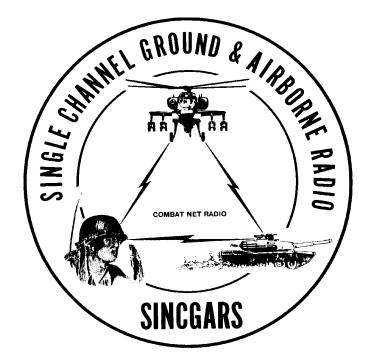
# **TECHNICAL BULLETIN**



## INSTALLATION INSTRUCTIONS FOR INSTALLATION KIT, ELECTRONIC EQUIPMENT, MK-2332/VRC (NSN 5895-01-309-9069) (EIC: N/A) TO PERMIT INSTALLATION OF RADIO SETS AN/VRC-87/88/90 SERIES IN A BASE STATION, SINGLE

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HEADQUARTERS, DEPARTMENT OF THE ARMY

1 AUGUST 1999

**TECHNICAL BULLETIN** 

NO. 11-5820-890-20-1

HEADQUARTERS, DEPARTMENT OF THE ARMY WASHINGTON, D.C.,1 AUGUST 1999

#### INSTALLATION INSTRUCTIONS FOR INSTALLATION KIT ELECTRONIC EQUIPMENT MK-2332/VRC (NSN 5895-01-309-9069) (EIC: N/A) TO PERMIT INSTALLATION OF RADIO SETS AN/VRC-87/88/90 SERIES IN A BASE STATION, SINGLE

#### 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.

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

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

#### TB 11-5820-890-20-1

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### 0.1 SCOPE.

This technical bulletin provides installation instructions for Installation Kit, Electronic Equipment MK-2332/VRC, commonly referred to as the Mounting Kit (MK). The MK shall be installed into the following:

Base Station, Single

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-2332/VRC (MK) contains the items needed to mount Radio Set AN/VRC-87/88/90 Series in a Base Station, Single.

### 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 2.5 work hours is required. Typical station downtime is 3.0 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
Mounting Base, Electrical Equipment MT-6352/VRC	5.1	1.5
Loudspeaker, LS-454/U	5.2	0.5
Cables	5.3	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. Use Table 4-2 and Figure 4-2 to identify and inventory additional items required for installation of "D" and "F" Series Radio Sets.

#### 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.

	ITEM DESCRIPTION	QUANTITY	SMR	FIGURE,
NSN	AND PART NUMBER	IN MK	CODE	ITEM NO.
5975-01-188-8873	Mounting Base, Electrical Equipment MT-6352/VRC(A3013367-1)	1	PAOOFA	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	5	PAOZZA	
5995-01-219-1843	Cable Assembly, Power, Electrical CX-13302/VRC (13 FT, 0 IN) (A3014039-2)	1	PAOZZA	4-1, 2
5965-00-876-2375	Loudspeaker, Permanent Magnet LS-454/U	1	PAOZZA	4-1, 4
5965-00-043-3463	Handset, H-250/U	1	PAOZZA	4-1, 3
	Lead, Electrical (5 FT, 0 in) A3013552-8	1	PAOZZA	
5306-00-225-9093	Bolt, Machine (5/16-24 x 1 1/2 in) MS90726-38	7	PAOZZA	
5310-00-407-9566	Nut, Hexagon (5/16-24 in) MS51968-5	2	PAOZZA	
5310-00-081-4219	Washer, Flat (5/16 in) MS27183-12	9	PAOZZA	
5310-00-407-9566	Washer, Lock (5/16 in) MS35338-45	2	PAOZZA	
5975-00-111-3208	Strap, Tiedown, Electrical Components MS3367-5-9	5	PAOZZA	

