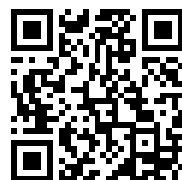

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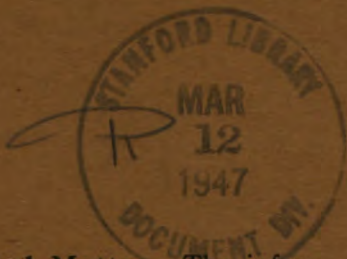
TM 11-315

WAR DEPARTMENT

TECHNICAL MANUAL

**MAINTENANCE EQUIPMENT
ME-40-(*)
AND
MAINTENANCE KIT ME-53-(*)**

10 October 1943



Dissemination of Restricted Matter.—The information contained in restricted documents and the essential characteristics of restricted materiel may be given to any person known to be in the service of the United States and to persons of undoubted loyalty and discretion who are cooperating in Government work, but will not be communicated to the public or to the press except through authorized military public relations agencies. (See Executive Order No. 11652, Par. 18b, AR 380-5, 28 Sep 1942.)



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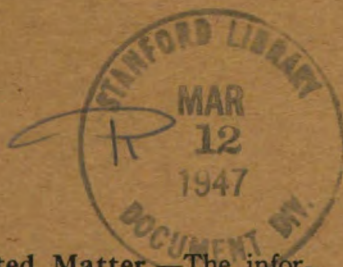
TM 11-315

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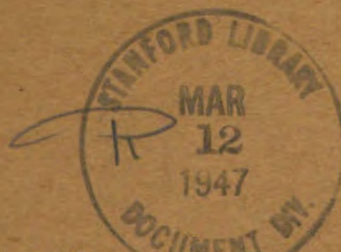
TM 11-315

WAR DEPARTMENT

TECHNICAL MANUAL

MAINTENANCE EQUIPMENT
ME-40-(*)
AND
MAINTENANCE KIT ME-53-(*)

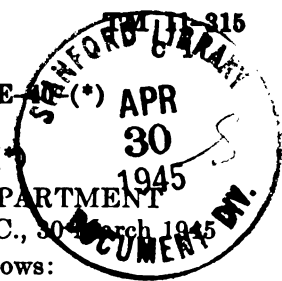
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W 1.35-11-315 Ch. 1

TECHNICAL MANUAL
 MAINTENANCE EQUIPMENT ME-40(*)
 AND
 MAINTENANCE KIT ME-53-(*)



CHANGES }
 No. 1 }

WAR DEPARTMENT
 WASHINGTON 25, D. C., 304 March 1945

TM 11-315, 10 October 1943, is changed as follows:
 The classification *RESTRICTED* is removed from the manual.

1. General.

Consult TM 11-242 * * * expendable items.

Official nomenclature followed by (*) is used in this manual to indicate reference to all models of the item of equipment, regardless of procurement.

2. (Superseded) Components with Weights and Dimensions.

a. Maintenance Equipment ME-40-(*).

Quantity	Name of component	Dimensions (in.)					Unit weight (lb.)
		Height	Width	Depth	Length	Diameter	
1	Alignment Indicator I-210-(*).	5 1/4	4 1/8	2			1.50
3	Alignment Tool				6	1/2	0.01
2	Antenna A-28-(*), phantom.						0.18
6	Antenna AN-130-A (2-section).				(1)	31(max)	0.39
6	Antenna AN-131-A (8-section).				(2)	2 1/2(max)	
2	Cord assembly (Galvin 1X4956 or Dayton Acme C-4537).						0.01
1	Cord CD-318						0.72
3	Cord CD-874				42		
2	Cord CD-1016				12		0.43
2	Cord CD-1108				12		
1	Chest CH-165:						
	Upper chest	7 1/4	13 1/2		21 1/8		21.75
	Lower chest	9 1/4	13 1/2		21 1/8		21.25
3	Handset TS-15-(*).						1.80
3	Headset HS-30-(*). with Cord CD-874.						0.57
1	Microphone T-45						0.094
1	Oscillator VO-6-(*).	5 1/8	5 1/8	3 1/2			3.25
2	Screwdriver TL-15				5 1/4		0.18
1	Screwdriver 1/4 in. tip				6 1/4		
2	TM 11-242	8 1/2	5 1/2				0.25
2	TM 11-315	8 1/2	5 1/2				0.25
3	Tube Puller TL-201						0.18
3	Wrench TL-108						0.18

¹ 33 (assembled); 17 (collapsed).
² 128 (assembled); 17 (collapsed).

NOTE: Running spares are for initial issue only and are not to be requisitioned as a kit or group as shown in the list of components.

b. Maintenance Kit ME-53-()*

Quantity	Name of component	Dimensions (in.)					Unit weight (lb.)
		Height	Width	Depth	Length	Diameter	
4	Battery BA-30				2%	1 $\frac{1}{16}$	0.18
1	Battery BA-39	7 $\frac{1}{2}$	6 $\frac{7}{16}$	3 $\frac{3}{4}$			8.5
2	Battery BA-51	3 $\frac{9}{16}$	2 $\frac{9}{16}$	1 $\frac{1}{4}$			0.88
12	Battery BA-70	7 $\frac{23}{32}$	10 $\frac{7}{16}$	4 $\frac{1}{2}$			15.00
6	Battery BA-80	5 $\frac{1}{4}$	10 $\frac{5}{16}$	4 $\frac{1}{2}$			9.00
2	Cover water seal						
10	Gasket, jack water seal						
24	Insert M-300						0.02
10	Lamp LM-52 (Mazda No. 47)						
10	Spring gasket retainer						
5	Tube JAN-1A3						0.06
24	Tube JAN-1L4						0.06
5	Tube JAN-1R5						0.06
15	Tube JAN-1S5						0.06
30	Tube JAN-1T4						0.06
10	Tube JAN-3A4						0.06
1	Tube JAN-6E5						0.12

NOTE: Running spares are for initial issue only and are not to be requisitioned as a kit or group as shown in the list of components.

5. Alignment Indicator I-210-(*)

Alignment Indicator I-210-(*) * * * a voltage indicator. It has three voltage measurement ranges, **4 $\frac{1}{2}$ volts, 6 volts, 30 volts**, and is so designed as to incorporate a circuit continuity tester **that tests** up to a limited resistance value.

6. Oscillator VO-6-(*)

Oscillator VO-6-(*) is * * * frequency output voltage. The output is fed to a terminal box designed to **match the output impedance of the oscillator. This prevents radiation of radio frequency waves from the connecting cable and shielded box.** A single-pole, * * * out of alignment, Oscillator VO-6-C uses a **double-pole, single-throw (DPST) switch for this same operation.**

10. Alignment Tool.

The alignment tool is a 6- by **7/32-inch** round tool of non-metallic material with an inset metal blade on one end and a metal screwdriver on the other end, for use on coil adjustment screws and trimmer capacitors.

12. Alignment Indicator I-210-(*)

Alignment Indicator I-210-(*) is a vacuum-tube-voltage-indicator

ing instrument (VTVI), and continuity tester, using electron-ray Tube **VT-215**. REMEMBER AN INCREASE * * * the applied voltage.

The circuit of * * * the fluorescent target. For plate (B+) and filament voltage (A+) supply, plug the VTVI into Battery **BA-39**. Use Plug **PL₁**, which is located in the back of the instrument. Alignment Indicator **I-210-(*)** may also be used with Batteries **BA-70** or **BA-80**. Cord **CD-1016** connects the alignment indicator to these batteries. The connecting lead from the socket of Cord **CD-1016** is attached to Pin No. 6 of Tube **VT-215 (JAN-6E5)**. Battery **BA-39** is * * * Figures 4 and 8.)

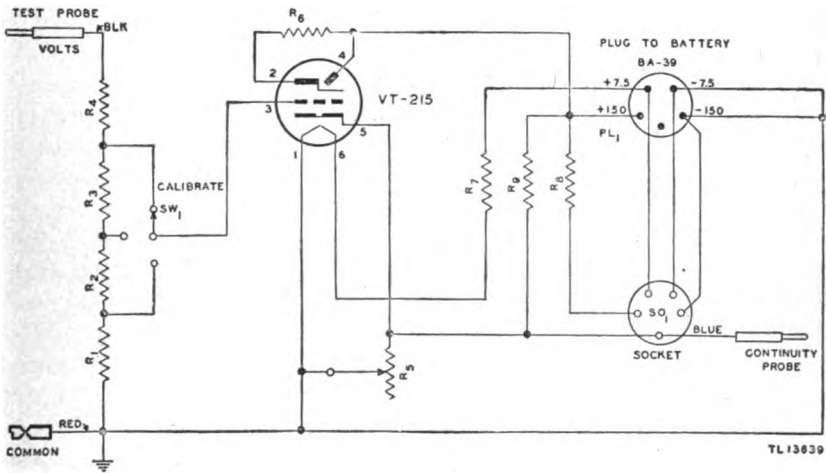


Figure 8.1.—Maintenance Equipment ME-40-(*). Alignment Indicator I-210-C, Schematic Diagram

a. Calibration of Alignment Indicator I-210-()*

The VTVI may be calibrated to indicate exactly $4\frac{1}{2}$, 6, and 30 volts. With the Voltage * * * the above voltages.

b. Continuity Measurements. Rescinded.

c. Operation as a Voltage Indicator (Superseded).

(1) The alignment indicator is used in the same way as a center zero voltmeter. When the red lead is connected to plus and the black to minus, an increase of voltage narrows the eye shadow. When the leads are connected with the black to plus and the red to minus an increase of voltage widens the shadow.

(2) Resistors R_1 , R_2 , R_3 , and R_4 with Switch SW_1 make up a voltage-dividing network which permits variations of shadow on the

fluorescent target, over a voltage range up to 30 volts, in three steps of $4\frac{1}{2}$, 6, and 30 volts.

(3) Variable Resistor R_6 (Calibration Potentiometer) is connected in the cathode circuit of Tube VT-215. The plate and target currents flow through the resistor and develop a voltage across it that is used to bias the grid of the tube. The bias can be varied by adjusting the resistor. With Voltage Selector Switch SW_1 in the $4\frac{1}{2}$ -volt CALIBRATE position and a $4\frac{1}{2}$ -volt potential applied to the black test lead, the shadow on the fluorescent target can be adjusted to a hairline by varying the potentiometer.

(4) Resistor R_6 is a voltage-dropping resistor connected between the target and plate of Tube VT-215. If no negative potential is present on the grid of Tube VT-215, plate current flows and a voltage drop is developed across Resistor R_6 . As a result, the plate potential of Tube VT-215 decreases to a lower potential than the target. The plate has a fin that protrudes in the electron path from the cathode to a section of the target. Because of the difference in potential between the plate and the target, an electrostatic field is set up between the fin of the plate and target. This field prevents some of the electrons emitted from the cathode from striking the target area directly behind the protruding fin. The target, which is coated with a fluorescent material, glows when electrons strike it; but the portion of the target that is not struck by electrons remains dark and appears as a shadow on the target. When there is a negative potential applied to the grid of Tube VT-215, less plate current flows and the voltage drop across Resistor R_6 decreases. This causes the plate voltage to rise and approach the target voltage. The electrostatic field decreases in intensity and more electrons are able to strike the area behind the fin, thus reducing the width of the shadow. As the negative potential on the grid is increased, plate current decreases, the voltage drop across R_6 decreases, and the plate voltage increases and approaches the target voltage. As a result the shadow becomes narrower. When the negative potential applied to the grid is high enough to block off the flow of plate current, the target and plate are nearly at the same potential and the electrostatic field that existed when the target and plate were of different potential disappears. When this occurs the electrons emitted from the cathode strike the entire target and no shadow appears. Thus, by varying the negative potential on the grid of Tube VT-215, a corresponding variation in shadow width will appear on the target.

(5) Resistor R_7 is a voltage-dropping resistor used to bring the filament battery potential down to the operating value for the filament of

Tube VT-215. When Cord CD-1016 is used, the loose lead from the socket of the cord is attached to Pin No. 6 of Tube VT-215 (JAN-6E5), thereby shorting out Resistor R_7 by applying the full $4\frac{1}{2}$ volts from Battery BA-70 or BA-80 to the filament of Tube VT-215.

(6) Resistor R_8 is a voltage-dropping resistor which is used with Battery BA-39 as the power source when equipment other than Radio Set SCR-300-(*) is maintained or repaired. Alignment Indicator I-210-(*) is plugged into Battery BA-39 and the plug from the unit (other than Radio Set SCR-300-(*) is plugged into the five-prong Socket SO_1 . Resistor R_8 then is in series with the B+ (+150-volt) battery source.

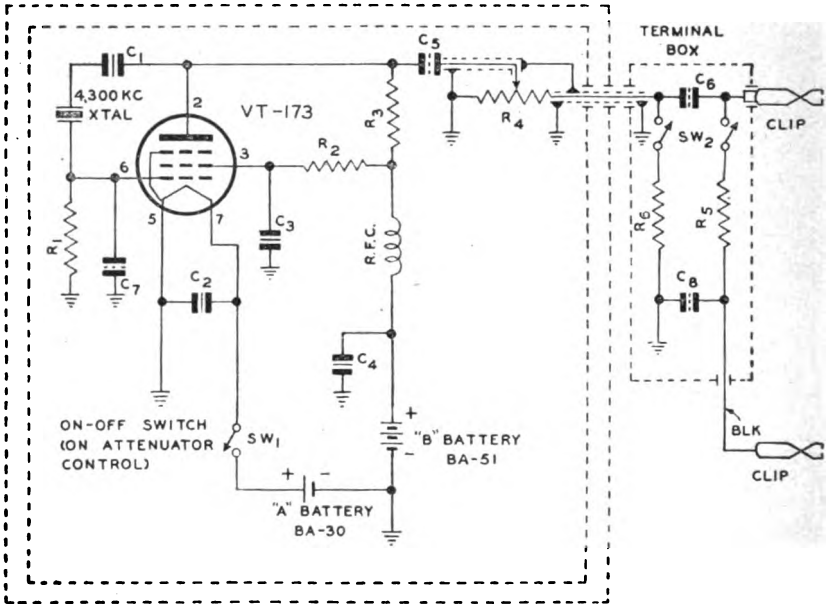
(7) Resistor R_9 used in Alignment Indicator I-210-C is a bleeder resistor which drains a small amount of current at all times from the B battery. This current flows through Resistor R_9 and has a stabilizing effect on the grid bias.

d. Operation as a Continuity Meter (Superseded).

To use Alignment Indicator I-210-(*) as a continuity tester, take the separate blue lead that is provided and plug one end into Socket SO_1 at the arrow. Leave Voltage Selector Switch SW_1 in any position. Adjust the CALIBRATE Knob (R_5) until the shadow on the fluorescent target becomes a hairline or disappears entirely. Test the operation of Alignment Indicator I-210-(*) as a continuity tester by shorting the red and blue leads together. A shadow of approximately 90° will appear on the target. When the leads are separated the shadow will again reduce to a hairline. Connect the portion of the circuit (transformer, resistor, etc.) to be tested between the red lead and the blue lead. If the part being tested is not open, the plate and target currents will flow through two paths, Resistor R_5 and the part under test. As a result, the current through R_5 will decrease below its normal value, the grid bias will decrease, and the shadow will then widen. Continuity tests of resistances up to 50,000 ohms can be made with Alignment Indicator I-210-(*). This procedure may also be used to test for shorts or filament continuity in tubes used with Radio Receiver and Transmitter BC-1000-(*).

13. Oscillator VO-6-(*)

a. Oscillator VO-6-(*) is * * * and Vacuum Tube VT-173. It is powered by one Battery BA-51 (which supplies the required plate voltage of $67\frac{1}{2}$ volts and current of approximately 1.5 ma.) and one Battery BA-30 (which supplies the required filament voltage of 1.5 volts and current of .05 amp.). These batteries are contained in Oscillator VO-6-(*).



TL13640

Figure 9.1.—Maintenance Equipment ME-40-(*), Oscillator VO-6-C.

Schematic Diagram

b. Switch SW₁ and * * * signal generator off. At the end of the attached rubber covered, flexible, shielded cable there is a terminal box which is designed as a dummy load (to match the characteristic impedance of the cable, thereby removing any standing wave (r-f) that might tend to radiate from the cable). The terminal box incorporates a single-pole, single-throw Switch SW₂ for switching the output signal from a low range to a high range. Oscillator VO-6-C uses a double-pole, single-throw (DPST) switch for this operation. Usually the output * * * and discriminator coils.

* * * * *

SECTION III—ALIGNMENT PROCEDURE

CAUTION

Don't press calibrate button of Radio Set SCR-300-(*), out in the field unless Antenna A-28-(*), (Phantom) is installed. This is apt to disable all other receivers in the vicinity.

Don't test filament continuity with an ohmmeter. Use Alignment Indicator I-210-(*). (See par. 12b.)

Don't press calibrate button and transmitter switch at the same time.

Before attempting to align Radio Receiver and Transmitter BC-1000-(*), check the Discriminator (par. 25), connect Radio Receiver and Transmitter BC-1000-(*) to Battery BA-70 or Battery BA-80 (par. 14), and refer to the following chart:

* * * * *

Figure 10.—Radio Receiver and Transmitter BC-1000-(*), Alignment Instruction Detail, Top View

Figure 11.—Radio Receiver and Transmitter BC-1000-(*), Alignment Instruction Detail, Bottom View

14. Preliminary Procedure.

* * * * *

b. Connect Radio Receiver and Transmitter BC-1000-(*) to Battery BA-70 or BA-80 by using Cord #1X4956, manufactured by Galvin, or #C-4537, manufactured by Dayton Acme, which includes Cord CD-1108.

* * * * *

16. Aligning Discriminator and 2nd Limiter.

* * * * *

c. Press the calibrate button on the receiver-transmitter and adjust L_6 so that the eye widens to about one-third its full opening.

* * * * *

d. After adjusting L_6 , adjust screw on L_7 for maximum shadow angle on the eye tube. If the angle * * * its lock nut.

e. With a very slight adjustment on the L_6 screw in a counter-clockwise direction the shadow angle on the eye tube **must** be reduced to a hairline. Tighten the lock * * * of the screw. Check this by observing that, **after the nut has been tightened**, the shadow angle remains a hairline **as described in paragraph 16a.**

* * * * *

17. Adjusting I. F.

* * * * *

c. Connect Oscillator VO-6-(*). * * * first tube (V7). (See Figure 11.)

* * * * *

e. Turn Potentiometer Control * * * SW_2 to HI. If there is still no indication, set $L_{5-1-2-3}$, L_{6-1-2} , so that the adjusting screws are extended about $\frac{1}{4}''$. **Turn off the oscillator. With the receiver**

turned on to full volume, adjust the screws for maximum noise in Handset TS-15-(*).

f. Reduce the input signal until a small indication is obtained on the fluorescent target VTVI, and adjust L_{5-1} and L_{6-1} to minimum shadow angle (maximum negative volts). If the shadow angle disappears before alignment of these stages is completed, reduce the signal input to minimum and complete the alignment procedure. Tighten each lock * * * is no misalignment.

