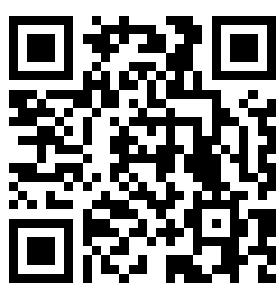

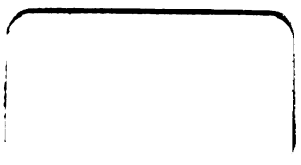

TM 11-2703

WAR DEPARTMENT TECHNICAL MANUAL

INSTALLATION OF RADIO AND INTERPHONE EQUIPMENT IN TANK RECOVERY VEHICLE T2

WAR DEPARTMENT • *20 JUNE 1944*

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[redacted]RESTRICTED. *DISSEMINATION OF RESTRICTED MATTER.*—The information contained in restricted documents and the essential characteristics of restricted material 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 by authorized military public relations agencies. (See also par. 236, AR 380–5, 15 Mar 1944.)

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United States Government Printing Office
Washington : 1944

WAR DEPARTMENT,
WASHINGTON 25, D. C., 20 June 1944.

TM 11–2703, Installation of Radio and Interphone Equipment in Tank Recovery Vehicle T2, is published for the information and guidance of all concerned.

[A.G. 300.7 (15 May 44).]

BY ORDER OF THE SECRETARY OF WAR:

G. C. MARSHALL,
Chief of Staff.

OFFICIAL:

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

DISTRIBUTION:

As prescribed in paragraph 9a, FM 21–6: Armies (10); Corps (10); Sv C (10); Depts (2); Base Comds (2); D (2); I Bn 6, 17, 18 (3); IC 2, 6, 11, 17, (5); Sig C Sch (10); Sig C Rep Shs (5); Sig C Dep (10); C of Tech Sv (2).

I Bn 6: T/O & E 6–165, Armd FA Bn.

I Bn 17: T/O & E 17–15, L Tk Bn.

I Bn 18: T/O 18–25, T D Bn (S–P) 18–35. T D Bn (Towed).

IC 2: T/O & E 2–26, Hq & Hq & Sv Tr, Cav Rcn Sq (Mecz) (Armd).

IC 6: T/O & E 6–169, Sv Btry, Armd F A Bn.

IC 11: T/O 11–107, Sig Dep Co; 11–127, Sig Rep Co; 11–237, Sig Co, Sv Gp; 11–327, Sig Port Sv Co; 11–587, Sig Base Maint Co; 11–572, Hq & Hq Co, Sig Base Dep; 11–597, Sig Base Dep Co.

IC 17: T/O & E 17–3, Sv Co, Armd Div; 17–13, Sv Co, Armd Regt; 17–14, Maint Co, Armd Regt; 17–26, Hq & Hq Co, Armd Tk Bn; 17–27 (M) Tk Co, Tk Bn, 17–465, Hq & Hq Co, (M) Tk Bn, Sp.

For explanation of symbols, see FM 21–6.

CONTENTS

DESTRUCTION NOTICE

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

WHEN—When ordered by your commander.

HOW—1. Smash—Use sledges, axes, handaxes, pickaxes, hammers, crowbars, or other heavy tools.
2. Cut—Use axes, handaxes, or machetes.
3. Burn—Use gasoline, kerosene, oil, flame throwers, or incendiary grenades.
4. Explosives—Use firearms, grenades, or TNT.
5. Disposal—Bury in slit trenches, fox holes, or 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 the 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 adjustments inside the equipment with the power switch on.
2. Do not operate the equipment with the shields removed.
3. Do not connect power to any unit of this equipment until operating instructions have been read completely.

SECTION I

GUIDE TO USE OF THIS MANUAL

1. Purpose

This manual provides methods and procedures, based upon actual field experience, for installation of radio and interphone equipment in Tank Recovery Vehicle T2. Items required to make a complete operating installation are listed for each radio set and interphone equipment.

2. Equipment

Installations covered include the following radio sets and interphone equipment:

SCR–610–(&)
SCR–528–(&)
SCR–538–(&)
RC–99

3. Symbol (&)

The symbol (&), used throughout this manual, refers to all existing 24-volt models of radio sets and interphone equipment mentioned, and to all models of other items of equipment with which it appears.

4. Holes and Brackets

Holes and brackets required for installations of the radio sets and interphone equipment normally are located prior to delivery of Tank Recovery Vehicle T2. Drilling instructions are given in pertinent sections of this manual for any other necessary holes and brackets. Holes and brackets in the vehicle or on any radio or interphone part should not be relocated unless absolutely necessary.

5. Before Beginning Installation

Study the illustrations, installation methods outlined herein, and any subsequent changes to this manual, before starting an installation.

Caution: Tank Recovery Vehicle T2 has a 24-volt electrical system. Before installing any radio set or interphone equipment covered in this manual, be sure that it is designed for a 24-volt installation.

6. Immediately after Installation

At the completion of the installation, a thorough operating check must be made to determine that the equipment has been properly installed and is in working order.

Caution: Do not operate any of the radio or interphone equipment until the instruction book or technical manual covering the specific radio set or interphone equipment has been studied carefully. Otherwise, damage to the equipment may result.

SECTION II

RADIO SET SCR-610-(&)

7. Required Parts

Items necessary for an operating installation of Radio Set SCR-610-(&) in Tank Recovery Vehicle T2 are listed below.

Quantity	Stock No.	Item
1	6Q349	Alignment Tool TL-207.
1	2A224A	Antenna AN-24-A, auxiliary antenna.
1 [1]	2A229(&)	Antenna AN-29-(&).
1	3A39	Battery BA-39, for transmitter.
1	3A40	Battery BA-40, for receiver.
1	3A41	Battery BA-41, for Radio Receiver and Transmitter BC-659-(&).
1	2Z1140A	Box BX-40-A, for crystals.
1 [1]	3B879(&)	Case CS-79-(&), for battery power supply.
1	2Z2651-423	Clamp MC-423, for securing Mast Sections MS-51 and MS-52.
1	2Z2651-424	Clamp MC-424, for securing Mast Sections MS-52 and MS-53.
1	6Z3147	Connector #61007 and Bondnut BL-50, Appleton Electric Company.
1	3E1307A-5.5	Cord CD-307-A, for Headset HS-30-(&).
1	3E1318(&)	Cord CD-318-(&) for Microphone T-30-(&).
1 [2]	3E1604	Cord CD-604, for Headset HS-30-(&).
9 ft	3E2282	Cordage CO-282, coaxial antenna lead.
1	2Z3400-108	Cover BG-108, for Mast Base MP-48.
2	2A2088-48/C4	Coupling, Lapp Company No. 26243.
1 [1]	2B613(&)	Handset TS-13-(&).
1	6L50-610V22	Hardware bag.
1 [2]	2B830(&)	Headset HS-30-(&).
2 [1]	3G586	Insulator IN-86, for auxiliary antenna.
1	3G611	Insulator IN-111.
1	2A2088-48(&)	Mast Base MP-48 or MP-48-A.
1	2A2351	Mast Section MS-51.
1	2A2352	Mast Section MS-52.
1	2A2353	Mast Section MS-53.
1	2B1617(&)	Microphone T-17-(&).
1	2B1630(&)	Microphone T-30-(&).
1	2Z6721-250(&)	Mounting FT-250-(&).
1 [3]	3H4496-120(&)	Power Unit PE-120-(&).
1 [4]	2C5379(&)	Radio Receiver and Transmitter BC-659-(&), including tubes.
1	2Z8056(&)	Roll BG-56-(&), for mast sections.
2 [1]	2Z9019(&)	Strap ST-19-(&).
1 [5]	2Z9299-210	Terminal Box TM-210, for antenna.
1 [5]	2Z9299-211	Terminal Box TM-211, for antenna.
1 [3]	3H6711	Vibrator VB-11-(&), 24-volt, for Power Unit PE-120-(&).
27 ft [1] [6]	1B29	Wire W-29, for auxiliary antenna.
7 ft [7]	1B128	Wire W-128.

[1] Required only when Radio Set SCR-610-(&) is used as a portable or field set.

[2] Headset HS-18 may be substituted for Headset HS-30-(&) and Cord CD-604.

[3] Plate Supply Unit PE-117-(&) may be substituted for Power Unit PE-120-(&) and Vibrator VB-11-(&).

[4] Quantity and frequency of crystals issued will be authorized for the particular using organization.

[5] Terminal Boxes TM-210 and TM-211 should be installed for use with Radio Set SCR-610-(&) when it is necessary to use more than 3 feet of antenna lead-in from Mast Base MP-48 or MP-48-A. See figure 14 for installation of Terminal Box TM-210; figure 13 shows method of installing Terminal Box TM-211 on Mast Base MP-48 or MP-48-A. Terminal Boxes TM-210 and TM-211, required for this installation, may not be available at the time of installation. As a temporary measure, use 43 inches of Wire W-128. (See figs. 1 and 12.) When TM-210 and TM-211 become available, they may be requisitioned to replace the temporary lead-in.

[6] Length of Wire W-29 for the auxiliary antenna must be 27 feet.

[7] To be used as antenna lead-in when coaxial cable (Cordage CO-282) and Terminal Boxes TM-210 and TM-211 are not available. If used, Insulator IN-101 and Insulator IN-104 will be required. For additional information see figures 1 and 12.

8. Assembly and Installation

Components of Radio Set SCR–610–(&) should be assembled and installed as directed below. The radio set may be installed with interphone equipment using Interphone Amplifier BC–605–(&) as shown in figures 8 and 9. See TM 11–600, on Radio Sets SCR–508–(*), SCR–528–(*), and SCR–538–(*), for information on Interphone Amplifier BC–605–(&).

Part and location	*Method and materials*
Mounting FT–250–(&), on floor of left sponson.	Secure in place as shown in figure 1 with the hardware provided.
Power Unit PE–120–(&) and Vibrator VB–11–(&), on Mounting FT–250–(&).	Open the case of the power unit and remove the chassis cover. Install the vibrator in its socket, making certain that the connector link is in the position required for use with Radio Receiver and Transmitter BC–659–(&). The change-over plug must be set for 24-volt operation (arrow pointing to 24). See that all tubes are in the correct sockets and pushed down flush. Replace the cover of the chassis and close the case of the power unit. Install the unit on the mounting.
Battery BA–41, in battery container in Radio Receiver and Transmitter BC–659–(&).	Disengage the radio receiver and transmitter from its case by removing the 10 screws on the outer edge of the front panel and pulling the chassis from the case. Then remove the cover of the battery box, on the chassis, and insert the battery. Line up the plugs and pins.
Terminal Box TM–210, Cordage CO–282, and coupling, on back of Radio Receiver and Transmitter BC–659–(&).	Install as shown in figure 14. Prepare cordage as shown in figure 10.
Radio Receiver and Transmitter BC–659–(&), on Power Unit PE–120–(&).	Place on the power unit and secure in position with the clamps provided.
Terminal Box TM–211, Cordage CO–282, Wire W–128, and coupling, on Mast Base MP–48.	See figure 1 for positioning of the terminal box, routing of Cordage CO–282, Wire W–128, and installation of the mast base. See figure 13 for detailed installation of Terminal Box TM–211.
Mast Base MP–48, in mast base well at left rear of vehicle.	Locate as shown in figure 1. Assemble as shown in figure 2. When Mast Base MP–48–A is used, see figure 13.
Mast Sections MS–51 through MS–53, and Clamps MC–423 and MC–424, on Mast Base MP–48.	Screw the mast sections together and place clamps over the section joints. Then screw the antenna into the mast base. Secure the mast antenna with item 18, figure 12, when using Mast Base MP-48–A.
Cover BG–108.	Place over the mast base when the mast sections are not in use.
Insulator IN–111, beneath mast base well.	Install as shown in figure 1.
Microphone T-30-(&) and Cord CD–318–(&).	Plug the microphone into the cord and insert cord into designated jack on the receiver and transmitter.
Headset HS–30–(&) and Cords CD–604 and CD–307–A.	Plug headset into Cord CD–604. Plug Cord CD–604 into Cord CD–307–A. Insert Cord CD–307–A into proper jack on receiver and transmitter.
Connector #61007 and Bondnut BL–50.	Install through the knock-out hole in the vehicle terminal box. (See fig. 1.)
Roll BG–56–(&).	Used for stowing mast sections when not in use. Carry in any convenient place in vehicle.
Cords and wires.	Interconnect the components of Radio Set SCR–610–(&) as shown in figure 1.

SECTION III

RADIO SETS SCR-528-(&), SCR-538-(&), AND SCR-538-(&) LESS RECEIVER AND ANTENNA, AND ASSOCIATED INTERPHONE EQUIPMENT

9. Required parts

Items necessary for an operating installation of Radio Sets SCR-528-(&), SCR-538-(&), and SCR-538-(&) less receiver and antenna, and associated interphone equipment in Tank Recovery Vehicle T2 are listed below.

Quantity		Stock No.	Item
Radio Set SCR-528-(&)	Radio Set SCR-538-(&)		
1	0	2A262	Antenna A-62, (Phantom).
1	1 [1]	2Z2651-423	Clamp MC-423, for securing Mast Sections MS-51 and MS-52.
1	1 [1]	2Z2651-424	Clamp MC-424, for securing Mast Sections MS-52 and MS-53.
1	1	6Z3147	Connector #61007 and Bondnut BL-50, Appleton Electric Co.
4	4	3E1307A-5.5	Cord CD-307-A, 65 inches long, for Headset HS-30-(&).
4	4	3E1604	Cord CD-604, 6 inches long, for Headset HS-30-(&).
4	4	3E1318(&)	Cord CD-318-(&), for Microphone T-30-(&).
30 ft	30 ft	3E2213	Cordage CO-213.
10 ft	10 ft [1]	3E2282	Cordage CO-282, coaxial lead-in.
1	1 [1]	2Z3400-108	Cover BG-108.
1 [2]	1 [2]	3H1636(&)	Dynamotor DM-36-(&), with spare parts, for receiver and interphone amplifier.
1 [2]	0	3H1637(&)	Dynamotor DM-37-(&), with spare parts, for transmitter.
1	1	6L50-508V22	Hardware bag.
4	4	2B830(&)	Headset HS-30-(&).
3	3	2C1738(&)	Interphone Control Box BC-606-(&), with hardware.
1	1 [1]	3G611	Insulator IN-111.
1	1	2A2088-84(&)	Mast Base MP-48 or MP-48-A.
1	1 [1]	2A2351	Mast Section MS-51.
1	1 [1]	2A2352	Mast Section MS-52.
1	1 [1]	2A2353	Mast Section MS-53.
1	1	2B1617(&)	Microphone T-17-(&).
1	1	2B1630(&)	Microphone T-30-(&).
1	1	2Z6721-237(&)	Mounting FT-237-(&).
1	1 [1]	2C4403(&)	Radio Receiver BC-603-(&), with tubes, spare parts, and crystals.
1	0	2C6494(&)	Radio Transmitter BC-60-(&), with tubes, spare parts, and crystals.
1	1	2Z8056(&)	Roll BG-56-(&), for mast sections.
0	1	2C1617(&)	Interphone Amplifier BC-605-(&), with tubes and spare parts.
10 ft	10 ft. [1]	1B128	Wire W-128.

[1] When Radio Set SCR-538-(&) is installed without a receiver and antenna the following items are not supplied: Clamps MC-423 and MC-424, Cover BG-108, Cordage CO-282, Mast Base MP-48, Mast Sections MS-51, MS-52, and MS-53; Radio Receiver BC-603-(&), Insulator IN-111, and Wire W-128.

[2] Dynamotors DM-36-(&) and DM-37-(&) may be installed in the cabinets of radio equipment when it is received.

10. Assembly and Installation

Components of Radio Sets SCR-528-(&) and SCR-538-(&), and SCR-538-(&) less receiver and antenna, and associated interphone equipment should be installed in the following sequence and manner. Items in parentheses are not required when Radio Set SCR-538-(&) is installed without the receiver and antenna. (See fig. 7.)

Part and location	*Method and materials*
Mast Base MP–48, in mast base well at left rear of vehicle (fig. 3).	Assemble the mast base as shown in figure 2. Assembly 7 must be installed inside the mast base. When using Mast Base MP–48–A, see figure 11.
Mast Sections MS–51 through MS–53, and Clamps MC–423 and MC–424, on Mast Base MP–48.	Screw the mast sections together and place the clamps over the joints between the sections. Then screw the antenna into the mast base. Lock with item 18, figure 12, when using Mast Base MP–48–A. Carry the mast sections in Roll BG–56–(&) when they are not in use.
Insulator IN–111, in hole leading into the mast base well.	Install as shown in figure 3.
Mounting FT–237–(&), on floor of left sponson.	Locate as shown in figure 3 with the eight machine screws provided.
Dynamotor DM–36–(&), in Radio Receiver BC–603–(&), or in Interphone Amplifier BC–605–(&) when Radio Set SCR–538–(&) is installed.	Secure the dynamotor in place with the four screws provided.
Dynamotor DM–37–(&), in Radio Transmitter BC–604–(&).	Used with Radio Set SCR–528–(&) only. Secure the dynamotor in place with the four screws provided.
Radio Transmitter BC–604–(&) and Radio Receiver BC–603–(&), on Mounting FT–237–(&).	Mount as shown in figure 3. Secure with screwlocks.
Interphone Amplifier BC–605–(&), on Mounting FT–237–(&).	Mount as shown in figure 3. Secure with screwlocks.
Microphone and headset hooks, on spacers provided in vehicle.	See figure 3 for mounting details.
Connector #61007 and Bondnut BL–50, on terminal box.	See figure 3 for mounting details.
Interphone Control Boxes BC–606–(&), for driver, commander, and winch operator; on brackets, and hull ceiling.	Mount and secure as shown in figure 3. The winch operator's control box is mounted on the hull ceiling without a bracket.
Microphone T–30–(&) and Cord CD–318.	Plug the microphone into the cord and insert the cord into designated jack on the receiver and transmitter.
Headset HS–30–(&) and Cords CD–604 and CD–307–A.	Plug headset into Cord CD–604. Plug Cord CD–604 into Cord CD–307–A. Insert Cord CD–307–A into proper jack on receiver and transmitter.
Microphone T–17–(&).	Use to replace the throat-type microphone for modulating the transmitter when greater intelligibility is required. Microphone T–17–(&) may be used as a spare microphone.
Cover BG–108.	Place over the mast base when the mast sections are not in use.
Cordage CO–213.	Before cutting any cordage, make a check installation in the vehicle. Then skin the insulation from the ends of the cable. Provide a soldered ground connection for the inner and the outer shieldings at each end of the cable. Tape the ends of all unused cable wires. Interconnect the components as shown in figures 3 and 4.

SECTION IV

INTERPHONE EQUIPMENT RC-99

11. Required Parts

Items necessary for an operating installation of Interphone Equipment RC-99 in Tank Recovery Vehicle T2 are listed below.

Quantity	Stock No.	Item
4	6Z3147	Connector #61007 and Bondnut BL-50, Appleton Electric Company.
1	2C1738(&)	Interphone Control Box BC-606-(&), with hardware.
2	2C675-739	Interphone Control Box BC-739-(&), with hardware.
3	3E1307A-5.5	Cord CD-307-A, 65 inches long; for Headset HS-30-(&).
3 [1]	3E1604	Cord CD-604, 6 inches long; for Headset HS-30-(&).
36 ft	3E2213	Cordage CO-213.
3 [2]	3E1318(&)	Cord CD-318-(&), for Microphone T-30-(&).
1	6L50-99V22	Hardware bag.
3 [1]	2B830(&)	Headset HS-30-(&).
1	2C1637	Interphone Amplifier BC-667, 24-volt, including Dynamotor DM-45.
3 [2]	2B1630(&)	Microphone T-30-(&).
3	2T107	Tube VT-107.

[1] Headset HS-18 may be substituted for Headset HS-30-(&) and Cord CD-604.
[2] Microphone T-17-(&) may be substituted for Microphone T-30-(&) and Cord CD-318-(&).

12. Assembly and Installation

Components of Interphone Equipment RC-99 should be assembled and installed in the following order:

Part and location	*Method and materials*
Interphone Amplifier BC-667, on left sponson wall, front. (See fig. 1.)	Remove the amplifier from its case. Mount the case on the mounting bracket with the hardware provided.
Connectors #61007 and Bondnuts BL-50, on interphone amplifier case and terminal box.	Position and install as shown in figure 1.
Tubes VT-107, inside Interphone Amplifier BC-667.	Install while the amplifier is still out of its case. Plug two of the tubes in sockets on the chassis of the amplifier and one in the spare socket on the back wall of the case. Then replace the amplifier in the case and secure it firmly in place.
Interphone Control Box BC-739-(&), for driver, on bracket, left front of hull.	Mount as shown in figure 1. Fasten in place with the hardware provided.
Interphone Control Box BC-739-(&), for commander, on bracket attached to hull ceiling near the right-central part of the vehicle.	Mount as shown in figure 1. Fasten in place with the hardware provided.
Interphone Control Box BC-606-(&), for winch operator, on hull ceiling at right rear of the vehicle.	Locate as shown in figure 1. Fasten in position with the hardware provided.
Microphone T-30-(&) and Cord CD-318.....	Plug the microphone into the cord and insert cord into designated jack on the receiver and transmitter.
Headset HS-30-(&) and Cords CD-604 and CD-307-A.	Plug headset into Cord CD-604. Plug Cord CD-604 into Cord CD-307-A. Insert Cord CD-307-A into proper jack on receiver and transmitter.

Part and location	*Method and materials*
Cordage CO–213.	Before cutting Cordage CO–213 and wiring any equipment, make a check installation. Then skin insulation from the ends of the cable by standard methods, providing a firm ground connection for the inner and outer shieldings at each end of the cable. Tape the ends of any unused wires of the cable. Connect the components of the equipment as shown in figures 1 and 5.

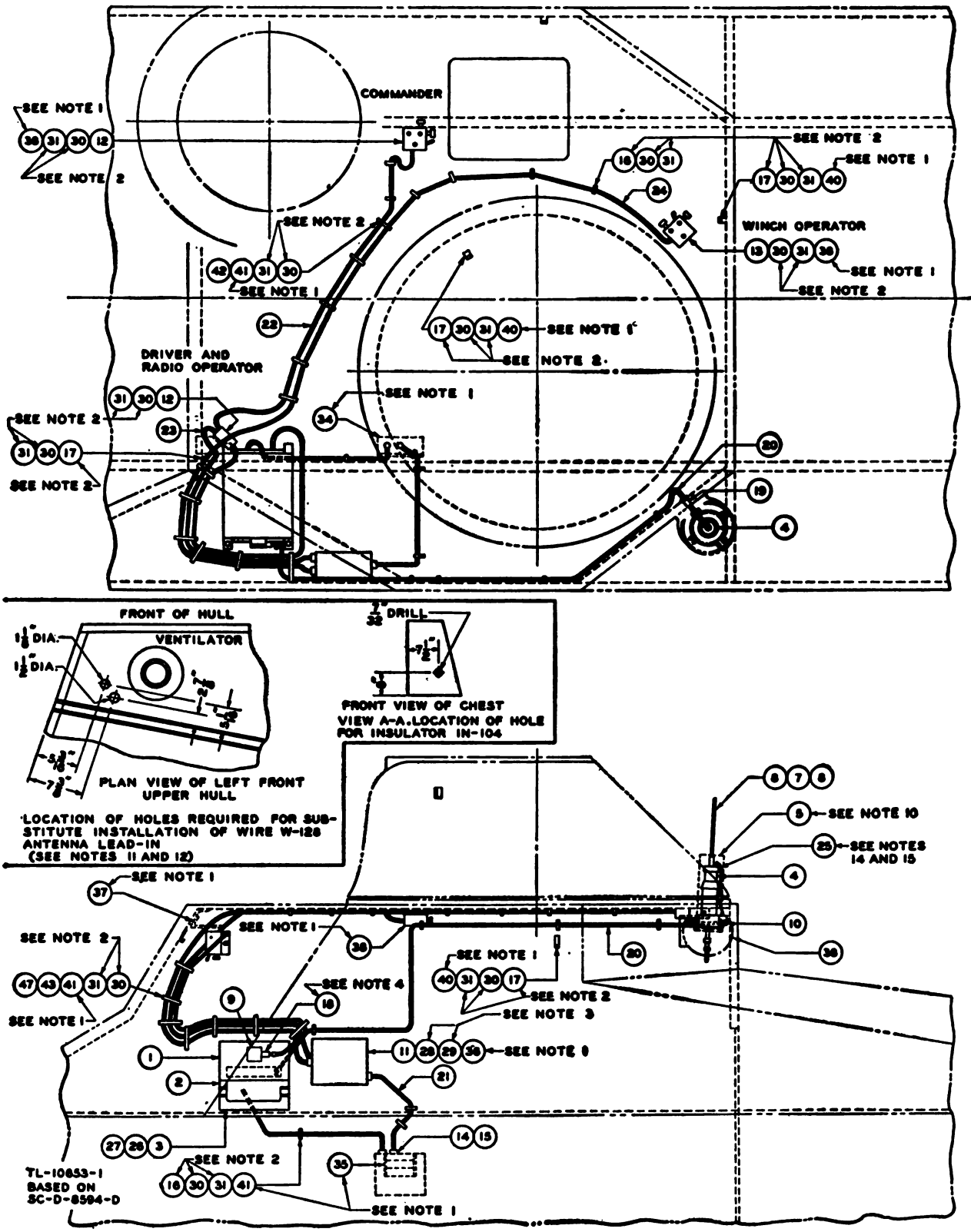
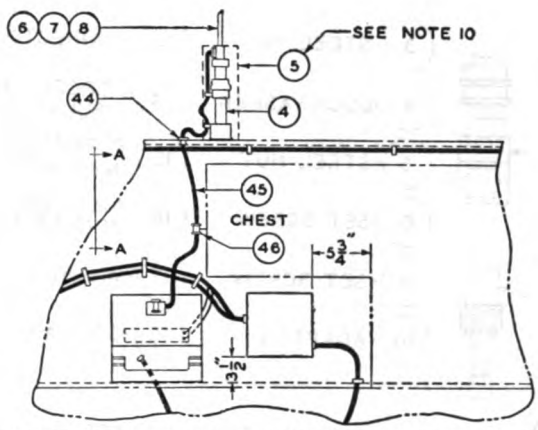


Figure 1. Installation of Radio Set SCR-610-(&) and



SUBSTITUTE INSTALLATION OF WIRE W-128 ANTENNA LEAD-IN (SEE NOTES 11 AND 12)

ITEM NO.	NAME OF ITEM	QUAN.
1	RADIO RECEIVER AND TRANSMITTER BC-659-(&)	1
2	POWER UNIT PE-120-(&)	* 1
3	MOUNTING FT-250-(&)	1
4	MAST BASE MP-48 OR MP-48-A	1
5	COVER BG-108	1
6	MAST SECTION MS-51	1
7	MAST SECTION MS-52 (WITH CLAMP MC-423)	1
8	MAST SECTION MS-53 (WITH CLAMP MC-424)	1
9	BOX (ANTENNA TERMINAL) TM-210	1
10	BOX (ANTENNA TERMINAL) TM-211	1
11	AMPLIFIER BC-667	1
12	INTERPHONE CONTROL BOX BC-739-(&)	2
13	INTERPHONE CONTROL BOX BC-606-(&)	1
14	APPLETON CONNECTOR CAT. #61007	5
15	BONDNUT CAT. #BL-50	5
16	#4 CLAMP	15
17	HOOK	4
18	COUPLING	1
19	INSULATOR IN-111	1
20	CORDAGE CO-282 120" LG.	
21	CORDAGE CO-213 48" LG.	
22	CORDAGE CO-213 90" LG.	
23	CORDAGE CO-213 75" LG.	
24	CORDAGE CO-213 204" LG.	
25	WIRE W-128 18" LG.	
26	HEX. HD. MACH. SCREW 1/4"-20 X 3/4" LG.	4
27	LOCKWASHER STD. FOR 1/4" SCR.	4
28	ROUND HD. MACH. SCREW 1/4"-20 X 1 1/4" LG.	4
29	LOCKWASHER STD. FOR 1/4" SCR.	4
30	ROUND HD. MACH. SCREW #8-32 X 3/8" LG	45
31	LOCKWASHER STD. FOR #8 SCR.	45
34	TERMINAL BOX	1
35	BRACKET A213266	1
36	BRACKET B229674	1
37	BRACKET B284501	1
38	BRACKET B200129	2
39	BRACKET C85029	1
40	SPACER A191964	4
41	SPACER A191935	11
42	CLAMP #7	6
43	CLAMP #10	7
44	INSULATOR IN-101	1
45	WIRE W-128 43" LG.	
46	INSULATOR IN-104	1
47	FLAT WASHER FOR #8 SCREW	7

* PLATE SUPPLY UNIT PE-117-(&) FOR RADIO SET SCR-610-(&) MAY BE SUBSTITUTED.

