

TM 11-2712

WAR DEPARTMENT TECHNICAL MANUAL

T7-530

INSTALLATION OF RADIO EQUIPMENT IN MULTIPLE GUN MOTOR CARRIAGE M13, M14, M16, OR M17

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. 23b, AR 380-5, 15 Mar 1944.)

INSTALLATION OF RADIO
EQUIPMENT IN MULTIPLE
GUN MOTOR CARRIAGE
M13, M14, M16, OR M17



WAR DEPARTMENT

15 JULY 1944

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. 23b, AR 380-5, 15 Mar 1944.)

WAR DEPARTMENT,
WASHINGTON 25, D. C., 15 July, 1944.

TM 11-2712, Installation of Radio Equipment in Multiple Gun Motor Carriage M13, M14, M16, or M17 is published for the information and guidance of all concerned.

[A. G. 300.7 (7 Jun 44).]

BY ORDER OF THE SECRETARY OF WAR:

G. C. MARSHALL,
Chief of Staff.

OFFICIAL:

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

DISTRIBUTION:

Armies (10); Corps (10); SvC (10); Depts (10); Def Comds (2); IBn 44 (3); IC 5, 11, 44 (5);
C of Tech Sv (2); Sig C Rep Shs (2); Sig C Deps (5).

IBn 44: T/O & E 44-75.

IC 5: T/O & E 5-800-2.

IC 11: T/O & E 11-107; 11-127; 11-237; 11-587; 11-592; 11-597.

IC 44: T/O & E 44-77.

For explanation of symbols, see FM 21-6.

CONTENTS

	<i>Paragraph</i>	<i>Page</i>
SECTION I. GUIDE TO USE OF THIS MANUAL.		
Purpose.....	1	1
Holes and brackets.....	2	1
Before beginning installation.....	3	1
Immediately after installation.....	4	1
II. RADIO SET SCR-528-(&).		
Required parts.....	5	2
Assembly and installation.....	6	3
APPENDIX. IGNITION NOISE SUPPRESSION IN MULTIPLE GUN MOTOR CAR- RIAGE M13, M14, M16, OR M17.....		6

DESTRUCTION NOTICE

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

WHEN—When ordered by your commander.

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

USE ANYTHING IMMEDIATELY AVAILABLE FOR DESTRUCTION OF THIS EQUIPMENT

WHAT—1. Smash—All vacuum tubes, crystals, control dials, coupling coils, transformers, speakers in 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 on.
2. Do not operate the equipment with the shields removed.
3. Do not connect power to any unit of the radio set until operating instructions have been read completely.

SECTION I

GUIDE TO USE OF THIS MANUAL

1. Purpose

This manual provides methods and procedures, based upon actual field experience, for installation of Radio Set SCR-528-(&) in Multiple Gun Motor Carriage M13, M14, M16, or M17. Items required to make a complete operating installation are listed for the radio set. Official nomenclature followed by (&), such as Headset HS-30-(&), is used to indicate any model of equipment regardless of its procurement.

2. Holes and Brackets

Holes and brackets required for installation of the radio set are normally located prior to delivery of Multiple Gun Motor Carriage M13, M14, M16, or M17. Drilling instructions are given in this manual for any other necessary holes and brackets. Do not relocate any holes or brackets unless absolutely necessary.

3. Before Beginning Installation

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

Caution: Multiple Gun Motor Carriage M13, M14, M16, or M17 has a 12-volt electrical system. Before installing the radio set, be sure that it is designed for a 12-volt installation, or tubes may burn out and dynamotors may be damaged.

4. Immediately After Installation

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

SECTION II

RADIO SET SCR-528-(&)

5. Required Parts

Items necessary for the installation of Radio Set SCR-528-(&) in Multiple Gun Motor Carriage M13, M14, M16, or M17 are listed below.