18. Aligning 1st Limiter.

* * * * *

NOTE: Check to see that lock nuts of L_3 , $L_{4-1-2-3}$, $L_{5-1-2-3}$, L_7 , L_8 are snug. Be careful not to change the settings.

20. Aligning Master Oscillator.

* * * * *

b. Bring the dial of the radio set under test to calibrate line between channels 36 and 37, or channel 15 (indicated by the letter C on the dial). The letter C should be directly under the dial indicator. Press the switch on Handset TS-15-(*), and with the receiver to your ear, QUICKLY adjust trimmer C6G for zero beat. (See Figure 11.)

NOTE: When removing the alignment tool there is a tendency for the zero beat to shift. If this should be observed, center the dial indicator over the letter C, using the indicator adjustment.

- c. (Superseded.) Remove the test lead of VTVI.
- d. Rescinded.

21. Aligning Doubler.

a. Bring the dial of the radio set under test to channel 35 and set Voltage Selector Switch SW₁ of VTVI in the 30-volt position. With adjustment of CALIBRATE knob (R₃), open the eye to approximately 90°.

* * * * *

c. Press the switch on Handset TS-15-(*), and quickly adjust C6E for minimum shadow on the fluorescent target.

22. Aligning Transmitter Mixer (Superseded).

With the probe in Pin No. 5, press the switch on Handset TS-15-(*), and adjust C_{6C} for minimum shadow.

23. Aligning Transmitter R-F Power Amplifier.

Insert the test probe in Pin No. 6 of metering socket, and with the switch of Handset TS-15- (*) pressed, quickly adjust C6A for a minimum shadow on fluorescent target.

SECTION IV—MAINTENANCE

Maintenance Equipment * * * will require maintenance.

NOTE: Failure or unsatisfactory performance of equipment used by Army Ground Forces and Army Service Forces will be reported on WD AGO Form 468 (Unsatisfactory Equipment Report); by Army Air Forces, on Army Air Forces Form 54 (Unsatisfactory Report). If either form is not available, prepare the data according to the sample form reproduced in figure 12.

WAR DEPARTMENT UNSATISFACTORY EQUIPMENT REPORT			
FOR	TECHNICAL SERVICE Signal Corps	MATERIEL	DATE 1 Feb 45
FROM	ORGANIZATION 175 Signal Repair Co.		STATION APO 102
TO	NEXT SUPERIOR HEADQUARTERS Supply Sec. Hq Fourth Army Sig Sv.	STATION APO 110	TECHNICAL SERVICE Signal Corps
COMPLETE MAJOR ITEM			
NOMENCLATURE Radio Transmitter BC-123-A		TYPE Ground, vehicular	MODEL A
MANUFACTURER American Radio Corp	U. S. A. REG. No Order No. 1234-Phila-45	SERIAL NO. 12345	DATE RECEIVED 5 Jan 45
EQUIPMENT WITH WHICH USED (if applicable) Radio Set SCR-45G-A Tank, Medium, M4			
DEFECTIVE COMPONENT—DESCRIPTION AND CAUSE OF TROUBLE			
PART NO. Sig C Stk. No. 3E47-3	TYPE Capacitor C20:fixed; 1-mf; 500 vdcw	MANUFACTURER American Radio Corp	DATE INSTALLED when manufactured
DESCRIPTION OF FAILURE AND PROBABLE CAUSE (if additional space is required, see back of form) Capacitor C20 shorts out due to humid operating conditions			
DATE OF INITIAL TROUBLE 15 Jan 45	TOTAL TIME INSTALLED		TOTAL PERIOD OF OPERATION BEFORE FAILURE
	YEARS —	MONTHS —	DAYS 0
			HOURS 0
			MINUTES 0
			SECONDS 0
BRIEF DESCRIPTION OF UNUSUAL SERVICE CONDITIONS AND ANY REMEDIAL ACTION TAKEN Operation in tropics; heavy rainfall. Was replaced and set given moistureproofing and fungiproofing treatment, 20 Jan 45.			
TRAINING OR SKILL OF USING PERSONNEL		RECOMMENDATIONS (if additional space is required, see back of form)	
POOR	FAIR	GOOD X	Substitute capacitor designed for tropical operation
ORIGINATING OFFICER			
TYPED NAME, GRADE, AND ORGANIZATION E. A. WILSON, 1st Lt., Sig C. 175 Sig Repair Co.		SIGNATURE <i>E. A. Wilson</i>	
FIRST ENDORSEMENT			
TO CHIEF	TECHNICAL SERVICE	OFFICE	
NAME, GRADE, AND STATION		STATION	OFFICE
Instructions			
<ol style="list-style-type: none"> 1. It is imperative that the chief of technical service concerned be advised at the earliest practical moment of any constructional, design, or operational defect in material. This form is designed to facilitate such reports and to provide a uniform method of submitting the required data. 2. This form will be used for reporting manufacturing, design, or operational defects in material, petroleum fuels, lubricants, and preserving materials with a view to improving and correcting such defects, and for use in recommending modifications of material. 3. This form will not be used for reporting failures, isolated material defects or malfunctions of material resulting from fair wear-and-tear or accidental damage due to the replacement, repair or the use of parts and equipment. It does not replace currently authorized operational or performance records. 4. Reports of malfunctions and accidents involving ammunition will continue to be submitted as directed in the manner described in AR 730-10 (change No. 10). 5. It will not be practicable or desirable to fill all blank spaces of the report. However, the report should be as complete as possible in order to expedite necessary corrective action. Additional pertinent information not provided for in the blank spaces should be submitted as inclosures to the form. Photographs, sketches, or other illustrative material are highly desirable. 6. When cases arise where it is necessary to communicate with a chief of service in order to assure safety to personnel, more expeditious means of communication are authorized. This form should be used to confirm reports made by more expeditious means. 7. This form will be made out in triplicate by using or service organization. Two copies will be forwarded direct to the technical service; one copy will be forwarded through command channels. 8. Necessity for using this form will be determined by the using or service troops. 			

W. D. A. G. O. Form No. 468
20 August 1941

This form supersedes W. D. A. G. O. Form No. 468, 1 December 1941, which may be used until existing stocks are exhausted.

U. S. GOVERNMENT PRINTING OFFICE 16-41660-1

TL 18586

Figure 12.—WD AGO Form 468, with sample entries

28. Oscillator VO-6- (*) (Superseded).

If the unit fails to operate, proceed as follows:

a. Replacement of Battery BA-30.

- (1) Remove the four screws on the outer housing cover.
- (2) Remove the screw on Battery BA-30 retainer plate.
- (3) Remove Battery BA-30.
- (4) Insert a new Battery BA-30, with the positive terminal down.
- (5) Reassemble the unit.

b. Replacement of Battery BA-51 or Tube VT-173.

- (1) Remove the four screws on the outer housing cover.
- (2) Remove the two screws holding the cover to the inside box, and remove the cover.
- (3) Remove Battery BA-51 or Tube VT-173.
- (4) Check Battery BA-51 or Tube VT-173, and replace if defective.
- (5) Insert new Battery BA-51 or Tube VT-173.
- (6) Reassemble the unit.

29.1. Maintenance Parts for Maintenance Equipment ME-40- (*) and Maintenance Kit ME-53- (*) (Added).

The following information was compiled on 26 February 1945. The appropriate sections of the ASF Signal Supply Catalog for Maintenance Equipment ME-40- (*) and Maintenance Kit ME-53- (*) are: SIG 6-ME-40, when published.

Organizational Spare Parts:

- SIG 7-ME-40.
- SIG 7-HS-30.
- SIG 7-SCR-300.

Higher Echelon Parts:

- SIG 8-ME-40.
- SIG 8-HS-30.
- SIG 8-I-210.
- SIG 8-TS-15.
- SIG 8-VO-6.
- SIG 8-SCR-300.

For the latest index of available catalog sections, see ASF Signal Supply Catalog SIG 2.

Appendix I (Added)

MOISTUREPROOFING AND FUNGIPROOFING

1. General.

When operated in tropical areas where temperature and relative humidity are extremely high, Signal Corps equipment requires special attention. These are some of the problems met:

a. Resistors, capacitors, coils, chokes, transformer windings, etc., fail because of the effects of fungus growth and excessive moisture.

b. Electrolytic action, often visible in the form of corrosion, takes place in resistors, coils, chokes, transformer windings, etc., causing eventual break-down.

c. Hook-up wire insulation and cable insulation break down. Fungus growth accelerates deterioration.

d. Moisture forms electrical leakage paths on terminal boards and insulating strips, causing flash-overs and crosstalk.

e. Moisture provides leakage paths between battery terminals.

12. Treatment.

A moistureproofing and fungiproofing treatment has been devised which, if properly applied, provides a reasonable degree of protection against fungus growth, insects, corrosion, salt spray, and moisture. The treatment involves the use of a moisture- and fungi-resistant varnish applied with a spray gun or brush. Refer to TB SIG 13, Moistureproofing and Fungiproofing Signal Corps Equipment, for a detailed description of the varnish-spray method of moistureproofing and fungiproofing and the supplies and equipment required in this treatment.

Caution: Varnish spray may have poisonous effects if inhaled. To avoid inhaling spray, use respirator if available; otherwise, fasten cheesecloth or other cloth material over nose and mouth. Never spray varnish or lacquer near an open flame. Do not smoke in a room where varnish or lacquer is being sprayed. The spray may be highly explosive.

3. Aligning Indicator, I-210-(*), Part of Maintenance Equipment ME-40-(*).

a. Preparation.

Make all repairs and adjustments necessary for the proper operation of the equipment.

b. Disassembly.

(1) Remove the four screws holding the cover to the case; remove the cover.

(2) Remove the fiber tube guard of Tube VT-215.

c. Cleaning.

Clean all dirt, dust, rust, and fungus from the equipment to be processed. Clean all oil and grease from the surfaces to be varnished.

d. Masking.

Cover the following components with masking tape as shown in figure 12.

(1) Calibrate switch.

- (2) Contacts in socket on side of case.
- (3) Pin plug and alligator clip on ends of test leads.
- (4) Prongs of battery plug.

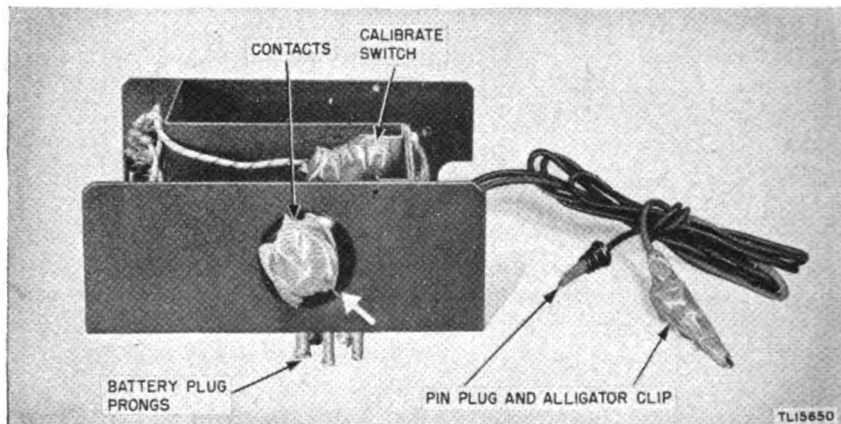


Figure 13.—Maintenance Equipment ME-40-(*), Alignment Indicator I-210-(*), Side and Interior View Showing Components Covered with Masking Tape

e. Drying.

Place equipment in oven or under heat lamps and dry for 2 or 3 hours at 160° F.

Caution: Do not exceed 160° F. If the wax should begin to melt in any of the components, decrease the temperature and increase the baking time approximately 1 hour for each decrease of 10° F.

f. Varnishing.

(1) Apply three coats of moistureproofing and fungiproofing varnish (Lacquer, Fungus-resistant, Spec No. 71-2202 (Stock No. 6G1005.3), or equal). Allow each coat to air-dry for 15 or 20 minutes before applying the next coat.

(2) Apply varnish immediately after the equipment is dried. If varnish is not applied immediately, moisture condenses on the equipment. Varnish applied over the moisture peels off readily after the varnish has dried.

(3) Using a brush, apply varnish to those portions not reached by the spray. Be sure that all components are adequately protected by varnish.

g. Reassembly.

(1) Remove all masking tape, being careful not to peel varnish from nearby areas.

(2) Reassemble the alignment indicator by following the instructions for disassembly in reverse order and test its operation.

h. Marking.

Mark the letters MFP and the date of treatment about $\frac{1}{2}$ inch below the nameplate.

Example: MFP—24 Feb 45

4. Oscillator VO-6-(*), Part of Maintenance Equipment ME-40-(*).

a. Preparation.

Make all repairs and adjustments necessary for the proper operation of the equipment.

b. Disassembly.

(1) Loosen the setscrew and remove the knob from the switch.

(2) Remove the four screws from the back cover and remove the cover.

(3) Remove the two screws from the front panel and remove the chassis from the case.

(4) Remove the two screws which hold the shield to the chassis and remove the shield.

(5) Remove the battery terminal strip from Battery BA-51 and remove the battery.

(6) Remove Battery BA-30.

(7) Remove the crystal.

c. Cleaning.

Clean all dirt, dust, rust, and fungus from the equipment to be processed. Clean all oil and grease from the surfaces to be varnished.

d. Masking.

Cover the following components with masking tape as shown in Figure 13.

(1) Contacts on battery terminal strip.

(2) Contacts on Battery BA-30 spring.

(3) Contacts of crystal socket.

(4) Battery contact in shield of chassis.

(5) Alligator clip.

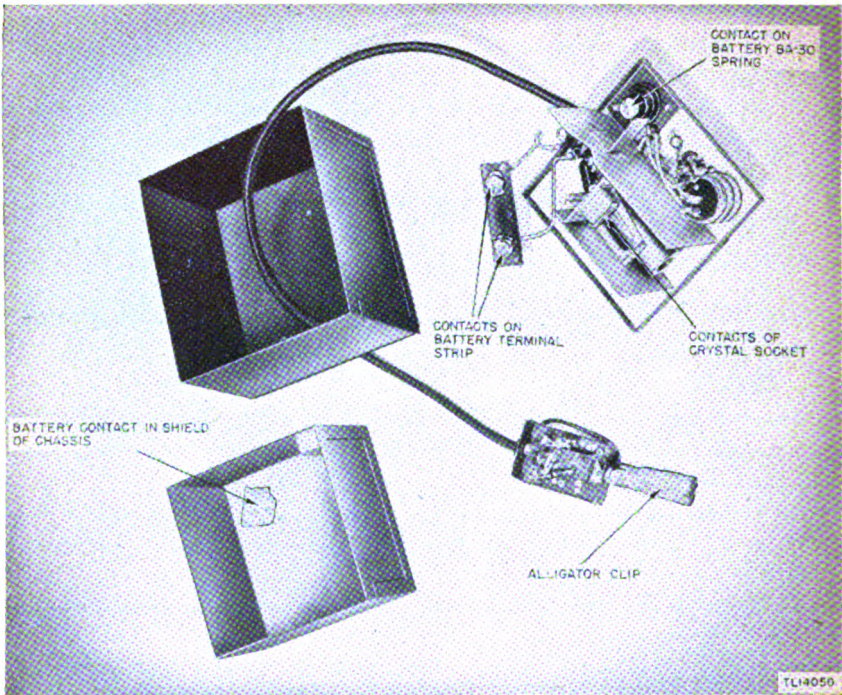


Figure 14.—Maintenance Equipment ME-40-(*), Oscillator VO-6-(*), Interior View of Components to be Covered with Masking Tape

e. Drying.

Place the oscillator (including the case shield and cover) in oven or under heat lamps and dry for 2 or 3 hours at 160° F.

Caution: Do not exceed 160° F. If wax should begin to melt in any of the components, decrease the temperature and increase the baking time approximately 1 hour for each decrease of 10° F.

f. Varnishing.

(1) Apply three coats of moistureproofing and fungiproofing varnish (Lacquer, Fungus-resistant, Spec. No. 71-2202 (Stock No. 6G1005.3), or equal). Allow each coat to air-dry for 15 or 20 minutes before applying the next coat.

(2) Apply varnish immediately after the equipment is dried. If varnish is not applied immediately, moisture condenses on the equipment. Varnish applied over the moisture peels off readily after the varnish has dried.

(3) Using a brush, apply varnish to those portions not reached by the spray. Be sure that all components are adequately protected by varnish.

g. Reassembly.

(1) Remove all masking tape, being careful not to peel varnish from nearby areas.

(2) Reassemble the oscillator and test its operation.

h. Marking.

Mark the letters MFP and the date of treatment about $\frac{1}{2}$ inch below the nameplate.

Example: MFP—24 Feb. 45.

5. Handset TS-15-(*), Part of Maintenance Equipment ME-40-(*)

a. Preparation.

Make all repairs and adjustments necessary for the proper operation of the equipment.

b. Disassembly.

(1) *Handset*

(a) Unscrew the transmitter cap.

(b) Unscrew the receiver cap.

(c) Remove the transmitter and receiver units from the handset handle.

(2) *Switch.* Remove the two screws holding the switch cover plate in place and lift up the plate, exposing the switch assembly and the associated connecting wires.

(3) *Plugs.*

(a) Unscrew the shells from Plugs PL-55 and PL-68 on the end of Cord CD-494.

(b) Remove the terminal screws from the plugs.

(c) Remove the metal band or twine securing the cords to the plugs.

(d) Remove the cordage from the plugs.

(e) Remove both shells from the cordage.

c. Cleaning.

Clean all dirt, dust, rust, and fungus from the equipment to be processed. Clean all oil and grease from the surfaces to be varnished.

d. Masking.

(1) Mask that portion of the contact posts in the transmitter and receiver unit housings of the handset handle which makes electrical contact with the transmitter and receiver units. (See Figure 14.)

(2) Mask the threaded portion of the plug shells. This masking may be done in one of two ways:

(a) With masking tape.

(b) With the improvised jig for this purpose. (See Figures 15 and 16.)

NOTE: This jig is constructed from an old plug from which the terminal shank has been removed and to which a brass washer has been soldered.

