:55	3:30
Remove insulation from conductors.	6:00	5:57	4:50
Continuity restored.	17:05	17:10	12:05
Ends trimmed on all pairs.	19:20	This step was unnecessary. Ends were trimmed when wires twisted & continuity restored.	
Wires taped on all pairs.	22:40	20:27	16:10
Tied square knot, twisted the splice	24:50	22:05	18:30
Applied 2 layers of rubber tape and 2 layers of friction tape	31:45	27:50	23:20

#### 10 Pair Cable WC-535

Remove jacket from both ends.	5:45	3:29	6:45
Remove insulation from conductors.	10:40	5:32	7:30
Continuity restored.	42:20	24:02	30:55
Ends trimmed on all pairs.	55:25	This step was unnecessary. Ends were trimmed when wires twisted & continuity restored.	
Wires taped on all pairs.	62:00	31:27	38:45
Tied square knot, twisted the splice	64:10	32:57	41:01
Applied 2 layers of rubber tape and 2 layers of friction tape	69:15*	38:02	46:08*

\* Estimated

It was recommended that:

a. The Modified Standard Expedient Splice as practiced by the Eastern Signal Corps School be adopted as the approved method of making temporary field splices.

b. The Pamphlet entitled, "Installation and Maintenance of Cable Assemblies CC-345 and CC-355-A," be reviewed and revised in its entirety.

c. The revised Training Pamphlet be issued as a Training Circular and given wide circulation, in order that a uniform method of making expedient splices in Cable WC-534 and WC-535 can be placed in force.

d. The Signal Corps Ground Signal Service be directed to specify or design suitable insulating sleeves for the protection of bronze sleeves when making expedient and permanent splices.

SIGNAL CORPS BOARD CASE NO. 494

Fluorescent Plastic Materials for Blackout Use

The Signal Corps Board was directed to investigate and study the possibilities of the use of fluorescent plastic materials for blackout use.

Reference is made to Signal Corps Technical Information Letter No. 14, January, 1943, for information on Signal Corps Board Case No. 469 (Black Light Hand Lamps). In this case the Board recommended that no further consideration be given at the present time to the employment of fluorescent materials and black light hand lamps in the Signal Corps.

Due to the similarity of these cases, no further information is submitted herewith on Case No. 494.

The following items are reproduced from "Tactical and Technical Trends," prepared by the Military Intelligence Service, War Department, by specific authority of the Assistant Chief of Staff, G-2.

GERMAN ARMY SIGNAL REGIMENT

There is evidence of the existence of a German signal regiment organized as follows:

1 Battalion	1 Company	Radio company
	2 Company	Armored signal company
	3 Company	Intercept company
2 Battalion	4 Company	Wire-laying company
	5 Company	Telephone operating company
	6 Company	Telephone operating company

While it is doubtful whether the intercept company was ever activated, it reportedly consisted of three platoons, whose respective functions were radio intelligence, intercept, and direction finding. The strength of the regiment is 45 officers and 1,674 enlisted men.

GERMAN AUTOMATIC METEOROLOGICAL TRANSMITTER

This meteorological transmitter was found to be located in the open on land, and serves a purpose similar to the larger, floating meteorological stations known to be used by the enemy.

The full equipment comprises a complete low-power, short-wave transmitter, automatically operated by meteorological instruments, to record the temperature and pressure in the locality in which it is stationed. The times and periods of transmission are set on a master clock.

The transmitter is a Lorenz crystal-controlled, four-tube transmitter made in 1940, operating over two wave bands: 17.5 to 6.6 and 6.6 to 5.6 megacycles per second. The tubes are master oscillator, frequency-doubler, and two 15-watt output tubes, in what appears to be a push-pull circuit. Continuous wave or interrupted continuous wave can be transmitted when the transmitter is switched on by the clock mechanism. This transmitter is obviously a factory production and is well mounted in a tubular frame, but the whole is encased in a weatherproof container of doubtful efficiency and "workshop" finish. The clock unit was also in this container, but was sealed in its case with a waxed-wood cover and a waterproof packing.

