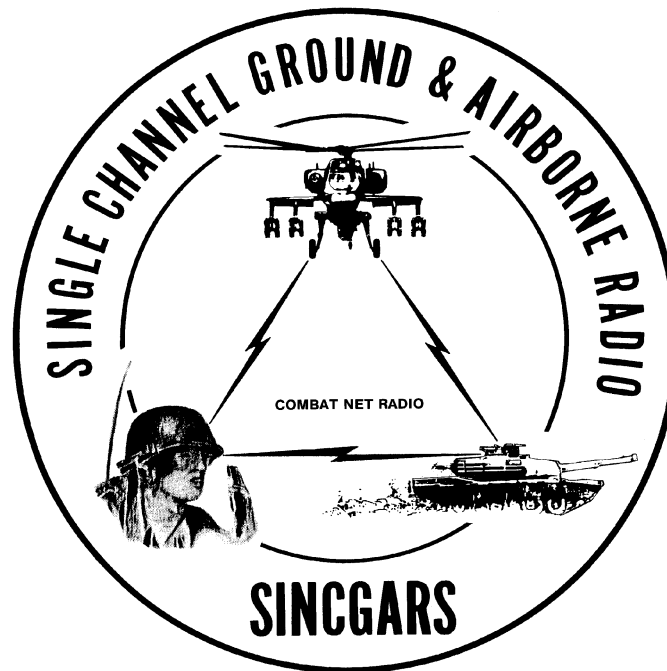


**TECHNICAL BULLETIN**



**INSTALLATION INSTRUCTIONS FOR  
INSTALLATION KIT,  
ELECTRONIC EQUIPMENT, MK-2400/VRC  
(NSN 5895-01-421-0814) (EIC: N/A)  
TO PERMIT INSTALLATION OF RADIO SET  
AN/VRC-87/88/90 SERIES  
INTO**

**M1078, M1080, M1081, M1083-M1086, M1088-M1094 AND  
M1096 FAMILY OF MEDIUM TACTICAL VEHICLES**

Approved for public release; distribution is unlimited.

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**HEADQUARTERS, DEPARTMENT OF THE ARMY**

**1 AUGUST 1999**

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INSTALLATION KIT  
ELECTRONIC EQUIPMENT MK-2400/VRC  
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M1078, M1080, M1081, M1083-M1086, M1088-M1094 AND M1096  
FAMILY OF MEDIUM TACTICAL VEHICLES (FMTV)**

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 Fort Monmouth, ATTN: AMSEL-LC-LEO-D-CS-CFO, Fort Monmouth, NJ 07703-5000. The Fax number is 732-532-1413, DSN 992-1413. You may also e-mail your recommendation to AMSEL-LC-LEO-PUBS-CHG@cecom3.monmouth.army.mil.

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

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\*This manual supersedes TB 11-5820-890-20-2, 1 September 1993.

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## 0.1 SCOPE.

This technical bulletin provides installation instructions for Installation Kit, Electronic Equipment MK-2400/VRC, commonly referred to as the Mounting Kit (MK). The MK shall be installed into the following type of vehicle(s):

- M1078, M1080, M1081, M1083-M1086, M1088-M1094, and M1096 Family of Medium Tactical Vehicles (FMTV)

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.

Included in the radio set AN/VRC-87/88/90 Series is:

- Radio Set AN/VRC-87/88/90 Series (for RT-1523(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 Packing 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-2400/VRC (MK) contains the items needed to mount Radio Set AN/VRC-87/88/90 Series in a M1078, M1080, M1081, M1083-M1086, M1088-M1094, and M1096 Family of Medium Tactical Vehicles (FMTV).

# 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 4.0 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 items will not reflect the typical vehicle downtime.

ITEM	SECTION	TIME
Antenna AS-3900/VRC	5.1	1.5
Mounting Base, Electrical Equipment MT-6352/VRC	5.2	3.5
Cables	5.4	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 AN/VRC-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 9-2320-289-20.

**4.1.2 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 cover 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 in 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-87/88/90 Series.

#### **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. MAP/MAS Countries: Instructions shall be provided for MAP/MAS countries.

**Table 4.1. Parts List for Installation of Radio Set AN/VRC-87/88/90 Series**

NSN	ITEM DESCRIPTION AND PART NUMBER	QUANTITY IN MK	SMR CODE	FIGURE, ITEM NO.
5985-01-297-2971	Antenna, Vehicular AS-3900/VRC (A3017899-1)	1	PAOOF A	4-1, 2
5305-00-847-1159	Screw, Cap, Hexagon (3/8-16 x 1-3/4 in) MS35307-365	4	PAOZZA	
5310-00-913-8881	Nut, Hexagon (3/8-16 in) MS51971-3	4	PAOZZA	
5310-00-061-1258	Washer, Lock, Internal/External-Toothed (3/8 in) MS45904-76	8	PAOZZA	
5310-00-889-2527	Washer, Lock, Internal/External-Toothed 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	
5975-01-188-8873	Mounting Base, Electrical Equipment MT-6352/VRC (A3013367-1)	1	PAOOF A	4-1, 1
5306-00-225-9089	Bolt, Machine (5/16-24 x 1 in) MS90726-34	5	PAOZZA	
5310-00-889-2527	Washer Lock, Internal/External-Toothed (5/16 in) MS45904-72	10	PAOZZA	
5310-00-880-7746	Nut, Hexagon (5/16-24 in) MS51968-5 (4 Not Used)	5	PAOZZA	
5995-01-219-7026	Cable Assembly, Radio Frequency, CG-3856/VRC (9 FT, 0 IN) (A3014031-4)	1	PAOZZA	4-1, 9
5995-01-387-0592	Cable Assembly, Power Electrical, CX-13450/VRC (9 FT, 0 IN) (A3191153-2)	1	PAOZZA	4-1, 8
4020-01-341-8795	Fiber Rope Assembly, Single Leg (A3167672-1)	1	PAOZZA	4-1, 6
5965-00-043-3463	Handset, H-250/U	1	PAOZZA	4-1, 3
5965-00-876-2375	Loudspeaker, Permanent Magnet, LS-454/U	1	PAOZZA	4-1, 4
	Bracket Assembly, Antenna Mount (A3210717-2)	1	XBOZZA	4-1, 12
	Base, Mounting (A3103996-1)	1	XBOZZA	4-1, 11
	Shelf, Electrical Equipment (A3104088-1)	1	XBOZZA	4-1, 7
	Plate Interface (A3103995-1)	1	XBOZZA	4-1, 10
	Frame, Weldment (A3103997-1)	2	XBOZZA	4-1, 5
5306-00-225-9095	Bolt, Machine (5/16-24 x 2 in) MS90726-40	16	PAOZZA	
5340-00-809-1490	Clamp, Loop (1/4-1/4 in) MS21333-98	3	PAOZZA	
5340-00-067-3868	Clamp, Loop (1/4-5/16 in) MS21333-109	2	PAOZZA	
5310-00-880-7744	Nut, Plain, Hexagon (5/16-18 in) MS51967-5	10	PAOZZA	
5310-00-880-7746	Nut, Plain, Hexagon (5/16-24 in) MS51968-5	16	PAOZZA	
5310-00-889-2528	Washer, Lock, Internal/External-Toothed (1/4 in) MS45904-68	32	PAOZZA	
5325-00-174-5315	Grommet, Nonmetallic 1/4 MS35489-7	1	PAOZZA	
5975-00-111-3208	Strap, Tiedown, Electrical Components MS3367-5-9	5	PAOZZA	
5360-00-225-8499	Bolt, Machine (5/16-18 x 1 in) MS90725-34	9	PAOZZA	

Table 4-1. Parts List for Installation of Radio Set AN/VRC-87/88/90 Series. Continued

NSN	ITEM DESCRIPTION AND PART NUMBER	QUANTITY IN MK	SMR CODE	FIGURE, ITEM NO.
5310-00-903-5966	Nut, Plain, Hexagon (1/4-20 in) MS51971-1	16	PAOZZA	
5305-00-225-3839	Screw, Cap, Hexagon (1/4-20 x 1 in) MS90725-8	16	PAOZZA	
5306-00-056-2942	Screw, Cap, Hexagon (5/16-18 x 1-1/4 in) MS90725-35	4	PAOZZA	
5305-00-432-4252	Screw, Tapping, Thread Forming (1/4-14 x 5/8 in) MS51861-66	3	PAOZZA	
5310-00-582-5965	Washer, Lock (1/4 in) MS35338-44	3	PAOZZA	
5310-00-889-2527	Washer, Lock, Internal/External-Toothed (5/16 in) MS45904-72	50	PAOZZA	
	Nut, Blind Rivet (5/16-18) ALS3-518-150L	9	PAOZZA	



