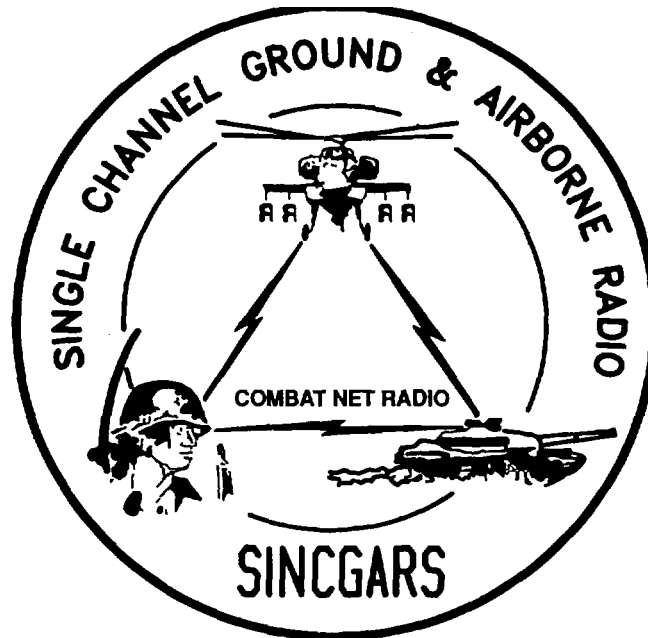

TECHNICAL BULLETIN



INSTALLATION INSTRUCTIONS FOR
INSTALLATION KIT,
ELECTRONIC EQUIPMENT MK-2304/VRC
(NSN 5895-01-299-5862) (EIC: N/A)
TO PERMIT INSTALLATION OF RADIO SET
AN/VRC-87C/88C
INTO
HOWITZER, HEAVY, SELF-PROPELLED, 8 INCH,
M110 A1/A2

Approved for public release; distribution is unlimited.

HEADQUARTERS, DEPARTMENT OF THE ARMY

1 SEPTEMBER 1993

**INSTALLATION INSTRUCTIONS FOR
 INSTALLATION KIT,
 ELECTRONIC EQUIPMENT MK-2304NRC
 (NSN 5895-01-299-5862) (EIC: N/A)
 TO PERMIT INSTALLATION OF RADIO SET
 ANNRC-87C/88C
 INTO
 HOWITZER, HEAVY, SELF-PROPELLED, 8 INCH,
 M110 A1/A2**

REPORTING OF ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-LC-LM-LT, Fort Monmouth, New Jersey 07703-5007.

In either case, a reply will be furnished direct to you.

TABLE OF CONTENTS

Subject	Section	Page
Scope	0.1	1
General Information.....	0.2	1
Maintenance Forms, Records, and Reports	0.3	1
Reports of Maintenance and Unsatisfactory Equipment	0.3.1	1
Report of Packing and Handling Deficiencies	0.3.2	1
Discrepancy in Transportation Deficiency Report (TDR) (SF 361)	0.3.3	1
Consolidated Index of Army Publications	0.4	1
Purpose of Installation.....	1.	2
End Item or System to be Modified	2.	2
Application Times	3.	2
Time for Completion of Installation	3.1	2
Time for Installation of One Assembly or Component.....	3.2	2
Preparation for Installation.....	4.	2
Preparation of Vehicle	4.1	2
Preparation of MK.....	4.2	2
MK, Distribution, and Consumables	4.3	3
Tools and Test, Measurement, and Diagnostic Equipment (TMDE) Required	4.4	10
Installation Procedures	5.	11
Installation of Antenna AS-3900NRC (antenna).....	5.1	13
Installation of Antenna Base.....	5.1.1	13
Installation of Antenna Base (With Crew Personnel Shelter)	5.1.2	15
Installation of Top Antenna Assembly	5.1.3	17
Modifications to Vehicle.....	5.2	18
Installation of Mounting Base, Electrical Equipment MT-6576NRC (mounting base)	5.3	21
Installation of Tray, Battery CY-8664NRC (battery tray) and Battery Box CY-8523A/PRC (battery box).....	5.4	24
Installation of Loudspeaker - Control Unit LS-671NRC (speaker)	5.5	26
Installation of Cables	5.6	27
Installation of RF Cable (With Crew Personnel Shelter)	5.6.1	31
Post-Installation and Checkout.....	5.7	32
Appendix A. References.....		A1

LIST OF ILLUSTRATIONS

Figure	Title	Page
4-1	MK Illustrated Parts List	7
5-1	MK and Radio Installation.....	11
5-2	Antenna Base Installation.....	13
5-3	Alternate Antenna Base Installation	15
5-4	Top Antenna Assembly Installation.....	17
5-5	Modifying Vehicle	18
5-6	Mounting Base Installation	21
5-7	Battery Tray and Battery Box Installation.....	24
5-8	Speaker Installation.....	26
5-9	Cable Installation.....	27
5-10	RF Cable Installation for Crew Personnel Shelter.....	31
5-11	Cable Diagram	33

LIST OF TABLES

Number	Title	Page
4-1	MK Parts List for Installation of Radio Set AN/VRC-87C/88C.....	4

0.1 SCOPE.

This technical bulletin provides Installation Instructions for Installation Kit, Electronic Equipment MK-2304NRC, commonly referred to as the Mounting Kit (MK). The MK shall be installed into the following type of vehicle(s):

- Howitzer, Heavy, Self-Propelled, 8 Inch, M110 A1/A2

The MK is used for installation of radio set components at field locations. The information contained in this technical bulletin is the official authorization to perform the installation at the unit maintenance level.

NOTES

- This technical bulletin is not an authorization for requisition or turn-in of vehicles.
- This technical bulletin does not establish quantity or types of vehicles assigned to using units.

This technical bulletin does not contain information on the maintenance or replacement of the MKs. This information is contained in the MAC of TM 11-5820-890-20-2, TM 11-5820-890-20-4 and RPSTL of TM 11-5820-890-20P.

0.2 GENERAL INFORMATION.

The MK becomes operable when all the radio set components are installed in the vehicle and correct power is supplied. Refer to TM 11-5820-890-20-1 or TM 11-5820-890-20-4 for installation, Operational (OP) Check instructions, and required maintenance procedures. Refer to TM 11-5820-890-20P for repair parts.

Radio Set ANNRC-87C/88C includes:

- Radio Set ANNRC-87C/88C (for RT-1 523(C)/U)

0.3 MAINTENANCE FORMS, RECORDS, AND REPORTS.

0.3.1 Reports of Maintenance and Unsatisfactory Equipment. See section 4.2.2.3 for information.

0.3.2 Report of Packaging and Handling Deficiencies. See section 4.2.2.1 for information.

0.3.3 Discrepancy in Transportation Deficiency Report (TDR) (SF361). See section 4.2.2.2 for information.

0.4 CONSOLIDATED INDEX OF ARMY PUBLICATIONS.

Refer to the latest issue of DA Pam 25-30 to determine whether there are new changes, or additional publications pertaining to the equipment.

1. PURPOSE OF INSTALLATION.

The Installation Kit, Electronic Equipment MK-2304NRC (MK) contains the items needed to mount Radio Set ANNRC-87C/88C in a Howitzer, Heavy, Self-Propelled, 8 Inch, M110 A1/A2 (vehicle).

2. END ITEM OR SYSTEM TO BE MODIFIED.

Not applicable

3. APPLICATION TIMES.

3.1 Time for Completion of Installation. Using two people, a total of 4.5 work hours is required. Typical vehicle downtime is 4.5 hours.

3.2 Time for Installation of One Assembly or Component. The following table lists the time required to install one component. All times have been rounded off to the nearest half hour. The sum of these times will not reflect the typical vehicle downtime.

ITEM	SECTION	TIME
Antenna AS-3900NRC	5.1	1.0
Mounting Base, Electrical Equipment MT-6576NRC	5.3	0.5
Cables	5.6	1.0

4. PREPARATION FOR INSTALLATION.

This section explains how to prepare the vehicle and MK for installation.

4.1 Preparation of Vehicle. To prepare the vehicle for installation, insure that the site includes adequate lighting and a power source when drilling is required. Inspect the vehicle for damage that could affect installation. Have any such damage repaired before installing MK.

4.1.1 Items to be Removed. Remove existing ANNRC-12 radio family installation kit/harness. See TM 11-5820-401-20-2 for removing items used with intercom systems, or TM 11-5820-401-20-1 (used without intercom systems), and TM 9-2350-30420.

4.1.2 List of Items to be Retained. Not applicable.

4.2 Preparation of MK. To prepare MK, unpack, inspect and check inventory.

4.2.1 Precautions During Handling. Observe these steps to prevent equipment damage.

- a. Keep dust covers in place on connectors.
- b. Do not disassemble or modify parts in MK unless authorized to do so.
- c. Keep mounting hardware covered and protected until needed.
- d. When exposed to moisture, rain or salt water, keep all parts dry to prevent corrosion.

4.2.2 Unpack and Inspect Equipment.

4.2.2.1 Inspect Packaging for Evidence of Damage. Any shipping damage should be reported on SF364 Report of Discrepancy (ROD) as prescribed in AR 735-11-2/DLAR 4140.55/NAVMATINST 4355.73A/AFR 400-64/MCO 4430.3F.

4.2.2.2 Unpack and Inventory MK. If any item is missing, fill out and forward Transportation Deficiency Report (TDR) (SF361) as described in AR 55-38/NAVSUPINST 4610.33C/AFR 75-18/MCO P4610.19D/DLAR 4500.15.

4.2.2.3 Examine Each Item for Damage. If any item is damaged, fill out and forward SF364 Report of Discrepancy (ROD) as prescribed in AR 735-11-2/DLAR 4140.55/NAVMATINST 4355.73A/AFR 400-64/MCO 4430.3F. All damages should be reported as prescribed by DA Pam 738-750, as contained in Maintenance Management Update.

4.3 MK, Distribution, and Consumables.

4.3.1 Items Supplied in MK and/or Required for Installation. Use Table 4-1 and figure 4-1 to identify and inventory MK parts supplied to install Radio Set AN/VRC-87C/88C.

4.3.2 Distribution and Issue Instructions.

- a. US Forces: Do not requisition MK. They will be shipped automatically.
- b. US Army Depots: Requisition MK through supply channels.
- c. Multiservice: Instructions shall be included for multiservice modifications.
- d. MAPIMAS Countries: Instructions shall be provided for MAP/MAS countries.

Table 4-1. MK Parts List for Installation of Radio Set ANIVRC-87C/88C

NSN	ITEM DESCRIPTION AND PART NUMBER	QUANTITY IN MK	SMR CODE	FIGURE, ITEM NO.
5985-01-297-2971 5305-00-847-1159	Antenna AS-3900/VRC (A3017899-1) Screw, Cap, Hexagon (3/8-16 x 1 3/4 in) MS35307-365	1 4	PAOOF A PAOZZA	4-1, 3
5310-00-913-8881 5310-00-061-1258	Nut, Hexagon (3/8-16 in) MS51971-3 Washer, Lock, Internal/External-Toothed (3/8 in) MS45904-76	4 8	PAOZZA PAOZZA	
5310-00-889-2527	Washer, Lock, Internal/External-Toothed (5/16 in) MS45904-72	2	PAOZZA	
5306-00-225-9086	Bolt, Machine (5/16-24 x 5/8 in) MS90726-31 (Not Used)	1	PAOZZA	
5330-01-205-2864	Gasket (A3013655-1)	1	PAOZZA	
5965-01-222-1420	Loudspeaker - Control Unit LS-671/VRC (A3014065-1)	1	PAOFFA	4-1, 4
5975-01-285-2352	Mounting Base, Electrical Equipment MT-6576/VRC (A3018353-1)	1	PAOOF A	4-1, 1
5306-00-225-9089 5310-00-889-2527	Bolt, Machine (5/16-24 x 1 in) MS90726-34 Washer, Lock, Internal/External-Toothed (5/16 in) MS45904-72 (4 Not Used)	4 8	PAOZZA PAOZZA	
5310-00-880-7746	Nut, Hexagon (5/16 - 24 in) MS51968-5 (Not Used)	4	PAOZZA	
6160-01-339-7723 5306-00-225-9089 5310-00-889-2527	Tray, Battery CY-8664/VRC (A3167734-1) Bolt, Machine (5/16-24 x 1 in) MS90726-34 Washer, Lock, Internal/External-Toothed (5/16 in) MS45904-72 (3 Not Used)	1 3 6	PAOZZA PAOZZA PAOZZA	4-1, 6
5310-00-880-7746	Nut, Hexagon (5/16 - 24 in) MS51968-5 (Not Used)	3	PAOZZA	
5310-00-407-9566	Washer, Lock, (5/16 in) MS35338-45 (Alternate)	3	PAOZZA	
5310-00-081-4219	Washer, Flat (5/16 in) MS27183-12 (Alternate)	6	PAOZZA	
5995-01-225-0503	Cable Assembly, Power, Electrical CX-13306/VRC (5 FT, 0 IN) (A3014043-6)	1	PAOZZA	4-1, 18
5995-01-219-7031	Cable Assembly, Radio Frequency CG-3855/VRC (9 FT, 0 IN) (A3014031-4)	1	PAOZZA	4-1, 19
5995-01-304-8428	Cable Assembly, Special Purpose, Electrical CX-13290/VRC (2 FT, 0 IN) (A3014035-6)	1	PAOZZA	4-1, 17
5995-01-300-9290	Cable Assembly, Special Purpose, Electrical CX-13300/VRC (24 FT, 0 IN) (A3014044-9)	1	PAOZZA	4-1, 21
5995-01-303-4951	Cable Assembly, Special Purpose, Electrical CX-13313/VRC (2 FT, 7 IN) (A3018360-1)	1	PAOZZA	4-1, 20
5995-01-259-9283	Cable Assembly, Special Purpose, Electrical CX-13292/VRC (8 FT, 0 IN) (A3014038-12)	1	PAOZZA	4-1, 22
	4			