The meteorological controlling unit is a Morse-sending device, the signals sent being altered by the positions of three contactors, and the contactors being moved by the meteorological instruments. In addition, a

further contactor is hand-set, presumably to pick out the recognition signal of the meteorological station. The operating meteorological devices consist of a curved bi-metallic strip for registering the temperature, and two barometers, one with twin capsules (coarse reading), and the second with four barometric capsules (fine reading). It is necessary to provide two barometric devices in order that the full reading may be obtained. It is thought that the first instrument will transmit a signal indicating the nearest millimeter, and the second will provide the decimal part of the local pressure reading. The contactors, operated by a geared-up rack-and-pinion movement, are in the form of 10-finger stars with sharpened points, arranged around the circumference of a circle. The result of a change of temperature or pressure is to alter the position of these points relative to the axis of this circle. The rotor, or contact arm on which these contactors operate, consists of a sector-shaped piece, the circumference of which moves around the circle inscribed by the contactors. The sequence is that the sector first makes contact with the identification signal, then with the coarse barometer, the fine barometer, and finally, the thermometer contactor.

It should be understood that, according to the setting of the contactors, a different signal is picked up by the projecting fingers. Anyone receiving this signal can ascertain the position of the contactor, and hence the temperature or pressure at the moment of transmission, if the key of the coding on the rotor arm is available.

The clock is an elaborate mechanism for performing the simple task of making contact between two leads for the periods of transmission. It consists of an electrically wound clock which registers the time by means of a rotating disk, engraved with the 24 hours. The switch operating devices are secured by means of two thumbscrews around the periphery of this disk. The two leads, "shorted" by the clock, switch on the transmitter and meteorological unit. There are two batteries in the set: one a 24-volt, 69-ampere hour, low-voltage unit, contained in a weather proof metal case, 3 feet 6 inches by 1 foot square; the other, a high-voltage battery consisting of four 90-volt cells connected in series. The latter was of similar type and construction but of 11-ampere hour capacity.

#### ITALIAN TANK SIGNALS

The following report gives some Italian tank signals used by Italian forces operating in the North African theater:

- (a) A triangular white (wooden) signal;

Shown repeatedly, means, "Pay Attention."

Shown continuously, "Go on or Stop" according to whether the signal is made at the halt or on the move.

- (b) A triangular white signal above a triangular red signal;

Shown repeatedly, "Increase distance and space between tanks."  
Moved sideways intermittently, "Form line."  
Moved sideways continuously, "Form wedge."

- (c) A triangular red signal above a triangular white signal;

Shown repeatedly, "Reduce distances and spaces between tanks."  
Moved back to front intermittently, "Form columns."  
Moved back to front continuously, "Form half platoons in line abreast."

- (d) A triangular red signal;

Shown continuously, "I am in trouble," "I cannot carry out my task."

All of these signals, except the last, which is made only by the tank that is in difficulty, are made by the unit commander; and individual tanks repeat the signals to show that they have been understood.

CONSERVING SCARCE EQUIPMENT

Signal officers, with rare exceptions, are fully aware of the scarcity and the value, both monetary and strategic, of the radio and wire equipment which is entrusted to them. Production of communication equipment for civilian use has been greatly curtailed in order to make it available for the Army. Certainly, then, it is imperative for the Army to make the most efficient possible use of the equipment under its jurisdiction. Overseas forces must never be required to go into action without sufficient communication equipment, because similar equipment has been unnecessarily tied up in a domestic installation.

The following instance of poor planning in the utilization of communication equipment is cited from the January 1943 issue of the Information Circular issued by the Office of the Inspector General, War Department, Washington, D. C.:

"1. Inspectors general have frequently reported that the most efficient use was not being made of certain valuable and scarce equipment, and that in some cases it was standing idle. Inspectors general can help solve the problem of full utilization of this equipment by reporting instances where full service is not being obtained from it and recommending its transfer to organizations or installations where such equipment will fill a vital need.