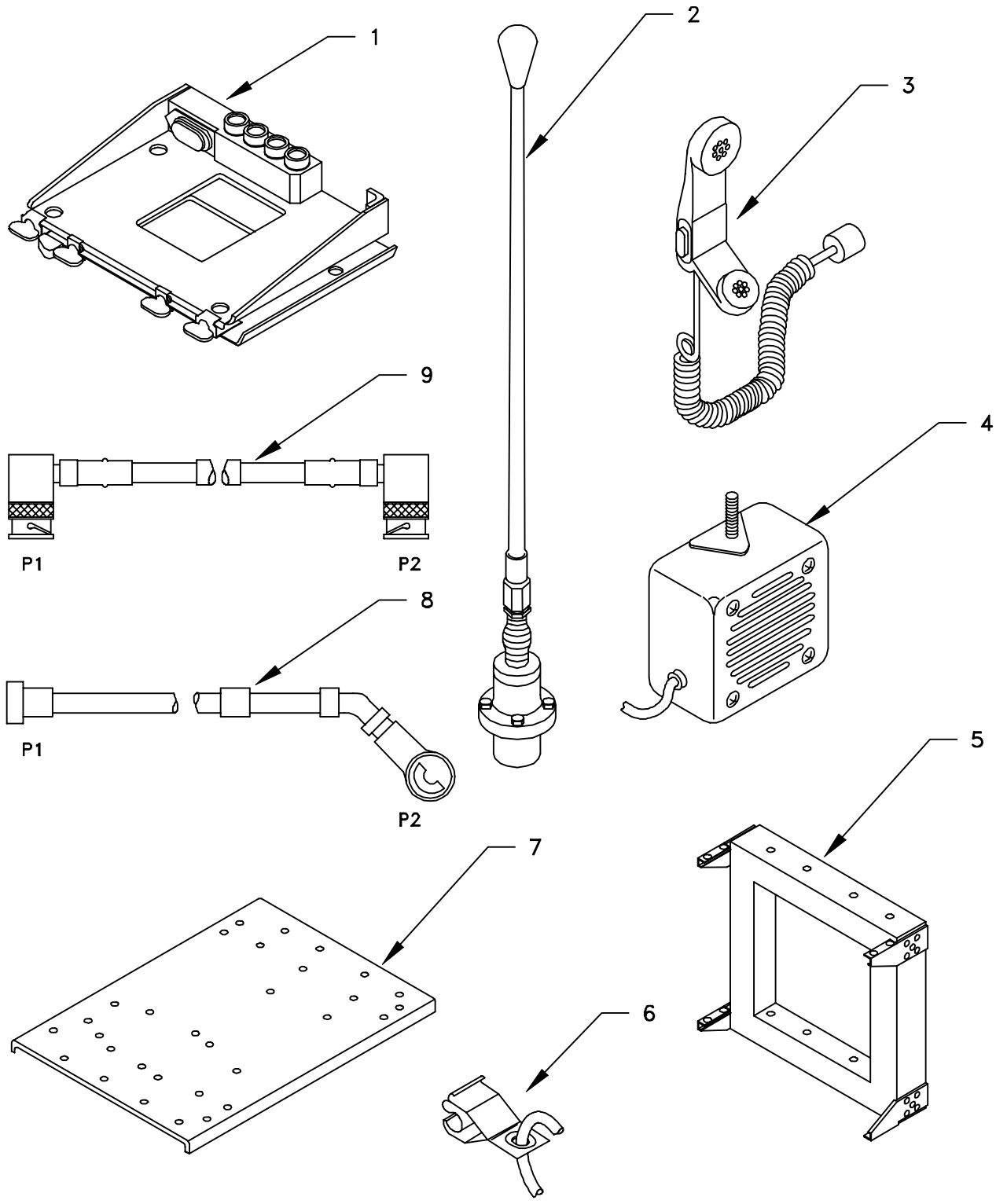


Figure 4-1(1). MK Illustrated Parts List

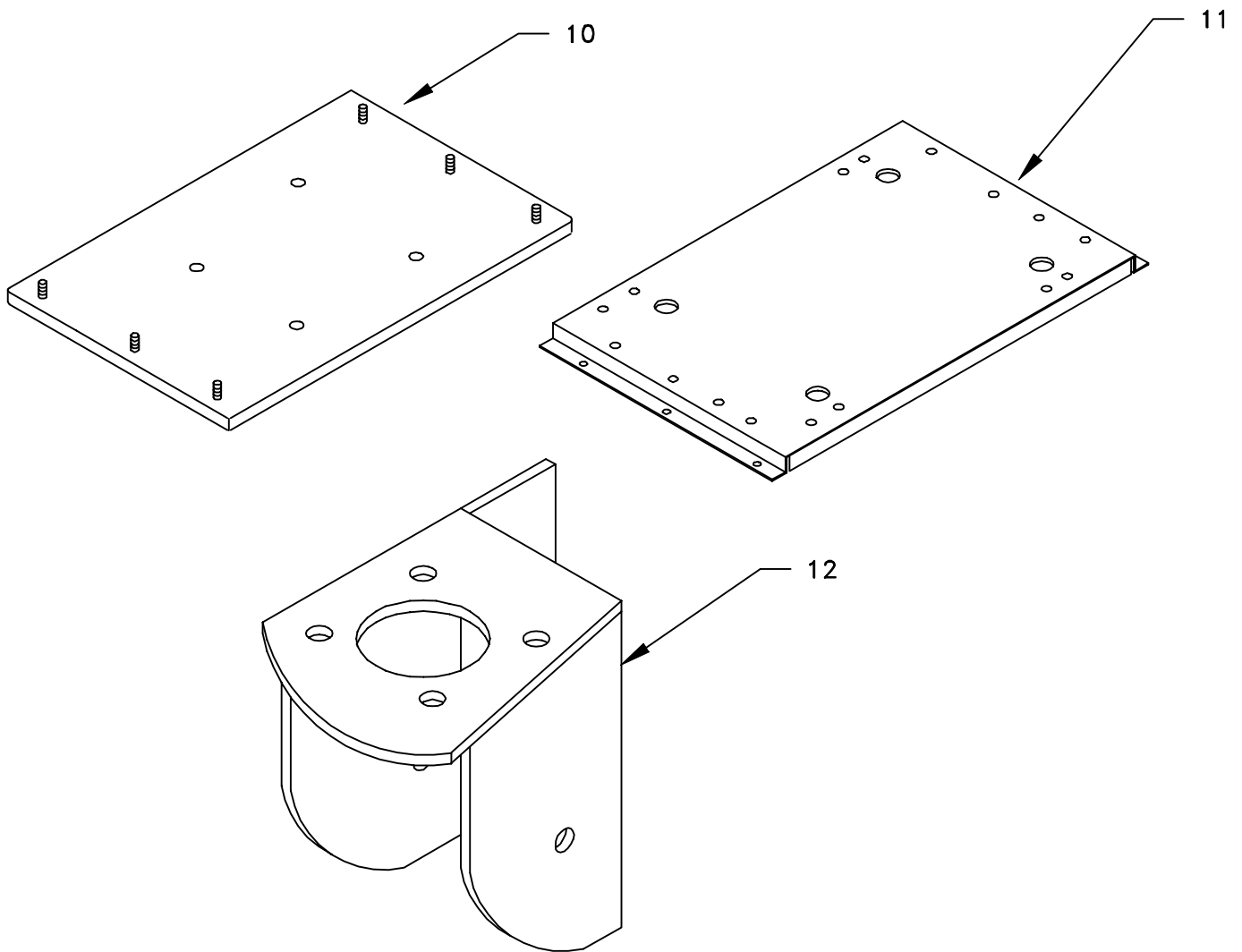
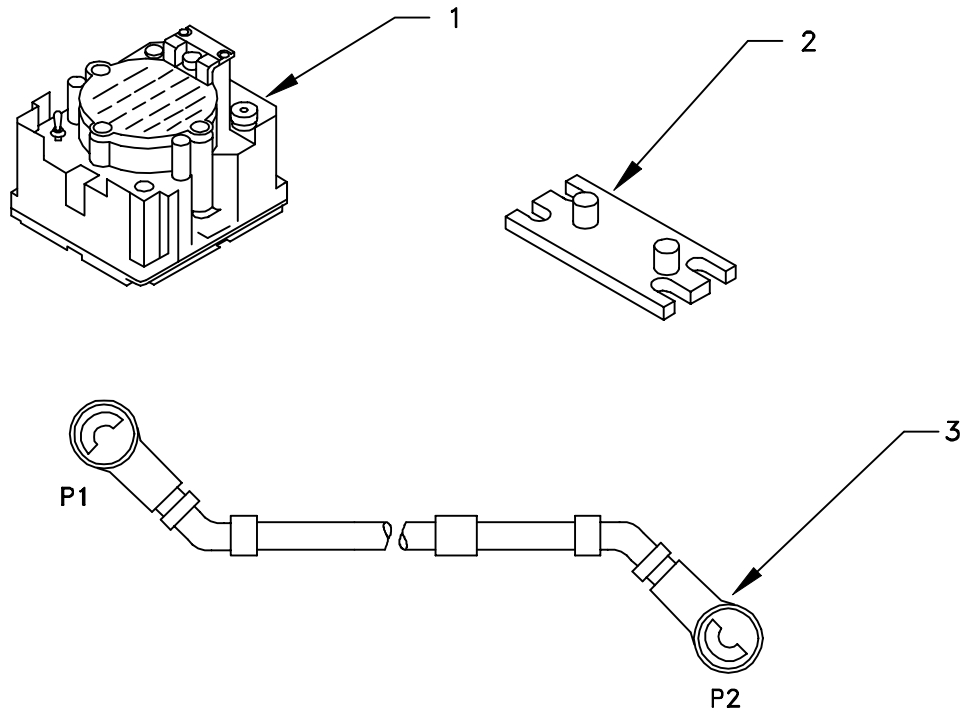


