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# **TECHNICAL BULLETIN**



# INSTALLATION INSTRUCTIONS FOR INSTALLATION KIT, ELECTRONIC EQUIPMENT, MK-2901/VRC (NSN 5895-01-458-1547) (EIC: N/A) TO PERMIT INSTALLATION OF RADIO SETS AN/VRC-87/88/90 SERIES IN A DEUCE VEHICLE

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**HEADQUARTERS, DEPARTMENT OF THE ARMY** 

# 1 APRIL 2000

#### TB 11-5820-890-20-113

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NO. 11-5820-890-20-113

HEADQUARTERS, DEPARTMENT OF THE ARMY WASHINGTON, D. C., 1 APRIL 2000

## INSTALLATION INSTRUCTIONS FOR INSTALLATION KIT ELECTRONIC EQUIPMENT MK-2901/VRC (NSN 5895-01-458-1547) (EIC: N/A) TO PERMIT INSTALLATION OF RADIO SETS AN/VRC-87/88/90 SERIES IN A DEUCE VEHICLE

#### 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-LEO-D-CS-CFO, Fort Monmouth, New Jersey 07703-5000. The fax number is 908-532-1413, DSN 992-1413. You may also e-mail your recommendations 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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### 0.1 SCOPE.

This technical bulletin provides installation instructions for Installation Kit, Electronic Equipment MK-2901/VRC, commonly referred to as the Mounting Kit (MK). The MK shall be installed into the following type of vehicle(s):

DEUCE Vehicle

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 shelter 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. Refer to SB 11-131-2 for Installation Kit 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-2901/VRC (MK) contains the items needed to mount Radio Set AN/VRC-87/88/90 Series in a DEUCE 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 3.5 work hours is required. Typical vehicle downtime is 3.5 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	1.0
Mounting Base, Electrical Equipment MT-6352/VRC	5.2	0.5
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 shelter for damage that could affect installation. Have any such damage repaired before installing MK.

4.1.1 Items to be Removed. Not applicable.

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.

**4.2.3 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.

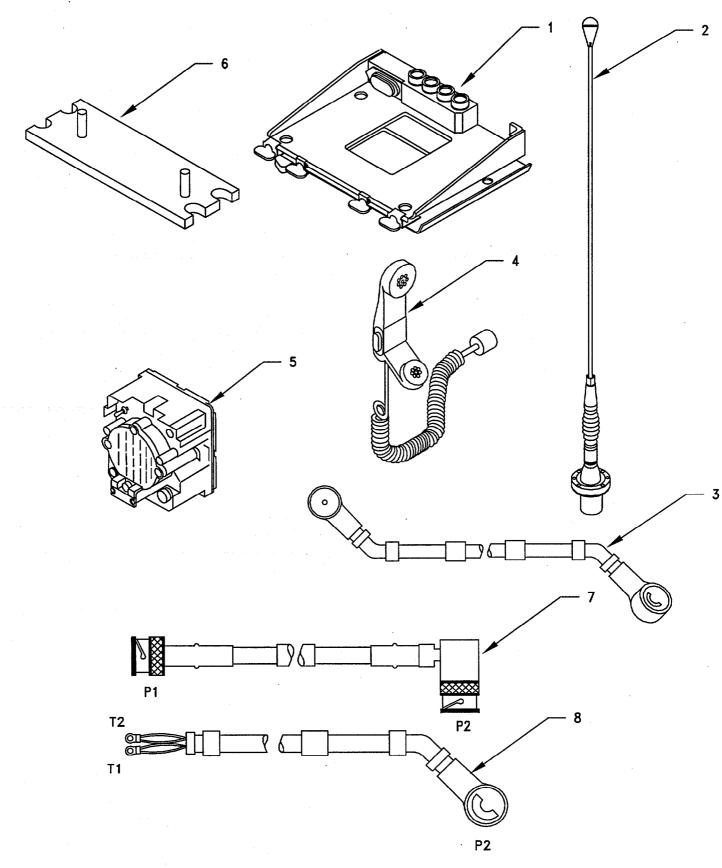
#### 4.3.2 Distribution and Issue Instructions.

- 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.