"2. An example of the aforementioned condition, as noted in an action-letter, is as follows:

a. The radio station near the south boundary \*\*\* is now receiving and sending a total of approximately 500 messages per month. The restricted, confidential and secret information is handled by teletype, which is located in the same building. \*\*\* If the teletype were located in the camp headquarters building, it would be more convenient and all communications could be transmitted by teletype.

(1) If the radio station were dismantled, the items listed below would be available for use at other places where a need exists:

- (a) 2 each, Hammarlund, super pro receivers, SCR-210-2X.
- (b) 1 each, radio transmitter, 3SOW (BC-365-13, Federal Telephone Company).
- (c) Radio Aerials.
- (d) 1 each, tool equipment, TE-6.
- (e) 1 each, frequency meter, SCR-211-C.

"The inspector general recommended that the teletype be moved to camp headquarters and that the radio station be dismantled and shipped to a point where this valuable equipment was genuinely needed. The above recommendation was approved."



Plant Branch, Office of the Chief Signal Officer, has been actively engaged in rearranging communication facilities so that only the essential minimum of equipment will be tied up in the zone of the interior. If all post commanders and signal officers will cooperate fully in carrying out this program and exercise initiative in releasing non-essential equipment, it will not be necessary for such reports as that cited above to be made by The Inspector General.

#### CHIEF ENGINEER'S OFFICE ESTABLISHED

Effective January 1, 1943, there was placed in operation within the Office of the Director, Army Communications Division, the Office of Chief Engineer.

The Chief Engineer is Colonel William C. Henry. Office of Chief Engineer will consist of the following sections: Executive, Radio Engineer, Telephone Engineer, and Traffic and Security Engineer.

This office will assist in determining the overall engineering policies and coordinating and directing the activities of the operating branches of the Division; for the purpose of maintaining records of the status of material under procurement and the status of construction projects in process of completion; for liaison with other arms and services and with War Plans Branch; for projecting service requirements and formulating plans for facilities which may be required in theaters of action; for inspection in the field and for such other special assignments in handling the details of administrative and supervisory control as the Director may assign.

#### PLANT BRANCH MOVES TO PHILADELPHIA

The Plant Branch will operate under the name of Plant Engineering Agency beginning Monday, February 1, 1943, and will be located at the Reburn Building, 32nd & Allegheny Streets, Philadelphia, Pennsylvania. Direct telephone communication facilities will be available with Plant Engineering Agency. The Plant Engineering Agency also can be reached through the Philadelphia Signal Depot.

Official Circulars

## XVIII

CURRENT DIGEST

This section is designed to help you keep up to date with announcements carried in official War Department circulars which apply specifically to the work of Signal Corps officers. The following are summaries and pertinent extracts from recently issued circulars.

Classification as Combat Troops

The Signal battalion, corps or army, and the Signal radio intelligence company, are specifically listed as combat troop units. Also classified as combat are complete divisions and the headquarters and headquarters troops of Corps and higher units, including all bases and defense commands and air forces. In general, the combat classification applies to: (1) All units the functional training and arms of which are designed for direct combat with the enemy; (2) All armed units in support of combat troops the primary function of which requires close contact with the enemy; (3) All Army Air Forces units the primary function of which requires operation over enemy-held territory. Service troops are all units the functional training of which emphasizes service activities rather than combat. The full explanation of this classification appears in War Department Circular No. 422, December 22, 1942.