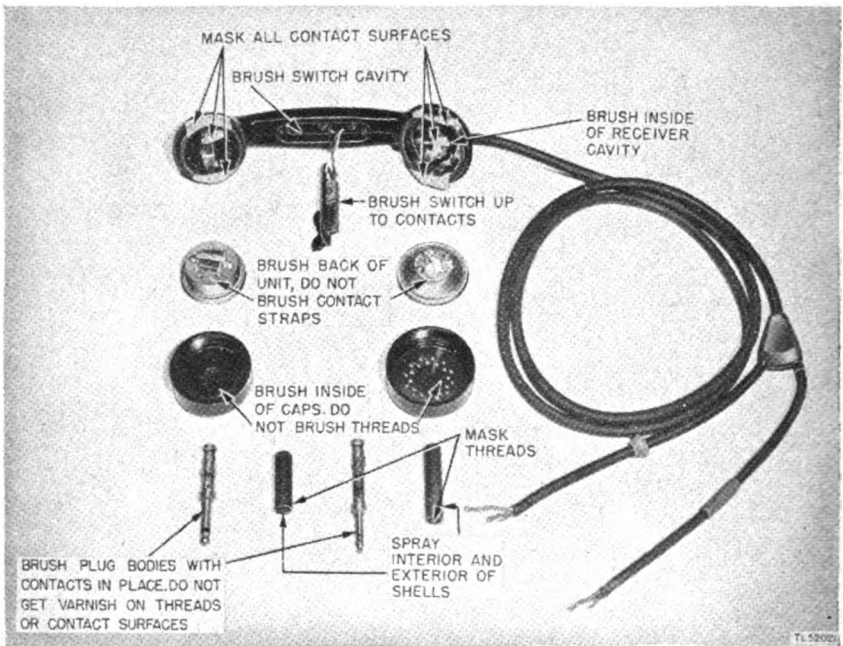


Figure 15.—Maintenance Equipment ME-40-(*), Handset TS-30-(), Masked

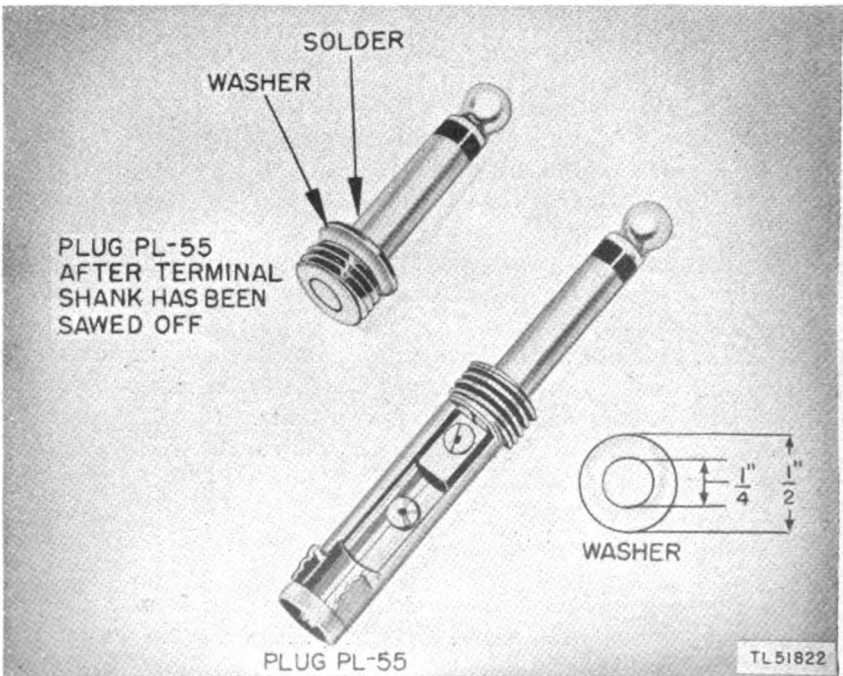


Figure 16.—Jig for Masking Threads on Plugs PL-55 and PL-68

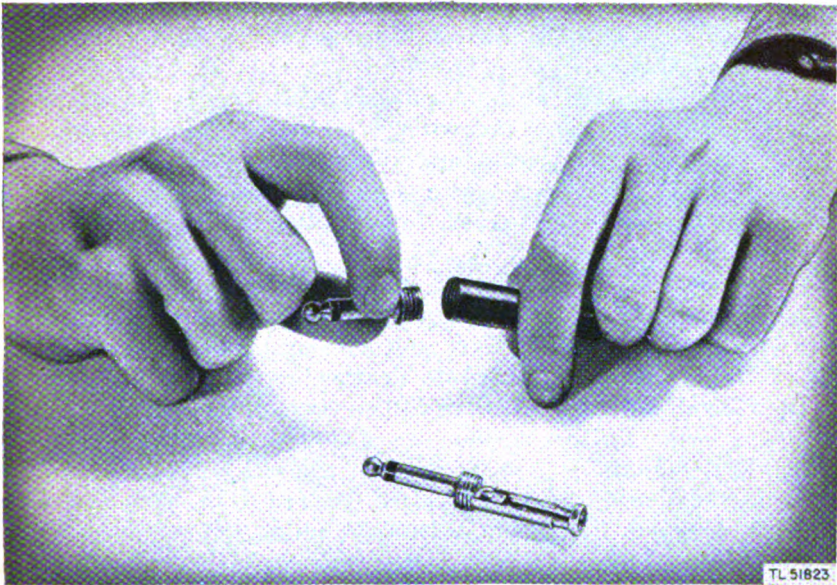


Figure 17.—Installing Jig for Masking Threads of Plug Shell

e. Drying.

Place the handset in oven or under heat lamps and dry for 2 or 3 hours at 160° F.

Caution: Do not exceed 160° F. If wax should begin to melt in any of the components, decrease the temperature and increase the baking time approximately 1 hour for each decrease of 10° F.

f. Varnishing.

(1) Apply three coats of moistureproofing and fungiproofing varnish (Lacquer, Fungus-resistant, Spec No. 71-2202 (Stock No. 6G1005.3), or equal). Allow each coat to air-dry for 15 or 20 minutes before applying the next coat.

(2) Apply varnish immediately after the equipment is dried. If varnish is not applied immediately, moisture condenses on the equipment. Varnish applied over the moisture peels off readily after the varnish has dried.

(3) Treat the following components:

(a) *Receiver cap.* Brush the inside of the surface. Do not apply varnish to the threads of the cap or to the holes in the cap.

(b) *Transmitter cap.* If the cap is made in one piece, apply varnish to the inside surface. Do not apply varnish to the threads or to the holes in the cap. If the cap is made in two or three pieces, apply varnish to the back surfaces of the phenolic grid.

(c) *Transmitter and receiver units.* Brush the back surfaces only, being careful not to apply varnish to the parts that are used to make electrical contact.

(d) *Switch assembly.* Using a suitable brush, apply the approved varnish to the underside of the switch cover plate, conductors, soldered connections, and the spring assemblies up to the contact-spring actuating cap. Be careful not to cover any points of electrical contact. Do not allow the varnish to run toward the contacts during application or drying.

(e) *Handset handle.* Apply varnish to the recess in the handset handle, being sure to cover any terminals and conductors in it. Brush the transmitter and the receiver unit housing in the handset handle. Be careful not to apply varnish to electrical contact portions.

(f) *Plug shells and plugs.* Spray three coats of varnish on the outside and inside surfaces of the plug shells; air-dry after each coat. When dry, slide the plug shells on their respective cord ends, reconnect the plugs to the cord, and secure the cord to the plug by means of a metal band. Brush varnish on the plugs, thoroughly covering the interior and the brass body piece of the plugs. Be careful not to cover the threaded portion or the parts of the plugs which make electrical connections with the corresponding jacks.

g. Reassembly.

(1) Remove all masking tape, being careful not to peel varnish from nearby areas.

(2) Reassemble the handset and test its operation.

h. Marking.

Mark the letters MFP and the date of treatment on the back of the transmitter housing.

Example: MFP—24 Feb 45.

6. Headset HS-30-(*), Part of Maintenance Equipment ME-40-(*).

a. Preparation.

Make all repairs and adjustments necessary for the proper operation of the equipment.

b. Disassembly.

(1) *Headset.*

(a) Remove Insert M-300 from the receiver cap.

(b) Unscrew the receiver cap from the receiver case.

(c) Pull the receiver unit out of the receiver case.

(2) *Junction box.* Remove the four screws holding the cover to the junction box, and remove the cover. Replace the screws.

(3) *Plug.*

(a) Unscrew the shell from the plug.

- (b) Remove the screws from the plug.
- (c) Remove the metal band or twine securing the cords to the plug.
- (d) Remove the cordage from the plug.
- (e) Remove the shell from the cordage.

c. Cleaning.

Clean all dirt, dust, rust, and fungus from the equipment to be processed. Clean all oil and grease from the surfaces to be varnished.

d. Masking.

Cover the following components with masking tape. (See Figure 18.)

- (1) RECEIVER CAP. Mask the holes in the receiver caps.
- (2) PLUG. The masking procedure for Plug PL-55 is given in paragraph 5.

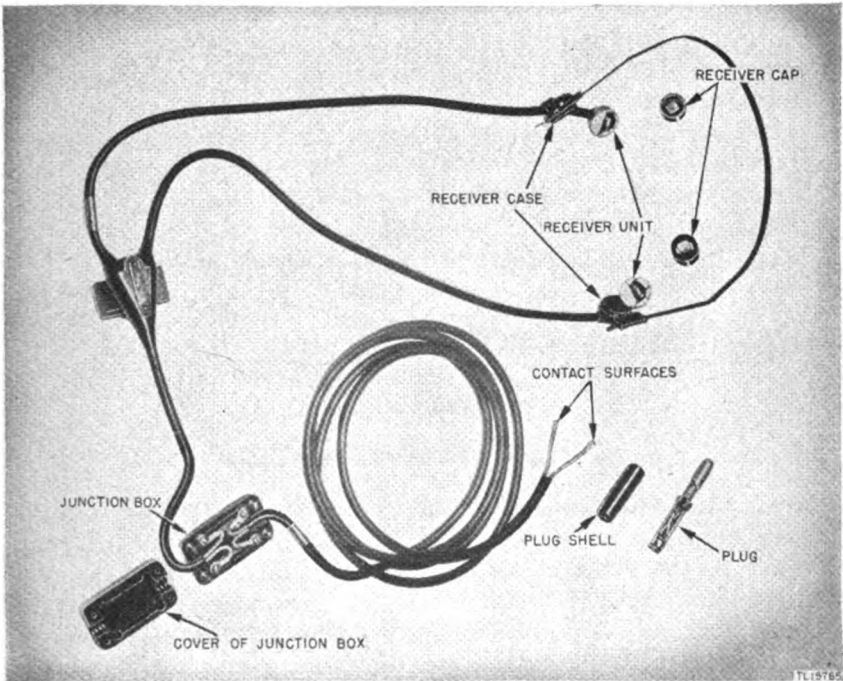


Figure 18.—Maintenance Equipment ME-40-(*), Headset HS-30-(*), Masked

e. Drying.

Place the equipment in oven or under heat lamps and dry for 2 or 3 hours at 160° F.

Caution: Do not exceed 160° F. If wax should begin to melt in any of the components, decrease the temperature and increase the baking time approximately 1 hour for each decrease of 10° F.

f. Varnishing.

(1) Apply three coats of moistureproofing and fungiproofing varnish (Lacquer, Fungus-resistant, Spec No. 71-2022 (Stock No. 6G1005.3), or equal). Allow each coat to air-dry for 15 or 20 minutes before applying the next coat.

(2) Apply varnish immediately after the equipment is dried. If varnish is not applied immediately, moisture condenses on the equipment. Varnish applied over the moisture peels off readily after the varnish has dried.

(3) Apply varnish to—

(a) All unmasked parts of the receiver cap.

(b) All unmasked parts of the receiver case.

(c) All unmasked portions of the receiver unit except the cover.

NOTE: The cover must be kept free of varnish, or impaired operation will result.

(d) The interior and exterior of the plug shells.

(e) Junction box.

g. Reassembly.

(1) Remove all masking tape, being careful not to peel varnish from nearby areas.

(2) Reassemble the headset and test its operation.

h. Marking.

Mark the letters MFP and the date of treatment on the back of the receiver case of one of the receiver units.

Example: MFP—24 Feb. 45.

Appendix II (Added)

PACKAGING INFORMATION

Maintenance Equipment ME-40-(*) and Maintenance Kit ME-53-(*) are shipped in crates 20% by 17 $\frac{1}{4}$ by 28 inches, packed 1 to a crate. The total weight of the packed crate is approximately 160 pounds. Unpack the equipment carefully and check the components thoroughly for any damage sustained in shipping. Refer to the list of components for checking, or to the packing slip that accompanies the equipment.

[AG 300.7 (14 Dec 44)]

BY ORDER OF THE SECRETARY OF WAR:

OFFICIAL:

J. A. ULIO
Major General
The Adjutant General

G. C. MARSHALL
Chief of Staff

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Refer to FM 21-6 for explanation of distribution formula.

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TECHNICAL MANUAL
No. 11-315*

WAR DEPARTMENT
Washington 25 D. C., 10 October 1943

MAINTENANCE EQUIPMENT ME-40-(*)
AND MAINTENANCE KIT ME-53-(*)

This technical manual published on Order No. 29903-Phila-43 is furnished for the information and guidance of all concerned.

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*This Technical Manual supersedes TM-11-315, dated 15 July, 1943.

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DESTRUCTION NOTICE

- WHY** To prevent the enemy from using or salvaging this equipment for his benefit.
- WHEN** When ordered by your commander or when you are in immediate danger of capture.
- HOW**
1. Smash—Use sledges, axes, hand-axes, hammers, crow-bars, heavy tools, etc.
 2. Cut—Use axes, hand-axes, machets, etc.
 3. Burn—Use gasoline, kerosene, oil, flame-throwers, incendiary grenades, etc.
 4. Explosives—Use firearms, grenades, TNT, etc.
 5. Disposal—Bury in slit trenches, fox-holes, other holes. Throw in streams, Scatter.
 6. **USE ANYTHING IMMEDIATELY AVAILABLE FOR DESTRUCTION OF THIS EQUIPMENT.**
- WHAT**
1. Smash—Tubes, variable capacitors, resistors and coils, dry batteries, etc.
 2. Cut—Wiring, cables, cords.
 3. Bend—Metal, housings, chassis, supports, etc.
 4. Burn—Technical manuals, instruction books, messages, notes and all other papers. Throw the broken-up set into the fire and make sure all wiring is burned.
 5. Bury or Scatter—Any or all of the above pieces after breaking.

DESTROY EVERYTHING

SAFETY NOTICE

RADIO TRANSMITTER BC-1000-(*), WHEN DISASSEMBLED FOR REPAIR AND SERVICE MUST BE HANDLED WITH GREAT CARE. AT CERTAIN POINTS WITHIN THE CHASSIS 90 AND 150 VOLTS CAN BE CONTACTED. BE CAREFUL!

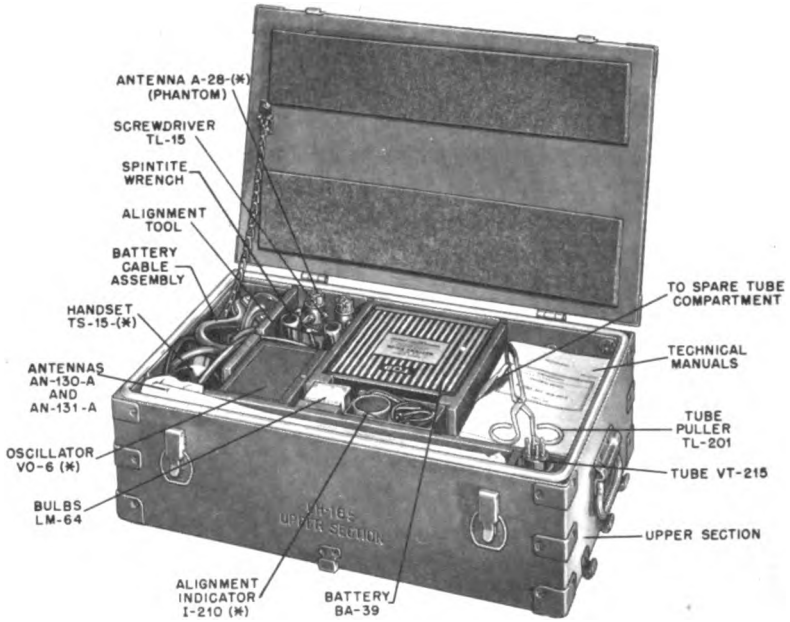


Figure 1. Chest CH-165-(*), Upper Section, Components in Position

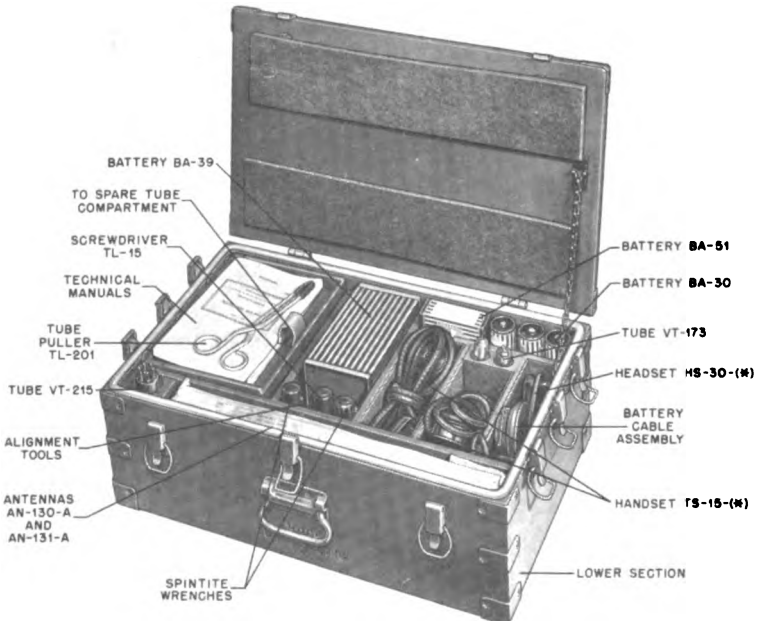


Figure 2. Chest CH-165-(*), Lower Section, Components in Position

SECTION I—DESCRIPTION

1. General.

Consult TM 11-242, Technical Manual for Radio Set SCR-300-(*). Maintenance Equipment ME-40-(*) (second echelon non-expendable tool and miscellaneous maintenance equipment for adjusting and aligning Radio Set SCR-300-(*)) is housed in Chest CH-165. Maintenance Kit ME-53-(*) used with ME-40-(*), also housed in Chest CH-165-(*), are expendable items.