NOTES:

1. (34) TO (41) INCLUSIVE, SHALL BE FURNISHED AND INSTALLED BY VEHICLE MANUFACTURER.

2. (16) (17) (30) AND (31) ARE FURNISHED WITH (12) AND (13)

3. FOR (28) AND (29) SEE PARTS LIST.

4. (18) SHALL BE BRASS COUPLING #26243 AS MADE BY LAPP INSULATOR CO. LEROY, N.Y. OR EQUAL.

5. FOR DRILLING OF (4) AND INSTALLATION OF (10) SEE FIGURE 13.

6. DRIVER, COMMANDER, WINCH OPERATOR, AND RADIO OPERATOR SHALL EACH BE FURNISHED ONE HEADSET HS-30-(&) WITH CORDS CD-307-A (65") AND CD-604, AND ONE MICROPHONE T-30-(&) WITH CORD CD-318-(&).

7. FOR WIRING DIAGRAM OF INTERPHONE EQUIPMENT RC-99 SEE FIGURE 5.

8. FOR ADDITIONAL COMPONENTS AND SPARE PARTS SEE PARTS LIST.

9. CORDAGE LENGTHS GIVEN INCLUDE THE EXTRA LENGTHS NECESSARY FOR CONNECTIONS.

10. USE COVER BG-108 WHEN MAST SECTIONS ARE NOT INSTALLED.

11. IF TERMINAL BOXES TM-210-(&) AND TM-211-(&) ARE NOT AVAILABLE A SUBSTITUTE INSTALLATION OF WIRE W-128 ANTENNA LEAD-IN WITH MAST BASE MP-48 LOCATED AT THE FORWARD PART OF THE VEHICLE MAY BE USED.

12. (44) (45) AND (46) ARE REQUIRED ONLY FOR SUBSTITUTE REFERRED TO IN NOTE 11.

13. (9) (10) (18) (19) (20) AND (25) ARE NOT REQUIRED FOR THIS SUBSTITUTE INSTALLATION.

14. REMOVE INTERNAL LEAD FROM MAST BASE MP-48 WHEN WIRE W-128 IS USED WITH SCR-610-(&).

15. (25) SHALL BE CUT TO PROPER LENGTH, ENDS SHALL BE TINNED FOR ANTENNA CONNECTIONS.

TL-10653-2
BASED ON
SC-D-8594-D

Interphone Equipment RC-99 in Tank Recovery Vehicle T2.

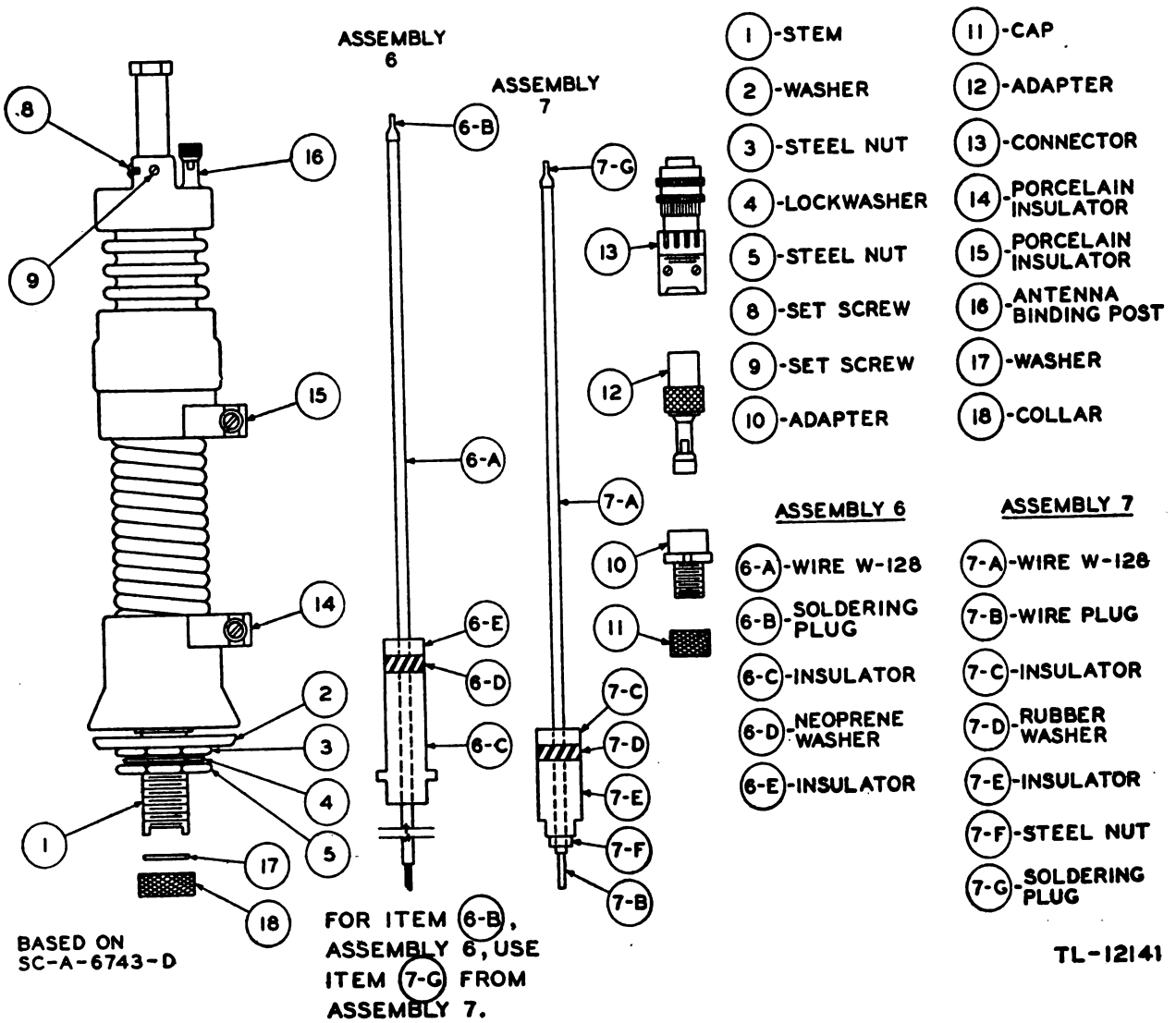


Figure 2. Mast Base MP-48.

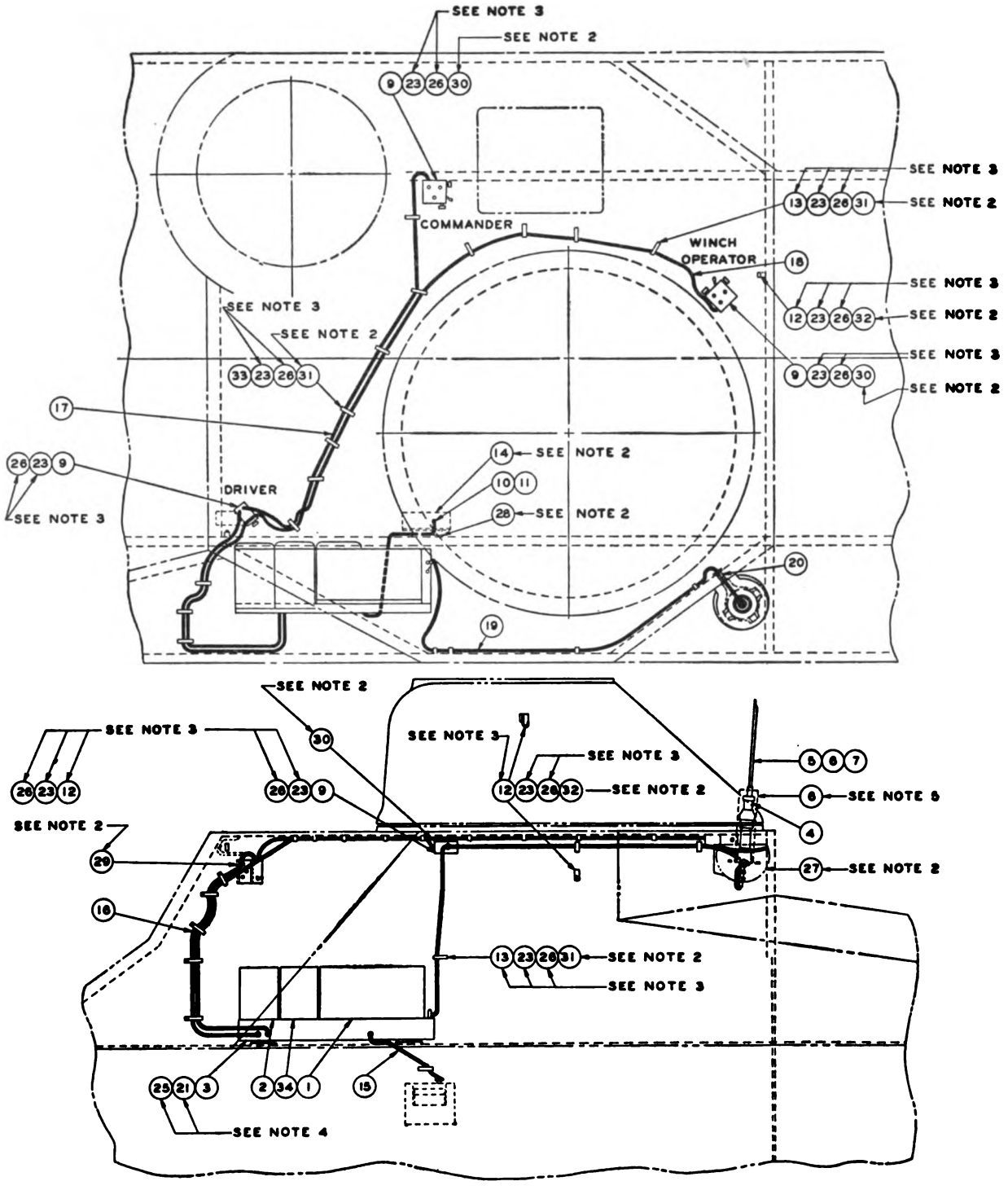


Figure 3. Installation of Radio Set SCR-528-(&) or SCR-538-(&)

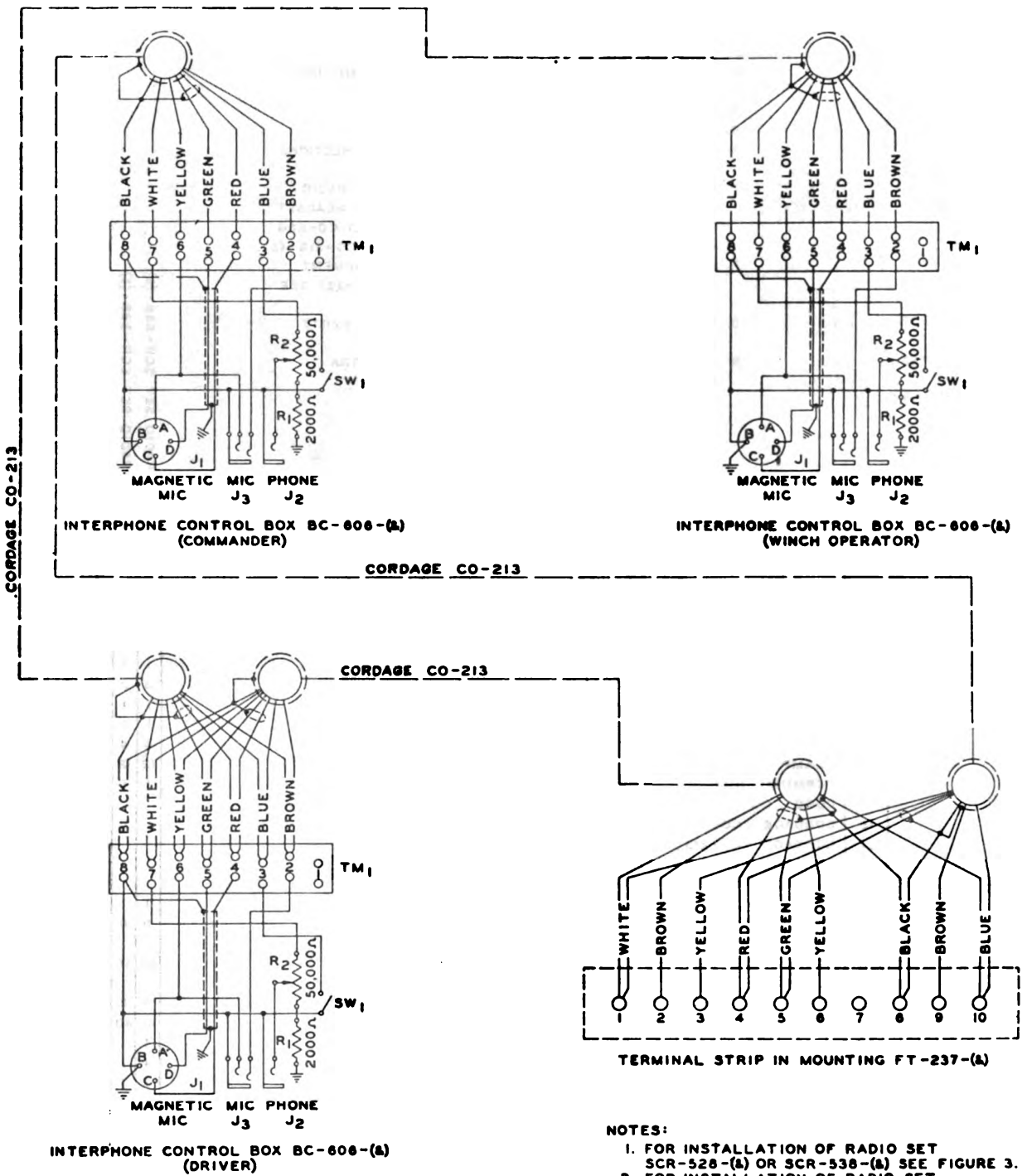
NOTES:

1. SHIELD OF (19) SHALL BE GROUNDED AT (3).
2. (27) TO (32) INCLUSIVE AND (14) SHALL BE FURNISHED AND INSTALLED BY VEHICLE MFR.
3. (12)(13)(23) AND (26) ARE FURNISHED WITH (9)
4. (21) AND (25) ARE FURNISHED WITH (3).
5. USE MAST BASE COVER BG-108 WHEN MAST SECTIONS ARE NOT IN USE.
6. DRIVER, COMMANDER, WINCH OPERATOR AND RADIO OPERATOR SHALL EACH BE FURNISHED ONE HEADSET HS-30-(A) WITH CORDS CD-307-A (66")AND CD-804 AND ONE MICROPHONE T-30-(A) WITH CORD CD-318-(A).
7. FOR WIRING DIAGRAM OF INTERPHONE EQUIPMENT FOR RADIO SET SCR-528-(A) OR SCR-536-(A) SEE FIGURE 4.
8. FOR ADDITIONAL COMPONENTS AND SPARE PARTS SEE PARTS LIST.
9. CORDAGE LENGTHS GIVEN INCLUDE THE EXTRA LENGTH NECESSARY FOR CONNECTIONS.

ITEM NO.	NAME OF ITEM	QUAN. REQ. RADIO SET SCR-536-(A)	QUAN. REQ. RADIO SET SCR-528-(A)
1	RADIO TRANSMITTER BC-604-(A) WITH DYNAMOTOR DM-37-(A)		1
2	RADIO RECEIVER BC-603-(A) WITH DYNAMOTOR DM-36-(A)	1	1
3	MOUNTING FT-237-(A)	1	1
4	MAST BASE MP-48 OR MP-48-A	1	1
5	MAST SECTION MS-51	1	1
6	MAST SECTION MS-52 WITH CLAMP MC-423	1	1
7	MAST SECTION MS-53 WITH CLAMP MC-424	1	1
8	COVER BG-108	1	1
9	INTERPHONE CONTROL BOX BC-608-(A)	3	3
10	APPLETON CONNECTOR CAT. NO.61007	1	1
11	BONDNUT CAT. NO. BL-50	1	1
12	HOOK	4	4
13	CLAMP NO.4	12	12
14	TERMINAL BOX	1	1
15	CORD CO-278		
16	CORDAGE CO-213 83" LG.		
17	CORDAGE CO-213 146"LG.		
18	CORDAGE CO-213 122"LG.		
19	CORDAGE CO-282 120"LG.		
20	INSULATOR IN-111	1	1
21	HEX. HD. MACH. SCREW 5/16"-24 X 3/4"LG.	8	8
22			
23	ROUND HEAD MACHINE SCREW NO.8-32 X 3/8"LG.	40	40
24			
25	LOCKWASHER STD. FOR 5/16" SCREW	8	8
26	LOCKWASHER STD. FOR NO. 8 SCREW	40	40
27	MAST BASE BRACKET C85029	1	1
28	BRACKET A213266	1	1
29	BRACKET B284501	1	1
30	BRACKET B200129	2	2
31	SPACER A191935	9	9
32	SPACER A191964	4	4
33	CLAMP NO.7	11	11
34	INTERPHONE AMPLIFIER BC-605-(A) WITH DYNAMOTOR DM-36-(A)	1	

TL-10654-2
BASED ON
SC-D-8995-D

and associated interphone equipment in Tank Recovery Vehicle T2.



NOTES:

1. FOR INSTALLATION OF RADIO SET SCR-528-(&) OR SCR-538-(&) SEE FIGURE 3.
2. FOR INSTALLATION OF RADIO SET SCR-538-(&) (LESS RECEIVER AND ANTENNA) SEE FIGURE 7.
3. SHIELD OF CABLE AND SHIELD OF TWISTED PAIR OF LEADS IN CABLE SHALL BE SECURELY GROUNDED AT EACH END.
4. DOTTED CIRCLE AROUND CABLE ENDS REPRESENTS SHIELD.
5. AN ADDITIONAL INTERPHONE STATION IS PROVIDED AT RADIO SET SCR-528-(&) OR SCR-538-(&).

TL-10655
BASED ON
SC-D-8598-D

Figure 4. Wiring diagram for interphone equipment for Radio Set SCR-528-(&) or SCR-538-(&) in Tank Recovery Vehicle T2.

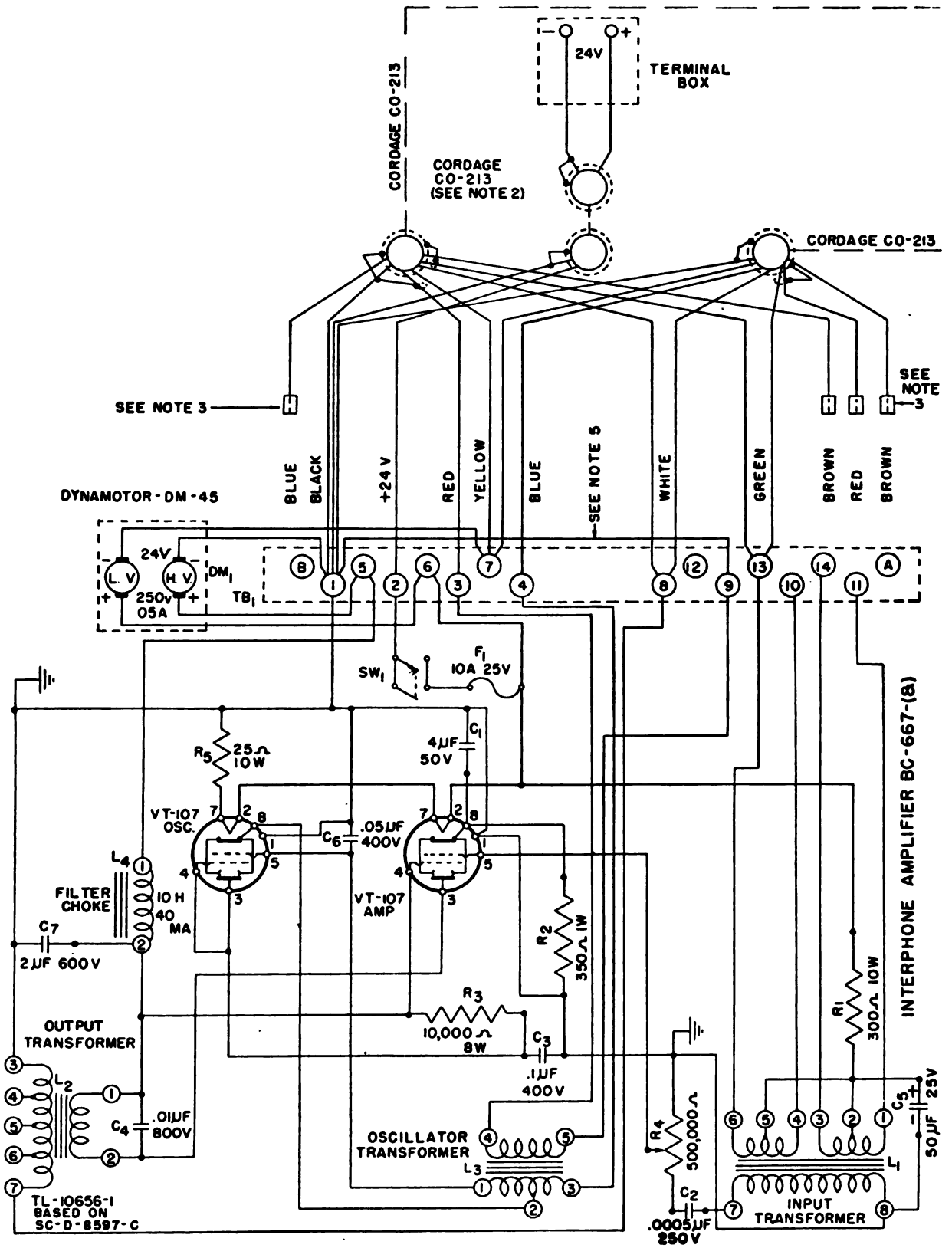
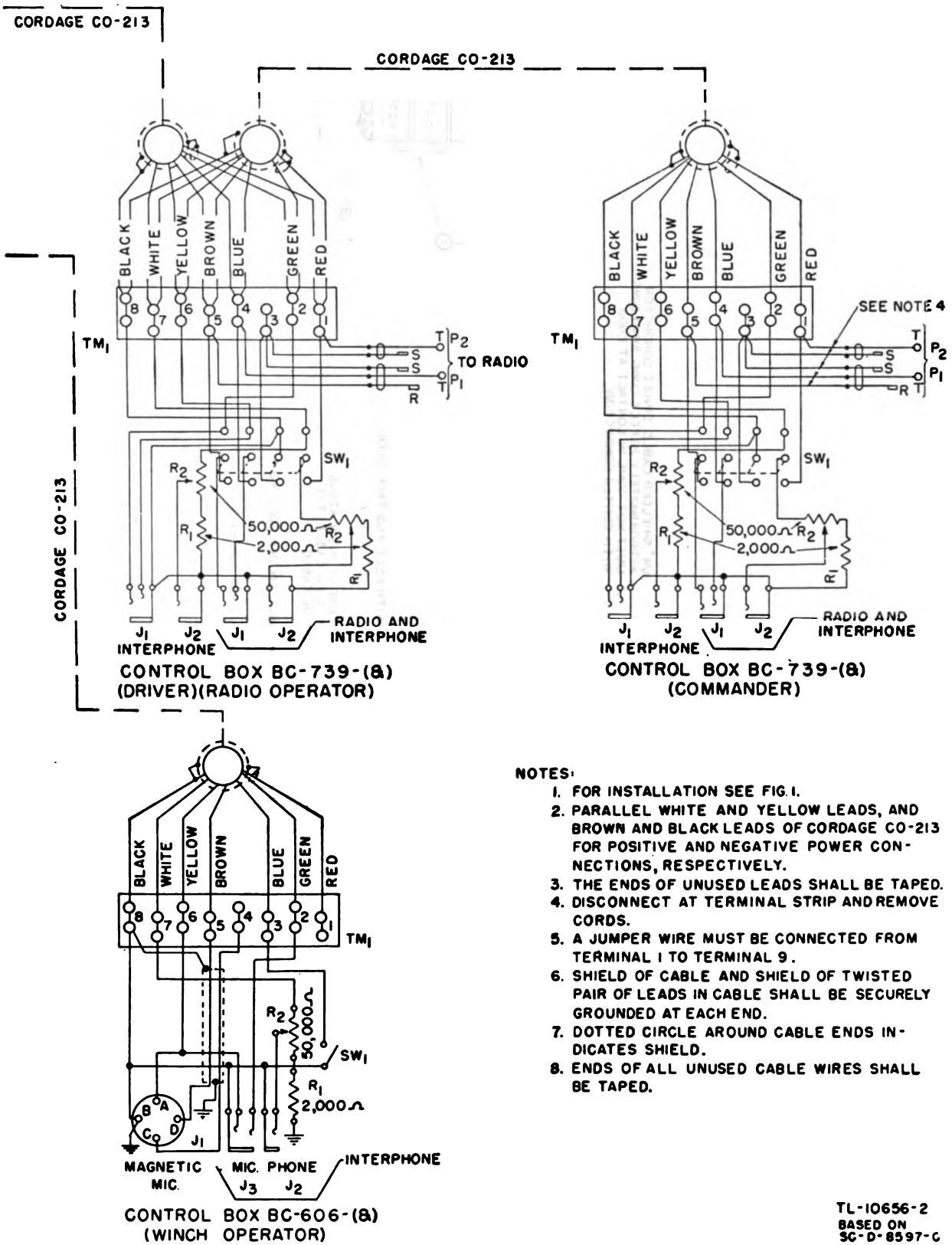


Figure 5. Wiring diagram of Interphone Equip



NOTES:

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

TL-10656-2
BASED ON
SC-D-8597-C

ment RC-99 in Tank Recovery Vehicle T2.

