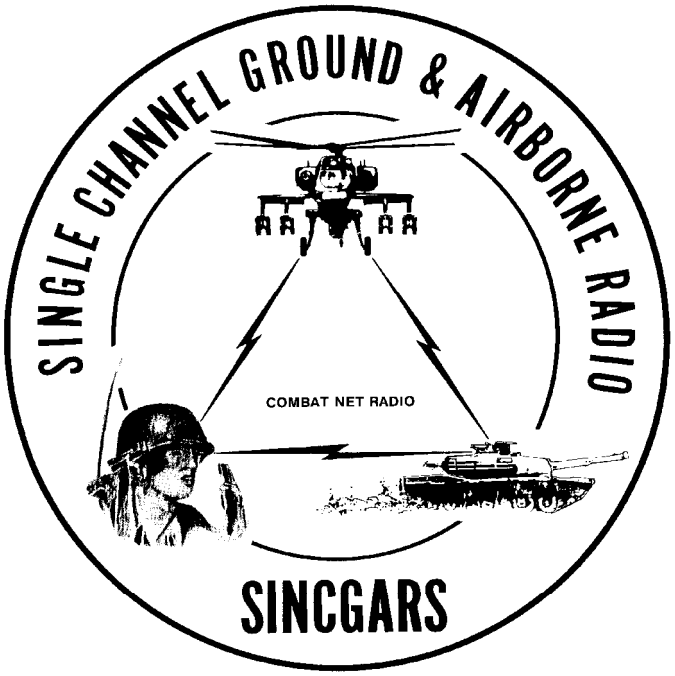
TECHNICAL BULLETIN



INSTALLATION INSTRUCTIONS FOR INSTALLATION KIT, ELECTRONIC EQUIPMENT, MK-2201/VRC (NSN 5895-01-299-5865) (EIC: N/A) TO PERMIT INSTALLATION OF RADIO SET AN/VRC-89/91 SERIES IN A AVENGER, AN/TWQ-1

Approved for public release; distribution is unlimited.

HEADQUARTERS, DEPARTMENT OF THE ARMY

1 JULY 2000

TECHNICAL BULLETIN

NO. 11-5820-890-20-9

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

INSTALLATION INSTRUCTIONS FOR INSTALLATION KIT ELECTRONIC EQUIPMENT MK-2201/VRC (NSN 5895-01-299-5865) (EIC: N/A) TO PERMIT INSTALLATION OF RADIO SETS AN/VRC-89/91 SERIES IN AVENGER, AN/TWQ-1

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.

TABLE OF CONTENTS

_____

*This manual supersedes TB 11-5820-890-20-9, 1 September 1993

LIST OF ILLUSTRATIONS

LIST OF TABLES

0.1 SCOPE.

This technical bulletin provides installation instructions for Installation Kit, Electronic Equipment MK-2201/VRC, commonly referred to as the Mounting Kit (MK). The MK shall be installed into the following type of vehicle(s):

- Avenger, AN/TWQ-1

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 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-89/91 Series is:

- Radio Set AN/VRC-89/91 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-2201/VRC (MK) contains the items needed to mount Radio Set AN/VRC-89/91 Series in Avenger, AN/TWQ-1.

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 vehicle 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
Antenna AS-3900/VRC	5.1	0.5
Mounting Base, Electrical Equipment MT-6352/VRC	5.2	1.5
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-88/91 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-89/91 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)	2	PAOOFA	4-1, 6
5305-00-847-1159	Screw, Cap, Hexagon (3/8-16 x 1-3/4 in) MS35307-365	8	PAOZZA	
5310-00-913-8881	Nut, Hexagon (3/8-16 in) MS51971-3	8	PAOZZA	
5310-00-061-1258	Washer, Lock, Internal/External-Toothed (3/8 in) MS45904-76	16	PAOZZA	
5310-00-889-2527	Washer, Lock, Internal/External-Toothed (5/16 in) MS45904-72	4	PAOZZA	
5306-00-225-9086	Bolt, Machine (5/16-24 x 5/8 in) MS90726-31 (Not Used)	2	PAOZZA	
5330-01-205-2864	Gasket (A3013655-1)	2	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	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 (3 Not Used)	5	PAOZZA	
5995-01-225-1662	Cable Assembly, Radio Frequency, CG-3855/VRC (12 FT, 0 IN) (A3014031-12)	1	PAOZZA	4-1, 3
5995-01-226-2443	Cable Assembly, Radio Frequency, CG-3855/VRC (13 FT, 0 IN) (A3014031-15)	1	PAOZZA	4-1, 3
5995-01-227-0473	Cable Assembly, Special Purpose, Electrical CX-13300/VRC (4FT, 0IN) (A3014044-6)	1	PAOZZA	4-1, 4
5995-01-303-4951	Cable Assembly, Special Purpose, Electrical CX-13313/VRC (2FT, 7IN) (A3018360-1)	1	PAOZZA	4-1, 2
4020-01-341-8795	Fiber Rope Assembly, Single Leg (A3167672-1)	2	PAOZZA	4-1, 5
5325-00-174-5314	Grommet, Nonmetallic MS35489-5	1	PAOZZA	
5325-00-263-6651	Grommet, Nonmetallic MS35489-12	1	PAOZZA	
5306-00-225-9093	Bolt, Machine (5/16-24 x 1 1/2 in) MS90726-38	5	PAOZZA	
5340-00-079-7837	Clamp, Loop (1/4-13/64 in) MS21333-67	2	PAOZZA	