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

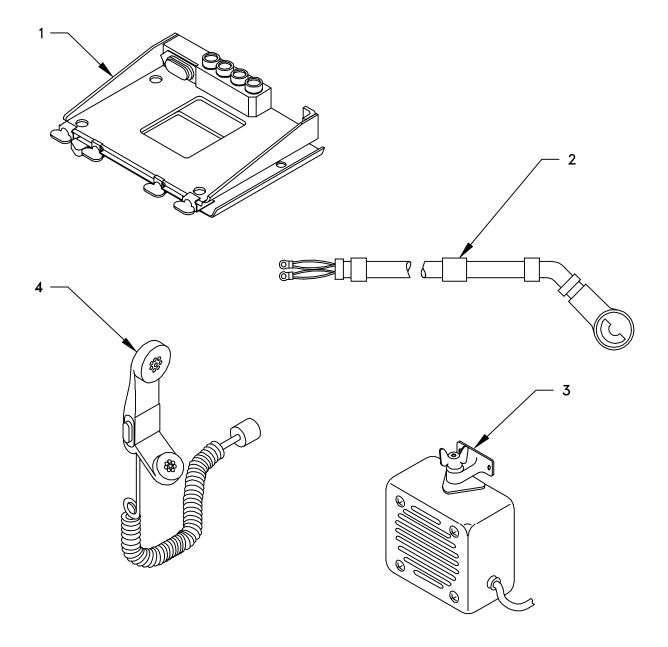


Figure 4-1. MK Illustrated Parts List

	ITEM DESCRIPTION	QUANTITY	SMR	FIGURE,
NSN	AND PART NUMBER	IN MK	CODE	ITEM NO.
5965-01-222-1420	Loudspeaker, Control Unit, LS-671/VRC (A3014065-1)	1	PAOFFA	4-2, 1
5995-01-219-4704	Cable Assembly, Special Purpose, Electrical CX-13292/VRC (6 FT, 0 IN) (A3014038-3)	1	PAOZZA	4-2, 2
	Plate, Mounting (A3014550-1)	1	XBOZZA	4-2, 3

#### Table 4.2. Additional Items Required for Installation of "D" and "F" Radio Sets

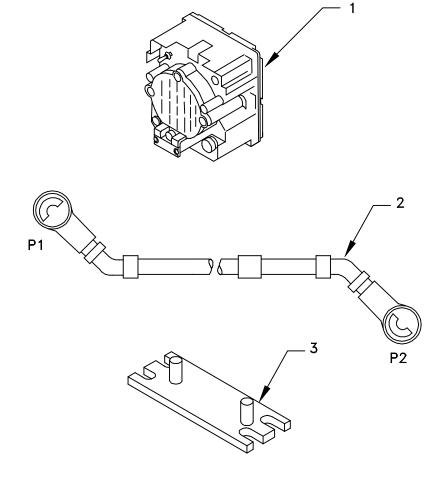


Figure 4-2. Illustrated Parts List for Table 4-2

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-seize Compound

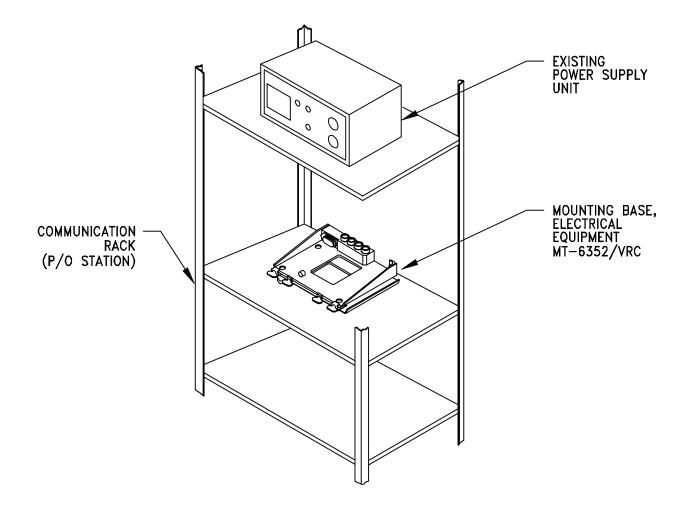
**4.4 Tools and Test, Measurement, and Diagnostic Equipment (TMDE) Required.** The following tools and TMDE are needed for installation.