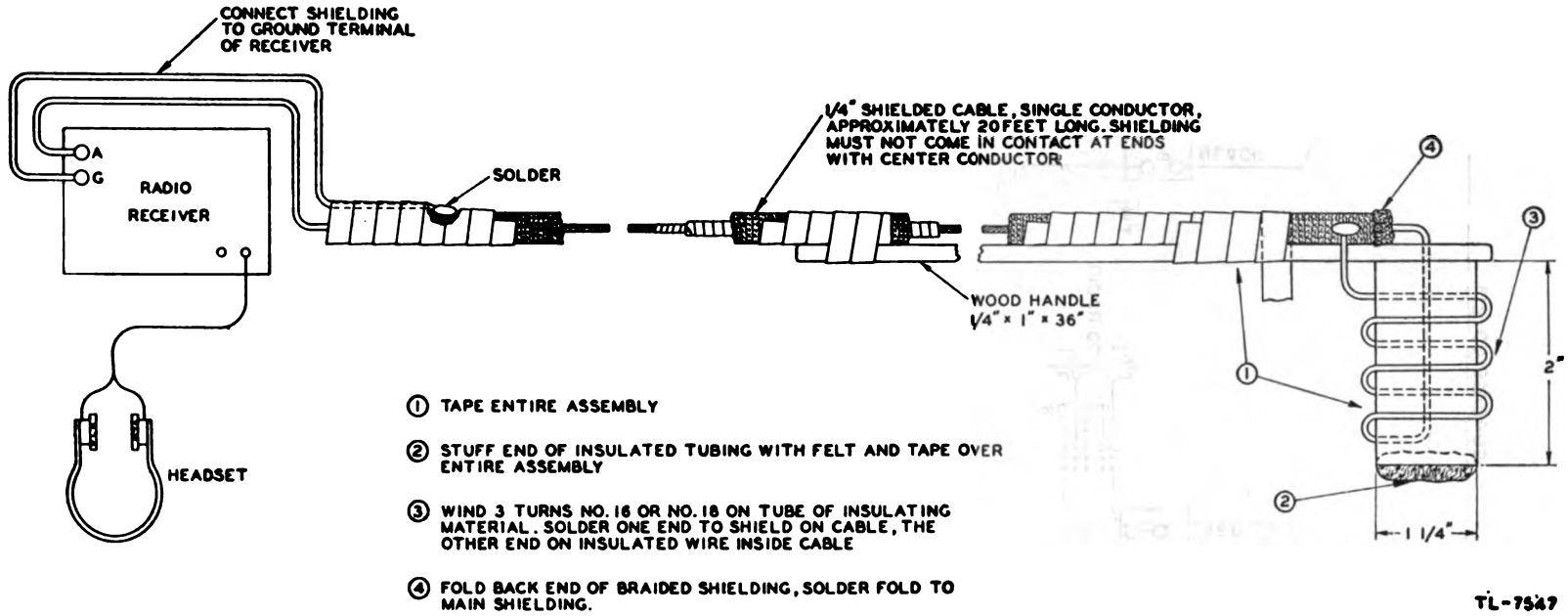
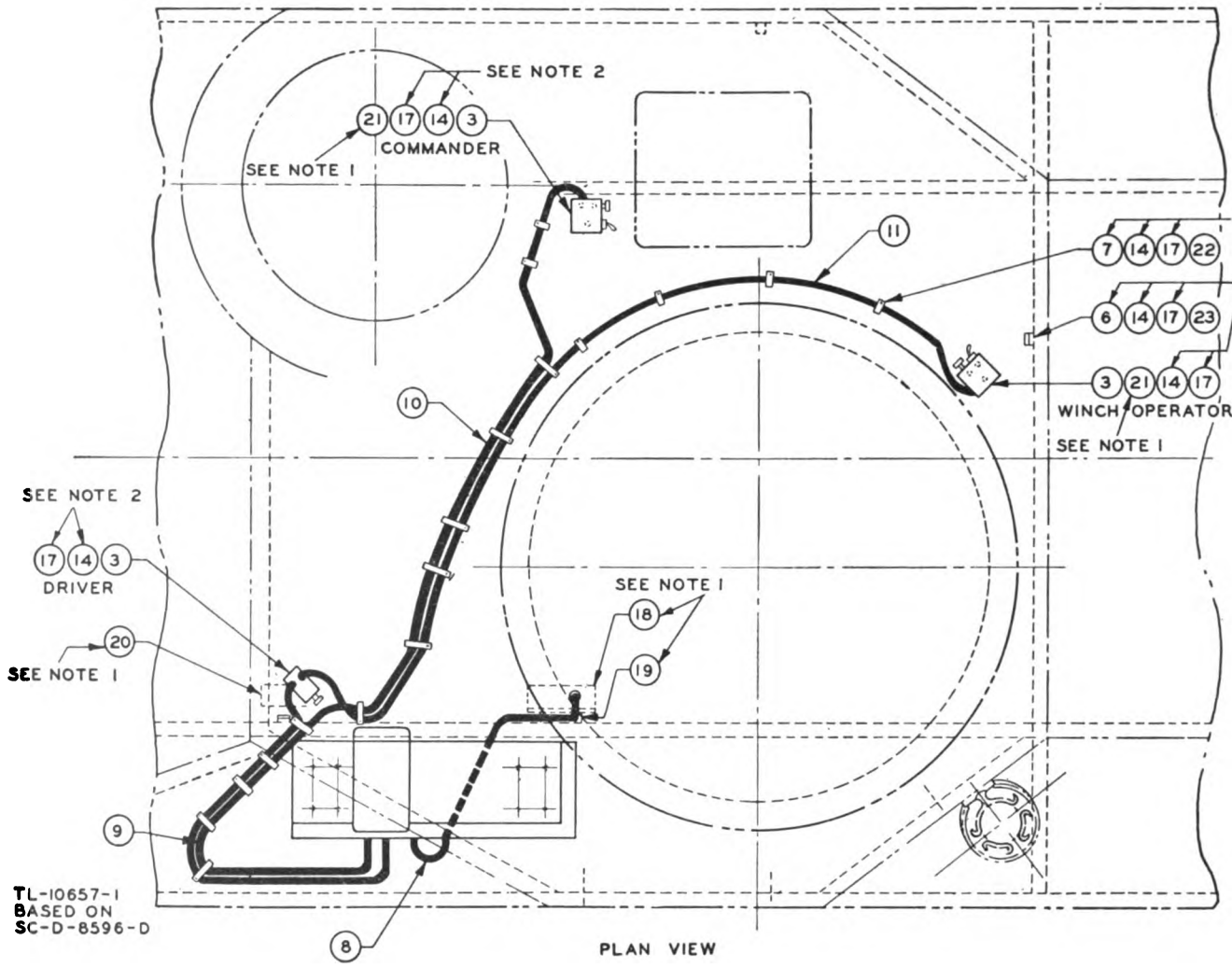


Figure 6. Probe antenna.



NOTES:

1- (18) TO (23) INCLUSIVE SHALL BE FURNISHED AND INSTALLED BY VEHICLE MANUFACTURER.

2- (6), (7), (14), AND (17) ARE FURNISHED WITH (3).

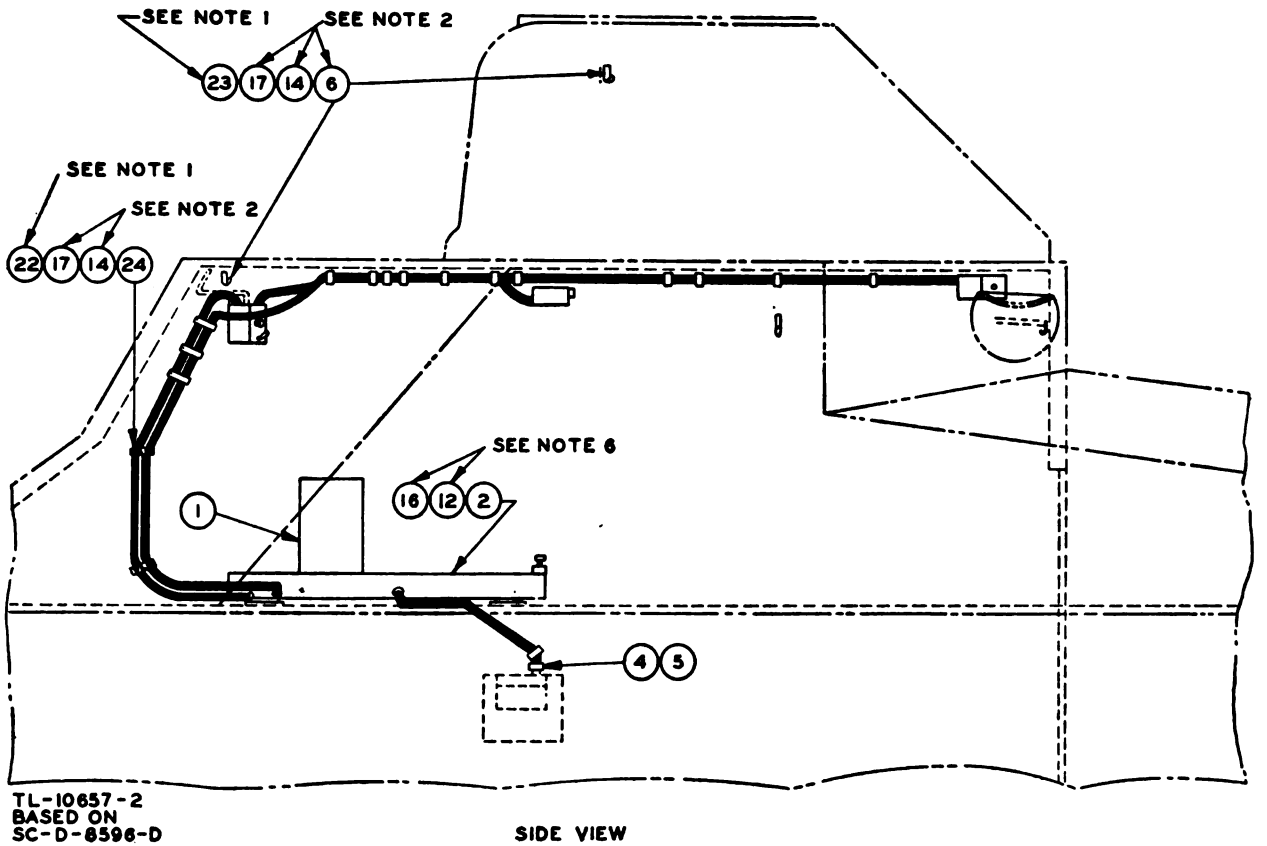
3- CORDAGE LENGTHS GIVEN INCLUDE THE EXTRA LENGTH NECESSARY FOR CONNECTIONS.

4- DRIVER, COMMANDER, WINCH OPERATOR, AND RADIO OPERATOR SHALL EACH BE FURNISHED ONE HEADSET HS-30-(&) WITH CORDS CD-307-A- (65") AND CD-604, AND ONE MICROPHONE T-30-(&) WITH CORD CD-318-(&).

5- FOR WIRING DIAGRAM OF INTERPHONE EQUIPMENT FOR RADIO SET SCR-528-(&) OR SCR-538-(&) SEE FIGURE 4.

6- (12) AND (16) ARE FURNISHED WITH (2).

7- DYNAMOTOR DM-36-(&) SHALL BE SUPPLIED WITH (1)



ITEM NO.	NAME OF ITEM	QUAN REQ.
1	INTERPHONE AMPLIFIER BC-605-(&) SEE NOTE 5	1
2	MOUNTING FT-237-(&)	1
3	INTERPHONE CONTROL BOX BC-606-(&)	3
4	APPLETON CONNECTOR CAT. #61007	1
5	BONDNUT CAT. # BL-50	1
6	HOOK	4
7	CLAMP #4	8
8	CORD CO-278	
9	CORDAGE CO-213 83" LG.	
10	CORDAGE CO-213 146" LG.	
11	CORDAGE CO-213 122" LG.	
12	HEX. HD. MACH. SCR. 5/16" - 24 X 3/4" LG.	8
14	RD. HD. MACH. SCR. #8 - 32 X 3/8" LG.	36
16	LOCKWASHER STD. FOR 5/16" SCR.	8
17	LOCKWASHER STD. FOR #8 SCR.	36
18	TERMINAL BOX	1
19	BRACKET A213266	1
20	BRACKET B284501	1
21	BRACKET B200129	2
22	SPACER A191935	7
23	SPACER A191964	4
24	CLAMP #7	11

Figure 7. Installation of Radio Set SCR-538-(&), less receiver and antenna, and associated interphone equipment in Tank Recovery Vehicle T2.

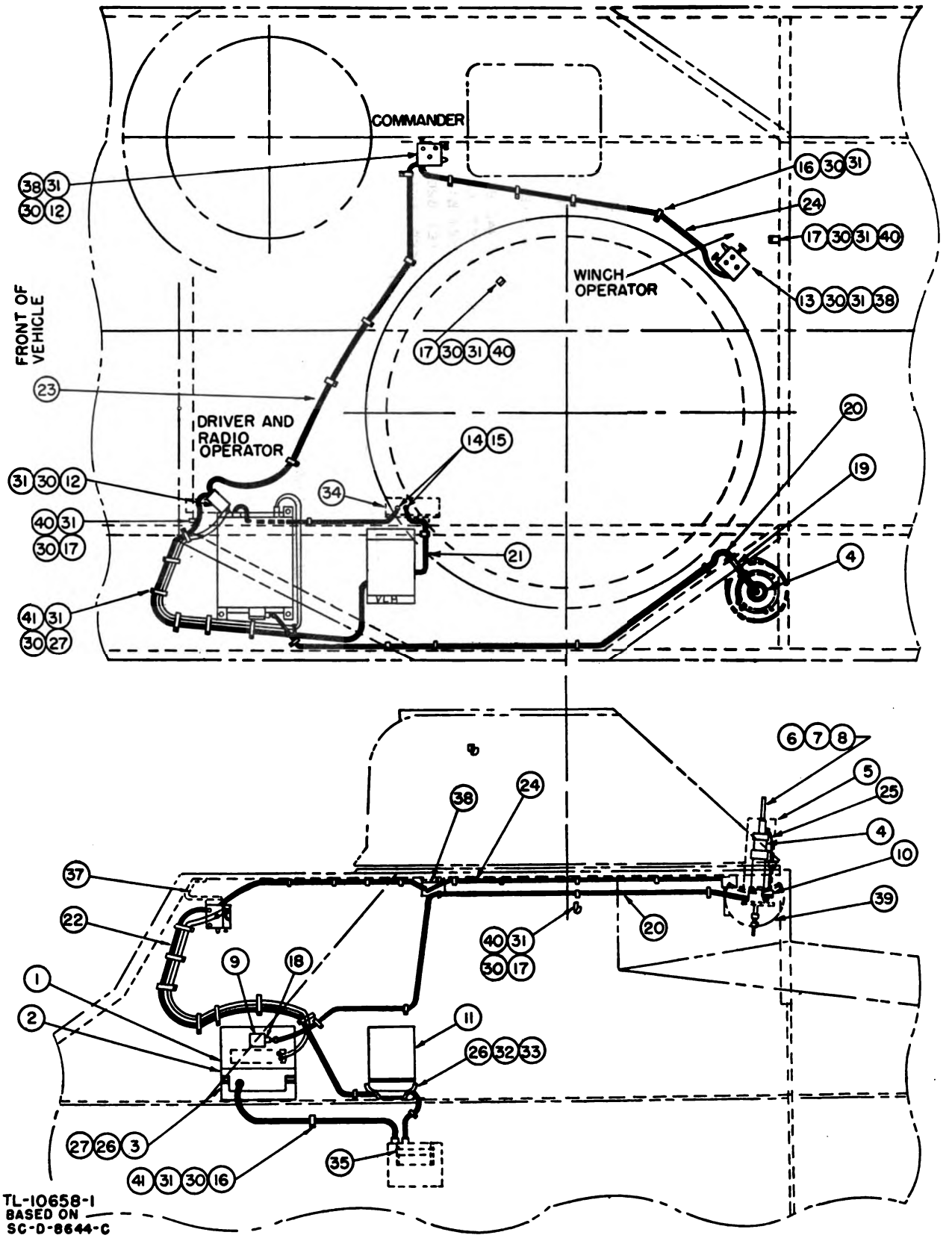


Figure 8. Installation of Radio Set SCR-610-(*) and Interphone

ITEM NO.	NAME OF ITEM	QUAN. REQ.
1	RADIO RECEIVER AND TRANSMITTER BC-659-(8)	1
2	POWER UNIT PE-120-(8)	1
3	MOUNTING FT-250-(8)	1
4	MAST BASE MP-48 OR MP-48-A	1
5	COVER BG-108	1
6	MAST SECTION MS-51	1
7	MAST SECTION MS-52, WITH CLAMP MC-423	1
8	MAST SECTION MS-53, WITH CLAMP MC-424	1
9	BOX (ANTENNA TERMINAL) TM-210	1
10	BOX (ANTENNA TERMINAL) TM-211	1
11	AMPLIFIER BC-605-(8)	1
12	INTERPHONE CONTROL BOX BC-739-(8)	2
13	INTERPHONE CONTROL BOX BC-606-(8)	1
14	APPLETON CONNECTOR, CAT. #61007	2
15	BONDNUT, CAT. # BL-50	2
16	CLAMP #4 (SEE NOTE 2)	23
17	HOOK (SEE NOTE 2)	4
18	COUPLING (SEE NOTE 3)	1
19	INSULATOR IN-111	1
20	CORDAGE CO-282, 120" LONG	
21	CORDAGE CO-213, 36" LONG	
22	CORDAGE CO-213, 100" LONG	
23	CORDAGE CO-213, 90" LONG	
24	CORDAGE CO-213, 68" LONG	
25	WIRE W-128, 18" LONG (SEE NOTES 10 TO 13)	
26	MOUNTING	1
27	CLAMP #7	7
28	HEX. HD. MACH. SCREW, 1/4"-20 X 3/4" LONG (SEE NOTE 2)	4
29	LOCKWASHER, STD. FOR 1/4" SCREW (SEE NOTE 2)	4
30	RD. HD. MACH. SCREW, #8-32 X 3/8" LONG (SEE NOTE 2)	47
31	LOCKWASHER, STD. FOR #8 SCREW (SEE NOTE 2)	47
32	FL. HD. MACH. SCREW, 5/16"-24 X 3/4" LONG	4
33	LOCKWASHER, STD. FOR 5/16" SCREW	4
34	TERMINAL BOX, (SEE NOTE 1)	1
35	BRACKET, A213266 (SEE NOTE 1)	1
36	BRACKET, B229674 (SEE NOTE 1)	1
37	BRACKET, B284501 (SEE NOTE 1)	1
38	BRACKET, B200129 (SEE NOTE 1)	2
39	BRACKET, C85029 (SEE NOTE 1)	1
40	SPACER, A191964 (SEE NOTE 1)	4
41	SPACER, A191935 (SEE NOTE 1)	11

NOTES:

1. (34) TO (41) INCLUSIVE, SHALL BE FURNISHED AND INSTALLED BY VEHICLE MFR.
2. (16) (17) (30) AND (31) ARE FURNISHED WITH (12) AND (13).
3. (18) SHALL BE BRASS COUPLING #26243 AS MADE BY LAPP INSULATOR CO., LEROY, N.Y., OR EQUAL.
4. FOR DRILLING OF (4) AND INSTALLATION OF (10) SEE FIG. 13.
5. DRIVER, COMMANDER, WINCH OPERATOR, AND RADIO OPERATOR SHALL EACH BE FURNISHED ONE HEADSET HS-30-(8) WITH CORDS CD-307-A (65") AND CD-604, AND ONE MICROPHONE T-30-(8) WITH CORD CD-318-(8).
6. FOR WIRING DIAGRAM OF INTERPHONE EQUIPMENT SEE FIG. 9.
7. FOR ADDITIONAL COMPONENTS AND SPARE PARTS SEE PARTS LIST.
8. CORDAGE LENGTHS GIVEN INCLUDE THE EXTRA LENGTH NECESSARY FOR CONNECTIONS.
9. USE COVER BG-108 WHEN MAST SECTIONS ARE NOT INSTALLED.
10. IF TERMINAL BOXES TM-210 AND TM-211 ARE NOT AVAILABLE, A SUBSTITUTE INSTALLATION OF WIRE W-128 ANTENNA LEAD-IN WITH MAST BASE MP-48 OR MP-48-A LOCATED AT THE FORWARD PART OF THE VEHICLE MAY BE USED. FOR DETAILS SEE FIGS. 1 AND 12.
11. (25), AFTER CUT TO PROPER LENGTH, SHALL BE TINNED FOR CONNECTION.
12. SEE FIGS. 1 AND 12 FOR ALTERNATE ANTENNA LEAD-IN INSTALLATION OF WIRE W-128.
13. REMOVE INTERNAL LEAD FROM MAST BASE MP-48 OR MP-48-A WHEN WIRE W-128 IS USED WITH SCR-610-(8).

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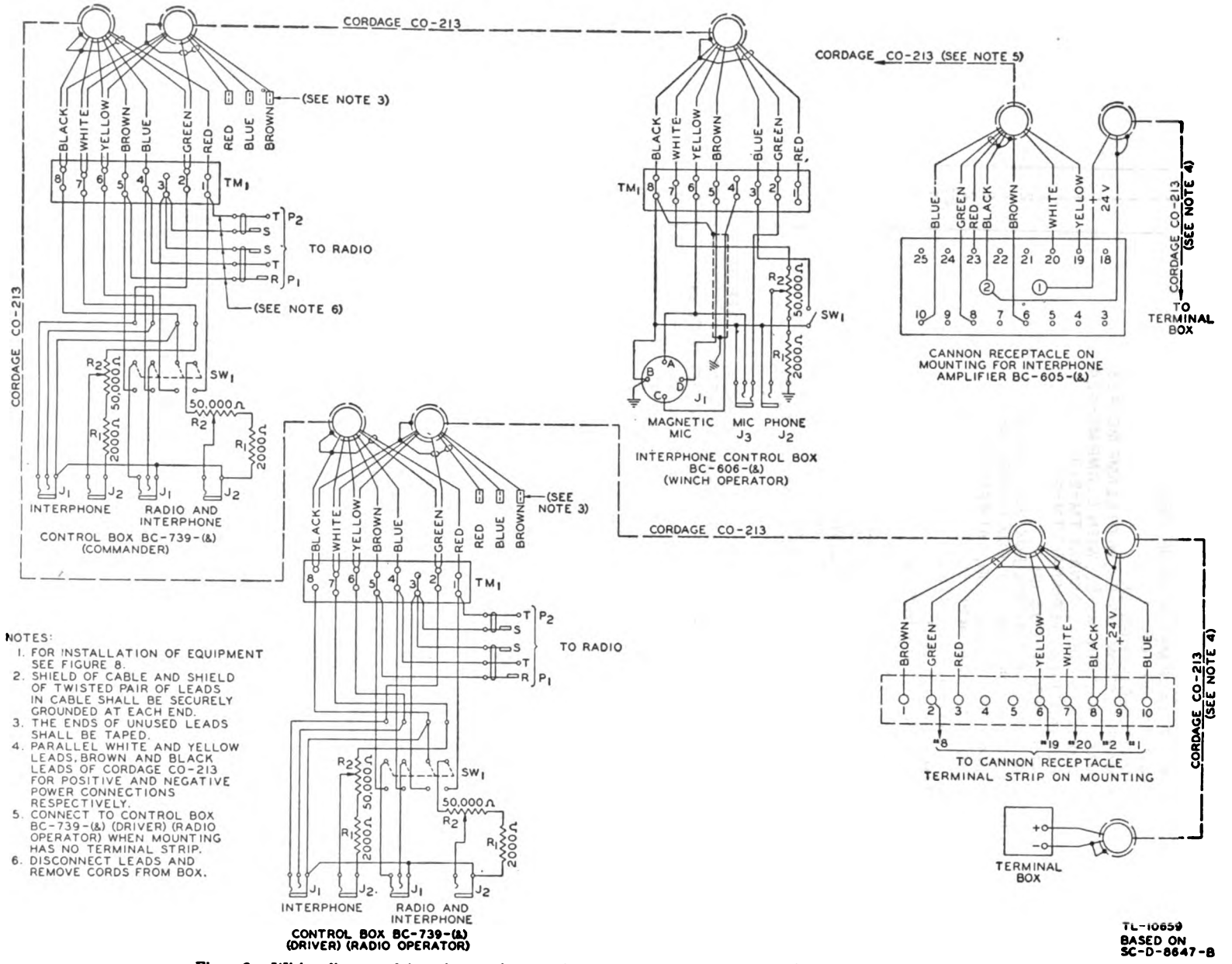
BASED ON
SC-D-8644-C

Amplifier BC-605-(8) in Tank Recovery Vehicle T2.