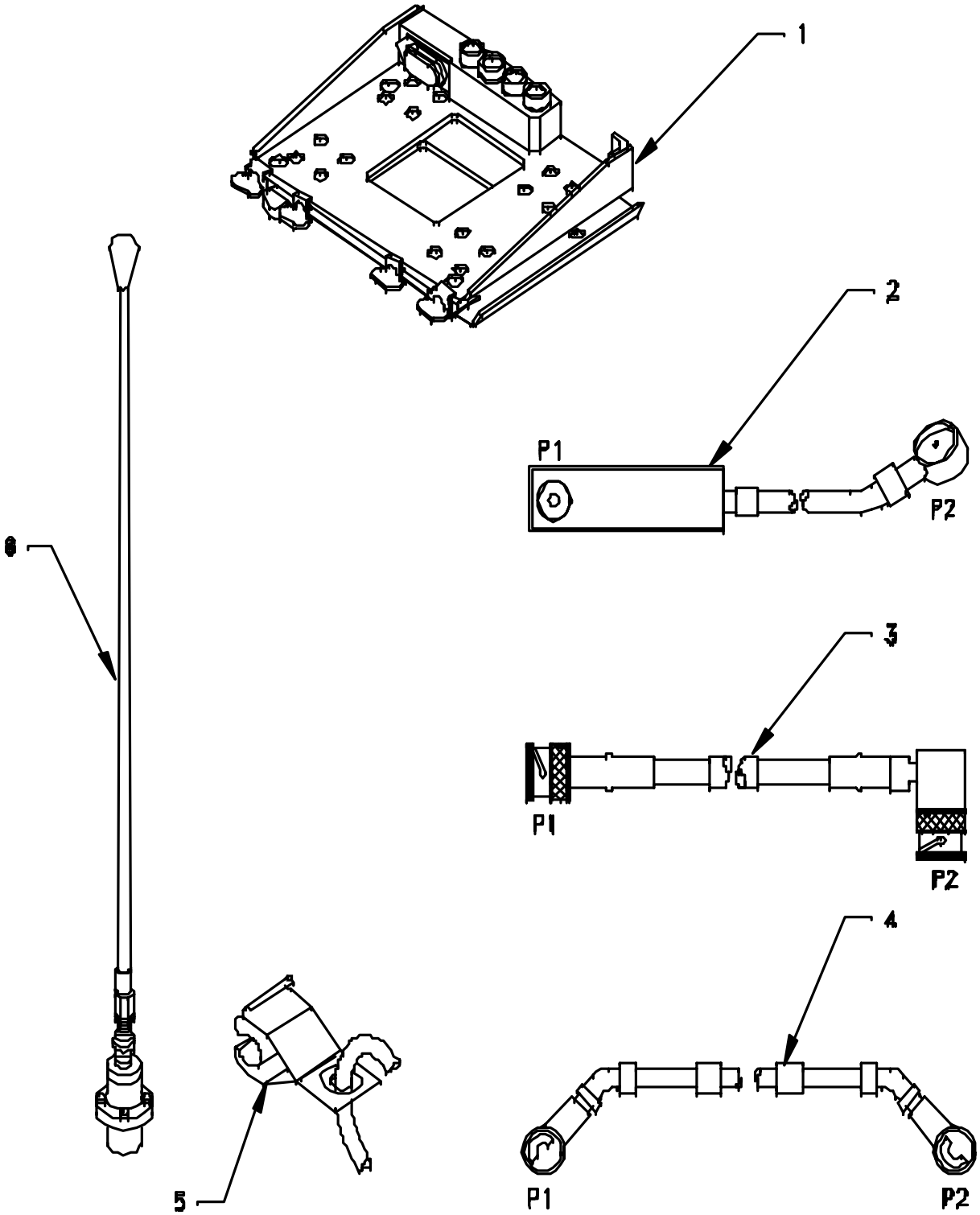


Figure 4-1. MK Illustrated Parts List

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
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:	7/16 in	5120-00-228-9505	1
	1/2 in	5120-00-228-9506	1
	9/16	5120-00-228-9507	1
Handle, Socket Wrench:		5120-00-240-5364	1
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

* Use radio issued with you're an/TWQ-1 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.

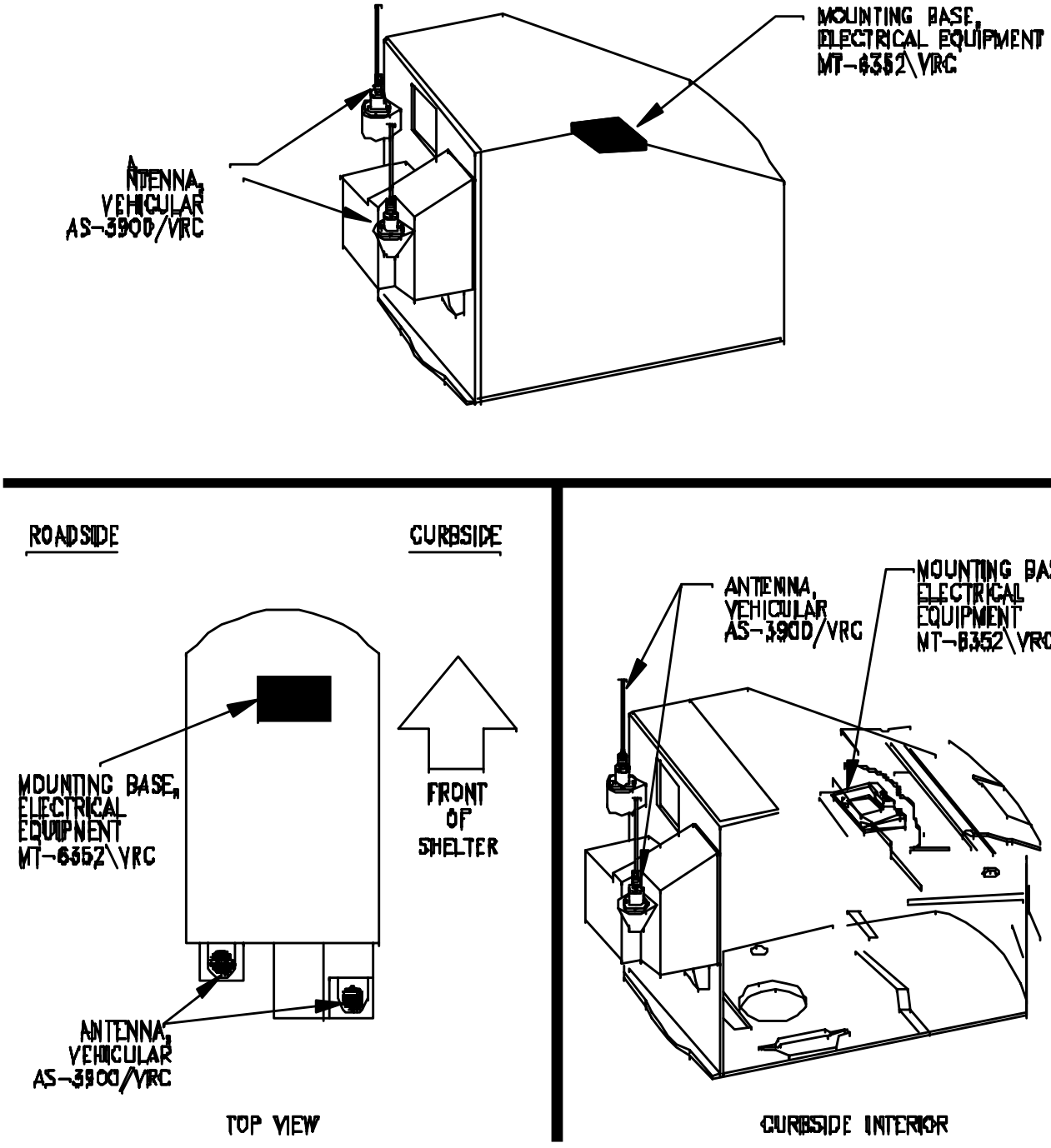
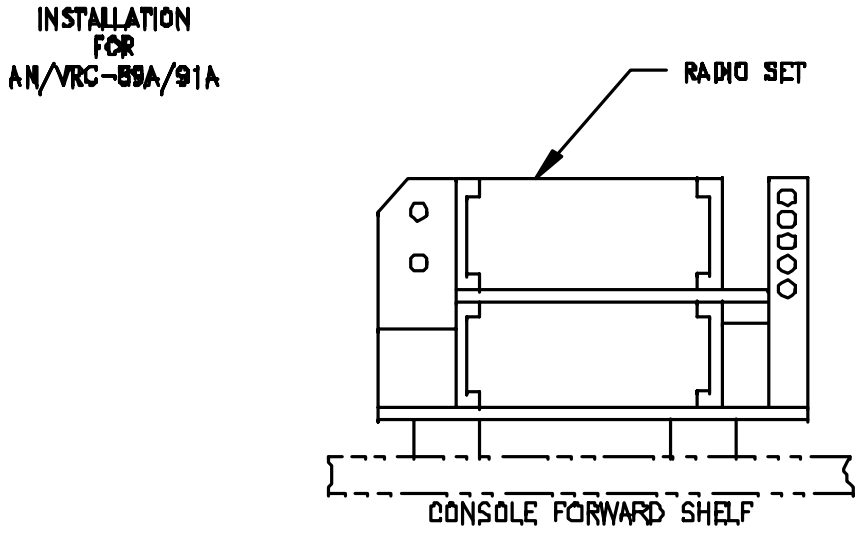