Figure 4-1(2). MK Illustrated Parts List

**Table 4.2. Additional Items Required for Installation of “D” and “F” Radio Sets**

NSN	ITEM DESCRIPTION AND PART NUMBER	QUANTITY IN MK	SMR CODE	FIGURE, ITEM NO.
5965-01-222-1420	Loudspeaker, Control Unit, LS-671/VRC (A3014065-1)	1	PAOFFA	4-2, 1
	Plate, Mounting (A3014550-1)	1	XBOZZA	4-2, 2
5306-00-225-9089	Bolt, Machine (5/16-24 x 1 in) MS90726-34	2	PAOZZA	
5310-00-880-7746	Nut, Hexagon (5/16-24 in ) MS51968-5	2	PAOZZA	
5310-00-081-4219	Washer, Flat (5/16 in) MS27183-12	4	PAOZZA	
5310-00-407-9566	Washer, Lock (5/16 in) MS35338-45	2	PAOZZA	
5995-01-219-7010	Cable Assembly, Special Purpose, Electrical CX-13292/VRC (3 FT, 0 IN) (A3014038-1)	1	PAOZZA	4-2, 3



**Figure 4-2. Illustrated Parts List for Table 4-2**

**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
8030-00-292-1102	Conductive Anti-sieze Compound

**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
Electric Grinder or Equivalent		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 I	5120-00-228-9505	1
1/2 inn	5120-00-228-9506	1
9/16 in	5120-00-228-9507	1
Handle, Socket Wrench:		
Socket		
7/16 in	5120-00-240-5364	1
1/2 in	5120-00-227-6703	1
1/2 in	5120-00-237-0977	1
9/16 in	5120-00-227-6704	1
Electric Drill		
Drill Bit		
1/4 in	5130-00-889-8994	1
3/4 in	5133-00-227-9658	1
3/4 in	5133-00-265-9471	1
17/32 in	5133-00-189-9324	1
Rivnut Installation Tool	5120-01-020-7814	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 and 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. If "D" or "F" Series radio is authorized, see paragraph 5.5 for installation of LS-671.

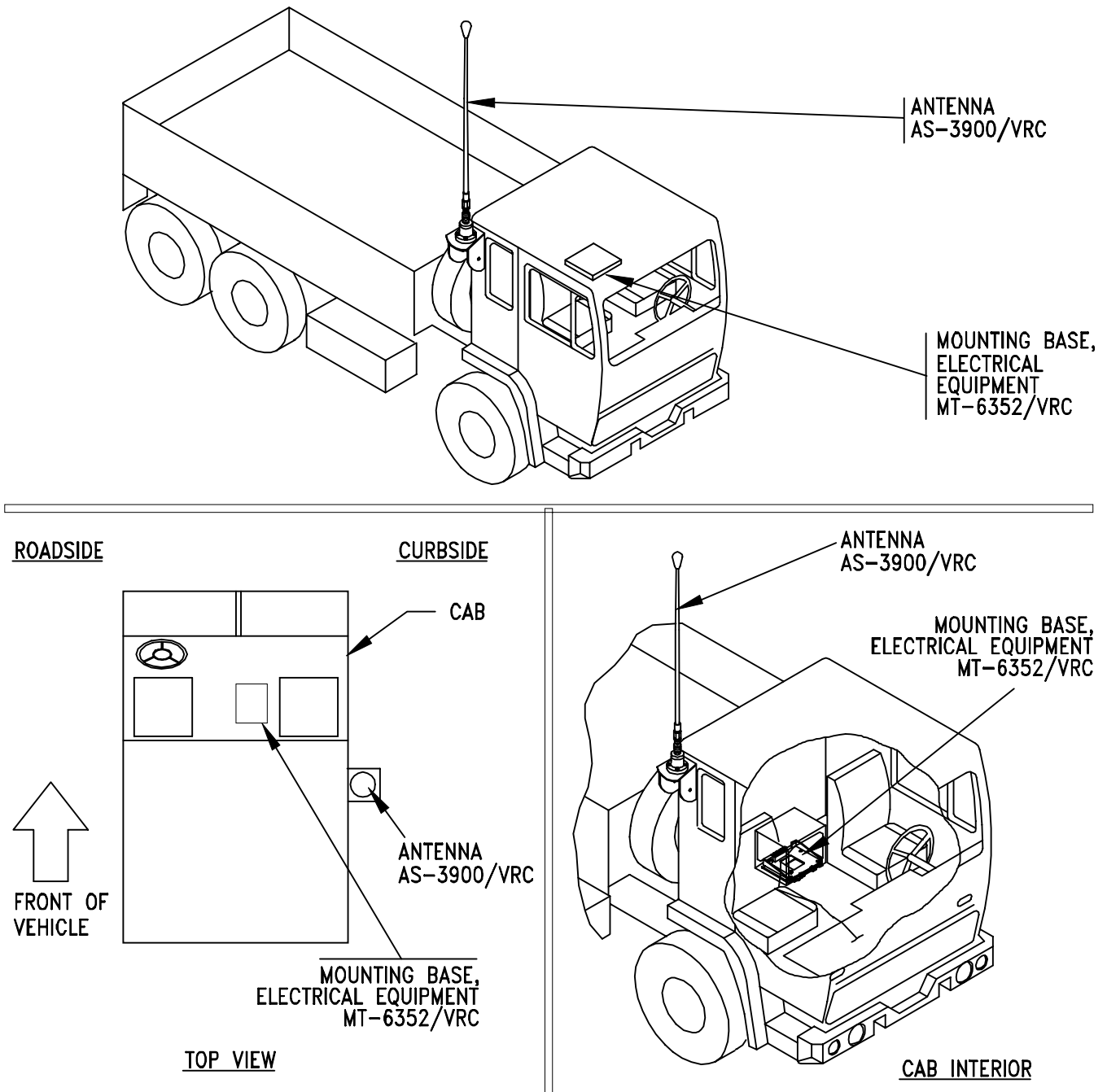
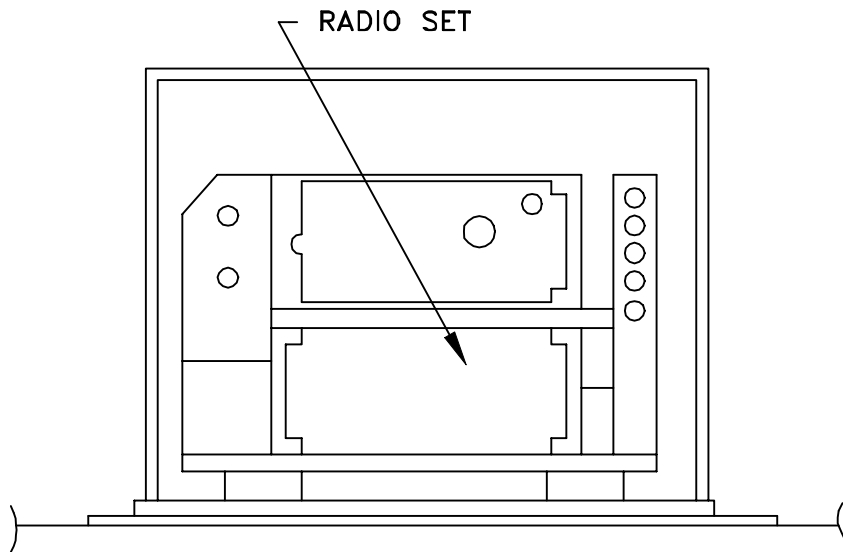


