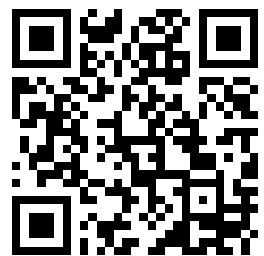


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VI.35:11-2723-2724

# TM 11-2723

WAR DEPARTMENT TECHNICAL MANUAL

## INSTALLATION OF RADIO AND INTERPHONE EQUIPMENT IN CARRIAGE, MOTOR, 3-INCH GUN, M10 or M10A1



**RESTRICTED. DISSEMINATION OF RESTRICTED MATTER.**  
No person is entitled solely by virtue of his grade or position  
to knowledge or possession of classified matter. Such matter  
is entrusted only to those individuals whose official duties  
require such knowledge or possession. (See also paragraph  
23b, AR 380-5, 15 March 1944.)

WAR DEPARTMENT

APRIL 1945



**INSTALLATION OF RADIO AND  
INTERPHONE EQUIPMENT IN  
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Washington 25, D. C., 28 April 1945

TM 11-2723, Installation of Radio and Interphone Equipment in Carriage, Motor, 8-inch Gun, M10 or M10A1, is published for the information and guidance of all concerned.

[AG 300.7 (30 Mar 45).]

BY ORDER OF THE SECRETARY OF WAR:

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*The Adjutant General*

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## DESTRUCTION NOTICE

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**WHY** —To prevent the enemy from using or salvaging this equipment for his benefit.

**WHEN**—When ordered by your commander.

**HOW** —1. Smash—Use sledges, axes, handaxes, pickaxes, hammers, crowbars, heavy tools.  
2. Cut—Use axes, handaxes, machetes.  
3. Burn—Use gasoline, kerosene, oil, flame throwers, incendiary grenades.  
4. Explosives—Use firearms, grenades, TNT.  
5. Disposal—Bury in slit trenches, fox holes, other holes. Throw in streams. Scatter.

## USE ANYTHING IMMEDIATELY AVAILABLE FOR DESTRUCTION OF THIS EQUIPMENT

**WHAT**—1. Smash—All vacuum tubes, crystals, control dials, coupling coils, transformers, speakers in receivers, external loudspeakers, microphones, headsets, dynamotors, and cable connectors.  
2. Cut—All connecting wires, cording, and cabling.  
3. Burn—All equipment and all associated training, technical, and installation manuals.  
4. Bury or scatter—All remains, after destroying their usefulness.

## DESTROY EVERYTHING

## SAFETY NOTICE

This equipment uses high voltages which are dangerous to life. Observe all safety precautions.

1. Make no adjustment with the power switch on.
2. Do not operate the equipment with the shields removed.
3. Do not connect power to any unit of the radio set until operating instructions have been read completely.

## SECTION I

## GUIDE TO USE OF THIS MANUAL

**1. Purpose**

**This manual provides methods and procedure, based upon actual field experience, for installation of radio and interphone equipment in Carriage, Motor, 3-inch Gun, M10 or M10A1. Items required to make a complete operating installation are listed for each set. Official nomenclature followed by empty parentheses, such as Headset HS-30-( ), is used to indicate any model of equipment regardless of its procurement.**

**2. Equipment**

**Installations covered include the following radio and interphone equipments:**

- Radio Set SCR-610-( ).**
- Interphone Equipment RC-99.**
- Interphone equipment using Interphone Amplifier BC-605-( ).**

**3. Holes and Brackets**

**Brackets required for installation of the radio**

**set are normally drilled and installed prior to delivery of Carriage, Motor, 3-inch Gun, M10 or M10A1. Drilling instructions are given in this manual for any other necessary holes and brackets. Do not relocate any holes or brackets unless absolutely necessary.**

**4. Preliminary Check**

**Study the illustrations, the installation methods outlined and any subsequent changes to this manual.**

**Caution:** Carriage, Motor, 3-inch Gun, M10 or M10A1 has a 24-volt electrical system. Before installing the radio sets, be sure they are designed for 24-volt operation, or tubes may burn out or dynamotors may be damaged.

**5. Operating Check**

**Carefully study the technical manual covering the radio set before trying to operate it; then, make a thorough operating check to determine whether the equipment has been properly installed and is in working order.**



**SECTION II**

**IGNITION NOISE SUPPRESSION IN CARRIAGE,  
MOTOR, 3-INCH GUN, M10 OR M10A1**

**6. General**

Excessive ignition or other electrical noises may interfere with the operation of radio equipment in Carriage, Motor, 3-inch Gun, M10 or M10A1. The technical manual issued with the vehicle will be helpful in locating the source of the noise, since it describes the suppression system used. Instructions for operating radio equipment used in the vehicle also should be studied. See TM 11-483 for further information on noise suppression.

**7. Procedure**

Locate and suppress ignition noises as follows:

a. Start the motor of the vehicle and turn on the radio set. Put the receiver sensitivity control at *maximum*; then, listening to the receiver output with a headset, slowly tune the receiver over the entire range of frequencies to be used for communication.

b. When the frequency (or frequencies) with greatest noise level is found, turn off the vehicle engine. If this noise continues, the source is outside the ignition system. If noise stops, the trouble is in the ignition system.

c. Start the engine again. Adjust the receiver sensitivity control until engine noises can be distinguished easily from static, etc. Interference may then be identified as follows:

Interference	Usual source
Popping sound: corresponds to ignition firing; stops when engine is turned off; accelerates when engine is raced.	Ignition system.
Intermittent, clicking sound: lingers for several seconds when ignition is turned off.	Generator regulator.

Interference	Usual source
Whining sound: varies with speed of engine; ceases only when generator stops rotating.	Generator.
Sparking, or continuous crackling noise.	Brushes and commutator of generator.

d. Interference from other electrical parts and circuits of the vehicle, such as panel gauges and heater fans, can usually be identified by turning off the gauges, fans, or other suspected mechanisms individually.

e. If the source of interference still cannot be found by any of the preceding methods, connect a probe antenna (fig. 6) to the antenna terminal of the radio set. Slowly move the loop of the probe antenna over the various parts of the electrical system of the vehicle. Keep the loop close to, but not in contact with, the part being examined. Noise from interference-producing parts should be heard in the receiver.

f. Usually interference can be eliminated by cleaning, tightening, or replacing noise-producing parts. Examine and tighten all suppressor and shielding components, and all connections and grounding bonds. Clean the surface under them. This will assure good electrical contact between wires and terminals, and between metal casings and the frame of the vehicle. (Insulated but ungrounded metal parts absorb and reradiate electrical noises.)

g. If interference persists, suppressor components should be checked by substituting new ones. If a replacement is not available, disconnect the suspected component, and test capacitors, resistors, and chokes within it. Replace any that are defective.

## SECTION III

## RADIO SET SCR-610-( )

## 8. Required Parts

Items necessary for installation of Radio Set SCR-610-( ) in Carriage, Motor, 3-inch Gun, M10 or M10A1 are listed below:

Basic unit Stock No. 2S610/24		
Quantity	Stock No.	Item
1	6Q849	Alignment Tool TL-207.
1 <sup>2</sup>	2A229C	Antenna AN-29-C.
1 <sup>2</sup>	3B879	Case CS-79, for carrying Batteries BA-39, BA-40, and Handset TS-13.
1	2Z1890-137	Case CS-137.
1	6Z3147	Connector No. 61007 and Bondnut BL-50.
2	2A2352/1	Fitting (includes spare).
1 <sup>2</sup>	2B613	Handset TS-13.
2	3G586	Insulator IN-86.
1	3G1250-64.15	Insulator, glazed porcelain.
1 <sup>2</sup>	2A2081-15	Mast Base AB-15/GR.
2 <sup>2</sup>	2A2416	Mast Section MS-116, one spare.
2 <sup>2</sup>	2A2417	Mast Section MS-117, one spare.
2 <sup>2</sup>	2A2418	Mast Section MS-118, one spare.
1	2Z6721-250	Mounting FT-250-( ).
1	3H4496-120	Power Supply Unit PE-120-( ).
1	2C6659	Radio Receiver and Transmitter BC-659-( ).
1	2Z8056	Roll BG-56-( ).

Basic unit Stock No. 2S610/24 (contd.)		
Quantity	Stock No.	Item
.15 ft	6Z7926	Rope RP-5.
2 <sup>2</sup>	2Z9019	Strap ST-19.
2	6D13037	TM 11-615, for Radio Set SCR-610-( ).
1	3H6711	Vibrator VB-11.
27 ft <sup>2</sup>	1B29	Wire W-29, auxiliary antenna wire.
6 ft	1B128	Wire W-128.

Installation unit Stock No. 2S610-V23/50		
Quantity	Stock No.	Item
1 <sup>2</sup>	3A27	Battery BA-27.
1 <sup>2</sup>	3A39	Battery BA-39.
1 <sup>2</sup>	3A40	Battery BA-40.
1	3A41	Battery BA-41.
1 <sup>2</sup>	4B417-4	Chest Set TD-4.
1	2Z3400-158	Cover BG-158.
1	6L50-510V33	Hardware bag.
1 <sup>2</sup>	2B800-16	Headset H-16/U.
1 <sup>2</sup>	2B1645	Microphone T-45.

<sup>2</sup>Used for portable, fixed, or emergency operation only.

<sup>2</sup>If Mast Base AB-15/GR, Mast Sections MS-116, MS-117, and MS-118 are not available, use Mast Base MP-48 or MP-48-A, Mast Sections MS-51, MS-52, MS-53, and Clamps MC-423 and MC-424, and Cover BG-108.

<sup>2</sup>If Headset H-16/U, Microphone T-45, and Chest Set TD-4 are not available, use Headset HS-30-( ), Microphone T-30-( ), and Cords CD-307-A and CD-318.

## 9. Assembly and Installation

Components of Radio Set SCR-610-( ) should be installed in Carriage, Motor, 3-inch Gun, M10 or M10A1 (figs. 1 and 2) as directed below:

*Part and location*

Mast Base AB-15/GR, on antenna mast base bracket right side of sponson (item 4, fig. 1 or 2).

*Method and materials*

Disassemble Mast Base AB-15/GR by holding lower insulator and turning body of mast base counterclockwise. See figure 5 and assemble mast base as follows: Place insulator, item 5, over hole in mast base bracket. Place small neoprene washer, item 4, over item 5 and place plain washer, item 3 over item 4. Insert body of mast base, item 2, through hole in items 3, 4, 5, 6, and hole in mast base bracket. Insert bolt, item 8, into item 2

*Part and location**Method and materials*

**Mast Sections MS-116, MS-117, and MS-118.**

**Mounting FT-250-( ) (item 3, fig. 1; item 10, fig. 2), on bracket, right sponson.**

**Radio Receiver-Transmitter BC-659-( ) and Battery BA-41 on Power Supply Unit PE-120-( ) (item 1, fig. 1 or 2).**

**Power Supply Unit PE-120-( ) (item 2, fig. 1 or 2) and Vibrator VB-11, on Mounting FT-250-( ).**

**Wire W-128 (item 19, fig. 1; item 27, fig. 2).**

from under side and turn item 2 clockwise until mast base is tightened securely. If Mast Base AB-15/GR is not available, use Mast Base MP-48 or MP-48-A. See figure 8 for assembly of Mast Base MP-48 or MP-48-A.

Screw mast sections together and install on Mast Base AB-15/GR. Place friction tape over joints to prevent loss of mast sections. When mast sections are removed, disassemble and stow them in Roll BG-56-( ). If Mast Base MP-48 or MP-48-A is used, screw Mast Sections MS-51, MS-52, and MS-53 together and place Clamps MC-423 and MC-424 over joints of mast sections. Cover BG-108 is used to cover mast base when mast sections are not in place.

Secure Mounting FT-250-( ) to bracket located in right front sponson, with  $\frac{1}{4}$ -20 x  $\frac{3}{4}$ -inch screws and  $\frac{1}{4}$ -inch lockwashers (fig. 1).

If Battery BA-41 is not already installed in Radio Receiver-Transmitter BC-659-( ) install as follows: Remove receiver-transmitter chassis from its case. Remove cover of battery compartment located on chassis near front panel. Place Battery BA-41 into battery compartment, being careful to engage plug into socket of battery. Replace cover. Before replacing chassis in its case make sure that all tubes are pressed down firmly in their proper sockets, that crystals for the desired operating frequencies are in their proper sockets with retaining clip in position, and that the two toggle switches near left side of chassis are in the ON position. Place Radio Receiver-Transmitter BC-659-( ) on Power Supply Unit PE-120-( ) in position (fig. 1).

Open case of power supply unit and remove power pack cover. Install Vibrator VB-11 in proper receptacle. Consult diagram inside power pack cover and make sure that the change-over plug is in 24-volt position (arrow pointing to 24) and that the connector link is set for BC-659 position. Press all vacuum tubes down firmly in their sockets. Replace power pack cover and close lid of power supply unit. Place Power Supply Unit PE-120-( ) on Mounting FT-250-( ) as shown in figure 1, and secure with hook fasteners provided. Route power cord, furnished with Power Supply Unit PE-120-( ), to vehicle terminal box (item 35). Install connector No. 61007 and Bondnut BL-50 in terminal box knockout hole to secure power cord. Connect power cord terminal lugs to positive and negative 24-volt terminals in terminal box.

Cut a 37-inch length of Wire W-128. Strip back  $\frac{1}{2}$  inch of insulation at both ends of wire. Tin exposed ends.

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Part and location

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*Method and materials*

Solder terminal, found in hardware bag, to one end. Connect one end of wire to binding post on bottom of mast base and route to antenna terminal on transmitter.

*Note.* The terminal-to-terminal length of Wire W-128 should be *exactly* 36 inches for Radio Set SCR-610- ( ).

**Case CS-137.**

Place 118 crystal units, supplied with Radio Receiver-Transmitter BC-659- ( ), in Case CS-137. Place Case CS-137 in Power Supply Unit PE-120- ( ).

**Case CS-79.**

Install Batteries BA-39 and BA-40 in Case CS-79. Stow Case CS-79 in convenient place in vehicle, as recommended by using organization.

**Roll BG-56- ( ).**

Stow in convenient place in vehicle as recommended by using organization.

**Fitting and insulator, glazed porcelain.**

Used with Rope RP-5, for tying down antenna. The fitting is designed for use with Mast Section MS-52, and must be reshaped when used with Mast Section MS-117.

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*Part and location**Method and materials*

from under side and turn item 2 clockwise until mast base is tightened securely. If Mast Base AB-15/GR is not available, use Mast Base MP-48 or MP-48-A. See figure 8 for assembly of Mast Base MP-48 or MP-48-A.

Mast Sections MS-116, MS-117, and MS-118.

Screw mast sections together and install on Mast Base AB-15/GR. Place friction tape over joints to prevent loss of mast sections. When mast sections are removed, disassemble and stow them in Roll BG-56-( ). If Mast Base MP-48 or MP-48-A is used, screw Mast Sections MS-51, MS-52, and MS-53 together and place Clamps MC-423 and MC-424 over joints of mast sections. Cover BG-108 is used to cover mast base when mast sections are not in place.

Mounting FT-250-( ) (item 3, fig. 1; item 10, fig. 2), on bracket, right sponson.

Secure Mounting FT-250-( ) to bracket located in right front sponson, with  $\frac{1}{4}$ -20 x  $\frac{3}{4}$ -inch screws and  $\frac{1}{4}$ -inch lockwashers (fig. 1).

Radio Receiver-Transmitter BC-659-( ) and Battery BA-41 on Power Supply Unit PE-120-( ) (item 1, fig. 1 or 2).

If Battery BA-41 is not already installed in Radio Receiver-Transmitter BC-659-( ) install as follows: Remove receiver-transmitter chassis from its case. Remove cover of battery compartment located on chassis near front panel. Place Battery BA-41 into battery compartment, being careful to engage plug into socket of battery. Replace cover. Before replacing chassis in its case make sure that all tubes are pressed down firmly in their proper sockets, that crystals for the desired operating frequencies are in their proper sockets with retaining clip in position, and that the two toggle switches near left side of chassis are in the ON position. Place Radio Receiver-Transmitter BC-659-( ) on Power Supply Unit PE-120-( ) in position (fig. 1).

Power Supply Unit PE-120-( ) (item 2, fig. 1 or 2) and Vibrator VB-11, on Mounting FT-250-( ).

Open case of power supply unit and remove power pack cover. Install Vibrator VB-11 in proper receptacle. Consult diagram inside power pack cover and make sure that the change-over plug is in 24-volt position (arrow pointing to 24) and that the connector link is set for BC-659 position. Press all vacuum tubes down firmly in their sockets. Replace power pack cover and close lid of power supply unit. Place Power Supply Unit PE-120-( ) on Mounting FT-250-( ) as shown in figure 1, and secure with hook fasteners provided. Route power cord, furnished with Power Supply Unit PE-120-( ), to vehicle terminal box (item 35). Install connector No. 61007 and Bondnut BL-50 in terminal box knockout hole to secure power cord. Connect power cord terminal lugs to positive and negative 24-volt terminals in terminal box.

Wire W-128 (item 19, fig. 1; item 27, fig. 2).

Cut a 37-inch length of Wire W-128. Strip back  $\frac{1}{2}$  inch of insulation at both ends of wire. Tin exposed ends.

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Part and location

5

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*Method and materials*

Solder terminal, found in hardware bag, to one end. Connect one end of wire to binding post on bottom of mast base and route to antenna terminal on transmitter.

*Notes.* The terminal-to-terminal length of Wire W-128 should be *exactly* 36 inches for Radio Set SCR-610-( ).

Case CS-137.

Place 118 crystal units, supplied with Radio Receiver-Transmitter BC-659-( ), in Case CS-137. Place Case CS-137 in Power Supply Unit PE-120-( ).

Case CS-79.

Install Batteries BA-39 and BA-40 in Case CS-79. Stow Case CS-79 in convenient place in vehicle, as recommended by using organization.

Roll BG-56-( ).

Stow in convenient place in vehicle as recommended by using organization.

Fitting and insulator, glazed porcelain.

Used with Rope RP-5, for tying down antenna. The fitting is designed for use with Mast Section MS-52, and must be reshaped when used with Mast Section MS-117.

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**SECTION IV**

**INTERPHONE EQUIPMENT RC-99**

**10. Required Parts**

Items necessary for installation of Interphone Equipment RC-99 in Carriage, Motor, 3-inch Gun M10 or M10A1 are listed below:

Basic unit Stock No. 2S99/24		
Quantity	Stock No.	Item
4	6Z3147	Connector No. 61007 and Bondnut BL-50.
2	2C675-739A	Control Box BC-739-A.
1	2C1637	Interphone Amplifier BC-667.
1	2C1738H	Interphone Control Box BC-606-H.
2	6D13033	TM 11-702, for Interphone Equipment RC-99.

Installation unit Stock No. 2S99-V23/50		
Quantity	Stock No.	Item
1	2Z1250.25	Bracket.
3*	4B417-4	Chest Set TD-4.
1	6Z3147	Connector No. 61007 and Bondnut BL-50.
30 ft	3E2213	Cordage CO-213.
1	6L50-99V23	Hardware bag.
3*	2B800-16	Headset H-16/U.
3*	2B1645	Microphone T-45.

\*When Headset H-16/U, Microphone T-45, and Chest Set TD-4 are not available, use Headset HS-30-( ) or HS-18, Microphone T-30-( ) or T-17, and Cords CD-307-A, CD-318, and CD-604. If Headset HS-18 is used, Cord CD-604 is not required.

**11. Assembly and Installation**

Components of Interphone Equipment RC-99 should be installed in Carriage, Motor, 3-inch Gun, M10 or M10A1 (fig. 1) as directed below:

*Part and location*

Cordage CO-213 (items 15, 16, 17, and 18, fig. 1).

Bracket (item 40, fig. 1), on bracket (item 30, fig. 1), attached to center of turret floor.

*Method and materials*

Cut Cordage CO-213 to required lengths. Strip back 3½ inches of outer rubber covering and 2½ inches of inner and outer shields of all ends entering control boxes, and 8½ inches of outer rubber covering and 7½ inches of inner and outer shields of all ends entering interphone amplifier. Using a pointed instrument, separate the weave of exposed 1-inch ends of shield braids. Strip about ½ inch of insulation from black leads at point exposed by separation shields. Twist the separated wires of shield braids to form a pigtail and wrap pig-tails, thus formed, around exposed portion of black leads and solder. The black leads are used for ground connections (fig. 4 or 9).