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:	1/2 in	5120-00-228-9506	1
Handle, Socket Wrench:	1/2 in	5120-00-240-5364 5120-00-227-0977	1 1
Electric Drill Drill Bit:	11/32 in	5130-00-889-8994 5133-00-227-9664	1 1

\* Use radio issued with your station 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.





### 5. INSTALLATION PROCEDURES. Continued.

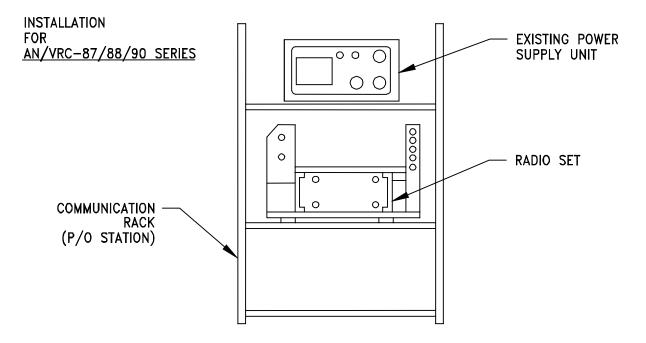
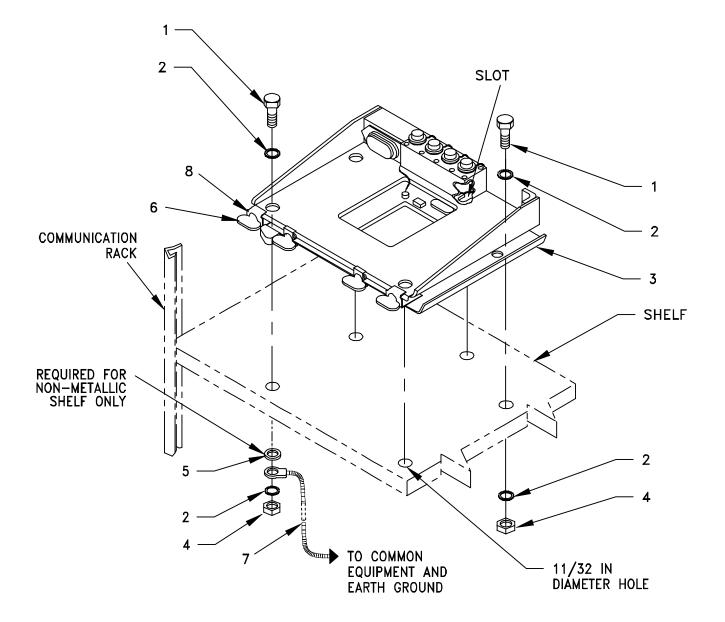


Figure 5-1 (2). MK and Radio Installation: Radio Equipment Location

**5.1 Installation of Mounting Base, Electrical Equipment MT-6352/VRC (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 a metallic shelf should be removed before installing the mounting base. On a non-metallic shelf, use ground straps to insure that mounting base is attached to a common equipment and earth ground. See Figure 5-2 and perform steps a through f and step g to install mounting base on a metallic shelf and step a, c, d, e, g, and h to install mounting base on a non-metallic shelf.