Figure 5-1(1). MK and Radio Installation: MK Equipment Locations

**5. INSTALLATION PROCEDURES.** Continued.



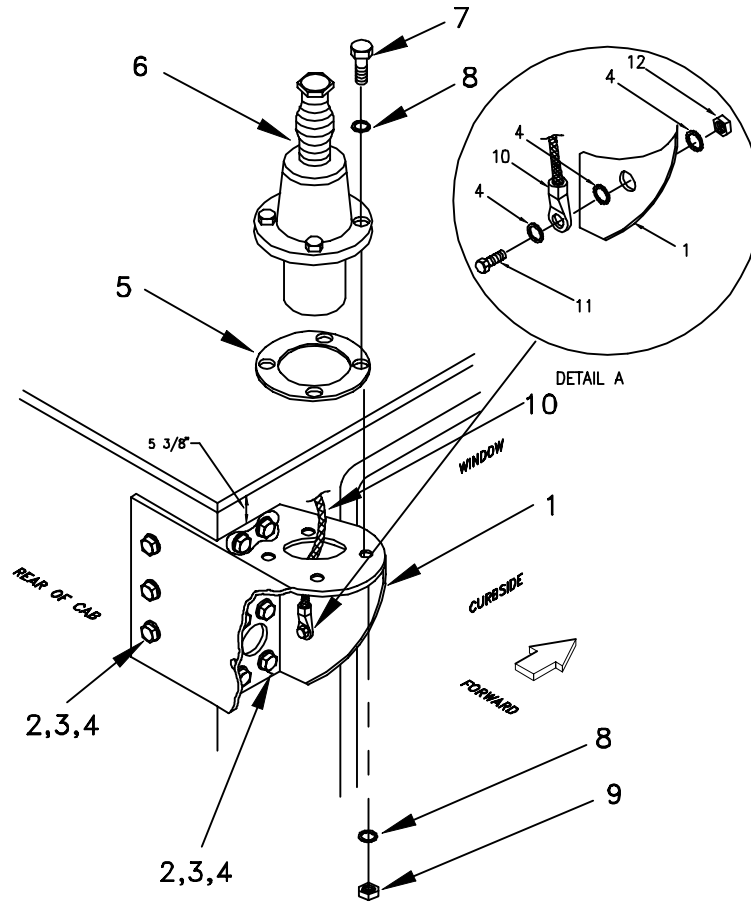
**Figure 5-1(2). MK and Radio Installation: Radio Equipment Locations**

## 5.1 Installation of Antenna, Vehicular, AS-3900/VRC (antenna).

**5.1.1 Installation of Antenna Base.** Use the following procedures to install antenna base. See Figure 5-1(1) for location.

ITEM	ACTION	REMARKS
<b>NOTE</b>		
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. Bracket assembly, antenna mount (1).	Using dimension shown and bracket assembly, antenna mount (1) as a template; mark six mounting holes and one RF cable "pass through" hole on the curbside cab wall. Mark three mounting holes on the rear cab wall. See Figure 5-2.	
b. Bracket assembly, antenna mount (1).	Remove bracket and drill six 17/32 diameter holes and one 3/4 in diameter hole in the curbside cab wall. Drill three 17/32 in diameter holes in the rear cab wall. See Figure 5-2. Remove a 1" diameter circle of paint centered on the nine 17/32 diameter holes drilled in the cab walls. Clean the paint removed surfaces.	Tools: Electric drill, 17/32 in drill bit and 3/4 in drill bit. Electric grinder or equivalent.
c. Nine rivet nuts (2).	Install to 17/32 in diameter holes drilled in step b. Apply a thin coat of conductive anti-sieze compound to paint removed area in step b.	Tools: Rivnut Installation Tool.
d. Bracket assembly antenna mount(1).	Remove a 1" diameter circle of paint on both sides of bracket assembly antenna mount(1) centered on the nine 17/32 diameter holes. Clean the paint removed surfaces and apply a thin coat of conductive anti-sieze compound.	Tools: Electric grinder or equivalent.
e. Bracket assembly, antenna mount (1), nine machine bolts (3), and nine IET washers (4).	Install and secure to curbside and rear cab wall. See Figure 5-2.	Tools 1/2 in socket.
f. Gasket (5).	Place on bracket assembly, antenna mount and align mounting holes. See Figure 5-2.	
g. Antenna base (6).	Place on top of gasket (5) and bracket assembly, antenna mount (1); then align mounting holes.	
h. Four cap screws (7), eight IET washers (8), and four nuts (9).	Install and secure to antenna base (6) and bracket assembly, antenna mount (1).	Tools: 9/16 in socket and 9/16 open/box wrench.
i. Ground strap (10), one machine bolt (11), three IET washers (4), and one nut (12).	Install and secure to mounting hole in bracket assembly, antenna mount (1). See Figure 5-2, Detail A.	Tools: 1/2 in socket and 1/2 in open/box wrench.

5.1.1 Installation of Antenna Base. Continued.



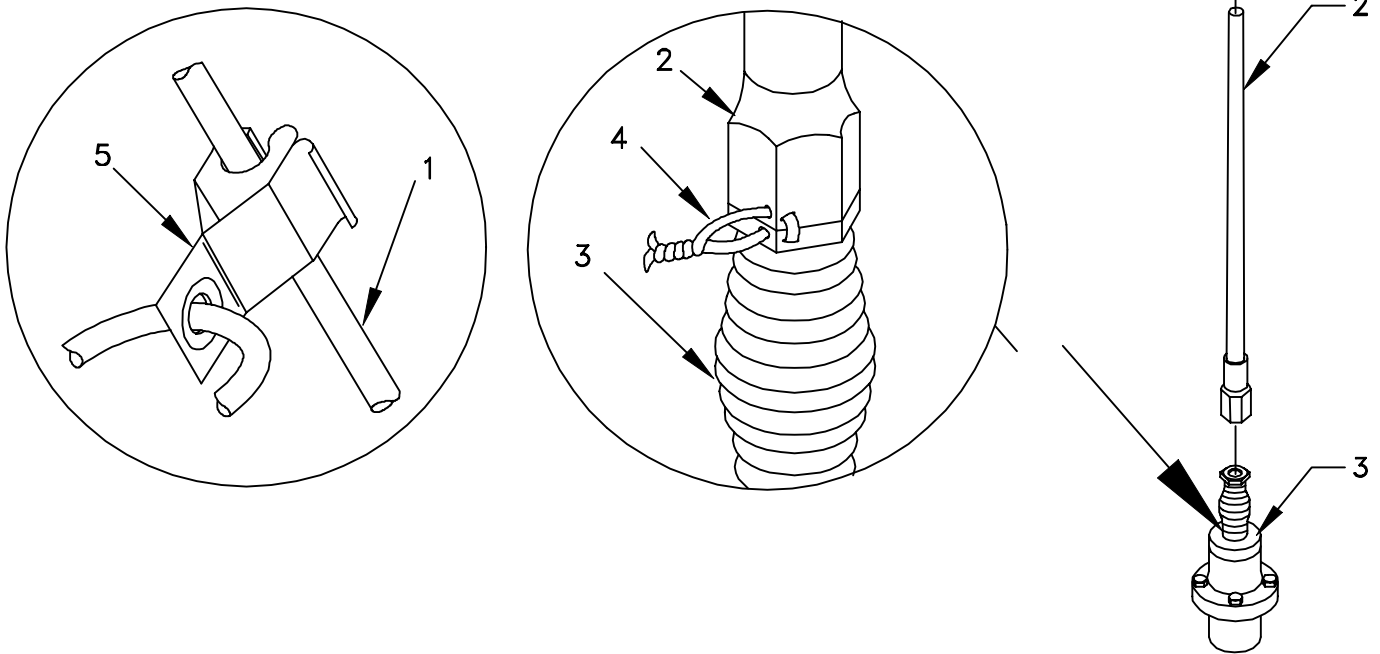
- |                                    |                                   |
|------------------------------------|-----------------------------------|
| 1. BRACKET ASSEMBLY, ANTENNA MOUNT | 7. CAP SCREW (3/8-16 X 1 1/4 IN)  |
| 2. NUT, BLIND RIVET (5/16-18)      | 8. IET WASHER (3/8 IN)            |
| 3. BOLT MACHINE (5/16-18 X 1 IN)   | 9. NUT (3/8-16 IN)                |
| 4. IET WASHER (5/16 IN)            | 10. GROUND STRAP (P/O ANTENNA)    |
| 5. GASKET                          | 11. MACHINE BOLT (5/16-24 X 1 IN) |
| 6. ANTENNA BASE                    | 12. NUT (5/16-24 IN)              |

Figure 5-2. Antenna Base Installation



**5.1.2 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 5-3.	
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 5-3, 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 5-3, Detail B.	