Table 4-1. MK Parts List for Installation of Radio Set AN/VRC-87C/88C Continued

NSN	ITEM DESCRIPTION AND PART NUMBER	QUANTITY IN MK	SMR CODE	FIGURE, ITEM NO.
6160-01-284-4200	Battery Box CY-8523A/PRC (A3148167-1)	1	PAOFFA	4-1, 7
5306-00-225-9089	Bolt, Machine (5/16-24 x 1 in) MS90726-34	17	PAOZZA	
	Bolt, Square Neck (3/8-16 x 3 1/2 in) (A3148290-1)	2	PAOZZA	
	Bracket, Multiple Angle (A3018351-1)	1	XBOZZA	4-1, 16
	Bracket, Mounting (A3018957-1)	1	XBOZZA	4-1, 15
	Bracket, Mounting (A3019268-1)	1	XBOZZA	4-1, 10
	Bracket, Mounting - Antenna (A3050655-1)	1	XBOZZA	4-1, 2
	Case, Electronic Communications Equipment (A3018996-1)	1	XBOZZA	4-1, 14
5340-00-809-1490	Clamp, Loop (1/4 - 1/4 in) MS21333-98	1	PAOZZA	
5340-00-400-0002	Clamp, Loop (1 1/4 - 1/4 in) MS9350-19	14	PAOZZA	
5340-00-764-7052	Clamp, Loop (1 3/16 - 5/16 in) MS21333-116	1	PAOZZA	
5340-00-088-1254	Clamp, Loop (5/8 - 1/4 in) MS21333-104	1	PAOZZA	
	Cover, Access (A3018998-1)	1	XBOZZA	4-1, 9
	Door, Access (A3018999-1)	1	XBOZZA	4-1, 12
4020-01-341-8795	Fiber Rope Assembly, Single Leg (A3167672-1)	1	PAOZZA	4-1, 8
5325-00-174-9332	Grommet, Nonmetallic (11/16 in) MS35489-48	1	PAOZZA	
5325-00-923-9512	Grommet, Nonmetallic - Plastic Edging MS21266-4N	3	PAOZZA	
5965-00-043-3463	Handset H-250/U	1	PAOZZA	4-1, 5
5310-00-913-8881	Nut, Hexagon (3/8-16 in) MS51971-3	6	PAOZZA	
5310-00-761-6882	Nut, Hexagon (1/4-20 in) MS51967-2	17	PAOZZA	
5310-00-880-7746	Nut, Hexagon (5/16-24 in) MS51968-5	2	PAOZZA	
	Plate, Mounting - AM-1780/VRC (A3019267-1)	1	XBOZZA	4-1, 13
	Plate, Mounting - Speaker (A3014550-1)	1	XBOZZA	4-1, 11
	Screw, Externally-Relieved Body (A3018701-2)	2		
5305-00-702-4523	Screw, Cap, Hexagon (1/4-20 x 3/4 in) MS35307-306	5	PAOZZA	
5305-00-068-0505	Screw, Cap, Hexagon (1/4-28 x 5/8 in) MS90726-5	14	PAOZZA	
5305-00-576-5417	Screw, Cap, Hexagon (3/8-16 x 1 in) MS35307-360	4	PAOZZA	
5305-00-087-4478	Screw, Tapping, Hex-Head (1/4-20 x 5/8 in) MS51 851-95	1	PAOZZA	
5305-01-012-8226	Screw, Tapping, Hex-Head (3/8-16 x 3/4 in) MS51851-136	4	PAOZZA	
	5			

Table 4-1. MK Parts List for Installation of Radio Set AN/VRC-87C188C Continued

NSN	ITEM DESCRIPTION AND PART NUMBER	QUANTITY IN MK	SMR CODE	FIGURE, ITEM NO.
5305-00-054-6654	Screw, Machine Hex-Head (No. 6-32 x 1/2 in) MS51957-30	4	PAOZZA	
5975-00-111-3208	Strap, Tiedown, Electrical Components MS3367-5-9	20	PAOZZA	
	Tubing, Nonmetallic - Polyurethane (A3018681-1)	1	XBOZZA	
5310-00-081-4219	Washer, Flat (5/16 in) MS27183-12	18	PAOZZA	
5310-00-809-4058	Washer, Flat (1/4 in) MS27183-10	12	PAOZZA	
5310-00-045-4007	Washer, Lock (No. 6) MS35338-41	4	PAOZZA	
5310-00-582-5965	Washer, Lock (1/4 in) MS35338-44	27	PAOZZA	
5310-00-407-9566	Washer, Lock (5/16 in) MS35338-45	17	PAOZZA	
5310-00-061-1258	Washer, Lock, Internal/External-Toothed (3/8 in) MS45904-76	12	PAOZZA	
5310-00-889-2528	Washer, Lock, Internal/External-Toothed (1/4 in) MS45904-68	7	PAOZZA	

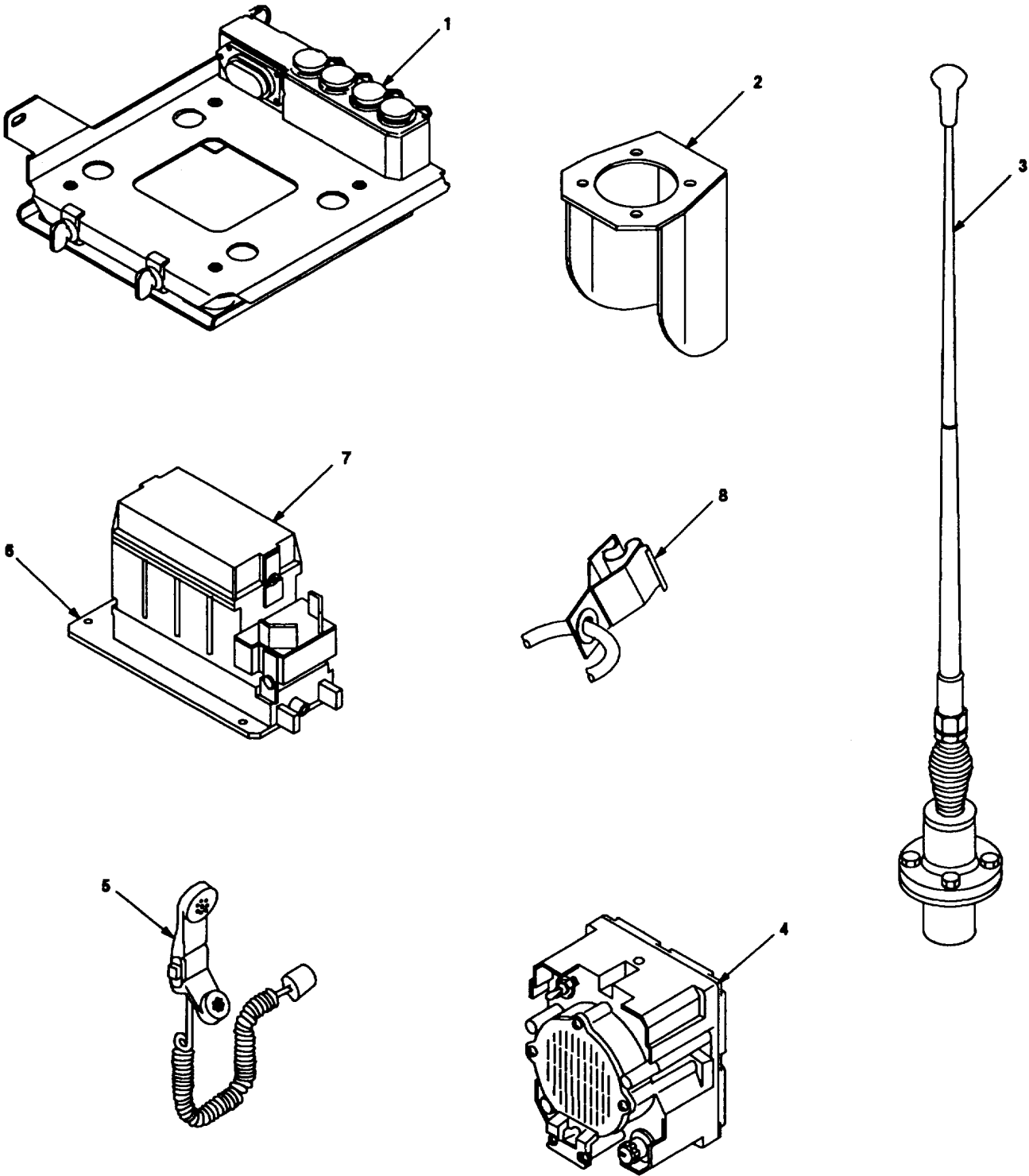


Figure 4-1 (1). MK Illustrated Parts List

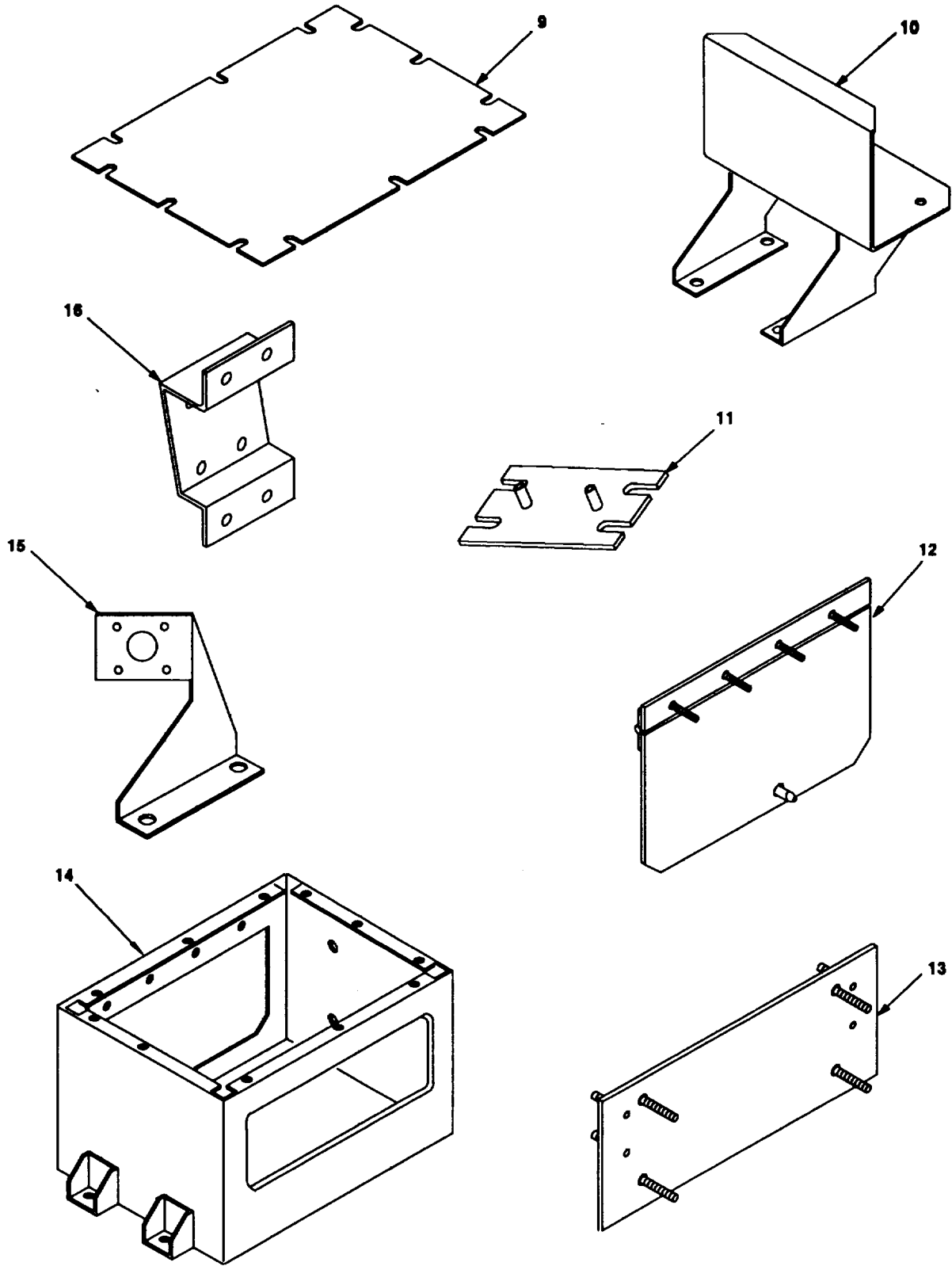


Figure 4-1 (2). MK Illustrated Parts List

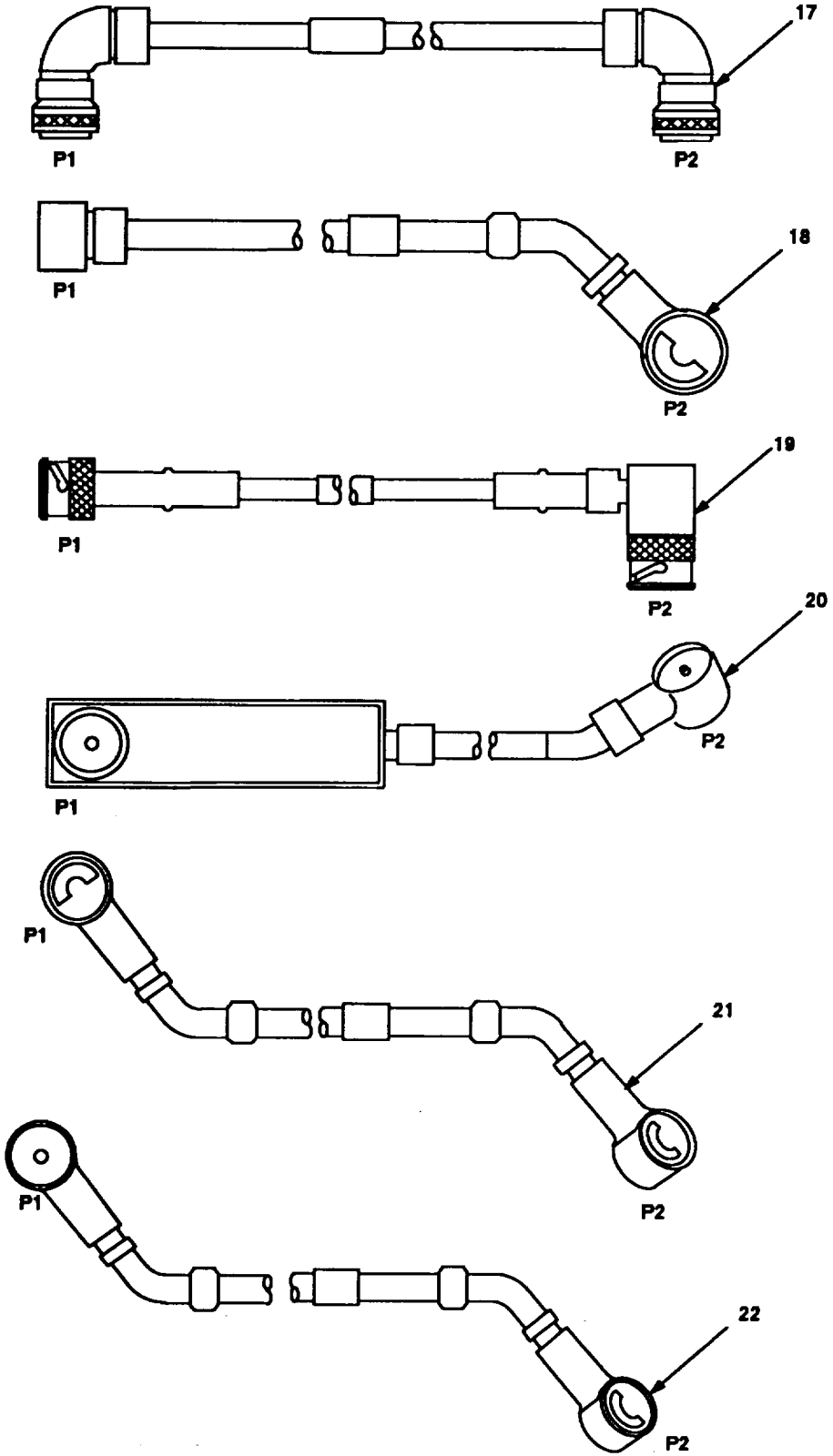


Figure 4-1 (3). MK Illustrated Parts List

4.3.3 Consumable Materials. The table below lists materials required for installation but not supplied with MK.

NSN	NOMENCLATURE
8040-00-117-8510	Adhesive-Sealant, Clear, RTV
6850-00-880-7616	Silicone Compound, MIL-S-8660

4.4 Tools and Test, Measurement, and Diagnostic Equipment (TMDE) Required. The following tools and TMDE are needed for installation.