Figure 5-1(1). MK and Radio Installation: MK Equipment Locations

5. INSTALLATION PROCEDURES. Continued.



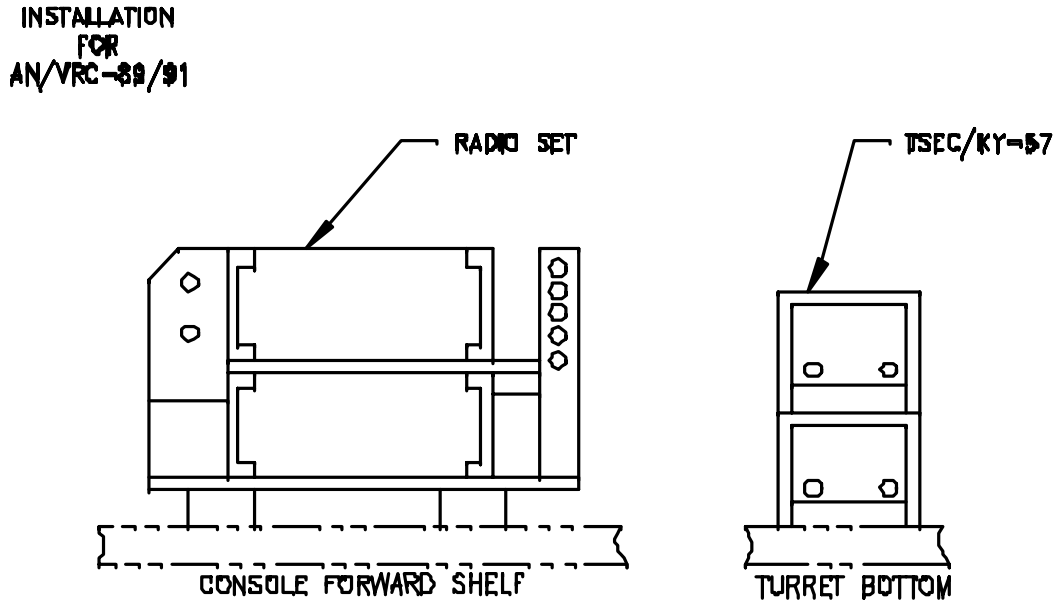


Figure 5-1(2). MK and Radio Installation: Radio Equipment Locations

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

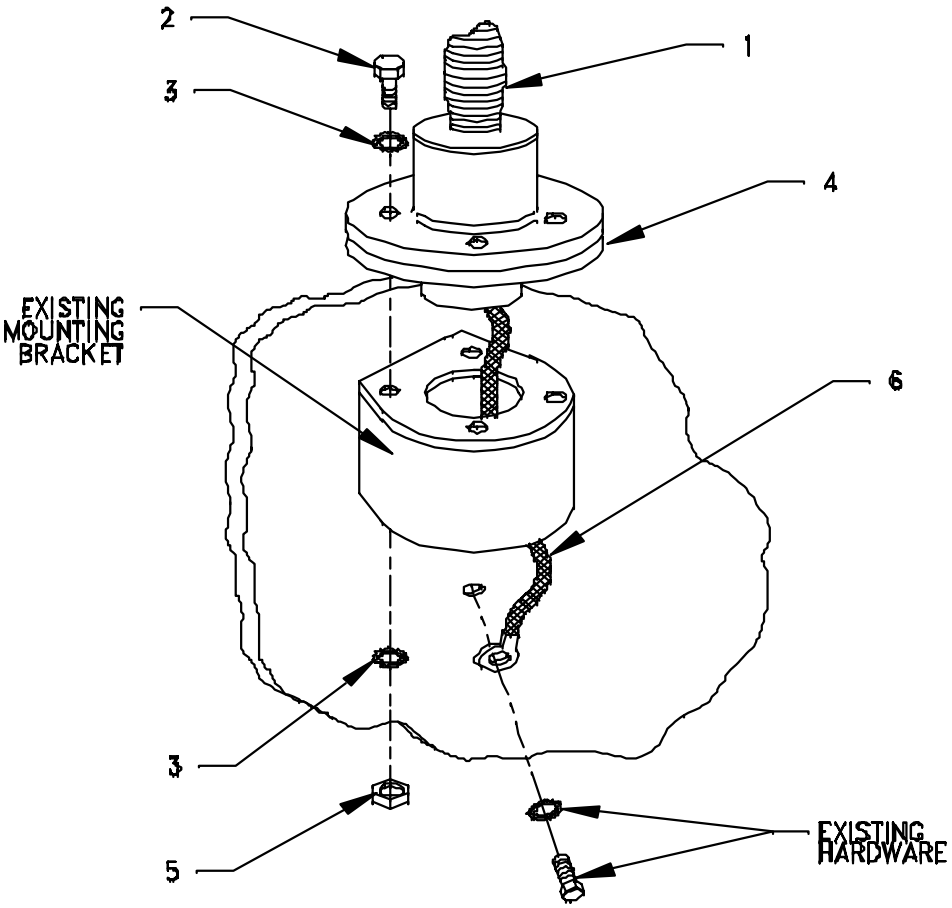
5.1.1 Installation of Antenna Base. Use the following procedures to install both antenna bases. Curbside shown, roadside is opposite hand.