Bracket (item 40, fig. 1) is supplied to raise commander's Control Box BC-739-A above the original location provided in vehicle. If bracket is too long, interference with gun breech results. When necessary, cut and drill bracket for proper fitting in accordance with TB ORD-FE-1. Drill an additional required hole in interphone bracket (item 30, fig. 1), on receptacle outlet on floor of vehicle, as shown in view A-A of figure 1.

**Control Box BC-739-A (commander and gunner) (item 9, fig. 1), on bracket (item 40, fig. 1).**

**Control Box BC-739-A (radio operator) (item 9, fig. 1), on bracket attached to center of hull ceiling.**

**Interphone Control Box BC-606-H (item 10, fig. 1).**

**Interphone Amplifier BC-667 (item 8, fig. 1).**

Bracket (item 40, fig. 1), when not provided in original equipment, should be added to vehicles already in service having Interphone Equipment RC-99 installed.

Secure Mounting FT-507, part of Control Box BC-739-A, to bracket (item 40, fig. 1) with hardware provided. Two connectors No. 61007 and Bondnuts BL-50 are supplied with each Control Box BC-739-A for securing Cordage CO-213. Remove disk sweated over hole in control box; place a rubber washer (item 36, fig. 1) over threaded stem of connector, insert stem through hole in control box and secure with bondnut. Enter Cordage CO-213 (item 15, fig. 1) through connector and bondnut and connect to terminal strip in control box as shown in figure 4 or 9. Secure commander's control box to Mounting FT-507 with studs and hex. nuts supplied. See plan view figure 1.

Prepare Control Box BC-739-A for entrance of Cordage CO-213 (item 17, fig. 1) in same manner as for commander and gunner's box. Secure Mounting FT-507 to bracket provided in hull ceiling of vehicle and attach Control Box BC-739-A to Mounting FT-507 with studs and hex. nuts provided. See plan view figure 1.

Prepare Interphone Control Box BC-606-H for entrance of Cordage CO-213 (item 16, fig. 1) in same manner as for commander's control box except wiring. See figure 9 for connection of Cordage CO-213. Jumper wires must be added to terminal strip in Interphone Control Box BC-606-H, one jumper connected between terminals 1 and 8, and another jumper connected between terminals 5 and 6. Secure Mounting FT-507, furnished with Interphone Control Box BC-606-H, to interphone bracket (fig. 1), and mount interphone control box to Mounting FT-507 with studs and hex. nuts provided.

Remove screws around edge of panel of Amplifier BC-667. Remove amplifier chassis from case. Remove necessary knockouts from case, and install connectors and bondnuts in holes. Enter Cordage CO-213 (items 15, 16, 17, and 18, fig. 1) through connectors and secure with bondnuts. Tape shielded pair of red and green wires (item 18, fig. 1), and parallel the white and yellow leads, and black and brown leads (fig. 4 or 9). Solder terminal lugs to the paralleled leads and connect to positive and negative terminals in vehicle terminal box (item 35, fig. 1) as shown in figure 4 or 9. Connect the prepared tips of Cordage CO-213 to terminal strip inside amplifier case (fig. 4 or 9). Secure case of interphone amplifier to provided bracket (fig. 1). Place two vacuum tubes VT-107, furnished with Interphone Amplifier BC-667, in provided sockets in the chassis, and



Interphone Control Box BC-606-A, B, C, D, E, F, or G, and Control Box BC-739.

place one tube VT-107 in spare socket in case. Remove chassis in case, and secure by replacing original screws in panel.

If Interphone Control Box BC-606-A, B, C, D, E, F, G, and Control Box BC-739 are supplied, Mounting FT-507 will not be included. Each control box interphone control box is secured directly to interphone brackets. Suitable waterproofing required as recommended by using organization.

## SECTION V

**INTERPHONE EQUIPMENT USING INTERPHONE AMPLIFIER BC-605-( )****2. Required Parts**

Items necessary for installation of interphone equipment using Interphone Amplifier BC-605-( ) in Carriage, Motor, 3-inch Gun, M10 or M10A1 are identical with the items necessary for installation of Interphone Equipment RC-99 in the same vehicle, except that Interphone Amplifier BC-605-( ) is substituted for Interphone Amplifier BC-667.

**13. Assembly and Installation**

Components of interphone equipment using Interphone Amplifier BC-605-( ) are installed in Carriage, Motor, 3-inch Gun, M10 or M10A1 as a stop-gap or substitute interphone system. Install as shown in figures 2 and 3. See TM 11-600 for information on Interphone Amplifier BC-605-( ).

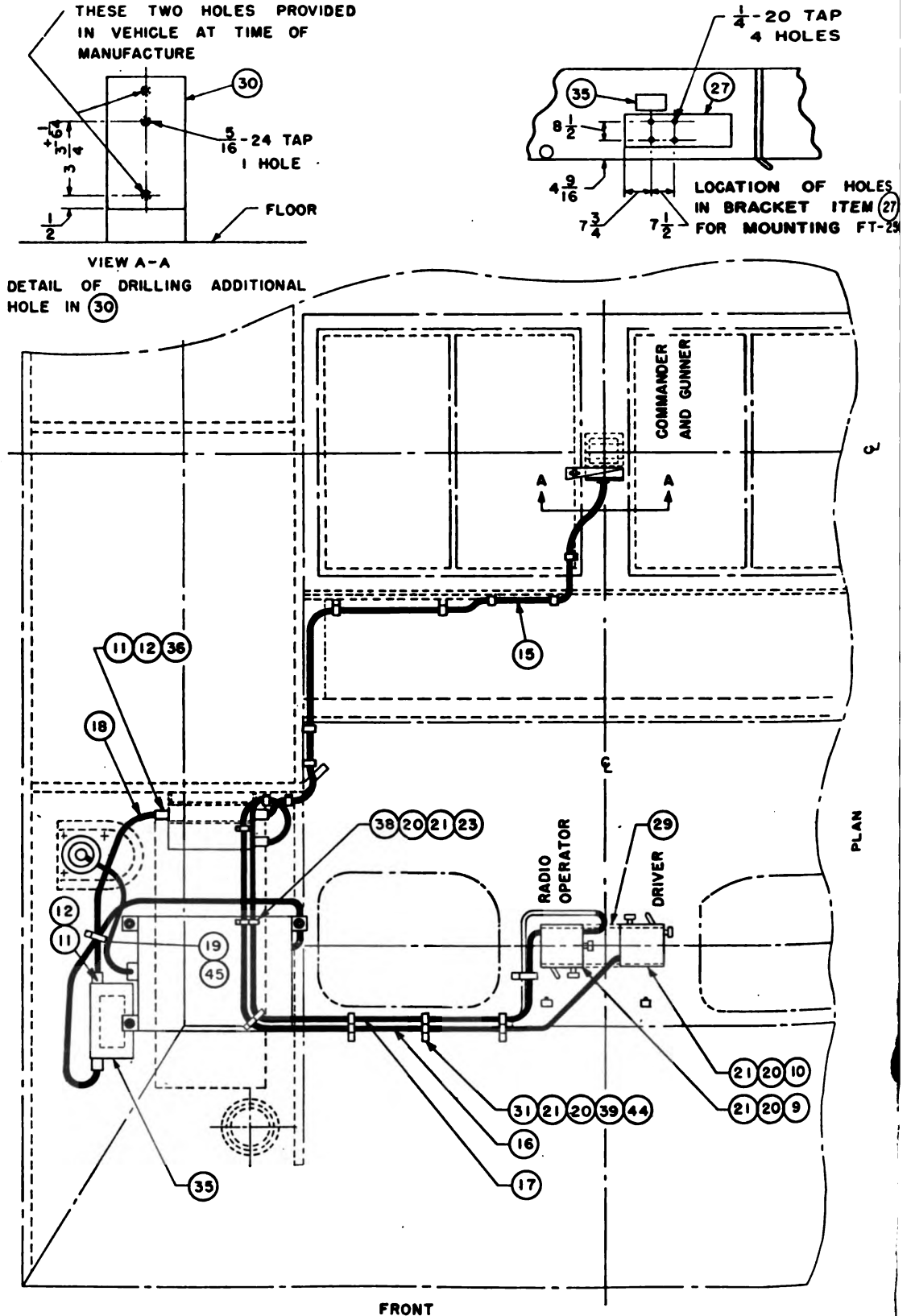
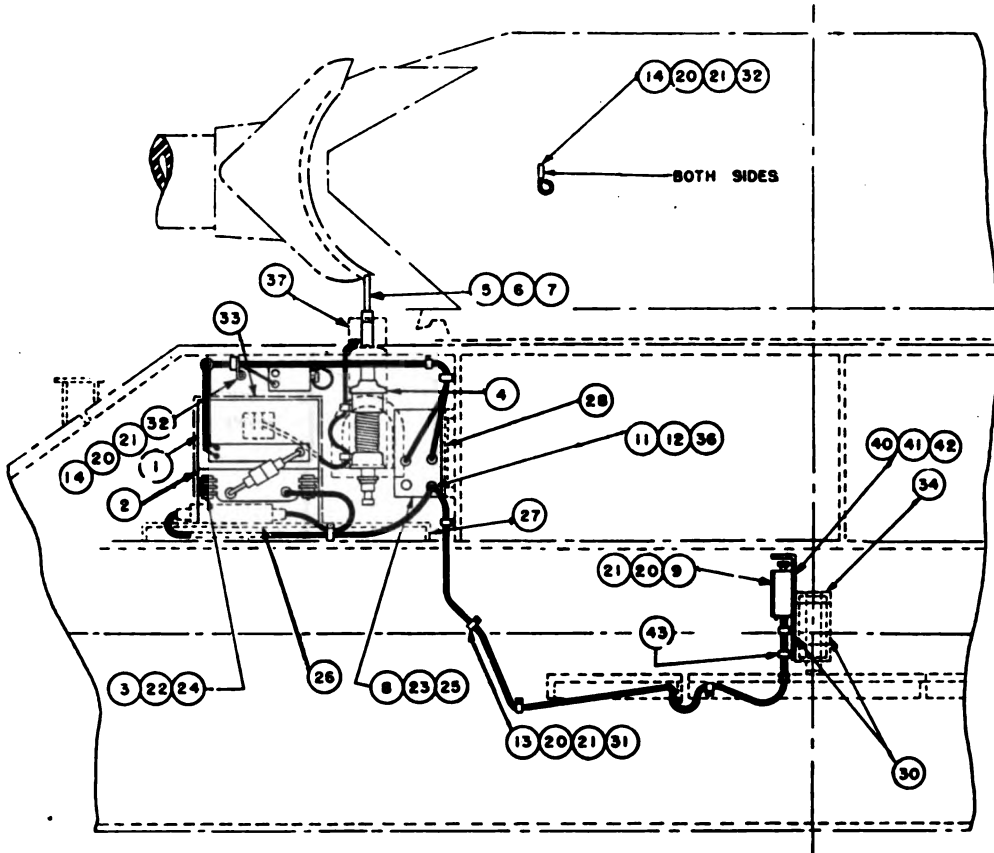


Figure 1. Installation of Radio Set SCR-610-( ) and Interphone



NOTES:

1. ITEMS 26 TO 22 INCLUSIVE, AND 36 AND 35 WILL BE FURNISHED AND INSTALLED BY THE VEHICLE MANUFACTURER.
2. TIN ONE END OF 18. SOLDER 18 TO OTHER END.
3. 13, 16, 20 AND 27 ARE FURNISHED WITH 8 AND 10.
4. SEE FIGURE 4 FOR WIRING DIAGRAM OF INTERPHONE EQUIPMENT RC-99.
5. FOR ADDITIONAL COMPONENTS AND SPARE PARTS, SEE REQUIRED PARTS LIST.
6. CORDAGE LENGTHS GIVEN INCLUDE THE EXTRA LENGTH NECESSARY FOR CONNECTIONS.
7. USE STANDARD ANTENNA SYSTEM Y PER FIGURE 10. IF COMPONENTS ARE NOT AVAILABLE, SUBSTITUTE WITH SYSTEM B PER FIGURE 10.
8. 20 SHALL BE REDUCING WASHER NO. 3703 AS MADE BY THOMAS AND BETTS OR EQUAL.
9. CLAMP NC-423 IS FURNISHED FOR USE WITH 6.
10. CLAMP NC-424 IS FURNISHED FOR USE WITH 6.
11. USE COVER DG-100 WHEN ANTENNA MAST SECTIONS MS-51 THROUGH MS-53 ARE NOT INSTALLED ON MAST BASE MP-40 OR MP-40-A.
12. REMOVE INTERNAL LEAD FROM MAST BASE MP-40.

ITEM NO.	NAME OF ITEM	QUANTITY REQUIRED
1	RADIO RECEIVER AND TRANSMITTER RC-990-( )	1
2	POWER SUPPLY UNIT PE-120 WITH VIBRATOR VD-11-( )	1
3	MOUNTING FT-250-( )	1
4	MAST BASE MP-40 OR MP-40-A SEE NOTE 7	1
5	MAST SECTION MS-51 SEE NOTE 7 AND 9	1
6	MAST SECTION MS-52 SEE NOTE 7 AND 10	1
7	MAST SECTION MS-53 SEE NOTE 7	1
8	INTERPHONE AMPLIFIER DC-947	1
9	CONTROL BOX DC-720-A	2
10	INTERPHONE CONTROL BOX DC-906-B	1
11	CONNECTOR NO. 61007	6
12	BOUNDBUT BL-50	6
13	CLAMP NO. 9 PER FIG. 7	9
14	HOOK	6
15	CORDBAGE CO-213 112 IN. LONG	1
16	CORDBAGE CO-213 80 IN. LONG	1
17	CORDBAGE CO-213 92 IN. LONG	1
18	CORDBAGE CO-213 40 IN. LONG	1
19	WIRE W-120 36 IN. LONG SEE NOTE 2 AND 12	1
20	ROUNDHEAD MACH. SCREW NO. 9-22 X 3/8 IN. LONG	25
21	LOCKWASHER STD. FOR NO. 8 SCREW	25
22	HEX. HEAD MACH. SCREW 1/8 - 20 X 3/8 IN. LONG	6
23	ROUNDHEAD MACH. SCREW 1/8 - 20 X 1-1/4 IN. LONG	6
24	LOCKWASHER STD. FOR 1/8 IN. SCREW	6
25	LOCKWASHER STD. FOR 1/8 IN. SCREW	6
26	BRACKET	1
27	BRACKET	1
28	BRACKET	1
29	BRACKET	1
30	BRACKET	1
31	SPACER	11
32	SPACER	6
33	COVER DG-153	1
34	SUPPORT	1
35	TERMINAL BOX	1
36	REDUCING WASHER SEE NOTE 8	2
37	COVER DG-100 SEE NOTE 11	1
38	CLAMP NO. 7 PER FIG. 7	6
39	CLAMP NO. 10 PER FIG. 7	3
40	BRACKET	1
41	HEX. HEAD. MACH. SCREW 5/16-24 X 3/4 IN. LONG	2
42	LOCKWASHER STD. FOR 5/16 IN. SCREW	2
43	CLAMP NO. 8 PER FIG. 7	2
44	FLATWASHER STD. FOR NO. 8 SCREW	2
45	TERMINAL	1

TL 10940-0

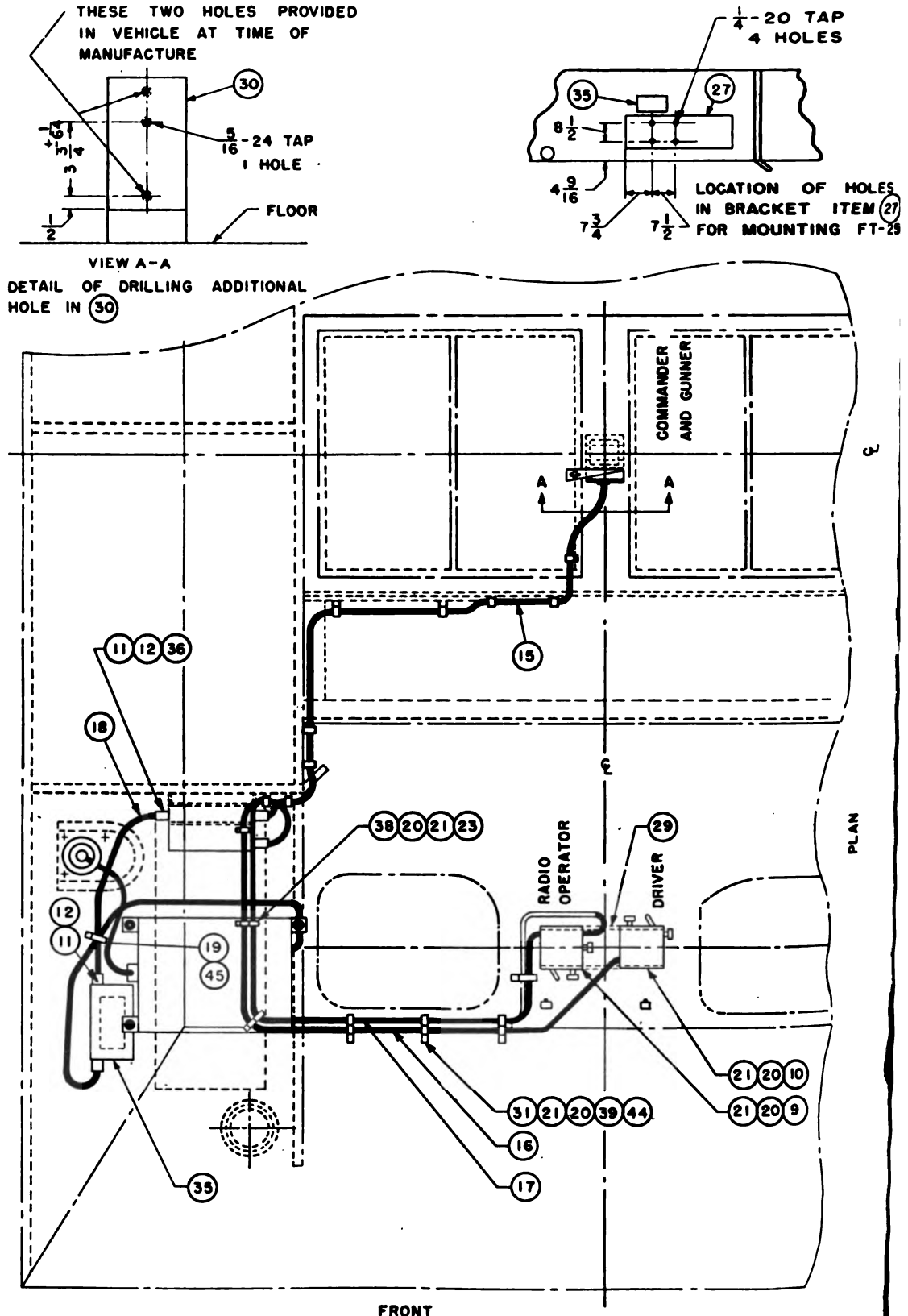
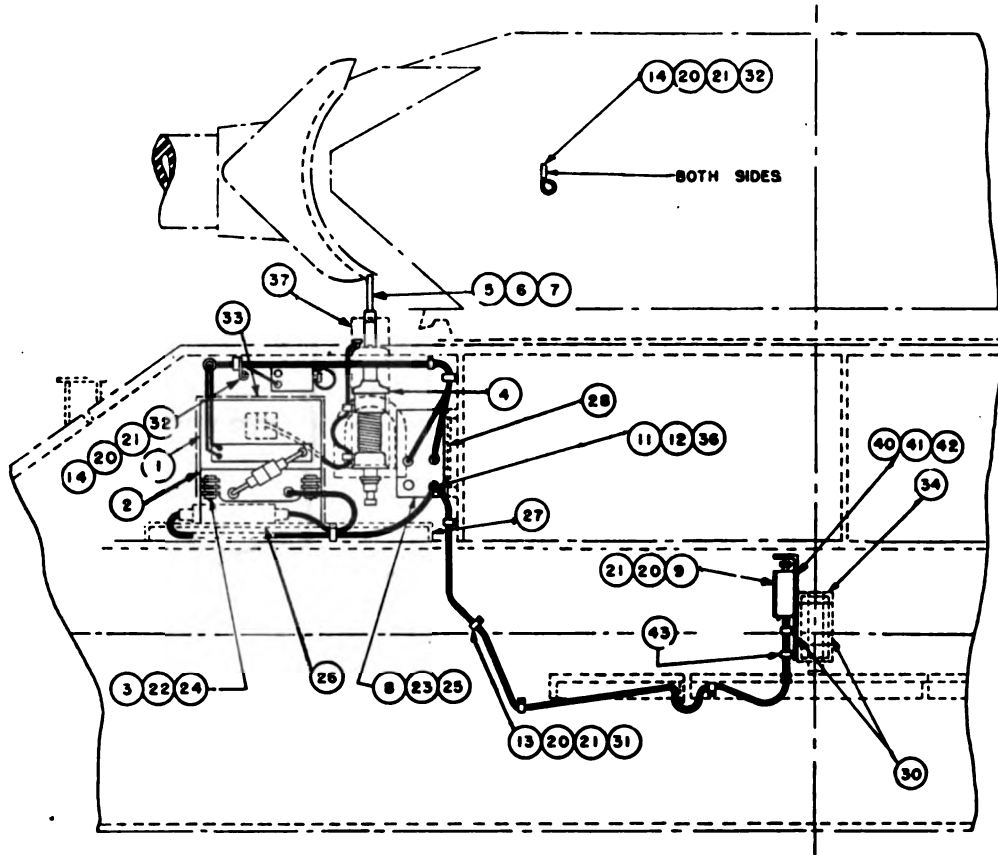