Quantity	Stock No.	Item
1	2A262	Antenna A-62 (phantom).
1	2Z1574(&)	Cabinet CH-74-(&).
1	2Z2595-264	Chest CH-264, for spare parts.
1	2Z2651-423	Clamps MC-423, for securing Mast Sections MS-51 and MS-52.
1	2Z2651-424	Clamps MC-424, for securing Mast Sections MS-52 and MS-53.
1	6Z3147	Connector No. 61007 and Bondnut BL-50 (Appleton).
2	3E1307A-5.5	Cord CD-307-A, 65 inches long, for HS-30-(&).
1	3E1318(&)	Cord CD-318-(&), for microphone.
2	3E1604	Cord CD-604, for Headset HS-30-(&).
1	2Z3400-108	Cover BG-108, for Mast Base MP-48 or MP-48-A.
1	2Z3396(&)	Cover BG-96-(&), for radio set.
80	2Z3541-A.1(&)	Crystal Holder FT-241-(&), with crystal installed.
1	3H1634(&)	Dynamotor DM-34-(&), 12-volt, for Radio Receiver BC-603-(&).
1	3H1635(&)	Dynamotor DM-35-(&), 12-volt, for Radio Transmitter BC-604-(&).
1	6L50-528V69	Hardware bag.
2	2B830(&)	Headset HS-30-(&).
1	3G621	Insulator IN-121.
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.
2	2B1567	Microphone Cover M-367.
2	2B1617(&)	Microphone T-17-(&).
1	2B1645	Microphone T-45.
1	2Z6721-237(&)	Mounting FT-237-(&), including Power Cord CO-278, mounting hardware, and spare fuses.
1	2Z1250.31	Mounting bracket.
1	2C4403(&)	Radio Receiver BC-603-(&), including set of tubes installed, spare lamps, and fuses.
1	2C6494(&)	Radio Transmitter BC-604-(&), including set of tubes installed, spare lamps, and fuses.
1	2Z8056(&)	Roll BG-56-(&), for carrying mast sections.
7 feet.	1B128	Wire W-128.

6. Assembly and Installation

a. PROCEDURE. Components of the radio set should be installed as shown in figure 1, and as directed below.

<i>Part and location</i>	<i>Method and materials</i>
Cabinet CH-74-($\&$) and Mounting FT-237-($\&$), on mounting plate to the rear of the right front seat as shown in figure 1.	Remove the mounting bracket which is already installed on the mounting plate. Drill the mounting plate as shown in detail in figure 1. Place Cabinet CH-74-($\&$) on the mounting plate; then put Mounting FT-237-($\&$) into the cabinet. Line up all the holes in the plate, cabinet, and mounting. Secure firmly with the hardware provided.
Mounting bracket, under unsupported end of Cabinet CH-74-($\&$).	Refer to figure 1 and fasten the mounting bracket (item 23) to the cabinet (item 13); then mark holes on the bulkhead and ammunition rack with a center punch. Drill the holes. Secure the bracket to the bulkhead and ammunition rack with the hardware provided.
Radio Transmitter BC-604-($\&$) and Dynamotor DM-35-($\&$), on Mounting FT-237-($\&$).	Mount the dynamotor on the transmitter chassis and secure with four screws through its base. Place the transmitter and dynamotor on the mounting as shown in figure 1 and secure with the thumbscrews provided.
Radio Receiver BC-603-($\&$) and Dynamotor DM-34-($\&$), on Mounting FT-237-($\&$).	Mount the dynamotor on the receiver chassis with four screws through its base. Place the receiver and dynamotor on mounting as shown in figure 1 and secure with the four locking screws furnished.
Insulator IN-121-----	Insert the insulator through the knock-out hole in the side of Cabinet CH-74-($\&$), as shown in figure 1.
Mast Base MP-48 or MP-48-A, on mast base bracket (item 28, fig. 1). If Mast Base MP-48 is supplied, refer to figure 2 for assembly. When Mast Base MP-48-A is supplied, refer to figure 3.	Remove nuts and washers (items 2, 3, 4, and 5) from stem (item 1) of Mast Base MP-48 (fig. 2). Loosen setscrews (items 8 and 9) and pull assembly 7 out of the mast base. Prepare assembly 6 (fig. 2) as follows: Strip $\frac{1}{2}$ inch of the insulation from each end of the 38-inch length of Wire W-128; clean and tin the ends. Solder plug (item 6B) to one end. Place the porcelain insulator (item 6C), neoprene washer (item 6D), and ceramic insulator (item 6E) over Wire W-128. Insert the assembly into the mast base and secure with setscrews (items 8 and 9). Insert Wire W-128 and the stem (item 1) through the hole in the mast base bracket and secure in place with items 2, 3, 4, and 5. Flex the mast base 90° and screw the retaining collar (item 18) on the end of the mast base stem (item 1) to secure the assembly in the mast base while the mast base is flexed. When Mast Base MP-48-A is supplied, assembly as shown in figure 3, using Wire W-128 internal lead-in. Run lead-in Wire W-128 through Insulator IN-121 in the side of Cabinet CH-74-($\&$) and connect to antenna terminal on Mounting FT-237-($\&$).
Mast Sections MS-51, MS-52, and MS-53, and Clamps MC-423 and MC-424, on Mast Base MP-48 or MP-48-A.	Screw the mast sections together and secure with the clamps. Fasten the clamps to the male end of the mast sections. Then screw the antenna into the mast base. When using Mast Base MP-48-A, secure with item 18 (fig. 3). Carry the mast sections and clamps in Roll BG-56-($\&$) when not in use.