Figure 3. Chest CH-165-(*), Upper and Lower Sections, Assembled

2. LIST OF COMPONENTS, WEIGHTS & DIMENSIONS

Quantity	Signal Corps Stock No.	Article	Dimensions (Inches)					Unit Weight Pounds	Part of Maint. Equip.
			Height	Width	Depth	Length	Diameter		
1		Alignment Indicator I-210-(*)	5½	4¾	2			1.50	ME-40
3		Alignment Tool						.01	ME-40
6	2A275-130A	Antenna AN-130-A (2 section)				33 (Assembled) 17 (Collapsed)	1 (Max)	.39	ME-40
6	2A275-131A	Antenna AN-131-A (8 section)				128 (Assembled) 17 (Collapsed)	1¾ (Max)	.93	ME-40
2		Antenna A-28-(*) (Phantom)						.18	ME-40
4		Battery BA-30 (1 installed in VO-6, 3 spare)				2¾	1½	.18	ME-40
3		Battery BA-51 (1 installed in VO-6, 2 spare)	3¾	2¾	1¼			.68	ME-40
2		Battery BA-29	7½	6¾	3¾			.25	ME-53
2		Battery Cable Assembly						.43	ME-40
10		Bulb LM-52 6-8 volts						.01	ME-53

MAINTENANCE EQUIPMENT ME-40- (*)
AND MAINTENANCE KIT ME-53- (*)

TM 11-315

2

3		Cord CD-874							.50	ME-40
3	26B615A	Handset TS-15- (*) Headset HS-30- (*)							1.80	ME-40
		ME-53:								
		50 1L4							.06	ME-53
		62 1T4/VT-173							.06	ME-53
		30 1S5/VT-172							.06	ME-53
		20 3A4							.06	ME-53
		10 1A3							.06	ME-53
		10 1R5/VT-171							.06	ME-53
		2 6E5/VT-215							.12	ME-53
1		Oscillator VO-6- (*)		5 1/8		5 1/8		3 1/8	3.25	ME-40
2		Screwdriver TL-15							.18	ME-40
2		Technical Manual TM 11-242		8 1/2		5 1/2			.25	ME-40
2		Technical Manual TM 11-315		8 1/2		5 1/2			.25	ME-40
3		Tube Puller TL-201							.18	ME-40
3		Wrench Spintite 3/8"		6 1/4		1 5/8 (Handle)			.12	ME-40
1		Chest CH-165		7 1/4		13 1/2		21 1/8	21.75	ME-40
1		Upper Chest		9 1/8		13 1/2		21 1/8	21.25	ME-40
1		Lower Chest								

3. Chest CH-165-(*).

Chest CH-165-(*), consists of two sections, each a separate chest made of plywood. The upper section carries that portion of Maintenance Equipment ME-40-(*), and ME-53-(*), required to make repairs on at least two Radio Sets SCR-300-(*), (within the limits of Maintenance Equipment ME-40-(*), and ME-53-(*)). The lower section stores the remaining Maintenance Equipment ME-40-(*), and ME-53-(*), components, with the exception of Battery BA-70 and BA-80 (spares for Radio Set SCR-300-(*)). (See Figures 4 and 5.) For convenience in carrying provision is made for fastening the two sections together by means of seven hold-down clips. (See Figure 3.)

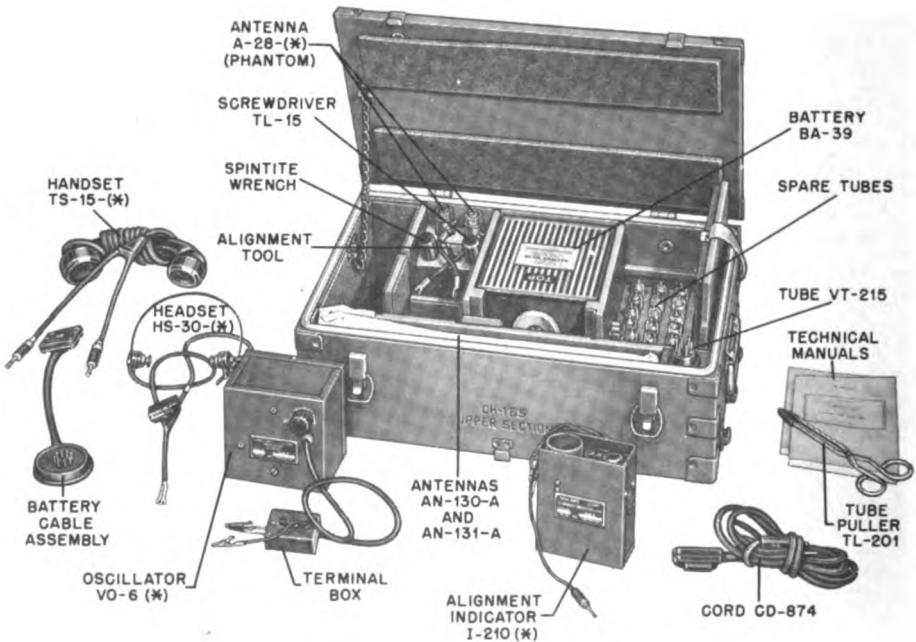


Figure 4. Chest CH-165-(*), Upper Section, Components

4. Antenna A-28-(*) (Phantom).

Antenna A-28-(*) (Phantom) consists of a parallel-resonant circuit, with a Pilot Lamp indicating Bulb LM₁ and is designed to simulate Antenna AN-131-(*) (long), so that the alignment of Radio Receiver and Transmitter BC-1000-(*) may be accomplished without the use of the antenna. Provisions have been made in Antenna A-28-(*) (Phantom) to permit the injection of a signal from a radio frequency generator.

5. Alignment Indicator I-210-(*).

Alignment Indicator I-210-(*) is a voltage indicating instrument, powered by an external battery, and uses an electron ray tube as a voltage indicator. It has three voltage measurement ranges, -4.5 volts, -6 volts, -30 volts, and is so designed as to incorporate a circuit continuity tester, up to a limited resistance value.



Figure 5. Chest CH-165-(*), Lower Section, Components

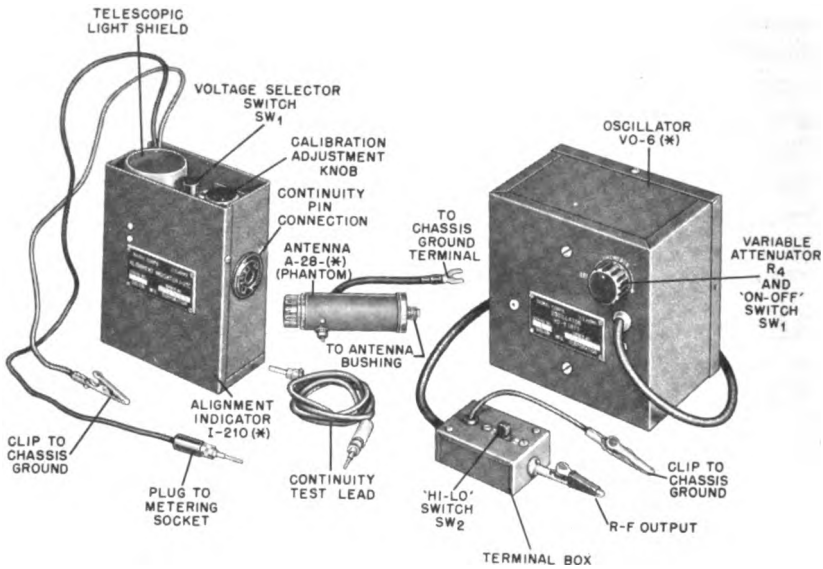


Figure 6. Instructional Detail of Alignment Indicator I-210-(*) Antenna A-28-(*) (Phantom), and Oscillator VO-6-(*)

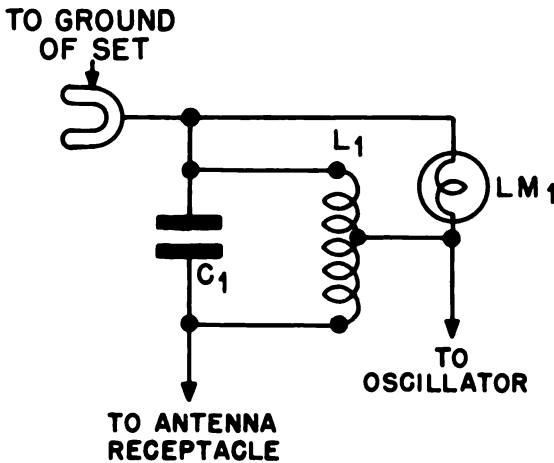


Figure 7. Maintenance Equipment ME-40-(*), Antenna A-28-(*) (Phantom), Schematic Diagram

6. Oscillator VO-6-(*)

Oscillator VO-6-(*) is a vacuum tube, crystal controlled signal generator operating at 4.3 megacycles, and powered by self contained batteries. A potentiometer control is provided to vary the radio frequency output voltage. The output is fed to a terminal box designed to simulate the radio frequency load at the mixer grid of the radio receiver under test. A single-pole, single-throw (SPST) switch in the terminal box permits "HI" and "LO" voltage output, to provide sufficient signal to receivers that are badly out of alignment.

7. Tube Puller TL-201.

Tube Puller TL-201 is a scissors-like instrument for use when replacing tube shields and vacuum tubes in Radio Receiver and Transmitter BC-1000-(*) .

8. Wrench.

The wrench is a commercial type $\frac{3}{8}$ " spin-tite, for use on coil adjustment lock-nuts.

9. Screwdriver TL-15.

Screwdriver TL-15 is a pocket screwdriver $5\frac{3}{4}$ " long having a 2" blade with $\frac{1}{4}$ " wide tip for general use.

10. Alignment Tool.

The alignment tool is a 6" by $\frac{1}{2}$ " round tool of non-metallic material with an inset metal blade on one end and a metal screwdriver on the other end, for use on coil adjustment screws and trimmer capacitors.

SECTION II—OPERATION

11. Antenna A-28-(*) (Phantom).

Antenna A-28-(*) (Phantom) consists of a parallel resonant circuit made up of 9 turns of No. 22 Wire, wound on a $\frac{3}{4}$ " coil form and spaced to cover $1\frac{5}{8}$ ", with a 15 μmf capacitor connected across it. Antenna A-28-(*) (Phantom) bearing Serial No. 1780 and higher have Capacitor C₂, 18 μmf replacing Capacitor C₁. See Tabular List of Replaceable Parts. The coil is tapped $2\frac{3}{4}$ " turns from ground end and a 150 ma. 6-8 volt bulb LM₅₂ is wired between this tap and ground. Provision is made at the tap for feeding a signal from a radio frequency signal generator. The phantom antenna simulates the loaded effect of Antenna AN-131-(*) (long), and is used when aligning transmitter of the Radio Receiver and Transmitter BC-1000-(*) . (See Figures 6 and 7.)

12. Alignment Indicator I-210-(*).

Alignment Indicator I-210-(*) is a vacuum-tube-voltage-indicating instrument (VTVI), and continuity tester, using electron-ray Tube VT-125. REMEMBER AN INCREASE OF A POSITIVE VOLTAGE APPLIED TO THE TEST PROBE TENDS TO CAUSE THE EYE TO OPEN. INCREASING THE VOLTAGE NEGATIVE TENDS TO CAUSE THE EYE TO CLOSE, *providing the VTVI is set for the range of the applied voltage.*

The circuit of Alignment Indicator I-210-(*) is so designed that a voltage is applied (through a voltage dividing network), to the grid of Tube VT-215, thus making a noticeable change in the angle of the shadow on the fluorescent target. For calibrating, plug the VTVI into Battery BA-39 by use of Plug PL₁ located in the back of the unit. Battery BA-39 is carried with Maintenance Equipment ME-40-(*) and ME-53-(*). (See Figures 4 and 8.)

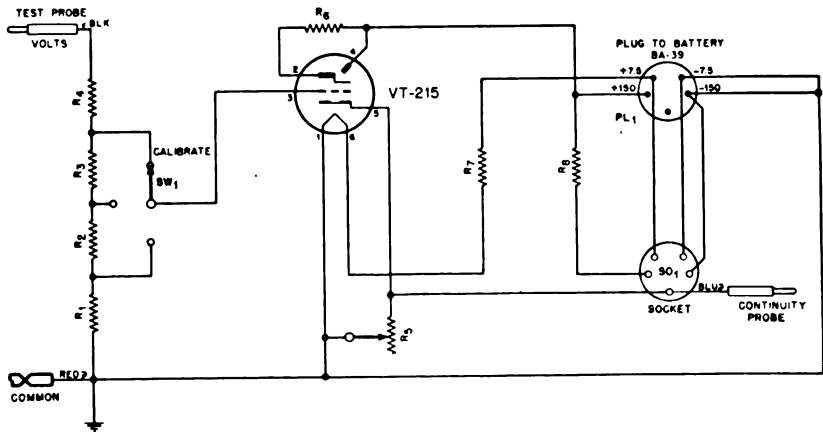


Figure 8. Maintenance Equipment ME-40-(*), Alignment Indicator I-210-(*), Schematic Diagram

a. Calibration of Alignment Indicator I-210-()*

The VTVI may be calibrated to indicate exactly $-4\frac{1}{2}$, -6 , and -30 volts. With the Voltage Selector Switch SW₁ in $4\frac{1}{2}$ volt position, connect the clip (red lead) to the positive terminal, and connect the test probe (black lead) to the minus terminal of a $4\frac{1}{2}$ volt supply. Adjust the CALIBRATE Knob (R₅) until only a hairline shadow appears on the fluorescent target. The unit is then calibrated to indicate the above voltages.

b. Continuity Measurements.

Take the separate blue lead that is provided and plug one end into Socket SO₁ at the arrow. Then use the blue and the red lead to test continuity or resistance indications below 5,000 ohms. For best operation, adjust the CALIBRATE Knob (R₅) to a hairline shadow of the fluorescent target, while the blue and red leads are shorted together.

c. Operation as a Voltage Indicator.

(1) When checking positive voltages connect the black lead to the chassis and the red lead to the positive terminal to be measured. When checking negative voltages connect the red lead to the chassis and the black lead to the negative terminal to be measured.

(2) Resistors, R₁, R₂, R₃ and R₄ with Switch SW₁ make up a voltage-dividing network which permits variations of shadow on the fluorescent target, over a voltage range up to -30 volts, in three steps of $-4\frac{1}{2}$ volts, -6 volts, -30 volts.

(3) Variable Resistor R₅ (Calibration Potentiometer) by virtue of the plate and target currents, permits adjustment (by varying the negative bias to the grid of Tube VT-215) so that when a $-4\frac{1}{2}$ volt potential is applied to the test lead (black with test probe), and with Voltage Selector Switch SW₁ in the $-4\frac{1}{2}$ volt CALIBRATE position, the shadow on the fluorescent target can be adjusted to a hairline.

(4) Resistor R₆ is a voltage dropping resistor connected between the target and plate of Tube VT-215. If no negative potential is present on the grid of Tube VT-215, a plate current will flow, thus bringing about a voltage drop across Resistor R₆ and putting the plate of Tube VT-215 at a lower potential than the target. The plate has a fin protruding in the electron path from the cathode to the target, which sets up an electrostatic field preventing electrons from

striking the immediate surrounding portion of the target. The target which is coated with a fluorescent material, glows when electrons strike it, thus causing a non-glow or shadow to appear. If there is a negative potential on the grid of Tube VT-215, less plate current will flow and very little (depending upon the negative potential of the grid of Tube VT-215) voltage drop across Resistor R₆ will result, thus putting the target and plate at nearly equal or equal potential. Since these two elements are of approximately the same potential, the electrostatic field that existed when the target and plate were of different potential, is no longer present. As a result, the electrons emitted from the cathode strike the entire fluorescent target and no shadow appears. Thus, by varying the negative potential on the grid of Tube VT-215, a respective variation in the shadow will appear on the fluorescent target.

(5) Resistor R₇ is a voltage-dropping resistor used to bring the filament battery potential down to the operating value for Tube VT-215.

(6) Resistor R₈ is a voltage-dropping resistor which is used when Battery BA-39 is the power source, when equipment other than Radio Set SCR-300-(*) is maintained or repaired. Alignment Indicator I-210-(*) is plugged into Battery BA-39 and the plug from the unit (other than SCR-300-(*) is plugged into the five prong Socket SO₁. Resistor R₈ then is in series with the B+ (+150 volts) battery source.

d. Operation as a Continuity Meter.

Using Alignment Indicator I-210-(*) as a continuity tester, take the separate blue lead that is provided and plug one end into Socket SO₁ at the arrow. Adjust Resistor R₅, so that the shadow on the fluorescent target becomes a hairline or entirely disappears. A negative bias is now present on the grid of Tube VT-215. Connect the portion of the circuit (tube, transformer, etc.) to be tested between the red lead and the blue lead. When continuity is present, it will short out the bias resistor R₅ and the shadow will again appear. This function of the Alignment Indicator I-210-(*) is limited to continuity of resistances that do not exceed 5,000 ohms. The continuity portion of the Alignment Indicator I-210-(*) will function with the Voltage Selector Switch SW₁ in any position. To test its operation after adjusting for continuity measurements, short the red and blue leads together, and a shadow (approximately 90°) should appear on the fluorescent target.

13. Oscillator VO-6-(*)

a. Oscillator VO-6-(*) is a crystal controlled signal generator using a 4.3 mc. crystal in Crystal Holder FT-243, and Vacuum Tube VT-173. It is powered by one Battery BA-51 (which supplies the required plate voltage of $67\frac{1}{2}$ volts and current of approximately 1.5 ma.) and one Battery BA-30 (which supplies the required filament voltage one volt and current of .05 amp.). These batteries are contained in Oscillator VO-6-(*)

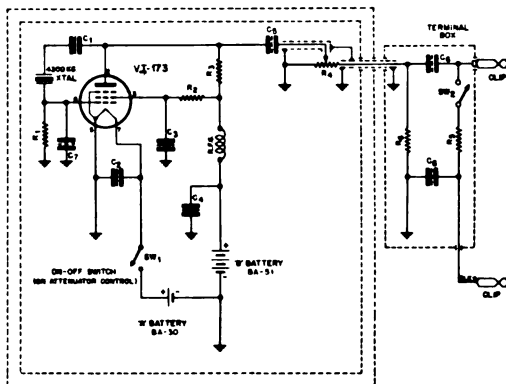


Figure 9. Maintenance Equipment ME-40-(*), Oscillator VO-6-(*) Schematic Diagram

b. Switch SW₁ and Potentiometer R₄ provide ON-OFF Control and attenuation of the radio frequency output, and is mounted directly in the housing proper. Rotating this control knob to the right (clockwise) increases the output. Extreme left hand (counter-clockwise) turns the filament current of the VT-173 and the signal generator off. At the end of the attached rubber covered, flexible, shielded cable there is a terminal box which is designed as a dummy load (to simulate the r-f load at the grid of the mixer tube of the receiver under test). The terminal box incorporates a single-pole single-throw Switch SW₂ for switching the output signal from a low range to a high range. Usually the output signal is fed into the receiver under test at the grid of the mixer tube, for alignment of I-F and discriminator coils.

c. Always TURN the Potentiometer control off after using Oscillator VO-6-(*). This is done by rotating the control to the extreme left (counter-clockwise) until the click of Switch SW₁ is heard. This precaution is necessary to prolong the life of the batteries.

SECTION III—ALIGNMENT PROCEDURE

CAUTION

Don't press calibrate button of Radio Set SCR-300-(*) out in the field unless Antenna A-28-(*) (Phantom) is installed. This is apt to disable all other receivers in the vicinity.

Don't test filament continuity with an ohmmeter.