3

	ITEM DESCRIPTION	QUANTITY	SMR	FIGURE,
NSN	AND PART NUMBER	IN MK	CODE	ITEM NO.
5985-01-353-4943	Antenna, Vehicular AS-3916/VRC (A3207487-1)	1	PAOOFA	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 (5/16 in) MS45904-72 (Not Used)	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 4010-01-381-1521	Gasket (A3013655-1) (Not Used) Wire Rope Assembly (A3207523-1)	1 1	PAOZZA PAOZZA	
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 (1 Not Used)	5	PAOZZA	
5310-00-889-2527	Washer Lock, Internal/External-Toothed (5/16 in) MS45904-72 (2 Not Used)	10	PAOZZA	
5310-00-880-7746	Nut, Hexagon (5/16-24 in) MS51968-5 (1 Not Used)	5	PAOZZA	
5995-01-219-4703	Cable Assembly, Special Purpose, Electrical CX-13292/VRC (4 FT, 0 IN) (A3014038-2)	1	PAOZZA	4-1, 3
5965-01-222-1420	Loudspeaker, Control Unit LS-671/VRC (A3014065-1)	1	PAOOFA	4-1, 5
5965-00-043-3463	Handset, H-250/U	1	PAOOFA	4-1, 4
	Plate, Mounting (A3014550-1)	1	XBOZZA	4-1, 6
5995-01-225-1656	Cable Assembly, Power, Electrical, CX-13302/VRC (3 FT, 0 IN) (A3014039-3)	1	PAOZZA	4-1, 8
5995-01-219-7031	Cable Assembly, Radio Frequency, CG-3855/VRC (9 FT, 0 IN) (A3014031-4)	1	PAOZZA	4-1, 7
	Grommet, Nonmetallic MS35489-11	1	PAOZZA	
5975-00-111-3208	Strap, Tiedown, Electrical Components MS3367-5-9	10	PAOZZA	
	· · · · ·			

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





5

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

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

# **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 1/2 i 9/16 i	n 5120-00-228-9506	1 1 1
Handle, Socket Wrench Socket 7/16 i 1/2 i 9/16 i	n 5120-00-237-0977	1 1 1 1
Electric Drill Drill Bit 11/32 i	5130-00-889-8994 n 5133-00-227-9664	1 1

\* Use radio issued with your vehicle if available.

## 5. INSTALLATION PROCEDURES.

This section describes where and how to install MK items in the shelter. 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.

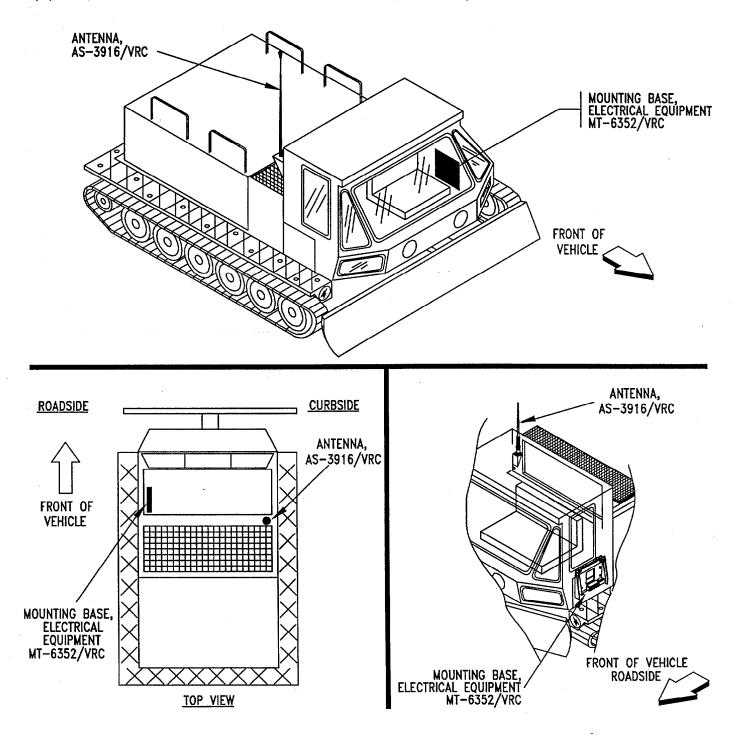
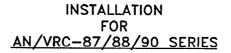
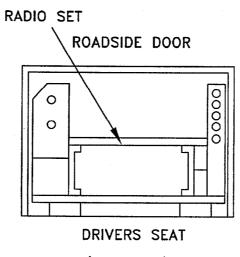