Figure 1. Installation of Radio Set SCR-610-( ) and Interphone

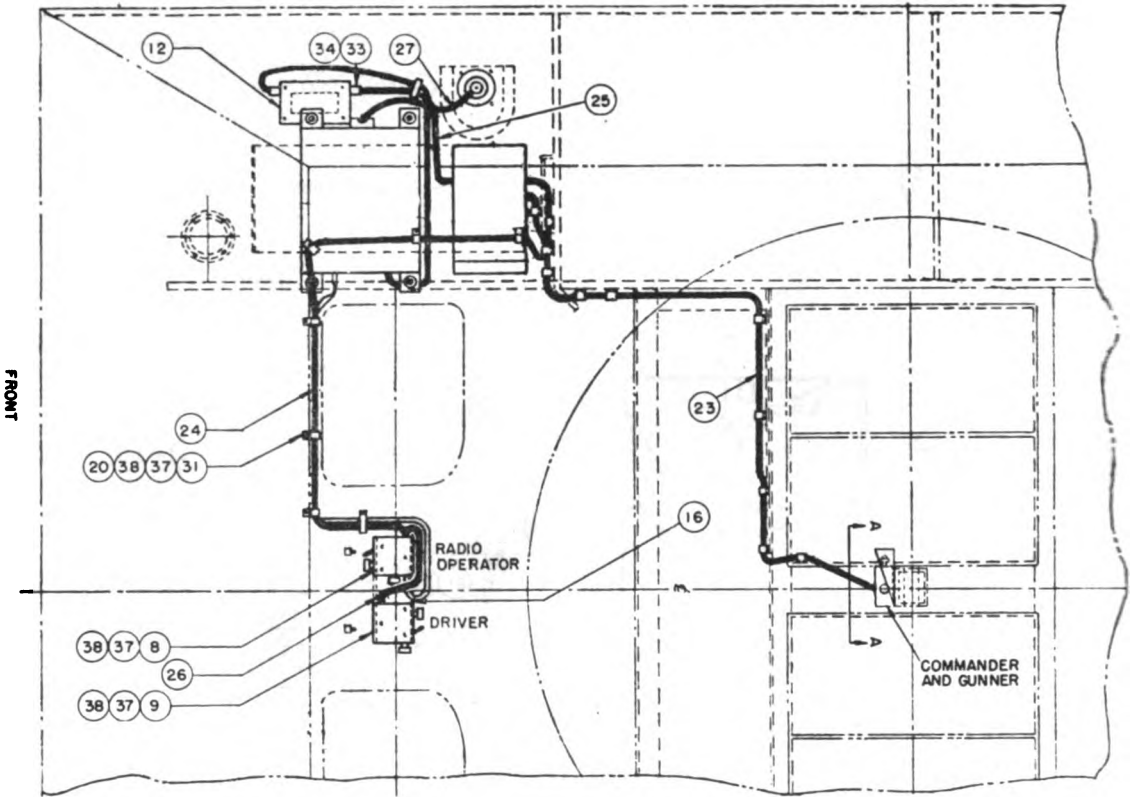


NOTES:

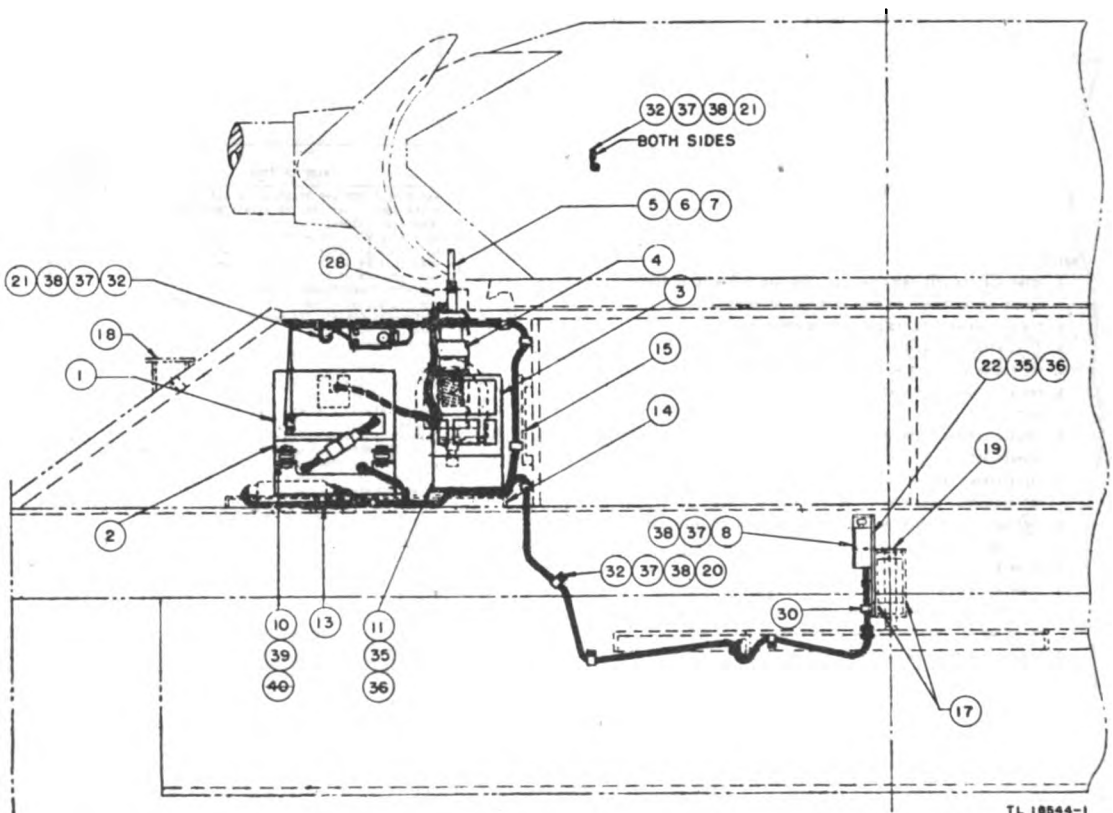
1. ITEMS 20 TO 32 INCLUSIVE, AND 34 AND 35 WILL BE FURNISHED AND INSTALLED BY THE VEHICLE MANUFACTURER.
2. TIN ONE END OF 10. SOLDER 10 TO OTHER END.
3. 13, 19, 20 AND 21 ARE FURNISHED WITH 8 AND 10.
4. SEE FIGURE 6 FOR WIRING DIAGRAM OF INTERPHONE EQUIPMENT RC-99.
5. FOR ADDITIONAL COMPONENTS AND SPARE PARTS, SEE REQUIRED PARTS LIST.
6. CORDAGE LENGTHS GIVEN INCLUDE THE EXTRA LENGTH NECESSARY FOR CONNECTIONS.
7. USE STANDARD ANTENNA SYSTEM T PER FIGURE 10. IF COMPONENTS ARE NOT AVAILABLE, SUBSTITUTE WITH SYSTEM B PER FIGURE 10.
8. 30 SHALL BE REDUCING WASHER NO. 5703 AS MADE BY THOMAS AND BETTS OR EQUAL.
9. CLAMP MC-923 IS FURNISHED FOR USE WITH 6.
10. CLAMP MC-924 IS FURNISHED FOR USE WITH 8.
11. USE COVER 80-100 WHEN ANTENNA MAST SECTIONS MS-51 THROUGH MS-53 ARE NOT INSTALLED IN MAST BASE MP-40 OR MP-40-A.
12. REMOVE INTERNAL LEAD FROM MAST BASE MP-40.

ITEM NO.	NAME OF ITEM	QUANTITY REQUIRED
1	RADIO RECEIVER AND TRANSMITTER RC-990-( )	1
2	POWER SUPPLY UNIT PE-120 WITH VIBRATOR VD-11-( )	1
3	MOUNTING FT-250-( )	1
4	MAST BASE MP-40 OR MP-40-A SEE NOTE 7	1
5	MAST SECTION MS-51 SEE NOTE 7 AND 9	1
6	MAST SECTION MS-52 SEE NOTE 7 AND 10	1
7	MAST SECTION MS-53 SEE NOTE 7	1
8	INTERPHONE AMPLIFIER RC-997	1
9	CONTROL BOX RC-720-A	2
10	INTERPHONE CONTROL BOX RC-406-B	1
11	CONNECTOR NO. 61007	1
12	BUSHING BL-50	6
13	CLAMP NO. 9 PER FIG. 7	6
14	HOOK	9
15	CORDAGE CO-213 112 IN. LONG	1
16	CORDAGE CO-213 86 IN. LONG	1
17	CORDAGE CO-213 92 IN. LONG	1
18	CORDAGE CO-213 90 IN. LONG	1
19	WIRE #120 30 IN. LONG SEE NOTE 2 AND 12	1
20	ROUNDHEAD MACH. SCREW NO. 6-32 X 3/8 IN. LONG	25
21	LOCKWASHER STD. FOR NO. 8 SCREW	NOTE 3
22	HEX. HEAD MACH. SCREW 1/4 - 20 X 3/4 IN. LONG	4
23	ROUNDHEAD MACH. SCREW 1/4 - 20 X 1-1/4 IN. LONG	4
24	LOCKWASHER STD. FOR 1/4 IN. SCREW	4
25	LOCKWASHER STD. FOR 1/4 IN. SCREW	4
26	LOCKWASHER STD. FOR 1/4 IN. SCREW	4
27	BRACKET	1
28	BRACKET	1
29	BRACKET	1
30	BRACKET	1
31	SPACER	111
32	SPACER	4
33	COVER 80-153	1
34	SUPPORT SEE NOTE 1	1
35	TERMINAL BOX	1
36	REDUCING WASHER SEE NOTE 8	2
37	COVER 80-100 SEE NOTE 11	1
38	CLAMP NO. 7 PER FIG. 7	1
39	CLAMP NO. 10 PER FIG. 7	5
40	BRACKET	1
41	HEX. HEAD. MACH. SCREW 5/16-24 X 2/4 IN. LONG	2
42	LOCKWASHER STD. FOR 5/16 IN. SCREW	2
43	CLAMP NO. 8 PER FIG. 7	2
44	FLATWASHER STD. FOR NO. 8 SCREW	3
45	TERMINAL	1

71 10840-2

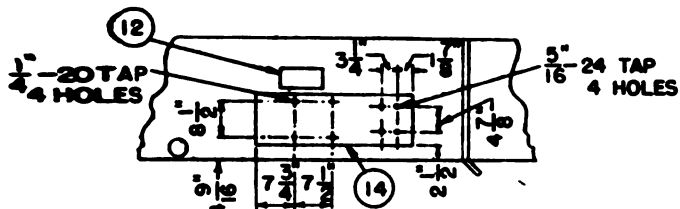


PLAN

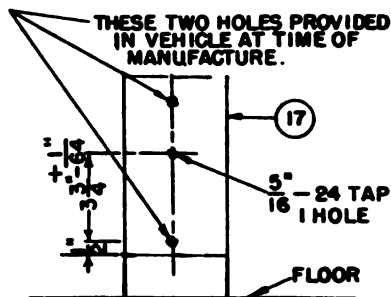


TL 18544-1

Figure 2. Installation of Radio Set SCR-610-( ) and interphone equipment



LOCATION OF HOLES IN BRACKET, ITEM (14), FOR MOUNTING FT-250 AND BRACKET, ITEM (11).



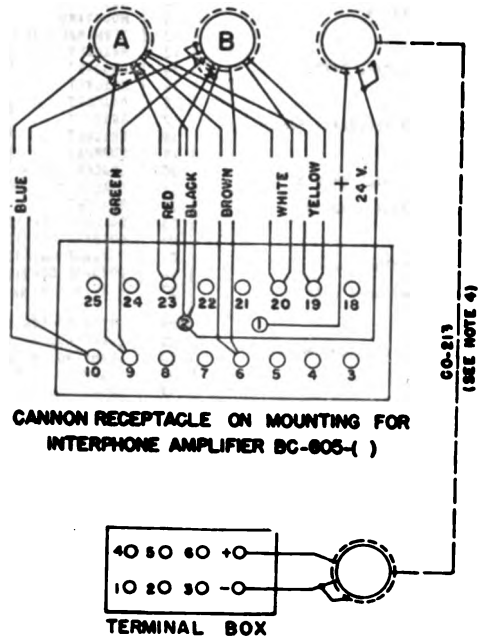
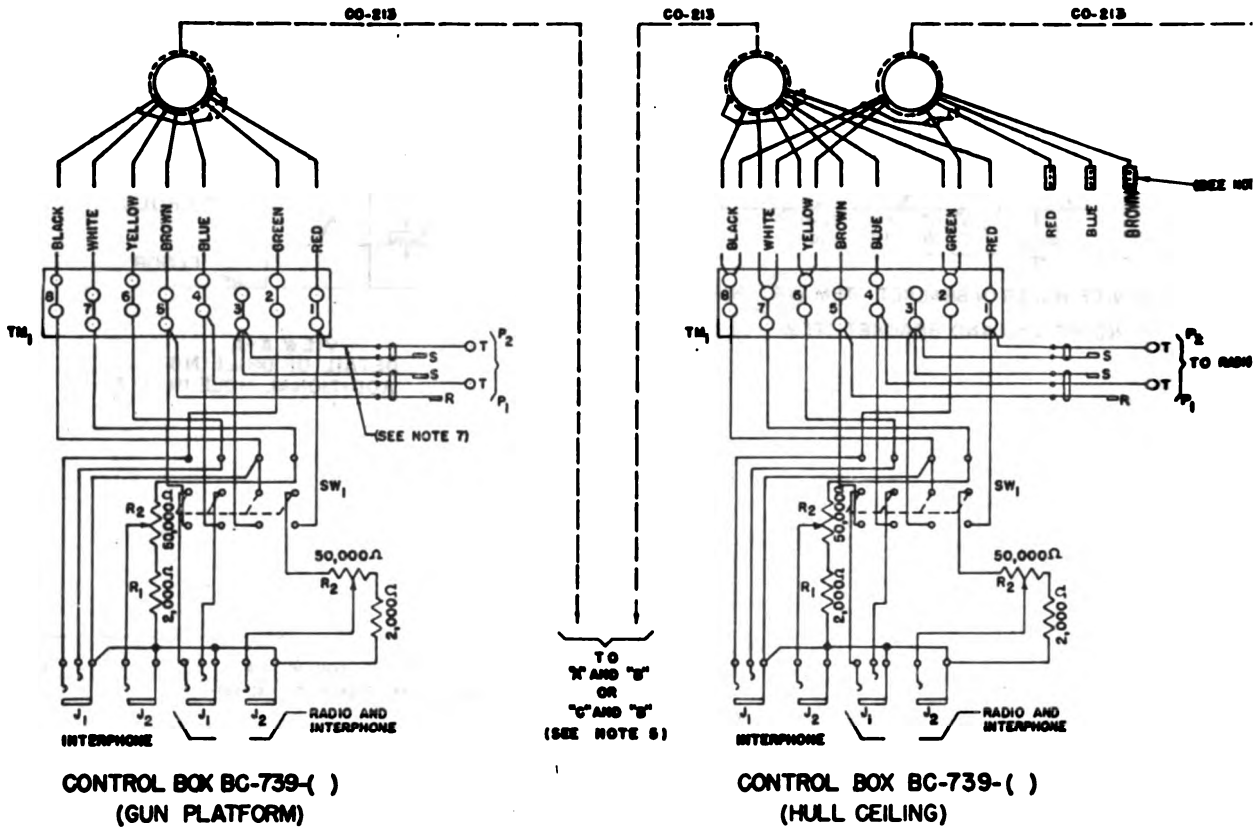
VIEW A-A  
DETAIL OF DRILLING  
ADDITIONAL HOLE IN (17)

NOTES:

1. ITEMS (12) TO (21) INCLUSIVE SHALL BE FURNISHED AND INSTALLED BY VEHICLE MANUFACTURER.
2. ENDS OF (27), AFTER BEING CUT TO PROPER LENGTH, SHALL BE TINNED FOR CONNECTING TO BINDING POSTS.
3. (29), (32), (37) AND (38) ARE FURNISHED WITH (8) AND (9).
4. FOR WIRING DIAGRAM SEE FIGURE 5.
5. FOR ADDITIONAL COMPONENTS AND SPARE PARTS SEE SPARE PARTS LIST.
6. CORDAGE LENGTHS GIVEN INCLUDE THE EXTRA LENGTH NECESSARY FOR CONNECTIONS.
7. DRIVER, RADIO OPERATOR, COMMANDER, AND OWNER SHALL EACH BE FURNISHED ONE HEADSET H-16/V, ONE MICROPHONE T-45, AND ONE CREST SET T9-4.
8. USE COVER B0-100 WHEN MAST SECTIONS ARE NOT INSTALLED.
9. REMOVE INTERNAL LEAD FROM MAST BASE MP-48 OR MP-48-A WHEN WIRE N-120 IS USED.
10. WHEN AVAILABLE, USE MAST BASE AB-15/BR AND MAST SECTIONS MS-116, MS-117, AND MS-118 IN PLACE OF (5), (6), (8), AND (7). COVER B0-100 IS NOT USED WITH MAST BASE AB-15/BR.