NOMENCLATURE	NSN	QUANTITY
Radio Set*		1
Pocket Knife, Electrician's	5110-00-240-5943	1
Screwdriver, No. 2 Point Phillips, 4 in	5120-00-234-8913	1
Screwdriver, 1/4 in Flatblade, 4 in	5120-00-222-8852	1
Pliers, Round Nose	5120-00-240-6172	1
Pliers, Diagonal Cutting	5110-00-965-0974	1
Wrench, Open/Box: 7/16 in	5120-00-228-9505	1
1/2 in	5120-00-228-9506	1
9/16 in	5120-00-228-9507	1
3/8 in	5120-00-228-9504	1
Hammer, Hand; 4 oz. Head	5120-00-243-2985	1
Handle, Socket Wrench	5120-00-240-5364	
Socket: 7/16 in	5120-00-227-6703	1
1/2 in	5120-00-237-0977	1
9/16 in	5120-00-227-6704	1
3/8 in	5120-00-227-6702	1
Tap Handle		
Tap: 3/8-16 UNC-2B		1
Electric Drill	5133-00-889-8994	1
Drill Bit: 9/32 in	5133-00-222-9374	
Size 1 (.228 in)	5133-00-189-9246	1
11/32 in	5133-00-227-9664	1
5/8 in		1
7/16 in	5133-00-227-9670	1

* Use radio issued with your vehicle if available.

5. INSTALLATION PROCEDURES.

This section describes where and how to install MK items in the vehicle. See figure 5-1 for an overall view of where vehicular MK equipment, as well as radio components, typically will be installed. When installing MK equipment, be sure to read and follow instructions and illustrations carefully.

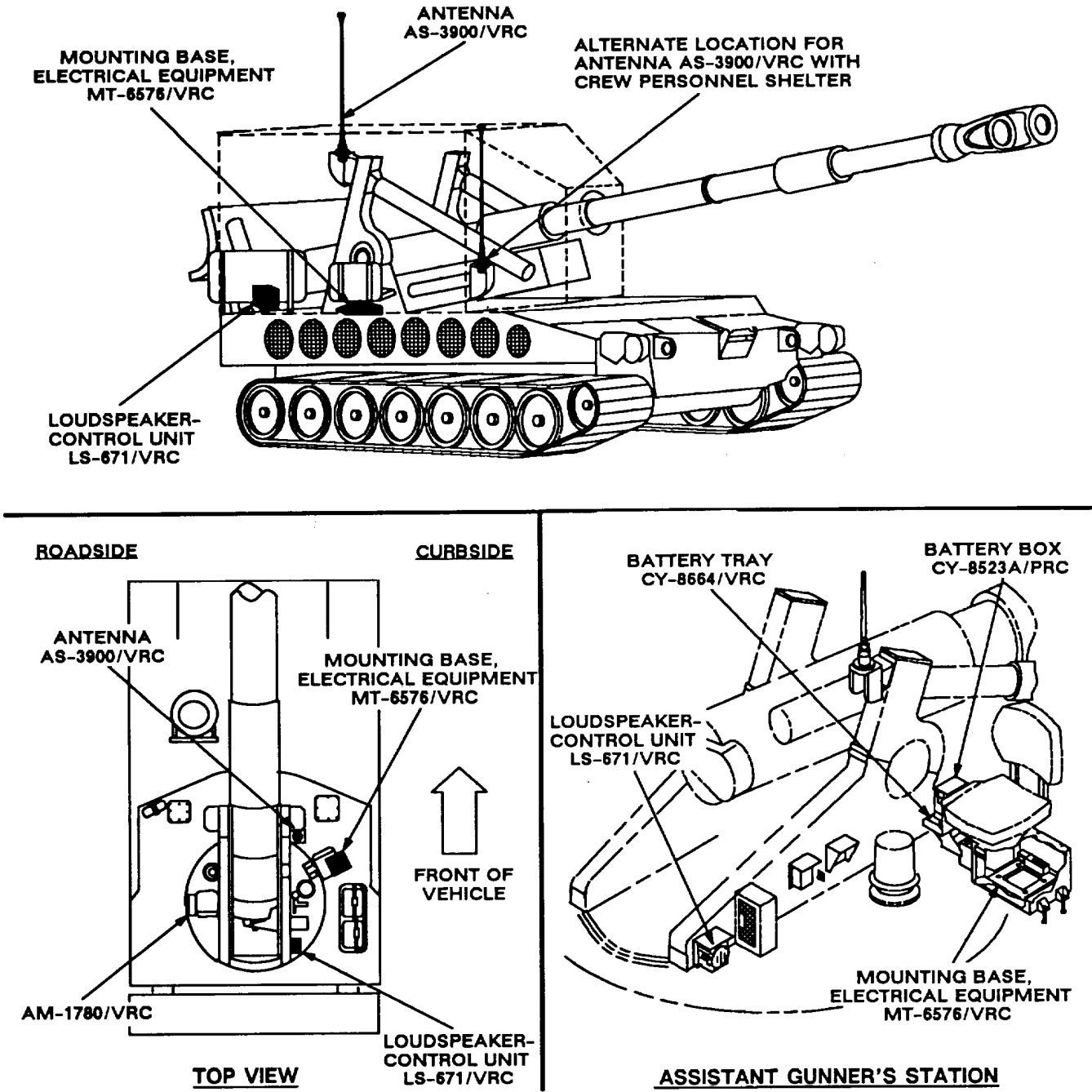
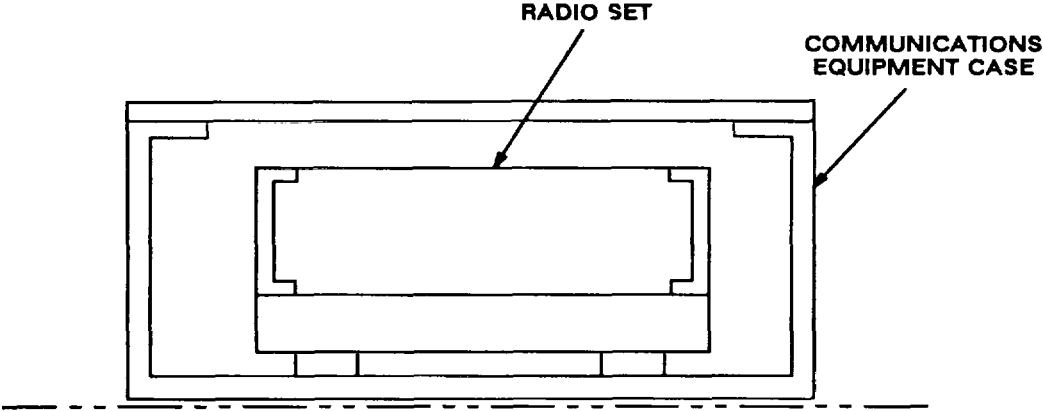


Figure 5-1 (1). MK and Radio Installation: MK Equipment Locations

5. INSTALLATION PROCEDURES. Continued

INSTALLATION
FOR
AN/VRC-87C/88C



ASSISTANT GUNNER'S STATION

Figure 5-1 (2). MK and Radio Installation: Radio Equipment Locations

5.1 Installation of Antenna AS-3900/VRC (antenna). See figures 5-1 (1) for locations.

5.1.1 Installation of Antenna Base.

ITEM	ACTION	REMARKS
------	--------	---------

NOTE

Apply a thin coat of adhesive-sealant to both sides of each internal/external-toothed (IET) washer during installation, and to the area of contact where IET washer is to be placed.

- | | | |
|---|---|---|
| a. Mounting holes for multiple angle bracket (3). | Using angle bracket as a template, drill four 11/32 in diameter holes in right trunnion above existing bolt. See figure 5-2 (1) for approximate location. | Tools: Electric drill and 11/32 in drill bit. |
| b. Four holes drilled in step a. | Cut screw threads in holes. See figure 5-2(2) | Tools: Tap handle and tap (3/8-16 UNC-2B). |
| c. Multiple angle bracket (3). | Place against trunnion and align with tapped holes. | |
| d. Four hex-head tapping screws (6) and four internal/external-toothed (IET) washers (7). | Install and secure to multiple angle bracket (3) and trunnion. | Tools: 9/16 in socket. |
| e. Antenna bracket (4). and align mounting holes. | Place against multiple angle bracket (3) | |

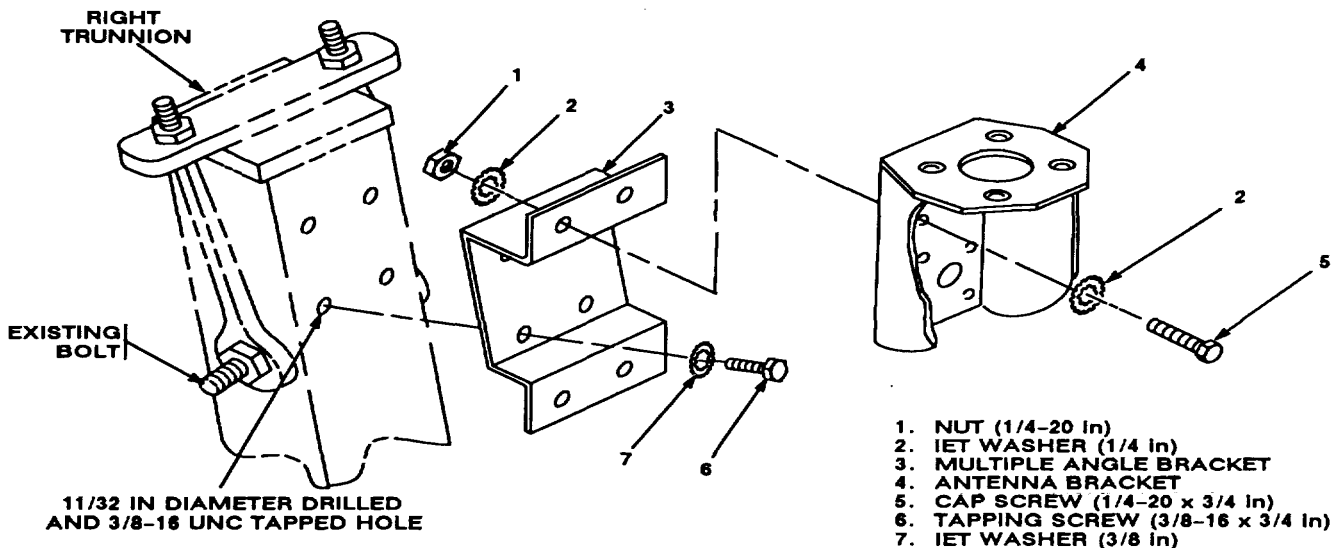


Figure 5-2 (1). Antenna Base Installation: Installing Antenna Bracket

5.1.1 Installation of Antenna Base. Continued

ITEM	ACTION	REMARKS
f. Three cap screws (5) and six IET washers (2).	Install and secure to top two and bottom right mounting holes in antenna bracket (4) and multiple angle bracket (3). See figure 5-2 (1).	Tools: 7/16 in socket and 7/16 in open/box wrench.
g. Gasket (4).	Place on antenna bracket (5) and aline mounting holes. See figure 5-2 (2).	
h. Antenna base (1).	Place on top of gasket (4) and antenna bracket (5); then aline mounting holes.	
i. Four cap screws (2), eight IET washers (3) and four nuts (6).	Install and secure to antenna base (1) and antenna bracket (5).	Tools: 9/16 in socket and 9/16 in open/box wrench.
j. Ground strap (9), cap screw (8), two IET washers (7), one IET washer (11) and nut (10).	Install and secure to bottom left hole in antenna bracket (5) and multiple angle bracket (12).	Tools: 7/16 in socket.