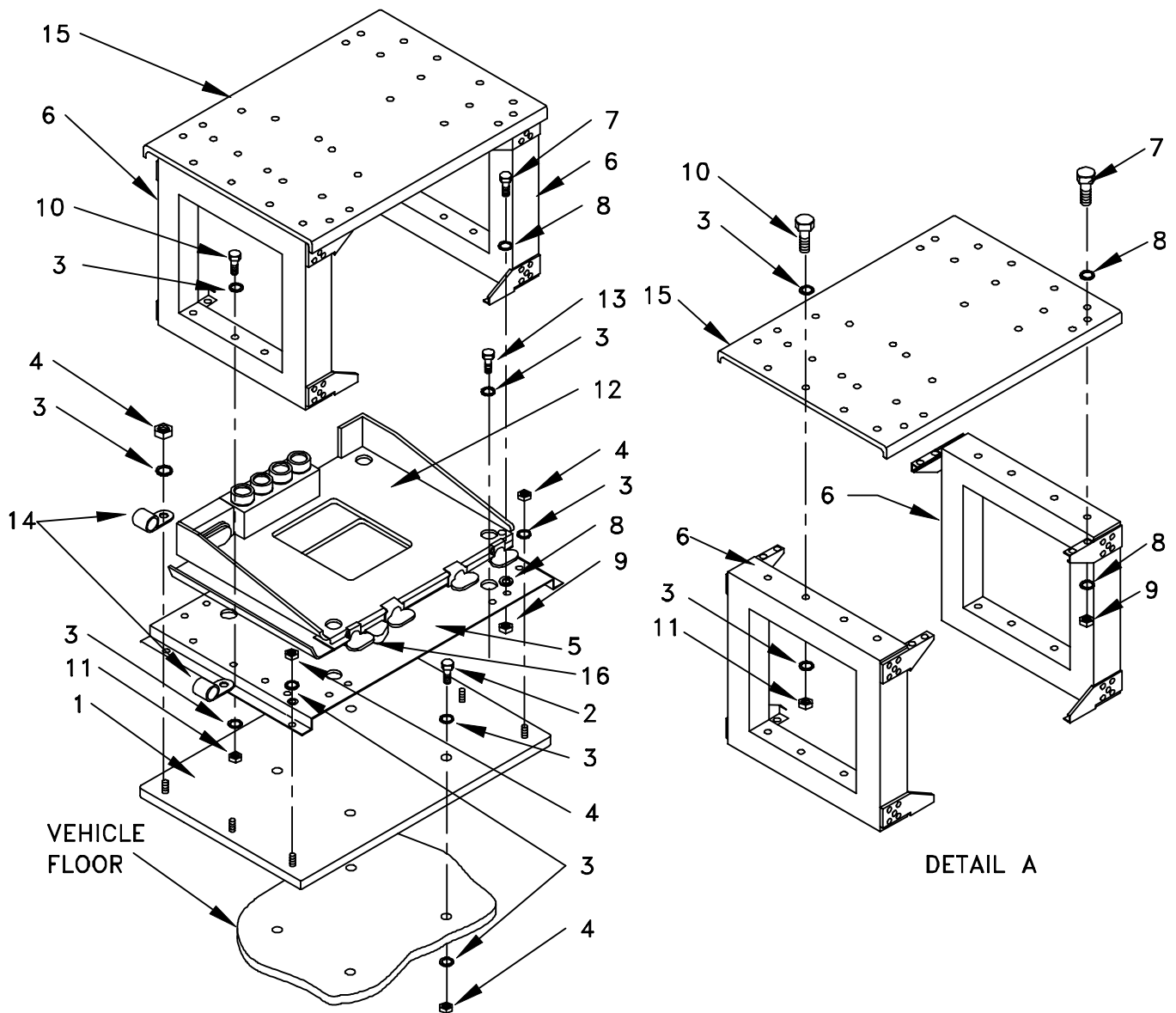
- 1. ANTENNA ELEMENT (UPPER)
- 2. ANTENNA ELEMENT (LOWER)
- 3. ANTENNA BASE
- 4. LOCK WIRE
- 5. FIBER ROPE ASSEMBLY

**Figure 5-3. Top Antenna Assembly Installation**

**5.2 Installation of Mounting Base, Electrical Equipment MT-6352/VRC (mounting base).** Remove and retain attaching bag of 5/16 mounting hardware. To insure good electrical grounding, any rust, corrosion or paint around mounting holes in mounting plate should be removed before installing the mounting base. See Figure 5-1(1) for location; then see Figure 5-4 and perform the following steps.

ITEM	ACTION	REMARKS
<b>NOTE</b>		
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. Existing center seat.	Remove seat and hardware and place in storage. Remove a 2" diameter circle of paint centered on the four existing holes in the cab floor. Clean the paint removed surfaces and apply a thin coat of conductive anti-sieze compound.	Tools: Electric grinder or equivalent.
b. Plate, interface (1).	Remove a 2" diameter circle of paint centered on the four mating mounting holes with the cab floor of plate, interface (1). Clean paint removed surfaces and apply a thin coat of conductive anti-sieze compound. Place on vehicle floor where center seat was removed; align mounting holes. See Figure 5-4.	Tools: Electric grinder or equivalent.
c. Four cap screws (2), eight IET washers (3) and four nuts 4).	Install and secure to plate, interface (1) and vehicle floor. See Figure 5-4.	Tools: 1/2 in socket and 1/2 in open/box wrench.
d. Shelf, electrical equipment (15).	Place on frames (6) and align mounting holes. See Figure 5-4 and Detail A.	
e. Four cap screws (7), eight IET washers (8), four nuts (9), four machine bolts (10), eight IET washers (3) and four nuts (11).	Attach the right side of shelf (15) to frame (6) with indicated hardware.	Tools: 7/16 in socket and 7/16 in open/box wrench.
f. Four cap screws (7), eight IET washers (8), four nuts (9), four machine bolts (10), eight IET washers (3) and four nuts (11).	Attach the left side of shelf (15) to frame (6) with indicated hardware.	Tools: 1/2 in socket and 1/2 in open/box wrench.
g. Mounting base (12) and base, mounting (5).	Remove a 2" diameter circle of paint from the bottom of the left two mounting holes of the mounting base (12) and the top of the left two mounting holes of the base, mounting (5). Clean the paint removed surfaces and apply a thin coat of conductive anti-sieze compound.	Tools: Electric grinder or equivalent.
h. Mounting base (12).	Place on base, mounting (5) over existing holes. See Figure 5-4.	