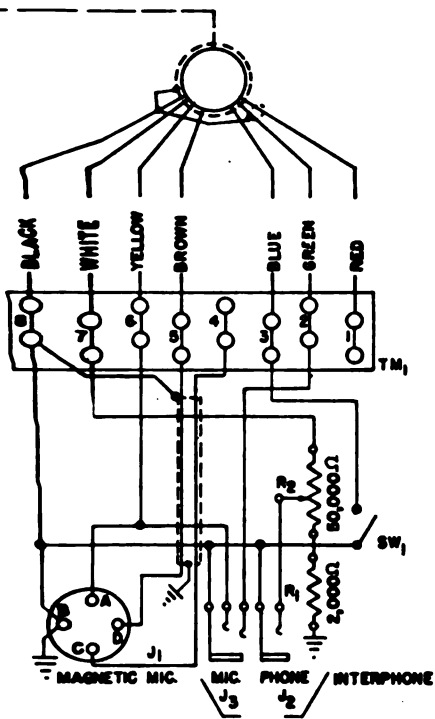
ITEM NO.	NAME OF ITEM	QUAN. REQ.
1	RADIO RECEIVER AND TRANSMITTER DC-650-( )	1
2	POWER SUPPLY UNIT PE-120-( )	1
3	INTERPHONE AMPLIFIER BC-805-( )	1
4	MAST BASE MP-48 OR MP-48-A SEE NOTE 10	1
5	MAST SECTION MS-51 AND CLAMP MC-928 (FOR RADIO SET SCR-610-( ) ONLY) SEE NOTE 10	1
6	MAST SECTION MS-52 AND CLAMP MC-924 SEE NOTE 10	1
7	MAST SECTION MS-53 SEE NOTE 10	1
8	CONTROL BOX DC-730-( )	2
9	INTERPHONE CONTROL BOX DC-606-( )	1
10	MOUNTING FT-250-( )	1
11	MOUNTING	1
12	TERMINAL BOX	1
13	BRACKET	1
14	BRACKET	1
15	BRACKET	1
16	BRACKET	1
17	BRACKET	2
18	BRACKET	1
19	SUPPORT	1
20	SPACER	11
21	SPACER	4
22	BRACKET	1
23	CORDAGE CO-218 124 IN. LONG	
24	CORDAGE CO-218 90 IN. LONG	
25	CORDAGE CO-213 35 IN. LONG	
26	CORDAGE CO-213 20 IN. LONG	
27	WIRE N-120 36 IN. LONG SEE NOTES 2 AND 9	
28	COVER B0-100 SEE NOTE 8	1
29	CLAMP NO. 4 PER FIG. 7	14
30	CLAMP NO. 6 PER FIG. 7	2
31	CLAMP NO. 7 PER FIG. 7	5
32	HOOK	4
33	CORRECTOR NO. 81007	2
34	BONDWIT NO. BL-50	2
35	HEX. HEAD MACH. SCREW 5/16 - 24 X 3/4 IN. LONG	6
36	LOCKWASHER STD. FOR 5/16 IN. SCREW	6
37	ROUNDHEAD MACH. SCREW NO. 8 - 32 X 3/8 IN. LONG	36
38	LOCKWASHER STD. FOR NO. 8 SCREW	36
39	HEX. HEAD MACH. SCREW 1/4 - 20 X 3/4 IN. LONG	3
40	LOCKWASHER STD. FOR 1/4 IN. SCREWS	4





TL 18846-1

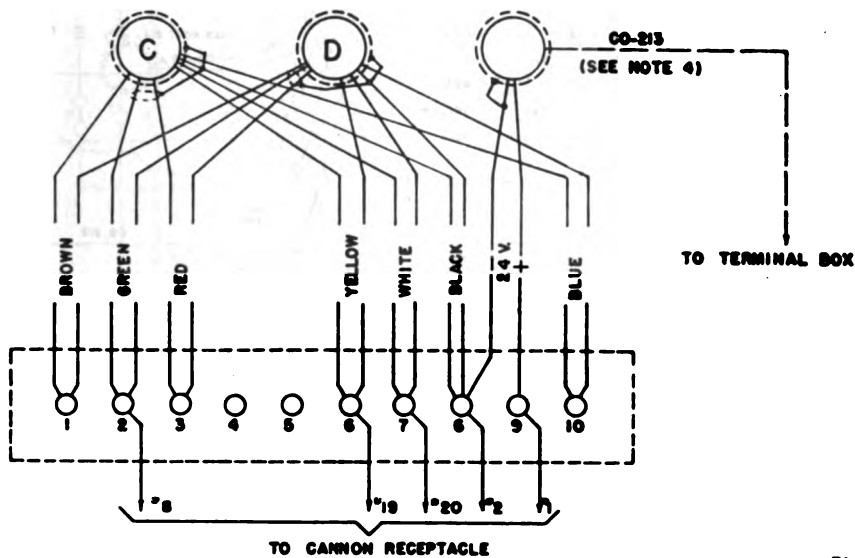
Figure 3. Wiring diagram of interphone equipment using Interphone



CONTROL BOX BC-606-( )  
(DRIVER)

NOTES:

1. FOR CORDING DIAGRAM SEE FIG. 2.
2. SHIELD OF CABLE AND SHIELD OF TWISTED PAIR OF LEADS IN CABLE SHALL BE SECURELY GROUNDED AT EACH END.
3. THE ENDS OF UNUSED LEADS SHALL BE TAPED.
4. PARALLEL WHITE AND YELLOW LEADS, BROWN AND BLACK LEADS OF CORDAGE CO-213 FOR POSITIVE AND NEGATIVE POWER CONNECTIONS RESPECTIVELY.
5. CONNECT CABLES TO "A" AND "B" POSITIONS FOR MOUNTING WHICH HAS NO TERMINAL STRIP AND TO "C" AND "D" POSITIONS FOR MOUNTING PROVIDED WITH TERMINAL STRIP.
6. DOTTED CIRCLE AROUND CABLE ENDS INDICATES SHIELD.
7. DISCONNECT LEADS AND REMOVE CORDS.



TERMINAL STRIP ON MOUNTING

Amplifier BC-605-( ) in Carriage, Motor, 3-inch Gun, M10 or M10A1.

TL18545-2

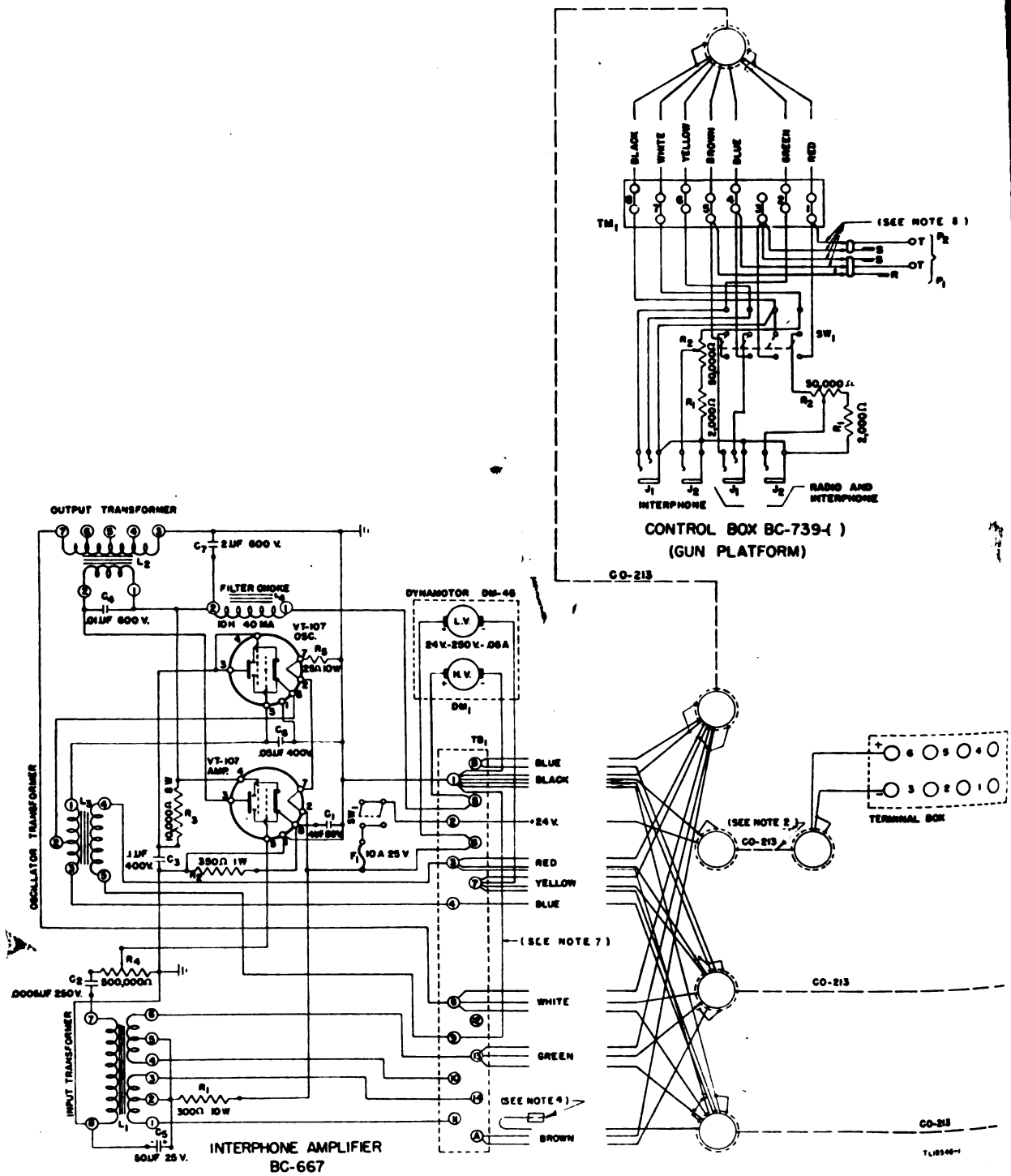
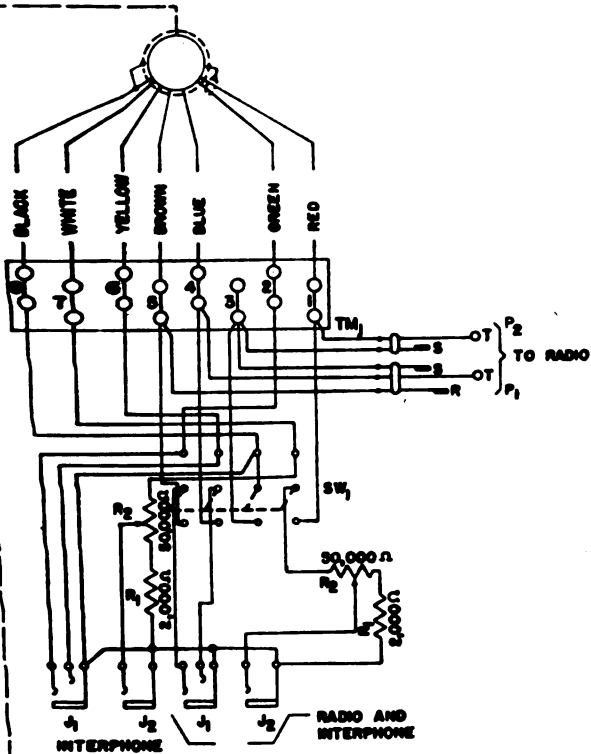


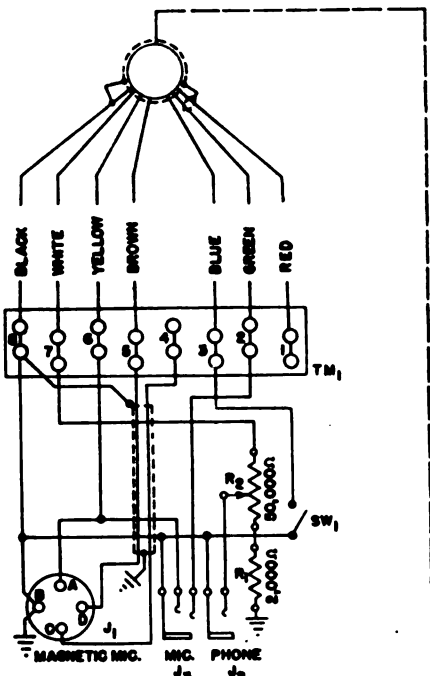
Figure 4. Wiring diagram of Interphone Equipment



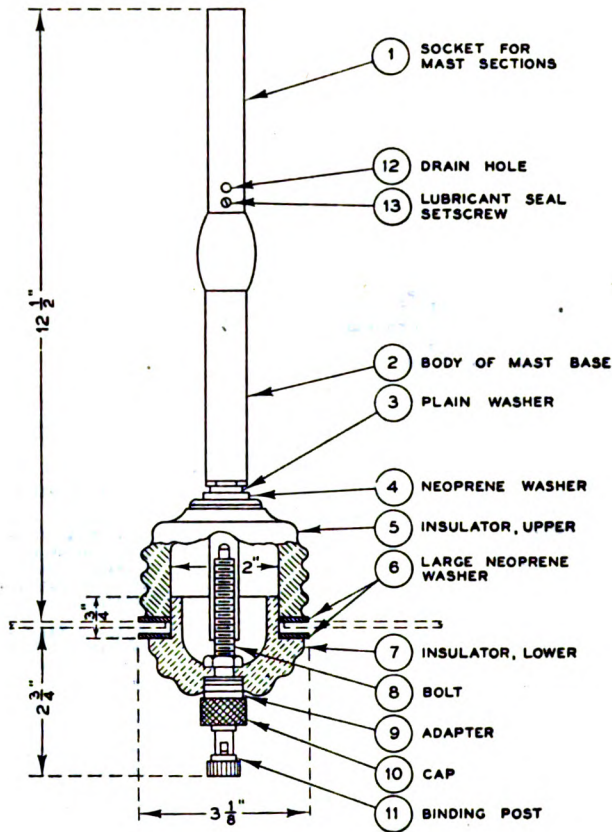
CONTROL BOX BC-739-1  
(HULL CEILING)

NOTES:

1. FOR INSTALLATION DRAWING SEE FIG. 1.
2. PARALLEL WHITE AND YELLOW LEADS, BROWN AND BLACK LEADS OF CORDAGE CO-213 FOR POSITIVE AND NEGATIVE POWER CONNECTIONS RESPECTIVELY.
3. SHIELD OF CABLE AND SHIELD OF TWISTED PAIR OF LEADS IN CABLE SHALL BE SECURELY GROUNDING AT EACH END.
4. THE ENDS OF UNUSED LEADS SHALL BE TAPED.
5. DOTTED CIRCLE AROUND CABLE ENDS INDICATES SHIELD.
6. NOTE TWO BLUE WIRES TO TERMINAL STRIP. USE CARE IN MAKING PROPER CONNECTIONS.
7. A JUMPER WIRE MUST BE CONNECTED BETWEEN TERMINAL 9 AND TERMINAL 1.
8. DISCONNECT AT TERMINAL STRIP AND REMOVE CORDS.

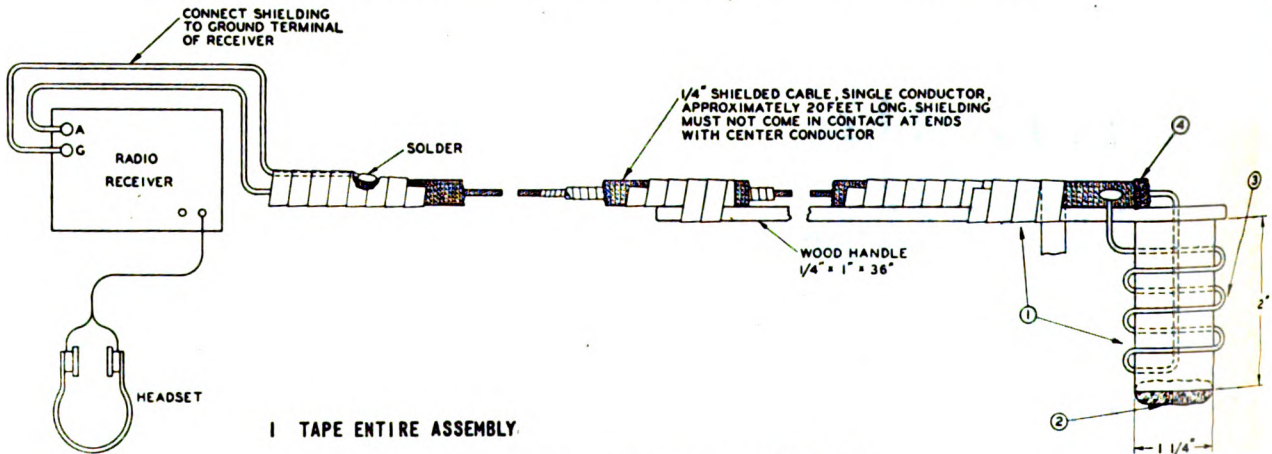


CONTROL BOX BC-606-1  
(DRIVER)



TL 13371

Figure 5. Mast Base AB-15/GR, assembly for Wire W-128 lead-in.

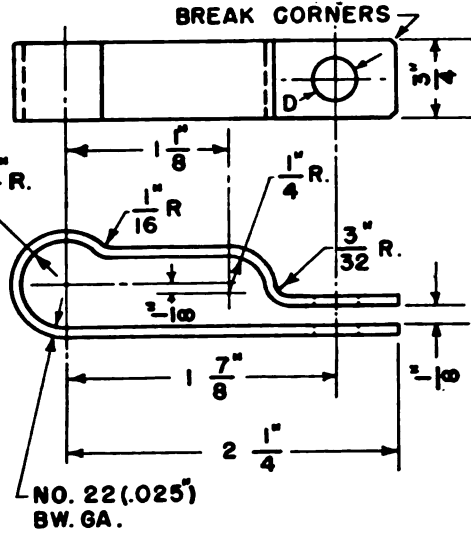
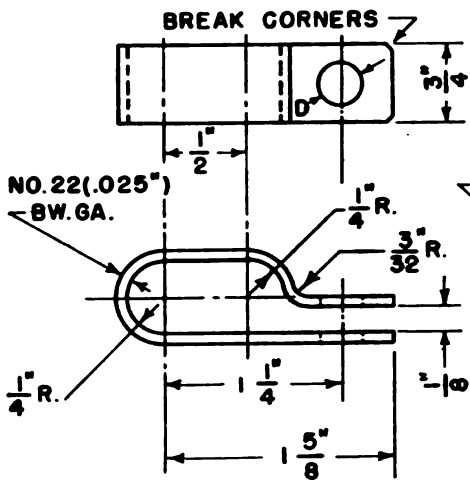
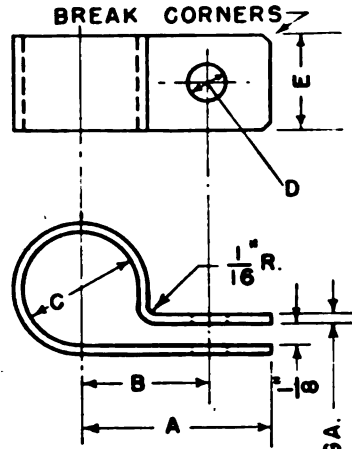


- 1 TAPE ENTIRE ASSEMBLY.
- 2 STUFF END OF INSULATED TUBING WITH FELT AND TAPE OVER ENTIRE ASSEMBLY
- 3 WIND 3 TURNS NO. 16 OR NO. 18 WIRE ON TUBE OF INSULATING MATERIAL. SOLDER ONE END TO SHIELD ON CABLE, THE OTHER END ON INSULATED WIRE INSIDE CABLE.
- 4 ROLL BACK END OF SHIELDING, AND SECURE WITH SOLDER.

Figure 6. Probe antenna.

TL-7547-A

CLAMP	A	B	C	D	E	STOCK NO.
1	1-1/8"	3/4"	7/16"	3/16"	1/2"	2Z2637-1
2	1-1/8"	3/4"	7/16"	9/32"	3/4"	2Z2637-2
3	1-1/8"	3/4"	7/16"	13/32"	3/4"	2Z2637-3
4	1-1/8"	3/4"	17/32"	3/16"	1/2"	2Z2637-4
5	1-1/8"	3/4"	17/32"	9/32"	3/4"	2Z2637-5
6	1-1/8"	3/4"	17/32"	13/32"	3/4"	2Z2637-6



CLAMP	D	STOCK NO.
7	3/16"	2Z2637-7
8	9/32"	2Z2637-8
9	13/32"	2Z2637-9

CLAMP	D	STOCK NO.
10	9/32"	2Z2637-10
11	13/32"	2Z2637-11

NOTE:  
TOLERANCES  $\pm 1/32$ "

Figure 7. Clamps for radio cordage.

TL-13319

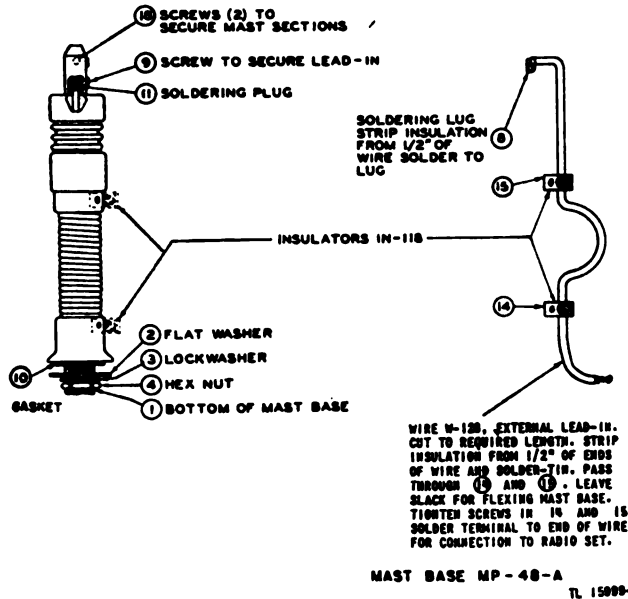
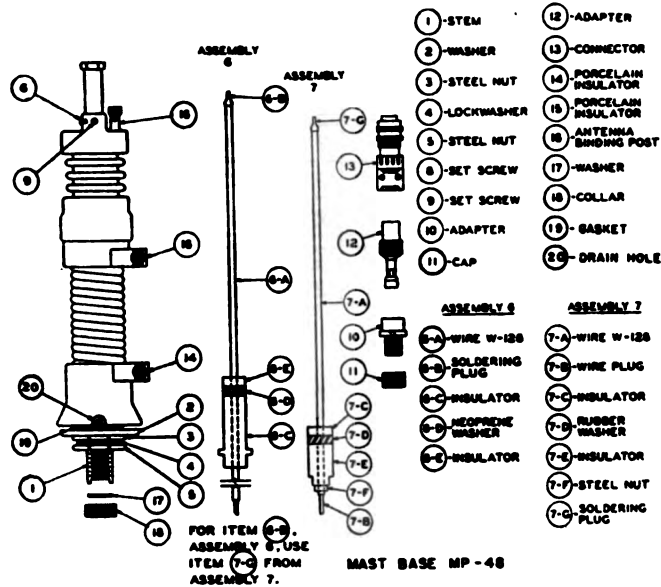


Figure 8. Mast Base MP-48 and MP-48-A, assembly.