- 1. ANTENNA BASE
- 2. CAP SCREW (3/8-16 x 1 3/4 in)
- 3. IET WASHER (3/8 in)
- 4. GASKET
- 5. ANTENNA BRACKET
- 6. NUT (3/8-16 in)
- 7. IET WASHER (5/16 in)
- 8. CAP SCREW (1/4-20 x 3/4 in)
- 9. GROUND STRAP
- 10. NUT (1/4 -20 in)
- 11. IET WASHER (1/4 in)
- 12. MULTIPLE ANGLE BRACKET

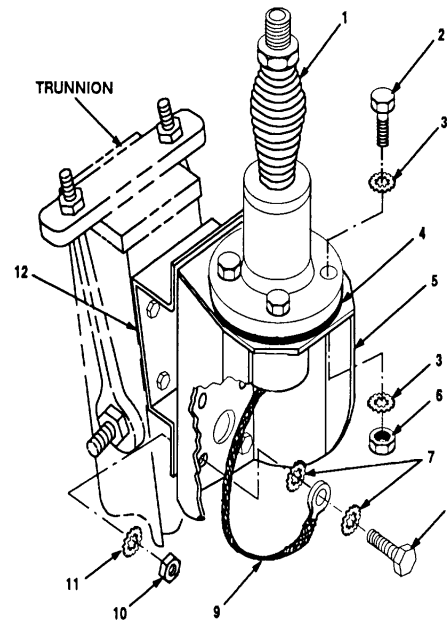


Figure 5-2 (2). Antenna Base Installation: Installing Antenna Base

5.1.2 Installation of Antenna Base (With Crew Personnel Shelter).

ITEM	ACTION	REMARKS
NOTE		
Apply a thin coat of adhesive-sealant to both sides of each internal/external-toothed (IET) washer during installation, and to the area of contact where IET washer is to be placed.		
a. Mounting holes for antenna bracket (3).	Using antenna bracket as a template, drill four 9/32 in diameter holes and one 5/8 in diameter hole through frame of crew personnel shelter. See figure 5-3 (1) for approximate location.	Tools: Electric drill, 9/32 in and 5/8 in drill bits.
b. Antenna bracket (3).	Place against crew personnel shelter frame and aline mounting holes. See figure 5-3 (1).	
c. Three cap screws (4), three IET washers (2) and three nuts (1).	Install and secure to top two holes and bottom right hole in antenna bracket (3) and crew personnel shelter frame.	Tools: 7/16 in socket.

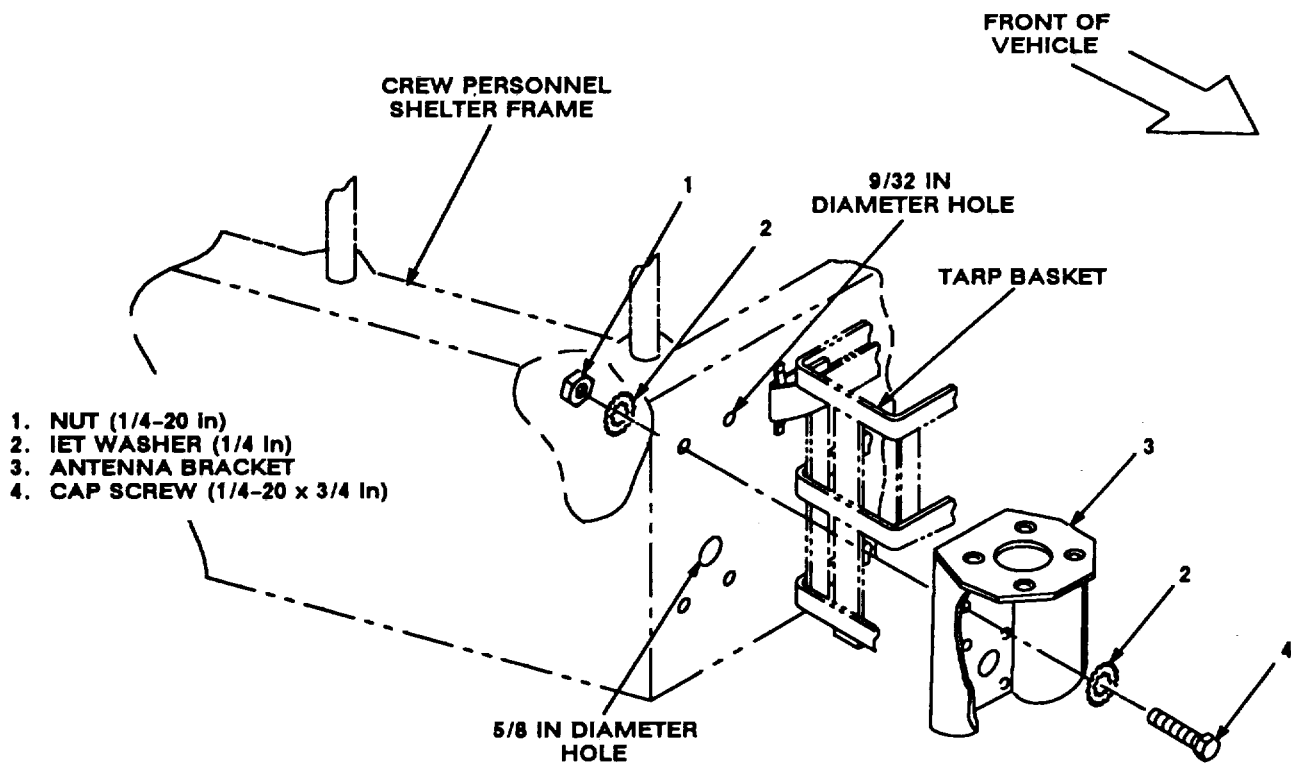


Figure 5-3 (1). Alternate Antenna Base Installation: Installing Antenna Bracket

5.1.2 Installation of Antenna Base (With Crew Personnel Shelter). Continued

ITEM	ACTION	REMARKS
d. Gasket (4).	Place on antenna bracket (5) and aline mounting holes. See figure 5-3 (2).	
e. Antenna base (1).	Place on top of gasket (4) and antenna bracket (5); then aline mounting holes.	
f. Four cap screws (2), eight IET washers (3) and four nuts (6).	Install and secure to antenna base (1) and antenna bracket (5).	Tools: 9/16 in socket and 9/16 in open/box wrench.
g. Ground strap (9), cap screw (8), two IET washers (7), one IET washer (10) and nut (11).	Install and secure to bottom left hole in antenna bracket (5) and crew personnel shelter frame.	Tools: 7/16 in socket and 7/16 in open/box wrench.

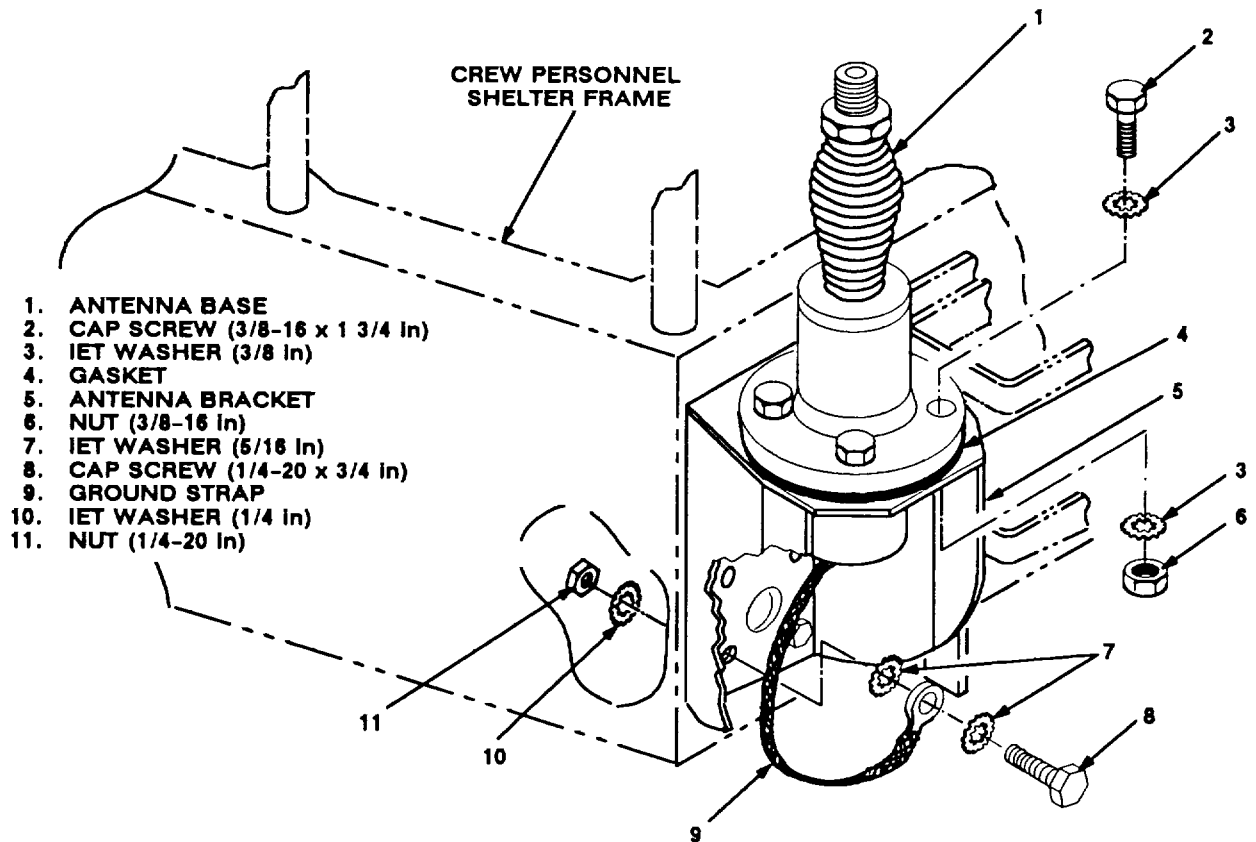
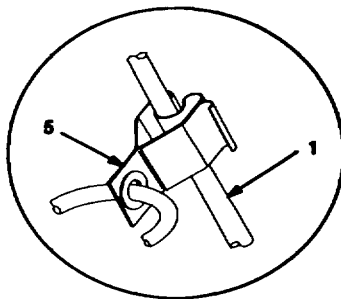
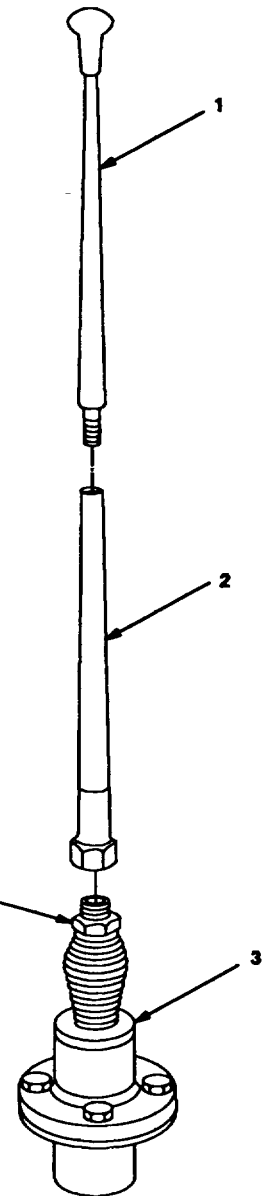


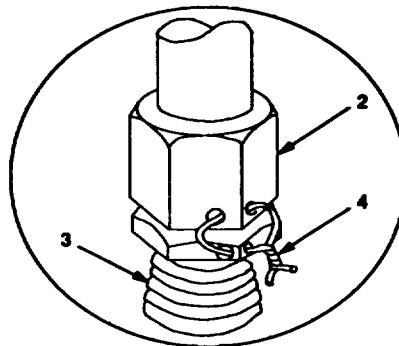
Figure 5-3 (2). Alternate Antenna Base Installation: Installing Antenna Base

5.1.3 Installation of Top Antenna Assembly. The top portion of the antenna includes a lower element and an upper element (with installed cap). Use the following procedure to assemble, install and tie down all antennas.

ITEM	ACTION	REMARKS
a. Antenna elements (1, 2).	Apply silicone compound to element threads and assemble. See Figure 5-4	
b. Antenna element (2).	Install and hand-tighten to antenna base (3).	
c. Lock wire (4).	Install to antenna element (2) and antenna base (3). See Figure 5-4 detail A. Cut and remove excess wire with diagonal cutting pliers.	
d. Fiber rope assembly (5).	Attach clip to antenna element (1). Tie rope to vehicle to position antenna in desired location. See Figure 5-4 detail B.	



DETAIL B



DETAIL A

- 1. ANTENNA ELEMENT (UPPER)
- 2. ANTENNA ELEMENT (LOWER)
- 3. ANTENNA BASE
- 4. LOCK WIRE
- 5. FIBER ROPE ASSEMBLY

Figure 5-4. Top Antenna Assembly Installation

5.2 Modifications to Vehicle. Use the following procedure to relocate existing intercom equipment and cables on the vehicle.

ITEM	ACTION	REMARKS
a. Intercom cables B, C and D.	Disconnect from AM-1780/VRC. See figure 5-5 (1) for location(s).	
b. AM-1 780/VRC.	Remove AM-1780/VRC from existing location and place in new location near gunner's seat.	
c. Intercom cable A.	Remove from connector assembly and route to new location below gunner's seat.	