Figure 5-1(1). MK and Radio Installation: MK Equipment Locations

# 5. INSTALLATION PROCEDURES. Continued.





(TOP VIEW)

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

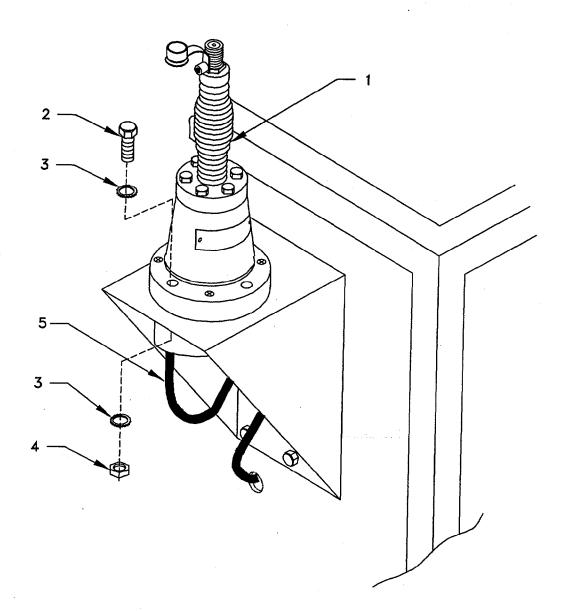
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#### 5.1 Installation of Antenna, Vehicular, AS-3916/VRC (antenna).

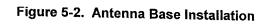
**5.1.1 Installation of Antenna Base.** Use the following procedures to install antenna base. See Figure 5-1(1) for location. To ensure good electrical grounding any rust, corrosion, or paint around mounting holes in antenna bracket should be removed before installing the antenna base.

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.				
Remove the paint (1" strip) for 360° centered around the four mounting holes Clean the paint removed area and apply a thin coat of conductive anti-seize compound (CASC).				
Place on top of antenna bracket; then align mounting holes.				
Install and secure to antenna base (1) and antenna bracket.	Tools: 9/16 in socket and 9/10 in open/box wrench.			
Apply a bead of adhesive-sealant/silicon compound 360° around the seam between antenna base (1) and existing antenna bracket.				
Connect and secure to antenna base (1) connector J1. See Figure 5-2.				
Insert through existing hole in rear wall below existing antenna bracket. See Figure 5-2. NOTE: Leave a drip loop in the RF cable.				
	NOTE thesive-sealant to both sides of each internal/externed to the area of contact where IET washer is to be pl Remove the paint (1" strip) for 360° centered around the four mounting holes Clean the paint removed area and apply a thin coat of conductive anti-seize compound (CASC). Place on top of antenna bracket; then align mounting holes. Install and secure to antenna base (1) and antenna bracket. Apply a bead of adhesive-sealant/silicon compound 360° around the seam between antenna base (1) and existing antenna bracket. Connect and secure to antenna base (1) connector J1. See Figure 5-2. Insert through existing hole in rear wall below existing antenna bracket. See Figure 5-2. NOTE:			

# 5.1.1 Installation of Antenna Base. Continued.



- 1. ANTENNA BASE
- 2. CAP SCREW (3/8-16 X 1 3/4 IN)
- 3. IET WASHER (3/8 IN)
- 4. NUT (3/8-16 IN)
- 5. RF CABLE, CG-3855/VRC (9 FT, 0 IN)