5.2 Installation of Mounting Base, Electrical Equipment MT-6352/VRC (mounting base). Continued.



- |                                   |                                   |
|-----------------------------------|-----------------------------------|
| 1. PLATE, INTERFACE               | 9. NUT (1/4-20 IN)                |
| 2. CAP SCREW (5/16-18 X 1-1/4 IN) | 10. MACHINE BOLT (5/16-24 X 2 IN) |
| 3. IET WASHER (5/16 IN)           | 11. NUT (5/16-24 IN)              |
| 4. NUT (5/16-18 IN)               | 12. MOUNTING BASE                 |
| 5. BASE, MOUNTING                 | 13. MACHINE BOLT (5/16-24 X 1 IN) |
| 6. FRAME                          | 14. LOOP, CLAMP (1/4-5/16 IN)     |
| 7. CAP SCREW (1/4-20 X 1 IN)      | 15. SHELF, ELECTRICAL EQUIPMENT   |
| 8. IET WASHER (1/4 IN)            | 16. THUMBSCREW                    |

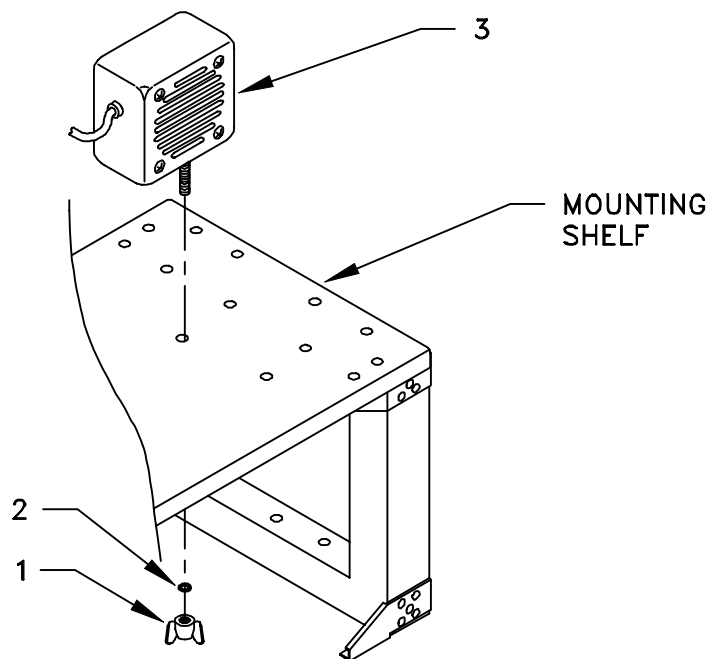
Figure 5-4. Mounting Base Installation

## 5.2 Installation of Mounting Base, Electrical Equipment MT-6352/VRC (mounting base). Continued.

ITEM	ACTION	REMARKS
i. Two outer thumbscrews (16).	Turn ccw until both sets of threads have cleared center of holes.	
j. Mounting base (12).	Align four holes with matching hole pattern in base, mounting (5).	
k. Four machine bolts (13) and four IET washers (3).	Install and secure to mounting base (12) and base, mounting (5).	Tools: 1/2 in socket.
l. Two outer thumbscrews (16).	Tighten and secure to rim clenching clamps and mounting base (12).	
m. Base, mounting (5), with attached mounting base (12).	Place over studs on plate interface (1). See Figure 5-4.	
n. Four nuts (4) and four IET washers (3).	Install and secure to right three studs and left front stud on plate, interface (1).	Tools: 1/2 in socket.
o. Two loop clamps (14), two IET washers (3) and two nuts (4).	Temporarily install to the left middle and rear studs on plate, interface (1).	
p. Two frames (6) with attached electrical equipment shelf (15) and base, mounting (5).	Remove a 1" diameter circle of paint from the bottom two mounting holes of each frame (6) that mate with base, mounting (5) and the four top mounting holes of base, mounting (5) that mate with top of the frames (6). Clean the paint removed surfaces and apply a thin coat of conductive anti-sieze compound.	Tools: Electric grinder or equivalent.
q. Two frames (6) with attached electrical equipment shelf (15).	Place on base, mounting (5) and align mounting holes. See Figure 5-4.	
r. Four cap screws (7), eight IET washers (8), four nuts (9), four machine bolts (10), eight IET washers (3) and four nuts (11).	Attach the right frame (6) to base, mounting (5) with indicated hardware. See Figure 5-4.	Tools: 7/16 in socket and 7/16 in open/box wrench.
s. Four cap screws (7), eight IET washers (8), four nuts (9), four machine bolts (10), eight IET washers (3), and four nuts (11).	Attach the left frame (6) to base, mounting (5) with indicated hardware. See Figure 5-4.	Tools: 1/2 in socket and 1/2 in open/box wrench.

**5.3 Installation of Loudspeaker, Permanent Magnet LS-454/U (speaker).** Install LS-454/U speaker on right side of top shelf, upside down. The details below show typical methods of mounting the LS-454/U.

ITEM	ACTION	REMARKS
a. Speaker (3).	Determine speaker (3) location on right side of top shelf. See Figure 5-5.	
b. Speaker (3).	Mount speaker (3) upside down on mounting shelf. Insert stud on speaker through hole; then secure with lock washer (2) and wing nut (1).	



1. WING NUT (P/O 3)
2. LOCK WASHER (P/O 3)
3. LS-454/U LOUDSPEAKER

**Figure 5-5. Installation of Loudspeaker, LS-454/U**

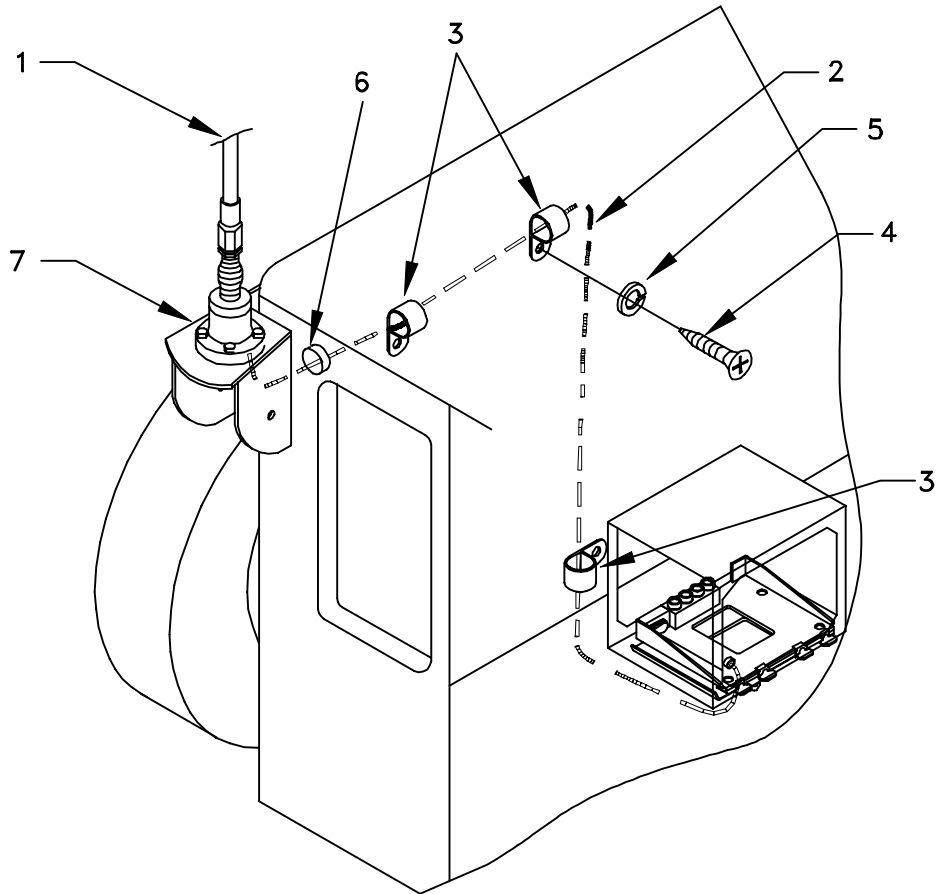
**5.4 Installation of Cables.** To accomplish the installation, leave loop clamps and tiedown straps loose enough to adjust cable slack and allow easy adjustment of equipment. When installation is complete, tighten and secure all clamps, clips and tiedown straps.

**WARNING**

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

ITEM	ACTION	REMARKS
a. RF cable (2) connector P1.	Connect and secure to antenna base (1) connector J1.	
b. Mounting holes for loop clamps (3).	Drill three 1/4 in diameter holes in rear cab wall approximately as shown. See Figure 5-6(1).	Tools: Electric drill and 1/4 in drill bit.
c. RF cable (2)	Route the cable through the RF pass through hole in bracket assembly, antenna mount and vehicle wall; then route toward roadside to middle of cab and temporarily tape to rear wall. Route the cable down the rear wall and forward along the curbside of the communications rack. See Figure 5-6 (1) and Figure 5-6 (2).	.
d. Grommet (6).	Wrap around RF cable (2) and install to RF pass through hole in bracket assembly (7) and vehicle wall.	
e. Three loop clamps (3), three screws, self tapping (4), and three lock washers (5).	Wrap clamps around RF cable (2) and install to holes drilled in step b.	Tools: Phillips screwdriver.
f. Two loop clamps(2) temporarily installed in paragraph 5-2 (n).	Wrap clamps (2) around RF cable (1) and install to studs with IET washers (3) and nuts (4). See Figure 5-6 (2).	Tools: 1/2 in socket.
g. RF cable (1) connector P2.	Route to right front of mounting base (5) and position on top of mounting base.	
h. Existing electrical distribution block cover under dashboard in curbside footwell.	Remove and retain. See Figure 5-6 (3).	
i. Power cable (1) connector P1.	Connect and secure to power mating connector (P/O electrical distribution block).	
j. Power cable (1).	Route along passenger seat to mounting base. See Figure 5-6(3).	
k. Power cable (1) connector P2.	Connect and secure to mounting base connector J1.	