NOTES:
1. FOR INSTALLATION OF EQUIPMENT SEE FIGURE 8.
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 TO CONTROL BOX BC-739-(&) (DRIVER) (RADIO OPERATOR) WHEN MOUNTING HAS NO TERMINAL STRIP.
6. DISCONNECT LEADS AND REMOVE CORDS FROM BOX.

Figure 9. Wiring diagram of interphone equipment using Interphone Amplifier BC-605-(&) in Tank Recovery Vehicle T2.

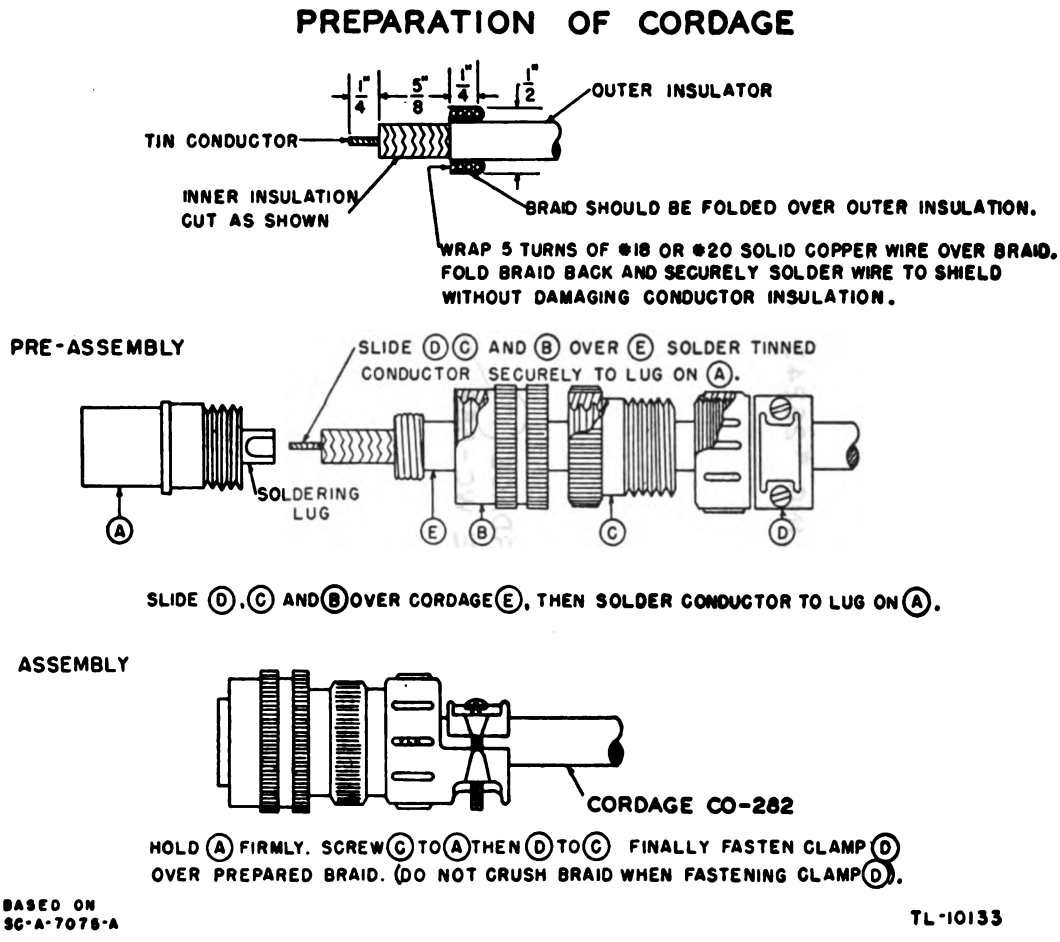


Figure 10. Coaxial connector for Mast Base MP–48 and Cordage CO–282, assembly for installation.

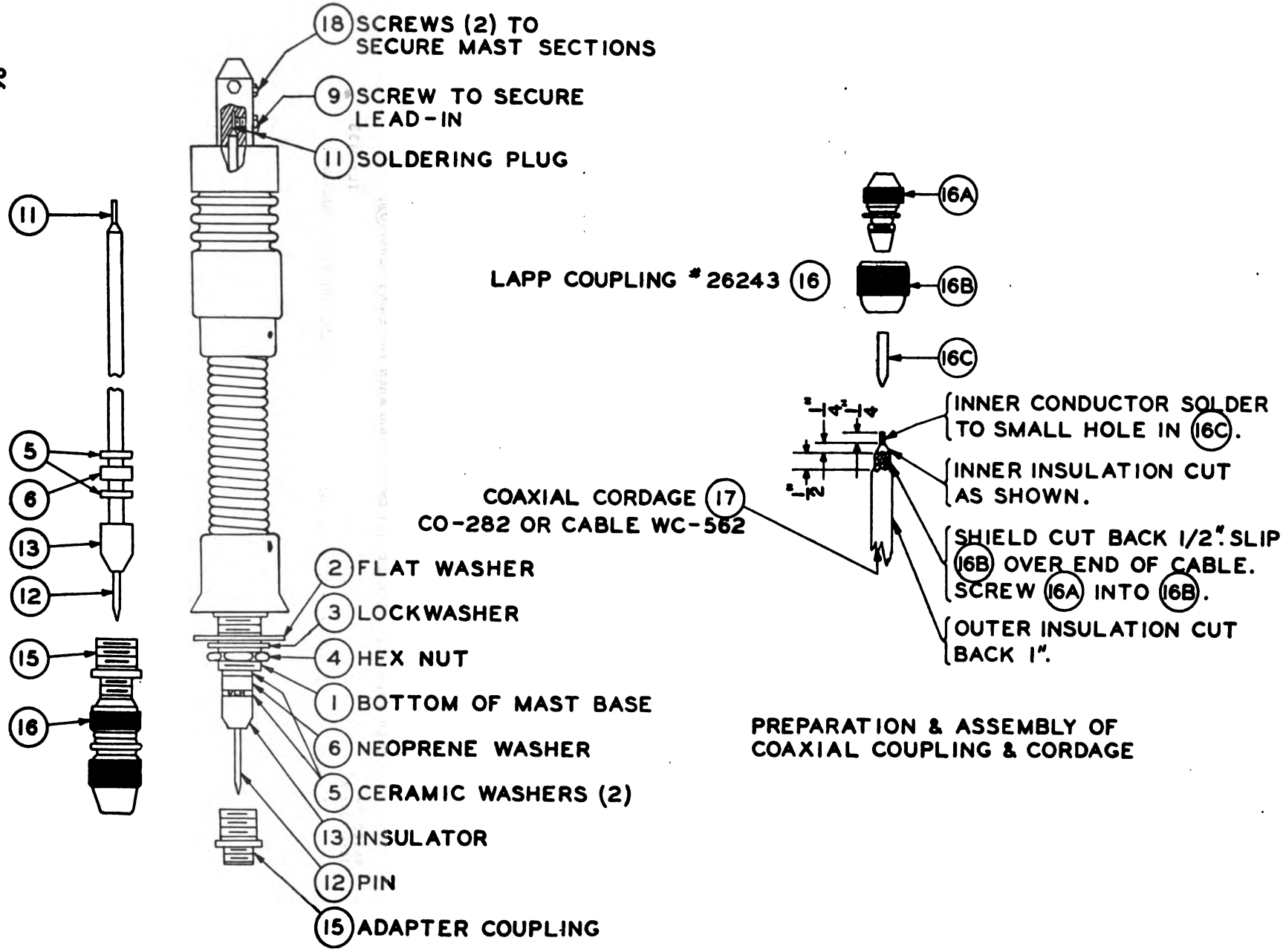


Figure 11. Mast Base MP-48-A, assembly with coaxial lead-in.

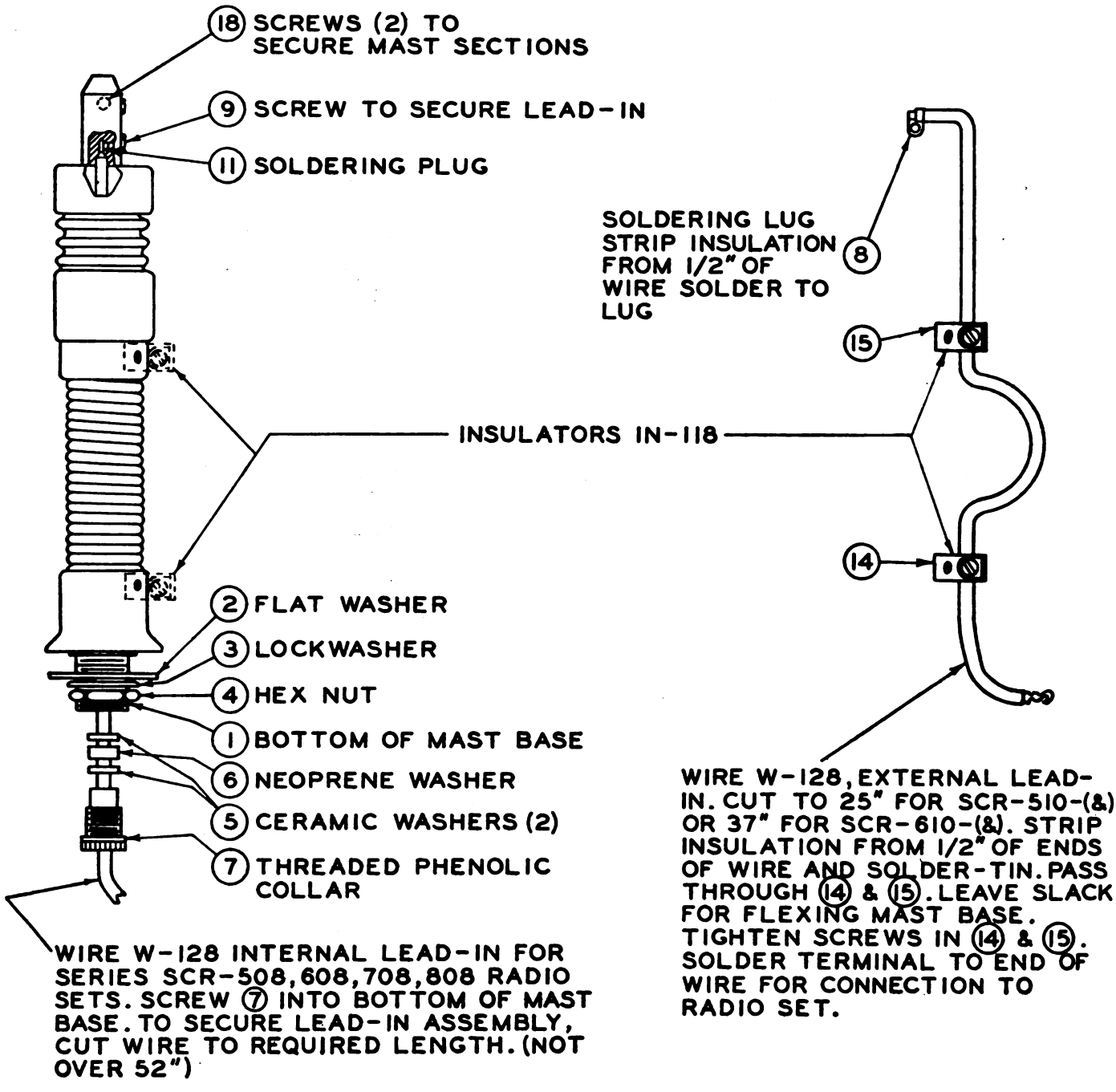


Figure 12. Mast Base MP-48-A, assembly with Wire M-128 lead-in.

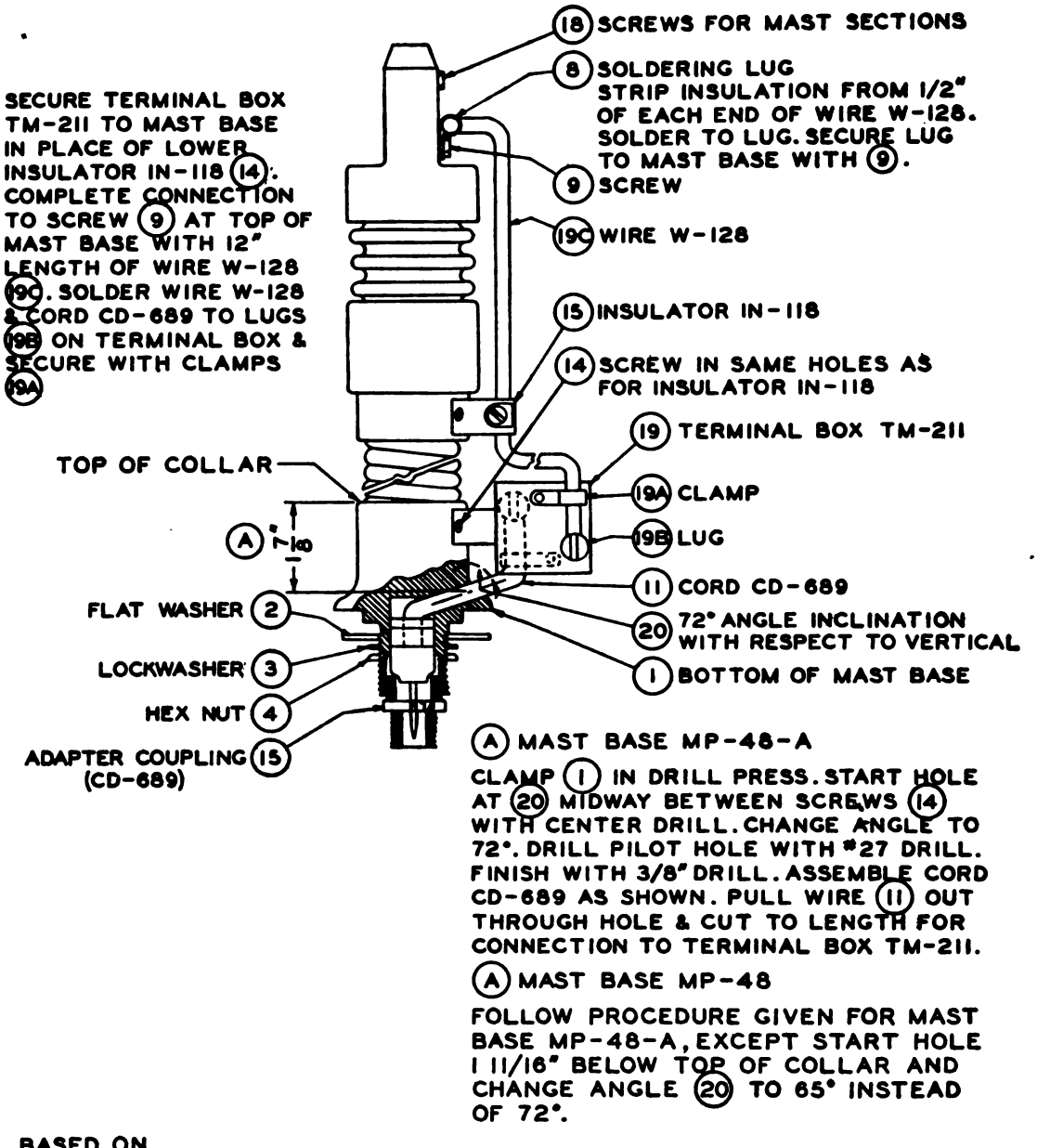
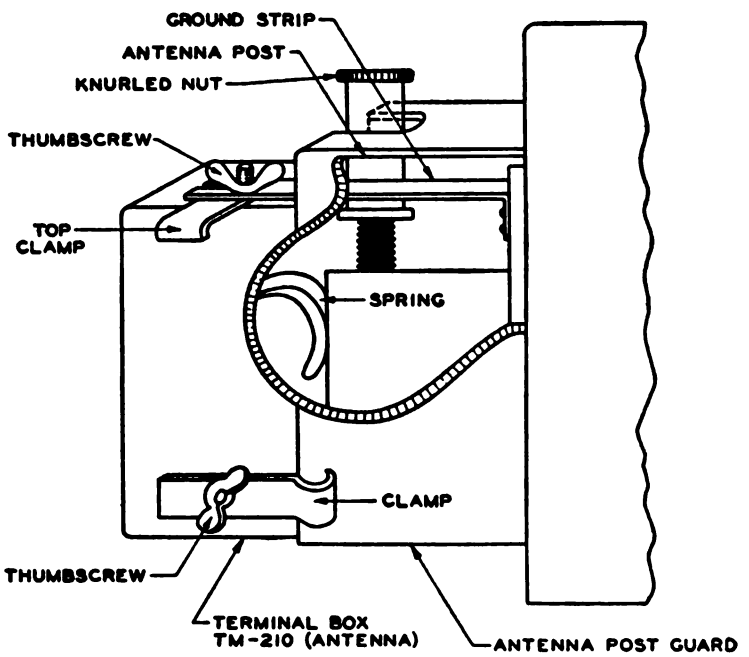


Figure 13. Mast Base MP-48-A, assembly with Terminal Box TM-211.



1. REMOVE CHASSIS OF RADIO RECEIVER AND TRANSMITTER BC-659-(&) FROM CASE.
2. MOUNT GROUND STRIP, SECURING WITH UPPER RIGHT HAND SCREW IN ANTENNA POST GUARD.
3. TIGHTEN KNURLED NUT ON ANTENNA POST.
4. TURN TERMINAL BOX TM-210 FOR MOST DIRECT CONNECTION OF CORDAGE CO-282.
5. TURN TOP CLAMP SIDEWISE.
6. PRESS TERMINAL BOX INTO POSITION AGAINST ANTENNA POST GUARD AND SECURE SLOTTED END OF GROUND STRIP BENEATH WASHER WITH THUMBSCREW.
7. SECURE THE THREE REMAINING CLAMPS TO THE ANTENNA POST GUARD BY TIGHTENING THE THUMBSCREWS.

TL-13301

Figure 14. Terminal Box TM-210, mounting on Radio Receiver and Transmitter BC-659-(&).

APPENDIX

IGNITION SUPPRESSION

1. General

Excessive radio interference, caused by the ignition systems of Tank Recovery Vehicle T2, must be located and eliminated. Technical Manuals issued with the vehicles give complete discussions of the suppression systems used by the vehicles. Procedure for locating and eliminating ignition noises is given below.

2. Procedure

a. Turn the radio receiver on and set the sensitivity control at maximum. Then start the vehicle motor and tune the receiver slowly over the entire range of frequencies. If heavy atmospheric static is present, tune over frequencies that have noise levels low enough to allow *vehicle* noises to be easily detected. Do not reduce the volume unlesss necessary.

b. When interference is heard at any frequency, leave the receiver at that frequency and turn off the vehicle ignition switch. Noise that ceases immediately is caused by ignition; that which lingers is caused by the voltage regulator or by the generator. Auxiliary equipment, such as oil, fuel, and temperature gauges, fans, turret-traversing motors, and others, should be turned on and off, or disconnected individually until the one causing interference is located.

c. With a probe antenna (fig. 6) connected to the antenna and ground terminals of the radio receiver, listen for noise in the receiver as the loop of the probe antenna is moved slowly over the vehicle's electrical system. The antenna should be held close to, but not in contact with, the part of the vehicle being examined. Receiver volume control should be set at maximum for this operation.

d. Noise traced to an electrical unit may often be eliminated by improving the grounding of the case of the unit. Clean the surfaces under the case and under all bonding straps. Tighten the mounting bolts and clean and tighten all wiring connections. If interference is still present, check the suppression system components, substituting new components of the *same type* where necessary.

TM 11-2704

WAR DEPARTMENT TECHNICAL MANUAL

INSTALLATION OF RADIO AND INTERPHONE EQUIPMENT IN MEDIUM TANK M4 SERIES

WAR DEPARTMENT • *20 APRIL 1944*

TM 11-2704

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TM 11-2704

INSTALLATION OF RADIO

AND INTERPHONE EQUIPMENT

IN MEDIUM TANK M4 SERIES

WAR DEPARTMENT • 20 APRIL 1944

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WASHINGTON 25, D. C., 20 April 1944.

TM 11–2704, Installation of Radio and Interphone Equipment in Medium Tank M4 Series, is published for the information and guidance of all concerned.

[A. G. 300.7 (14 Mar 44).]

BY ORDER OF THE SECRETARY OF WAR:

G. C. MARSHALL,
Chief of Staff.

OFFICIAL:

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

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IC 11: T/O & E 11–107, Sig Dep Co; 11–127, Sig Rep Co; 11–327, Sig Port Sv Co.

IC 17: T/O & E 17–14, Maint Co, Armd Regt; 17–26, Hq Hq Co Tk Bn; 17–27, Medium Tk Co, Armd Regt; 17–46S, Hq Hq Co Medium Tk Bn Sp; 17–47S, Medium Tk Co, Medium Tk Bn Sp.

For explanation of symbols see FM 21–6.

CONTENTS

INSTRUCTION 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, or other heavy tools.

2. Cut—Use axes, handaxes, or machetes.
3. Burn—Use gasoline, kerosene, oil, flame throwers, or incendiary grenades.
4. Explosives—Use firearms, grenades, or TNT.
5. Disposal—Bury in slit trenches, fox holes, or 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 the 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. Burn 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. Make no adjustments inside the equipment with the power switch on. Do not operate the equipment with the shields removed. 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 procedures, based upon actual field experience, for installation of radio and interphone equipment in Medium Tank M4 series. Items required to make a complete operating installation are listed for each radio set and interphone equipment.

2. Equipment.

Installations covered include the following radio sets:

SCR–508–(&) SCR–528–(&) SCR–538–(&)

3. Symbol (&).

The symbol (&), used throughout this manual, refers to all existing 24-volt models of radio sets and interphone equipment mentioned, and to all models of other items of equipment with which it appears.

4. Holes and Brackets.

Holes and brackets required for installations of the radio sets or interphone equipment normally are located prior to delivery of Medium Tank M4 series. Drilling instructions will be given in the pertinent section of this manual for any other necessary holes and brackets. Holes and brackets in the vehicle or on any radio or interphone part should not be relocated unless absolutely necessary.

5. Before Beginning Installation.

Illustrations, installation methods, and any subsequent changes to this manual must be studied carefully before an installation is made.

CAUTION: Medium Tank M4 series has a 24-volt electrical system. Before installing any radio set or interphone equipment covered in this manual, be sure that it is designed for a 24-volt installation, and that 24-volt dynamotors have been supplied.

6. Immediately After Installation.

At the completion of the installation, a thorough operating check must be made to determine that the equipment has been properly installed and is in working order.

CAUTION: Do not operate any of the radio or interphone equipment until the instruction book or Technical Manual covering the specific radio set or interphone equipment has been studied carefully. Otherwise, damage to the equipment may result.

SECTION II

RADIO SET SCR-508-(&)

7. Required Parts.

Items necessary for installation of Radio Set SCR–508–(&) in Medium Tank M4 series are listed below.

Quantity	Stock No.	Item
1	2A262	Antenna A–62 (Phantom).
1 [a]	3E1307A–5.5	Cord CD–307–A, 65 ins. long, for Headset HS–30–(&).
1 [a]	3E1604	Cord CD–604, 6 ins. long, for Headset HS–30–(&).
1	2Z2651–423	Clamp MC–423, for securing Mast Sections MS–51 and MS–52.
1	2Z2651–424	Clamp MC–424, for securing Mast Sections MS–52 and MS–53.
1	6Z3147	Connector No. 61007 and Bondnut BL–50, Appleton Electric Co.
1	2Z3400–108	Cover BG–108, for Mast Base MP–48.
2 [b]	3H1636(&)	Dynamotor DM–36–(&), 24 volt, including attached spare parts.
1 [b]	3H1637(&)	Dynamotor DM–37–(&), 24 volt, including attached spare parts.
1	6L50–508V8	Hardware bag.
1 [a]	2B830(&)	Headset HS–30–(&).
1	2A2088–48	Mast Base MP–48, or Mast Base MP–48–A.
1	2A2351	Mast Section MS–51.
1	2A2352	Mast Section MS–52.
1	2A2353	Mast Section MS–53.
1 [c]	2B1617(&)	Microphone T–17–(&).
1	2Z6721–237(&)	Mounting FT–237–(&), including Cord CO–278 to car terminal box, necessary mounting bolts, locknuts, etc.
2	2C4403(&)	Radio Receiver BC–603–(&), including one set of tubes installed.
1	2C6494(&)	Radio Transmitter BC–604–(&), including one set of tubes installed and necessary crystals.
1	2Z8056(&)	Roll BG–56–A, for antenna mast sections.
5 [d] ft	1B128	Wire, W–128.

[a] Headset HS–18 may be substituted for Headset HS–30–(&) and Cord CD–604.
[b] Dynamotor DM–36–(&) and Dynamotor DM–37–(&) may already be installed in Radio Receivers BC–603–(&) and Radio Transmitter BC–604–(&) respectively.
[c] Microphone T–30–(&) and Cord CD–318 may be substituted for Microphone T–17–(&).
[d] Not less than 8 feet nor more than 10 feet of coaxial cable may be substituted for Wire W–128. For preparation of coaxial cable see figures 10 and 11.

8. Assembly and Installation.

a. Components of the radio set should be installed as follows (refer to figs. 5, 6, and 8 for bracket details):

Part and location	*Method and materials*
Mounting FT–237–(&), including Cord CO–278, on bracket turret bulge.	Mount as shown in figure 1. Secure with hardware provided.
Mast Base MP–48, on mast base well, left rear of turret bulge (for Mast Base MP–48–A, see fig. 12).	For this installation, Wire W–128, *internal,* may be used. Cut the wire to proper length and strip one-half inch of insulation from one end.