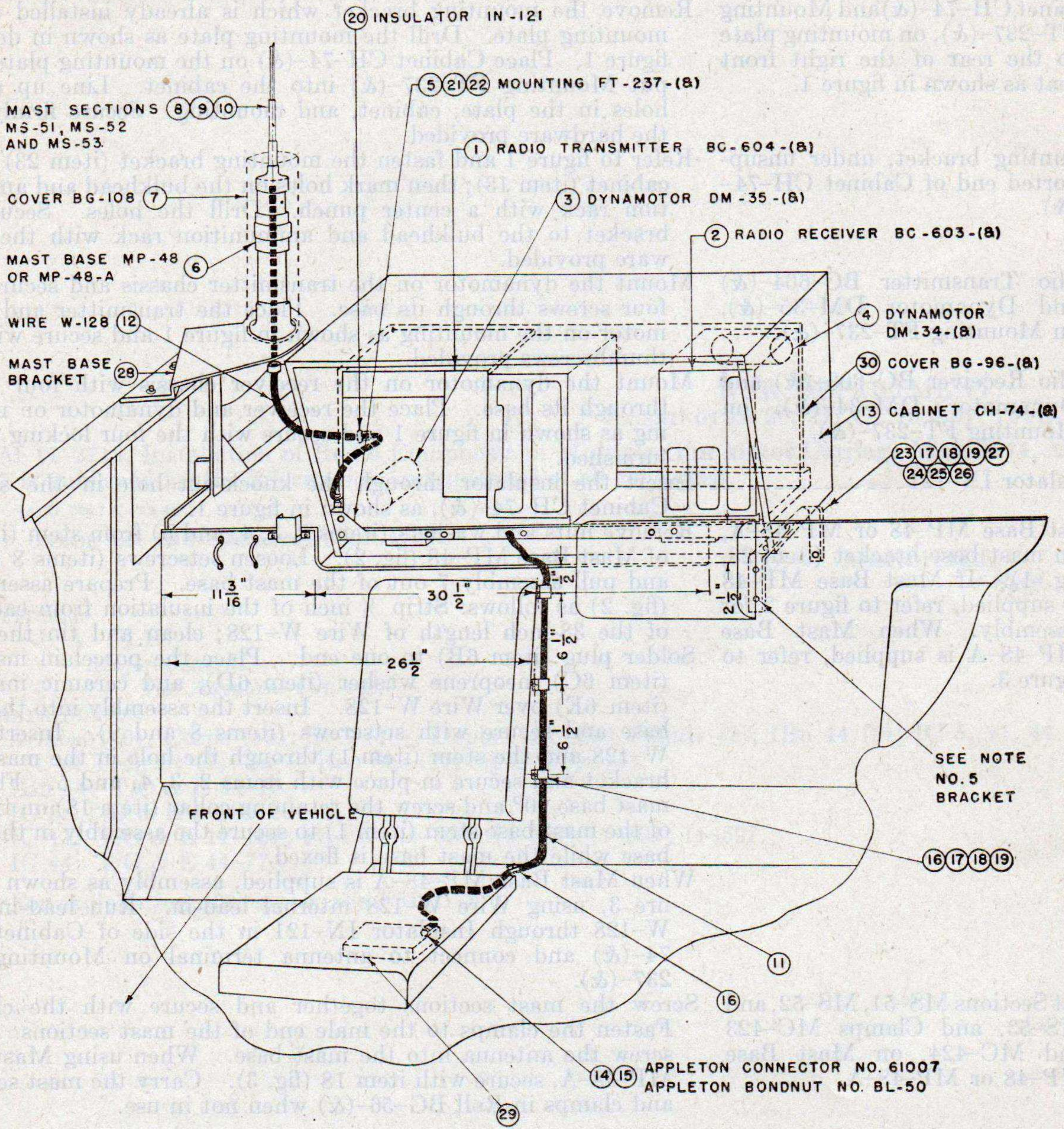
b. CORDING AND WIRING.

(1) Cord and wire Radio Set SCR-528-($\&$) as shown in figure 1. Connect and secure so as not to interfere with the accessibility and operation of the equipment. Enough slack must be left to permit free movement of all units having shock mounting. Cording or cable likely to rub against

sharp edges should be taped with at least two layers to prevent damage. Solder-tin all wire ends.