Message, signal, and distribution centers defined

1. The term "message center," as defined in paragraph 13a, FM 24-5, will be used to designate only the agency of the commanding officer of each unit or establishment concerned with the receipt, transmission, and delivery of all messages received by or sent from the unit or establishment.
2. The term "signal center," as defined in AR 105-25, will be used only for those headquarters installations operated by signal communication personnel for the purpose indicated by the definition.
3. In headquarters requiring agencies for the routing of correspondence and other papers in the different offices, departments, branches, or sections of the staff, such agency will be designated as the "distribution center" of the office, department, branch, or section of the staff served.

- War Department Training Circular  
No. 100, par. IV, December 5, 1942.

Definition of jammed, jamming, and interference

Pending revision of FM 11-5, April 15, 1940, the following definitions are furnished for the information and guidance of all concerned:

1. "Jammed" (used in relation to reception): reception impaired by deliberate emissions.

2. "Jamming" (used in relation to transmission): deliberate emissions with the object of impairing reception.

3. "Interference": reception impaired by atmospheric, unwanted signals (not known to be deliberate), or the effects of electrical apparatus or machinery.

- War Department Training Circular  
No. 107, par. II, December 22, 1942.

Wiring Change on Radio Set SCR-284-A

Pending publication of TM 11-275, Radio Set SCR-284-A, the following is published for the information and guidance of all concerned:

1. Radio sets SCR-284-A with serial numbers from 1 to 3,500 may be rendered useless by audio howl in radio receiver BC-654-A, which is of continuous intensity.

2. The condition, which is caused by coupling between the lead from the plate of the output tube to the output transformer and a lead from No. 8 terminal to the automatic volume control switch, may be corrected by cutting the plate lead out of the cable and running it as far away from the cable and the No. 8 terminal as possible. This lead is a blue wire and is identified in the connection diagram as lead No. 49, between the plate of tube 2-V-6 and No. 1 terminal of transformer 2-T-1.

3. This change will be made in all radio sets with above serial numbers in the field by radio repairmen of using units and higher signal repair organizations.

- War Department Training Circular  
No. 3, par. III, January 13, 1943.

XIX

TO ALL PERSONNEL OF SIGNAL SUPPLY SERVICES:

With a deep feeling of appreciation to all members of the Signal Supply Services and their co-workers in the electronics industry, I am pleased to announce that deliveries of Signal Corps equipment for 1942 were more than 100 percent of the high objectives that had been originally set for our supply program.

I wish to express this appreciation on behalf of the War Department and on behalf of hundreds of thousands of American soldiers overseas, from Algiers to the Aleutians, whose achievements and whose very lives are dependent upon the quantity and quality of the work put out by you.

Your unremitting and unselfish efforts in Signal Corps research, development, production, expediting, inspection, assembling, storing, issuing and maintenance have made it possible for the products of the nation's electronic factories to fulfill their mission in the hands of courageous troops on the field of battle.

You men and women in the domestic installations of the Signal Corps are the vital link between the factory and the battlefield. The chain of supply has never failed to date because the link constituted by you has been strong and unwavering.

The goals we set for 1942 were very high, but they have been achieved. Our goals for 1943 are much higher, but they, too, will be achieved through the loyalty and industry of Signal Corps personnel in carrying out their tremendous responsibility to the nation.



Roger B. Colton  
Major General, AUS  
Chief, Signal Supply Services.

ESTABLISHMENT OF FIELD AGENCIES

The decentralization of development work under the Signal Supply Service has been furthered recently by the establishment of two new field agencies corresponding with units of the Research and Development Division, Signal Supply Services, Office of the Chief Signal Officer. One is the Signal Corps Stock Numbering Agency, established in Philadelphia and operating in coordination with the Nomenclature Section in the OCSigO. The other is the Signal Corps Standards Agency located in the vicinity of Fort Monmouth and operating in coordination with the Standards Section of the OCSigO.

Signal Corps Stock Numbering Agency

Headquarters of this agency have been set up at 22nd and Lehigh Avenue, Philadelphia, Pa., with Colonel A. M. Pigg assigned as Officer in Charge. This field activity reports to the Director of the Research and Development Division, OCSigO. Its functions are to assign stock numbers and IBM code numbers, to publish radar detection equipment, to distribute nomenclature, type numbers and stock numbers of new items to procurement districts and depots, and to prepare descriptive sections of the Signal Corps catalogue.