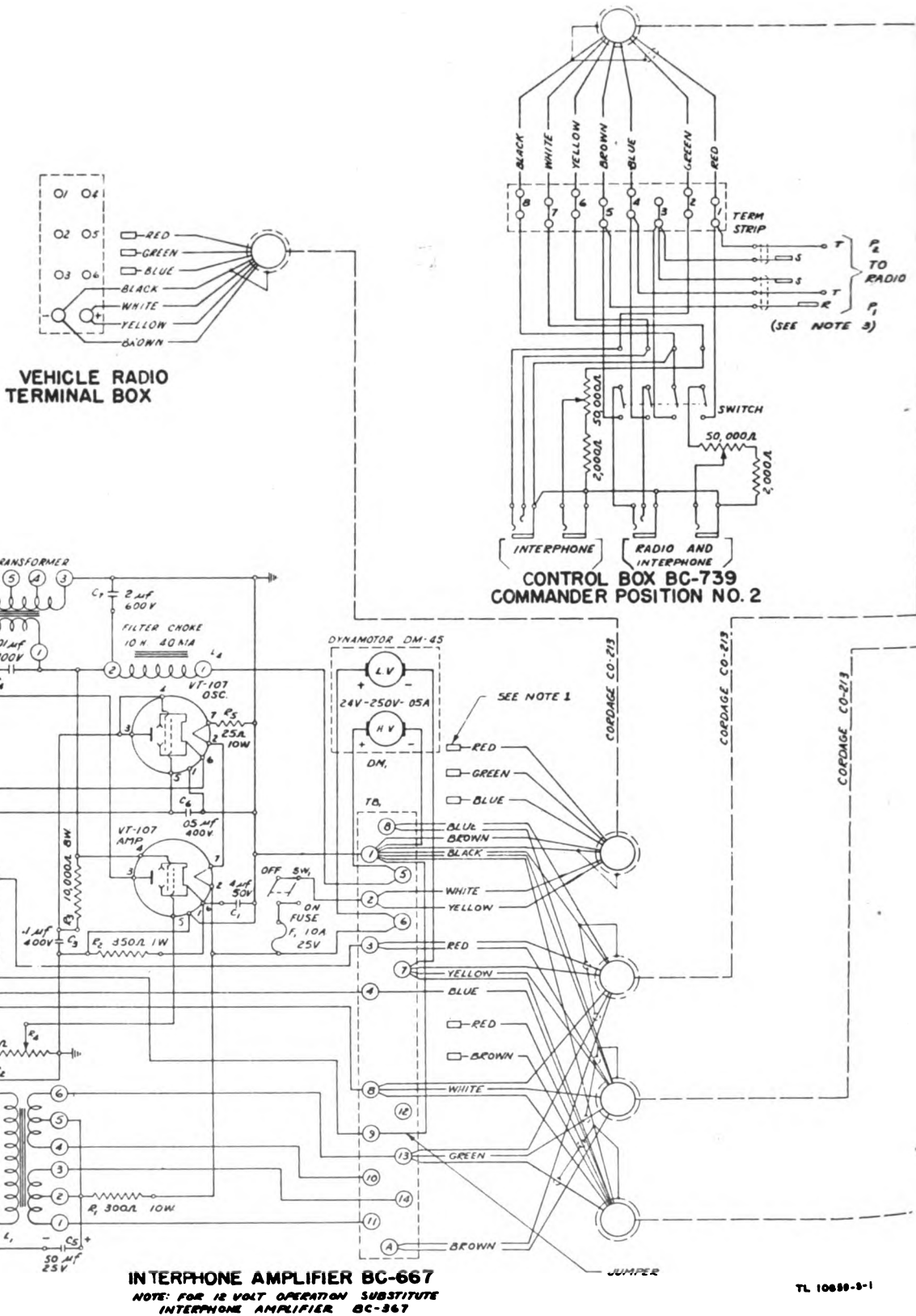
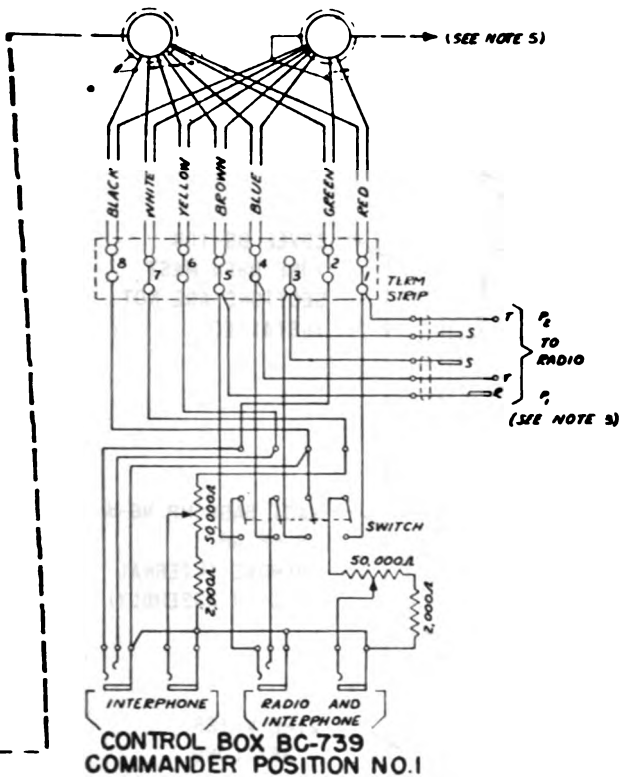
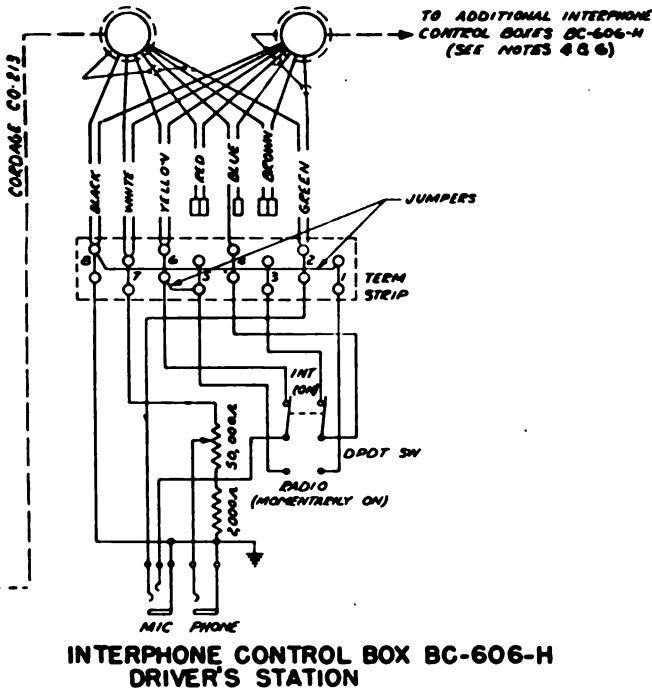


Figure 9. Wiring Diagram of Interphone Equipment RC-99



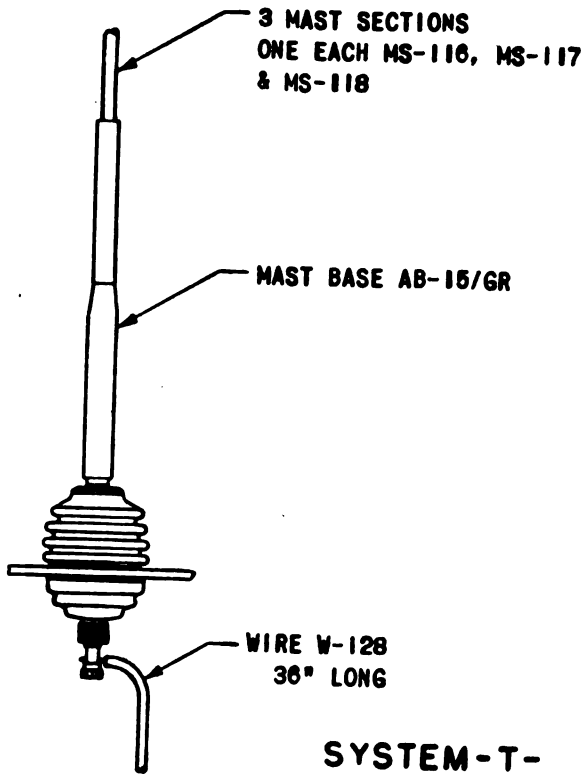
NOTE:

1. TAPE ENDS OF UNUSED LEADS OF CO-213.
2. BROKEN CIRCLE AROUND CABLE ENDS INDICATES SHIELD.
3. REMOVE THE CORDS P<sub>1</sub> AND P<sub>2</sub> FROM THE CONTROL BOX BC-739 IN WHICH THEY WILL NOT BE USED TO MAKE CONNECTIONS TO RADIO SET.
4. CONNECTIONS TO ADDITIONAL INTERPHONE CONTROL BOXES BC-606-H MAY BE MADE DIRECTLY TO BC-267 OR BC-667 OR MAY BE MADE AS INDICATED BY ARROW. OMIT BLUE LEAD AND JUMPERS FROM BC-606-H UNLESS IT IS DESIRED TO PROVIDE FACILITIES TO SIGNAL THE COMMAND STATIONS.
5. CONTROL BOX BC-739 COMMANDER POSITION NO. 2 MAY BE CONNECTED IN THIS MANNER DEPENDING ON RELATIVE PHYSICAL LOCATIONS OF BC-739 BOXES AND INTERPHONE AMPLIFIER.
6. WHEN SIGNALLING FACILITIES ARE DESIRED BLUE LEAD MUST BE CONNECTED TO PROVIDE CONTINUOUS CIRCUIT FROM TERM. 4 OF BC-606-H TO TERM. 4 OF INTERPHONE AMPLIFIER.
7. OMISSION OF SUFFIX LETTERS FROM TYPE NUMBERS INDICATES THAT ANY ISSUE OF THAT TYPE MAY BE USED.

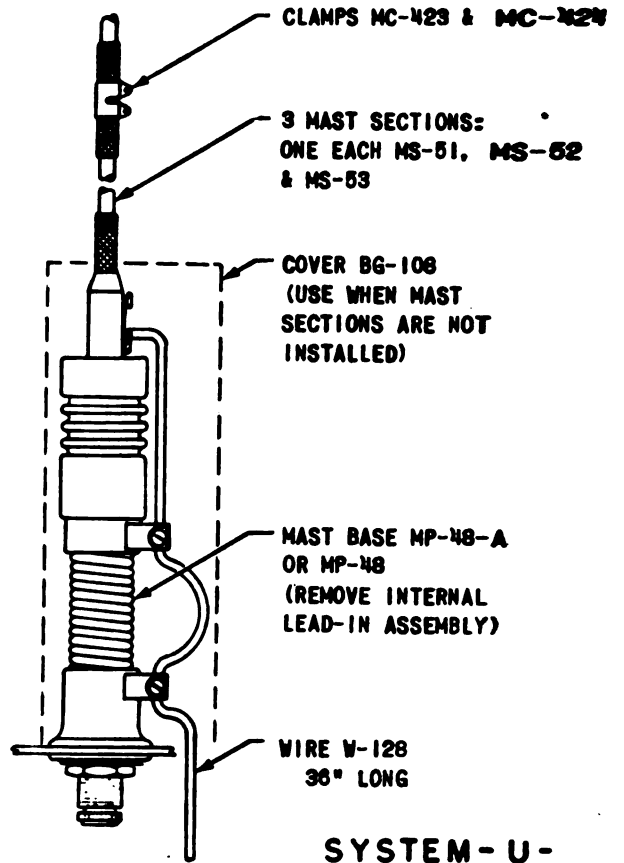


TL 10839-5-2

to permit control of radio set from two interphone positions.



**SYSTEM-T-**  
RADIO SET SCR-610  
TL 10879-3-1



**SYSTEM-U-**  
RADIO SET SCR-610  
TL 10879-3-2

*Figure 10. Alternate antenna systems.*





1.35:11-2724

# TM 11-2724

WAR DEPARTMENT TECHNICAL MANUAL

## INSTALLATION OF RADIO AND INTERPHONE EQUIPMENT IN CARRIAGE, MOTOR, 76-MM GUN, M18



**RESTRICTED. DISSEMINATION OF RESTRICTED MATTER.**  
No person is entitled solely by virtue of his grade or position to knowledge or possession of classified matter. Such matter is entrusted only to those individuals whose official duties require such knowledge or possession. (See also paragraph 23b, AR 380-5, 15 March 1944.)

WAR DEPARTMENT

APRIL 1945



INSTALLATION OF RADIO  
AND  
INTERPHONE EQUIPMENT  
IN CARRIAGE, MOTOR,  
76-MM GUN, M18



WAR DEPARTMENT • APRIL 1945

---

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---



WAR DEPARTMENT  
Washington 25, D. C., 11 April 1945

TM 11-2724, Installation of Radio and Interphone Equipment in Carriage, Motor, 76-MM Gun, M18, is published for the information and guidance of all concerned.

[AG 300.7 (20 Mar 45)]

BY ORDER OF THE SECRETARY OF WAR:

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*The Adjutant General*

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E's: 11-7; 11-15; 11-47; 11-107; 11-127; 11-147; 11-587; 11-592;  
11-597.

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

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<b>III. RADIO SET SCR-610-( ).</b>		
Required parts .....	8	4
Assembly and installation .....	9	4
<b>IV. INTERPHONE EQUIPMENT RC-99.</b>		
Required parts .....	10	6
Assembly and installation .....	11	6

## DESTRUCTION NOTICE

---

**WHY** —To prevent the enemy from using or salvaging this equipment for his benefit.

**WHEN**—When ordered by your commander.

**HOW** —1. Smash—Use sledges, axes, handaxes, pickaxes, hammers, crowbars, heavy tools.

2. Cut—Use axes, handaxes, machetes.

3. Burn—Use gasoline, kerosene, oil, flame throwers, incendiary grenades.

4. Explosives—Use firearms, grenades, TNT.

5. Disposal—Bury in slit trenches, fox holes, other holes. Throw in streams. Scatter.

### USE ANYTHING IMMEDIATELY AVAILABLE FOR DESTRUCTION OF THIS EQUIPMENT

**WHAT**—1. Smash—All vacuum tubes, crystals, control dials, coupling coils, transformers, speakers in receivers, external loudspeakers, microphones, headsets, dynamotors, and cable connectors.

2. Cut—All connecting wires, cording, and cabling.

3. Burn—All equipment and all associated training, technical, and installation manuals.

4. Bury or scatter—All remains, after destroying their usefulness.

**DESTROY EVERYTHING**

## SAFETY NOTICE

---

This equipment uses high voltages which are dangerous to life. Observe all safety precautions.

1. Make no adjustment with the power switch on.
2. Do not operate the equipment with the shields removed.
3. Do not connect power to any unit of the radio set until operating instructions have been read completely.



## SECTION I.

## GUIDE TO USE OF THIS MANUAL

---

**1. Purpose**

This manual provides methods and procedure, based upon actual field experience, for installation of radio and interphone equipment in Carriage, Motor, 76-MM Gun, M18. Items required to make a complete operating installation are listed for each set. Official nomenclature followed by empty parentheses, such as Headset HS-30-( ), is used to indicate any model of equipment regardless of its procurement.

**2. Equipment**

Installations covered include the following radio sets: Radio Set SCR-610-( ) and Interphone Equipment RC-99.

**3. Holes and Brackets**

Brackets required for installation of the radio set are normally drilled and installed prior to delivery

of Carriage, Motor, 76-MM Gun, M18. Drilling instructions are given in this manual for any other necessary holes and brackets. Do not relocate any holes or brackets unless absolutely necessary.

**4. Preliminary Check**

Study the illustrations, the installation methods outlined, and any subsequent changes to this manual.

*Caution:* Carriage, Motor, 76-MM Gun, M18 has a 24-volt electrical system. Before installing the radio sets, be sure they are designed for 24-volt operation, or tubes may burn out or dynamotors may be damaged.

**5. Operating Check**

Carefully study the Technical Manual covering the radio set before trying to operate it; then, make a thorough operating check to determine whether the equipment has been properly installed and is in working order.



SECTION II.

IGNITION NOISE SUPPRESSION IN CARRIAGE, MOTOR, 76-MM GUN, M18

6. General

Excessive ignition or other electrical noises may interfere with the operation of radio equipment in Carriage, Motor, 76-MM Gun, M18. The Technical Manual issued with the vehicle will be helpful in locating the source of the noise, since it describes the suppression system used. Instructions for operating radio equipment used in the vehicle also should be studied. For further information on ignition noise suppression see TM 11-483.

7. Procedure

Locate and suppress ignition noises as follows:

a. Start the motor of the vehicle and turn on the radio set. Put the receiver sensitivity control at *maximum*; then, listening to the receiver output with a headset, slowly tune the receiver over the entire range of frequencies to be used for communication.

b. When the frequency (or frequencies) with greatest noise level is found, turn off the vehicle engine. If this noise continues, the source is outside the ignition system. If noise stops, the trouble is in the ignition system.

c. Start the engine again. Adjust the receiver sensitivity control until engine noises can be distinguished easily from static, etc. Interference may then be identified as follows:

Interference	Usual source
Popping sound: corresponds to ignition firing; stops when engine is turned off; accelerates when engine is raced.	Ignition system.
Intermittent, clicking sound: lingers for several seconds when ignition is turned off.	Generator regulator.

Interference	Usual source
Whining sound: varies with speed of engine; ceases only when generator stops rotating.	Generator.
Sparking, or continuous crackling noise.	Brushes and commutator of generator.

d. Interference from other electrical parts and circuits of the vehicle, such as panel gauges and heater fans, can usually be identified by turning off the gauges, fans, or other suspected mechanisms individually.

e. If the source of interference still cannot be found by any of the preceding methods, connect a probe antenna (fig. 8) to the antenna terminal of the radio set. Slowly move the loop of the probe antenna over the various parts of the electrical system of the vehicle. Keep the loop close to, but not in contact with, the part being examined. Noise from interference-producing parts should be heard in the receiver.

f. Usually interference can be eliminated by cleaning, tightening, or replacing noise-producing parts. Examine and tighten all suppressor and shielding components, and all connections and grounding bonds. Clean the surface under them. This will assure good electrical contact between wires and terminals, and between metal casings and the frame of the vehicle. (Insulated but ungrounded metal parts absorb and reradiate electrical noises.)

g. If interference persists, suppressor components should be checked by substituting new ones. If a replacement is not available, disconnect the suspected component, and test capacitors, resistors, and chokes within it. Replace any that are defective.



SECTION III.

RADIO SET SCR-610-( )

8. Required Parts

Items necessary for installation of Radio Set SCR-610-( ) in Carriage, Motor, 76-MM Gun, M18 are listed below:

Basic unit Stock No. 2S610/24			Basic unit Stock No. 2S610/24 (contd.)		
Quantity	Stock No.	Item	Quantity	Stock No.	Item
1	6Q349	Alignment Tool TL-207.	1	2Z8056	Roll BG-56-( ).
1	2A229C	Antenna AN-29-C.	15 ft	6Z7926	Rope RP-5, for tying down mast sections.
1	3B879	Case CS-79.	2	2Z9019	Strap ST-19.
1	ZZ1890-137	Case CS-137.	2	6D13037	TM 11-615, for Radio Set SCR-610-( ).
1	6Z3147	Connector No. 61007 and Bondnut BL-50.	1	3H6711	Vibrator VB-11.
2	2A2352/1	Fitting, including spare.	27 ft	1B29	Wire W-29.
1	2B613	Handset TS-13, a spare.	6 ft	1B128	Wire W-128.
2	3G586	Insulator IN-86, for tying down masts sections.			
1	2G1250-64.15	Insulator, glazed porcelain.	Installation unit Stock No. 2S610-V65/50		
1	2A2081-15	Mast Base AB-15/GR.	Quantity	Stock No.	Item
2	2A2416	Mast Section MS-116, including spare.	1	3A41	Battery BA-41.
2	2A2417	Mast Section MS-117, including spare.	1	3E1307-5.5	Cord CD-307.
2	2A2418	Mast Section MS-118, including spare.	1	3E1318	Cord CD-318.
1	2Z6721-250	Mounting FT-250-( ).	1	3E1604	Cord CD-604.
1	3H4496-120	Power Supply Unit PE-120-( ).	1	2Z3400-153	Cover BG-153.
1	2C5379	Radio Receiver and Transmitter BC-659-( ).	1	6L50-610V65	Hardware bag.
			1	2B830	Headset HS-30.
			2	3G621	Insulator IN-121, including spare.
			1	2B1645	Microphone T-45.