Don't press calibrate button and transmitter switch at the same time.

Before attempting to align Radio Receiver and Transmitter BC-1000-(*), check the Discriminator (See Par. 25), refer to the following chart:

BURNED OUT TUBE LOCATION CHART

<i>Test No.</i>	<i>Following Tube Filaments OK if Indication is Obtained</i>	<i>Metering Socket Connection</i>	<i>Press the Following</i>	<i>OK Indication Obtained</i>
1	V ₄ , V ₅ , V ₈	1		Voltage indication (on 6-volt scale).
2	V ₂ (also dial light).	4	PRESS FOR DIAL LIGHT AND CALIB. button.	Dial light lights dimly. Voltage indication (on 30-volt scale).
3	V ₁	4	Handset transmit switch	Voltage indication (on 30-volt scale).
4	V ₃ , V ₁₁ , V ₁₂	5	Handset transmit switch.	Voltage indication. (on 30-volt scale).
5	V ₉ , V ₁₀ , V ₁₄	2	PRESS FOR DIAL LIGHT AND CALIB. button.	Voltage indication (on 30-volt scale).
6	V ₇ , V ₁₃	3	PRESS FOR DIAL LIGHT AND CALIB. button.	Voltage indication (on 30-volt scale).
7	V ₆ , V ₁₅	—	PRESS FOR DIAL LIGHT AND CALIB. button.	Hear signal at either one of calibration marks.
8	V ₁₆ , V ₁₇ , V ₁₈	—	Turn SQUELCH control on and advance to the right. Tubes OK if noise disappears.	

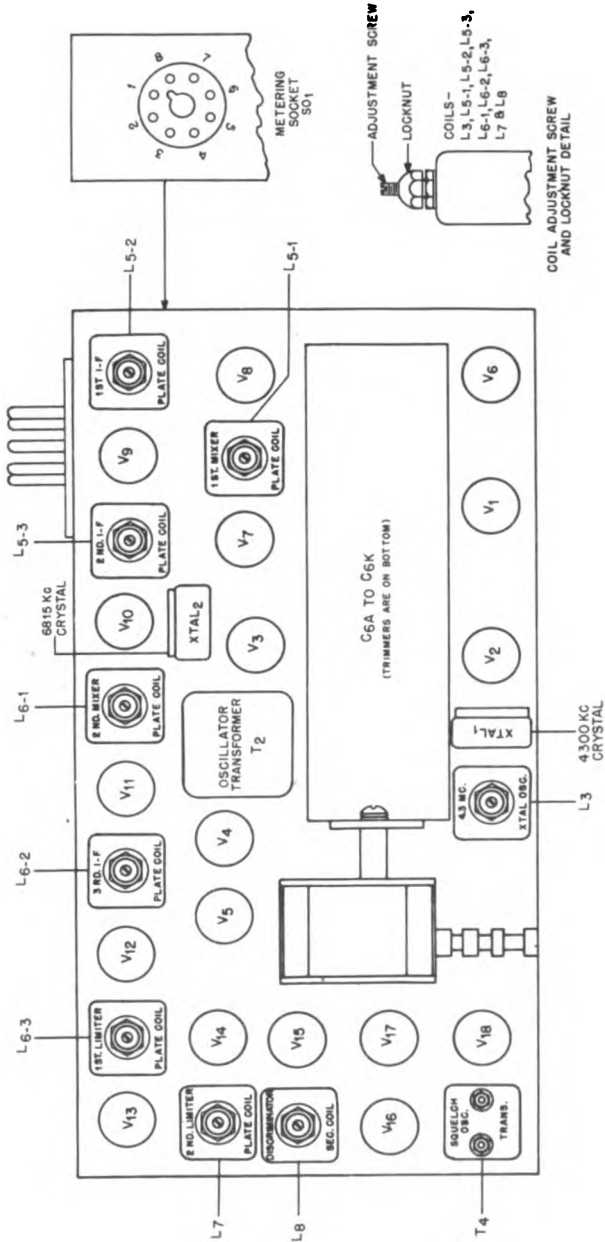


Figure 10. Radio Receiver and Transmitter BC-1000-A, Alignment Instructional Detail, Top View

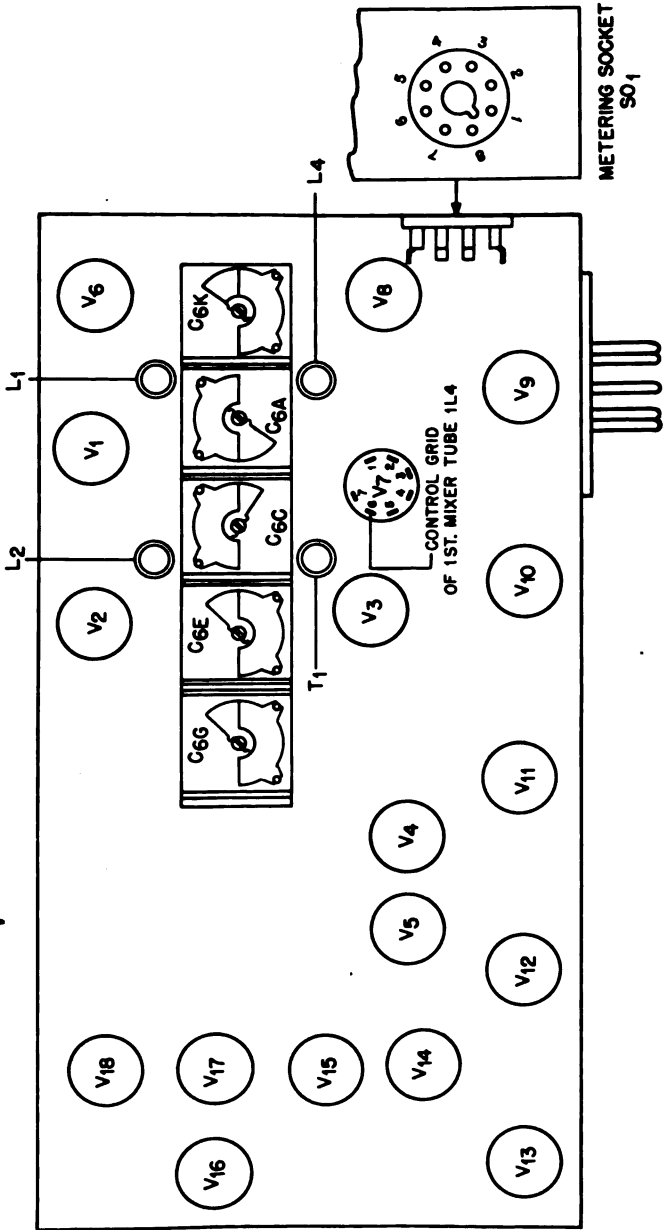


Figure 11. Radio Receiver and Transmitter BC-1000-A, Alignment Instruction Detail, Bottom View

14. Preliminary Procedure.

- a. Remove chassis of Radio Receiver and Transmitter BC-1000-(*) from case and disconnect Battery BA-70 or BA-80 from case.
- b. Connect Radio Receiver and Transmitter BC-1000-(*) to Battery BA-70 or BA-80 by using Cord #1X41796 (Galvin part number) furnished with Maintenance Equipment ME-40-(*).
- c. Plug in Handset TS-15-(*).
- d. Turn on the Radio Receiver and Transmitter BC-1000-(*), and allow it to warm up for two or three minutes.
- e. Loosen lock nuts on L₃, L₅₋₁₋₂₋₃ and L₆₋₁₋₂₋₃, L₇ and L₈. *These lock nuts should be loosened just enough to leave some tension on the screw adjustment.*
- f. Remove antenna from radio receiver under test if one is installed.
- g. Install Antenna A-28-(*) (Phantom).

15. Aligning 4.3 Megacycles Crystal Oscillator.

- a. Plug the Alignment Indicator I-210-(*) (VTVI) into Battery BA-39.
- b. Turn the VTVI CALIBRATE Knob to open the shadow angle on fluorescent target to 90° (30 volt scale), and screw the adjustment of L₃ on Radio Receiver and Transmitter BC-1000-(*) all the way out (counter-clockwise).
- c. Insert the test probe in metering socket Pin No. 4 of Radio Receiver and Transmitter BC-1000-(*) and connect the alligator clip to the chassis.
- d. Press the calibrate button on Radio Receiver and Transmitter BC-1000-(*), and screw the adjustment of L₃ to the right (clockwise) until the shadow on the fluorescent target becomes a hairline or entirely disappears; then screw the adjustment to the left (counter-clockwise) ½ to ¾ turn and leave it there. Tighten the lock-nut.

16. Aligning Discriminator and 2nd Limiter.

- a. With the Voltage Selector Switch SW₁ in the 4½ volt position, short the test probe and alligator clip of the VTVI and adjust the CALIBRATE Knob (R₅) for a hairline shadow on the fluorescent target.

- b.* Insert the test probe in Pin No. 7 of metering socket.
- c.* Press the calibrate button on the radio receiver-transmitter and adjust L_8 so that plus 0.5 volts appears at Pin No. 7.

NOTE: In adjusting Coil L_8 , it will be noted that there is a point where the indicator eye of the Alignment Indicator I-210-(*) will be extremely active. At this point have the adjustment such that a shadow of approximately 5 or 10° appears on the fluorescent target of the VTVI. REMEMBER AN INCREASE IN POSITIVE VOLTAGE TENDS TO CAUSE THE EYE TO OPEN, AND AN INCREASE IN NEGATIVE VOLTAGE CAUSES THE EYE TO CLOSE OR OVERLAP.

d. After adjusting L_8 to +0.5 volts adjust screw on L_7 for maximum shadow angle on the eye tube. If the angle opens up too wide during this adjustment (85 to 90 degrees) turn L_8 screw back in a counter-clockwise left direction very slowly so the angle again reduces to 5 or 10 degrees and re-adjust L_7 to maximum angle on the eye tube and tighten its lock nut.

e. With a very slight adjustment on the L_8 screw in a counter-clockwise direction the shadow angle on the eye tube may be reduced to a hairline. Tighten the lock nut on L_8 , making sure it does not disturb the final setting of the screw. Check this by observing that the shadow angle remains a hairline after nut is tightened.

NOTE: THE CALIBRATE BUTTON MUST BE DEPRESSED DURING THIS ENTIRE OPERATION.

17. Adjusting I. F.

a. With the Voltage Selector Switch SW_1 set in the 4½ volt position, open the shadow angle of VTVI by adjusting the CALIBRATE Knob R_5 .

b. Insert the probe in Pin No. 2 of metering socket.

c. Connect Oscillator VO-6-(*) by attaching the loose lead alligator clip of the terminal box to chassis or ground and attach the other alligator clip to grid (Pin No. 6) of mixer first tube (V_7).

d. Throw Switch SW_2 of the oscillator terminal box (dummy load) to LO position.

e. Turn Potentiometer Control R_4 of the oscillator to the right (clockwise) just enough to show an indication or vary the shadow of the VTVI indicator tube. (If there is no indication leave the potentiometer control on full, and throw Switch SW_2 to HI. If there is still no indication, set $L_{5-1-2-3}$, L_{6-1-2} , so that the adjusting screws are extended about $\frac{1}{4}$ " , and then adjust them for maximum noise in Handset TS-15-(*).

f. Reduce the input signal until a small indication is obtained on the fluorescent target VTVI, and adjust L_{5-1} and L_{6-1} to minimum shadow angle (negative volts). Tighten each lock nut as you go, watching the eye to insure that there is no misalignment.

18. Aligning 1st Limiter.

a. Set the VTVI Voltage Selector Switch SW_1 in the 30 volts position.

b. Insert the probe in Pin No. 3 of metering socket and adjust L_{6-3} for minimum shadow angle. Turn off signal generator by rotating Potentiometer Control to extreme left (counter-clockwise), and remove output leads of the signal generator from the radio set.

NOTE: Check to see that lock nuts of L_3 , L_{5-1} , L_{6-1} , L_7 , L_8 are snug. Be careful not to change the settings.

19. Checking Discriminator.

a. Set the VTVI Voltage Selector Switch SW_1 in the $4\frac{1}{2}$ volt position, short the test leads and adjust CALIBRATE Knob for a hairline shadow on the fluorescent target.

b. Insert the probe in Pin No. 7 of metering socket (SO_1). There should be no change in the shadow angle of Tube VT-215 from the original hairline setting. If there is, a very slight readjustment of L_{5-1} or L_{5-2} should bring the eye back to the hairline, with slight flutter (due to noise (R.F.)).

CAUTION: ALL FOLLOWING ADJUSTMENTS SHOULD BE MADE QUICKLY TO PREVENT DAMAGE TO OUTPUT TUBES.

20. Aligning Master Oscillator.

a. Center the dial indicator (in the window over the dial of the radio set under test) by use of the Indicator Adjustment.

b. Bring the dial of the radio set under test to calibrate line between channels 36 and 37. Press the switch on Handset TS-15-(*), and with the receiver to your ear, QUICKLY adjust trimmer C₆ g. for zero beat.

c. Bring dial of radio set under test to Channel 20.

d. Remove the test lead of VTVI.

21. Aligning Doubler.

a. Set the Voltage Selector Switch SW₁ of VTVI in the 30 volt position and with adjustment of CALIBRATE knob (R₅), open the eye to approximately 90°.

b. Insert the probe in metering socket in Pin No. 5.

c. Press the switch on Handset TS-15-(*), and quickly adjust C₆ e for minimum shadow on the fluorescent target.

22. Aligning Transmitter Mixer.

Press the switch on Handset TS-15-(*), and adjust C₆ c for minimum shadow.

23. Aligning Transmitter R-F Power Amplifier.

Insert the test probe in Pin No. 6 of metering socket, and with the switch of TS-15-(*) pressed, quickly adjust C₆A for a minimum shadow on fluorescent target (approximately -25 volts).

24. Aligning Receiver R-F Power Amplifier

Insert test probe in metering socket Pin No. 3 and adjust C₆k for minimum shadow. (Handset TS-15-(*) switch is not pressed for this step, and no signal is being received.)

25. A Final Check of Discriminator.

a. Set the VTVI Voltage Selector Switch SW₁ in the 4½ volt position, short the test probe and alligator clip and adjust CALIBRATE knob (R₅) for a hairline shadow on the fluorescent target.

b. Insert the probe in metering socket No. 7. There should be no change in the shadow angle of Tube VT-215 from the original hairline setting. If there is, then a very slight readjustment of L₅₋₁ or L₅₋₂

should bring the eye back to the hairline, with slight flutter (due to noise (R.F.)).

SECTION IV—MAINTENANCE

Maintenance Equipment ME-40-(*) and ME-53-(*) contain only three units which will require maintenance.

26. Antenna A-28-(*) (Phantom)

To replace the indicator bulb, unscrew the plastic cap. Remove the tubular, bayonet tube bulb LM₁ and replace with a new LM₁ (6-8 volt, 0.15 Amp.) or Mazda 47. Replace the plastic cap.

27. Alignment Indicator I-210-(*)

If the unit fails to work properly, change to a fresh Battery BA-39. If the tube does not light, replace it with one of the spare Vacuum Tubes VT-215 contained in the Chest CH-165. Use the Tube Puller TL-201 for this purpose. If the tube still does not light, short the clip of the read lead to the socket SO₁ at the arrow. The tube then should light, and it is an indication that there is a poor contact within the Calibrate Control Potentiometer R₅.

28 Oscillator VO-6-(*)

If the unit fails, replace the Tube VT-173 and Batteries BA-30 and BA-31. Check the removed parts later, and discard those that are defective.

a. Replacement of BA-51 or Vacuum Tube VT-173, or BA-30.

- (1) Remove the four screws on the outer housing cover.
- (2) Remove the screw on Battery BA-30 retainer plate.
- (3) Remove Battery BA-30.
- (4) Remove the control knob and the two screws on the front of the outer housing.
- (5) Pull the inside case out, allowing the cord to slide through the outer housing.
- (6) Remove the screw holding the cover to the inside box, and lift the chassis out.
- (7) Insert a new Battery BA-51 and/or Vacuum Tube VT-173, and replace chassis in case.
- (8) Insert Battery BA-30 with its positive terminal in.
- (9) Reassemble the unit.

29 TABULAR LIST OF REPLACEABLE PARTS FOR MAINTENANCE EQUIPMENT ME-40-(*)
a. ANTENNA A-28-(*)(PHANTOM)

TM 11-315
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SECTION V—SUPPLEMENTARY DATA
SIGNAL CORPS

Field Stock	Quantity Depot Stock	In Set	Ref. No.	Signal Corps Stock No.	Name of Part and Description	Function	Mfr. No.	Galvan Part and Drawing No.
2		1	C ₁ *		Capacitor Fixed, ceramic; 15 μ f. \pm 2%, D15 printed on body and red dot. Negative temperature coefficient zero. .437" long x .203" diameter.	Part of parallel resonant circuit.	118	21A49795
2		1	C ₂ *		Capacitor Fixed, ceramic; 18 μ f \pm 2%, 500 w-v d-c. Temperature coefficient zero. D-18 printed on body, red tolerance dot. .625" long x .203" diameter. —Muter Type D-18	Part of parallel resonant circuit.	8	21A60848
		1	L ₁		Coil, Antenna (Phantom) 8 $\frac{3}{4}$ turns of #22 tinned copper wire, tapped at 2 $\frac{3}{4}$ turns from top. Wound on varnished sleeving form. Inductance—1.25 micro henries. —Special	Part of parallel resonant circuit.	1	24B49041
10		1	LM ₁		Pilot Light Bulb LM-6 $\frac{1}{2}$. 6-8 volt, 0.15 ampere (brown bead). Tubular bulb, bayonet type base. —Mazda #47	Pilot light for output indicator.	53	65X11854
1		1	101		Antenna A-28-(*)(Phantom) A parallel resonant circuit, consisting of L ₁ , C ₁ , LM ₁ and all necessary hardware. —Special	Antenna used for alignment.	1	1X47500

*C, replaced by C₂ after serial No. 1780 on order No. 29903-Phila.-43.

1	102	Bushing, Adaptor 3/8-24 thread on one end, 7/8-14 thread on other end. Overall dimensions: 1.0627" long x 7/8" diameter. Brass, black nickel finish. —Special	Antenna (AN-130-A) adaptor.	1	43B41813
1	103	Insulating Sleeve, Assembly Natural laminated phenolic tube 2 1/4" long x 1" diameter. One end tapped 7/8-16 thread, 3/8" deep; other end tapped 7/8-14 thread, 7/16" deep. Olive drab wrinkle finish. —Special	Sleeve over antenna coil.	1	1X49087
1	104	Lead, Antenna Grounding (Assembly) 5 1/2" long flexible insulated lead with a spade lug on one end and a plain terminal lug on other end. —Special	Antenna A-28 (Phantom) grounding lead.	1	30A41694
11	105	Lockwasher #6 internal, 3/8" outside diameter. Spring steel, black nickel finish. —Shakeproof #1206	Lockwasher for #6 screws.	70	4S8410
11	106	Nut 6-32 thread, 5/16" hexagonal. Cold rolled steel, black nickel finish.	Nut for #6 screw.	26	2S9603
2	107	Screw, Antenna Terminal 6-32 thread; 3/8" long 1/8" underhead, .150" diameter has straight knurl. Plain head .260" diameter. Brass, black nickel finish. —Special	Screw to connect Antenna A-28 to radio set.	1	3A41664
3					

List of Manufacturer's names and addresses follows Tabular List of Replaceable Parts.