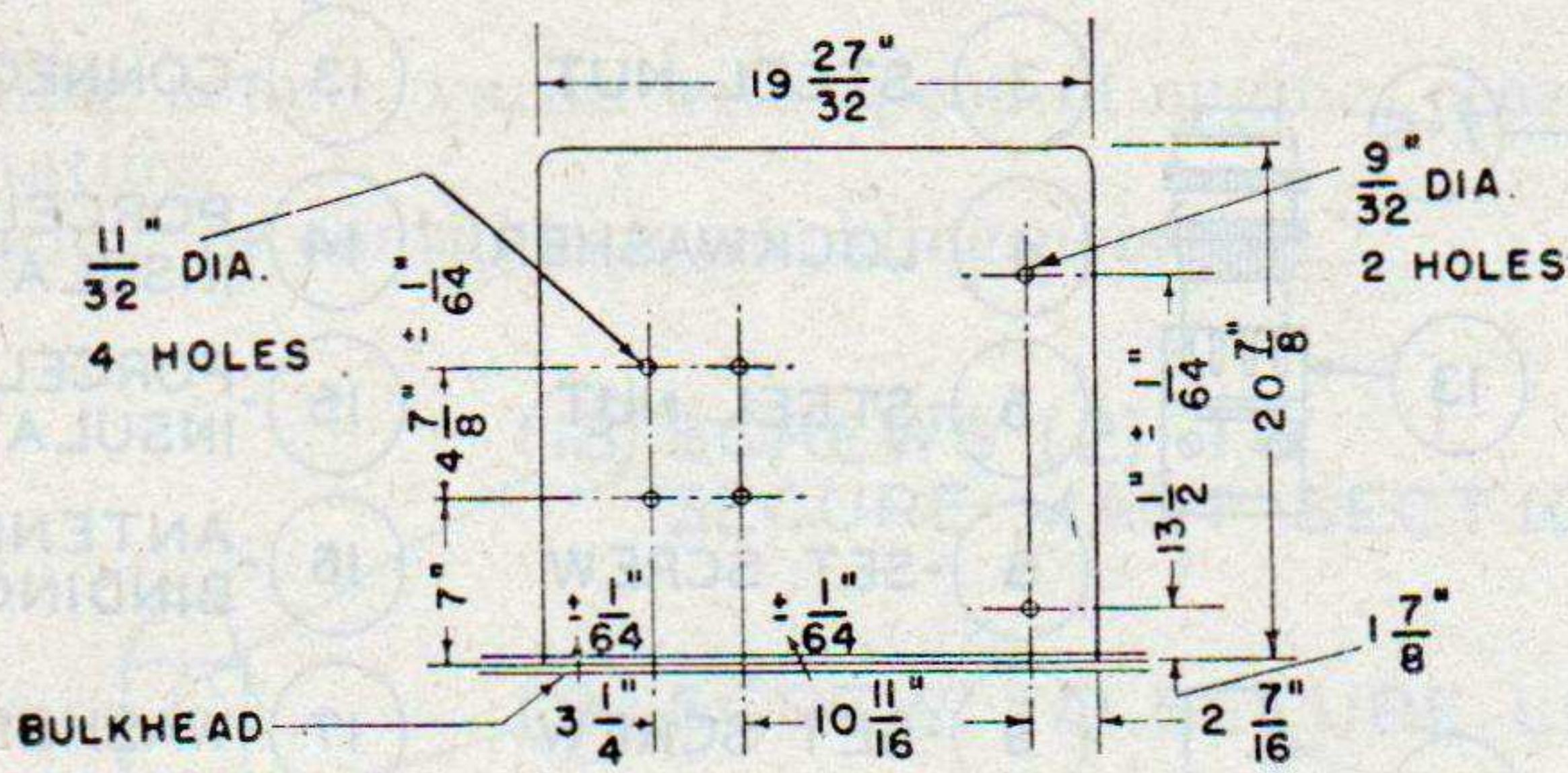
(2) To prevent accidental shorts of the battery, do not connect the positive 12-volt and negative 12-volt leads (in the terminal box) until all other connections have been completed.

Assembly and Installation
 Components of the radio set should be installed as shown in figure 1 and as directed below.