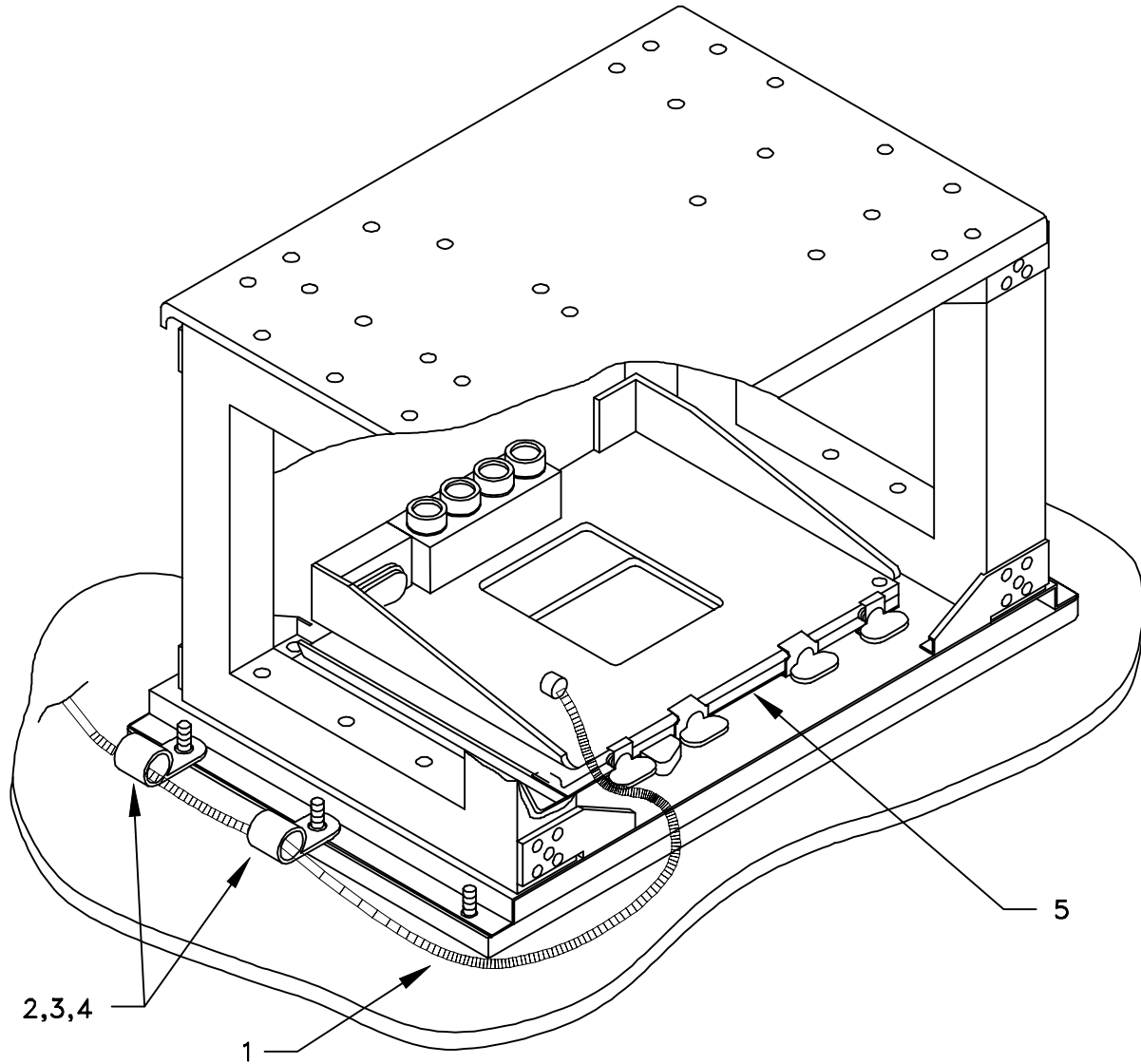
5.4 Installation of Cables. Continued.



1. ANTENNA BASE
2. RF CABLE, CG-3856/VRC (9 FT, 0 IN)
3. LOOP CLAMP (1/4-1/4 IN)
4. TAPPING SCREW (1/4-14 X 5/8 IN)
5. LOCK WASHER (1/4 IN)
6. GROMMET, NONMETALLIC 1/4

Figure 5-6(1). Cable Installation: RF Cable

5.4 Installation of Cables. Continued.

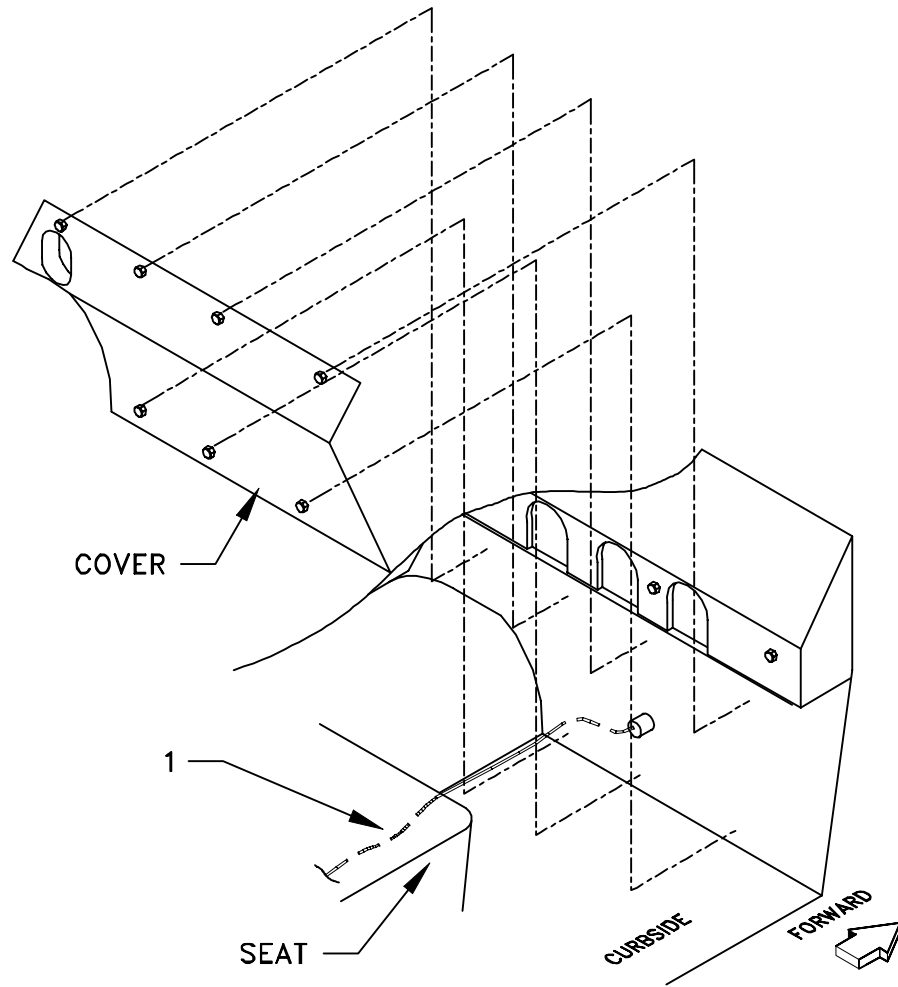


- 1. RF CABLE, CG-3856/VRC (9 FT, 0 IN)
- 2. LOOP CLAMP (1/4-5/16 IN)
- 3. IET WASHER (5/16 IN)
- 4. NUT (5/16-18 IN)
- 5. MOUNTING BASE