**TABULAR LIST OF REPLACEABLE PARTS FOR MAINTENANCE EQUIPMENT ME-40-(*),
a ANTENNA A-28-(* (PHANTOM) Cont.**

Field Stock	Quantity Depot Stock	In Set	Ref. No.	Signal Corps Stock No.	Name of Part and Description	Function	Mfr. No.	Galvin Part and Drawing No.
		1	108		Socket, Pilot Light (Assembly) Consists of bayonet type socket shell soldered to a plug bottom drilled for leads, flat washer and spring. White cadmium finish.	R-F output indicator.	23	60A47949
		1	109		Washer $\frac{5}{16}$ " outside diameter x $\frac{3}{4}$ " inside diameter x .032" thick. Black nickel finish.	Used under antenna screw terminal.	13	4S8261
		2	110		Washer, Waterseal $\frac{5}{16}$ " outside diameter x $\frac{1}{8}$ " inside diameter x $\frac{1}{8}$ " thick. Black synthetic rubber. —Special	Used under antenna screw terminal.	1	4K41624
		3	111		Washer, Waterseal 1" outside diameter; $\frac{7}{8}$ " inside diameter x $\frac{1}{8}$ " thick. Black neoprene. —Special	Waterseal for antenna grounding lead.	1	4A47947
		1	112		Window, Pilot Light Clear molded, cellulose acetate or Acetobuytrate. 12 notches on top. $\frac{7}{8}$ " on bottom has $\frac{7}{8}$ -16 thread. Overall $\frac{3}{8}$ " thick x $\frac{1}{2}$ " diameter. —Special	Window for pilot light bulb.	1	61A47886
		2	113		Washer, Waterseal $1\frac{1}{16}$ " outside diameter x $\frac{3}{4}$ " inside diameter x $\frac{1}{16}$ " thick. Neoprene. Black.	Waterseal for antenna ground lead.		4A49653

**TABULAR LIST OF REPLACEABLE PARTS FOR MAINTENANCE EQUIPMENT ME-40-(*),
b ALIGNMENT INDICATOR I-210-(*)**

Field Stock	Quantity Depot Stock	In Set	Ref. No.	Signal Corps Stock No.	Name of Part and Description	Function	Mfr. No.	Galvin Part and Drawing No.
		1	125		Alignment Indicator I-210-(*) —Special	Negative voltage indicator and continuity meter.	1	1X47400
2		1	PL ₁		Plug Bakelite body, five pins, nickel plated. 1¼" diameter x 3¼" high overall. Body held to plate or chassis with clamping ring. —Special	Battery plug.	1	28A49006
2		1	R ₁		Resistor Fixed, carbon; 600,000 ohms, ± 10%, ½ watt insulated. ⅛" long x .218" diameter. Erie Type 504 Ins. Stackpole Type MB ½ Ins. ⅝" long x .187" diameter. I.R.C. Type BT ½ Ins.	Voltage divider.	45 61 103	6B5681
2		1	R ₂		Resistor Fixed, carbon; 2.4 megohms, ± 10%, ½ watt insulated. ⅛" long x .218" diameter. Erie Type 504 Ins. Stackpole Type MB ½ Ins. ⅝" long x .187" diameter. I.R.C. Type BT ½ Ins.	Voltage divider.	45 61 103	6B5282

List of Manufacturer's names and addresses follows Tabular List of Replaceable Parts.

TABULAR LIST OF REPLACEABLE PARTS FOR MAINTENANCE EQUIPMENT ME-40-(*)
b ALIGNMENT INDICATOR I-210-(*) Cont.

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SIGNAL CORPS

Field Stock	Quantity Depot Stock	In Set	Ref. No.	Signal Corps Stock No.	Name of Part and Description	Function	Mfr. No.	Galvan Part and Drawing No.
2		2	R ₃		Resistor Fixed, carbon; 1 megohm, = 10%, ½ watt insulated. ¼" long x .218" diameter. Erie Type 504 Ins. Stackpole Type MB ½ Ins. ⅝" long x .187" diameter. I.R.C. Type BT ½ Ins. (Also R ₆).	Voltage divider.	45 61 103	6B6046
2		1	R ₄		Resistor Fixed, carbon; 2 megohms, = 10%, ½ watt insulated. ¼" long x .218" diameter. Erie Type 504 Ins. Stackpole Type MB ½ Ins. ⅝" long x .187" diameter. I.R.C. Type BT ½ Ins.	Voltage divider.	45 61 103	6B69498
2		1	R ₅		Potentiometer, Calibrating Overall resistance: 5,000 ohms, = 10%. Mounting shaft insulated, cover grounded. Control end terminals brass tin finish. Control center terminals nickel silver tin finish. ⅜-32 thread x ¼" long mounting stud. Overall dimensions: 1¼" diameter x 1¼" high.	Calibrating control.	16	18A47992

—Chicago Telephone Supply #252

2	R ₆	Resistor Same as R ₃ .	Plate dropping.	1	17A49042
2	R ₇	Resistor Fixed, wire-wound; 3 ohms, $\pm 5\%$, 1 watt insulated. $1\frac{1}{8}$ " long x $\frac{1}{8}$ " diameter. Ceramic cover. —Special	Filament dropping.	1	17A49043
2	R ₈	Resistor Fixed, wire-wound; 500 ohms, $\pm 5\%$, 5 watts insulated. $1\frac{1}{8}$ " long x $1\frac{1}{8}$ " diameter. Two metal clamps at ends eyeleted to terminal lugs and soldered. —Special or: Resistor Fixed, wire-wound; 500 ohms, $\pm 5\%$, 5 watts. $1\frac{1}{8}$ " long x $1\frac{1}{8}$ " diameter. Ceramic cover. —Special	Plate dropping to radio set under test.	1	17K49008
2	SO ₁	Socket, molded (5 prong) Bakelite body; 5 American Phenolic #9-4 contacts, bright silver plated. Tube pin members molded in bottom face of body. Mounting plate cold rolled steel, bright nickel plated, 2 slotted holes for mounting. Body held to plate by clamping ring.	Socket connection to radio under set	102	9A49028

List of Manufacturer's names and addresses follows Tabular List of Replaceable Parts.

**TABULAR LIST OF REPLACEABLE PARTS FOR MAINTENANCE EQUIPMENT ME-40-(*),
b ALIGNMENT INDICATOR I-210-(*) Cont.**

Field Stock	Quantity Depot Stock	In Set	Ref. No.	Signal Corps Stock No.	Name of Part and Description	Function	Mfr. No.	Galvan Part and Drawing No.
2		1	SW1		Switch, Voltage Selector Bakelite body; silver plated contacts and lugs. Metal parts cadmium plated. Two holes extruded and tapped for 6-32 thread. Overall dimensions: $1\frac{1}{8}$ " wide x $2\frac{1}{2}$ " long x $\frac{7}{16}$ " thick.	Voltage selector.	6	40A47938
2		1	126		Assembly, Alligator Clip and Leads Alligator clip (129) and 25" red #18 wire soldered to clip.	Common ground lead (red).	1	1X47995
2		1	127		Assembly, Solderless Tip and Lead Solderless tip (146) and 23" blue wire connected and soldered to tip.	Continuity test probe.	1	1X47996
2		1	128		Assembly, Insulated Pin Terminal and Lead Terminal insulated pin (144) and 34" #18 black wire soldered to terminal. —Special	Voltage test lead.	1	1X47997
		1	129		Cable Clamp Cold rolled steel; $\frac{7}{8}$ " long x $\frac{1}{16}$ " wide x .032" thick. .140" diameter mounting hole. White cadmium plated. —Special	Clamps cable in position.	1	42A49003

1	130	Clip, Alligator Metal, white cadmium plated. Overall dimensions: $1\frac{1}{8}$ " long x $\frac{1}{2}$ " wide. —Mueller Electric #60	Alligator clip for common lead (red)	113	42A47888
1	131	Knob, Calibrate 1 " diameter x $\frac{9}{16}$ " thick. Has two 8-32 x $\frac{5}{16}$ " setscrews; white indicator dot on face. Edge is fluted. Black bakelite.	Knob for calibra- tion potentiome- ter.	94	36A41538
2	132	Lockwasher $\#6$ internal, $\frac{9}{32}$ " outside diameter. Spring steel, white cadmium finish. —Shakeproof #1206	Lockwasher for #6 screw.	70	4S7650
1	133	Lockwasher $\frac{3}{8}$ " internal, $1\frac{1}{16}$ " outside diameter. Spring steel, white cadmium finish. —Shakeproof #1220	Used under nut of calibrating poten- tiometer.	70	4S7655
4	134	Nut 6-32 thread; $\frac{1}{4}$ " hexagonal. Cold rolled steel. White cadmium finish.	Nut for #6 screw.	26	2S7005
1	135	Nut $\frac{3}{8}$ -32 thread; $\frac{1}{2}$ " hexagonal. Cold rolled steel. White cadmium finish.	Fastening calibra- ting potentiome- ter.	26	2S7018

List of Manufacturer's names and addresses follows Tabular List of Replaceable Parts.

**TABULAR LIST OF REPLACEABLE PARTS FOR MAINTENANCE EQUIPMENT ME-40-(*),
b ALIGNMENT INDICATOR I-210-(*) Cont.**

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SIGNAL CORPS

Field Stock	Quantity Depot Stock	In Set	Ref. No.	Signal Corps Stock No.	Name of Part and Description	Function	Mfr. No.	Galvin Part and Drawing No.
2		1	136		Button Knob Bakelite, molded; overall dimensions: $1\frac{9}{16}$ " long x $1\frac{1}{8}$ " wide. —Kurz Kasch #S-332-50	Knob for selector switch.	110	38A49275
		2	137		Rivet $\frac{3}{16}$ " long x .088" diameter. Cold rolled steel, black nickel plated. Thomson S-1727-1- $\frac{1}{2}$.	Mounting tube retainer spring.	111	5S8487
		11	138		Screw 6-32 thread x $\frac{3}{16}$ " long, slotted binder-head machine screw. Cold rolled steel, black nickel finish.	Mounting molded sockets.	26	3S9683
		4	139		Screw 4-24 thread x $\frac{3}{16}$ " long, slotted round head, Self tapping sheet metal. Black nickel finish. —Parker Kalon Type Z	Screw used to fasten name plate.	112	3S8183
		1	140		Setscrew 8-32 thread x $\frac{3}{16}$ " long, slotted headless cup point. Case hardened steel, black nickel finish.	Calibration control knob set screw.	109	3S7146

1	141	Shield, Indicator Tube Laminated bakelite; 4 1/4" long x 1 5/8" inside diameter x 3/16" thick wall. —Special	Shield around Tube VT-215.	1	26A47890
2	142	Socket, Molded (6 prong) Bakelite; six American Phenolic #9-4 contacts, silver plated. Tube pin members molded into bottom face. Body held to plate or chassis by clamping ring. —American Phenolic #4	Tube VT-215 socket.	102	9A49007
	143	Spring, Tube Retainer Spring steel; half round, 13/16" radius x 5/8" wide x .025" thick. Two holes .136" diameter at center. —Special	Hold tubes in position.	1	41A49096
	144	Terminal, Insulated Pin (Blue) Bakelite, blue; 3/8" diameter x 1 5/16" long. Pin: 17/32" long x .125" diameter.	Continuity lead terminal.	102	29K5409
	145	Terminal, Insulated Pin (Black) Bakelite, black; 3/8" diameter x 1 5/16" long. Pin: 7/16" long x .093" diameter.	Terminal on voltage test lead.	107	29K49094
2	146	Terminal Strip Bakelite; 1 1/2" long x 3/8" wide x 1/16" thick. Two #X1464 and one #1465 Cinch lugs mounted on strip.	Tie point.	23	31A31218

List of Manufacturer's names and addresses follows Tabular List of Replaceable Parts.

**TABULAR LIST OF REPLACEABLE PARTS FOR MAINTENANCE EQUIPMENT ME-40-(*)
b ALIGNMENT INDICATOR I-210-(*) Cont.**

Field Stock	Quantity Depot Stock	In Set	Ref. No.	Signal Corps Stock No.	Name of Part and Description	Function	Mfr. No.	Galvin Part and Drawing No.
		1	147		Tip, Solderless Wire Lucite sleeve, blue; 3/8" diameter x 3/4" long. Brass tip, 1" long overall. Knurled sleeve tapped 10-32 to fit over 10-32 threaded portion of tip. —American Hardware #141	Tip on continuity test probe.	107	29K47952
		1	148		VT-215 (Electron Ray Indicator 6E5.	Voltage and continuity indicator.	21	6E5

TABULAR LIST OF REPLACEABLE PARTS FOR MAINTENANCE EQUIPMENT ME-40- (*)
C. COMPONENTS

Field Stock	Quantity Depot Stock	In Set	Ref. No.	Signal Corps Stock No.	Name of Part and Description	Function	Mfr. No.	Galvin Part and Drawing No.
		2	175		Screwdriver TL-15 5 $\frac{13}{16}$ " long x $\frac{15}{16}$ " diameter at wood handle. Steel bit, 2 $\frac{1}{8}$ " long x $\frac{7}{16}$ " diameter x $\frac{1}{16}$ " width blade. All metal parts are cadmium plated, wood part is dull black enamel. —Yankee #90	General repairing equipment.	114	66A49283
5		3	176		Tube Puller TL-201 (Complete) A scissors shaped instrument, 8" long x 3 $\frac{1}{4}$ " wide at handle. Neoprene sleeving over $\frac{3}{8}$ " wide blades. Steel, electro-zinc plated. —Special	Removal and replacement of tubes and tube shields.	1	66C49288
		3	177		Wrench, Spintite 6 $\frac{1}{4}$ " long x 1" diameter at wood handle. Steel bit, 2 $\frac{13}{16}$ " long x $\frac{1}{4}$ " diameter, with socket wrench on end for $\frac{3}{8}$ " hexagonal nuts. All metal parts are cadmium plated, wood part is dull black enamel. —Stevens #3412	Coil locknut wrench.	115	66A49284

List of Manufacturer's names and addresses follows Tabular List of Replaceable Parts.

**TABULAR LIST OF REPLACEABLE PARTS FOR MAINTENANCE EQUIPMENT ME-40-(*)
c. COMPONENTS Cont.**

Field Stock	Quantity Depot Stock	In Set	Ref. No.	Signal Corps Stock No.	Name of Part and Description	Function	Mfr. No.	Galvin Part and Drawing No.
		2	178		<p>Battery Cable Assembly (Complete) Consists of a six conductor rubber covered battery cable with an 8 prong plug, 8 prong socket, and socket housing plate. Battery cable and plug is a single piece molding, and is soldered to the eight prong socket. Battery conductor leads are rubber covered and coded white, black, green, yellow, red, and blue, and connect to pins 1, 2, 4, 5, 6 and 7, respectively, of the molded plug. Each conductor is 17 strands #30 copper wire (equivalent to #18 solid).</p>	Connector between Battery BA-70 and Radio Receiver and Transmitter BC-1000-A.	1	1X49560
		2	179	3E4300-3	<p>Battery Cable and Plug (Only) 12" six conductor rubber covered cable with a molded 8 prong plug. Conductor leads are rubber covered and coded white, black, green, yellow, red and blue, and connect to pins 1, 2, 4, 5, 6 and 7, respectively, of the molded plug. Each conductor is 17 strands of #30 copper wire (equivalent to #18 solid).</p>	Connector between Battery BA-70 and chassis case socket.	1	30C41914

MAINTENANCE EQUIPMENT ME-40-(*)
AND MAINTENANCE KIT ME-53-(*)

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2	180	4B1115A	Handset TS-15-(*) Handset TS-15-(*) with Cord CD-494. A send-receive switch is incorporated in the handle. Headphone unit has an impedance of approximately 250 ohms. The receiver terminates in Plug PL-55. The microphone terminates in Plug PL-68.	Handset	5C41518
2	181	2B930()	Headset HS-30 (*) and Cord CD-874 A light weight, close fitting headset. Special rubber pieces fitted to the receivers are designed to fit lightly into the ear cavities and exclude outside noises. The head band is a thin band of steel that can be adjusted to fit the contour of the wearer's head. For use with Radio Set SCR-300-A, the headset is supplied with Cord CD-874 which terminates in Plug PL-55 The impedance of Headset HS-30(*) with Cord CD-874 is approximately 250 ohms.	Headset and Cord	Signal Corps Spec. 271-1518. Drawing SC-A-8000
3	182		Alignment Tool 6"x1/2" round tool of non-metallic material. Inset metal blade on one end, metal screw-driver on other end.	For coil adjustment screw and trimmer capacitor.	66A49803

List of Manufacturer's names and addresses follows Tabular List of Replaceable Parts.

**TABULAR LIST OF REPLACEABLE PARTS FOR MAINTENANCE EQUIPMENT ME-40-(*),
d. CHEST CH-165-(*)**

Field Stock	Quantity Depot Stock	In Set	Ref. No.	Signal Corps Stock No.	Name of Part and Description	Function	Mfr. No.	Galvin Part and Drawing No.
		1	300		Chest CH-165-(*)	Chest for ME-40 (*) maintenance equipment.	1	1X47501
		8	301		Brace, Chest Two holes .272" diameter for mounting with #10 screw, centered at 1/2". 3" long with 1/8" rod band in center. Cold rolled steel. Bonderized.—Special	Chest brace.	1	7A49067
		2	302		Catch, Friction Spring steel catch. 2 elongated mounting holes .156" diameter. 15/16" mounting hole centers. 1 5/8" long x 1 1/4" wide. Bonderized. American Cab. Hardware Corp. #9700	Friction catch.	107	55A49079
		7	303		Catch, Hold Down Clip Steel. Bonderized.—Special	Catch for holding chests together.	1	55A49148
		4	304		Catch, Hold Down Clip Large. Metal. Olive Drab finish. Bonderized.—Special	Catch for holding chests together.	1	55B31520

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AND MAINTENANCE KIT ME-53-(*)

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2	305	Chain, Stop Lid 2 holes in plate for fastening chain to lid $\frac{1}{8}$ " diameter, centered 1.250". Mounting Plate $1\frac{1}{8}$ " long x $\frac{3}{4}$ " wide. Chain of 20 sash links. Steel, black nickel finish. —Special	1	30B49551
2	306	Clamp, Cable Strap 1" long. Two holes for mounting .140" diameter. $\frac{1}{2}$ " mounting holes center. Cold rolled steel. Black nickel finish. —Special	1	42A36785
7	307	Clip, Hold Down Hook shaped. 1" x $1\frac{1}{16}$ " x $\frac{1}{32}$ ". $\frac{3}{16}$ " mounting hole centers. 2 holes .196" diameter. Cold rolled steel, bonderized. —Special	1	55A49150
4	308	Clip, Chest Lid Hook Hook shaped. $1\frac{1}{8}$ " x $\frac{13}{16}$ ". $\frac{13}{32}$ " mounting hole centers. 2 holes .272" diameter. Cold rolled steel. Bonderized.	1	55A49065
2	309	Handle, Chest 5 holes. .203" diameter for mounting on chest with #8-32 flat head machine screw. Bonderized. Olive drab finish. —Stanley Works #1207	108	55A34355
2	310	Gasket, Top Edge T shaped. Rounded top. 67 $\frac{1}{2}$ " long. Rounded top $\frac{1}{2}$ " wide x $\frac{1}{4}$ " long. Bottom $\frac{3}{16}$ " wide x $\frac{1}{4}$ " long. Neoprene. Grade "GN". —Special	1	32A49529

List of Manufacturer's names and addresses follows Tabular List of Replaceable Parts.