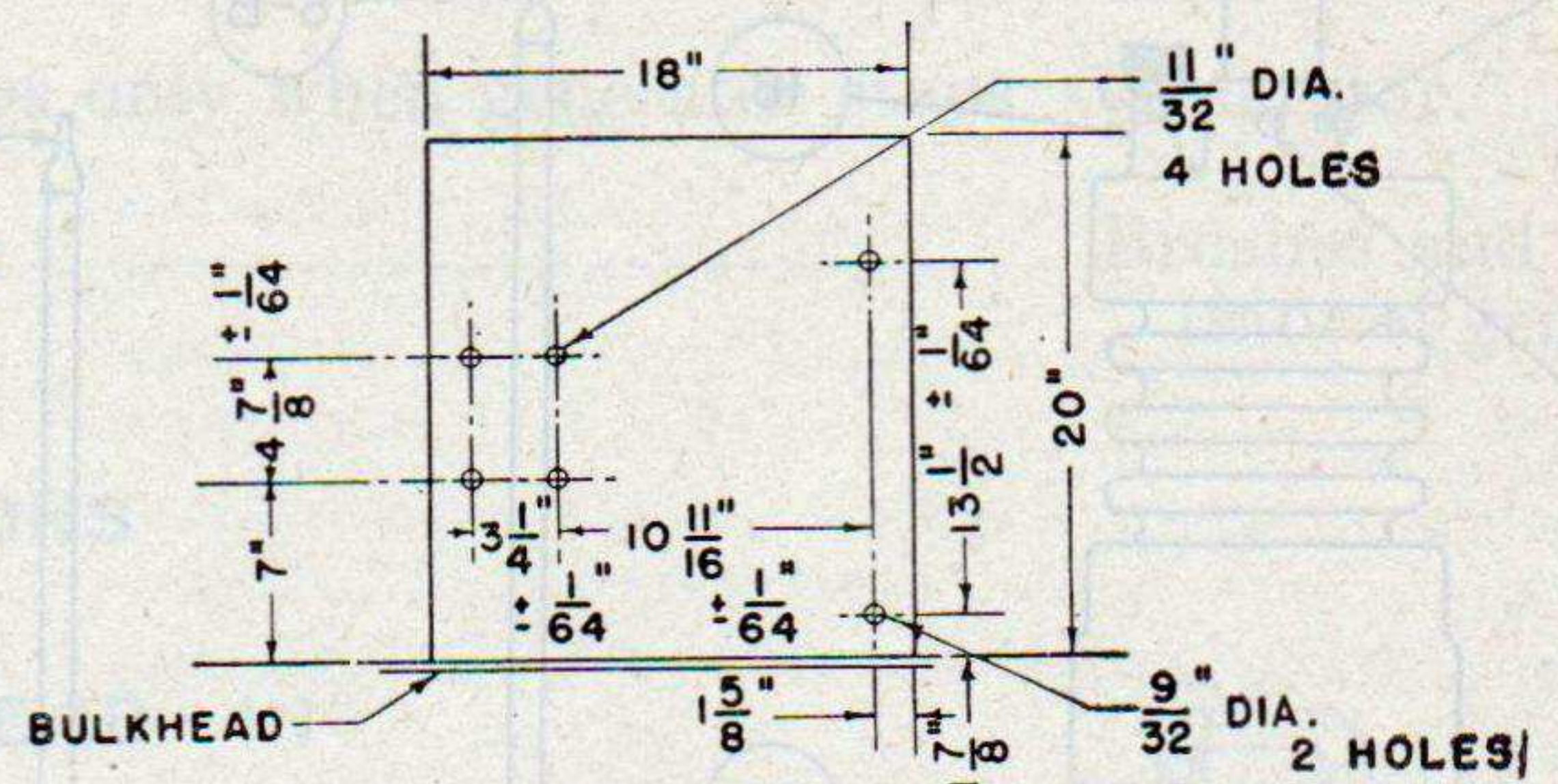


TL -13311-1
 BASED ON
 SC-D-8695-C

Figure 1. Installation of Radio Set SCR-528-(B) in Multiple Gun Motor Carriage M13, M14, M16, or M17.