Part and location	*Method and materials*
	Clean and tin this end and solder tip, item 6B, to it as shown in figure 2. Loosen set screws 8 and 9. Remove assembly 7 and install wire inside mast base through hollow stem, item 1, inserting the metallic tip in the slot as far as possible. Tighten setscrews 8 and 9. Then refer to figure 2, remove items 2, 3, 4, and 5 from mast base, and install mast base through hole in mast base well, as follows: Place item 1 through hole in well, and item 2 over item 1. Tighten in place with item 3. Place item 4 over item 1 and tighten firmly with item 5. Now slip insulator 6C, rubber gasket 6D, and insulator 6E over wire W–128, and install inside hollow stem, item 1. Follow up with gasket, item 17, and retaining collar, item 18. Leave sufficient slack inside the stem to permit flexing of mast base.
Dynamotors DM–36–(&), in cabinets of Radio Receivers BC–603–(&).	If the dynamotors are not already installed, loosen screw lock in rear center of receiver cabinet, remove the chassis, and bolt the dynamotor unit on top rear of the chassis.
Dynamotor DM–37–(&), in cabinet of Radio Transmitter BC–604–(&).	If the dynamotor is not already installed, loosen two screw locks on front panel of transmitter cabinet and pull out crystal case. Loosen four screw locks holding cover on top of transmitter and remove cover. Bolt dynamotor unit in left rear of transmitter chassis.
Radio Transmitter BC–604–(&), including necessary crystals, on Mounting FT–237–(&).	Mount as shown in figure 1. Secure with screw locks.
Radio Receivers BC–603–(&), on Mounting FT–237–(&).	Mount as shown in figure 1. Secure with screw locks.
Connector No. 61007 and Bondnut BL–50.	Install through knock-out hole in terminal box to secure Cord CO–278.
Cover BG–108.	Place over Mast Base MP–48 when equipment is not in use.
Headset HS–30–(&).	Use Cords CD–604 and CD–307–A to connect headset to jack in Radio Receiver BC–603–(&).
Microphone T–17–(&).	Plug cord into microphone jack of Radio Transmitter BC–604–(&).
Mast Sections MS–51, MS–52, and MS–53, on Mast Base MP–48.	Screw mast sections together and secure with Clamps MC–423 and MC–424. Mount on mast base and secure Mast Section MS–53 as shown in figure 11. Carry mast sections in Roll BG–56 or BG–56–A when not in use.
Roll BG–56–A.	Disposition left to discretion of using arms.

b. CORDING AND WIRING. Cord and wire Radio Set SCR–508–(&) as shown on figures 3 and 4. Leave sufficient slack in all cording and wiring at Mounting FT–237–(&) to permit free motion of the shock mountings. To prevent accidental shorts on the battery, complete *all* other connections *before* installing Cord CO–278 connecting Mounting FT–237–(&) and the battery terminal strip in the turret terminal box.

SECTION III

RADIO SET SCR-528-(&)

9. Required Parts.

Items necessary for installation of Radio Set SCR–528–(&) in Medium Tank M4 series are listed below.

Quantity	Stock No.	Item
1	2A262	Antenna A–62 (Phantom).
1 [a]	3E1307A–5.5	Cord CD–307–A, 65 in. long, for Headset HS–30–(&).
1 [a]	3E1604	Cord CD–604, 6 in. long, for Headset HS–30–(&).
1	2Z2651–423	Clamp MC–423, for securing Mast Sections MS–51 and MS–52.
1	2Z2651–424	Clamp MC–424, for securing Mast Sections MS–52 and MS–53.
1	6Z3147	Connector No. 61007 and Bondnut BL–50, Appleton Electric Co.
1	2Z3400–108	Cover BG–108, for Mast Base MP–48.
1 [b]	3H1636(&)	Dynamotor DM–36–(&), 24 volt, including attached spare parts.
1 [b]	3H1637(&)	Dynamotor DM–37–(&), 24 volt, including attached spare parts.
1	6L60–528V8	Hardware bag.
1 [a]	2B830(&)	Headset HS–30–(&).
1	2A2088–48	Mast Base MP–48 or MP–48–A.
1	2A2351	Mast Section MS–51.
1	2A2352	Mast Section MS–52.
1	2A2353	Mast Section MS–53.
1 [c]	2B1617(&)	Microphone T–17–(&).
1	2Z6721–237(&)	Mounting FT–237–(&), including Cord CO–278 to car terminal box, necessary mounting bolts, locknuts, etc.
1	2C4403(&)	Radio Receiver BC–603–(&), including one set of tubes installed and necessary crystals.
1	2C6494(&)	Radio Transmitter BC–604–(8), including one set of tubes installed and necessary crystals.
1	2Z8056(&)	Roll BG–56–A, for antenna mast sections.
5 [d] ft	1B128	Wire W–128.

[a] Headset HS–18 may be substituted for Headset HS–30–(&) and Cord CD–604.
[b] Dynamotors DM–36–(&) and DM–37–(&) may already be installed in Radio Receiver BC–603–(&) and Radio Transmitter BC–604–(&) respectively.
[c] Microphone T–30–(&) and Cord CD–318 may be substituted for Microphone T–17–(&).
[d] Not less than 8 feet nor more than 10 feet of coaxial cable may be substituted for Wire W–128. For preparation of coaxial cable see figures 10 and 11.

10. Assembly and installation.

a. Components of the radio set should be installed as follows (refer to figs. 5, 6, and 8 for bracket details):

Part and location	*Method and materials*
Mounting FT–237–(&), including Cord CO–278, on bracket inside turret.	Mount as shown in figure 1. Secure mounting with hardware provided.
Mast Base MP–48, on mast base well, left rear of turret bulge. (for Mast Base MP–48–A, see fig. 12.)	For this installation, Wire W–128, *internal,* may be used. Cut the wire to proper length and strip one-half inch of insulation from one end.

Part and location	*Method and materials*
	Clean and tin this end and solder tip, item 6B, to it as shown in figure 2. Loosen setscrews 8 and 9. Remove assembly 7 and install wire inside mast base, through hollow stem, item 1, inserting the metallic tip in the slot as far as possible. Tighten setscrews 8 and 9. Then refer to figure 2, remove items 2, 3, 4, and 5 from mast base, and install mast base through hole in mast base well, as follows: Place item 1 through hole in well, and item 2 over item 1. Tighten in place with item 3. Place item 4 over item 1 and tighten firmly with item 5. Now slip insulator 6C, rubber gasket 6D, and insulator 6E over Wire W–128, and install inside hollow stem, item 1. Follow up with gasket item 17, and retaining collar, item 18. Leave sufficient slack inside the stem to permit flexing of the mast base.
Dynamotor DM–36–(&), in cabinet of Radio Receiver BC–603–(&).	If the dynamotor is not already installed, loosen screw lock in rear center of receiver cabinet, remove the chassis, and bolt dynamotor unit on top rear of receiver chassis.
Dynamotor DM–37–(&), in cabinet of Radio Transmitter BC–604–(&).	If the dynamotor is not already installed, loosen two screw locks on front panel of transmitter cabinet and pull out crystal case. Loosen four screw locks holding cover on top of transmitter and remove cover. Bolt dynamotor unit in left rear of transmitter chassis.
Radio Transmitter BC–604–(&), including necessary crystals, on Mounting FT–237–(&).	Mount as shown in figure 1. Secure with screw locks.
Radio Receiver BC–603–(&), on Mounting FT–237–(&).	Mount as shown in figure 1. Secure with screw locks.
Connector No. 61007 and Bondnut BL–50.	Install through knock-out hole in turret terminal box to secure Cord CO–278.
Cover BG–108.	Place over Mast Base MP–48 when equipment is not in use.
Headset HS–30–(&).	Use Cords CD–604 and CD–307–A to connect headset to jack in Radio Receiver BC–603–(&).
Microphone T–17–(&).	Plug cord into microphone jack of Radio Transmitter BC–604–(&).
Mast Sections MS–51, MS–52, MS–53, on Mast Base MP–48.	Screw mast sections together and secure with Clamps MC–423 and MC–424. Mount on mast base and secure Mast Section MS–53 as shown in figure 11. Carry mast sections in Roll BG–56 or BG–56–A when not in use.
Roll BG–56–A.	Disposition left to discretion of using arms.

b. CORDING AND WIRING. Cord and wire Radio Set SCR–528–(&) as shown on figures 3 and 4. Leave sufficient slack in all cording and wiring at Mounting FT–237–(&) to permit free motion of the shock mountings. To prevent accidental shorts on the battery, complete *all* other connections *before* installing Cord CO–278 connecting Mounting FT–237–(&) and the battery terminal strip in the turret terminal box.

SECTION IV

RADIO SET SCR-538-(&)

11. Required Parts.

Items necessary for installation of Radio Set SCR–538–(&) in Medium Tank M4 Series are listed below.

Quantity	Stock No.	Item
1	2A262	Antenna A–62 (Phantom).
1 [a]	3E1307A–5.5	Cord CD–307–A, 65 in. long, for Headset HS–30–(&).
1 [a]	3E1604	Cord CD–604–(&), 6 in. long, for Headset HS–30–(&).
1	2Z2651–423	Clamp MC–423 for securing Mast Sections MS–51 and MS–52.
1	2Z2651–424	Clamp MC–424 for securing Mast Sections MS–52 and MS–53.
1	6Z3147	Connector No. 61007 and Bondnut BL–50, Appleton Electric Co.
1	2Z3400–108	Cover BG–108, for Mast Base MP–48.
1 [b]	3H1636(&)	Dynamotor DM–36–(&), 24 volt, including attached spare parts.
1	6L50–538V8	Hardware bag.
1 [a]	2B830(&)	Headset HS–30–(&).
1	2A2088–48	Mast Base MP–48, or MP–48–A.
1	2A2351	Mast Section MS–51.
1	2A2352	Mast Section MS–52.
1	2A2353	Mast Section MS–53.
1	2Z6721–237(&)	Mounting FT–237–(&), including Cord CO–278 to car terminal box, necessary mounting bolts, locknuts, etc.
1	2C4403(&)	Radio Receiver BC–603–(&), including one set of tubes installed.
1	2Z8056(&)	Roll BG–56–A, for antenna mast sections.
5 [c] ft	1B128	Wire W–128.

[a] Headset HS–18 may be substituted for Headset HS–30–(&) and Cord CD–604.
[b] Dynamotor DM–36–(&) may already be installed in Radio Receiver BC–603–(&).
[c] Not less than 8 feet nor more than 10 feet of coaxial cable may be substituted for Wire W–128. For preparation of coaxial cable see figures 10 and 11.

12. Assembly and Installation.

a. Components of the radio set should be installed as follows (refer to figs. 5, 6, and 8 for bracket details):

Part and location	*Method and materials*
Mounting FT–237–(&), including Cord CO–278, on bracket inside turret.	Mount as shown in figure 1. Secure with screw locks.
Mast Base MP–48, on mast base well, left rear of turret bulge. (For Mast Base MP–48–A, see fig. 12.)	For this installation, Wire W–128, *internal,* may be used. Cut the wire to proper length and strip one-half inch of insulation from one end. Clean and tin this end and solder tip, item 6B, to it as shown in figure 2. Loosen set-screws 8 and 9. Remove assembly 7 and install wire inside mast base through hollow

Part and location	*Method and materials*
	stem, item 1, inserting the metallic tip in the slot as far as possible. Tighten setscrews 8 and 9. Then refer to figure 2, remove items 2, 3, 4, and 5 from the mast base, and install mast base through hole in mast base well, as follows: Place item 1 through hole in well, and item 2 over item 1. Tighten in place with item 3. Place item 4 over item 1 and tighten firmly with item 5. Now slip insulator 6C, rubber gasket 6D, and insulator 6E over Wire W–128, and install inside hollow stem, item 1. Follow up with gasket, item 17, and retaining collar, item 18. Leave sufficient slack inside the stem to permit flexing of the mast base.
Dynamotor DM–36–(&), in cabinet of Radio Receiver BC–603–(&).	If the dynamotor is not already installed, loosen screw lock in rear center of receiver cabinet, remove chassis, and bolt dynamotor unit on top rear of chassis.
Radio Receiver BC–603–(&), on Mounting FT–237–(&).	Mount as shown in figure 1. Secure with screw locks.
Connector No. 61007 and Bondnut BL–50.	Install through knock-out hole in turret terminal box to secure Cord CO–278.
Cover BG–108.	Place over Mast Base MP–48 when equipment is not in use.
Headset HS–30–(&).	Use Cords CD–604 and CD–307–A to connect headset to jack in Radio Receiver BC–603–(&).
Mast Sections MS–51, MS–52, and MS–53, on Mast Base MP–48.	Screw mast sections together and secure with Clamps MC–423 and MC–424. Mount on mast base and secure as shown in figure 11. Carry mast sections in Roll BG–56 or BG–56-A when not in use.
Roll BG–56–A.	Disposition left to discretion of using arms.

b. CORDING AND WIRING. Cord and wire Radio Set SCR–538–(&) as shown on figures 3 and 4. Leave sufficient slack in all cording and wiring at Mounting FT–237–(&) to permit free motion of the shock mountings. To prevent accidental shorts of the battery, complete *all* other connections *before* installing Cord CO–278 connecting Mounting FT–237–(&) and the battery terminal strip in the turret terminal box.

SECTION V

INTERPHONE EQUIPMENT ASSOCIATED WITH RADIO SETS SCR-508-(&), SCR-528-(&), AND SCR-538-(&)

13. Required Parts.

Items necessary for installation of Interphone Equipment in Medium Tank M4 series are listed below.

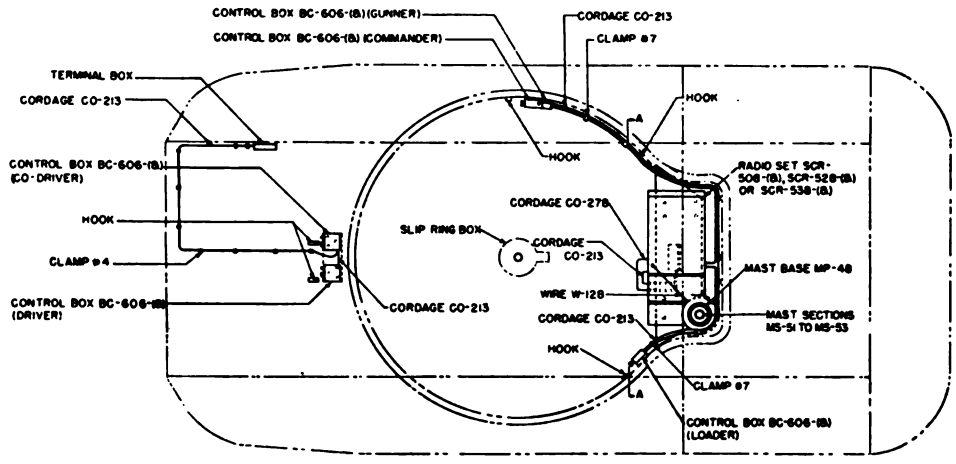
Quantity	Stock No.	Item
2	6Z3147	Connector No. 61007 and Bondnut BL-50, Appleton Electric Co., or equal.
5	2C1738(&)	Control Box BC-606-(&), including screws, clamps, etc.
4 [a]	3E1307A-5.5	Cord CD-307-A, 65 in. long, for Headset HS-30-(&).
5 [b]	3E1318(&)	Cord CD-318, control cord for Microphone T-30-(&).
4 [a]	3E1604	Cord CD-604, 6 in. long, for Headset HS-30-(&).
36 [c] ft	3E2213	Cordage CO-213, interconnecting cable.
1 [d]	3H1636(&)	Dynamotor DM-36-(&).
4 [a]	2B830(&)	Headset HS-30-(&).
1	6L50-508(528)(538)V8	Hardware Bag containing: 11 clamps No. 7.
1 [e]	2C1617(&)	Interphone Amplifier BC-605-(&).
5 [b]	2B1630(&)	Microphone T-30-(&).

[a] Headset HS-18 may be substituted for Headset HS-30-(&) and Cord CD-604.
[b] In emergencies, Microphone T-17-(&) may be substituted for Microphone T-30-(&) and Cord CD-318.
[c] Before cutting Cordage CO-213 and wiring a quantity of interphone equipment, make one check installation of the interphone equipment in Medium Tank M4. Any variation found in lengths of Cordage CO-213 shown on figure 4 connecting the various Interphone Control Boxes BC-606-(&) and Mounting FT-237-(&) may be readily corrected.
[d] Dynamotor DM-36-(&) may already be installed in Interphone Amplifier BC-605-(&).
[e] Interphone Amplifier BC-605-(&) is used to provide speech amplification in Radio Set SCR-538-(&). However, it is not required in Radio Sets SCR-508-(&) and SCR-528-(&) where amplification is provided by the speech amplifier section of Radio Transmitter BC-604-(&).

14. Assembly and Installation.

The interphone equipment supplied for Radio Sets SCR-508-(&), SCR-528-(&), and SCR-538-(&) is not completely wired for installation. To interconnect interphone Control Boxes BC-606-(&) as shown on figures 1, 3, and 4, cut Cordage CO-213 to lengths shown on figure 4. At the end of each length, strip back 3½ inches of outer rubber and 2 inches of shielding. One and one-half inches of shielding will thus be exposed. Slit exposed shielding on opposite sides of the cable and pull back both strips. Slit and pull back one side of the shielding covering the red and green wires. Strip one-half inch of insulation from the black (ground) wire close to the end of the outer rubber cable covering. Neatly twist the three strips of shielding together, cut the twisted shielding to proper length, and connect and solder it to the exposed section of the black (ground) wire. Now insert the prepared cable through appropriate hole in Control Box BC-606-(&). Solder ends of wires to numbered studs and clamp the cable. Insert the prepared cable connecting to the radio set through hole on appropriate end of Mounting FT-237-(&) and wire and clamp to terminal board as described above. Follow the same procedure for preparing the cable for connecting Cordage CO-213 to hull terminal box and turret terminal box. Then install components of the interphone equipment as follows:

Part and location	*Method and materials*
Control Box BC–606–(&), for driver, on bracket, center front of hull.	Mount as shown in figure 1. Secure with hardware provided.
Control Box BC–606–(&), for co-driver, on bracket, center front of hull.	Mount as shown in figure 1. Secure with hardware provided.
Control Box BC–606–(&), for turret gunner, on wall in turret at right side of post.	Mount as shown in figure 1. Secure with hardware provided.
Control Box BC–606–(&), for turret leader, in turret, on wall to left of radio.	Mount as shown in figure 1. Secure with hardware provided.
Control Box BC–606–(&), for tank commander, on bracket, right side of turret, above gunner's interphone control box.	Mount as shown in figure 1. Secure with hardware provided.
Connector No. 61007 and Bondnut BL–50.	Install through knock-out hole in both the turret terminal box and hull terminal box to secure Cordage CO–213, as shown in figure 4.
Dynamotor DM–36–(&), in cabinet of Interphone Amplifier BC–605–(&).	If the dynamotor is not already installed, loosen screw lock in rear center of cabinet and remove chassis. Bolt dynamotor unit on top rear of receiver chassis.
Interphone Amplifier BC–605–(&), on Mounting FT–237–(&).	Mount as shown in figure 1. Secure with screw locks.
Headset HS–30–(&).	Use Cords CD–604 and CD–307–A to connect headsets to jacks of Control Boxes BC–606–(&).
Microphone T–30–(&).	To be strapped comfortably around throat above the larynx.
Cordage CO–213, for interconnecting interphone components.	After mounting and interconnecting control boxes as shown in figure 3, secure cable along walls and hull of tank with clamps, screws, etc., as shown in figure 1. (Refer to fig. 7 for wiring diagram of slip rings and terminal boxes.)



PLAN VIEW

HARDWARE REQUIRED

MOUNTING FT-237-(S):
- 8-5/16"-24 X 3/4" LONG HEX. HEAD MACH. SCREWS
- 8-5/16"- LOCKWASHERS.

CONTROL BOXES BC-606-(S):
- 12-#8-32 X 3/8" LONG ROUND HEAD MACH. SCREWS
- 12-#8 LOCKWASHERS.

HOOKS (5 REQ):
- 10-#8-32 X 3/8" LONG ROUND HEAD MACH. SCREWS
- 10-#8 LOCKWASHERS.

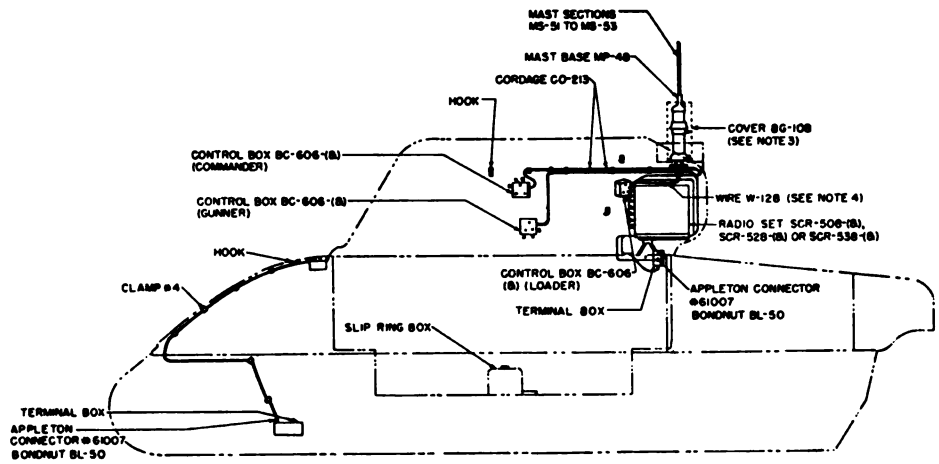
CLAMPS:

CLAMP #4 (II REQ):
- 11-#8-32 X 3/8" LONG ROUND HEAD MACH. SCREWS
- 11-#8 LOCKWASHERS.

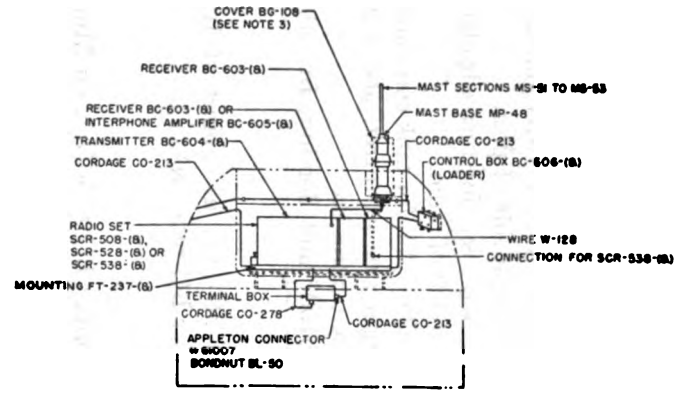
CLAMP #7 (II REQ):
- 11-#8-32 X 3/8" LONG ROUND HEAD MACH. SCREWS
- 11-#8 LOCKWASHERS.

ALL SCREWS AND LOCKWASHERS SHALL BE STEEL, ELECTRO-GALVANIZED.

NOTES:
1. FOR WIRING DIAGRAM SEE FIG. 3.
2. FOR CORDING DIAGRAM SEE FIG. 4.
3. USE COVER BG-108 WHEN MAST SECTIONS ARE NOT INSTALLED.
4. AFTER CUT TO PROPER LENGTH, TIN ENDS, FOR CONNECTIONS.



ELEVATION



VIEW A-A

TL-10660
BASED ON SC-D-7024-F

Figure 1. Installation of Radio Set SCR-508-(&), SCR-528-(&), or SCR-538-(&), and associated interphone equipment in Medium Tank M4 series.

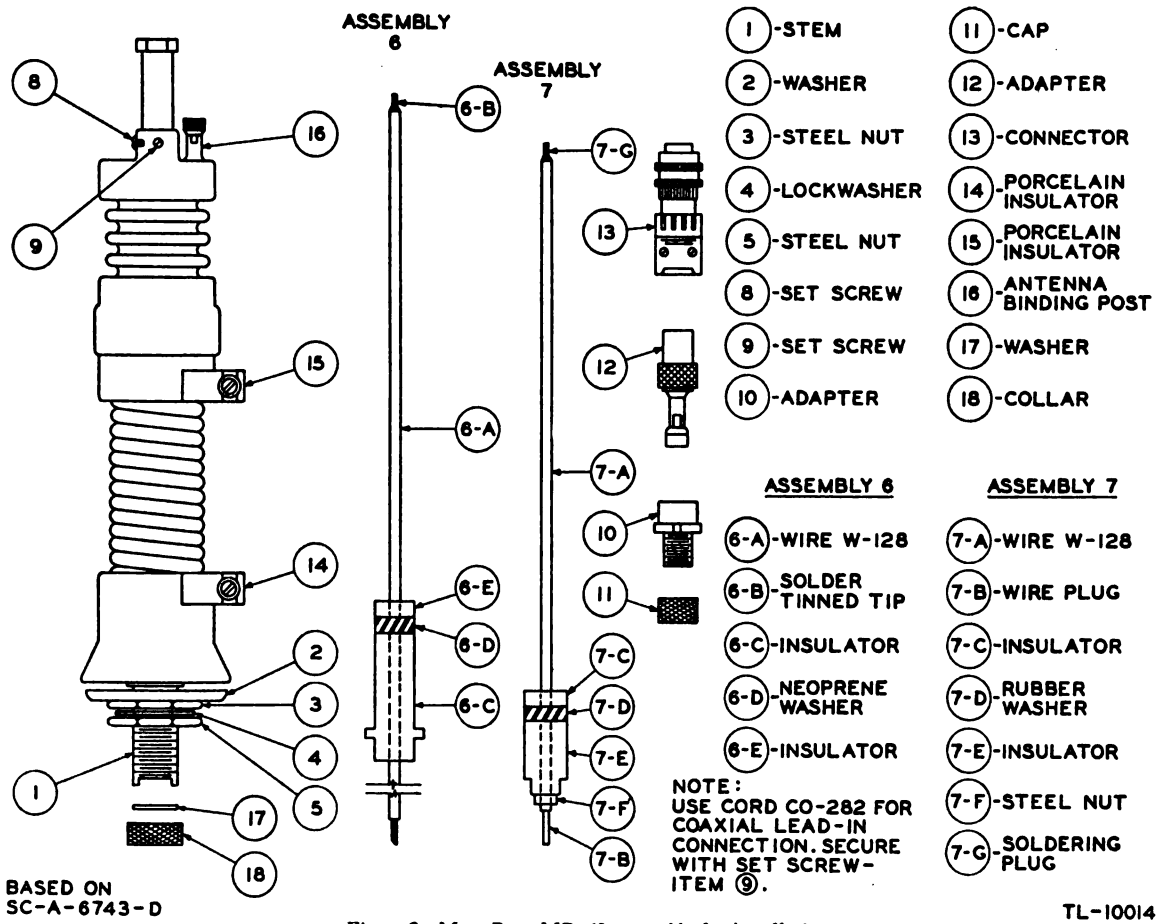


Figure 2. Mast Base MP-48, assembly for installation.