These functions were formerly exercised by the Nomenclature Section, R & D Division. That section, with Captain F. W. Decker as Officer in Charge, continues to exercise broad policy supervision over all matters relating to designation of nomenclature, the assigning of stock, type and code numbers, and publication and description of parts list and catalogue supplement cards.

Signal Corps Standards Agency

A Signal Corps Standards Agency has been established in close proximity to the Fort Monmouth Signal Laboratory of the Signal Corps Ground Signal Service. It will be responsible to the Chief Signal Officer through the Director of the Research and Development Division. The mission of this agency is to fulfill certain field duties hitherto carried out by the Standards Section, R & D Division, Office of the Chief Signal Officer. Those responsibilities concern standardization of resistors, capacitors, tubes and other such components of Signal Corps equipment. Colonel G. C. Irwin has been assigned as Officer in Charge of the Agency. The Standards Section, R & D Division, continues to coordinate Standardization of radio parts as above mentioned for the OCSigO.

GROUND SIGNAL EQUIPMENT

Research and Development activities in the Ground Signal Equipment field during the last month have included means of increasing the comfort of soldiers in the Arctic, simplification of meter readings and special manufacturing jobs — all to the end of helping the man in the field beat the Axis more quickly.

Defeating Frigid Weather

On the premise that a comfortable soldier is a better fighter, tests are being conducted in the laboratories of the Ground Signal Service on a chemical heating pad for use by troops stationed at frigid outposts. These pads may also be used on gasoline engines to facilitate starting.

Cold weather also cuts the output of dry cell batteries. At  $-40^{\circ}$  F. the ordinary flashlight battery is virtually inoperative. In addition to the improvement of low temperature battery output, development work is being conducted on batteryless flashlights powered by small generators. Several commercial types have been tested but have been found unsatisfactory for military use, due to a number of factors, such as noisy operation, low efficiency, fluctuating light, and lack of ruggedness. However, certain types now under test appear promising, particularly those which use two-pole rather than four-pole rotors. A revised specification has been sent to fifteen interested manufacturers.

Eliminating Undesired Equipment

The Signal Corps Catalog at present contains 145 pages of teletypewriter equipment. As a result of a study in R & D Division, a recommendation has been forwarded to Equipment Coordination Branch for elimination of 219 items which are no longer considered desirable for field or tactical use. It is expected that this will simplify the selection of equipment from stock.

Concurrence has been given to a proposed limitation on the number of types of files, rasps and vises to be manufactured, although it was recommended that linemen's vises be exempted specifically from the limitation. It is understood that these recommendations will be considered by the SOS and the WPB in curtailing the number of types of these tools.

Saving Brass, Tin and Rubber

Chrome-plated steel ferrotype tins (known as squeegee plates to many a photographer) will soon replace chrome-plated brass, the latter being a more strategic material. As a matter of fact, many commercial print dryers had been using steel instead of brass long before restrictions were imposed on non-ferrous metals.

To save tin, tests are being made to determine whether an alloy composed of 90 percent lead and 10 percent tin will be satisfactory for coating the leads on fixed condensers.

Tests with Neoprene, a synthetic rubber, have proven highly successful for use in jacketing field wire. Resources Branch has been requested to act to provide sufficient Neoprene to jacket 25 percent of all the Cable WC548 (Spiral-Four) which is being produced. It is thought that this will permit manufacturers to change gradually to the new material.

#### Putting Frequencies on a Decimal Scale

Signal Generator I-208 at present includes two frequency triplers, giving combined multiplication of 9. This makes it necessary to convert readings by means of a calibration chart. A modification has been initiated, providing for one frequency quintupler and one doubler. This results in a multiplication factor of 10. Thus the user may be able to take direct readings, merely shifting the decimal point from the scale reading.