ITEM	ACTION	REMARKS

NOTE

Apply a tin 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. Gasket (4). Place on existing antenna bracket and align with mounting holes. See Figures 5-2(1) and (2).

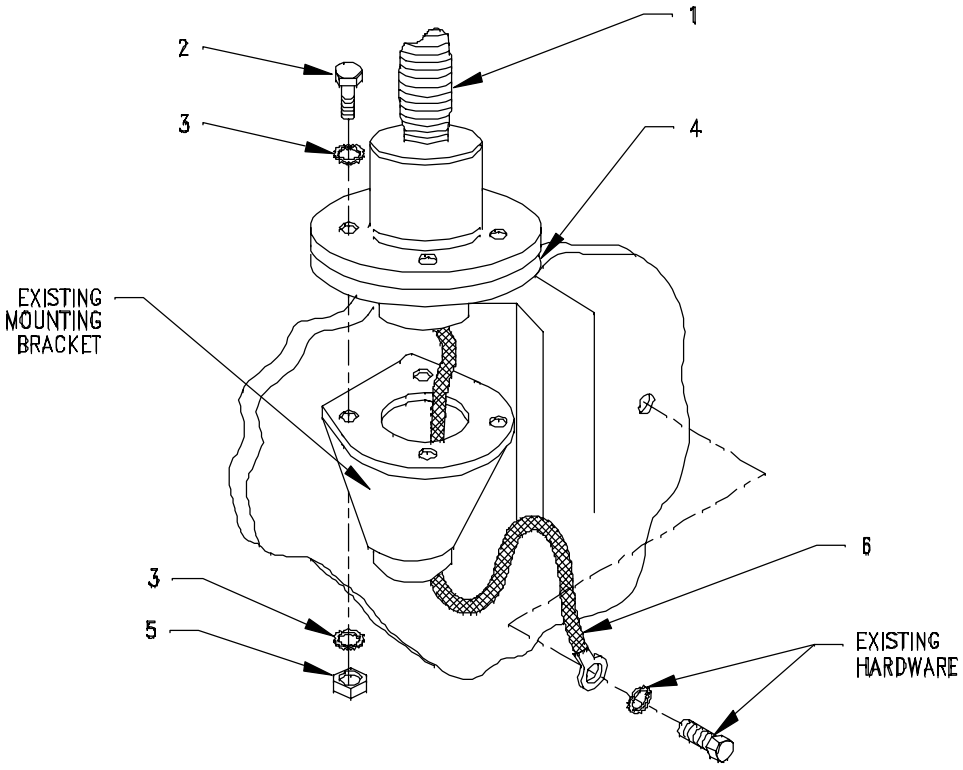


1. **ANTENNA BASE**
2. **CAP SCREW (3/8-16 x 3/4 IN)**
3. **IET WASHER (3/8 IN)**
4. **GASKET**
5. **NUT (3/8-16)**
6. **GROUND STRAP**

Figure 5-2(1). Antenna Base Installation (Roadside)

5.1.1 Installation of Antenna Base. Continued.

ITEM	ACTION	REMARKS
b. Antenna base (1).	Place on top of gasket (4) and existing antenna bracket; then align mounting holes. See Figures 5-2(1) and (2).	
c. Four cap screws (2), eight internal/external-toothed (IET) washers (3) and four nuts (5).	Install and secure..	Tools: 9/16 in socket and 9/16 in open/box wrench.
d. Ground strap (6), existing cap screw and IET washer.	Install and secure to mounting hole in existing turret.	Tools: 3/8 in socket and 3/8 in open/box wrench.
e.	Use the same procedure (paragraph a through d) to install the curbside antenna base using Figure 5-2(2).	

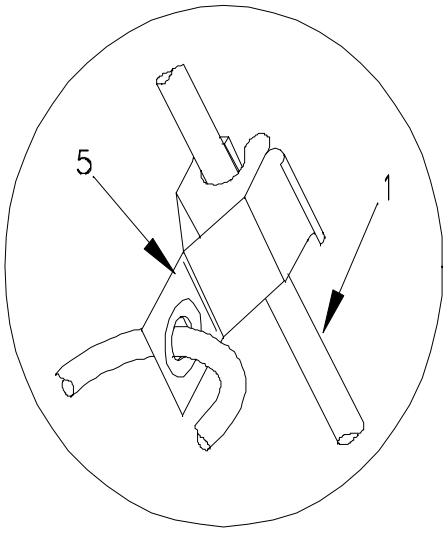


1. **ANTENNA BASE**
2. **CAP SCREW (3/8-16 X 1 3/4 IN)**
3. **IET WASHER (3/8 IN)**
4. **GASKET**
5. **NUT**
6. **GROUND STRAP**

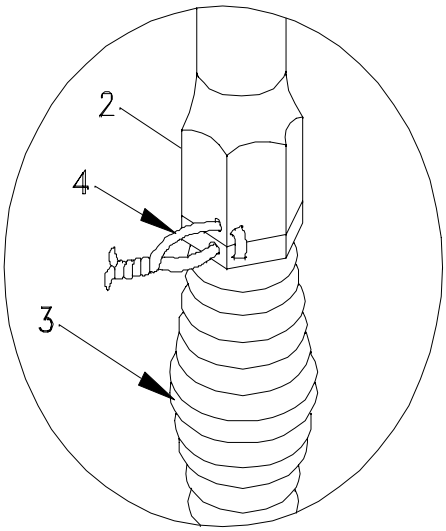
Figure 5-2(2). Antenna Base Installation (Curbside)

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.

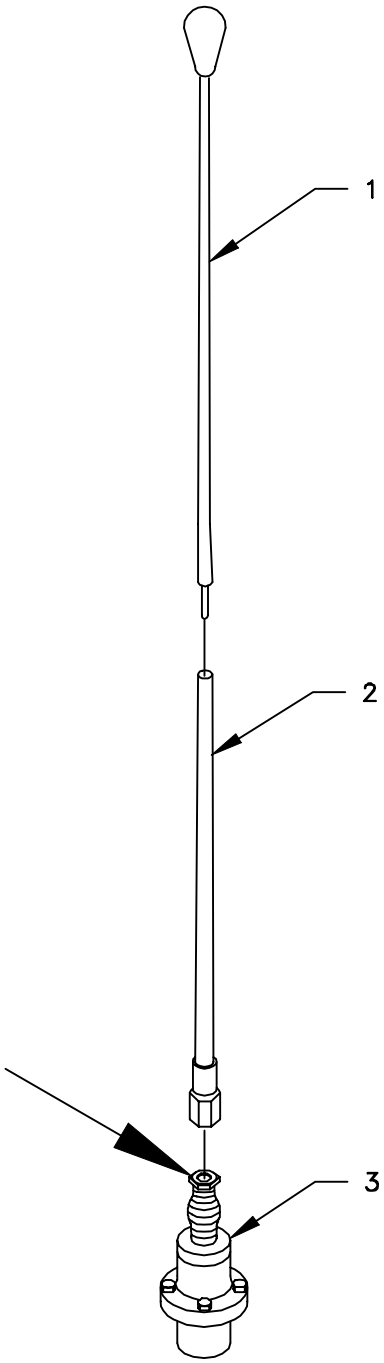
ITEM	ACTION	REMARKS
a. Antenna elements (1, 2.	Apply silicone compound to element threads and assemble. See Figure 5-3.	
b. Antenna element (2).	Install and hand tighten to antenna base (3).	
c. Lock wire (4).	Install to antenna element (2) and antenna base (3). See Figure 5-3, Detail A. Cut and remove 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.	