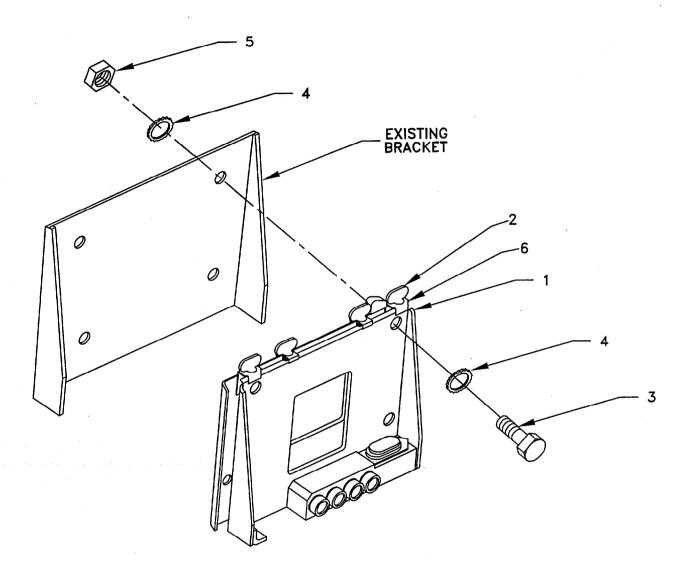
**5.1.2** Installation of Top Antenna Assembly. The top portion of the antenna consists of one element (with installed cap). Use the following procedure to install and tiedown all antennas.

	ITEM	ACTION	REMARKS
a.	Antenna element (1).	Install and secure to antenna base (2).	$\Theta$
b.	Wire rope assembly (3).	Attach clip to antenna element (1). Tie rope to vehicle to position antenna in desired location. See Figure 5-3, Detail A.	
		3	
			Ŕ
		DETAIL A	
2.	ANTENNA ELEMENT ANTENNA BASE WIRE ROPE ASSEMBL	Y	<b>H</b>

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

	ITEM	ACTION	REMARKS
	Apply a thin coat of a during installation, an	NOTE dhesive-sealant to both sides of each internal/extern id to the area of contact where IET washer is to be p	al-toothed (IET) washer laced
а.	Mounting base (1) and existing mounting bracket.	Remove a 2" square area of paint on the underside of the mounting base (1) around left front and rear mounting holes. Remove a 2" square area of paint on the existing mounting bracket around the existing mounting holes that mate with left front and rear mounting holes of mounting base (1). Clean the paint removed areas and apply a thin coat of CASC.	
b.	Mounting base (1).	Place on existing mounting bracket over existing holes. See Figure 5-4.	
C.	Two outer thumbscrews (2).	Turn ccw until both sets of threads have cleared center of holes.	
d.	Mounting base (1).	Align four holes with matching hole pattern in bracket.	
е.	Four machine bolts (3), eight IET washers (4) and four nuts (5).	Install and secure to mounting base (1) and bracket.	Tools: 1/2 in socket and 1/2 in open/box wrench.
f.	Two outer thumbscrews (2).	Tighten and secure to rim clenching clamps (6) and mounting base (1).	

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



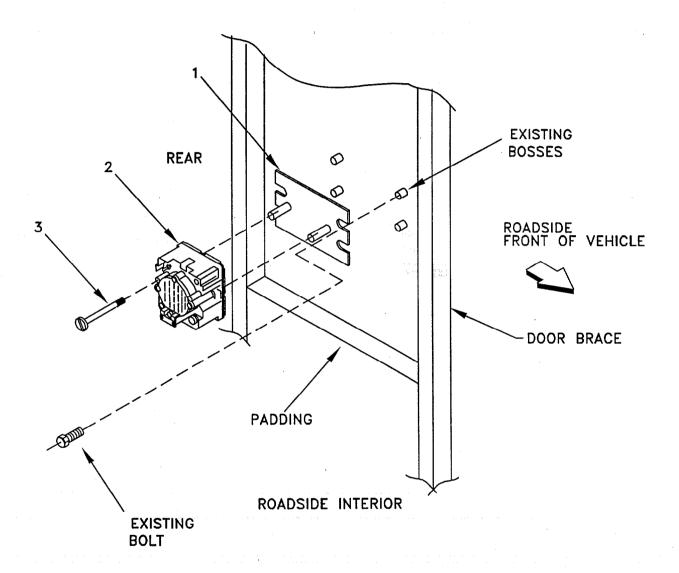
- 1. MOUNTING BASE
- 2. THUMBSCREW
- 3. MACHINE BOLT (5/16-24 X 1 IN)
- 4. IET WASHER (5/16 IN)
- 5. NUT (5/16-24 IN)
- 6. RIM CLENCHING CLAMP

Figure 5-4. Mounting Base Installation

**5.3 Installation of Loudspeaker, Control Unit, LS-671/VRC (speaker).** Use the following procedures to install speaker.