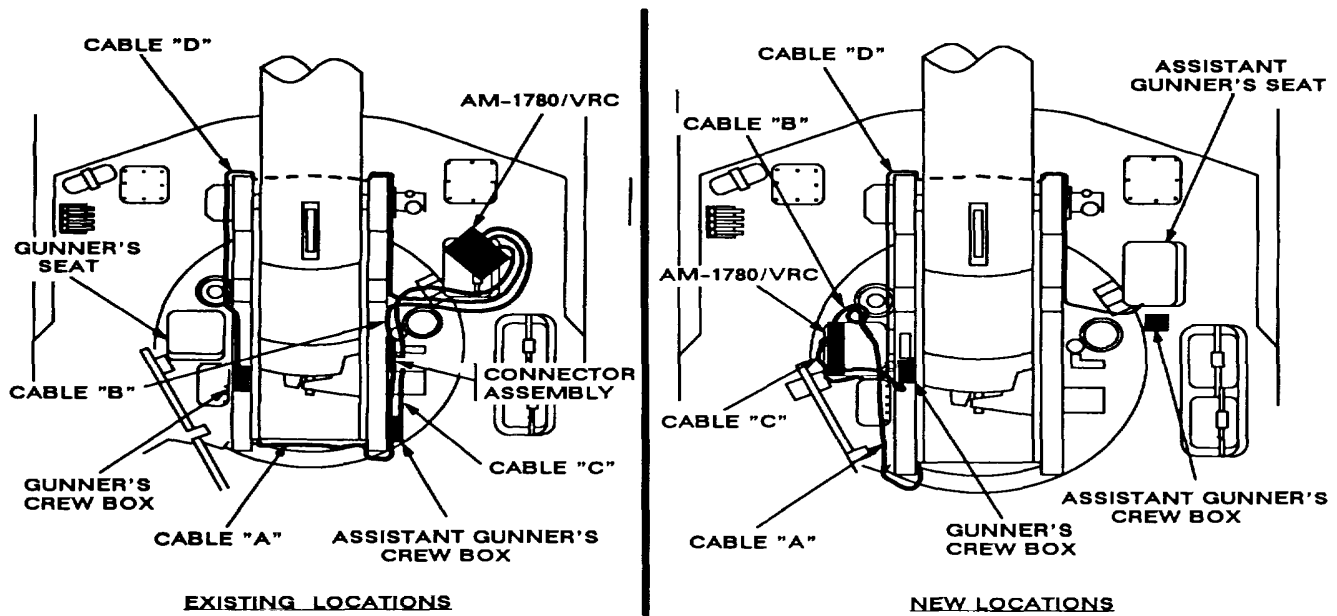
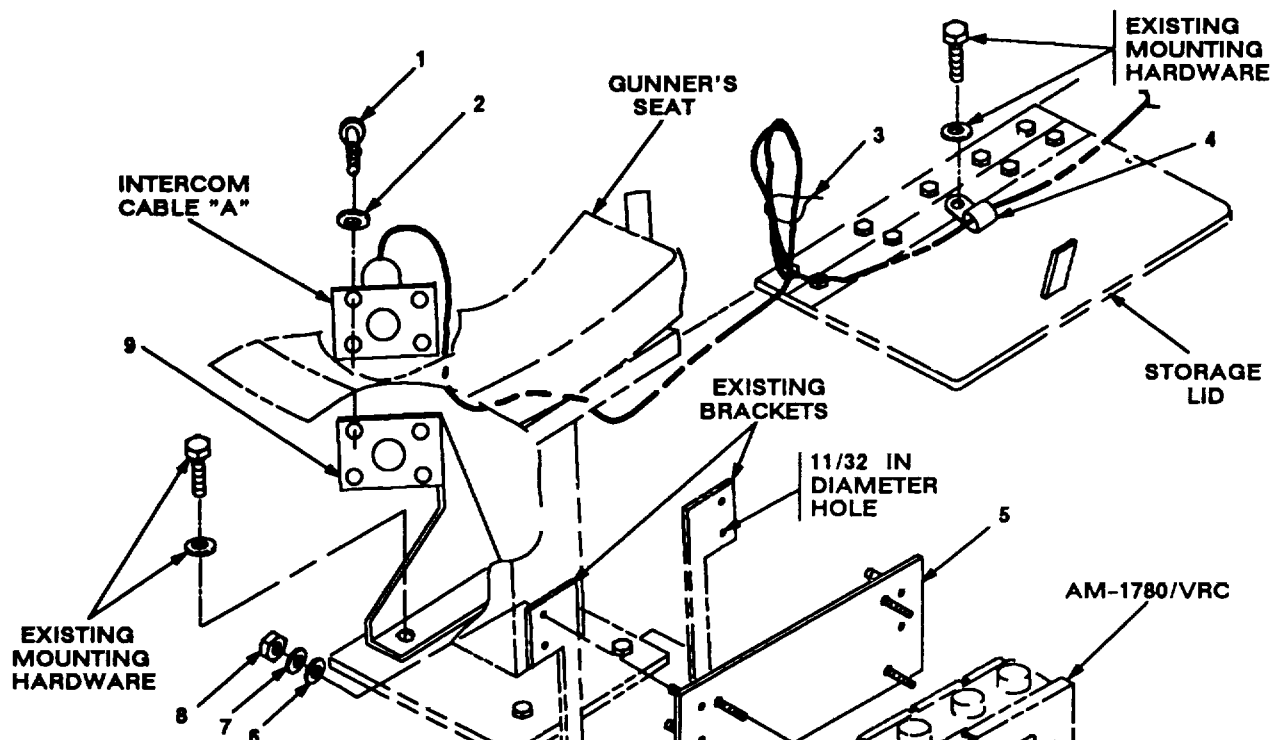


Figure 5-5 (1). Modifying Vehicle: Relocating Intercom Equipment and Cables

d. Mounting holes in existing brackets (below gunner's seat).	Enlarge to 11/32 in diameter. See figure 5-5 (2).	Tools: Electric drill and 11/32 in drill bit.
e. Mounting plate (5), four lock washers (7), four flat washers (6) and four nuts (8).	Install and secure to existing brackets.	Tools: 7/16 in socket.
f. AM-1780/VRC, four lock washers (7), four flat washers (6) and four nuts (8).	Install and secure to mounting plates (5).	Tools: 7/16 in socket.

5.2 Modifications to Vehicle. Continued

ITEM	ACTION	REMARKS
------	--------	---------



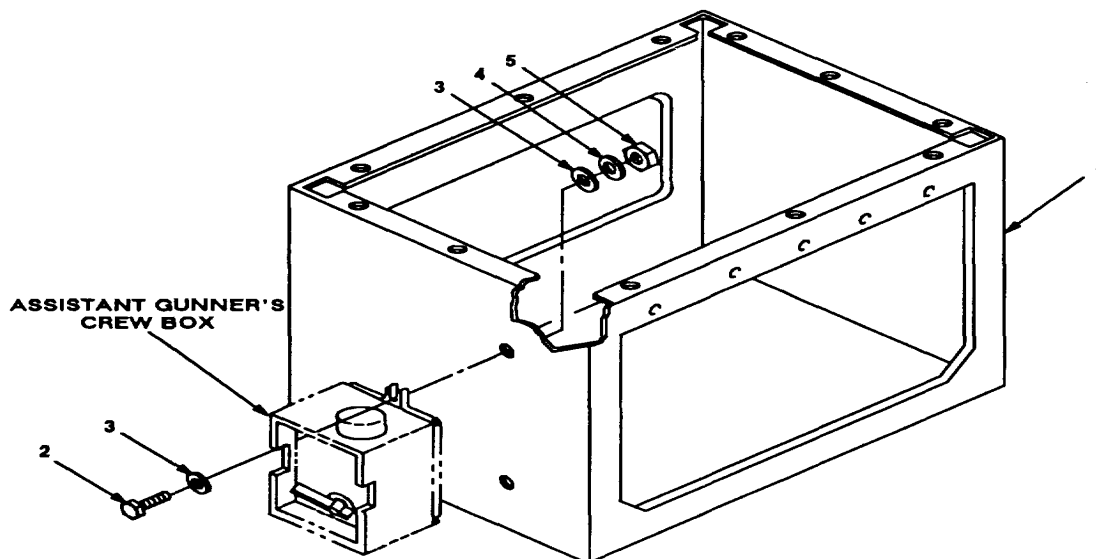
- 1. MACHINE SCREW (NO. 6-32 x 1/2 in)
- 2. LOCK WASHER (NO. 6)
- 3. TIEDOWN STRAP
- 4. LOOP CLAMP (5/8-1/4 IN)
- 5. MOUNTING BRACKET
- 6. FLAT WASHER (1/4 in)
- 7. LOCK WASHER (1/4 in)
- 8. NUT (1/4-20 in)
- 9. MOUNTING BRACKET

Figure 5-5 (2). Modifying Vehicle: Reinstalling AM-1780/VRC and Intercom Cable A

g. Mounting bracket (9).	Install and secure to base of gunner's seat with existing mounting hardware. See figure 5-5 (2).	
h. Intercom cable A, four pan-head machine screws (1) and four lock washers (2).	Install and secure to mounting bracket (9).	Tools: Phillips screwdriver.
i. Loop clamp (4).	Install to storage lid with existing mounting hardware.	
j. Intercom cable A.	Adjust cable slack and secure with tiedown strap (3). See figure 5-5 (2) for location.	
k. Intercom cable D.	Disconnect connector J801 from gunner's crew box and reconnect opposite end to AM-1780/VRC. See figure 5-5 (1) for location (s).	

5.2 Modifications to Vehicle. Continued

ITEM	ACTION	REMARKS
l. Intercom cable C.	Disconnect from assistant gunner's crew box; then move to new location and re-connect to gunner's crew box and AM-1780/VRC. See figure 5-5 (1) for location(s).	
m. Intercom cable B.	Disconnect from connector assembly; then move to new location and reconnect to AM-1780/VRC and intercom cable A.	
n. Assistant gunner's crew box.	Remove from existing location and place near assistant gunner's seat.	
o. Existing intercom cable D.	Position connector J801 near assistant gunner's seat.	
p. Assistant gunner's crew box, two machine bolts (2), four flat washers (3), two lock washers (4) and two nuts (5).	Install and secure to communications equipment case (1). See figure 5-5 (3).	Tools: 1/2 socket and 1/2 in open/box wrench.



1. COMMUNICATIONS EQUIPMENT CASE
2. MACHINE BOLT (5/16-24 x 1 in)
3. FLAT WASHER (5/16 in)
4. LOCK WASHER (5/16 in)
5. NUT (5/16-24 in)

Figure 5-5 (3). Modifying Vehicle: Reinstalling Assistant Gunner's Crew Box

5.3 Installation of Mounting Base, Electrical Equipment MT-65761VRC (mounting base). Remove and retain attaching bag of 5/16 in mounting hardware for installation. To insure good electrical grounding, any rust, corrosion or paint around mounting holes in communications equipment case should be removed before installing the mounting base. See figure 5-6 and perform the following steps.

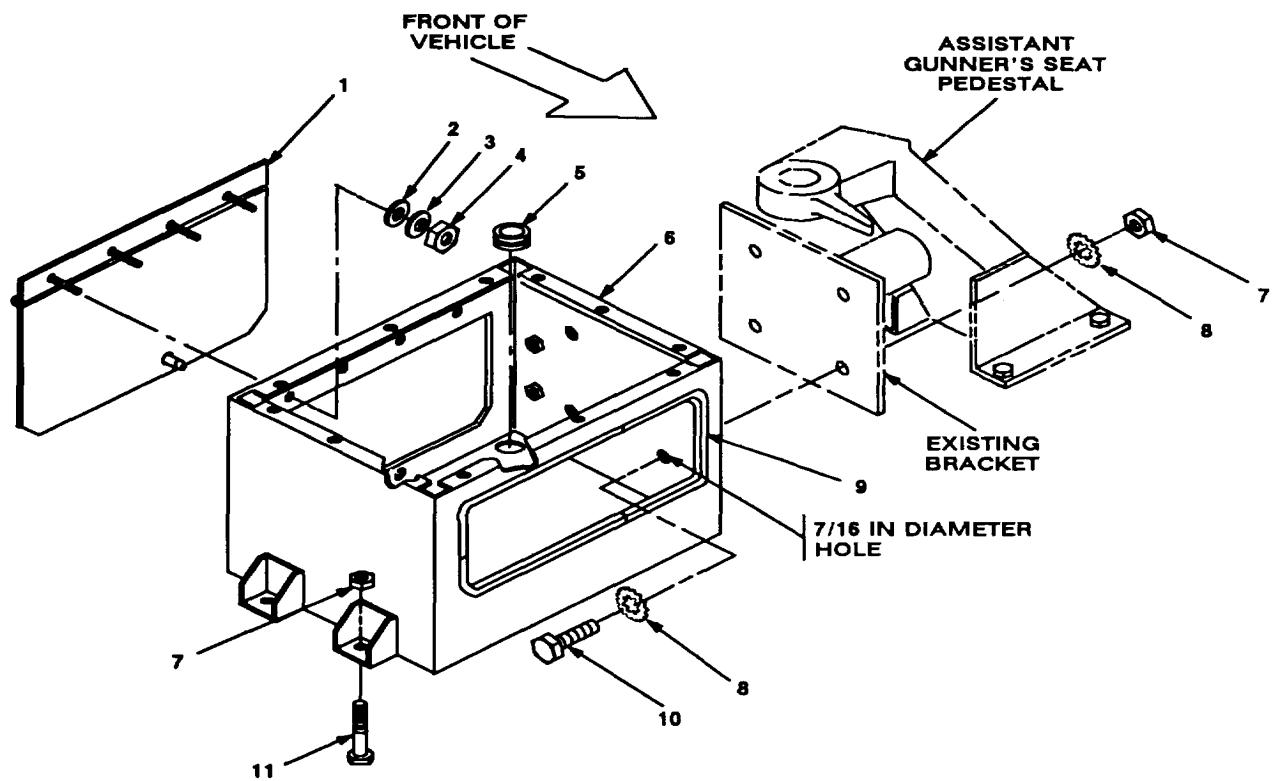
ITEM	ACTION	REMARKS
------	--------	---------

NOTE

Apply a thin coat of adhesive-sealant to both sides of each internal/external-toothed (IET) washer during Installation, and to the area of contact where IET washer is to be placed.

- | | | |
|--|---|--|
| a. Mounting holes for communications equipment case (6). | Using existing bracket (under assistant gunner's seat) as a template, mark and drill four 7/16 in diameter holes through side panel of communications equipment case (6). See figure 5-6 (1). | Assistant gunner's seat not shown.