DETAIL FOR DRILLING HOLES
IN MOUNTING PLATE FOR MI4 OR MI7



DETAIL FOR DRILLING HOLES
IN MOUNTING PLATE FOR MI3 OR MI6

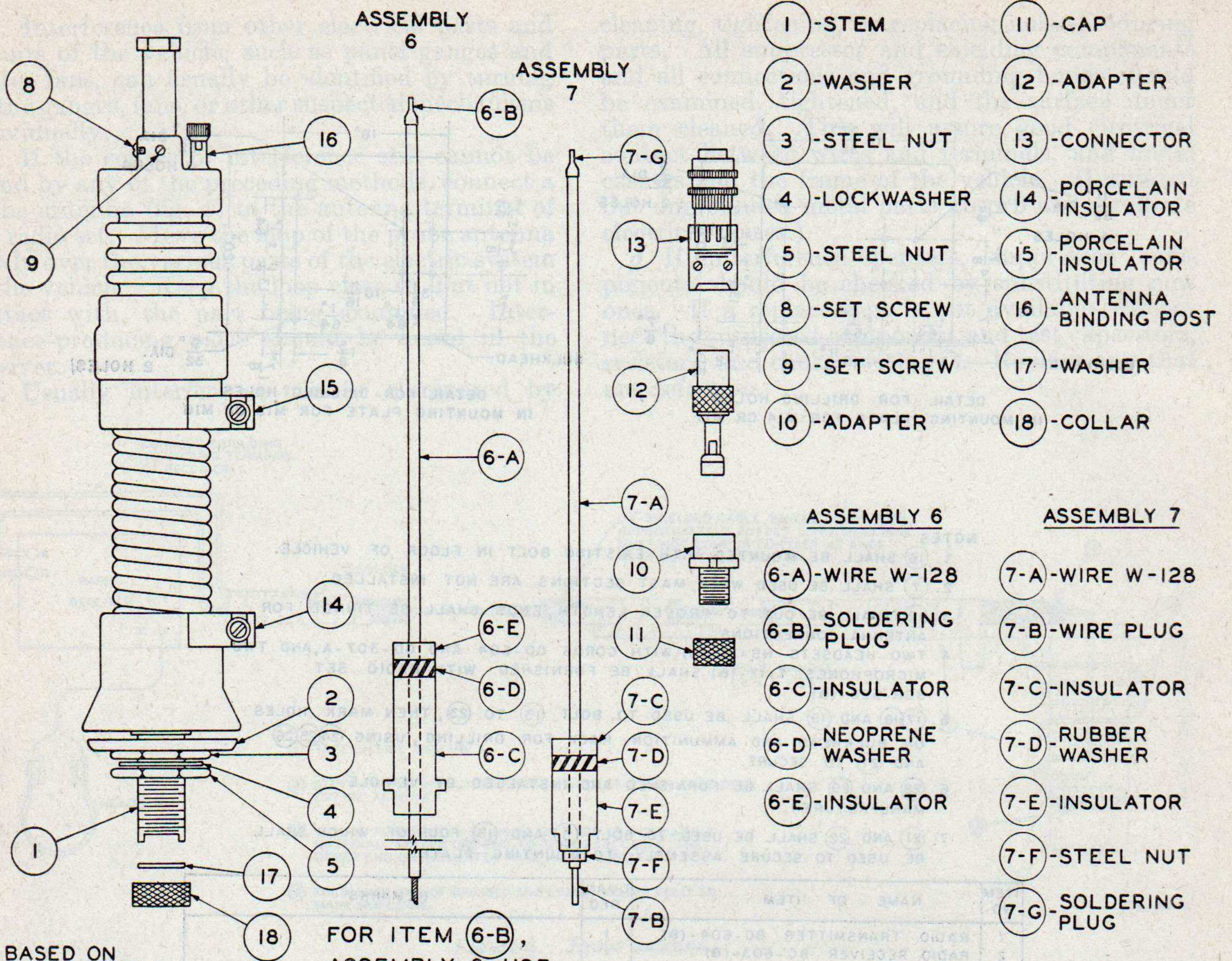
NOTES.

1. (16) SHALL BE MOUNTED WITH EXISTING BOLT IN FLOOR OF VEHICLE.
2. (7) SHALL BE USED WHEN MAST SECTIONS ARE NOT INSTALLED.
3. (12) SHALL BE CUT TO PROPER LENGTH, ENDS SHALL BE TINNED FOR ANTENNA CONNECTIONS.
4. TWO HEADSETS HS-30-(8) WITH CORDS CD-604 AND CD-307-A, AND TWO MICROPHONES T-17-(8) SHALL BE FURNISHED WITH RADIO SET SCR-528-(8).
5. (17)(18) AND (19) SHALL BE USED TO BOLT (13) TO (23), THEN MARK HOLES ON BULKHEAD AND AMMUNITION RACK FOR DRILLING, USING (24)(25)(26) AND (27) TO SECURE.
6. (28) AND (29) SHALL BE FURNISHED AND INSTALLED BY VEHICLE MANUFACTURER.
7. (21) AND (22) SHALL BE USED TO BOLT (5) AND (13), FOUR OF WHICH SHALL BE USED TO SECURE ASSEMBLY TO MOUNTING PLATE.

ITEM NO	NAME OF ITEM	QUAN. REQ	REMARKS
1	RADIO TRANSMITTER BC-604-(8)	1	
2	RADIO RECEIVER BC-603-(8)	1	
3	DYNAMOTOR DM-35-(8)	1	
4	DYNAMOTOR DM-34-(8)	1	
5	MOUNTING FT-237-(8)	1	
6	MAST BASE MP-48 OR MP-48-A	1	
7	COVER BG-108	1	SEE NOTE NO. 2
8	MAST SECTION MS-51	1	WITH CLAMP MC-423
9	MAST SECTION MS-52	1	WITH CLAMP MC-424
10	MAST SECTION MS-53	1	
11	CORD CO-278	1	
12	WIRE W-128	1	38" LONG, SEE NOTE NO. 3
13	CABINET CH-74-(8)	1	
14	APPLETON CONNECTOR	1	CAT. NO. 61007
15	APPLETON BONDNUT	1	CAT. NO. BL-50
16	CLAMP NO 5	4	SEE NOTE NO. 1
17	RD. HD. MACH SCREW	5	1/4"-20 X 3/4" LONG, SEE NOTE NO. 5
18	HEX NUT	5	1/4"-20 ST'D, SEE NOTE NO. 5
19	LOCKWASHER	5	ST'D. FOR 1/4" SCREW, SEE NOTE NO. 5
20	INSULATOR IN-121	1	
21	HEX HD. MACH SCREW	8	5/16"-24 X 3/8" LONG, SEE NOTE NO. 7
22	ELASTIC STOP NUT	8	5/16"-24 ST'D., SEE NOTE NO. 7
23	MOUNTING BRACKET	1	
24	HEX HD MACH SCREW	2	3/8"-24 X 1 1/4" LONG, SEE NOTE NO. 5
25	HEX HD. MACH SCREW	1	3/8"-24 X 1" LONG, SEE NOTE NO. 5
26	HEX. NUT	3	3/8"-24 ST'D., SEE NOTE NO. 5
27	LOCKWASHER	3	ST'D. FOR 3/8" SCREW, SEE NOTE NO. 5
28	MAST BASE BRACKET B 258382	1	SEE NOTE NO. 6
29	TERMINAL BOX C100427	1	SEE NOTE NO. 6
30	COVER BG-96-(8)	1	