	ITEM	ACTION	REMARKS
		NOTE	
	during installation, an	dhesive-sealant to both sides of each internal/externa d to the area of contact where IET washer is to be pl nick shelf, use the longer machine bolts (5/16-24 x 1	aced. When installing
a.	Mounting holes for mounting base (3).	If existing, go to step b. If not existing, use mounting base as a template and drill five 11/32 in diameter holes through shelf. See Figure 5-2.	Tools: Electric drill and 11/32 in drill bit.
b.	For metallic shelf: mounting base (3) and shelf.	Remove a 2" square area of paint on the underside of the mounting base (3) around left front and rear mounting holes. Remove a 2" square area of paint on the existing shelf around the mounting holes drilled in step a that mate with left front and rear mounting holes of mounting base (3). Clean the paint removed areas and apply a thin coat of conductive anti-seize compound.	Tools: Electric grinder or equivalent.
C.	Mounting base (3).	Place on shelf over mounting holes. See Figure 5-2.	
d.	Two outer thumbscrews (6).	Turn ccw until both sets of threads have cleared center of holes.	
e.	Mounting base (3).	Align four holes and rear slot with matching hole pattern in shelf.	
f.	For metallic shelf: five machine bolts (1), ten internal/external-toothed (IET) washers (2) and five nuts (4).	Install and secure to mounting base (3) and shelf.	Tools: 1/2 in socket and 1/2 in open/box wrench.
g.	For non-metallic shelf: five machine bolts (1), ten internal/external- toothed (IET) washers (2), five flat washers (5), five nuts (4) and lead, electrical (7).	Install and secure to mounting base (3) and shelf.	Tools: 1/2 in socket and 1/2 in open/box wrench.
h.	Two outer thumbscrews (6).	Tighten and secure to rim clenching clamps (8) and mounting base (3).	



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

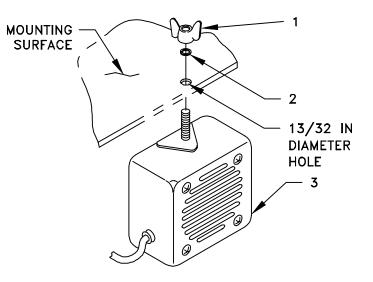
- 1. MACHINE BOLT (5/16-24 x 1 IN) OR MACHINE BOLT (5/16-24 x 1 1/2 IN)
- 2. IET WASHER (5/16 IN)
- 3. MOUNTING BASE
- 4. NUT (5/16-24 IN)
- 5. FLAT WASHER (5/16 IN)
- 6. THUMBSCREW
- 7. LEAD, ELECTRICAL (5 FT, O IN)
- 8. RIM CLENCHING CLAMP

Figure 5-2. Mounting Base Installation

**5.2 Installation of Loudspeaker, Permanent Magnet LS-454/U (speaker).** Mounting location for speakers to be determined by vehicle commander. Typical methods used for mounting the speaker are as follows:

Method A. See Figure 5-5 (1).

- a. Determine speaker (3) location.
- b. Drill 13/32 in diameter hole through mounting surface.
- c. Insert stud on speaker (3) through drilled hole; then secure with lock washer (2) and wing nut (1).



- 1. WING NUT (3/8-24 IN)
- 2. LOCK WASHER (3/8 IN)
- 3. SPEAKER
- 4. CAP SCREW (1/4-20 x 1/IN)
- 5. SPEAKER BRACKET
- 6. LOCK WASHER (1/4 IN)
- 7. NUT (1/4-20 IN)

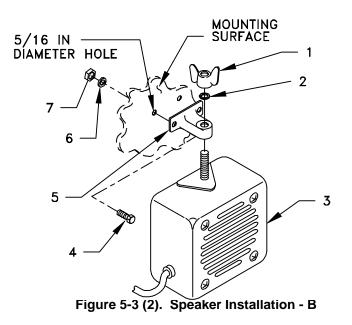
Figure 5-3 (1). Speaker Installation - A

#### NOTE

Items (4), (6) and (7) are not supplied in kit.

Method B. See Figure 5-5 (2).

- a. Determine speaker (3) location.
- b. Drill two 5/16 in diameter holes through mounting surface.
- Install and secure two cap screws (4), two lock washers (6) and two nuts (7) to speaker bracket (5) and mounting surface.
- Insert speaker (3) stud through speaker bracket (5) hole; then secure with lock washer (2) and wing nut (1).