Tools: Electric drill and 7/16 in drill bit. |
|--|---|--|



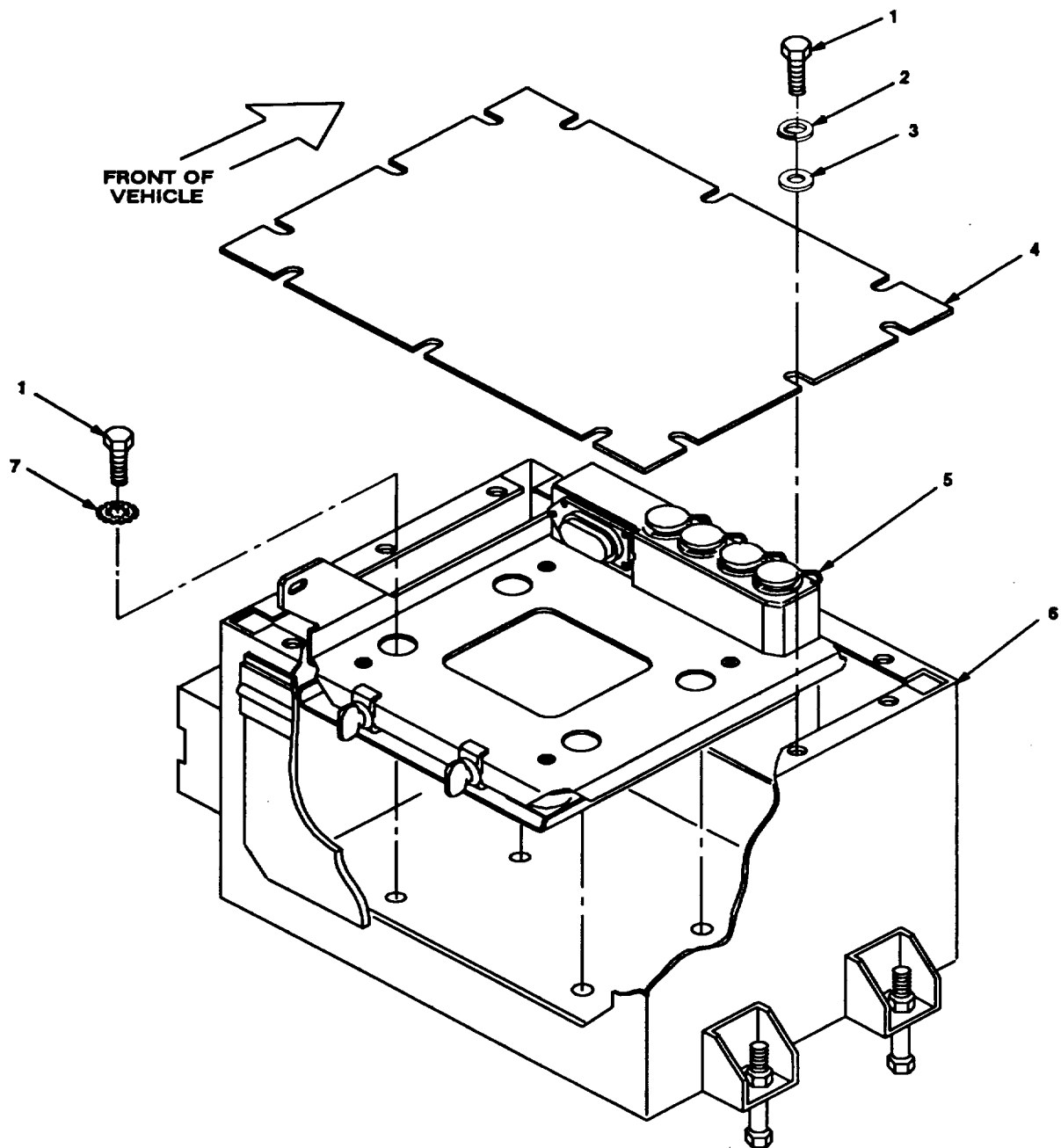
1. ACCESS DOOR
2. FLAT WASHER (1/4 in)
3. LOCK WASHER (1/4in)
4. NUT (1/4-20 in)
5. GROMMET (11/16 in)
6. COMMUNICATIONS EQUIPMENT CASE
7. NUT (3/8-16 In)
8. IET WASHER (3/8 In)
9. GROMMET (PLASTIC EDGING)
10. CAP SCREW (3/8-16 x 1 In)
11. SQUARE NECK BOLT (3/8-16 x 3 112 In)

Figure 5-6 (1). Mounting Base Installation: Installing Communications Equipment Case

5.3 Installation of Mounting Base, Electrical Equipment MT-6576/VRC (mounting base). Continued

ITEM	ACTION	REMARKS
b. Communications equipment case (6).	Place against existing bracket and aline mounting holes. See figure 5-6 (1).	
c. Four cap screws (10), eight IET washers (8) and four nuts (7).	Install and secure to coummunications equipment case (6) and existing bracket.	Tools: 9/16 in socket.
d. Two square neck bolt (11) and two nuts (4).	Install to base of communications equipment case (6), then adjust spacing between screw head and floor to 1/4 in.	Tools: 9/16 in open/box wrench.
e. Three plastic-edging grommets (9). equipment case (6).	Cut to size and install to cable access hole in rear panel of communications	Tools: Pocket knife.
f. Grommet (5).	Install to cable hole in bottom panel of communications equipment case (6).	
g. Access door (1), four flat washers (2), four lock washers (3) and four nuts (4).	Install and secure to front panel of communications equipment case (6).	Tools: 7/16 in socket.
h. Mounting base (5).	Place inside communications equipment case and aline with matching hole pattern. See figure 5-6 (2).	
i. Four machine bolts (1) and four IET washers (7).	Install and secure to mounting base (5) and communications equipment case (6).	Tools: 1/2 in socket.
j. Access cover (4).	Position on top of communications equipment case (6) and aline mounting holes.	
k. Twelve machine bolts (1), twelve lock washers (2) and twelve flat washers (3).	Install and secure to access cover (4) and communications equipment case (6).	Tools: 1/2 in socket.

5.3 Installation of Mounting Base, Electrical Equipment MT-65761VRC (mounting base). Continued



1. MACHINE BOLT (5/16-24 x 1 in)
2. LOCK WASHER (5/16 in)
3. FLAT WASHER (5/16 in)
4. ACCESS COVER
5. MOUNTING BASE
6. COMMUNICATIONS EQUIPMENT CASE
7. IET WASHER (5/16 in)

Figure 5-6 (2). Mounting Base Installation: Installing Mounting Base

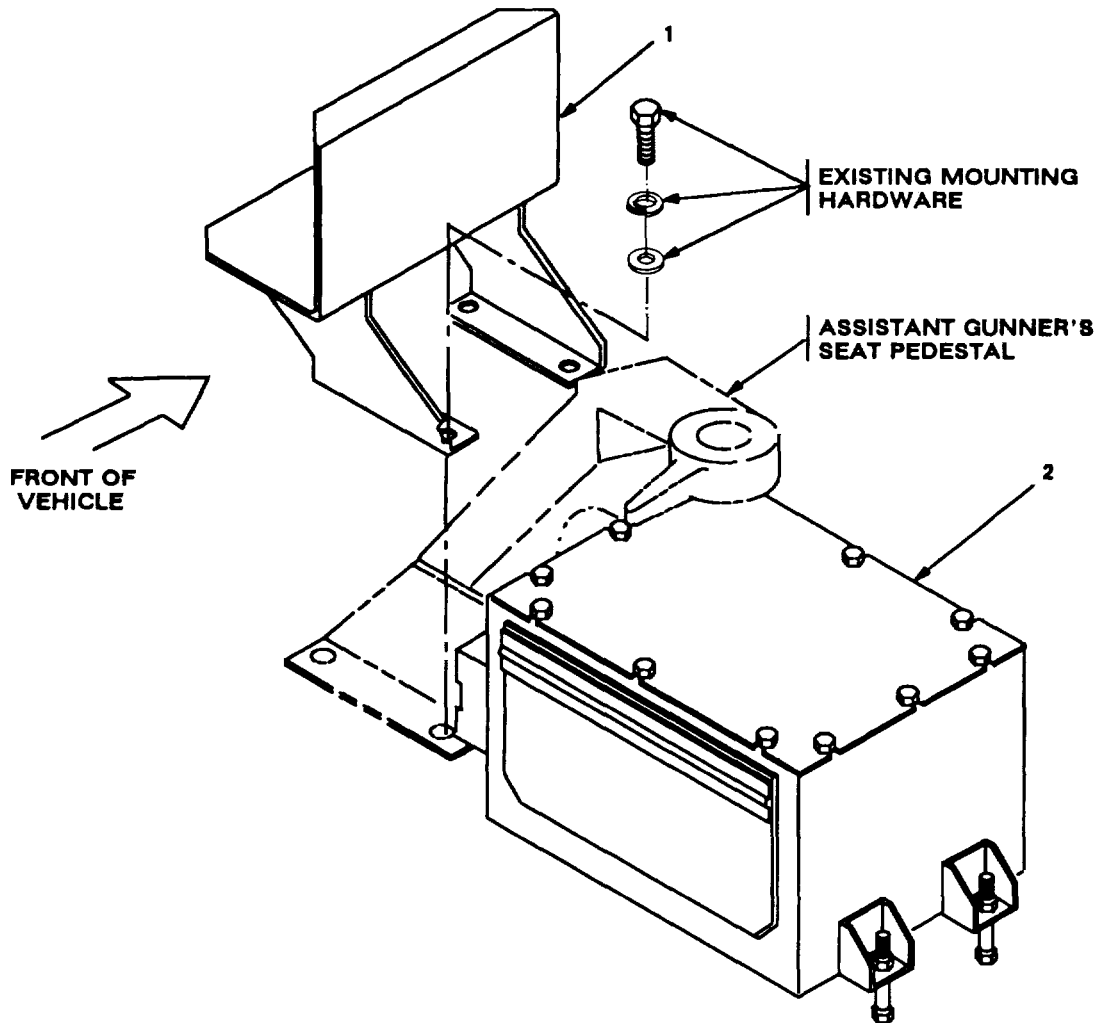
5.4 Installation of Tray, Battery CY-8664IVRC (battery tray) and Battery Box CY-8523A/PRC (battery box).

ITEM	ACTION	REMARKS
------	--------	---------

NOTE

Apply a thin coat of adhesive-sealant to both sides of each internal/external-toothed (IET) washer during installation, and to the area of contact where IET washer is to be placed.

- | | |
|--|--|
| b. Existing mounting hardware. | Temporarily remove from base of assistant gunner's pedestal. See figure 5-7 (1). |
| b. Mounting bracket (1). mounting holes. | Place on pedestal base and align mounting holes. |
| c. Existing mounting hardware removed in step a. | Install and secure to mounting bracket (1) and pedestal base. |



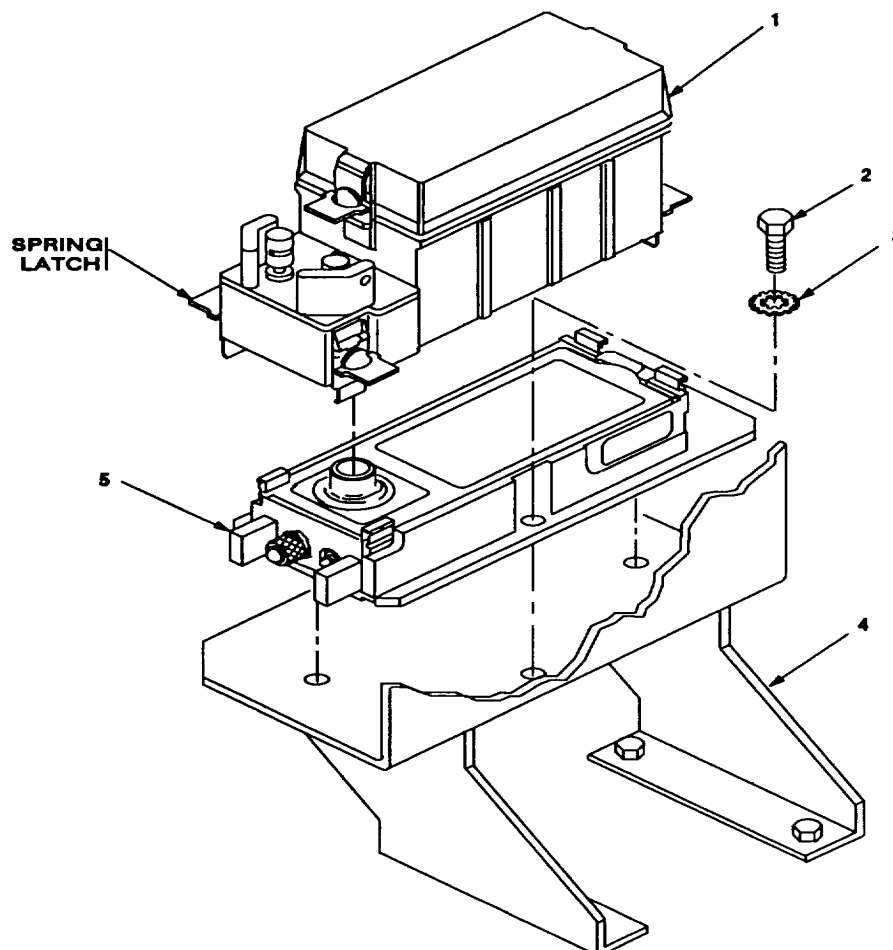
- 1. MOUNTING BRACKET
- 2. COMMUNICATIONS EQUIPMENT CASE

Figure 5-7 (1). Battery Tray and Battery Box Installation: Installing Mounting Bracket

5.4 Installation of Tray, Battery CY-86641VRC (battery tray) and Battery Box CY-8523A/PRC (battery box).

Continued

ITEM	ACTION	REMARKS
d. Battery tray (5).	Place on right side of mounting bracket (4) and align mounting holes. See figure 5-7 (2).	
e. Three machine bolts (2), and three IET washers (3).	Install and secure to battery tray (5) and mounting bracket (4).	Tools: 1/2 in socket.
f. Battery box (1).	Place on battery tray (5); then secure with four spring latches.	