**TABULAR LIST OF REPLACEABLE PARTS FOR MAINTENANCE EQUIPMENT ME-40-(*),
d. CHEST CH-165-(*). Cont.**

Field Stock	Quantity Depot Stock	In Set	Ref. No.	Signal Corps Stock No.	Name of Part and Description	Function	Mfr. No.	Galvin Part and Drawing No.
		4	311		Hinge, Chest 6 holes for mounting on chest .272" diameter with #10 screw. Hot rolled steel. Bonderized. —Special	Chest hinge.	1	55B49081
		2	312		Hinge, Tube Compartment .030" to .040" thick. Steel. 1 $\frac{1}{8}$ " mounting hole centers. 4 holes for #5 flat head screw. 1" x 1". Bonderized. —Special	Hinge on tube compartment.	1	55A49271
		8	313		Plate, Chest Lid Corner 3 holes .272" diameter for #10 screw. 1 $\frac{1}{8}$ " wide with rounded corners. Cold rolled steel. Bonderized. —Special	For reinforcing corners of chest lid.	1	55A49073
		8	314		Plate, Chest Corner Cold rolled steel, bonderized. 3 holes .272" diameter for fastening to chest with #10 screw. 1 $\frac{1}{8}$ " wide with rounded corners. .062" thick. —Special	For reinforcing corners of chest.	1	55A49075
		4	315		Plate, Dome One elongated mounting hole $\frac{1}{8}$ " diameter. 2 $\frac{1}{8}$ " diameter holes for mounting with #8 screw. 1.750" mounting hole centers. Cold rolled steel. Bonderized. —Special	Plate on lower case lid.	1	64A49558

4	316	Plate, Dome One elongated mounting hole $\frac{1}{4}$ " diameter. 2 $\frac{1}{2}$ " diameter holes for mounting with #8 screw. 1.750" mounting hole centers. Cold rolled steel. Bonderized. —Special	Plate on lower case lid.	1	64A49561
8	317	Rivet 1 $\frac{1}{2}$ " long x .122" diameter. Cold rolled steel. White cadmium finish.	.122" diameter rivet (general).	105	5S6825
2	318	Rivet $\frac{3}{8}$ " long x .122" diameter. Cold rolled steel. Black nickel finish.	.122" diameter rivet (general).	105	5S8475
20	319	Screw #8 x 1 $\frac{1}{4}$ " long. Slotted flat head wood screw. White cadmium finish.	#8 screw (general).	104	3S8331
71	320	Screw #10 x $\frac{5}{8}$ " long. Slotted flat head wood screw. White cadmium finish.	#10 screw (general).	104	3S8339
40	321	Screw #10-32 thread x $\frac{5}{8}$ " long. Slotted flat head machine screw. White cadmium finish.	#10 screw (general).	104	3S9688
45	322	Screw 8-32 thread x $\frac{5}{8}$ " long. Slotted flat head ma- chine screw. White cadmium finish.	#8 screw (general).	104	3S6989

List of Manufacturer's names and addresses follows Tabular List of Replaceable Parts.

**TABULAR LIST OF REPLACEABLE PARTS FOR MAINTENANCE EQUIPMENT ME-40-(*),
d. CHEST CH-165-(*). Cont.**

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SIGNAL CORPS

Field Stock	Quantity Depot Stock	In Set	Ref. No.	Signal Corps Stock No.	Name of Part and Description	Function	Mfr. No.	Galvan Part and Drawing No.
		8	323		Screw 8-32 thread x $\frac{5}{8}$ " long. Slotted round head machine screw. White cadmium finish.	#8 screw (general).	104	3S9689
		4	324		Screw #5 x $\frac{3}{8}$ " long. Slotted round head wood screw. Black nickel finish.	#5 screw (general).	104	3S8340
		4	325		Screw #5 x $\frac{3}{8}$ " long. Slotted flat head wood screw. White cadmium finish.	#5 screw (general).	104	3S8341
		4	326		Screw #5 x $\frac{1}{2}$ " long. Slotted flat head wood screw. White cadmium finish.	#5 screw (general).	104	3S8342
		4	327		Screw #5 x $\frac{1}{2}$ " long. Slotted round head wood screw. Black nickel finish.	#5 screw (general).	105	3S8343
		8	328		Screw 8-32 thread x $\frac{5}{8}$ " long. Slotted round head machine screw. Black nickel finish.	#8 screw (general).	105	3S9690
		40	329		Screw #2 x $\frac{1}{4}$ " long. Slotted round head wood screw. Black nickel finish	#2 screw (general).	106	3S8345

MAINTENANCE EQUIPMENT ME-40-(*)
AND MAINTENANCE KIT ME-53-(*)

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14	330	Screw 10-32 x $\frac{5}{8}$ " long. Slotted round head machine screw. White cadmium finish.	#10 screw (general).	104	3S7351
1	331	Screw #10 x $1\frac{1}{4}$ " long. Slotted flat head wood screw. White cadmium finish.	#10 screw (general).	104	3S8344
2	332	Strap, Lid Pull 4" long x $1\frac{1}{4}$ " wide. 2 holes .156" diameter. $\frac{3}{16}$ " mounting hole centers. Cotton webbing treated for water repellent and mildew resistance. Dipped in wax. —Special	Lid puller.	1	35K49563
2	333	Strap, Pull (Complete) 13" long 1" wide. 2 holes .156" diameter. $\frac{3}{8}$ " mounting hole centers. Cotton webbing treated for water repellent and mildew resistance. Dipped in shellac. —Special	Pull strap.	1	35A49398
2	334	Strike, Friction $\frac{3}{16}$ " center mounting holes. Two .157" holes $1\frac{1}{8}$ " long x $\frac{3}{8}$ " wide. Cold rolled steel. Bond-erized, smooth olive drab finish. —Special	Used on lid of upper case.	1	55A49077
14	335	Tee Nut, Pronged $1\frac{9}{16}$ " long x $\frac{3}{4}$ " diameter. $1\frac{1}{2}$ " diameter hole in center tapped for 8-32 thread. Cold rolled steel. Cadmium plated. —Cinch #58026	Nut for #8 screw.	23	2A49402

List of Manufacturer's names and addresses follows Tabular List of Replaceable Parts.

**TABULAR LIST OF REPLACEABLE PARTS FOR MAINTENANCE EQUIPMENT ME-40-(*) ,
d. CHEST CH-165-(*) Cont.**

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SIGNAL CORPS

Field Stock	Quantity Depot Stock	In Set	Ref. No.	Signal Corps Stock No.	Name of Part and Description	Function	Mfr. No.	Galvin Part and Drawing No.
		47	336		<p> Tee Nut, Pronged $\frac{1}{4}$" long x $\frac{3}{4}$" diameter. $\frac{1}{8}$" diameter hole in center tapped for 8-32 thread. Cold rolled steel, white cadmium finish.</p>	Nut for #8 screw.	23	2A49629
		28	337		<p> Tee Nut, Pronged $\frac{5}{16}$" long x $\frac{3}{4}$" diameter. $\frac{1}{8}$" diameter hole in center tapped for 10-32 thread. Cold rolled steel. Cadmium plated. —Cinch #48444</p>	Nut for #10 screw.	23	2A40066
		14	338		<p> Tee Nut, Pronged $\frac{5}{16}$" long x $\frac{3}{4}$" diameter. $\frac{1}{8}$" diameter holes in center tapped for 10-32 thread. Cold rolled steel. Cadmium plated.</p>	Nut for #10 screw.	23	2A49405
		14	339		<p> Washer $\frac{1}{4}$" outside diameter x .128" inside diameter x .0320" thick. Cold rolled steel. White cadmium finish.</p>	Washer for .122" diameter rivet.	105	4S7555

**TABULAR LIST OF REPLACEABLE PARTS FOR MAINTENANCE EQUIPMENT ME-40-(*),
OSCILLATOR VO-6-(*)**

MAINTENANCE EQUIPMENT ME-40-(*)
AND MAINTENANCE KIT ME-53-(*)

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Field Stock	Quantity Depot Stock	In Set	Ref. No.	Signal Corps Stock No.	Name of Part and Description	Function	Mfr. No.	Galvin Part and Drawing No.
		1	400		Oscillator VO-6-(*)	Signal Generator.	1	1X47401
		1	C1		Capacitor Fixed, ceramic; 2000 μ f, \pm 20%, 500 w-v d. c. .850" long x .237" diameter.	Coupling Xtal; to plate.	8	21A83081
2		3	C3		Capacitor Fixed, paper; .01 μ f, +60% -20%, 120 w-v d-c. Enclosed in black bakelite case. Color coded;; brown, black, orange. $\frac{5}{16}$ " long x $\frac{15}{16}$ " wide x $\frac{1}{16}$ " thick. —Micamold Type 338	Battery BA-30 by-pass.	9	8A41695
					or:		.	
					Fixed, paper; .01 μ f, +60% -20%, 120 w-v d-c. Enclosed in black bakelite case. .730" long x .462" wide x .250" thick. —Coronet Type SW		86	8A47292
					or:			
					Fixed, paper; .01 μ f, +60% -20%, 120 w-v d-c. Enclosed in black bakelite case. $\frac{3}{16}$ " long x $\frac{15}{16}$ " wide x $\frac{1}{16}$ " thick. —Fast Type A7590		3	8A47293
					or:			

**TABULAR LIST OF REPLACEABLE PARTS FOR MAINTENANCE EQUIPMENT ME-40-(*),
OSCILLATOR VO-6-(*). Cont.**

Field Stock	Quantity Depot Stock	In Set	Ref. No.	Signal Corps Stock No.	Name of Part and Description	Function	Mfr. No.	Galvin Part and Drawing No.
					Fixed, paper; .01 μ f, +60% -20%, 120 w-v d-c. Enclosed in black bakelite case. .725" long x .468" wide x .218" thick. Also C ₃ , C ₄ —Guthman Type 1		101	8A47555
			C ₃		Capacitor Same as C ₂ .	Screen grid by-pass.		
			C ₄		Capacitor Same as C ₂ .	Battery.		
2		4	C ₅		Capacitor Fixed, ceramic; 15 μ f, \pm 5%. Coded: X15 and green dot. .375" long .187" diameter. or: Fixed, ceramic; 15 μ f, \pm 5%. Color coded: violet, brown, green, black, green. .460" long x .225" diameter. Also C ₆ , C ₇ , C ₈ .	Coupling plate to terminal box.	8	21A40212
			C ₆		Capacitor Same as C ₅ .	Coupling.	6	21A28817

2	1	C ₇	Capacitor Fixed, ceramic; 15 μ mf, \pm 2%. D15 printed on body and red dot. Negative temperature coefficient zero. .437" long x .203" diameter.	Control grid by-pass.	118	21A49795
		C ₈	Capacitor Same as C ₇ .	Coupling		
2	1	R ₁	Resistor Fixed, carbon; 1.5 megohms, \pm 10%, 1/2 watt insulated. 1/16" long x .218" diameter. Erie Type 504 Ins. Stackpole Type MB 1/2 Ins. I.R.C. Type BT 1/2 Ins.	Control grid bias	45 61 103	6B6460
2	1	R ₂	Resistor Fixed, carbon 100,000 ohms, \pm 10%, 1/2 watt insulated. 1/16" long x .218" diameter. Erie Type 504 Ins. Stackpole Type MB 1/2 Ins. I.R.C. Type BT 1/2 Ins.	Screen grid drooping.	45 61 103	6B6031
2	1	R ₃	Resistor Fixed, carbon; 18,000 ohms, 10%, 1/2 watt insulated. 1/16" long x .218" diameter. Erie Type 504 Ins. Stackpole Type MB 1/2 Ins. I.R.C. Type BT 1/2 Ins.	Plate drooping.	14 45 61	6B5591

List of Manufacturer's names and addresses follows Tabular List of Replaceable Parts.

TABULAR LIST OF REPLACEABLE PARTS FOR MAINTENANCE EQUIPMENT ME-40-(*),
OSCILLATOR VO-6-(*) Cont.

Field Stock	Quantity Depot Stock	In Set	Ref. No.	Signal Corps Stock No.	Name of Part and Description	Function	Mfr. No.	Galvin Part and Drawing No.
2		1	R ₄		Potentiometer Variable; 300 ohms, ±20%. Contact arm insulated from shaft; mounting stud 3/8-32 thread x 1/4" long. Shaft .250" diameter x 1/2" long. Overall dimensions: 1 1/8" diameter x 2.25" long. Single pole switch. —Chicago Telephone Supply A2-35	Output attenuator.	16	18A49002
2		2	R ₅		Resistor Fixed, paper; 27 ohms, ±10%, 1/2 watt. 1/16" long x .218" diameter. Erie Type 504 Ins. (Also R ₆ .)	Part of terminal box.	103	6B683
			R ₆		Resistor Same as R ₅ .	Part of terminal box.		
		1	RFC ₁		Coil, R. F. Choke 5 pie, wound on ceramic core. 167 turns of #36 solid SQE wire per pie, 2 crossovers per turn. Inductance: 2.1 μh, ±10% at 1000 C. P. S. 1.5" long x 1/2" diameter.	B+, r-f choke.	1	24A49038

2	1	SW ₁	Switch Single pole, single throw switch on back of R4.	16	Part of 18A49002
1	1	SW ₂	Switch Single pole, single throw. Terminals insulated from frame. Arm of black bakelite. 1.125" between 2-40" mounting holes.	1	40K49009
1	1	XTAL ₁	Crystal and holder Operates at a frequency of 4,300 kc. 450 cycles. Bakelite case, metal or phenolic cover. Two contact pins. .093" diameter x .40" long. Overall dimensions: 1 19/32" long x 1 13/16" wide x 7/16" thick. —Special	1	48C49528
2	1	401	Assembly, Alligator Clip and Lead Consists of alligator clip, (406) and 5' of #18 wire, rubber covered. —Special	1	1X49268
	1	402	Assembly, Oscillator Lead 8 strands of #36 AWG solid tinned copper wire and 1 strand of #29 solid tinned copper welding wire. Insulations of white glass yarn, rubber, acetate thread. Copper wire shield and outer covering of neoprene. 2' of #22 wire wrapped at ends and soldered to shield. 25 1/2" long. —Special	1	30A49103
2	1	403	Assembly, Tube Shield and Spring Consists of tube shield (437) and spring.	23	1X41980

List of Manufacturer's names and addresses follows Tabular List of Replaceable Parts.

**TABULAR LIST OF REPLACEABLE PARTS FOR MAINTENANCE EQUIPMENT ME-40-(*)
e. OSCILLATOR VO-6-(*) Cont.**

Field Stock	Quantity Depot Stock	In Set	Ref. No.	Signal Corps Stock No.	Name of Part and Description	Function	Mfr. No.	Galvan Part and Drawing No.
2		1	404	2Z1234	Base, Tube Shield Cold rolled steel, hot tin dipped. $\frac{7}{8}$ " mounting centers, $\frac{1}{4}$ " high. Has ears for engaging into bayonet lock slots of tube shield. —Cinch #1006	Base tube shield	23	42A41276
		2	405		Clip, Alligator Cold rolled steel; overall dimensions: $1\frac{1}{2}$ " long x $\frac{1}{2}$ " wide. White cadmium plated.	Clip of output of terminal box lead.	113	42A47888
		1	406		Clamp, Crystal (4300 kc) Spring steel, .020" thick; electro zinc plated. Has white filled 4,300 kc and arrow marking on top. —Special	Hold crystal holder in socket.	1	42B40614
		1	407		Grommet Rubber, $\frac{1}{2}$ " outside diameter x $\frac{3}{16}$ " thick x $\frac{1}{8}$ " diameter hole. $\frac{1}{16}$ " wide groove along edge.	Protect wire passing thru housing.	117	37A14529
		3	408		Grommet Rubber; $\frac{1}{2}$ " diameter x $\frac{1}{4}$ " diameter hole x $\frac{3}{8}$ " thick. $\frac{1}{16}$ " wide groove along edge. —Salisbury #G-420	Protect cable.	116	37A49027

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AND MAINTENANCE KIT ME-53-(*)

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1	409		Insulator, Spacer Linen bakelite: 4 $\frac{3}{8}$ " long x 1 $\frac{1}{2}$ " wide x $\frac{1}{4}$ " thick. 8 holes—.125" diameter; 4 holes—.136" diameter; 2 holes—.312" diameter. —Special	1	14A47897
2	410		Insulator Spring Linen bakelite; 1 $\frac{3}{8}$ " x 1 $\frac{3}{8}$ " square x .046" thick. 3 holes—.136" diameter. —Special	1	14A47896
1	411	2Z5820.2	Knob 1" diameter x $\frac{5}{16}$ " thick. Has two 8-32 x $\frac{5}{16}$ " setscrews; white indicator dot on face. Edge is fluted. Black bakelite. Same as Midwest Molding Co. #550 except white dot and extra setscrew added.	94	36A41538
2	412		Lockwasher #2 internal, $\frac{3}{16}$ " outside diameter. Spring steel, white cadmium finish. —Shakeproof #1202	70	4S8406
2	413		Lockwasher #4 internal; spring steel, white cadmium plated.	70	4S7683
1	414		Lockwasher $\frac{3}{8}$ " internal; spring steel, cadmium plated. —Shakeproof #1202	70	4S7655
1	415		Lug, Soldering Phosphor bronze, .018" thick, lock type, bent. Hot tinned plated. —Shakeproof #2104-5L	70	29B5342

List of Manufacturer's names and addresses follows Tabular List of Replaceable Parts.