DETAIL B



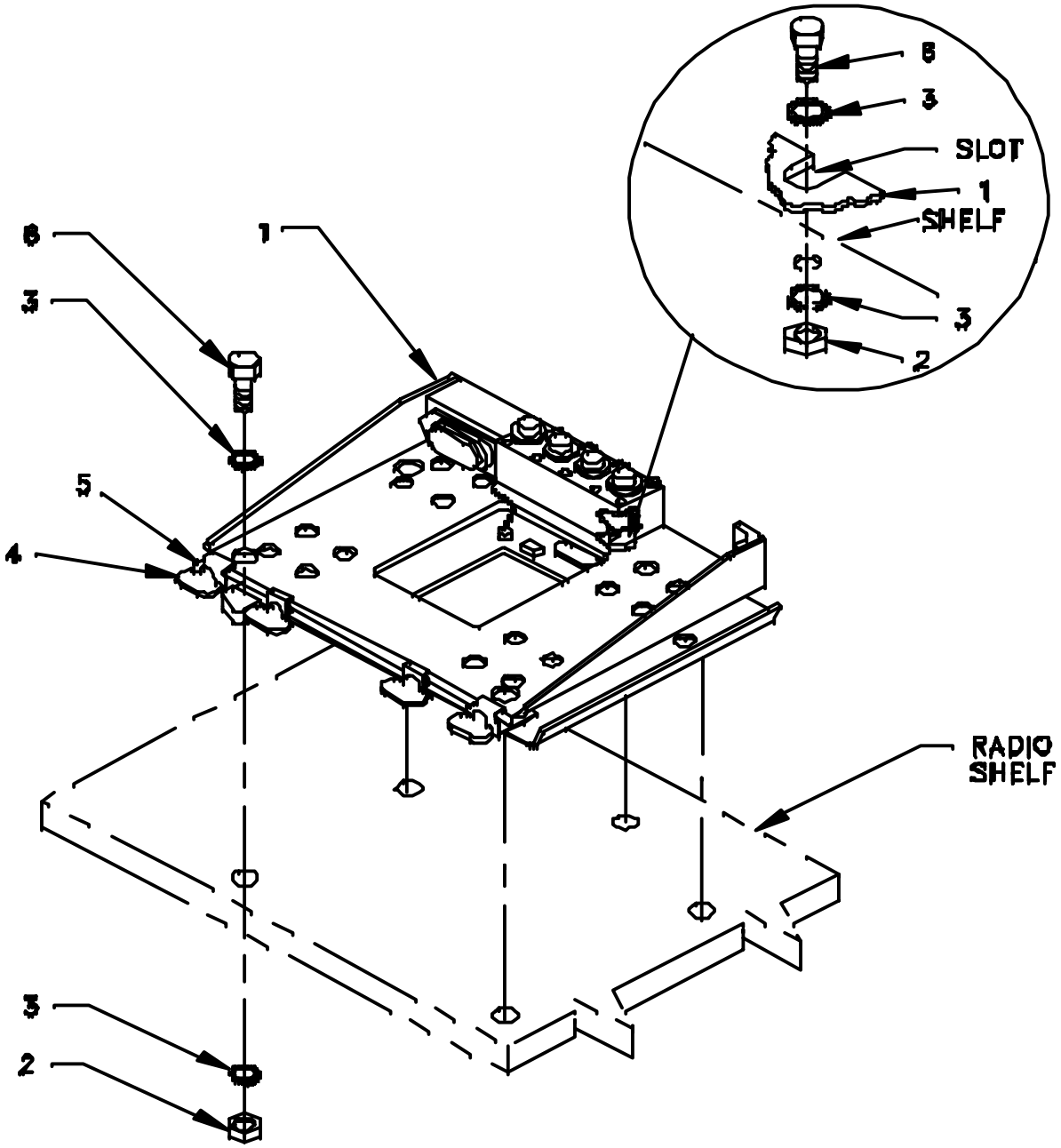
DETAIL A



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

Figure 5-2(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 5-3 and perform the following steps to install mounting base.



1. MOUNTING BASE
2. NUT (5/16-24 IN)
3. IET WASHER (5/16 IN)
4. THUMBSCREW
5. RIM CLENCHING CLAMP
6. MACHINE BOLT (5/16-24 x 11/2 IN)

Figure 5-3. Mounting Base Installation.

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

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 base (1) and existing radio shelf.	Remove a 2” square of paint from the left front and rear of the underside of mounting base (1) centered around the mounting holes. Remove a 2” square of paint from the top of the existing radio shelf centered around the two left mounting holes that mate with the mounting base (1). Clean the paint removed surfaces and apply a thin coat of conductive anti-sieze compound.	Tools: Electric grinder or equivalent.
b. Mounting base (1).	Place on radio shelf over existing mounting holea. See Figure 5-3.	
c. Mounting base (1).	Align four holes and rear slot with matching hole pattern in shelf.	
d. Five machine bolts (6), ten internal/external-toothed (IET) washers (3) and five nuts (2).	Install and secure to mounting base (1) and radio shelf.	Tools: 1/2 in socket and 1/2 in open/box wrench.
e. Two outer thumbscrews (4).	Attach the right side of shelf (15) to frame (6) with Tighten and secure to rim clenching clamps (5) and mounting base (1).	