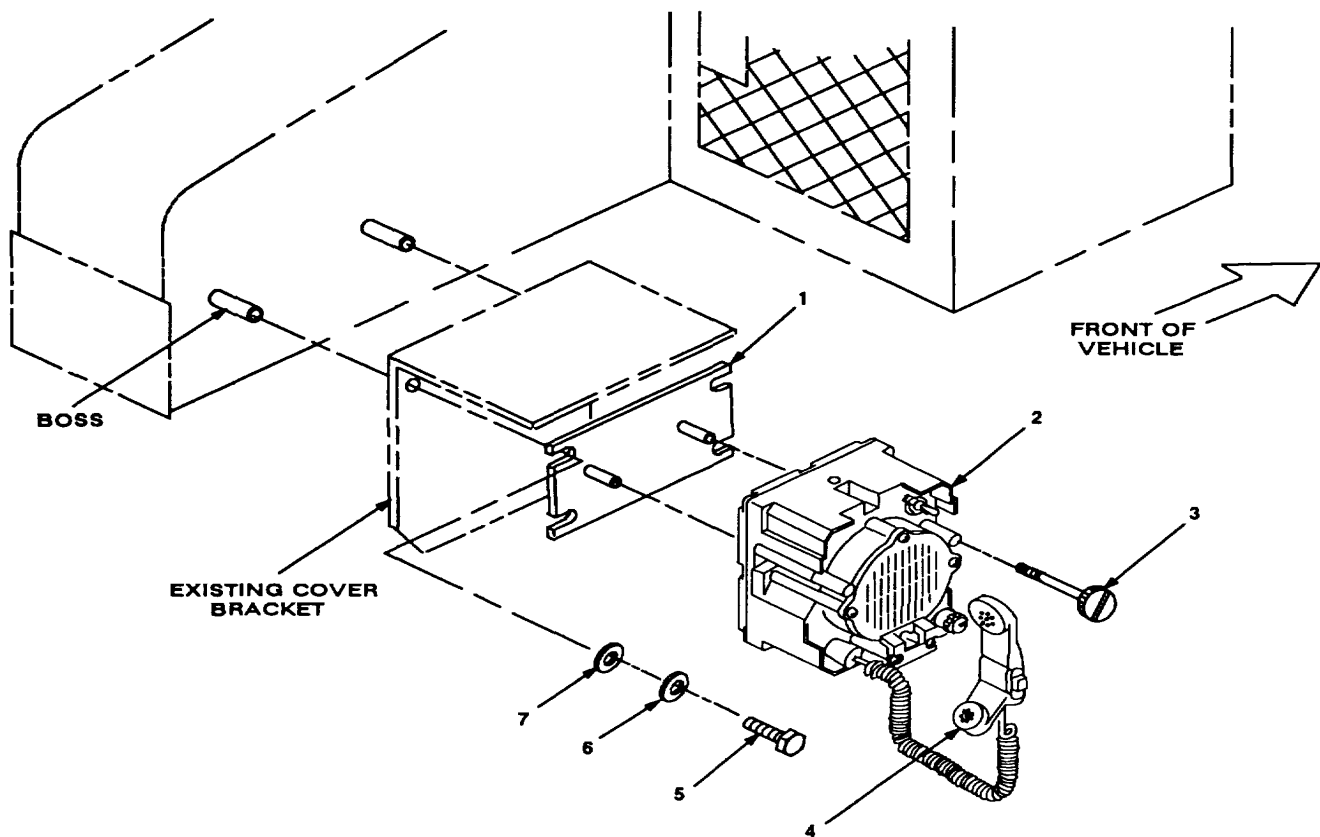


1. BATTERY BOX
2. MACHINE BOLT (5/16-24 x 314 in)
3. IET WASHER (5/11 in)
4. MOUNTING BRACKET
5. BATTERY TRAY

Figure 5-7 (2). Battery Tray and Battery Box Installation

5.5 Installation of Loudspeaker - Control Unit LS-671/VRC (speaker). See figure 5-1 (1) for location.

ITEM	ACTION	REMARKS
a. Mounting plate (1).	Align top slots over two mounting holes in existing cover bracket. See figure 5-8.	
b. Two machine bolts (5), two flat washers (7) and two lock washers (6).	Install and secure to mounting plate (1), existing cover bracket and bosses.	Tools: 1/2 in socket.
c. Speaker (2).	Place on mounting plate (1).	
d. Two externally-relieved body screws (3).	Thread through speaker (2) and secure to mounting plate (1).	Tools: Flatblade screwdriver.
e. Handset (4).	Connect and secure to speaker (2) connector J2.	



1. MOUNTING PLATE
2. SPEAKER
3. BODY SCREW
4. HANDSET
5. MACHINE BOLT (5/16 - 24 x 1 in)
6. LOCK WASHER (5/16 in)
7. FLAT WASHER (5/16 in)

Figure 5-8. Speaker Installation: Right Rear Trunnion Base

5.6 Installation of Cables. To accomplish the installation, leave loop clamps and tiedown straps loose enough to adjust cable slack and allow easy adjustment of equipment. When installation is complete, tighten and secure clamps and tiedown straps.

WARNING

Make sure vehicle power source is positioned OFF or disconnected before installing cables.

ITEM	ACTION	REMARKS
a. SP cable (2) connector P1. connector J501. See figure 5-9 (1).	Connect and secure to AM-1780/VRC	
b. SP cable (2).	Wrap around gunner's seat pedestal; then route forward along base of left trunnion and across front to right trunnion.	

1. ANTENNA BASE
2. SP CABLE, CX-13300/VRC (24 FT, 0 IN)
3. LOOP CLAMP (1 1/4-1/4 in)
CAP SCREW (1/4-28 x 5/8 in)
LOCK WASHER (1/4 in)
4. LOOP CLAMP (5/18-1/4in)

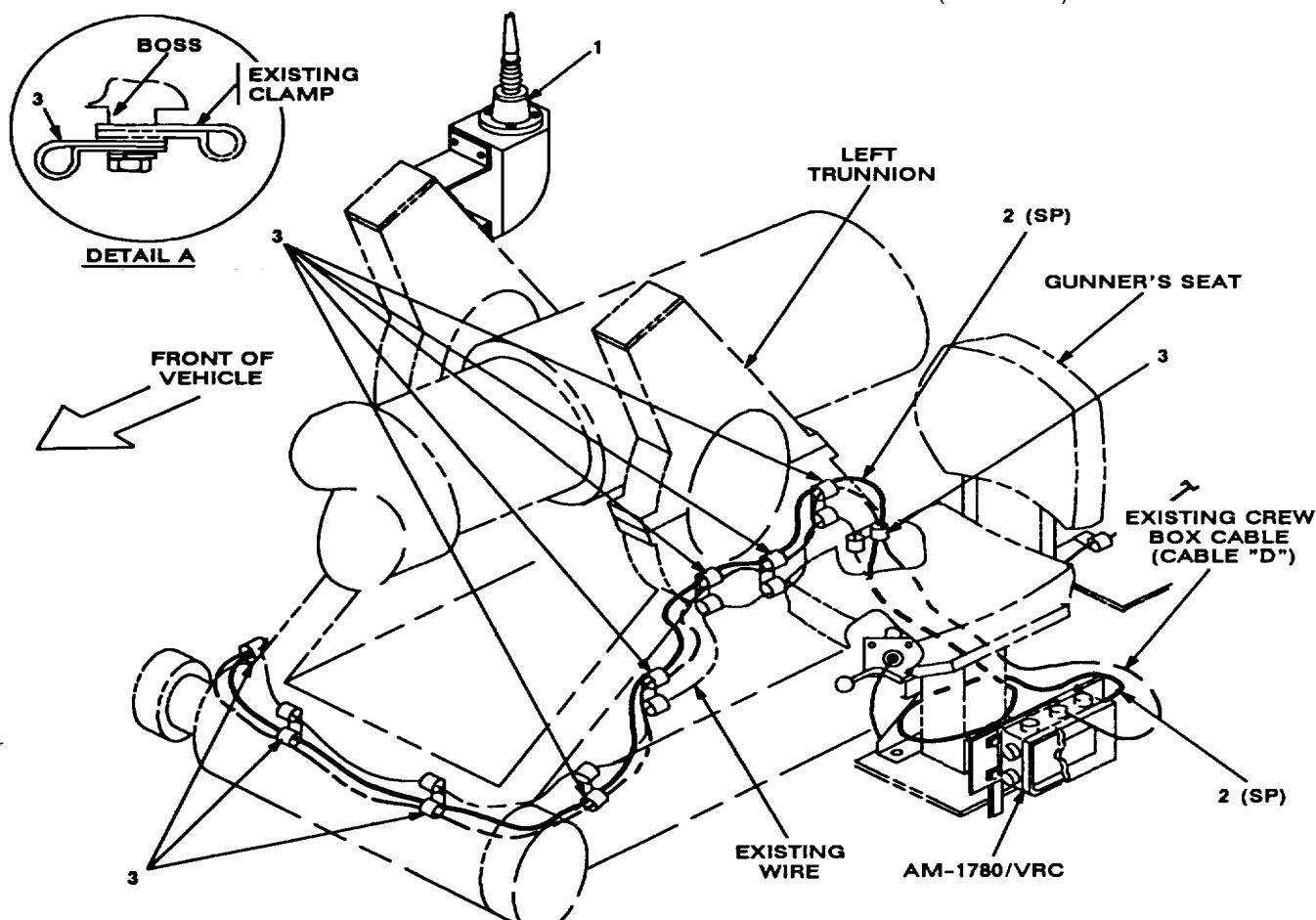


Figure 5-9 (1). Cable Installation: Gunner's Station

5.6 Installation of Cables. Continued

ITEM	ACTION	REMARKS
c. Six loop clamps (3), six cap screws (1/4-28 x 5/8 in) and six lock washers (1/4 in).	Wrap clamps around SP cable (2) and existing crew box cable; then install to existing clamps and bosses on left trunnion. See figure 5-9 (1), detail A and figure 5-9 (1) for location(s).	Tools: 7/16 in socket.
d. Three loop clamps (3), three cap screws (1/4-28 x 5/8 in) and three lock washers (1/4 in).	Wrap clamps around SP cable (2) and existing crew box cable; then install to existing clamps and bosses across forward base and corner of right trunnion.	Tools: 7/16 in socket.
e. SP cable (2).	Route along base of right trunnion and across top of trunnion brace. See figure 5-9 (2).	
f. RF cable (3) connector P1.	Connect and secure to antenna base (1) connector J1.	
g. RF cable (3). across top of trunnion brace.	Route down side of right trunnion and	
h. Mounting hole for loop clamp (16). location (s).	Drill a Size 1 (.228 in) diameter hole in right trunnion. See figure 5-9 (2) for	Tools: Electric drill and Size 1 drill bit.
i. Loop clamp (16), hex-head tapping screw (1/4-28 x 5/8) and lock washer (1/4 in).	Wrap around RF cable (3); then install to hole drilled in step h.	Tools: 3/8 in socket.
j. Two loop clamps (15), two cap screws (1/4-28 x 5/8 in) and two lock washers (1/4 in).	Wrap clamps around SP cable (2) and existing crew box cable; then install to existing clamps and bosses on right trunnion. See figure 5-9 (2), detail A for installation and figure 5-9 (2) for location(s).	Tools: 7/16 in socket.
k. Two loop clamps (15), two cap screws (1/4-28 x 5/8 in) and two lock washers (1/4 in).	Wrap clamps around SP cable (2), RF cable (3) and existing crew box cable; then install to existing clamps and bosses on right trunnion.	Tools: 7/16 in socket.
l. SP cable (2), RF cable (3) and existing crew box cable.	Route below trunnion brace to left side communications equipment case (8). See figure 5-9 (2).	
m. Tiedown strap (5).	Wrap around SP cable (2), RF cable (3) and existing crew box cable; then install loosely to upper part of trunnion brace. See figure 5-9 (2) for location(s).	
n. Tiedown strap (5).	Wrap around SP cable (2) and RF cable (3); then install loosely to lower part of trunnion brace.	

5.6 Installation of Cables. Continued

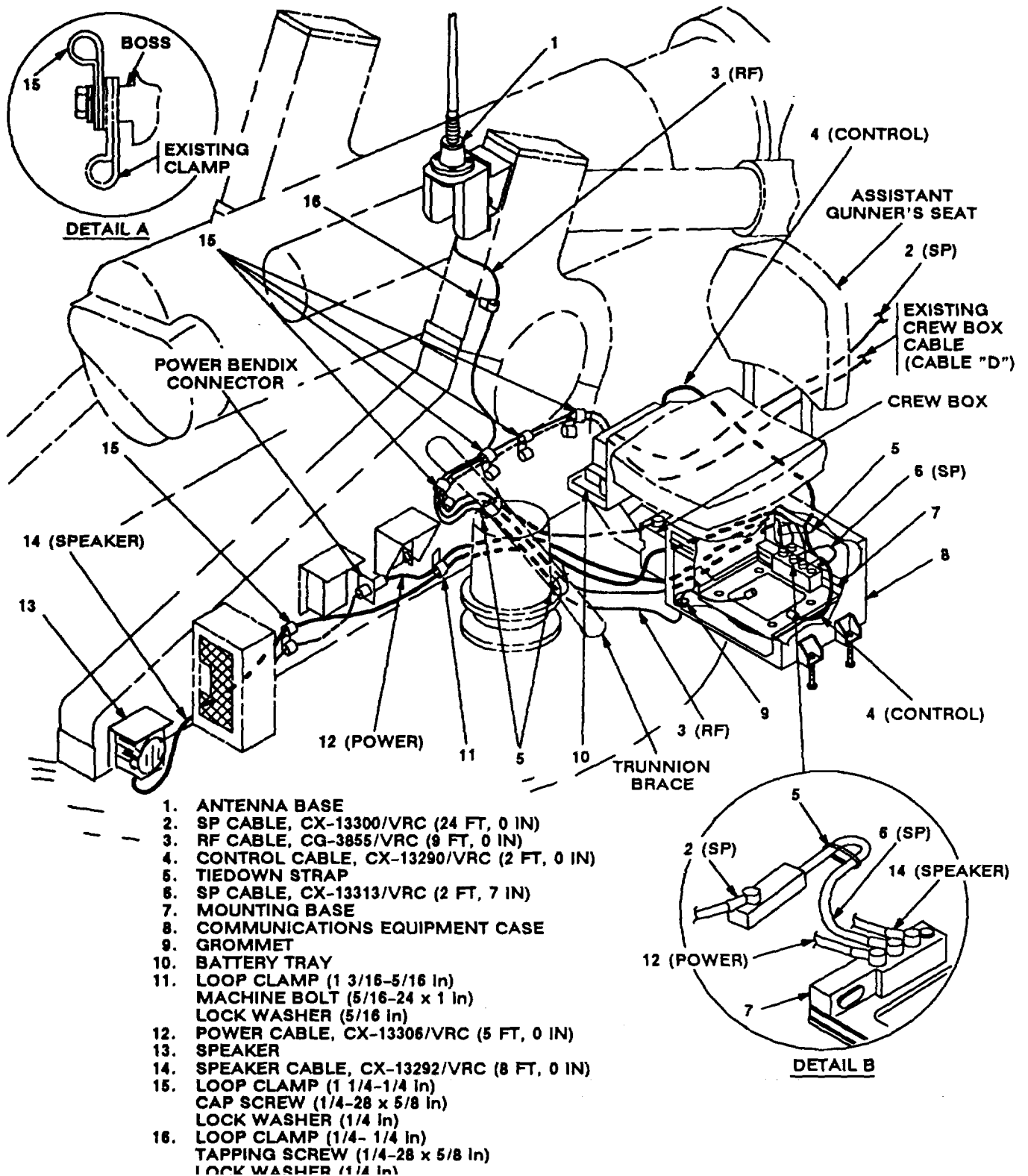


Figure 5-9 (2). Cable Installation: Assistant Gunner's Station

5.6 Installation of Cables. Continued

ITEM	ACTION	REMARKS
o. Existing crew box cable (cable D).	Connect and secure to crew box. See figure 5-9 (2).	
p. RF cable (3) connector P2.	Insert through grommet (9) and position on top of mounting base (7).	
q. SP cable (2) connector P2.	Connect and secure SP cable (6) connector P1. See figure 5-9 (2), detail B.	
r. SP cable (6) connector P2.	Connect and secure to mounting base (7) connector J3; then secure with tiedown strap (5).	
s. Speaker cable (14) connector P2.	Connect and secure to speaker (13) connector J1. See figure 5-9 (2).	
t. Speaker cable (14).	Route forward along base of right trunnion to area below trunnion brace.	
u. Loop clamp (15), cap screw (1/4-28 x 5/8 in) and two lock washers (1/4 in).	Wrap clamp around speaker cable (14); then install to existing clamp and boss on right trunnion. See figure 5-9 (2), detail A and figure 5-9 (2) for location(s).	Tools: 7/16 in socket.
v. Power cable (12) connector P1.	Connect and secure to power Bendix connector.	
w. Speaker cable (14) and power cable (12).	Route below assistant gunner's seat to rear of communications equipment case.	
x. Loop clamp (11), machine bolt (5/16-24 x 1 in) and lock washer (5/16 in).	Wrap clamp around speaker cable (14) and power cable (12); then install to existing boss on right trunnion. See figure 5-9 (2) for location(s).	Tools: 1/2 in socket.
y. Control cable (4) connector P1.	Connect and secure to battery tray (10) connector J1. See figure 5-9 (2).	
z. Control cable (4) connector P2.	Position on side of mounting base (7).	
aa. Speaker cable (14) connector P1.	Connect and secure to mounting base (7) connector J4. See figure 5-9 (2), detail B.	
ab. Power cable (12) connector P2.	Connect and secure to mounting base (7) connector J1.	
ac. Tiedown strap (5).	Wrap around and secure to SP cable (6), power cable (12), speaker cable (14) and control cable (4). See figure 5-9 (2) for location (s).	