\* Items used for portable, fixed, or emergency operation.  
 \* Headset HS-18 (Cord CD-604 not required) or Headset P-18 (Cords CD-604 and CD-307 not required) may be substituted for Headset HS-30.

\* When Mast Base AB-15/GR, Mast Section MS-116, MS-117, and MS-118 are not available, use Mast Base MP-48 or MP-48-A, Mast Sections MS-51, MS-52, MS-53, Clamps MC-423 and MC-424, and Cover BG-108.

9. Assembly and Installation

Components of Radio Set SCR-610-( ) should be installed in Carriage, Motor, 76-MM Gun, M18 as shown in figure 1 and as directed below:

<i>Part and location</i>	<i>Method and materials</i>
Mounting FT-250-( ) (item 3, fig. 1), on mounting plate (item 31) attached floor of turret bulge.	Secure Mounting FT-250-( ) to mounting plate with hardware provided as shown in figure 1.
Power Supply Unit PE-120-( ) (item 2, fig. 1), on Mounting FT-250-( ).	Open case of Power Supply Unit PE-120-( ) and remove chassis cover. Install Vibrator VB-11 in its socket. Make certain that connector link is in BC-659 position; that change-over plug is set for 24 volts, and that tubes are pressed down firmly in their proper sockets. Replace cover on chassis and close case of power supply unit. Place unit on Mounting FT-250-( ) and secure with catch-clips provided.

*Part and location*

Battery BA-41, in battery compartment of Radio Receiver and Transmitter BC-659-( ).

Radio Receiver and Transmitter BC-659-( ) (item 1, fig. 1), on Power Supply Unit PE-120-( ).

Insulator IN-121 (item 12, fig. 1), in hole provided beside mast base.

Mast Base AB-15/GR (item 4, fig. 1), in hole in roof of turret bulge.

Mast Sections MS-116, MS-117, and MS-118 (items 5, 6, and 7, fig. 1), in mast base.

Connector No. 61007, Bondnut BL-50 (items 13 and 14, fig. 1) and power cord for Power Supply Unit PE-120-( ), to turret terminal box (item 37, fig. 1).

Case CS-137.

*Method and materials*

Remove ten screws on outer edges of front panel of radio receiver and transmitter, and pull chassis out from case. Remove cover of battery compartment located on chassis, and insert battery into compartment. While chassis is out of its case, see that all tubes are in proper sockets and pushed down firmly; that crystals for desired operating frequencies are in their sockets; and that retaining clip is in position to hold them securely. Do not interchange these crystals. See that two toggle switches near left edge of chassis are in ON position. Replace chassis in case.

Place on Power Supply Unit PE-120-( ) and secure with catch-clips provided.

Place insulator through hole, with flange end outside, and secure with clip provided.

Disassemble Mast Base AB-15/GR by holding lower insulator and turning body of mast base counterclockwise. Install mast base in hole in roof. Refer to figure 4 and assemble mast base as follows: Place insulator, item 5, over hole in roof. Place small neoprene washer, item 4, over item 5 and place plain washer, item 3, over item 4. Insert body of mast base, item 2, through hole in items 3, 4, 5, 6, and hole in roof. Insert bolt, item 8, through item 7 and into item 2 from under side and turn item 2 clockwise until mast base is tightened securely. Cut a 37-inch length of Wire W-128. Strip back  $\frac{1}{2}$  inch of insulation from each end and solder-tin tips. CAUTION: Wire W-128 must be exactly 36 inches long between binding post on mast base and antenna terminal on receiver and transmitter. Connect Wire W-128 to binding post on bottom of mast base and route wire to antenna terminal of left side of Radio Receiver and Transmitter BC-659-( ).

Screw mast sections together and secure joints with friction tape to prevent loss. Mast sections are carried in Roll BG-56-( ) when not in use.

Slip connector over power cord at terminal box end. Remove terminal box knock-out most convenient for short connections. Secure connector to terminal box with bondnut. Connect terminal lugs of power cord to 24-volt positive and negative terminals as marked. Note: If Plate Supply Unit PE-117-( ) is substituted for Power Supply Unit PE-120-( ), the connection must be made to 12-volt terminals, and plate supply unit adjusted for 12-volt operation.

Place remaining crystals in Case CS-137; stow case in Power Supply Unit PE-120-( ).

SECTION IV.

INTERPHONE EQUIPMENT RC - 99

10. Required Parts

Items necessary for installation of Interphone Equipment RC-99 in Carriage, Motor, 76-MM Gun, M18 are listed below:

Basic unit Stock No. 2S99/24			Installation unit Stock No. 2S99-V65/50 (contd.)		
Quantity	Stock No.	Item	Quantity	Stock No.	Item
4	6Z3147	Connector No. 61007 and Bondnut BL-50.	30 ft	3E2213	Cordage CO-213.
1	2C1637	Interphone Amplifier BC-667-( ).	1	6L50-99V65	Hardware bag.
1	2C1738	Interphone Control Box BC-606-( ).	4	2B800-16	Headset H-16/U.
2	2C675-739	Control Box BC-739-( ).	1	2C1738	Interphone Control Box BC-606-( ).
2	6D13033	TM 11-702, for Interphone Equipment RC-99.	4	2B1645	Microphone T-45.
			1	6H306	Reel Assembly RL-106/V1, including:
			1	3E1264	Cord CD-264.
			1	3E1265	Cord CD-265.
			75 ft	3E2146	Cordage CO-146.
			1	6H875-171	Guide Ring MX-171/V1.
			1	2Z5600-65	Junction Box J-65/V1.
			1	6H6308	Reel RL-108/V1.
			2	6D13244	TM 11-2254, for Reel Assembly RL-106/V1.

Installation unit Stock No. 2S99-V65/50		
Quantity	Stock No.	Item
4	4B417-4	Chest Set TD-4.
3	6Z3147	Connector No. 61007 and Bondnut BL-50.

11. Assembly and Installation

Components of Interphone Equipment RC-99 should be installed in Carriage, Motor, 76-MM Gun, M18 as shown in figures 1 and 3 and as directed below:

*Part and location*

*Method and materials*

Cordage CO-213 (items 19, 20, 21, 22, 23, and 24, fig. 1).

Prepare ends of cable by stripping back insulation and solder-tinning ends. Provide a soldered ground connection for inner and outer shielding at both ends of cable. Tape ends of all unused wires.

Interphone Amplifier BC-667-( ) (item 11, fig. 1), on bracket on left side of turret bulge.

Refer to figure 1. Remove eight screws at edge of front panel and pull out chassis. Remove two knock-outs from amplifier case for power cord and interphone cable. Wire as shown in figure 2. Secure cords to amplifier case with connectors and bondnuts provided. Secure amplifier case to bracket as shown in figure 1.

Control Boxes BC-739-( ) (item 10, fig. 1), on brackets attached at left and right sides of turret.

Wire control boxes as shown in figure 2. Secure box and route cords as shown in figure 1. Insert plugs on attached cord into proper jacks on panel of Radio Receiver and Transmitter BC-659-( ).

Interphone Control Boxes BC-606-( ) (item 9, fig. 1), on brackets (item 36) at center of hull.

Wire control boxes as shown in figure 2. Locate and secure in position as shown in figure 1.

Connectors No. 61007 and Bondnuts BL-50 (items 13 and 14, fig. 1).

Locate on hull terminal box, turret terminal box, and Interphone Amplifier BC-667-( ) in position as shown in figure 1.

*Part and location*

Cordage CO-213.

Reel Assembly RL-106/V1.

Mounting block (item 4, fig. 3), on left wall of turret.

Guide Ring MX-171/V1 (item 3, fig. 3), on left wall of turret.

Reel RL-108/V1 (item 1, fig. 3), on mounting block.

Cords CD-264 and CD-265 (items 5 and 6, fig. 3).

Cordage CO-146 (item 7, fig. 3).

*Method and materials*

Complete interconnection of component parts as shown in figure 2.

Refer to TM 11-2254 and disassemble reel assembly as follows: Place brake lever in drag position. Place a wrench on square shoulder of spindle, hold mounting block on other side of reel, and unscrew spindle from mounting block. This removes entire reel unit except brake disk from mounting block. Remove brake disk by removing the four screws holding brake disk and mounting block together. Refer to figure 3 and proceed with installation.

Weld mounting block securely to left side wall of turret, forward from turret bulge, as shown in figure 3. Relocate hooks.

Weld guide ring securely to left side wall of turret, as shown in figure 3, cutting pad as required. Replace brake disk on mounting block, and secure with No. 8 screws previously removed.

Replace entire reel unit on mounting block. Place brake lever in drag position, and screw spindle into mounting block.

Insert plugs on Cords CD-264 and CD-265 into jacks on jack box on Reel RL-108/V1 and into commander's Control Box BC-739-( ), located on left side wall of turret, as shown in figure 3.

Thread Cordage CO-146 through Guide Ring MX-171/V1 and install in Junction Box J-65/V1, installed in bracket on guide ring, as shown in figure 3.

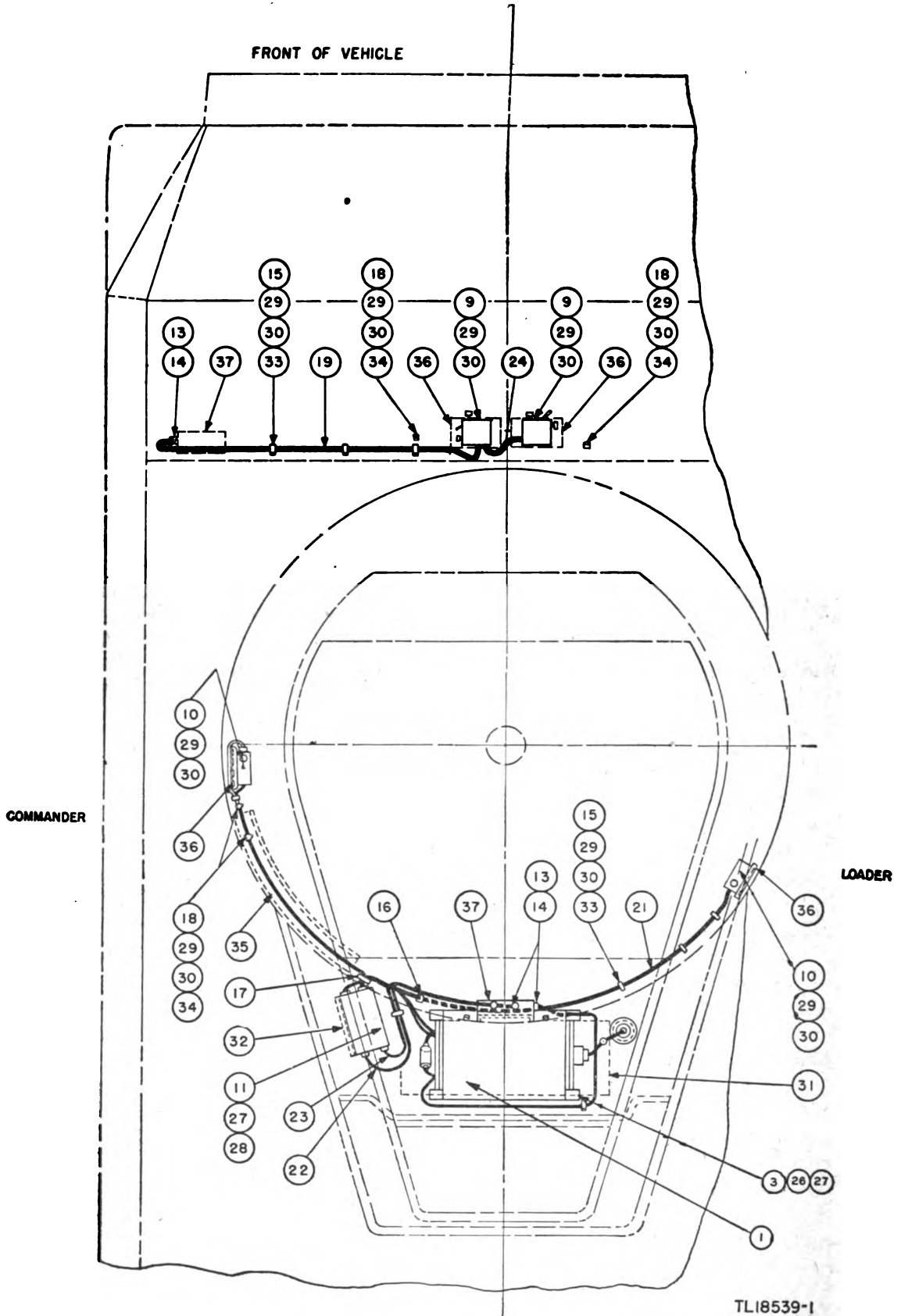
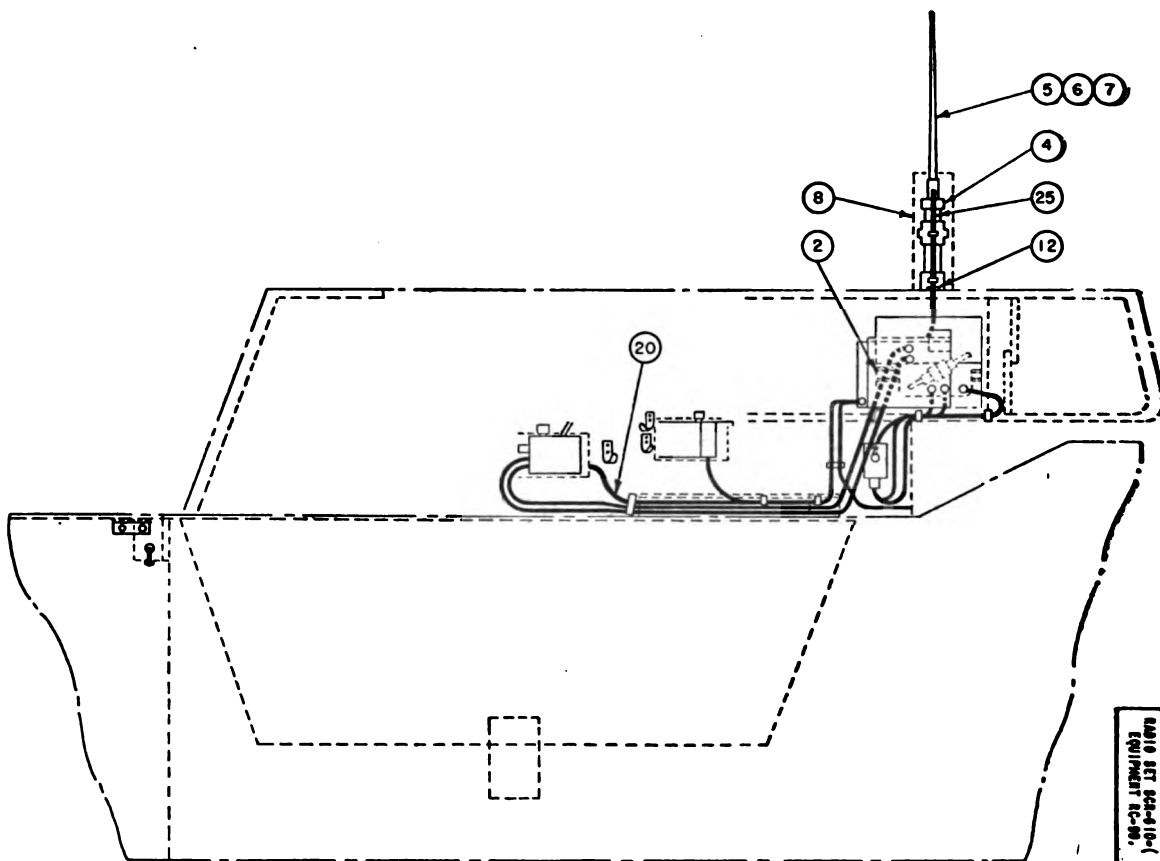


Figure 1. Installation of Radio Set SCR-610-( ) and Interphone



RADIO SET RC-98-10(-) AND INTERPHONE EQUIPMENT RC-99.

NOTES:

1. (15) (16) (2) AND (24) ARE FURNISHED WITH (1) AND (16)
2. FOR ADDITIONAL COMPONENTS AND SPARE PARTS, SEE PARTS LIST.
3. (11) TO (27) INCLUSIVE SHALL BE FURNISHED AND INSTALLED BY THE VEHICLE MANUFACTURER.
4. FOR WIRING DIAGRAM OF INTERPHONE EQUIPMENT RC-99, SEE FIG. 2.
5. END OF WIRE (25) AFTER BEING CUT TO PROPER LENGTH SHALL BE TINNED FOR CONNECTION TO BINDING POST.
6. USE (4) WHEN MAST SECTIONS ARE NOT INSTALLED.
7. (17) SHALL BE MOUNTED WITH EXISTING SCREW ON (15)
8. USE MAST BASE AB-15/GR AND MAST SECTIONS MS-116 AND MS-117 AND MS-118 WHEN AVAILABLE.