#### Manufacturing Activities

Requirements for tools and test equipment have resulted in considerable manufacturing activity by machinists and mechanics in the shops of the several Ground Service Laboratories. Some recent activities of this nature are: a set of newly designed tools for repairing Mast Base MP-37 in the field, to eliminate delays previously caused by shipping mast bases to the depots for repair; a modified version of a special wrench which will make it easier to install and remove Mast Base MP-48; six models of a crystal holder extractor; new models of Adaptor FT-384, modified as to mechanical design; special testing apparatus to illustrate causes of field failure in a certain push-to-talk switch; a Standard Radio Test Panel, and a vibration machine for testing filters, capacitors and suppressors.

TUNGSTEN IN ELECTRONIC TUBES

Of the many exacting processes used in the various stages of electronic tube manufacture, none have necessitated greater knowledge, accuracy, and care than are required in the making of the tungsten wire filament and the tungsten seal rod. Tungsten rod is used for grid and anode supporting columns. Tungsten wire is used for filaments and for supporting structures in some receiving type tubes.

The high melting point of tungsten (3392° C) prevents its being melted in crucibles. Its peculiar crystalline characteristics are such that it cannot be drawn in the manner common to the drawing of many other materials such as iron, copper, and nickel. Hence special methods had to be developed to transform the tungsten ore into wire and rod having a tensile strength greater than that of the highest grade of steel.

The tungsten ore in the form of a coarse brown powder is first chemically analyzed and then ground to a talc-like powder in preparation for the chemical processes to follow. Of these highly technical processes, it is sufficient to say that from the raw ore to the pure tungsten powder, the tungsten varies in form from a black powder to a black solution to a white crystalline powder and then to a yellow sulphur-like mass known as tungstic oxide. These processes involve the use of hot and cold water, caustic soda, calcium chloride, hydro-chloride acid, ammonia, and caustic potash.

Following the chemical treatment the tungstic oxide is filtered and dried to remove the water. Next the powder is placed in tungsten containers or "boats" and passed through an air-tight furnace into zones of increasingly greater temperature. During the heating all water and oxygen are driven off and removed by means of a continuous flow of pure hydrogen gas over the powder. After being screened to a uniformity of grain size, the powder is placed in a mold and subjected to a hydraulic pressure. The resultant bar is very brittle and must be handled with great care until baked in a hydrogen atmosphere to allow its being handled in subsequent processes.

The next step is to place the bars in a cylindrical air-tight metal container, known as a sintering bottle. After each bottle is closed, it is filled with pure hydrogen gas, and a current of approximately 2,000 amperes is passed through the bar for varying periods. The passage of the current through the bar fuses the tungsten particles, shrinking the bar, increasing its strength, and causes it to assume a metallic appearance. It should be pointed out that for all processing until final inspection of the metallic bar is complete, operations are conducted in a room in which the temperature and humidity are kept constant, as experience has shown that the quality of the tungsten wire and rod varies with fluctuations of these conditions.

The next step in the manufacture of tungsten rod and wire consists



of swaging or hammering the tungsten bar after it has been heated in an electric furnace in a hydrogen atmosphere. The swaging is continued until the bar has changed into a rod gradually diminishing in diameter and increasing in length. At this point the required sizes are abstracted from the swaging process several thousandths of an inch over the finished size desired and then processed through a centerless grinder to insure perfect uniformity of surface and diameter. For some types of applications, however, no grinding is required. For securing the tungsten wire, the further reduction of the smallest sized swaged rod is accomplished by means of a die-drawing process wherein the wire is lubricated by graphitic carbon heated to a carefully regulated temperature and drawn through dies of composition metal down to a diameter of approximately 10 mils. From that point the ultimate in accuracy is achieved by the use of diamond dies. The smallest commercial size drawn in the past has been on the order of four tenths of a mil.