5.6.1 Installation of RF Cable (With Crew Personnel Shelter).

ITEM	ACTION	REMARKS
a. RF cable (5) connector P1.	From inside shelter, insert through cable hole in frame and antenna bracket (4); then connect and secure to antenna base (3) connector J1. See figure 5-10.	
b. Tubing (9).	Cut to approximate length of shelter frame and antenna bracket (4) thickness; then cut through mark shown. See figure 5-10, detail A. Wrap around RF cable (5) and insert in cable hole.	Tools: Pocket knife.
c. RF cable (5).	Route under assistant gunner's seat to front of communications equipment case (1). See figure 5-10.	

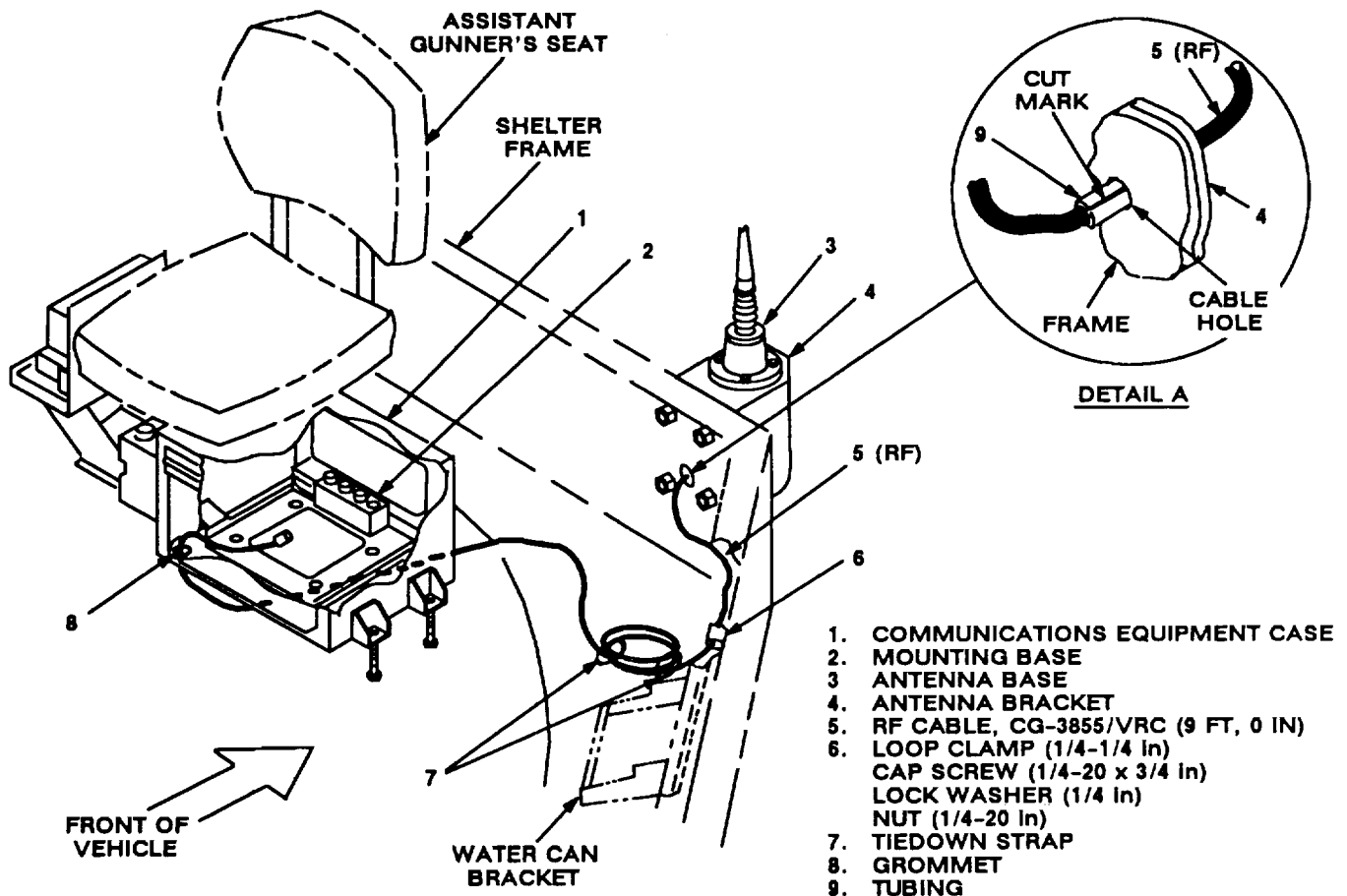


Figure 5-10. RF Cable Installation for Crew Personnel Shelter

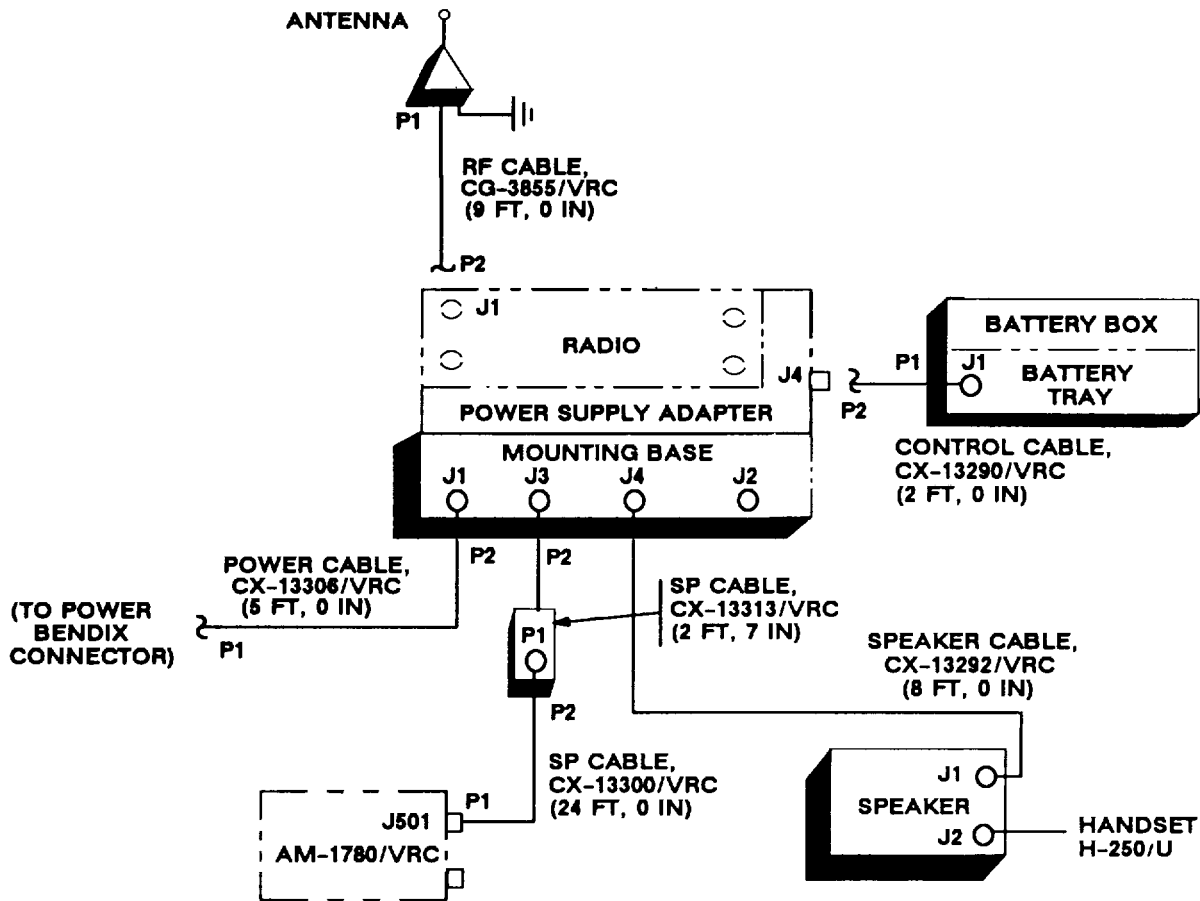
5.6.1 Installation of RF Cable (Crew Personnel Shelter Only). Continued

ITEM	ACTION	REMARKS
d. RF cable (5) connector P2.	Insert through grommet (8) and position on top of mounting base (2). See figure 5-10.	
e. Loop clamp (6), cap screw (114-20 x 3/4), lock washer (1/4 in) and nut (1/4-20 in).	Wrap clamp around RF cable (5); then install to existing hole in frame near water can bracket. See figure 5-10 for location.	Tools: 3/8 in socket.
f. Access RF cable (5).	Coil and secure with tiedown straps (7); then position cable near water can bracket. See figure 5-10.	
g. Adhesive-sealant.	Apply to and around cable hole in frame and antenna bracket (4).	

5.7 Post-Installation and Checkout. After equipment is installed and cables are connected, perform the following steps.

ITEM	ACTION	REMARKS
a. Equipment.	Check for secure mounting. Check for loose parts, connectors and mounting hardware.	
b. Cables.	Check for proper installation and connection of cables. See figure 5-11 for cable connections. Unused cables should be stowed in appropriate place inside the vehicle.	
c. Loop clamps.	Check that all have been properly installed and tightened.	
d. Protective covers.	Insure that all installed cables are covered when not in use or connected.	
e. Radio issued with vehicle.	Install and connect cables. See TM 11-5820-890-20-1 or TM 11-5820-890-20-4 for installation and Operational (OP) Check instructions.	
f. MK line replaceable units.	See TM 11-5820-890-20P for Repair Parts and Special Tools List (RPSTL) information.	

5.7 Post-Installation and Checkout. Continued



CABLE ASSEMBLY	FROM			TO		
	CABLE CONN.	UNIT.	UNIT CONN.	CABLE CONN	UNIT	UNIT CONN.
CX-13306/VRC (5 FT, 0 IN)	P2	Mounting Base	J1	P1	Power Bendix connector	
CX-13313/VRC (2 FT, 7 IN)	P2	Mounting Base (2 FT, 7 IN)	J3	P1	CX-13300/VRC (24 FT, 0 IN)	P2
CX-13300/VRC (24 FT, 0 IN)	P2	CX-13313/VRC (2 FT, 7 IN)	P1	P1	AM-1780/VRC	J501
CG-3855/VRC (9 FT, 0 IN)	P1	Antenna base	J1	P2	Radio	J1
CX-13290/VRC (2 FT, 0 IN)	P2	Power supply adapter	J4	P1	Battery tray	J1
CX-13292/VRC	P2	Mounting base	J4	P1	Speaker	J1

Figure 5-11. Cable Diagram: For ANIVRC-87C/88C

APPENDIX A**REFERENCES**

AMDF	Army Master Data File (Microfiche)
AR 710-2	Supply Policy Below the Wholesale Level as Contained in Unit Supply UPDATE
AR 725-50	Requisitioning, Receipt and Issuing System in UPDATE
DA Pam 25-30	Consolidated Index of Army Publications (Microfiche)
DA Pam 710-2-1	Using Unit Supply System Manual Procedures as Contained in Unit Supply UPDATE
SB 11-131-2	Vehicular Radio Sets and Authorized Installations (SINCGARS)
TM 11-5820-890-10-1	Operator's Manual (ICOM Radio Sets)
TM 11-5820890-10-3	Operator's Manual (Non-ICOM Radio Sets)
TM 11-5820-890-21	Unit Maintenance Manual (ICOM Radio Sets, Vol.1)
TM 11-5820-890-20-2	Unit Maintenance Manual (ICOM Radio Sets, Vol. 2)
TM 11-5820-890-20-3	Unit Maintenance Manual Handbook (ICOM Radio Sets)
TM 11-5820-890-204	Unit Maintenance Manual (Non-ICOM Radio Sets)
TM 11-5820-890-20P	Repair Parts and Special Tools List

A-1/(A-2 blank)

TB 11-5820-890-20-18

By Order of the Secretary of the Army:

GORDON R. SULLIVAN
General, United States Army
Chief of Staff

Official:



MILTON H. HAMILTON
Administrative Assistant to the
Secretary of the Army
06034

DISTRIBUTION:

To be distributed in accordance with DA Form 12-36-E,
block 9639 requirements for TB 11-5820-890-20-18.

* U.S. GOVERNMENT PRINTING OFFICE: 1994 - 510-106/00127

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS



THEN... JOT DOWN THE DOPE ABOUT IT ON THIS FORM, CAREFULLY TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL!

SOMETHING WRONG WITH THIS PUBLICATION?

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

PUBLICATION NUMBER

TM 11-5825-270-10

PUBLICATION DATE

23 Jul 81

PUBLICATION TITLE

Radio Frequency R-2176/FRN

BE EXACT... PIN-POINT WHERE IT IS

PAGE NO.

PARA-GRAPH

FIGURE NO.

TABLE NO.

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

TEAR ALONG PERFORATED LINE

PRINTED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER

SIGN HERE:

DA FORM 2028-2
JUL 79

PREVIOUS EDITIONS ARE OBSOLETE.

P.S.—IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS.