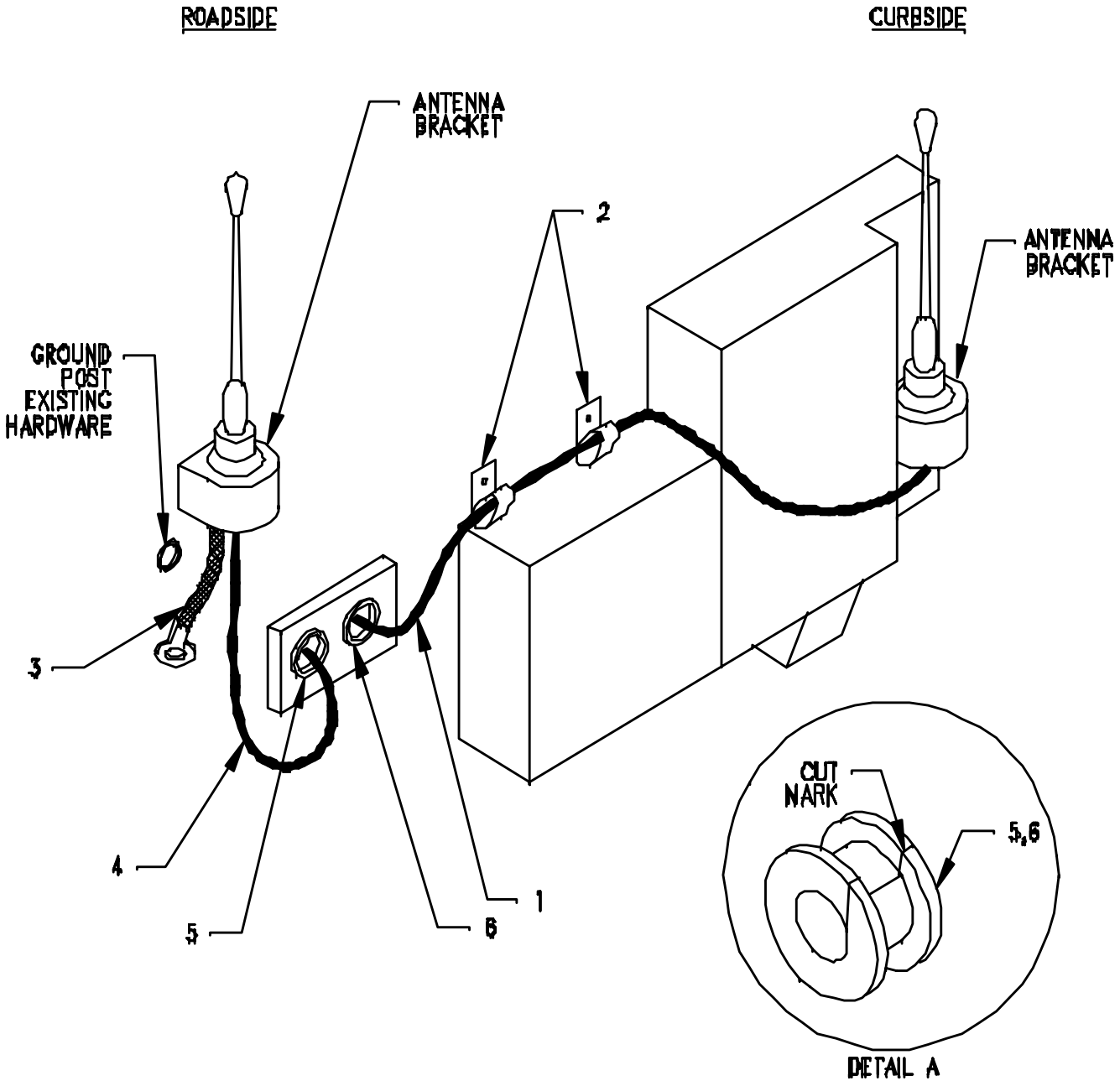
5.3 Installation of Cables. To accomplish the installation, leave loop clamps and tiedown straps loose enough to adjust cable slack and allow easy adjustment of equipment. When installation is complete, tighten and secure all clamps, clips and tiedown straps.

WARNING

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

ITEM		ACTION	REMARKS
a.	RF cable (4) connector P1.	Connect and secure to antenna base (1) connector J1. See Figure 5-4(1).	
b.	Grommet (5).	Cut through on mark shown. See Figure 5-4(1), Detail A, then wrap around RF cable (4) and install in left hole of rear entrance plate.	Tools: Pocket knife.
c.	RF cable (1) connector P1.	Connect and secure to antenna base connector J1. See Figure 5-4(1).	
d.	RF cable (1).	Route from curbside to rear entrance panel. See Figure 5-4(1).	
e.	Two loop clamps (2) and existing mounting hardware.	Wrap around RF cable (1) then install to existing holes. See Figure 5-4(1) for locations.	Tools: Phillips screwdriver.
f.	Grommet (6).	Cut through on mark shown. See Figure 5-4(1), Detail A, then wrap around RF cable (1) and install in right hole of rear entrance plate. See Figure 5-4(1).	Tools: Pocket knife.
g.	Adhesive sealant.	Apply to both previously installed grommets.	

5.3 Installation of Cables. Continued.



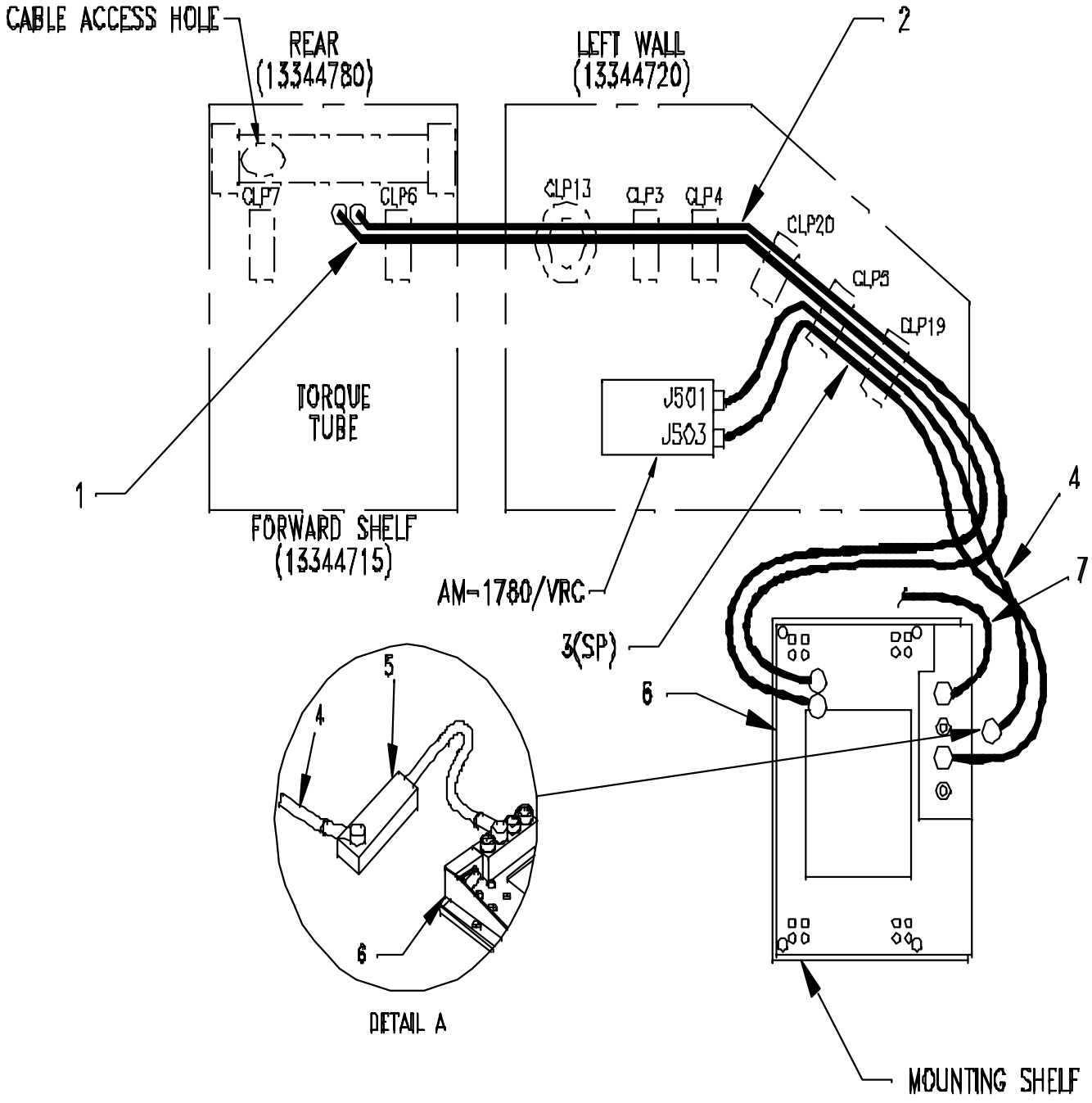
1. CG-3855/VRC (13 FT, 0 IN)
2. CLAMPS (1/4-13/64 IN)
3. GROUND STRAP
4. CG-3855/VRC (12 FT, 0 IN)
5. GROMMET (LARGER DIA)
6. GROMMET (SMALLER DIA)