ITEM NO.	NAME OF ITEM	QUAN. REQ.
1	RADIO RECEIVER AND TRANSMITTER RC-98-10(-)	1
2	POWER SUPPLY UNIT PE-120-(-)	1
3	MOUNTING FT-250-(-)	1
4	MAST BASE MP-48 OR MP-48-A	1
5	MAST SECTION MS-51 WITH CLAMP NC-423	1
6	MAST SECTION MS-52 WITH CLAMP NC-424	1
7	MAST SECTION MS-53	1
8	COVER BG-106 SEE NOTE 6	1
9	INTERPHONE CONTROL BOX RC-606-(-)	1
10	CONTROL BOX RC-728-(-)	2
11	INTERPHONE AMPLIFIER RC-667	1
12	INSULATOR IN-121	1
13	CONNECTOR NO. 61007	1
14	BONDHUT BL-50	1
15	CLAMP NO. 4 SEE NOTE 1	10
16	CLAMP NO. 7 PER FIG. 6	3
17	CLAMP NO. 9 SEE NOTE 7	1
18	HOOK PER FIG. 7 SEE NOTE 1	5
19	CORDAGE CO-213 67 IN. LONG	1
20	CORDAGE CO-213 62 IN. LONG	1
21	CORDAGE CO-213 62 IN. LONG	1
22	CORDAGE CO-213 58 IN. LONG	1
23	CORDAGE CO-213 45 IN. LONG	1
24	CORDAGE CO-213 14 IN. LONG	1
25	WIRE W-128 36 IN. LONG SEE NOTE 5	1
26	HEX. HEAD MACH. SCREW 1/4-20 X 3/4 LONG	4
27	LOCKWASHER STD. FOR 1/4 SCREW	4
28	HEX. HEAD MACH. SCREW 1/4-20 X 1 LONG	4
29	ROUNDHEAD MACH. SCREW NO. 8-32 X 3/8 LONG SEE NOTE 1	25
30	LOCKWASHER STD. FOR NO. 8 SCREW SEE NOTE 1	25
31	MOUNTING PLATE	1
32	AMPLIFIER BRACKET	1
33	SPACER	1
34	SPACER	1
35	GUARD	1
36	BRACKET	4
37	TERMINAL BOX	2

TL18539-2

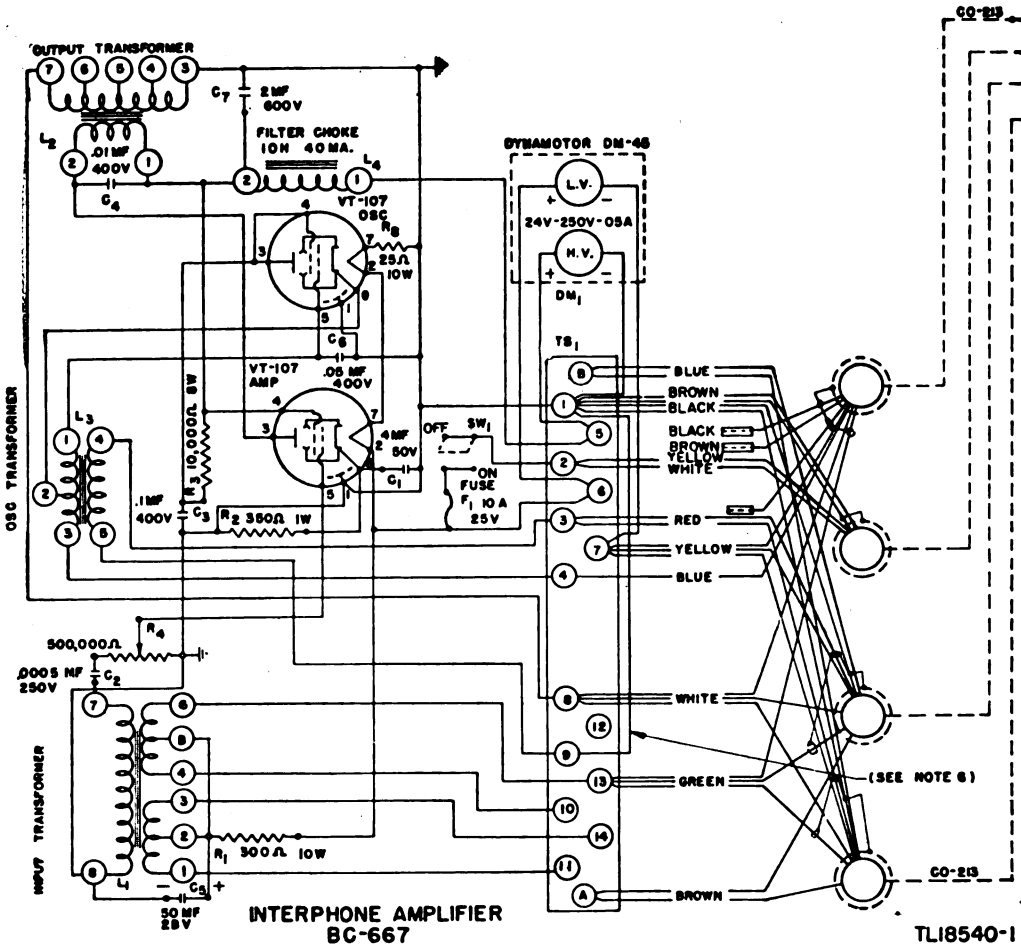
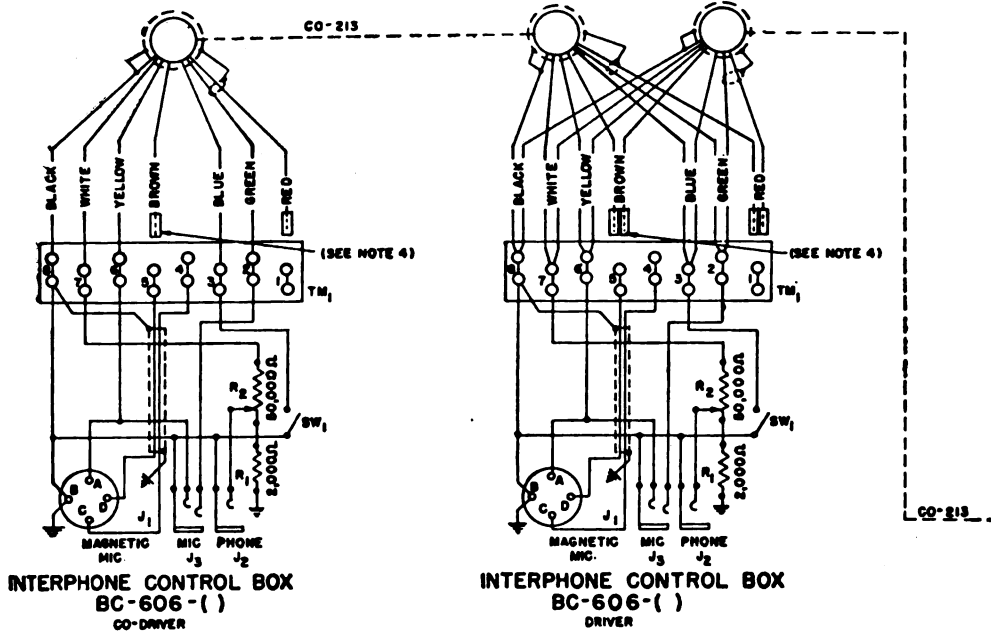
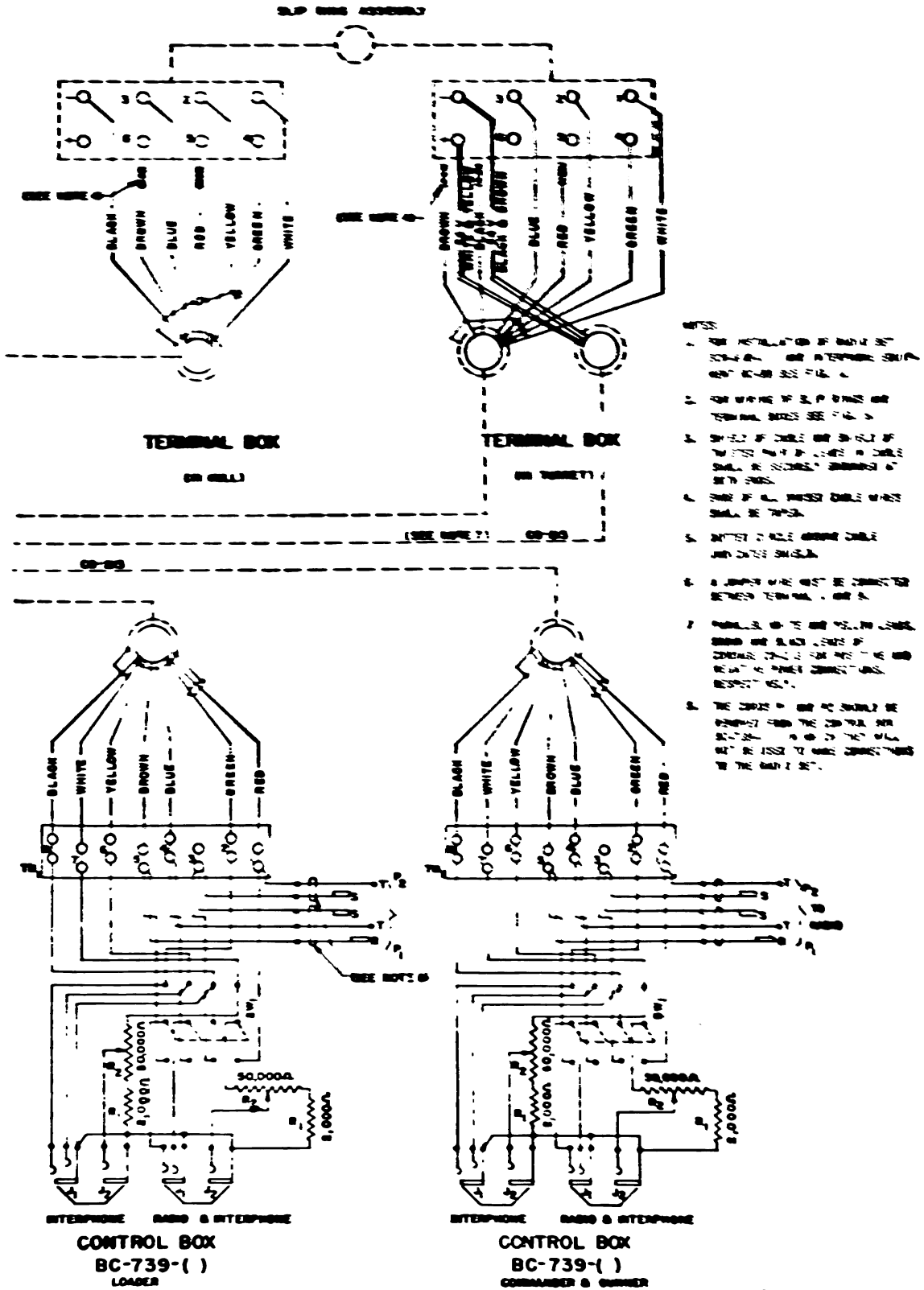


Figure 2. Wiring Diagram of Interphone Equipment

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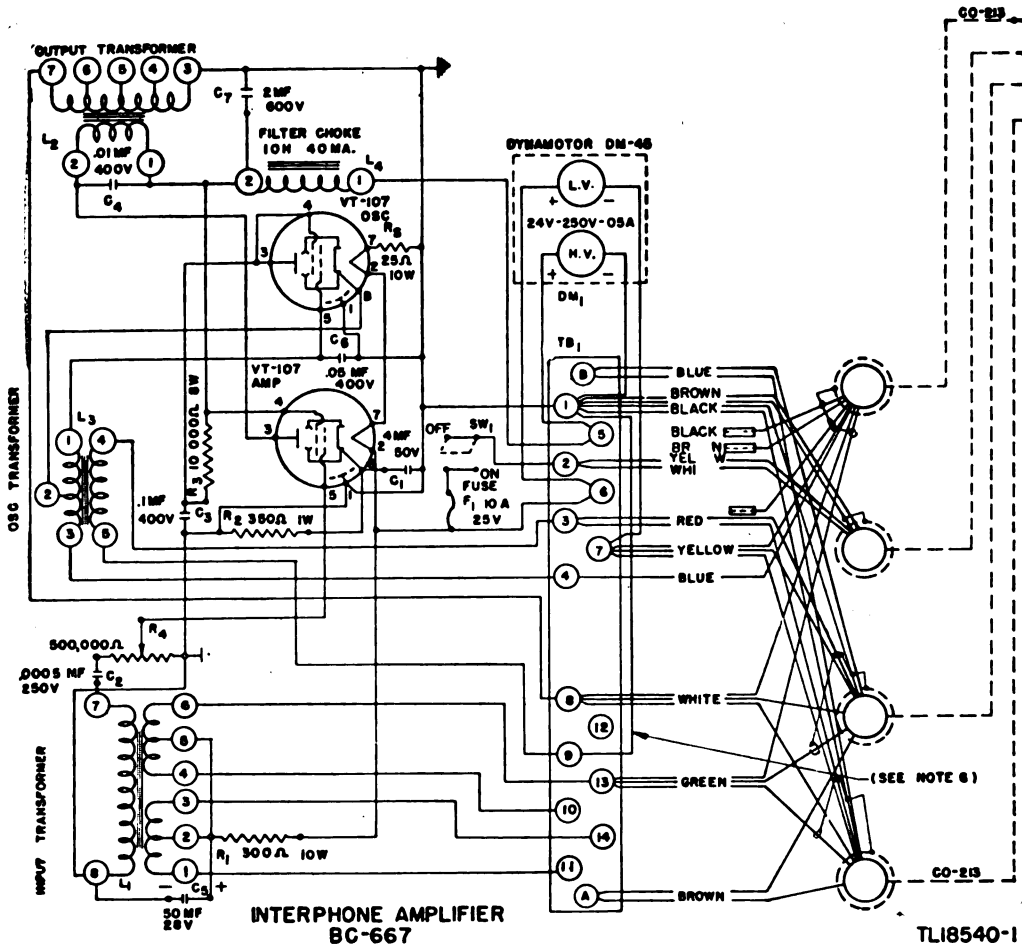
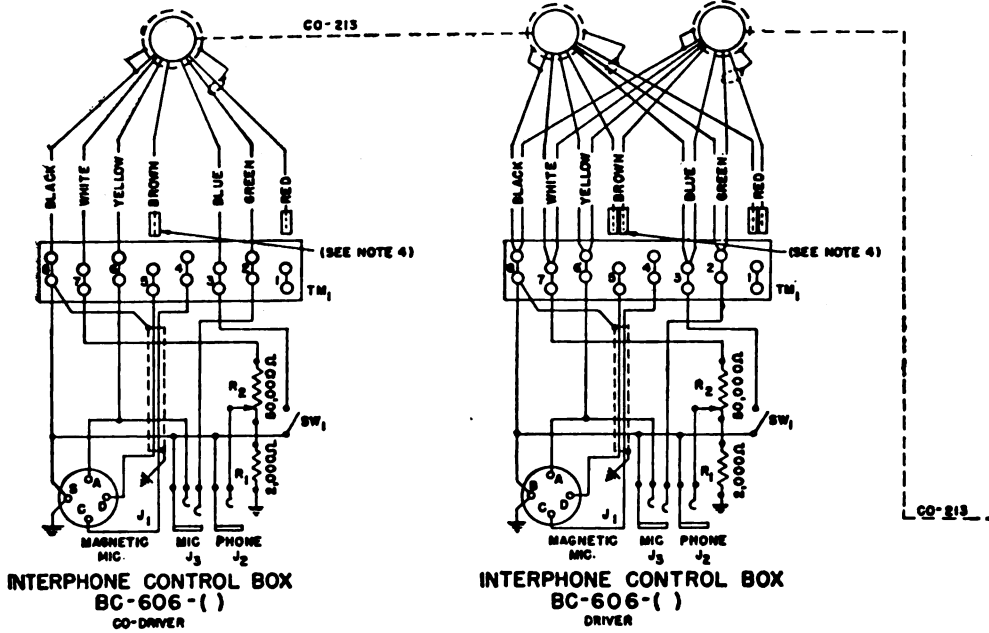
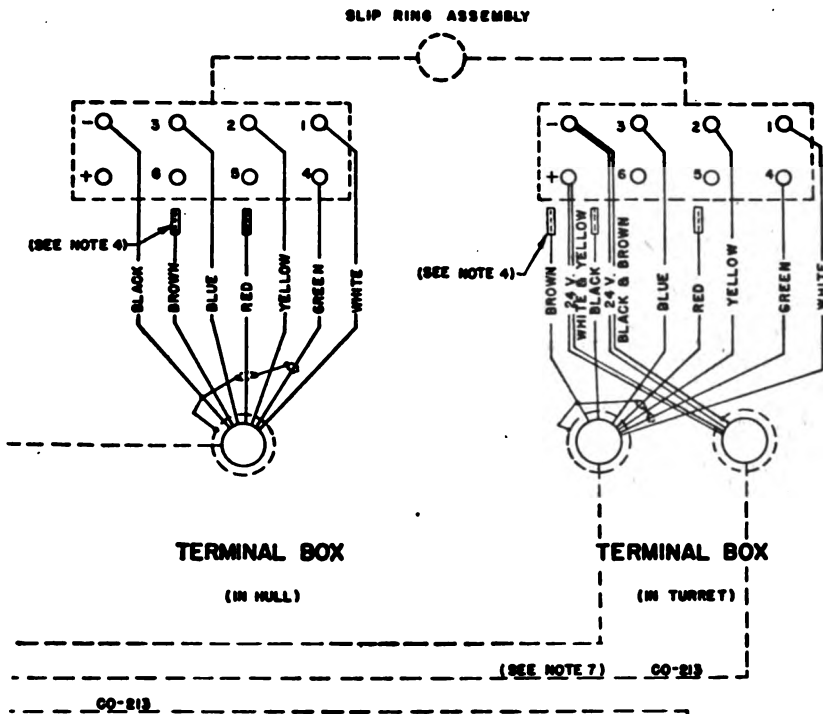
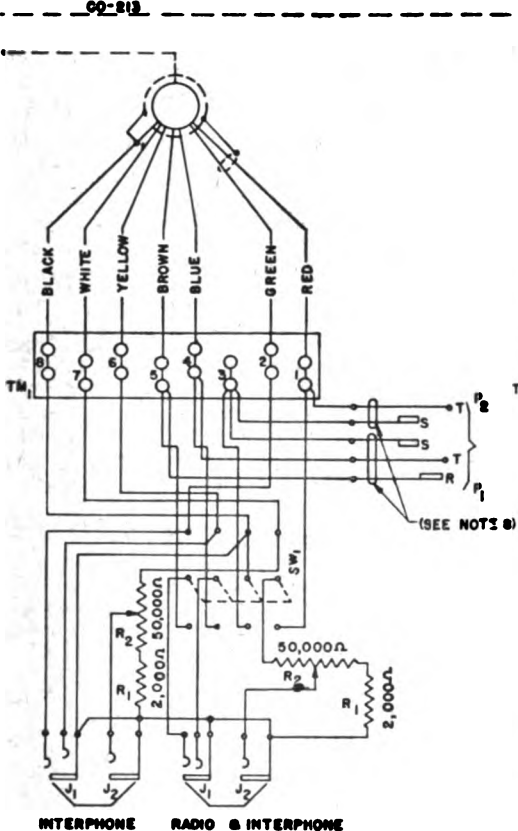


Figure 2. Wiring Diagram of Interphone Equipment

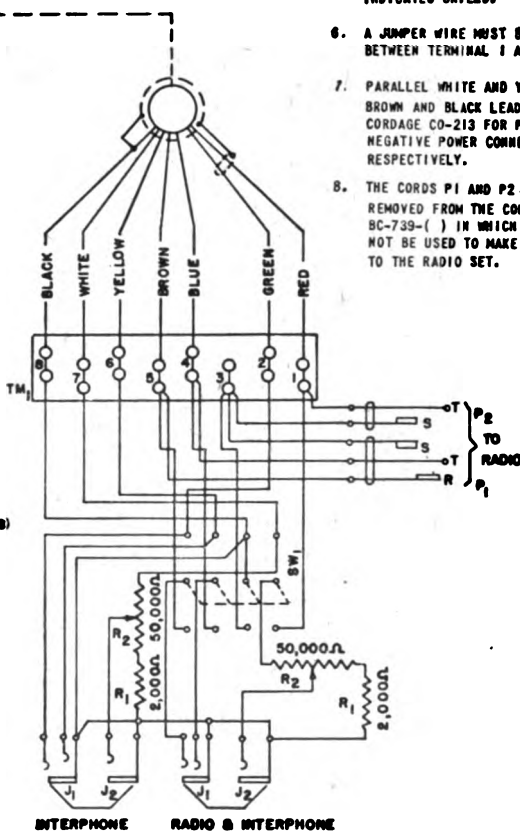


NOTES:

1. FOR INSTALLATION OF RADIO SET SCR-610-( ) AND INTERPHONE EQUIPMENT RC-99 SEE FIG. 1.
2. FOR WIRING OF SLIP RINGS AND TERMINAL BOXES SEE FIG. 5.
3. SHIELD OF CABLE AND SHIELD OF TWISTED PAIR OF LEADS IN CABLE SHALL BE SECURELY GROUNDED AT BOTH ENDS.
4. ENDS OF ALL UNUSED CABLE WIRES SHALL BE TAPED.
5. DOTTED CIRCLE AROUND CABLE INDICATES SHIELD.
6. A JUMPER WIRE MUST BE CONNECTED BETWEEN TERMINAL 1 AND 9.
7. PARALLEL WHITE AND YELLOW LEADS, BROWN AND BLACK LEADS OF CORDAGE CO-213 FOR POSITIVE AND NEGATIVE POWER CONNECTIONS, RESPECTIVELY.
8. THE CORDS P1 AND P2 SHOULD BE REMOVED FROM THE CONTROL BOX BC-739-( ) IN WHICH THEY WILL NOT BE USED TO MAKE CONNECTIONS TO THE RADIO SET.