TL-13311-2
BASED ON
SC-D-8695-0

Figure 1.—Continued.



BASED ON
SC-A-6743-D

TL-12141

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

APPENDIX

IGNITION NOISE SUPPRESSION IN MULTIPLE GUN MOTOR CARRIAGE M13, M14, M16, OR M17

1. General

Excessive ignition or other electrical noises may interfere with the operation of radio equipment in Multiple Gun Motor Carriage M13, M14, M16, or M17. The Technical Manual issued with the vehicle will be helpful in locating the source of the noise since it describes the suppression systems used. Instructions for operating radio equipment used in the vehicle should also be studied.

2. Procedure

Locate and suppress ignition noises as follows:

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

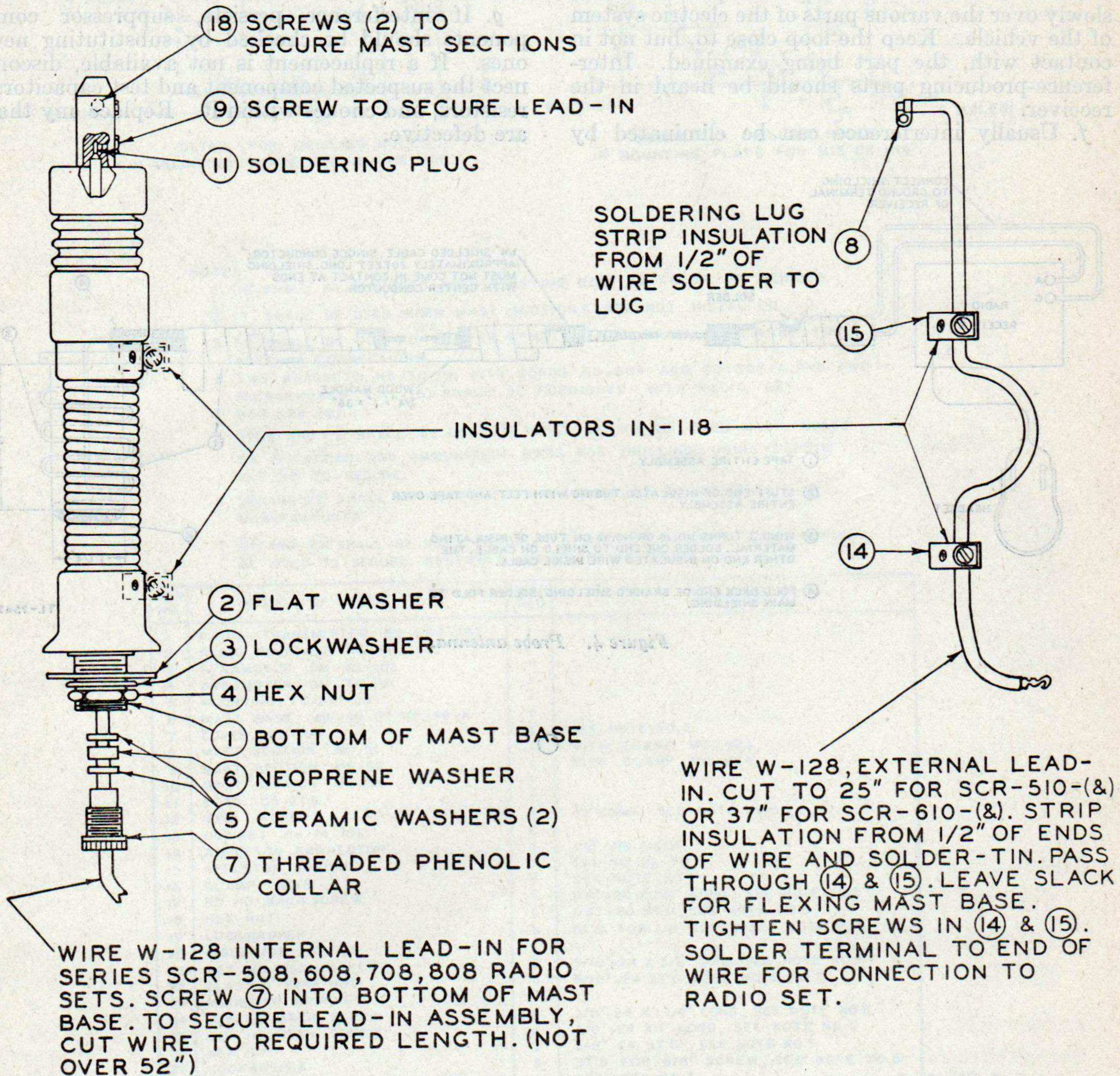
b. When the frequency (or frequencies) with greatest noise level is found, turn off the vehicle engine. If interference persists, the source is outside the ignition system. If noise stops, the trouble is in the ignition system.