Figure 5-4(1). Cable Installation

5.3 Installation of Cables. Continued.

ITEM	ACTION	REMARKS
h. RF cable (1 and 2).	Insert in clips 6, 13, 3, 4, 20, 5 and 19. See Figure 5-4(2). Route through cable access hole in forward shelf and position on top of mounting base (6).	
i. SP cable (3) connector P1.	Connect and secure to AM-1780/VRC connector J503. Insert in clips 19 and 5 and route through cable access hole on forward shelf. See Figure 5-4(2).	
j. SP cable (3) connector P2.	Connect and secure to mounting base (6) connector J4.	
k. SP cable (4) connector P1.	Connect and secure to AM-1780/VRC connector J501. Insert in clips 19 and 5 and route through cable access hole in forward shelf. See Figure 5-4(2).	
l. SP cable (4) connector P2.	Connect and secure to SP cable (5) connector P1. See Figure 5-4(2), Detail A.	
m. SP cable (5) connector P2.	Connect and secure to mounting base (6) connector J3.	
n. Existing power cable (7).	Connect and secure to mounting base (6) connector J1. See Figure 5-4(2).	

5.3 Installation of Cables. Continued.



1. **RF CABLE CG-3855/VRC (12 FT, 0 IN)**
2. **RF CABLE CG-3855/VRC (13 FT, 0 IN)**
3. **SP CABLE CX-13300/VRC (4 FT, 0 IN)**
4. **SP CABLE CX-13300/VRC (4 FT, 0 IN)**
5. **SP CABLE CX-13313/VRC (2 FT, 7 IN)**
6. **MOUNTING BASE**
7. **EXISTING POWER CABLE**

Figure 5-4(2). Cable 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 5-5 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.	