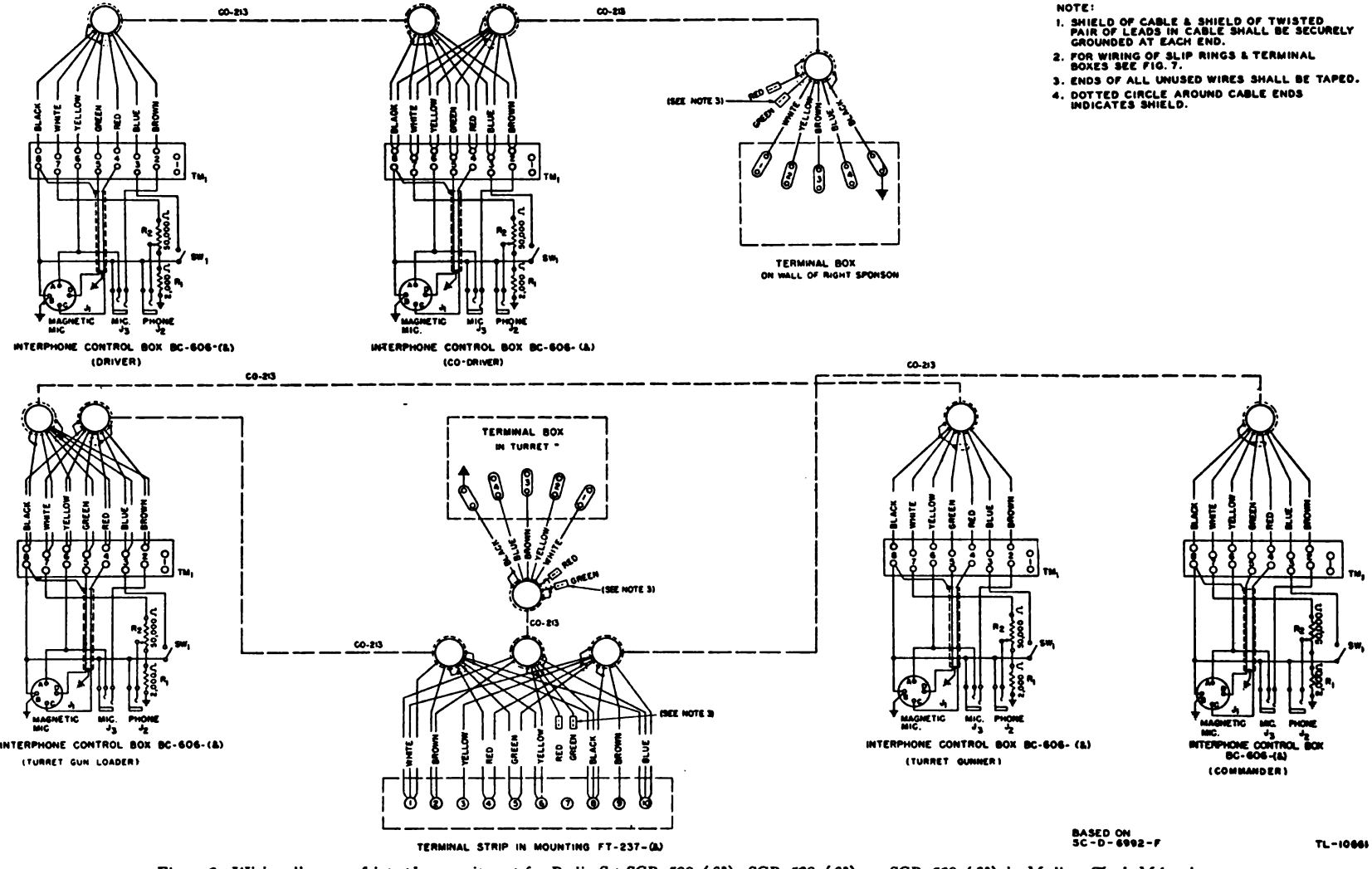


Figure 3. Wiring diagram of interphone equipment for Radio Set SCR-508-(&), SCR-528-(&), or SCR-538-(&) in Medium Tank M4 series.

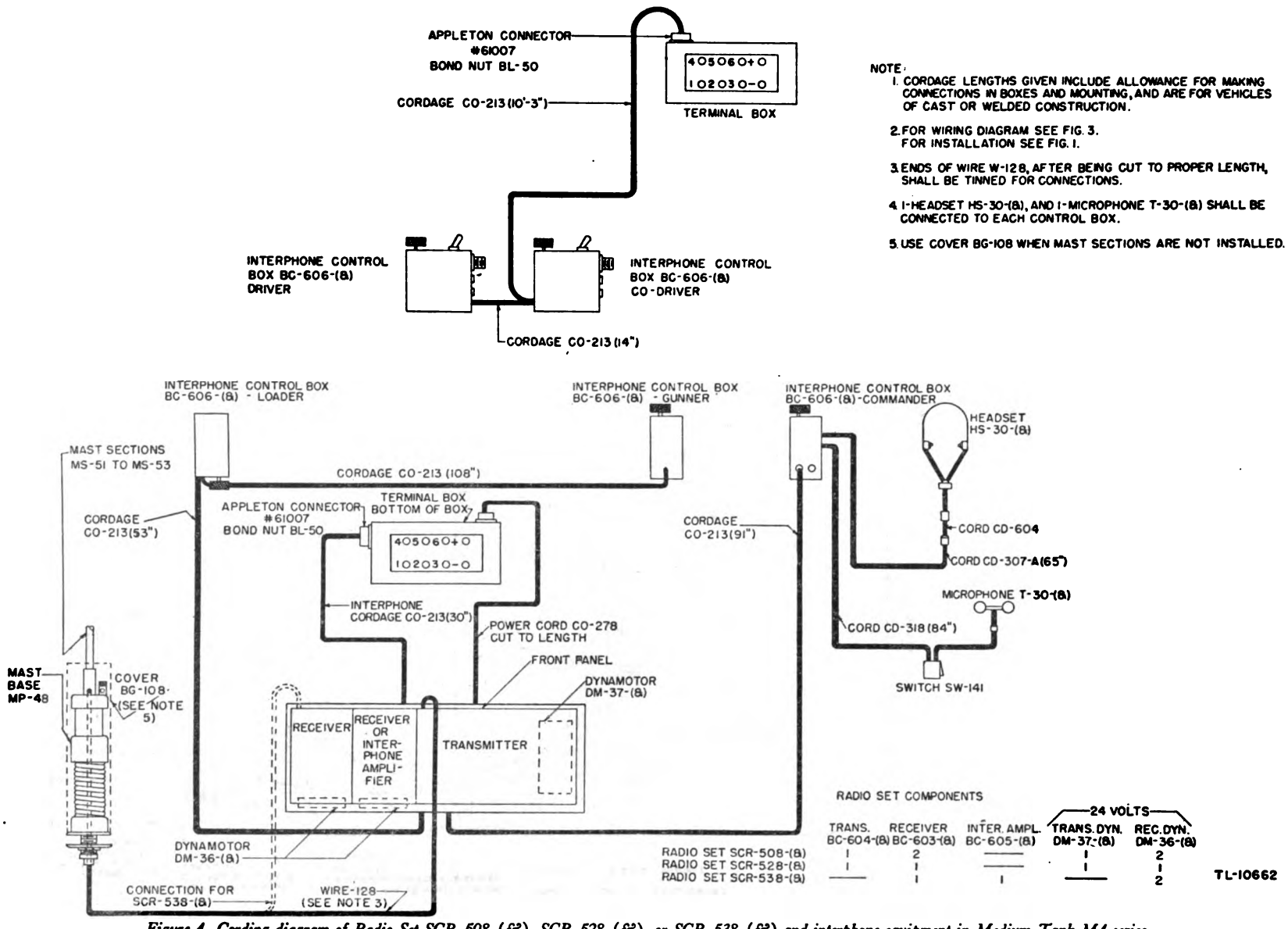


Figure 4. Cording diagram of Radio Set SCR-508-(&), SCR-528-(&), or SCR-538-(&) and interphone equipment in Medium Tank M4 series.

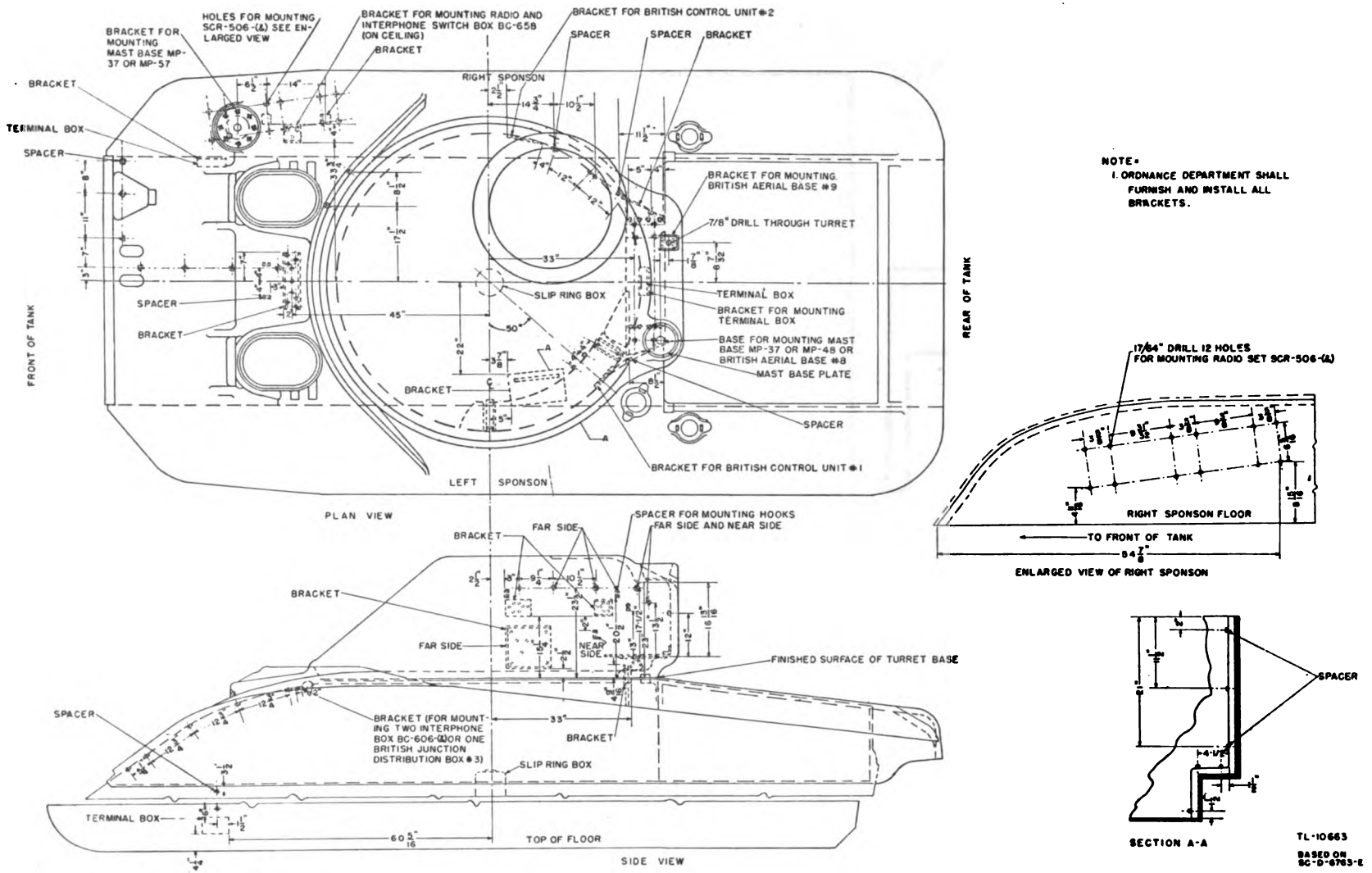
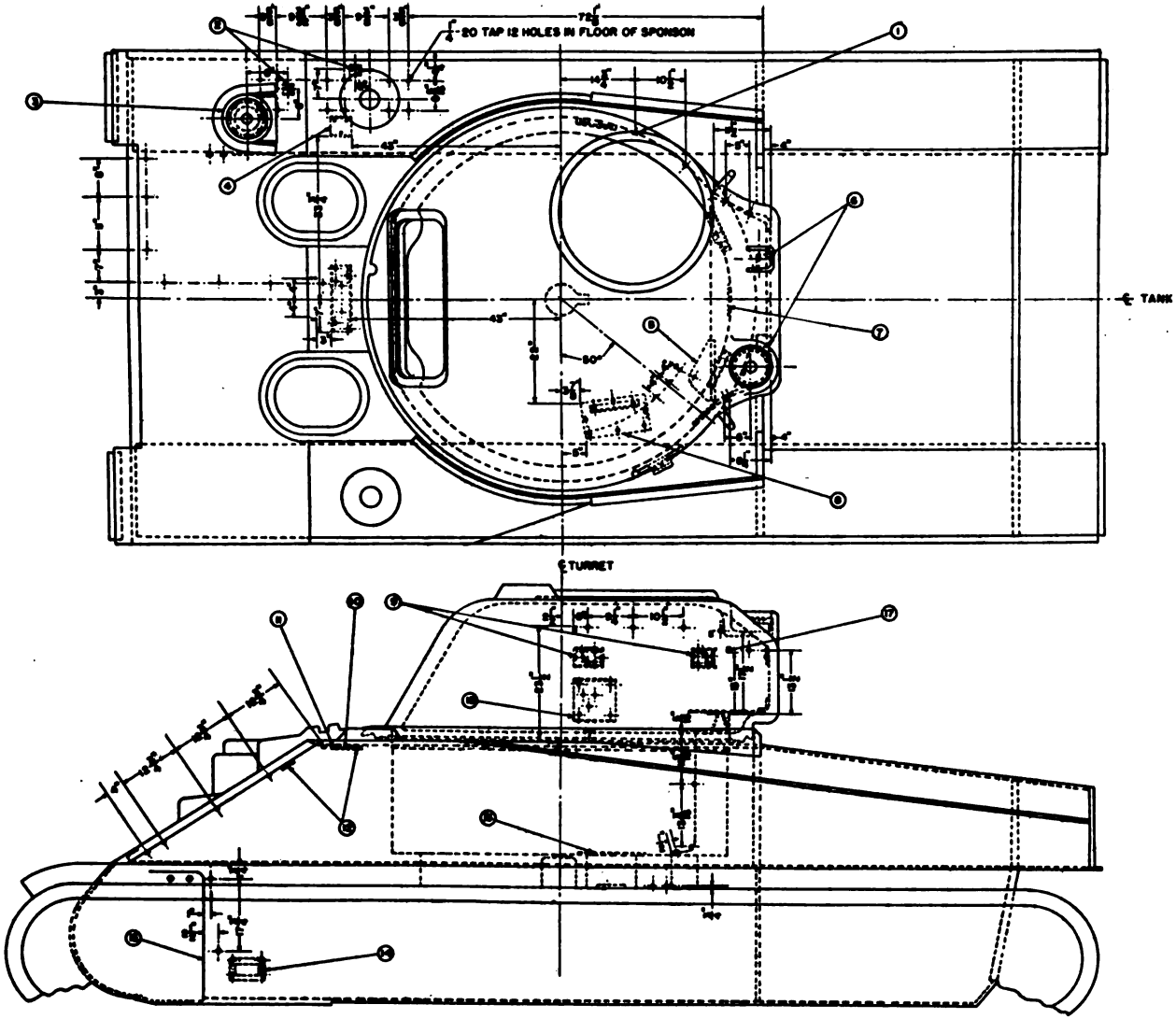


Figure 5. Installation of radio and interphone brackets in Medium Tank M4 series, cast hull construction.



NOTE:
ITEMS SHOWN BELOW ARE INSTALLED BY TANK MANUFACTURER.

ITEM NO.	NAME OF ITEM	NO. INSTALLED
①	SPACER	1
②	BRACKET	1
③	ANTENNA BASE	1
④	BRACKET	1
⑤	PLATE	1
⑥	BRACKET	1
⑦	PLATE	1
⑧	§BRACKET	1
⑨	BRACKET	2
⑩	BRACKET	1
⑪	BRACKET	1
⑫	BRACKET	1
⑬	EDGE OF DRIVE SHAFT HOUSING	
⑭	BRACKET	1
⑮	BRACKET	1
⑯	BRACKET	1
⑰	SPACER	1

§ THIS BRACKET MAY NOT BE INCLUDED IN SOME VEHICLES.

TL-10664
BASED ON SC-D-64825-I

Figure 6. Installation of radio and interphone brackets in Medium Tank M4 series, welded hull construction.

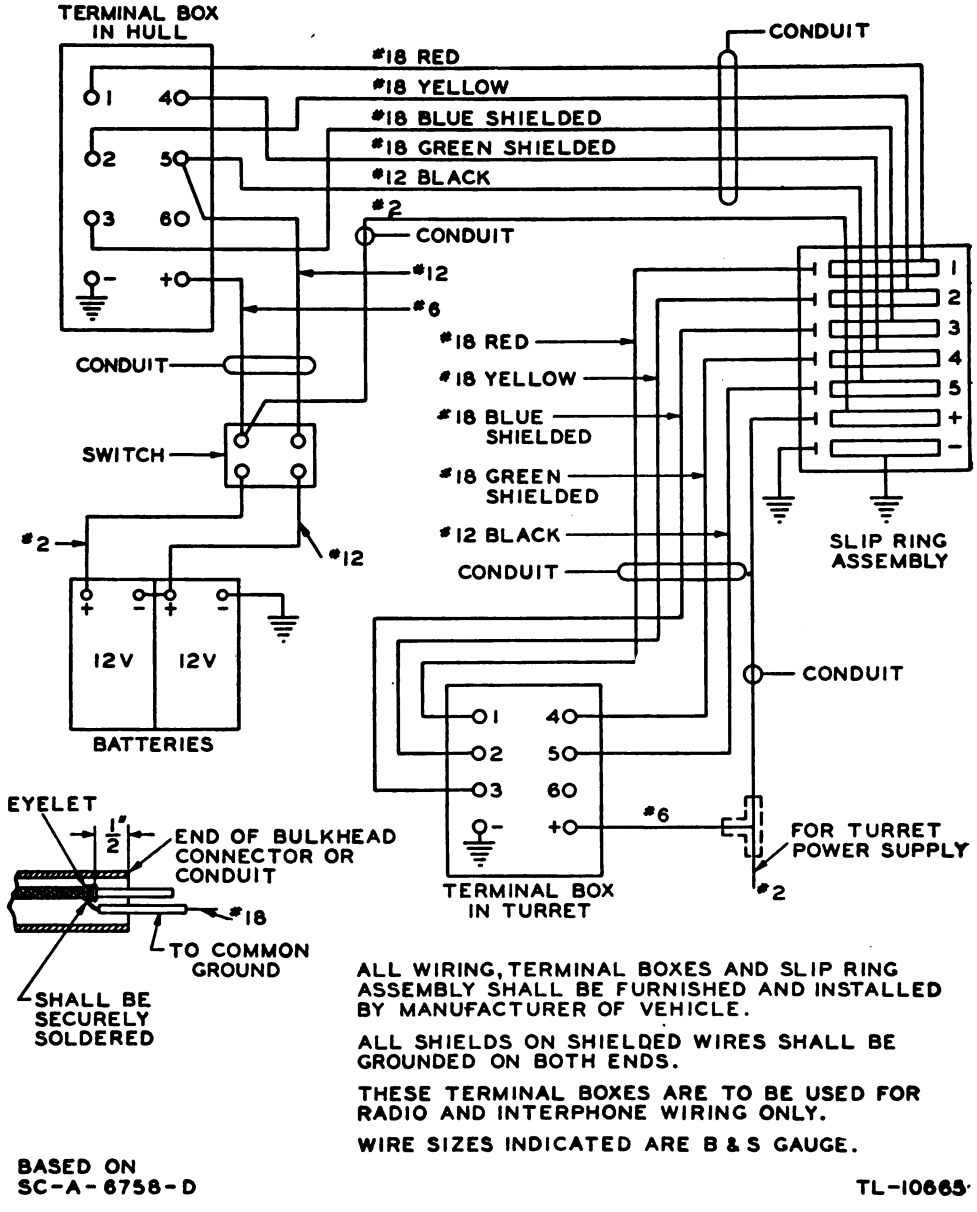


Figure 7. Wiring diagram of slip rings and terminal boxes in 24-volt tanks and armored cars.

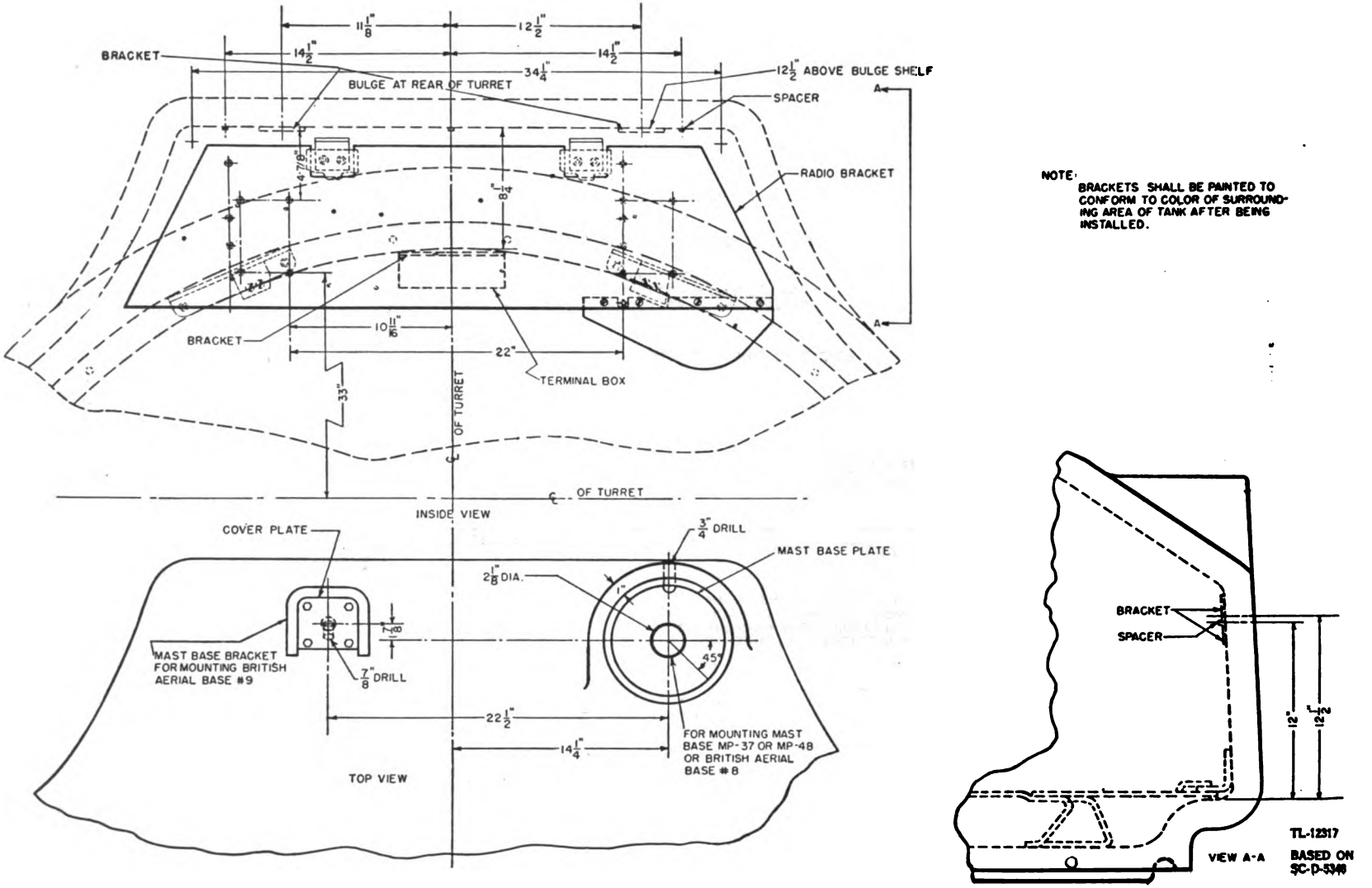


Figure 8. Installation and details of radio brackets in turret of Medium Tank M4 series.

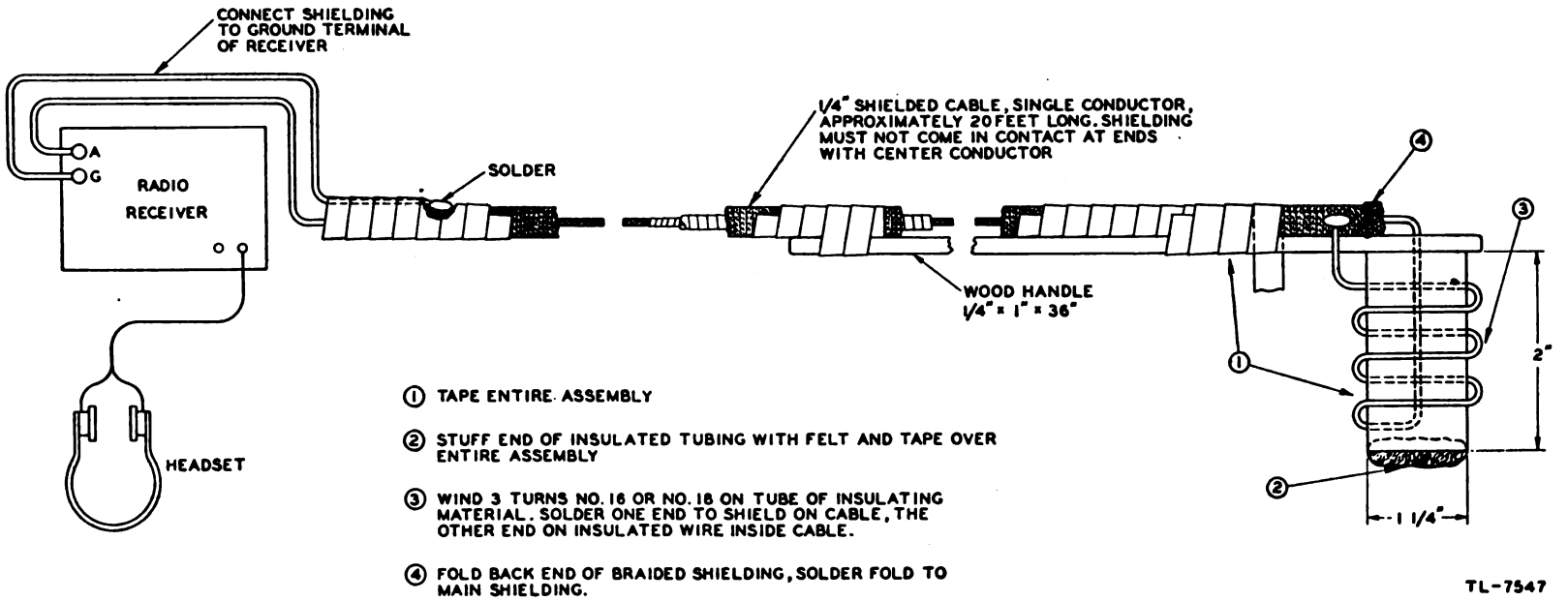


Figure 9. Probe antenna.