ITEM		ACTION	REMARKS
a.	Plate, mounting(1).	Place over four existing bosses in roadside wall after removing the existing bolts. See Figure 5-5.	
b.	Four existing bolts.	Install and secure to plate, mounting (1) and existing bosses.	Tools: 1/2 in socket
C.	Speaker (2).	Place on plate, mounting (1).	
d.	Two externally-relieved body screws (3).	Thread through speaker (2) and secure to plate, mounting (1).	Tools: Flat blade screwdriver.
e.	Handset.	Connect and secure to speaker (2) connector J2.	

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



- 1. PLATE, MOUNTING
- 2. SPEAKER
- 3. BODY SCREW (P/O SPEAKER

Figure 5-5. Speaker Installation

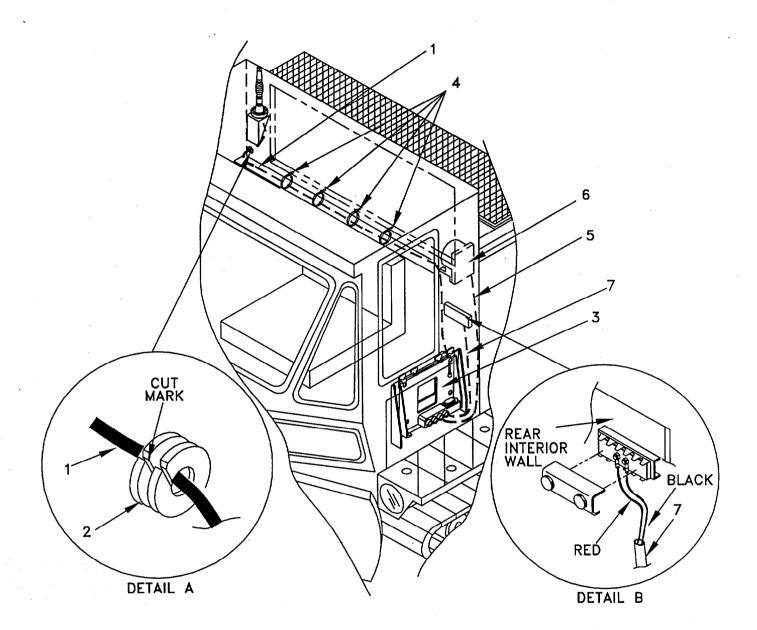
**5.4. Installation of Cables.** To accomplish the installation, leave loop clamps and tiedown straps loose enough to adjust cable slack and allow easy adjustment of equipment. When installation is complete, tighten and secure all clamps, clips and tiedown straps.

#### WARNING

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

	ITEM	ACTION	REMARKS
a.	Grommet (2).	Cut through on mark shown; then wrap around RF cable (1) and install to hole in rear wall. See Figure 5-6, Detail A.	
b.	RF cable (1).	Route along interior rear wall along ridge behind seat towards the roadside then down and position on left side of mounting base (3).	
C.	Four tiedown straps (4).	Wrap around RF cable (1), then install to ridge behind seat.	
d.	Speaker cable (5) connector P2.	Connect and secure to mounting base (3) connector J3.	
e.	Speaker cable (5) connector P1.	Connect and secure to speaker(6) connector J1	
f.	Power cable (7) terminal leads: T1 (red) and T2 (black)	Connect and secure to terminal lugs on power strip with existing mounting hardware. See Figure 5-6, Detail B.	
g.	Sealant	Apply to and around previously installed grommets.	
h.	Power cable (7) connector P2.	Connect and secure to mounting base (3) connector J1.	