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 sounds, corresponding to ignition firing: stop when engine is turned off; accelerate when engine is raced. 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.



BASED ON
SC-A-7166-A

TL-10134

Figure 3. Mast Base MP-48-A, assembly with Wire W-128 lead-in.

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

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

f. Usually interference can 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 surface under them cleaned. This will assure good electrical contact between wires and terminals, and metal casings and the frame of the vehicle. (Insulated but ungrounded metal parts absorb and reradiate electrical noises.)

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

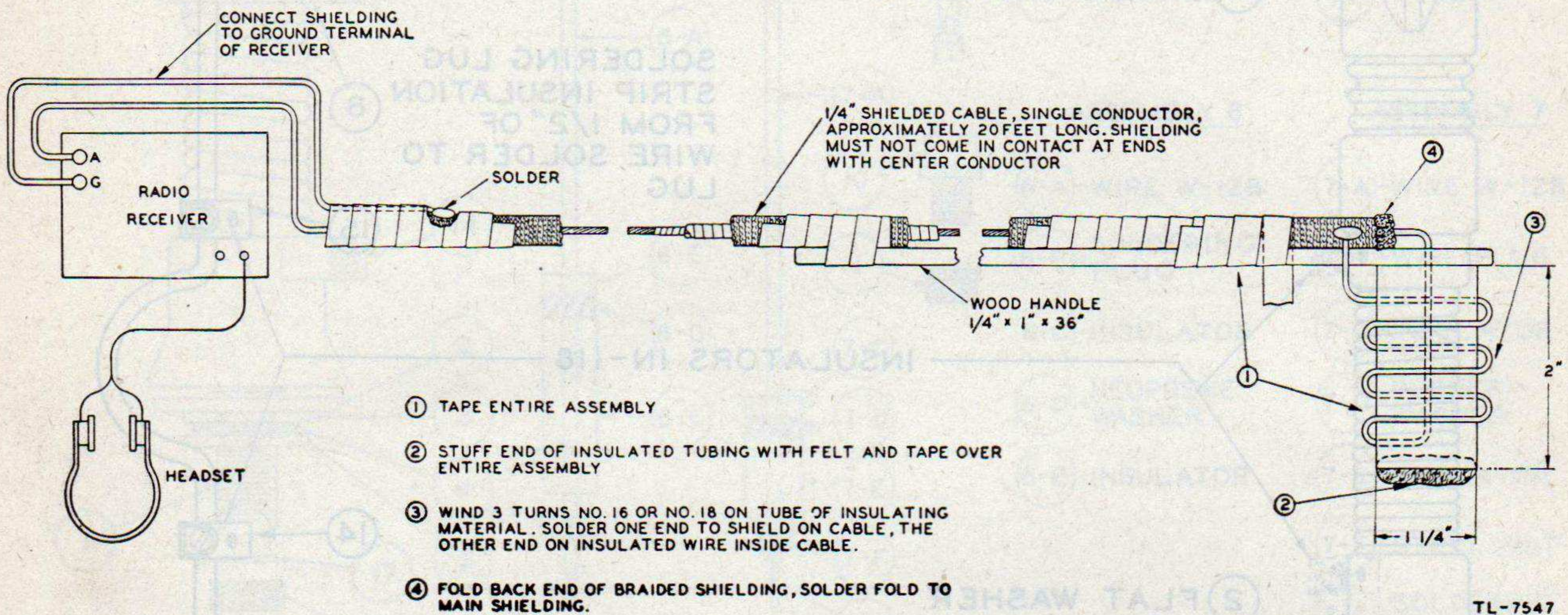


Figure 4. Probe antenna.