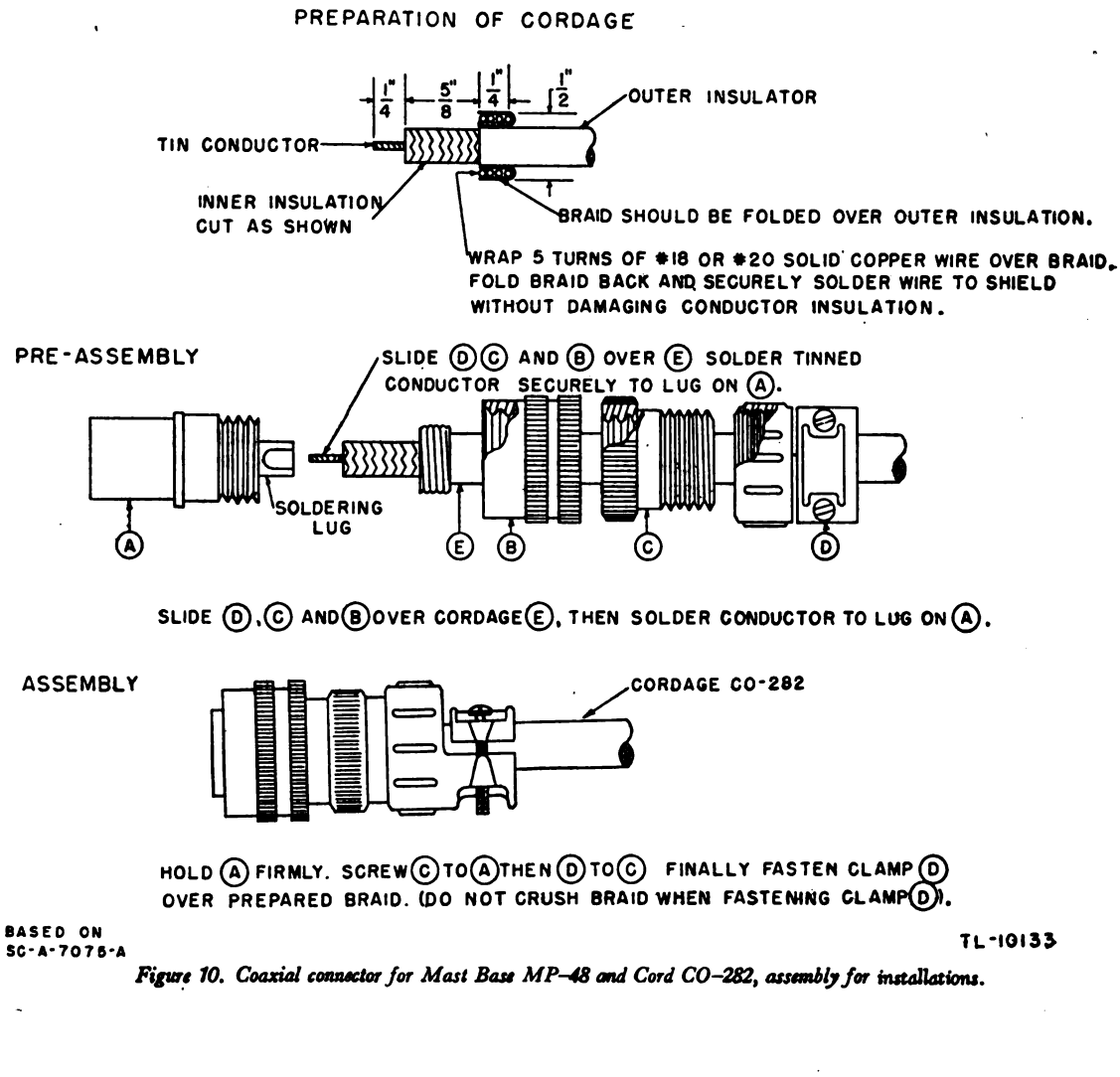


Figure 10. Coaxial connector for Mast Base MP-48 and Cord CO-282, assembly for installations.

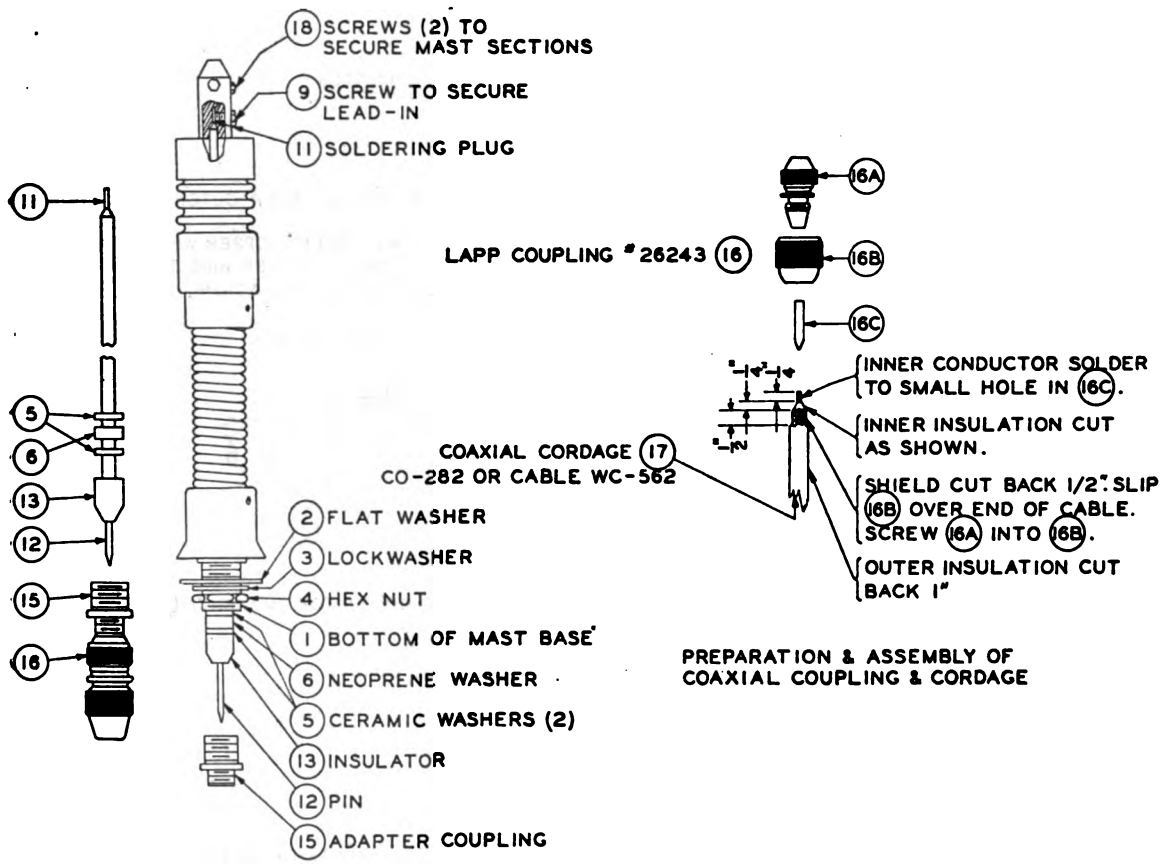


Figure 11. Mast Base MP–48–A, assembly with coaxial lead-in.

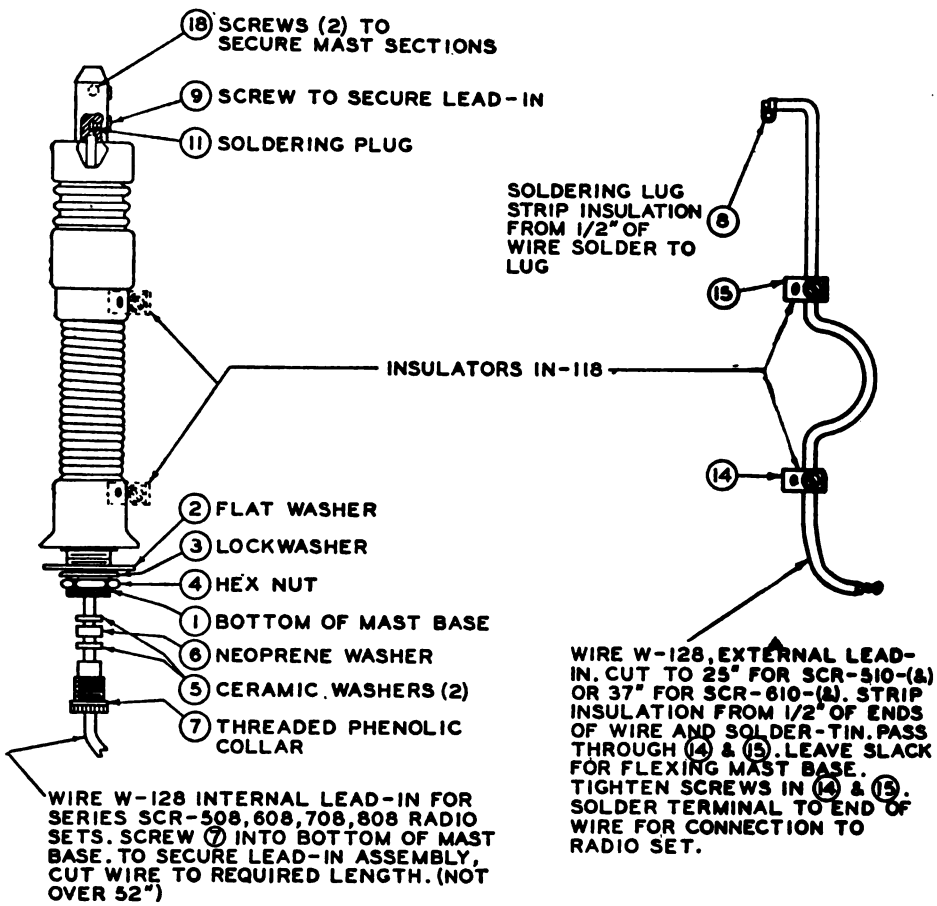


Figure 12. Mast Base MP-48-A, assembly with Wire W-128 lead-in.

APPENDIX

IGNITION NOISE SUPPRESSION IN MEDIUM TANK M4 SERIES

1. General.

Excessive ignition or other electrical noises may interfere with the operation of radio equipment in Medium Tank M4 series. The Technical Manual issued with the tank will be helpful in locating the source of noise since it describes the suppression systems used. Instructions for operating radio and interphone equipment used in Medium Tank M4 series should also be studied.

2. Procedure.

Locate and suppress ignition noise as follows:

a. Start the tank motor and turn on the radio receiver. Put the receiver sensitivity control at *maximum.* Then, listening to the receiver output with a handset, tune the receiver *slowly* 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 interference persists, 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 most easily from static, etc. Interference may then be identified as follows:

Interference	*Usual source*
Popping sound; corresponds to ignition firing; accelerates when engine is raced, stops when engine is turned off.	Ignition system.
Intermittent, clicking sound; lingers for several seconds when ignition is turned off.	Generator regulator.
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, heater fans, and, in vehicles with turrets, traversing motors and gyrostabilizers, can usually be identified by turning off the gauges, fans, or other suspected mechanisms, individually.

e. If the source of interference cannot be found by any of the preceding methods, connect a probe antenna (fig. 9) to the antenna terminal of the radio set. Move the loop of the probe antenna slowly over the various parts of the vehicle's electrical system. Keep the loop close to, but not in contact with, the part being examined. Interference-producing parts should be heard in the receiver.

f. Interference can generally be eliminated by cleaning, tightening, or replacing noise-producing parts. All suppressor and shielding components and all connections and grounding bonds should be examined, tightened, and the surfaces under them cleaned. This will assure good electrical contact between wires and terminals, and metal casings and the frame of the vehicles. (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, for opens, shorts, or other faults.

TM 11-2705

WAR DEPARTMENT TECHNICAL MANUAL

INSTALLATION OF RADIO AND INTERPHONE EQUIPMENT IN LIGHT TANK T9E1

WAR DEPARTMENT • *13 APRIL 1944*

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TM 11-2705

INSTALLATION OF RADIO AND INTERPHONE EQUIPMENT IN LIGHT TANK T9E1

WAR DEPARTMENT • 13 APRIL 1944

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WAR DEPARTMENT,
WASHINGTON 25, D. C., 13 April 1944.

TM 11–2705, Installation of Radio and Interphone Equipment in Light Tank T9E1, is published for the information and guidance of all concerned.

[A. G. 300.7 (13 Mar 44).]

BY ORDER OF THE SECRETARY OF WAR:

G. C. MARSHALL,
Chief of Staff.

OFFICIAL:

J. A. ULIO,
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The Adjutant General.

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IR 2: T/O 2–71, Cav Regt Mecz;
17: T/O 17–11, Armd Regt;
IBn 2: T/O 2–25, Rcn Sq Mecz;
9: T/O 9–65, Ord Maint Bn, Armd Div;
17: T/O 17–15, Light Tank Bn; 17–55, Airborne Tank Bn;
IC 2: T/O 2–28, Cav Assault Gun Tr, Mecz;
9: T/O 9–66, Hq and Hq Co, Ord Maint Bn, Armd; 9–67, Maint Co, Ord Maint Bn, Armd Div;
11: T/O 11–107, Sig Dep Co; 11–127, Sig Rep Co; 11–327, Sig Port Sv Co; 11–587, Sig Base Maint Co;
17: T/O 17–2, Hq Co, Armd Div; 17–14, Maint Co, Armd Regt; 17–17, Light Tank Co, Rcn; 17–19, Light Tank Sv Co; 17–22, Hq and Hq Co, Armd Gp; 17–57, Airborne Tank Co.

(For explanation of symbols see FM 21–6.)

CONTENTS

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, or other heavy tools.
2. Cut—use axes, handaxes, or machetes.
3. Burn—Use gasoline, kerosene, oil, flame throwers, or incendiary grenades.
4. Explosives—Use firearms, grenades, or TNT.
5. Disposal—Bury in slit trenches, fox holes, or 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 the 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. Make no adjustments inside the equipment with the power switch on. Do not operate the equipment with the shields removed. Do not connect power to any unit of this radio set until operating instructions have been read completely.

SECTION I

GUIDE TO USE OF THIS MANUAL

1. Purpose

This manual provides methods and procedures, based upon actual field experience, for installation of radio and interphone equipment in Light Tank T9E1. Items required to make a complete operating installation are listed for the radio set and the interphone equipment.

2. Equipment

Installations covered include Radio Set SCR–510–(&) and Interphone Equipment RC–99.

3. Symbol (&)

The symbol (&), used throughout this manual, refers to all existing 12-volt models of the radio set and interphone equipment mentioned, and to all models of other items of equipment with which it appears.

4. Holes and brackets

Holes and brackets required for installations of the radio set or interphone equipment normally are located prior to delivery of Light Tank T9E1. Drilling instructions will be given in the pertinent section of this manual for any other necessary holes and brackets. Holes and brackets in the vehicle or on any radio or interphone part should not be relocated unless absolutely necessary.

5. Before beginning installation

Illustrations, installation methods, and any subsequent changes to this manual must be studied carefully before an installation is made.

Caution.—Light Tank T9E1 has a 12-volt electrical system. Before installing the radio set or interphone equipment covered in this manual, be sure that it is designed for a 12-volt installation, or tubes will burn out.

6. Immediately after installation

At the completion of the installation, a thorough operating check must be made to determine if the equipment has been properly installed and is in working order.

Caution.—Do not operate any of the radio or interphone equipment until the instruction book or Technical Manual covering the specific radio set or interphone equipment has been studied carefully. Otherwise, damage to the equipment may result.

SECTION II

RADIO SET SCR-510-(&)

7. Required Parts

Items necessary for installation of Interphone Equipment RC-99 in Light Tank T9E1 are listed below.

Quantity	Stock No.	Item
1 [a]	6Q338-150	Alignment Tool TL-150 or TL-207.
1	3A41	Battery BA-41, for Radio Receiver and Transmitter BC-620-(&), internal use.
80	2Z3543.1	Crystal Holder FT-243, with crystal, two installed in receiver-transmitter.
1	6Z3147	Connector No. 61007 and Bondnut BL-50, Appleton Electric Co.
1	3E1509	Cord CD-509, for power supply connection.
1	3E1307A-5.5	Cord CD-307-A, 65 inches long, for Headset HS-30-(&).
1 [b]	3E1604	Cord CD-604, 6 inches long, for Headset HS-30-(&).
1	3E1318	Cord CD-318, for Microphone T-30-(&).
1	2Z3400-108	Cover BG-108, for Mast Base MP-48 or MP-48-A.
1	2Z2651-424	Clamp MC-424, for securing Mast Sections MS-52 and MS-53.
1 [b]	2B830(&)	Headset HS-30-(&).
1	3G601	Insulator IN-101.
1 [c]	2A2088-48	Mast Base MP-48.
1	2A2352	Mast Section MS-52.
1	2A2353	Mast Section MS-53.
1	2B1617(&)	Microphone T-17-(&).
1	2B1630(&)	Microphone T-30-(&).
1	2Z5725-475	Mounting (Installation Kit MC-475).
1	3H4297(&)	Power Unit PE-97-(&), including one set of tubes installed. (Power Unit PE-120 may be substituted for Power Unit PE-97.)
1	2C5360(&)	Radio Receiver and Transmitter BC-620-(&), including one set of tubes and two Crystal Holder FT-243 installed.
1	2Z8056A	Roll BG-56-A, for mast sections.
7 ft	1B128	Wire W-128. (Cordage CO-282 or Cable WC-562 may be substituted.)

[a] Alignment Tool TL-207 may be substituted for Alignment Tool TL-150.
[b] Headset HS-18 may be substituted for Headset HS-30-(&) and Cord CD-604.
[c] Mast Base MP-48-A may be substituted for Mast Base MP-48.

8. Assembly and Installation

a. **PROCEDURE.** Components of the radio set should be installed as follows:

Part and location	*Method and materials*
Mast Base MP-48, on bracket at rear of turret bulge. (See figs. 6 and 7 when Mast Base MP-48-A is substituted.)	Refer to figure 1. Remove assembly 7 by loosening setscrews 8 and 9. Install mast base on bracket as shown on figure 2. For coaxial connection see figure 5.

Part and location	*Method and materials*
Mounting (Installation Kit MC–475).	Secure in place (fig. 2) with hardware provided.
Battery BA–41, in battery container inside Radio Receiver and Transmitter BC–620–(&).	If the battery is not already installed, remove the 10 screws on outer edge of front panel of the radio receiver and transmitter case and pull out chassis. Remove cover of battery box on chassis near front panel and insert the battery into the box, engaging the plug in the battery socket. Make certain all tubes are firm in proper sockets. See that the two crystals for the desired operating frequencies are in their sockets and held securely by their retaining clips. Do *not* interchange these crystals. Place the two toggle switches near left edge of chassis in ON position. Then slide chassis back into case and replace screws.
Power Unit PE–97–(&), on bracket straps, underneath commander's seat in the turret.	Remove power unit from its case by removing the six screws from bottom of case. Use these six screws to fasten the two brackets to the power unit. Mount the unit, as shown in figure 2, by fastening to the four retainers welded to the floor.
Radio Receiver and Transmitter BC–620–(&), in mounting.	Install firmly in the mounting (fig. 2).
Microphone T–30–(&) and Headset HS–30–(&).	Plug the microphone and the headset into jacks of Control Box BC–739, a component of Interphone Equipment RC–99, as shown in figure 2. Use Cords CD–604 and CD–307–A with Headset HS–30–(&) and Cord CD–318 with Microphone T–30–(&).
Insulator IN–121 and rubber washer.	Place washer over insulator and insert insulator through hole in top of turret bulge as shown in figure 2.
Mast Sections MS–52 and MS–53, on Mast Base MP–48.	Screw sections together and, after clamping with Clamp MC–424, screw into mast base. Carry mast sections in Roll BG–56–A when not in use.
Cover BG–108.	Place over mast base when mast sections are not in use.
Connector No. 61007 and Bondnut BL–50, on terminal box.	Figure 2. If excess length must be removed from the power cord, resolder the terminal lugs to the leads.

b. **CORDING AND WIRING.** Cord and wire Radio Set SCR–510–(&) as shown in figure 2. Leave sufficient slack in all cording to permit free motion of all units having shock mountings. To prevent accidental shorts on the battery, complete *all* other connections *before* connecting the positive and negative leads in the car terminal box.

Caution.—*Do not reverse the positive and negative battery terminal connections,* or damage to the equipment will result.

SECTION III

INTERPHONE EQUIPMENT RC-99

9. Required Parts

Items necessary for installation of Radio Set SCR-510-(&) in Light Tank T9E1 are listed below.

Quantity	*Stock No.*	*Item*
4	6Z3147	Connector No. 61007 and Bondnut BL-50, Appleton Electric Co.
1	2C669-739	Control Box BC-739-(&), with mounting screws, lockwashers, hooks, etc.
2*	3E1307A-5.5	Cord CD-307-A, 65 inches long, for Headsets HS-30-(&).
2*	3E1604	Cord CD-604, 6 inches long, for Headsets HS-30-(&).
2	3E1318	Cord CD-318, for Microphones T-30-(&).
11 ft	3E2144	Cordage CO-144, for Control Box BC-739-(&).
11 ft	3E2145	Cordage CO-145, for Control Box BC-739-(&).
8 ft	3E2213	Cordage CO-213.
2*	2B830(&)	Headset HS-30-(&).
1	2C1738(&)	Interphone Control Box BC-606-(&).
1	2C1614	Interphone Amplifier BC-367
1	6L50-99V59	Hardware Bag containing: 1 hook. 4 lockwashers, ¼ inch standard, steel, zinc plated. 4 nuts, hexagonal, ¼ inch—20, steel, zinc plated. 4 screws, mach., RH, ¼ inch—20 x ¼ inch, steel, zinc plated. 8 terminal lugs. 10 clamp No. 7.
2	2B1630(&)	Microphone T-30-(&).
3	2T107	Tube VT-107, two in use, one in spare tube socket.

* Headsets HS-18 may be substituted for Headsets HS-30-(&) and Cords CD-604.

10. Assembly and Installation

Components of the interphone equipment should be installed as follows:

Part and location	*Method and materials*
Interphone Control Box BC-739-(&), for commander, on bracket attached to rib of turret basket.	Mount as shown in figure 2. Replace the original cords, which will be too short for this installation, with the 11 feet of Cordage CO-144 and Cordage CO-145 provided. Plug the attached cords into appropriate jacks on panel of the radio receiver and transmitter.
Interphone Control Box BC-606-(&), for driver, on center of hull ceiling.	Mount as shown in figure 2 and secure with hardware furnished.
Interphone Amplifier BC-367, on hull ceiling.	Remove the eight screws at edges of front panel and pull amplifier out of its case. Mount the case as shown in figure 2. Secure with hardware supplied.
Connector No. 61007 and Bondnuts BL-50, through appropriate knock-out holes in Interphone Amplifier BC-367 and terminal box.	Place connectors and bondnuts as shown in figure 2. Run appropriate cords and cordage through them. Secure connectors and bondnuts firmly to terminal box and amplifier casing.

Part and location	*Method and materials*
Cordage CO–213.	Before cutting the cordage and wiring a quantity of equipment, make one check installation in Light Tank T9E1. Prepare ends of cable by standard methods, and provide a soldered ground connection for inner and outer shielding at *both* ends of cable. Tape ends of all unused wires. Interconnect component parts as shown in figure 3.
Tubes VT–107, in sockets of Interphone Amplifier BC–367.	Install tubes while amplifier is out of its case. Two tubes are installed in sockets on chassis as marked, and one spare is placed in socket on back wall of case. Replace the chassis in case.
Microphones T–30–(&).	Strap comfortably around throat above larynx. Attach to Cords CD–318 and plug into designated jacks on each control box as shown in figure 2.
Headsets HS–30–(&), Cords CD–604, and Cords CD–307–A.	Attach the headsets to Cords CD–604 which then plug into Cords CD–307–A. Plug Cords CD–307–A into designated jacks on each control box.