#### 5.4 Installation of Cables. Continued.



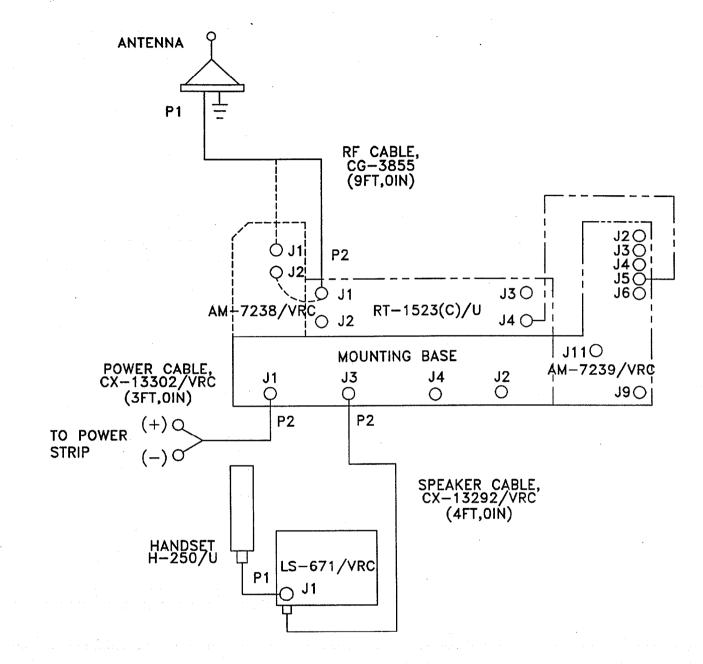
1. RF CABLE, CG-3855/VRC (9 FT, 0 IN)

- 2. GROMMET
- 3. MOUNTING BASE
- 4. TIEDOWN STRAP
- 5. SPEAKER CABLE, CX-13292/VRC (4 FT, 0 IN)
- 6. SPEAKER
- 7. POWER CABLE, CX-13302/VRC (3 FT, 0 IN)



5.5 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 5-7 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.	



5.5 Post-Installation and Checkout. Continued.

#### Figure 5-7. Cable Diagram: For AN/VRC-87/88/90 Series

		FROM	·		то	
CABLE ASSEMBLY	CABLE CONN.	UNIT	UNIT CONN.	CABLE CONN.	UNIT	UNIT CONN.
CX-13302/VRC (3 FT, 0 IN)	P2	Mounting base	J1	T1: Red (+) T2: Black (-)	Existing power strip	(+) lug (-) lug
CG-3855/VRC (9 FT, 0 IN)	P1	Antenna base	J1	P2	RF amplifier or RT	J1
CX-13292/VRC (4 FT, 0 IN)	P2	Mounting base	J3	P1	Speaker	J1

5.5 Post-Installation and Checkout. Continued.

## APPENDIX A

## REFERENCES

Army Master Data File (Microfiche)
Supply Policy Below the Wholesale Level as Contained in Unit Supply UPDATE
Requisitioning, Receipt and Issuing System in UPDATE
Consolidated Index of Army Publications (Microfiche)
Using Unit Supply System Manual Procedures as Contained in Unit Supply UPDATE
Vehicular Radio Sets and Authorized Installations (SINCGARS)
Operator's Manual (ICOM Radio Sets)
Operator's Manual (Non-ICOM Radio Sets)
Unit Maintenance Manual (ICOM Radio Sets, Vol. 1)
Unit Maintenance Manual (ICOM Radio Sets, Vol. 2)
Unit Maintenance Manual Handbook (ICOM Radio Sets)
Unit Maintenance Manual (Non-ICOM Radio Sets)
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: 1 B. Hul

JOEL B. HUDSON Administrative Assistant to the Secretary of the Army 0008305

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PUBLICAT	TION NUMB	ER		PUBLICATION DA	ATE	PUBLICATION TITLE		
TM	11-5840	-340-12		23 Jan 74	Radar Set AN/PRC-76			
	1	NT WHERE	T	IN THIS SPACE TELL WHA AND WHAT SHOULD BE D				
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 shown that with only a 10 lag,				
				the antenna servo sy excess of 25 knots, a and decelerate as it h	stem is t and has a nunts, ca ed by adj	oo sensitive to wind gusting in a tendenter to rapidly accelerate using store to the drive train. usting the sets o 20 without		
3-10	3-3		3-1	Item 5. Function	Denn.	Change $\Box 2  dB''$ to $\Box 3  dB''$ .		
				REASON: The adju	isterent j lls for a	procedure for the TRANS POWER 3 dB (500 watts) adjustment to light		
5-6	5-8			stationew step f.1 to r stationary above."	read, 🗆	Replace cover plate removed in		
				REASON: To replace	ce the co	ver plate.		
		FO-3		Tone C.3 On II-2	change I	∃+24 VDC" to □+5 VDC".		
		10-3			ne outpu	t line of the 5 VDC power supply.		
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REVERSE OF DA FORM 2028-2

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