Figure 5-6(2). Cable Installation: RF Cable Routing



5.4 Installation of Cables. Continued.

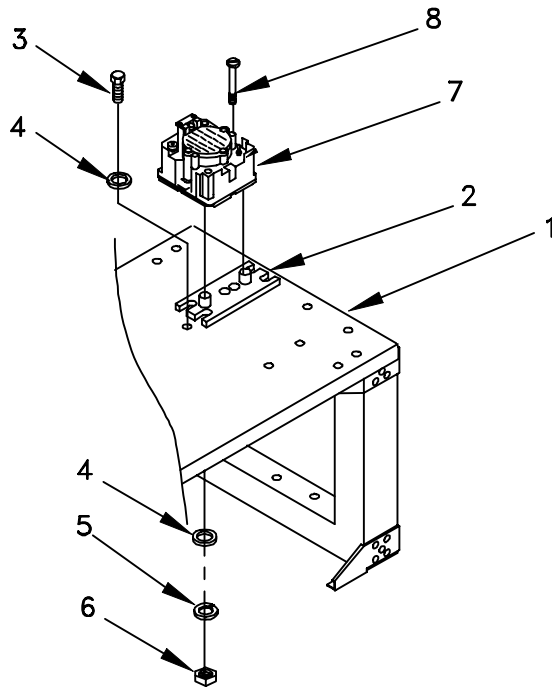


1. POWER CABLE, CX-13450/VRC (9 FT, 0 IN)

Figure 5-6(3). Cable Installation: Power Cable Routing

**5.5 Installation of Loudspeaker, Control-Unit, LS-671/VRC (speaker).** Use the following procedure to install speaker for "D" and "F" Radio Sets.. Mounting location on electrical equipment shelf may be determined by the vehicle commander.

ITEM	ACTION	REMARKS
a. Mounting plate (2).	Place on electrical equipment shelf (1) and align bottom slots over existing mounting holes or drill 11/32 in holes, if required. See Figure 5-7.	
b. Two machine bolts (3), four flat washers (4), two lock washers (5) and two nuts (6).	Install and secure to mounting plate (2) and electrical equipment shelf (1).	Tools: 1/2 in socket and 1/2 in open/box wrench.
c. Speaker (7).	Place on mounting plate (2).	
d. Two externally-relieved body screws (8).	Thread through and secure to speaker (7) and mounting plate (2).	Tools: Flatblade screwdriver.
e. Handset.	Connect and secure to speaker (7) connector J2.	



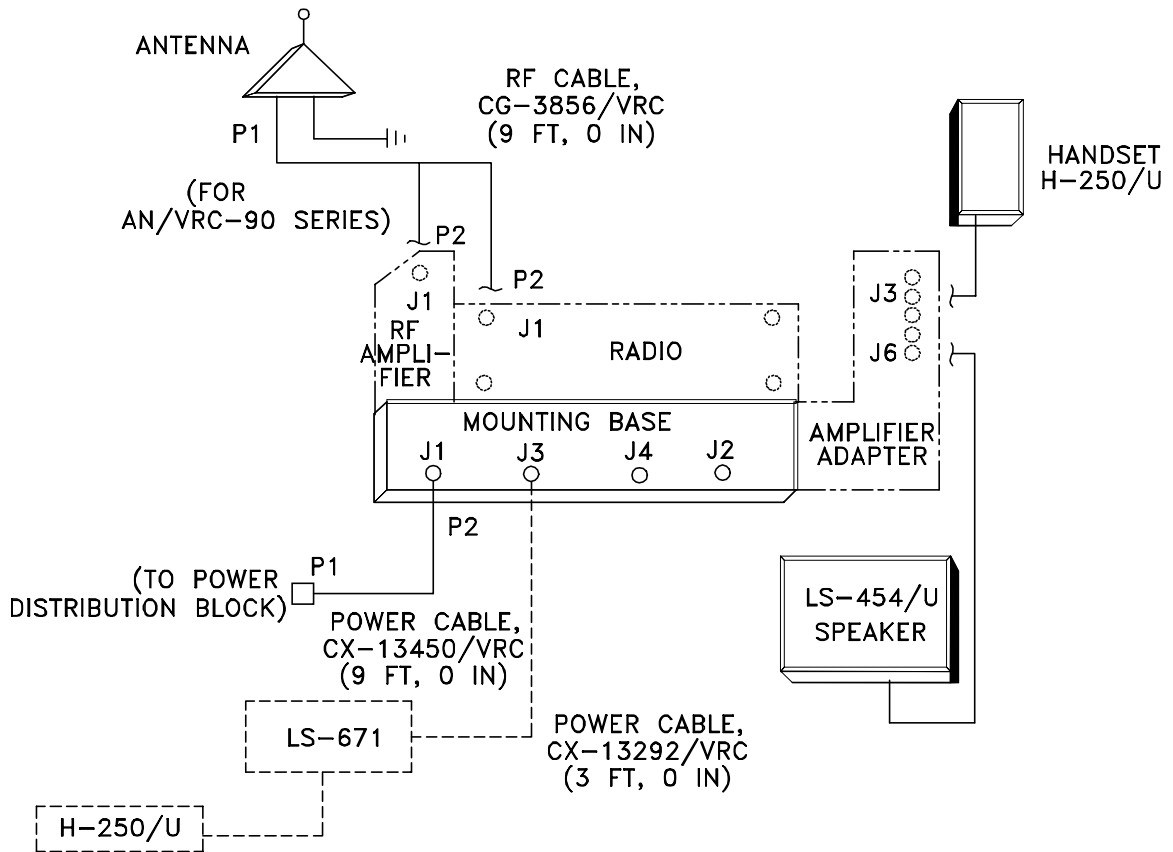
- |                                  |                             |
|----------------------------------|-----------------------------|
| 1. SHELF, ELECTRICAL EQUIPMENT   | 5. LOCK WASHER (5/16 IN)    |
| 2. MOUNTING PLATE                | 6. NUT (5/16-24 IN)         |
| 3. MACHINE BOLT (5/16-24 X 1 IN) | 7. SPEAKER                  |
| 4. FLAT WASHER (5/16 IN)         | 8. BODY SCREW (P/O SPEAKER) |

Figure 5-7. Speaker Installation

**5.6 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 5-8 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) checks and instructions.	
f. MK line replaceable units.	See TM 11-5820-890-20P for Repair Parts and Special Tools List (RPSTL) information.	

5.6 Post-Installation and Checkout. Continued.



CABLE ASSEMBLY	FROM			TO		
	CABLE CONN.	UNIT	UNIT CONN.	CABLE CONN.	UNIT	UNIT CONN.
CX-13450/VRC (9 FT, 0 IN)	P2	Mounting base	J1	P1	Power distribution block	
CG-3856/VRC (9 FT, 0 IN)	P1	Antenna base	J1	P2	RF amplifier or radio	J1
Handset cable		Handset			Amplifier-adapter	J3
Speaker cable		LS-454/U speaker			Amplifier-adapter	J6
*CX-13292/VRC (3 FT, 0 IN)	P2	Mounting base	J3	P1	LS-671/VRC	J1

\*Not supplied in this MK.

Figure 5-8. Cable Diagram: For AN/VRC-87/88/90 Series



## APPENDIX A

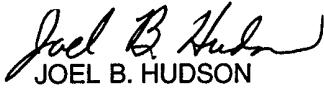
### REFERENCES

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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 (SINGARS)
TM 11-5820-890-10-1	Operator's Manual (ICOM Radio Sets)
TM 11-5820-890-10-3	Operator's Manual (Non-ICOM Radio Sets)
TM 11-5820-890-20-1	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 11-5820-890-20-4	Unit Maintenance Manual (Non-ICOM Radio Sets)
TM 11-5820-890-20P	Repair Parts and Special Tools List

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5-6	5-8		
		FO-3	

Recommend that the installation antenna alignment procedure be changed throughout to specify a 20 IFF antenna lag rather than 10

REASON: Experience has shown that with only a 10 lag, the antenna servo system is too sensitive to gusting in excess of 25 knots, and has a tendency to rapidly accelerate and decelerate as it hunts, causing strain to the drive train. Hunting is minimized by adjusting the lag to 20 without degradation of operation.

Item 5, Functional column. Change  2 dB" to  3 dB".

REASON: The adjustment procedure for the TRANS POWER FAULT indicator call for a 3 dB (500 watts) adjustment to light the TRANS POWER FAULT indicator.

Add new step f.1 to read,  Replace cover plate removed in step d above."

REASON: To replace the cover plate.

ZONE C 3. On J1-2, change  +24 VDC" to  +5 VDC".

REASON: This is the output line of the 5 VDC power supply. +24 VDC is the input voltage.

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