52 TABULAR LIST OF REPLACEABLE PARTS FOR MAINTENANCE EQUIPMENT ME-40-(*)
e. OSCILLATOR VO-6-(*) Cont.

Field Stock	Quantity Depot Stock	In Set	Ref. No.	Signal Corps Stock No.	Name of Part and Description	Function	Mfr. No.	Galvin Part and Drawing No.
		1	416		Lug, Soldering Phosphor bronze; .018" thick, lock type, bent. Hot tinned plated. —Shakeproof #2104-4L	Tie lug to battery spring.	70	29B5293
		1	417		Nut 3/8-32 thread x 1/2" diameter, hexagonal. Cold rolled steel, white cadmium plated.	Fasten potentiometer.	26	2S7018
		2	418		Nut 4-40 thread x 1/4" diameter, hexagonal. Cold rolled steel, white cadmium plated.	For 4-40 screws.	26	2S7019
		2	419		Nut 2-56 thread; 3/8" hexagonal. Cold rolled steel, white cadmium finish.	Nut for 2-56 screw	26	2S7041
		1	420		Nut 4-40 thread; 3/16" hexagonal. Brass, white nickel finish.	Nut for #4 screws.	26	2S8376
		1	421		Nut, Locking 4-40 thread x 1/4" diameter, hexagonal. Knurled mounting collar. Cadmium plated. —Cinch #58288	Fastened to inner housing for locking battery plate.	23	2A38449

1	422	Plate, Battery Cover Cold rolled steel; 1 $\frac{1}{16}$ " x 1 $\frac{1}{8}$ " square x .032" thick. Corner hole .144" diameter. Cadmium plated. —Special	Hold battery in inner housing.	1	15A47891
3	423	Rivet $\frac{5}{8}$ " diameter x .122" long. Cold rolled steel, polished nickel finish.	Used to fasten washers to battery spring.	111	5S7707
2	424	Rivet .122" diameter x $\frac{1}{8}$ " long. Cold rolled steel, black nickel plated.	Fasten switch to attenuator housing.	111	5S6823
1	425	Rivet $\frac{3}{16}$ " diameter x .122" long. Cold rolled steel, polished nickel finish.	Fasten lug and spring to insulator plate.	111	5S7701
4	426	Rivet $\frac{5}{8}$ " diameter x .122" long. Cold rolled steel, polished nickel finish.	Fasten insulator spacer to mounting plate.	111	5S7708
2	427	Screw 4-40 thread x $\frac{1}{4}$ " long, slotted binderhead machine screw. Cold rolled steel, white cadmium plated	Fasten chassis to mounting plate.	26	3S8022
2	428	Screw 2-56 thread x $\frac{7}{8}$ " long, slotted round head machine screw. Cold rolled steel, black nickel plated.	Fasten cover to terminal box housing.	26	3S9687

List of Manufacturer's names and addresses follows Tabular List of Replaceable Parts.

TABULAR LIST OF REPLACEABLE PARTS FOR MAINTENANCE EQUIPMENT ME-40-(*)
e. OSCILLATOR VO-6-(*) Cont.

Field Stock	Quantity Depot Stock	In Set	Ref. No.	Signal Corps Stock No.	Name of Part and Description	Function	Mfr. No.	Galvin Part and Drawing No.
		1	429		Screw 4-40 thread x $\frac{1}{4}$ " long, slotted binderhead machine screw. Cold rolled steel, white cadmium plated.	Fasten battery plate to housing.	26	3S8022
		2	430		Screw 2-56 thread x $\frac{5}{16}$ " long, slotted, round head machine screw. Cold rolled steel, white cadmium plated.	Mounting tube socket and base shield.	26	3S6959
		1	431		Screw 4-40 thread x $\frac{1}{2}$ " long, slotted round head machine screw. Cold rolled steel, white nickel finish.	Crystal socket mounting screws	26	3S8080
		4	432		Screw 4-24 thread x $\frac{3}{16}$ " long, slotted round head. Cold rolled steel, black nickel finish. —Parker Kalon Type Z	Fasten inner housing cover and outer housing cover to respective housings.	112	3S8183
		2	433		Setscrew 8-32 thread x $\frac{5}{16}$ " long, slotted headless, cup point. Case hardened steel, black nickel finish.	Fasten knob to potentiometer.	109	3S7146

2	1	434	Shield, Tube Cold rolled steel; 1 3/4" high x 55/64" diameter. Hot tin or white silver finish	Shield oscillator tube	23	26B47550
	1	435	Socket, Crystal For single crystal. Made of tan mica filled bakelite. Overall dimensions: 5/64" long x 5/16" wide x 35/64" high. Silver plated beryllium cop- per contacts. Has .120" diameter hole in cen- ter for mounting screw. —Cinch #9816	Crystal holder socket.	23	9A40050
2	1	436	Socket, Tube 7 prong; XXXP natural bakelite, wax im- pregnated insulation. 7/8" mounting centers. —Cinch #2543	Socket for VT-173.	23	9A40536
	1	437	Spring, Battery Brass wire; .062" diameter. Coiled, tapering 1" diameter to .218" diameter. White silver plated. —Special	Battery contact	1	41A27454
	1	438	Spring Music wire; .033" diameter. Coiled; tapers from .828" diameter to 9/16" diameter; 4 1/2 turns.	Lock tube shield on shield base.	23	41A41974
	1	439	Strip, Terminal Bakelite; 1 1/8" long x 3/8" wide. Two Cinch lugs #X1464 and one Cinch lug #2494 mount- ed on strip.	Tie point	23	31A49064

List of Manufacturer's names and addresses follows Tabular List of Replaceable Parts.

56 TABULAR LIST OF REPLACEABLE PARTS FOR REPLACEABLE EQUIPMENT ME-40-(*)
e. OSCILLATOR VO-6-(*) Cont.

Field Stock	Quantity Depot Stock	In Set	Ref. No.	Signal Corps Stock No.	Name of Part and Description	Function	Mr. No.	Galvin Part and Drawing No.
		1	440		Stud Brass; $\frac{5}{8}$ " diameter x $1\frac{1}{2}$ " long. Collar on end $\frac{3}{8}$ " diameter x $\frac{1}{8}$ " thick. Silver plated. —Special	Mount alligator clip.	1	46A47910
		1	441		Tee Nut, Pronged Cold rolled steel; .026" thick. Overall dimensions: $\frac{1}{2}$ " long x $\frac{5}{16}$ " wide x $\frac{3}{16}$ " thick. 8-32 thread tapped. Cadmium plated. —Cinch Type #58047	Fasten mounting plate and chassis to outer housing.	23	2A49034
		1	442		Tube, 1T4/VT-173 Tung Sol, RCA, Nat'l Union.	Oscillator tube	21 65 99	
		2	443		Washer $\frac{3}{8}$ " outside diameter x $\frac{1}{8}$ " inside diameter x .032" thick. Cold rolled steel, white cadmium finish	Used on battery spring.	13	4S7554
		1	444		Washer $\frac{5}{16}$ " outside diameter x .145" inside diameter x .025" thick. Cold rolled steel. White cad- mium finish.	Used on battery spring.	13	4S7569

**MAINTENANCE EQUIPMENT ME-40-(*)
AND MAINTENANCE KIT ME-53-(*)**

**TM 11-315
29**

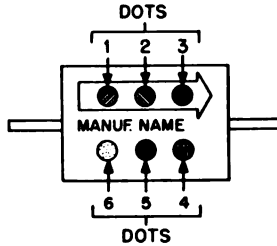
2	1	445	Washer 5/16" outside diameter x .145" inside diameter x .0250" thick. Cold rolled steel, white cadmium plated.	Mount alligator clip on solder lug.	13	4S7569
2	1	446	Washer Bakelite; 7/16" outside diameter x .128" diameter hole x .046" thick. Wax impregnated.	Insulate alligator stud on attenuator housing	13	4A49029
2	1	447	Washer Bakelite; 7/16" diameter x .210" diameter hole x .031" thick. Wax impregnated.	Insulate stud on attenuator..	13	4A49032
2	1	448	Strip, Terminal Two insulated lugs and 1 mounting lug mounted on 1 7/8" long x 3/8" wide linen bakelite.	Tie point.	23	31A47887
2	1	449	Strip, Terminal One insulated lug and one mounting lug mounted on 3 5/8" long x 3/8" wide bakelite.	Tie point.	23	31A31217

List of Manufacturer's names and addresses follows Tabular List of Replaceable Parts.

LIST OF MANUFACTURER'S NAMES AND ADDRESSES

Mfr. No.	Name	Street Address	City	State
1	Galvin Mfg. Corporation	4545 W. Augusta Blvd.	Chicago	Illinois
3	John E. Fast and Company	3101 N. Pulaski Road	Chicago	Illinois
6	Centralab	900 E. Keefe Avenue	Milwaukee	Wisconsin
8	Muter Company	1255 S. Michigan Avenue	Chicago	Illinois
9	Micamold Corporation	1087 Flushing Avenue	Brooklyn	New York
13	Gates Washer Company	2949 N. Elston Avenue	Chicago	Illinois
16	Chicago Telephone Supply		Elkhart	Indiana
21	Tung Sol Radio Tube	95—8th Avenue	Newark	New Jersey
23	Cinch Manufacturing Company	2339 W. Van Buren Street	Chicago	Illinois
26	United Screw and Bolt Company	2513 W. Cullerton Street	Chicago	Illinois
45	Stackpole Carbon Company	Elk County	St. Mary's	Pennsylvania
53	General Electric	215 W. 3rd Street	Cincinnati	Ohio
61	International Resistance Co.	18 W. Chelton	Philadelphia	Pennsylvania
70	Shakeproof, Inc.	2501 N. Keeler Avenue	Chicago	Illinois
86	Coronet Electric Company	646 N. Michigan Avenue	Chicago	Illinois
94	Midwest Molding Company	319 N. Whipple Street	Chicago	Illinois
101	E. I. Guthman Company	15 S. Throop Street	Chicago	Illinois
102	American Phenolic Co.	1830 S. 54th Street	Cicero	Illinois
103	Erie Resistor Corp.	644 W. 12th Street	Erie	Pennsylvania
104	Igloo Cabinet Co.	1701 N. Damen Avenue	Chicago	Illinois
105	Price Bros.	36 S. Throop Street	Chicago	Illinois
106	American Screw Co.	589 E. Illinois Street	Chicago	Illinois
107	American Cabinet Hdwe.	737 N. Michigan Ave.	Chicago	Illinois
108	Stnaley Works	61 N. Kinzie Street	Chicago	Illinois
109	Pedersen Bros.	625 W. Washington Blvd.	Chicago	Illinois
110	Kurz Kasch		Dayton	Ohio
111	Thomson Mfg. Co.	17 N. Loomis Street	Chicago	Illinois
112	Parker Kalon Co.	200 Varick Street	New York	New York
113	Mueller Electric Co.	9 S. Clinton Street	Chicago	Illinois
114	North & Judd Mfg. Co.	251 E. Grand Avenue	Chicago	Illinois
115	Steven-Walden		Wooner	Massachusetts
116	Salisbury, W. H. & Co.	401 N. Morgan Street	Chicago	Illinois
117	Atlantic India Rubber Co.	1453 W. Van Buren Street	Chicago	Illinois

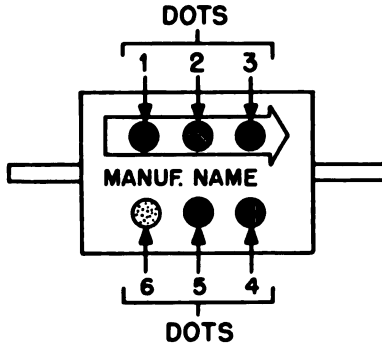
AMERICAN WAR STANDARD 6-DOT COLOR CODE CHART
For Capacitors (Molded Mica)



Color	1st Dot	2nd Dot	3rd Dot	4th Dot	5th Dot	6th Dot
	<i>1st Digit</i>	<i>2nd Digit</i>	<i>3rd Digit</i>	<i>Decimal Multiplier</i>	<i>Tolerance</i>	<i>Characteristics</i>
Black	0	0	0	1	$\pm 20\%$	*A
Brown	1	1	1	10		B
Red	2	2	2	100	$\pm 2\%$	C
Orange	3	3	3	1,000		D
Yellow	4	4	4	10,000		E
Green	5	5	5	100,000		F
Blue	6	6	6	1,000,000		G
Violet	7	7	7	10,000,000		
Gray	8	8	8	100,000,000		
White	9	9	9	1,000,000,000		
Gold	...	...	...	0.1	$\pm 5\%$	
Silver	...	...	...	0.01	$\pm 10\%$	

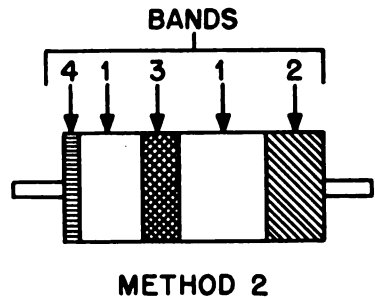
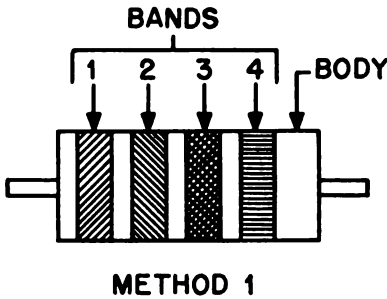
- *A—Ordinary Mica By-pass.
- B—Same as A—Low Loss Case.
- C—By-pass or Silver Mica Capacitor (± 200 parts/Million/C)
- D—Silver Mica Capacitor (± 100 Parts/Million/C)
- E—Silver Mica Capacitor (0 to +100 Parts/Million/C)
- F—Silver Mica Capacitor (0 to +50 Parts/Million/C)
- G—Silver Mica Capacitor (0 to -50 parts/Million/C)

RMA STANDARD 6-DOT COLOR CODE CHART
For Capacitors (Molded Mica)



Color	1st Dot	2nd Dot	3rd Dot	4th Dot	5th Dot	6th Dot
	<i>1st Digit</i>	<i>2nd Digit</i>	<i>3rd Digit</i>	<i>Decimal Multiplier</i>	<i>Tolerance</i>	<i>Voltage</i>
Black	0	0	0	1	....	....
Brown	1	1	1	10	1%	100v.
Red	2	2	2	100	2%	200v.
Orange	3	3	3	1,000	3%	300v.
Yellow	4	4	4	10,000	4%	400v.
Green	5	5	5	100,000	5%	500v.
Blue	6	6	6	1,000,000	6%	600v.
Violet	7	7	7	10,000,000	7%	700v.
Gray	8	8	8	100,000,000	8%	800v.
White	9	9	9	1,000,000,000	9%	900v.
Gold	...	...	...	0.1		1,000v.
Silver	...	...	...	0.01	10%	2,000v.
Body	...	...	...	.....	20%	500v.

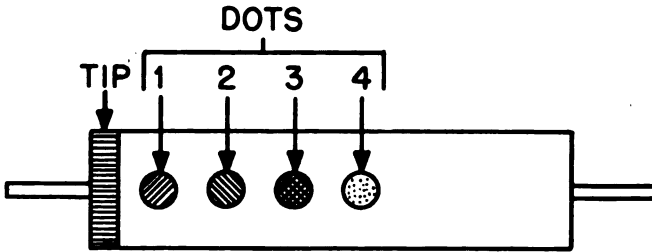
RMA STANDARD COLOR CODE CHART
For Resistors



COLOR	1st Band	2nd Band	3rd Band	4th Band
	<i>1st Digit</i>	<i>2nd Digit</i>	<i>Decimal Multiplier</i>	<i>Tolerance</i>
Black	0	0	1	
Brown	1	1	10	
Red	2	2	100	
Orange	3	3	1,000	
Yellow	4	4	10,000	
Green	5	5	100,000	
Blue	6	6	1,000,000	
Violet	7	7	10,000,000	
Gray	8	8	100,000,000	
White	9	9	1,000,000,000	
Gold	...	...	.....	± 5%
Silver	...	...	.....	± 10%
No Color	...	...	.....	± 20%

COLOR CODE CHART

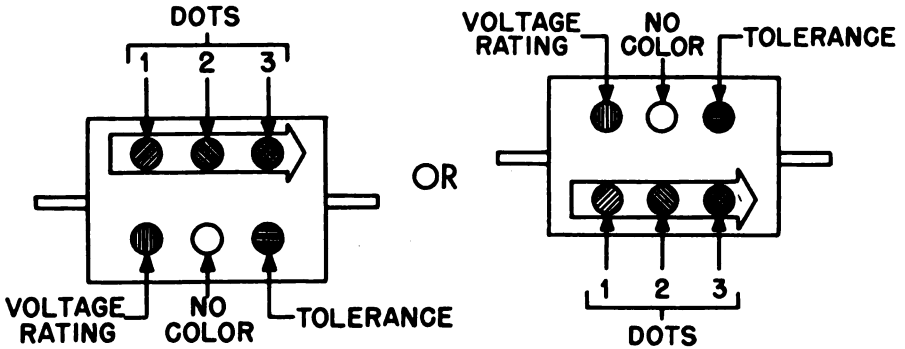
For Capacitors (Tubular Ceramic)



Color	Tip	1st Dot	2nd Dot	3rd Dot	4th Dot
	<i>Temperature Coefficient</i>	<i>1st Digit</i>	<i>2nd Digit</i>	<i>Decimal Multiplier</i>	<i>Tolerance</i>
Black	0	0	0	1	...
Brown	.00003 Neg.	1	1	10	1%
Red	.00008 "	2	2	100	2%
Orange	.00015 "	3	3	1,000	3%
Yellow	.00022 "	4	4	10,000	4%
Green	.00033 "	5	5	100,000	5%
Blue	.00047 "	6	6	1,000,000	6%
Violet	.00075 "	7	7	10,000,000	7%
Gray		8	8	0.1	
White		9	9	0.01	10%

3-DOT COLOR CODE CHART

For Capacitors



COLOR	1st Dot	2nd Dot	3rd Dot	Tolerance	Voltage Rating
	1st Digit	2nd Digit	Decimal Multiplier		
Black	0	0	1		
Brown	1	1	10	1%	100v.
Red	2	2	100	2%	200v.
Orange	3	3	1,000	3%	300v.
Yellow	4	4	10,000	4%	400v.
Green	5	5	100,000	5%	500v.
Blue	6	6	1,000,000	6%	600v.
Violet	7	7	10,000,000	7%	700v.
Gray	8	8	100,000,000	8%	800v.
White	9	9	1,000,000,000	9%	900v.
Gold	...	...	0.1		1000v.
Silver	...	...	0.01	10%	2000v.
Body	...	...	.....	20%	*

*When no Color is indicated the Voltage Rating may be as low as 300 volts.

A. G. 062.11 (4-7-43)

By Order of the Secretary of War:

G. C. MARSHALL,
Chief of Staff.

OFFICIAL:

J. A. ULIO,
Major General,
The Adjutant General.

DISTRIBUTION: R7(5); Bn 7(5); IBn 19(5); IC 7, 19(5), 11 (10)

(For explanation of symbols see FM-21-6)