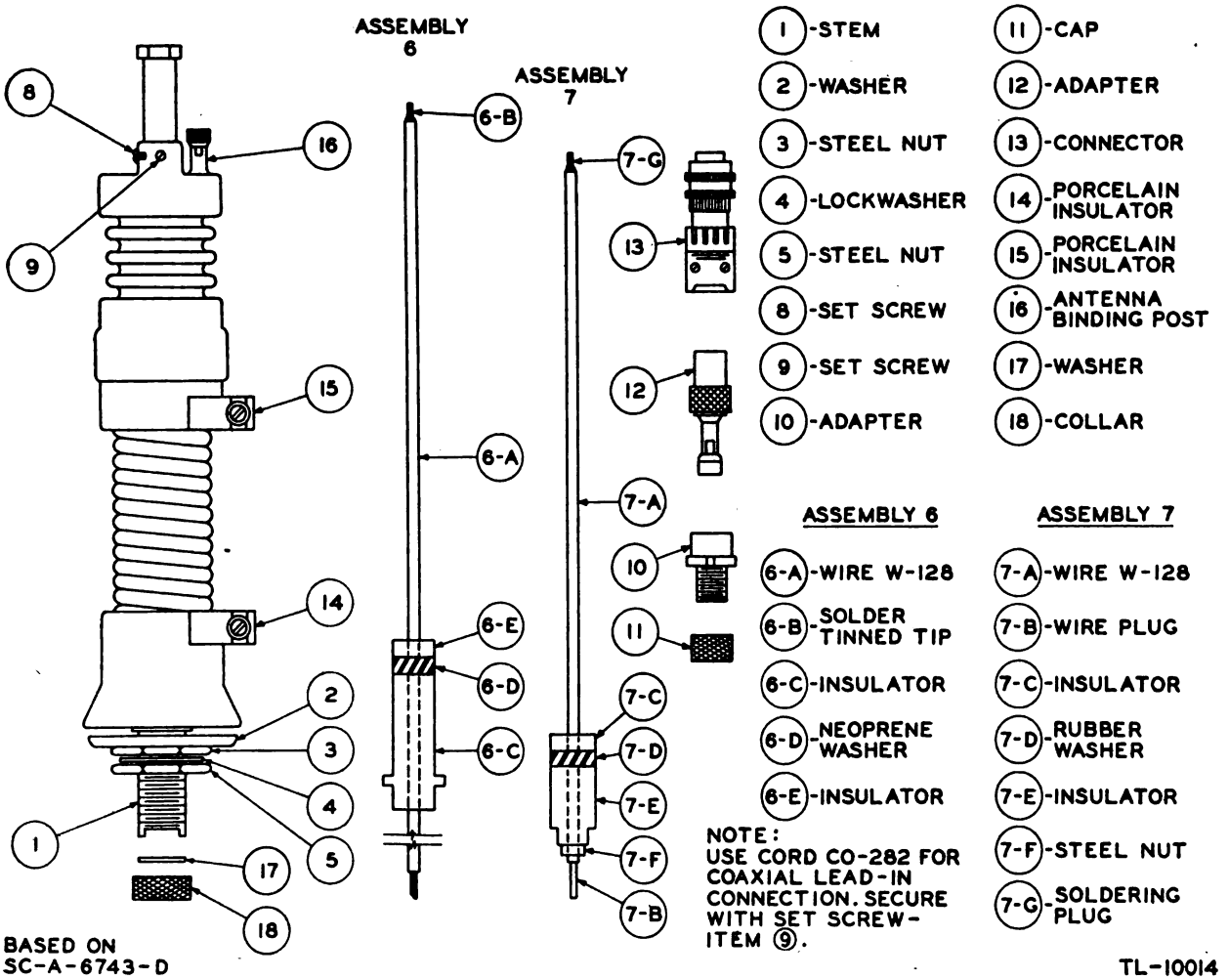
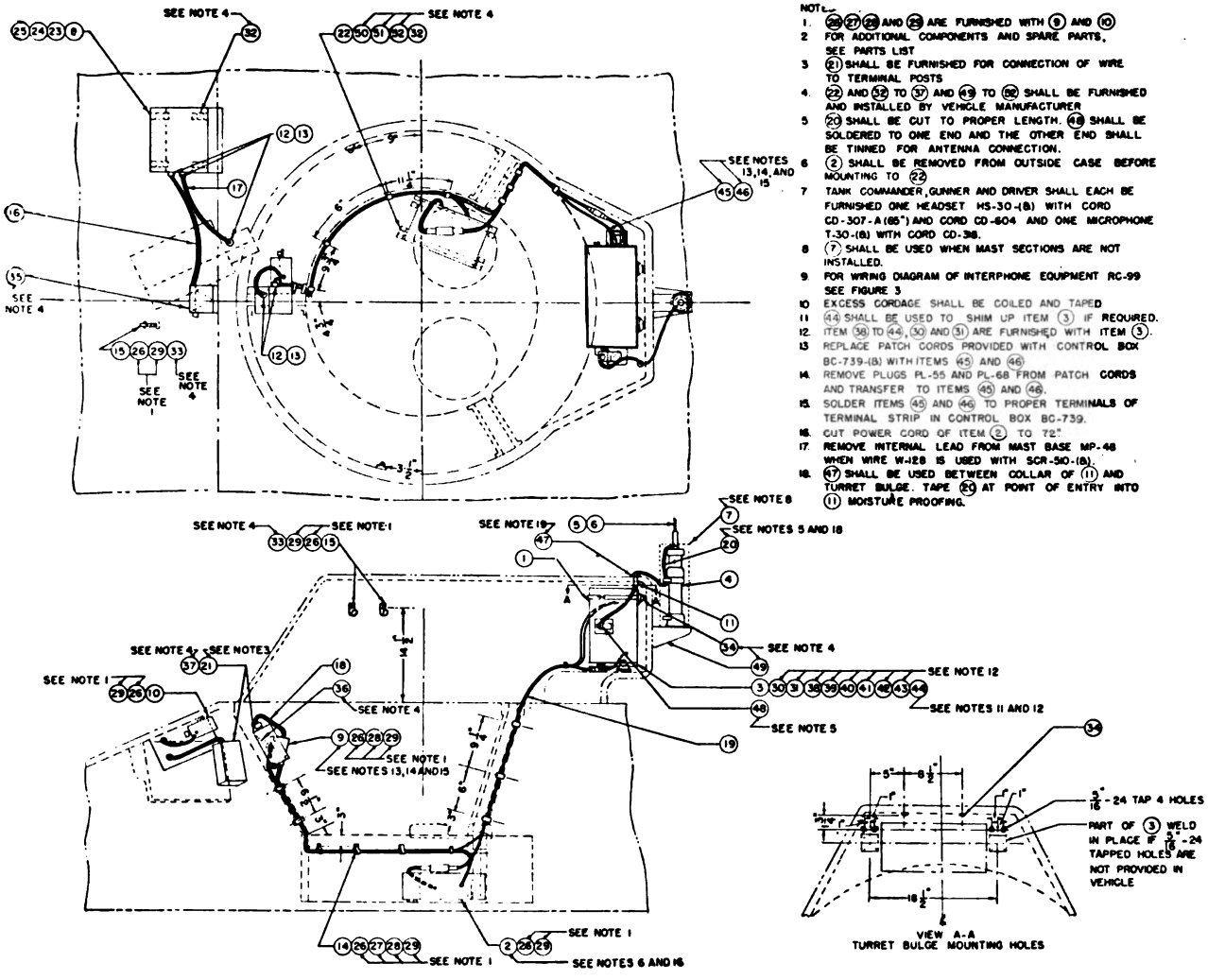


Figure 1. Mast Base MP–48, assembly for installation.



NOTES:

1. (25) (27) (28) AND (23) ARE FURNISHED WITH (9) AND (10)
2. FOR ADDITIONAL COMPONENTS AND SPARE PARTS, SEE PARTS LIST
3. (21) SHALL BE FURNISHED FOR CONNECTION OF WIRE TO TERMINAL POSTS
4. (22) AND (52) TO (37) AND (49) TO (32) SHALL BE FURNISHED AND INSTALLED BY VEHICLE MANUFACTURER
5. (20) SHALL BE CUT TO PROPER LENGTH. (48) SHALL BE SOLDERED TO ONE END AND THE OTHER END SHALL BE TINNED FOR ANTENNA CONNECTION.
6. (2) SHALL BE REMOVED FROM OUTSIDE CASE BEFORE MOUNTING TO (22)
7. TANK COMMANDER, GUNNER AND DRIVER SHALL EACH BE FURNISHED ONE HEADSET HS-30-(8) WITH CORD CD-307-A (65") AND CORD CD-604 AND ONE MICROPHONE T-30-(8) WITH CORD CD-318.
8. (7) SHALL BE USED WHEN MAST SECTIONS ARE NOT INSTALLED.
9. FOR WIRING DIAGRAM OF INTERPHONE EQUIPMENT RC-99 SEE FIGURE 3
10. EXCESS CORDAGE SHALL BE COILED AND TAPED
11. (44) SHALL BE USED TO SHIM UP ITEM (3) IF REQUIRED.
12. ITEM (38) TO (44), (30) AND (31) ARE FURNISHED WITH ITEM (3).
13. REPLACE PATCH CORDS PROVIDED WITH CONTROL BOX BC-739-(8) WITH ITEMS (45) AND (46)
14. REMOVE PLUGS PL-55 AND PL-68 FROM PATCH CORDS AND TRANSFER TO ITEMS (45) AND (46).
15. SOLDER ITEMS (45) AND (46) TO PROPER TERMINALS OF TERMINAL STRIP IN CONTROL BOX BC-739.
16. CUT POWER CORD OF ITEM (2) TO 72"
17. REMOVE INTERNAL LEAD FROM MAST BASE MP-48 WHEN WIRE W-128 IS USED WITH SCR-510-(8).
18. (47) SHALL BE USED BETWEEN COLLAR OF (11) AND TURRET BULGE. TAPE (20) AT POINT OF ENTRY INTO (11) MOISTURE PROOFING.

ITEM NO.	NAME OF ITEM	QUAN. REQ.
1	RADIO RECEIVER AND TRANSMITTER BC-620-(8)	1
2	POWER UNIT PE-97-(8) OR PE-120-(8).	1
3	MOUNTING	1
4	MAST BASE MP-48 OR MP-48-A	1
5	MAST SECTION MS-52 WITH CLAMP MC-424	1
6	MAST SECTION MS-53	1
7	COVER 86-108	1
8	INTERPHONE AMPLIFIER BC-367	1
9	CONTROL BOX BC-739-(8)	1
10	INTERPHONE CONTROL BOX BC-606-(8)	1
11	INSULATOR IN-101-(8)	1
12	APPLETON CONNECTOR CAT. NO 61007	5
13	BONDNUT CAT. NO. BL-50	5
14	CLAMP NO. 7	10
15	HOOK	3
16	CORDAGE CO-213 32" LONG	
17	CORDAGE CO-213 32" LONG	
18	CORDAGE CO-213 24" LONG	
19	CORD CD-509	1
20	WIRE W-128 30" LONG	
21	TERMINAL	8
22	MOUNTING BRACKET A-330831	2
23	RD. HD. MACH. SCREW 1/4"-20 X 1 1/4" LONG	4
24	HEX. NUT 1/4"-20 ST'D.	4
25	LOCKWASHER ST'D. FOR 1/4" SCREW	4
26	RD. HD. MACH. SCREW NO. 8-32 X 3/8" LONG	28
27	LARGE FLAT WASHER FOR NO. 8 SCREW	4
28	HEX. NUT NO. 8-32	6
29	LOCKWASHER ST'D. FOR NO. 8 SCREW	28
30	HEX. HD. MACH. SCREW 5/16"-24 X 5/8" LONG	4
31	LOCKWASHER ST'D FOR 5/16" SCREW	4
32	RETAINER A-264580	8
33	SPACER B-28805	3
34	PLUG A-264371	2
35	BRACKET A-264604	1
36	BRACKET C-14265	1
37	TERMINAL BOX	2
38	RD HD. MACH. SCREW NO 10-32 X 3/8" LONG	16
39	LOCKWASHER ST'D FOR NO 10 SCREW	16
40	HEX. HD MACH SCREW 1/4"-20 X 1" LONG	2
41	HEX. HD MACH. SCREW 1/4"-20 X 1 3/4" LONG	2
42	LOCKWASHER ST'D FOR 1/4" SCREW	10
43	HEX. NUT 1/4"-20 ST'D	8
44	FLAT WASHER ST'D FOR 1/4" SCREW	6
45	CORDAGE CO-144 10'-6 IN. LONG	1
46	CORDAGE CO-145 10'-6 IN. LONG	1
47	WASHER, RUBBER	1
48	TERMINAL	1
49	BRACKET D-59349	1
50	RD HD. MACH SCREW 1/4"-20 X 1 1/4" LONG	4
51	HEX. NUT 1/4"-20 ST'D.	4
52	LOCKWASHER ST'D. FOR 1/4" SCREW	4

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Figure 2. Installation of Radio Set SCR-510-(8) and Interphone Equipment RC-99 in Light Tank T9E1

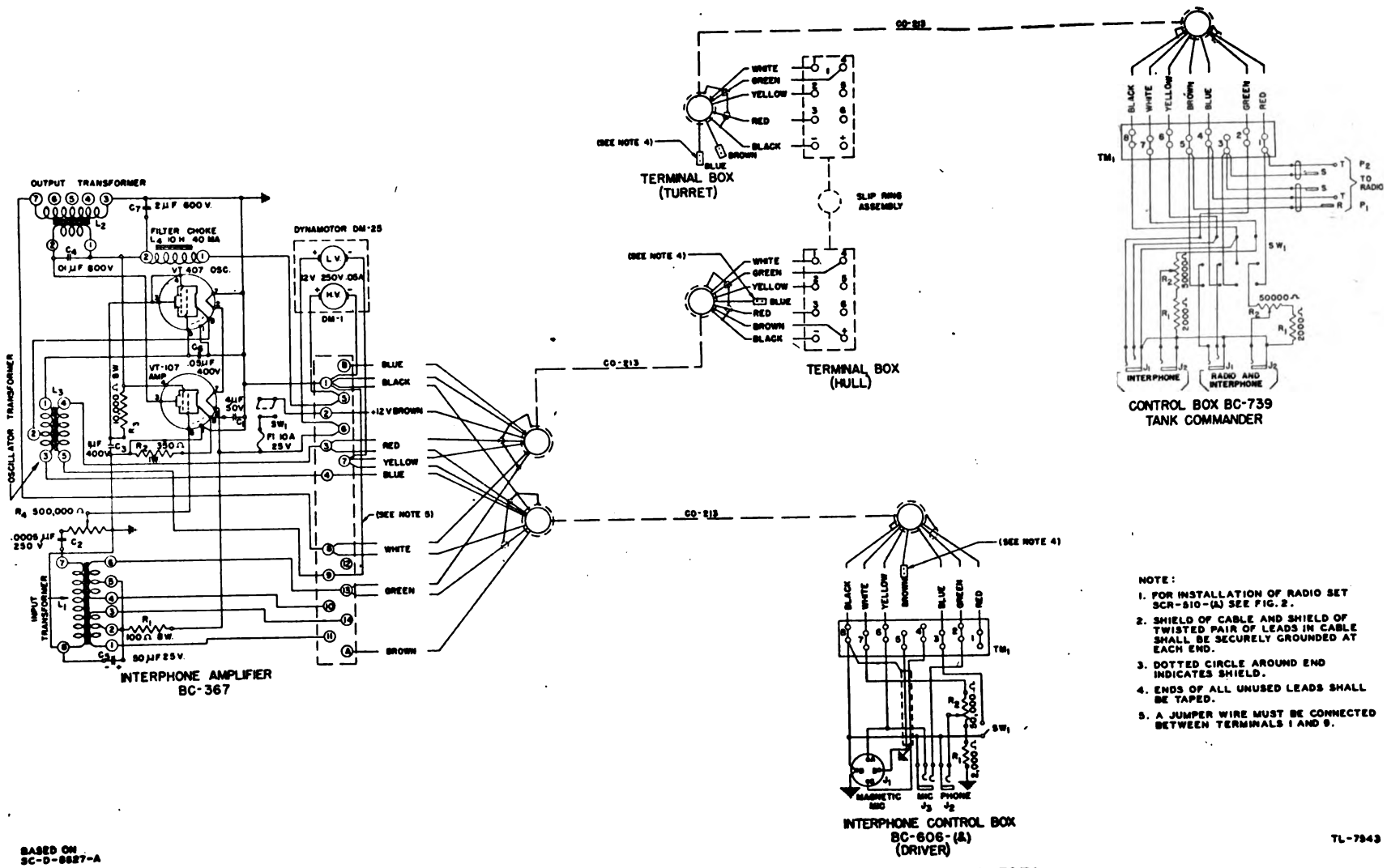


Figure 3. Wiring diagram of Interphone Equipment RC-99 in Light Tank T9E1

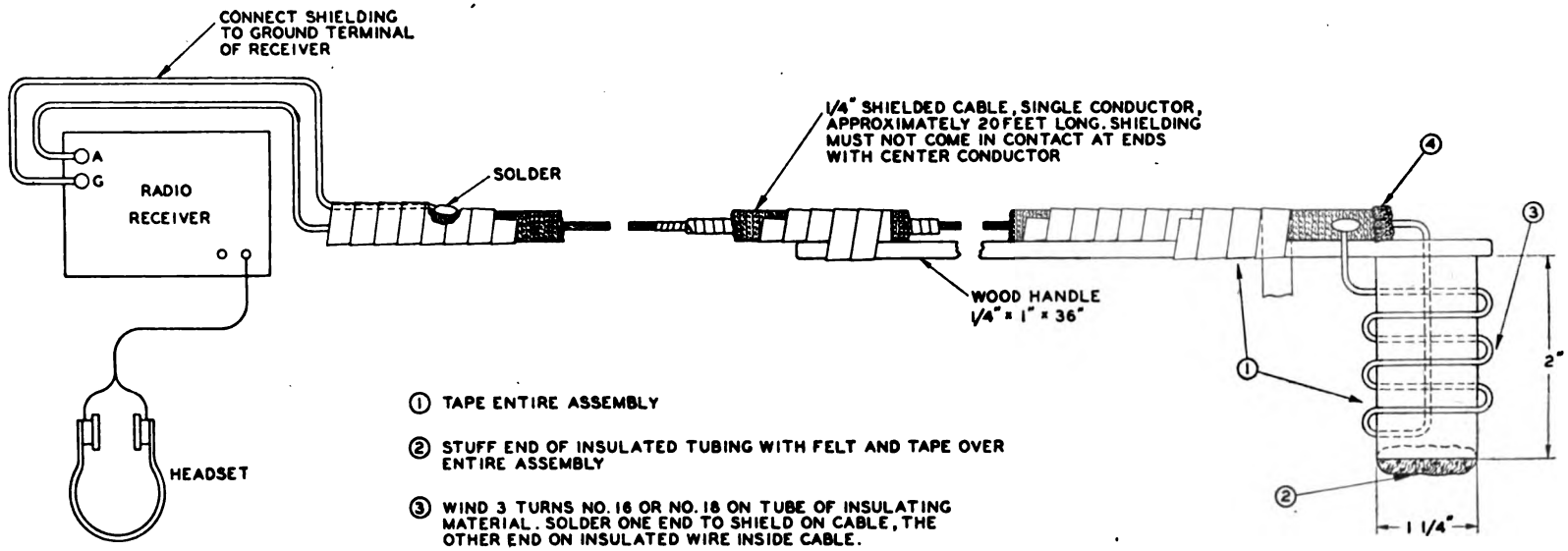


Figure 4. Probe Antenna

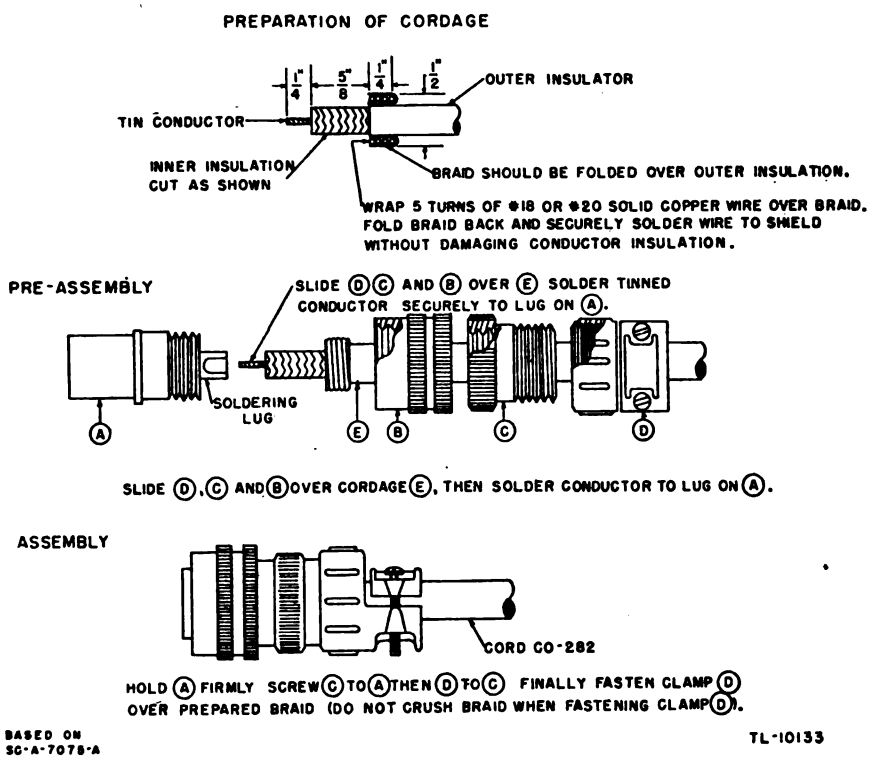
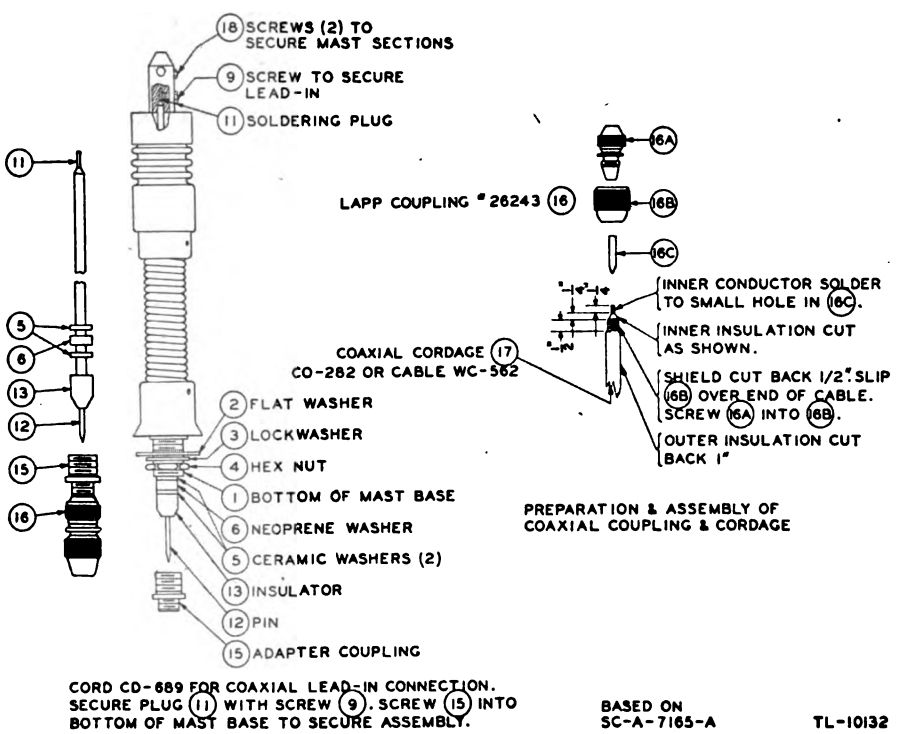


Figure 5. Coaxial connector for Mast Base MP–48 and Cord CO–282, assembly for installation.



Firgure 6. Mast Base MP–48–A, assembly with coaxial lead in.

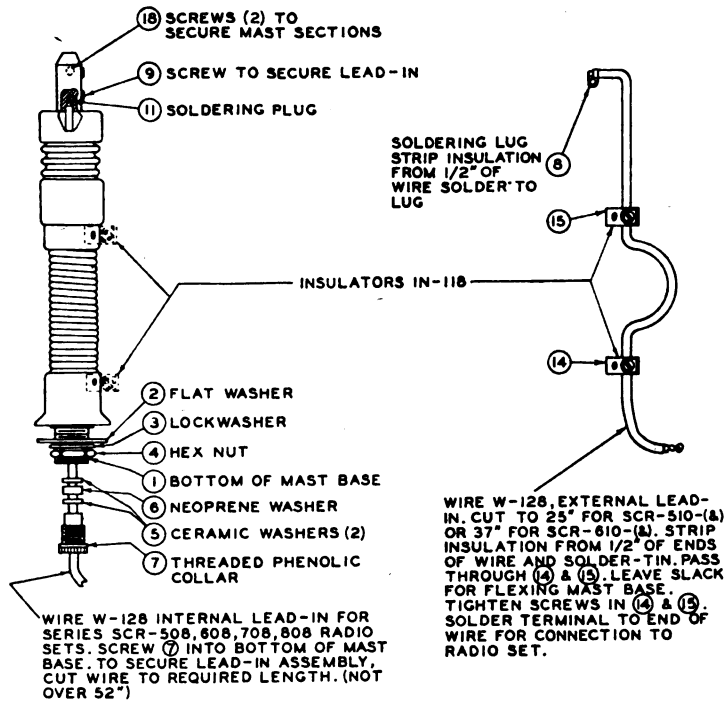


Figure 7. Mast Base MP–48–A, assembly with Wire W–128 lead in.

APPENDIX

IGNITION NOISE SUPPRESSION IN LIGHT TANK T9E1

1. General.

Excessive ignition or other electrical noises may interfere with the operation of radio equipment in Light Tank T9E1. The Technical Manual issued with the tank will be helpful in locating the source of noise since it describes the suppression systems used. Instructions for operating radio and interphone equipment used in Light Tank T9E1 should also be studied.

2. Procedure.

Locate and suppress ignition noise as follows:

a. Start the tank motor and turn on the radio receiver. Put the receiver sensitivity control at *maximum.* Then, listening to the receiver output with a headset, tune the receiver *slowly* 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 interference persists, 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 sensivity control until engine noises can be distinguished most easily from static, etc. Interference may then be identified as follows:

Interference	*Usual source*
Popping sound; corresponds to ignition firing; accelerates when engine is raced, stops when engine is turned off.	Ignition system.
Intermittent, clicking sound; lingers for several seconds when ignition is turned off.	Generator regulator.
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, heater fans, and, in vehicles with turrets, traversing motors and gyrostabilizers, can usually be identified by turning off the gauges, fans, or other suspected mechanism, individually.

e. If the source of interference cannot be found by any of the preceding methods, connect a probe antenna (fig. 4) to the antenna terminal of the radio set. Move the loop of the probe antenna slowly over the various parts of the vehicle's electrical system. Keep the loop close to, but not in contact with, the part being examined. Interference-producing parts should be heard in the receiver.

f. Interference can generally be eliminated by cleaning, tightening, or replacing noise-producing parts. All suppressor and shielding components and all connections and grounding bonds should be examined, tightened, and the surfaces under them cleaned. This will assure good electrical contact between the wires and terminals, and the metal casings and the frame of the vehicles. (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 for opens, shorts, or other faults.