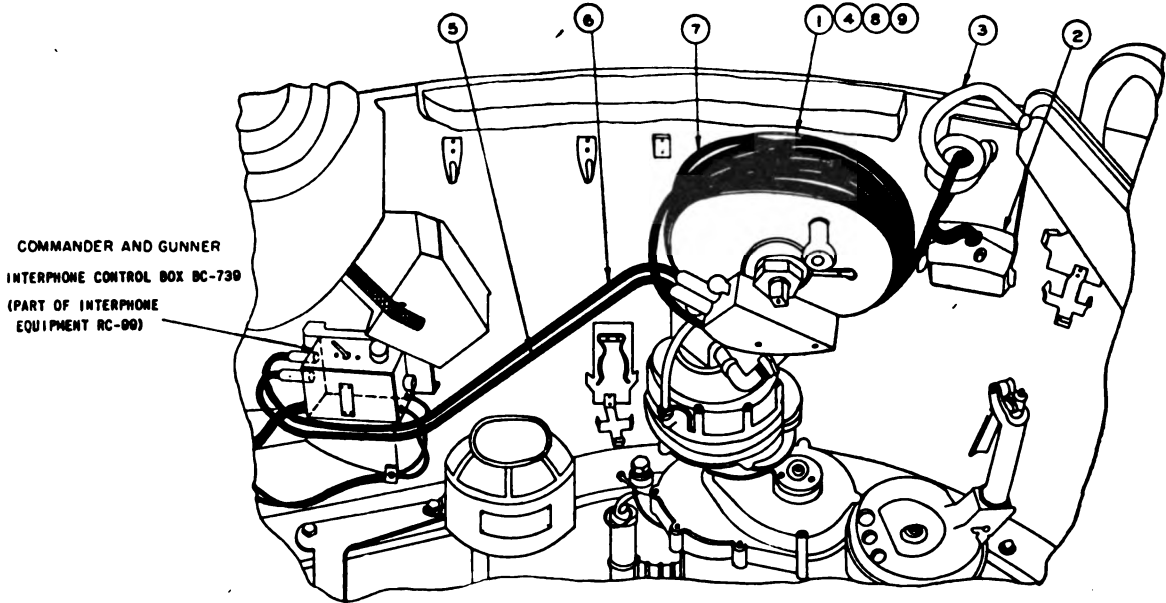


INTERPHONE RADIO & INTERPHONE  
**CONTROL BOX**  
 BC-739-( )  
 LOADER



INTERPHONE RADIO & INTERPHONE  
**CONTROL BOX**  
 BC-739-( )  
 COMMANDER & GUNNER

TL18540-2

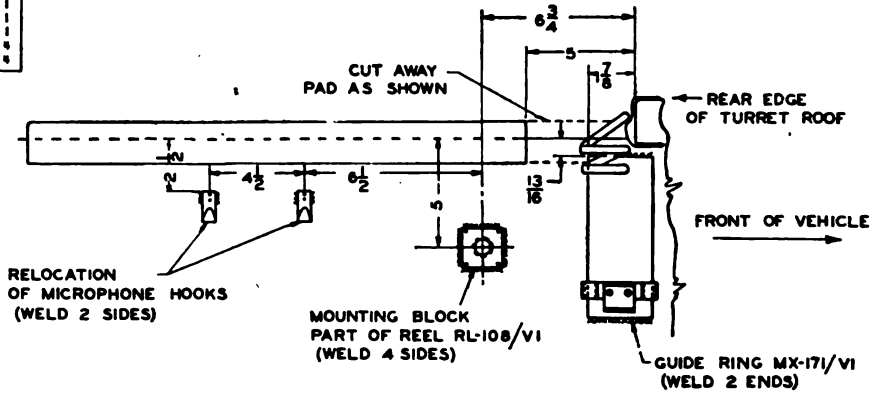


LEFT SIDE WALL OF TURRET

ITEM NO.	NAME OF ITEM	QUAN. REQ.
1	REEL RL-106/V1 SEE NOTE 2	1
2	JUNCTION BOX J-85/V1	1
3	GUIDE RING MX-171/V1	1
4	MOUNTING BLOCK	1
5	CORD CD-264	1
6	CORD CD-265	1
7	CORDAGE CO-146 75 FT. LONG	1
8	ROUNDHEAD MACH. SCREW NO. 8-32 X 1/2 LONG	4
9	LOCKWASHER S.A.E. ST'D. FOR NO. 8 SCREW	4

NOTES:

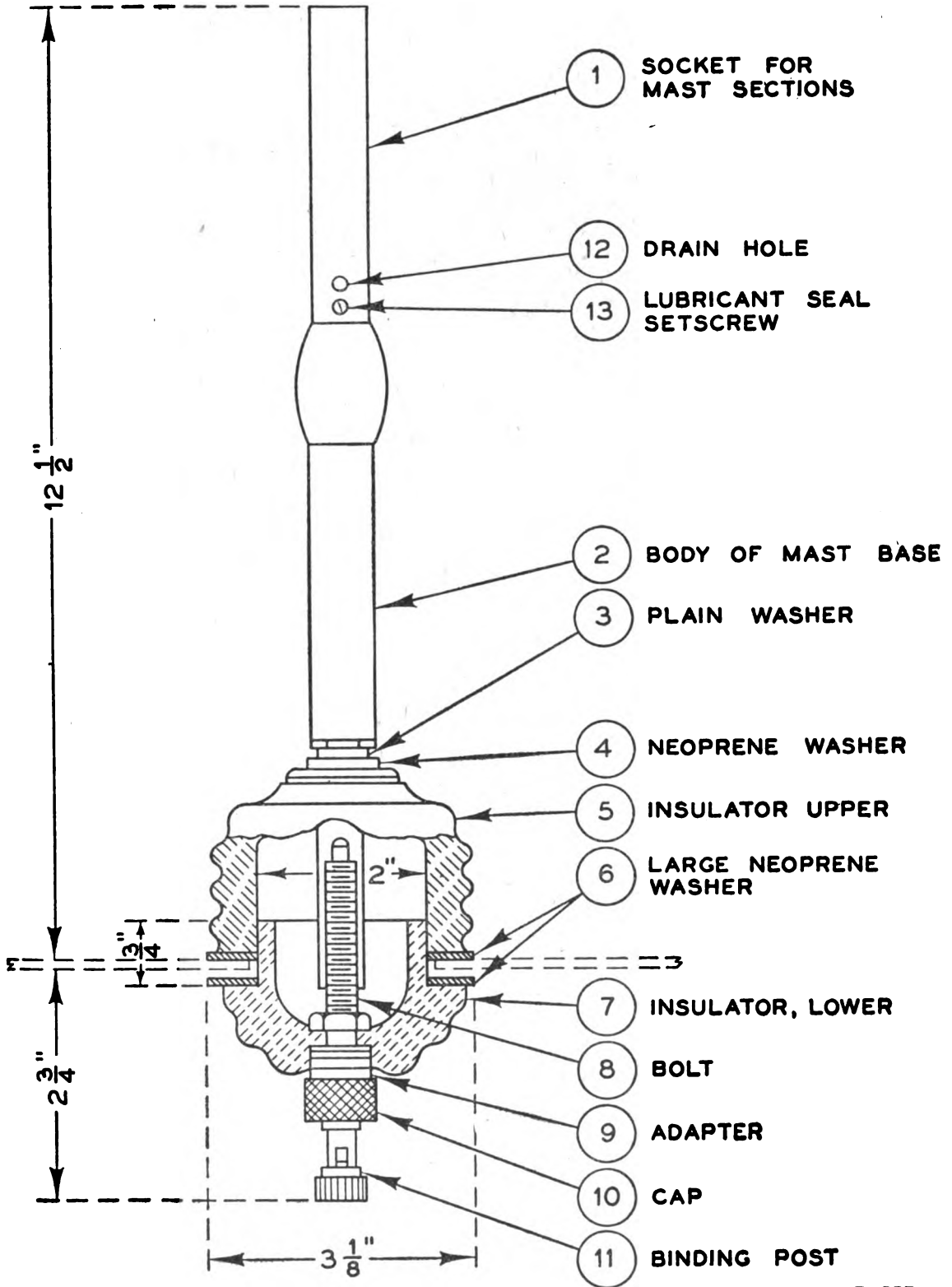
- DIMENSIONS WHERE NOT SHOWN OTHERWISE ARE IN INCHES.
- (2) (4) (8) AND (9) ARE PART OF REEL UNIT RL-106/V1.
- DRAWING REFERENCES:  
 INSTALLATION OF RADIO SET SCR-610-( ) AND INTERPHONE EQUIPMENT RC-99..... FIG. 1  
 WIRING DIAGRAM OF INTERPHONE EQUIPMENT RC-99..... FIG. 2



LOCATION OF GUIDE RING, MOUNTING BLOCK AND MICROPHONE HOOKS ON LEFT SIDE WALL OF TURRET

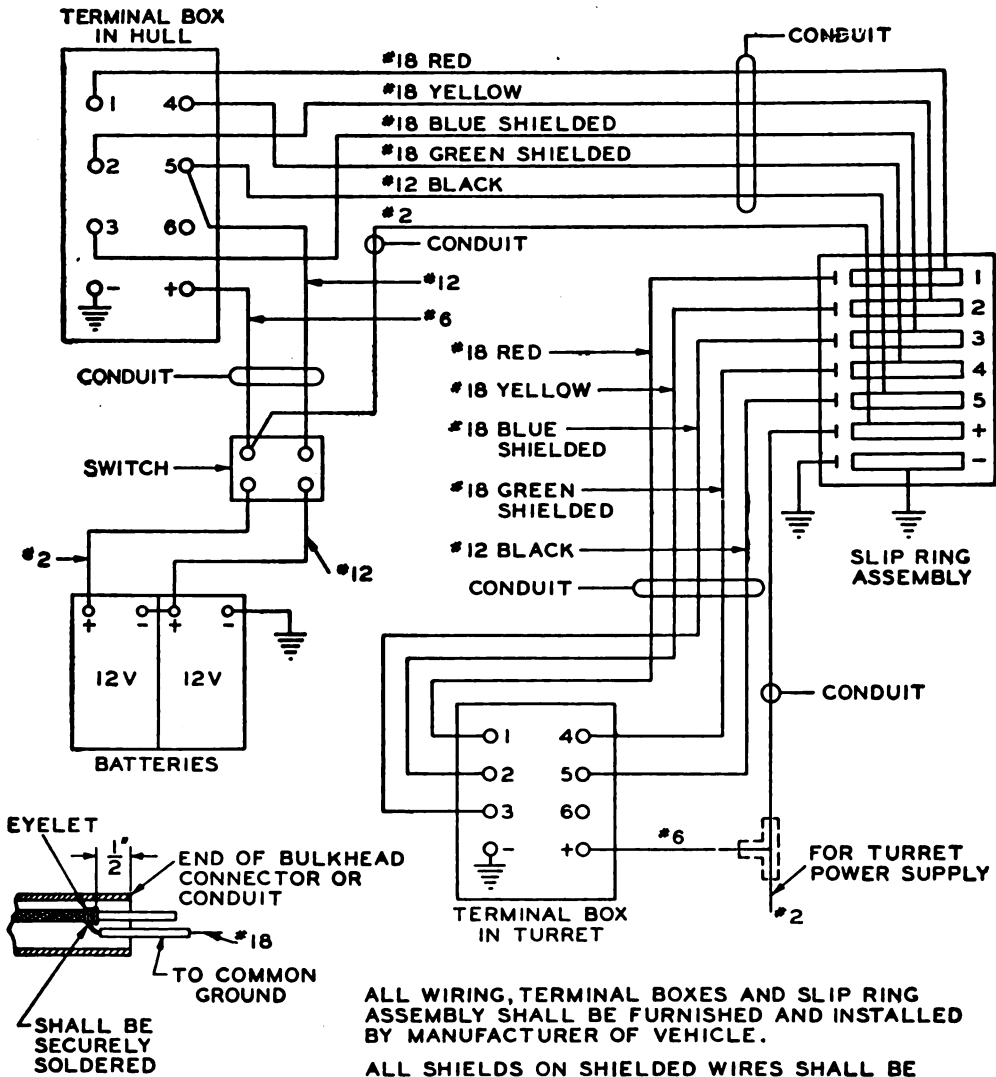
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Figure 3. Installation of Reel Assembly RL-106/V1 in Carriage, Motor, 76-MM Gun, M18.



TL13371

Figure 4. Mast Base AB-15/GR, assembly for installation.



ALL WIRING, TERMINAL BOXES AND SLIP RING ASSEMBLY SHALL BE FURNISHED AND INSTALLED BY MANUFACTURER OF VEHICLE.

ALL SHIELDS ON SHIELDED WIRES SHALL BE GROUNDED ON BOTH ENDS.

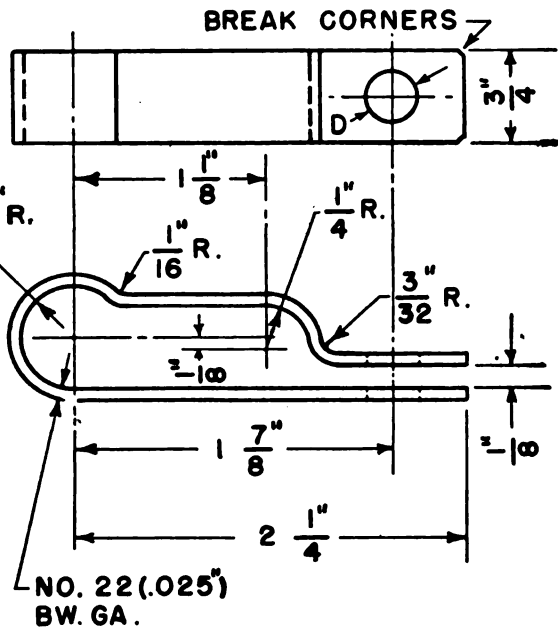
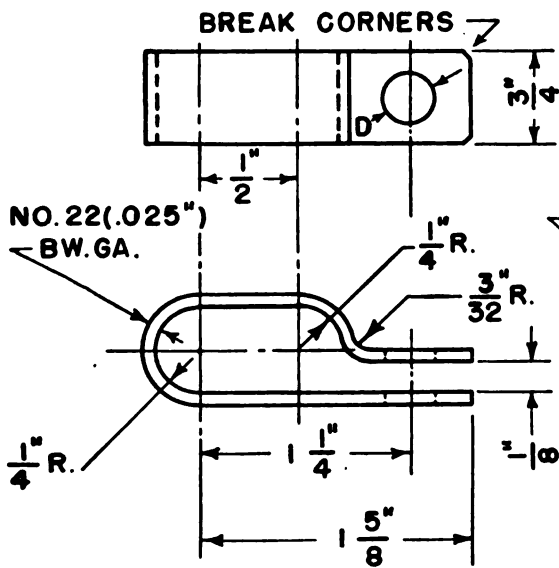
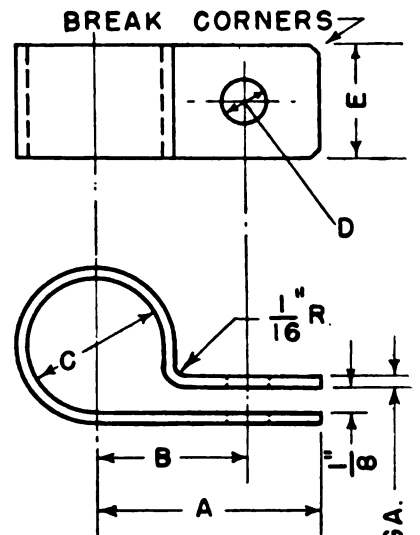
THESE TERMINAL BOXES ARE TO BE USED FOR RADIO AND INTERPHONE WIRING ONLY.

WIRE SIZES INDICATED ARE B & S GAUGE.

TL10665

Figure 5. Wiring diagram of slip rings and terminal boxes in 24-volt vehicles.

CLAMP	A	B	C	D	E	STOCK NO.
1	1-1/8"	3/4"	7/16"	3/16"	1/2"	222637-1
2	1-1/8"	3/4"	7/16"	9/32"	3/4"	222637-2
3	1-1/8"	3/4"	7/16"	13/32"	3/4"	222637-3
4	1-1/8"	3/4"	17/32"	3/16"	1/2"	222637-4
5	1-1/8"	3/4"	17/32"	9/32"	3/4"	222637-5
6	1-1/8"	3/4"	17/32"	13/32"	3/4"	222637-6



NO. 22 (.025) BW. GA.

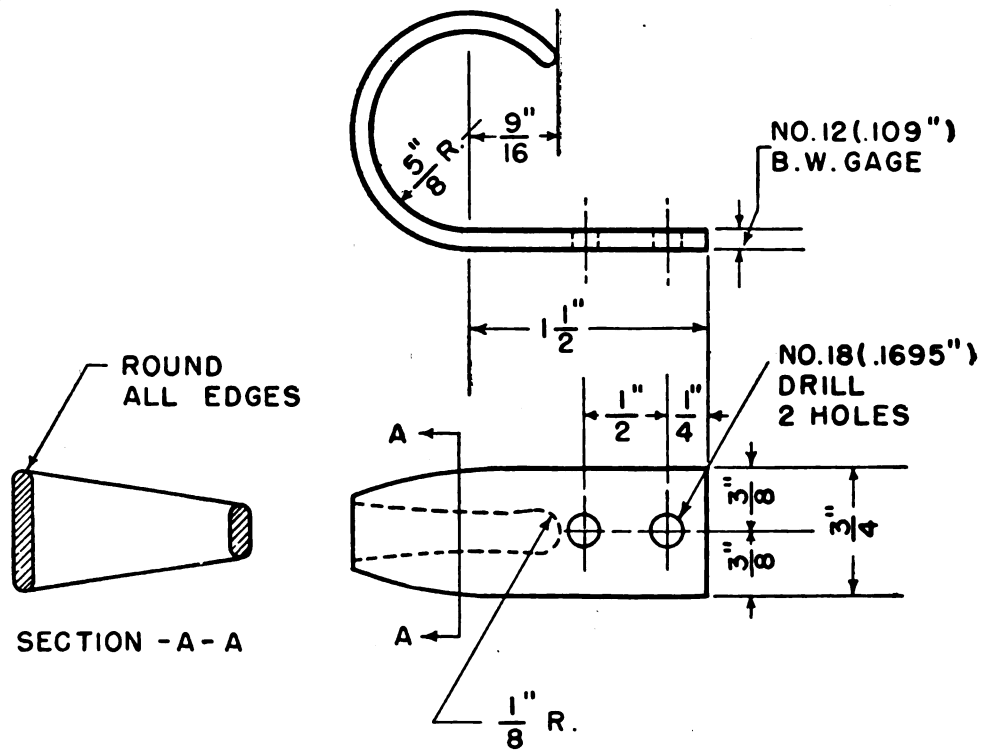
CLAMP	D	STOCK NO.
7	3/16"	222637-7
8	9/32"	222637-8
9	13/32"	222637-9

CLAMP	D	STOCK NO.
10	9/32"	222637-10
11	13/32"	222637-11

NOTE:  
TOLERANCES  $\pm 1/32"$

TL13319

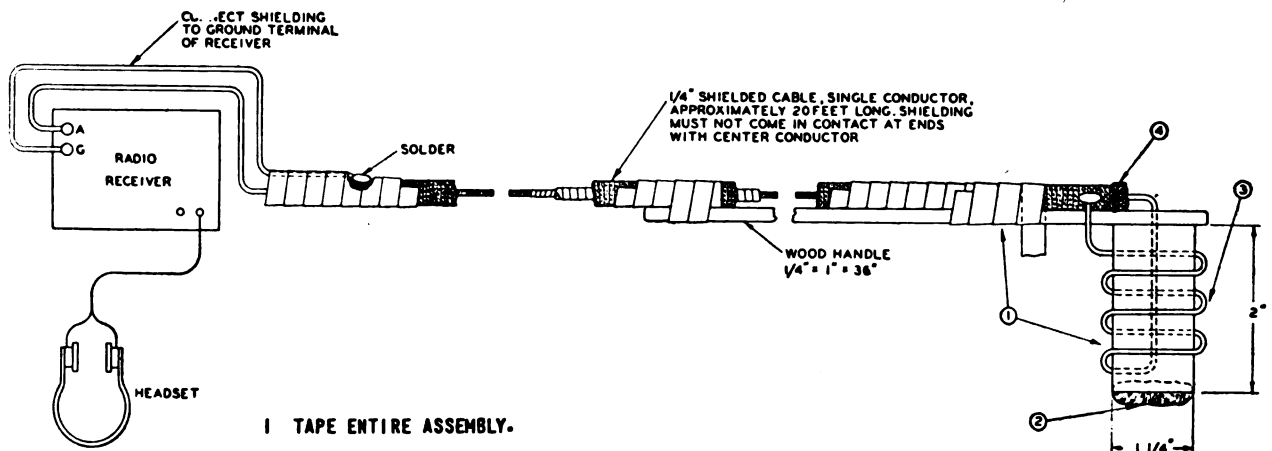
Figure 6. Clamps for radio cordage.



**HOOK  
STEEL - ELECTROGALVANIZE**

TL13320

Figure 7. Hook.



- 1 TAPE ENTIRE ASSEMBLY.
- 2 STUFF END OF INSULATED TUBING WITH FELT AND TAPE OVER ENTIRE ASSEMBLY
- 3 WIND 3 TURNS NO. 16 OR NO. 18 WIRE ON TUBE OF INSULATING MATERIAL. SOLDER ONE END TO SHIELD ON CABLE, THE OTHER END ON INSULATED WIRE INSIDE CABLE.
- 4 ROLL BACK END OF SHIELDING, AND SECURE WITH SOLDER.

TL7547-A

Figure 8. Probe antenna.











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