**5.3 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

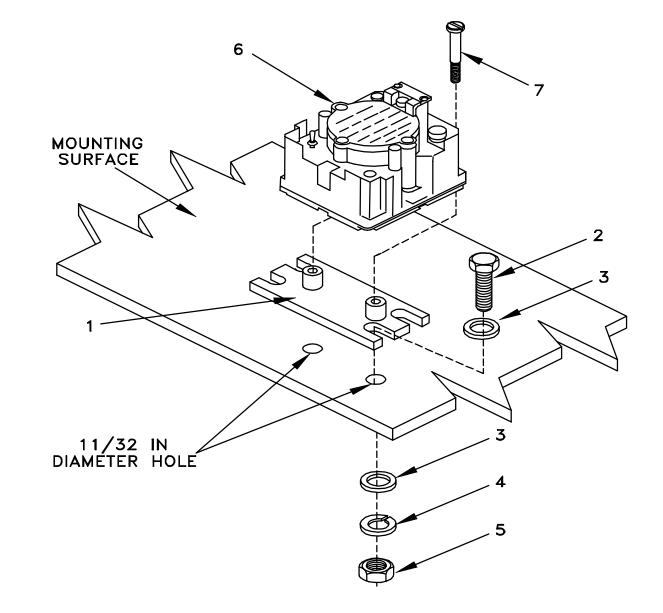
Make sure vehicle power source is positioned OFF or disconnected before installing cables.

- ITEM ACTION REMARKS a. Existing RF cable. Position on mounting base (1). b. Power cable (2) Connect and secure to mounting base (1) connector J1. connector P1. c. Power cable (2) Connect and secure to existing power supply unit. connector T1 (red) and T2 (black). EXISTING POWER SUPPLY UNIT EXISTING **RF CABLE** 0 COMMUNICATION 2 RACK 1
  - 1. MOUNTING BASE
  - 2. POWER CABLE CX-13302/VRC (13 FT, 0 IN)



**5.4 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 communications rack may be determined by the station commander.

	ITEM	ACTION	REMARKS
a.	Mounting holes for plate, mounting (1).	Using plate, mounting (1) as a template, drill two 11/32 in diameter holes through mounting surface. See Figure 5-5.	Tools: Electric drill and 11/32 in drill bit.
b.	Plate, mounting (1)	Align bottom slots with holes drilled in step a.	
c.	Two machine bolts (2), two flat washers (3), two lock washers (4) and two nuts (5).	Install and secure to plate, mounting (1) and mounting surface.	Tools: 1/2 in socket and 1/2 in open/box wrench
d.	Speaker (6).	Place on plate, mounting (1)	
e.	Two externally-relieved body screws (7).	Thread through and secure to speaker (6) and plate, mounting (1).	Tools: Flatblade screwdriver.
f.	Handset.	Connect and secure to speaker (6) connector J2.	



5.4 Installation of Loudspeaker, Control-Unit, LS-671/VRC (speaker). Continued

- 1. PLATE, MOUNTING
- 2. BOLT MACHINE (5/16-24 x 1 1/2 IN)
- 3. FLAT WASHER (5/16 IN)
- 4. LOCK WASHER (5/16 IŃ)
- 5. NUT (5/16 IN)
- 6. SPEAKER
- 7. BODY SCREW (P/O PLATE, MOUNTING)

Figure 5-5. Speaker Installation

**5.4 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 5-6 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.	
	MK line replaceable units.	See TM 11-5820-890-20P for Repair Parts and Special Tools List (RPSTL) information.	

5.5 Post-Installation and Checkout. Continued.

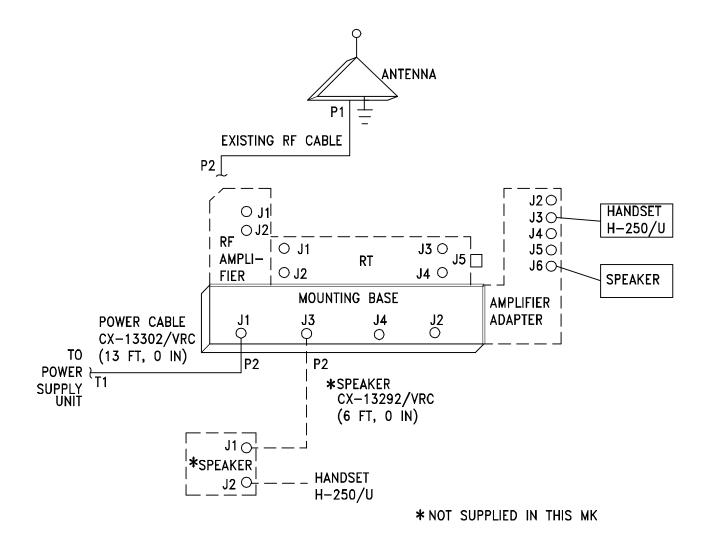
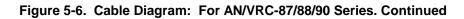


Figure 5-6. Cable Diagram: For AN/VRC-87/88/90 Series

#### 5.5 Post-Installation and Checkout. Continued.

	FROM			то		
CABLE	CABLE	UNIT	UNIT	CABLE	UNIT	UNIT
ASSEMBLY	CONN.		CONN.	CONN.		CONN.
Existing RF cable	P2	RF amplifier or RT	J1	P1	Existing antenna	
CX-13302/VRC (13 FT, 0 IN)	P2	Mounting base	J1	T1: Red (+) T2: Black (-)	Existing power supply unit	
Speaker cable		Amplifier-adapter	J6		Speaker	
Handset cable		Amplifier-adapter	J3		Handset	
*CX-13292/VRC (6 FT, 0 IN)	P2	Mounting base	J3	P1	*Speaker	J1

\* Not supplied in this MK.



### **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 Sets and Authorized Installations, Volume II, SINCGARS and EPLRS
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

By Order of the Secretary of the Army:

ERIC K. SHINSEKI General, United States Army Chief of Staff

Official:

Joel B. Hulm I JOEL B. HUDSON

Administrative Assistant to the Secretary of the Army

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1

55			ABOUT II CAREFUL	JOT DOWN THE INFO ON THIS FORM. LY TEAR IT OUT.	M: (PRINT YOUR UNIT'S COMPLETE ADDRESS) Commander Stateside Army Depot ATTN: AMSTA-US Stateside, NJ 07703-5007 TE SENT 10 July 1995		
PUBLICAT	ION NUMBE	R		PUBLICATION DATE	PUBLICATION TITLE		
Т	M 11–5	840-340	-12	23 Jan 74	Radar Set AN/PRC-76		
BE EXA	CT PIN-POI	NT WHERE I	T IS	IN THIS SPACE TELL WHAT IS W AND WHAT SHOULD BE DONE A			
PAGE NO	PARA- GRAPH	FIGURE NO	TABLE NO				
2-25 2-28				Recommend that the installation antenna alignment procedure be changed throughout to specify a 20 IFF antenna lag rather than 10			
				REASON: Experience has s antenna servo system is too s of 25 knots, and has a tender decelerate as it hunts, cau is minimized by adjusting the operation.	shown the wide only a 10 lag, the sensitive to a subgusting in excess ney to rapidly accelerate and a strain to the drive train. Hunting a to 20 without degradation of		
3-10	3-3		3-1	REA	Change $\Box 2 dB$ to $\Box 3 dB$ . procedure for the TRANS POWER dB (500 watts) adjustment to light $\Gamma$ indicator.		
5-6	5-8		5	At new step f.1 to read, step d above."	Replace cover plate removed in		
		FO-3		ZONE C 3. On J1-2, change $\Box$ +24 VDC" to $\Box$ +5 VDC". REASON: This is the output line of the 5 VDC power supply. +24 VDC is the input voltage.			
				LEPHONE NUMBER SIGN			

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	RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATION
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