5.4 Post-Installation and Checkout. Continued.

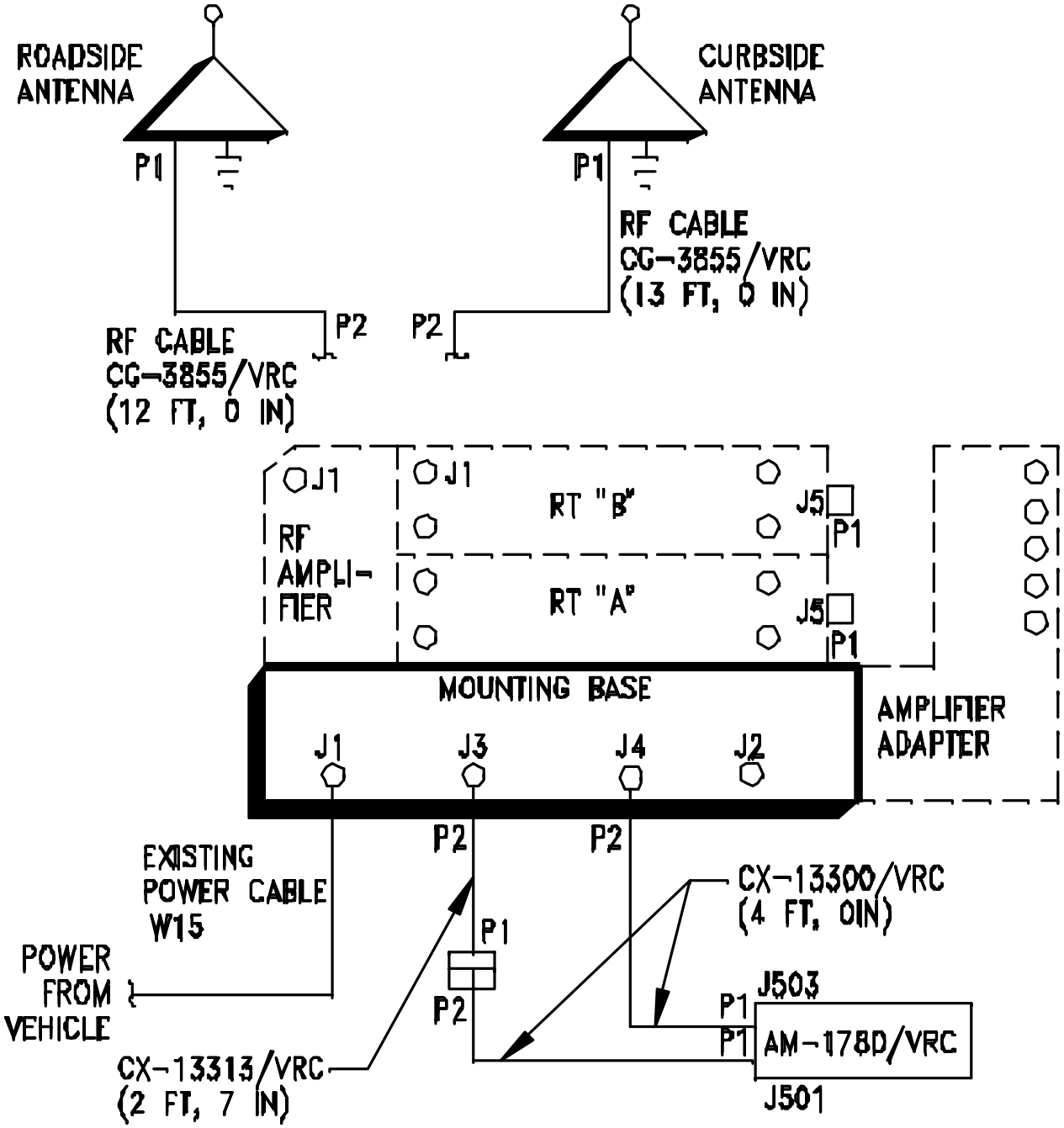


Figure 5-5. Cable Diagram: For AN/VRC-89/91 Series

5.4 Post-Installation and Checkout. Continued.

	FROM			TO		
CABLE ASSEMBLY	CABLE CONN.	UNIT	UNIT CONN.	CABLE CONN.	UNIT	UNIT CONN.
CX-13313 (2 FT, 7 IN)	P2	Mounting base	J3	P1	Cable CX-13300/VRC	P2
CG-3856/VRC (12 FT, 0 IN)	P1	Roadside antenna base	J1	P2	RF amplifier	J1
CX-13300/VRC (4 FT, 0 IN)	P2	Cable CX-13313	P1	P1	AM-1780/VRC	J501
CG-3855/VRC (13 FT, 0 IN)	P1	Curbside antenna base	J1	P2	RT	J1
CX-13300/VRC (4 FT, 0 IN)	P2	Mounting base	J4	P1	AM-1780/VRC	J503
Existing power cable		Vehicle power supply		CNP21	Mounting base	J1

Figure 5-5. Cable Diagram: For AN/VRC-89/91 Series. Continued.

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 11-5820-890-10-3	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

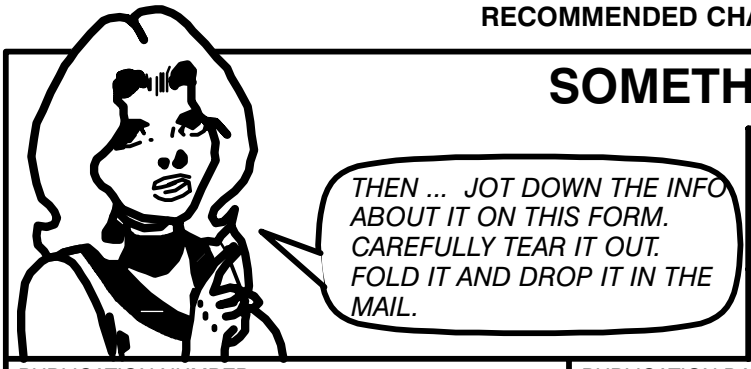
Official:

JOEL B. HUDSON
Administrative Assistant to the
Secretary of the Army
0020009

DISTRIBUTION:

To be distributed in accordance with the initial distribution number (IDN) 369647 requirements for TB 11-5820-890-20-9.

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS



SOMETHING WRONG WITH THIS PUBLICATION

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)
Commander
Stateside Army Depot
ATTN: AMSTA–US
Stateside, NJ 07703–5007

DATE SENT
10 July 1995

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
TM 11–5840–340–12	23 Jan 74	Radar Set AN/PRC–76

BE EXACT PIN-POINT WHERE IT IS

PAGE NO	PARA-GRAPH	FIGURE NO	TABLE NO
2–25	2–28		
3–10	3–3		3–1
5–6	5–8		
		FO–3	

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

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

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

Item 5, Fu[illegible]ctional co[illegible]n. Change ☐ 2 dB" to ☐ 3 dB".

REA[illegible] adjustment procedure for the TRANS POWER FAULT [illegible]r call for a 3 dB (500 watts) adjustment to light the TRA[illegible] POWER FAULT indicator.

A[illegible]d 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.

PRINTED NAME, GRADE OR TITLE AND TELEPHONE NUMBER

SSG I. M. DeSpiritof 999–1779

SIGN HERE

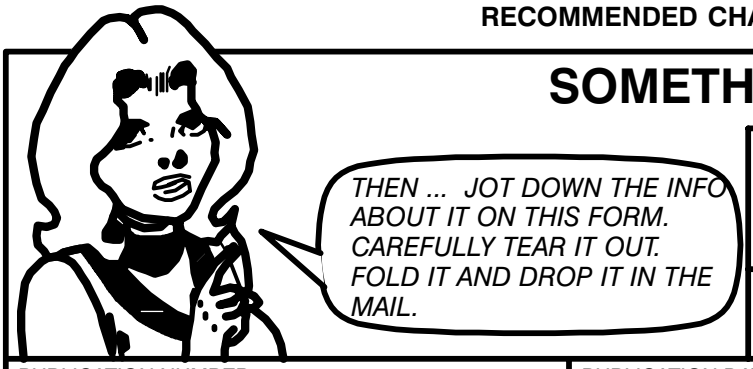
DA FORM 1 JUL 79 2028-2

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.

TEAR ALONG DOTTED LINE

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS



SOMETHING WRONG WITH THIS PUBLICATION

DATE SENT

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE

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:

PRINTED NAME, GRADE OR TITLE AND TELEPHONE NUMBER

SIGN HERE

DA FORM 1 JUL 79 **2028-2**

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.

TEAR ALONG DOTTED LINE

REVERSE OF DA FORM 2028–2

FILL IN YOUR
UNIT'S ADDRESS

FOLD BACK

DEPARTMENT OF THE ARMY

OFFICIAL BUSINESS

PLEASE
AFFIX
STAMP
POSTAGE
REQUIRED

TEAR ALONG DOTTED LINE

Commander
U.S. Army Communications-Electronics Command
and Fort Monmouth
ATTN: AMSEL-LC-LEO-D–CS–CFO
Fort Monmouth, New Jersey 07703-5000

FOLD BACK

THE METRIC SYSTEM AND EQUIVALENTS

'NEAR MEASURE

. Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches
1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches
1 Kilometer = 1000 Meters = 0.621 Miles

'VEIGHTS

Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces
1 Kilogram = 1000 Grams = 2.2 lb.
1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

SQUARE MEASURE

1 Sq. Centimeter = 100 Sq. Millimeters = 0.155 Sq. Inches
1 Sq. Meter = 10,000 Sq. Centimeters = 10.76 Sq. Feet
1 Sq. Kilometer = 1,000,000 Sq. Meters = 0.386 Sq. Miles

CUBIC MEASURE

1 Cu. Centimeter = 1000 Cu. Millimeters = 0.06 Cu. Inches
1 Cu. Meter = 1,000,000 Cu. Centimeters = 35.31 Cu. Feet

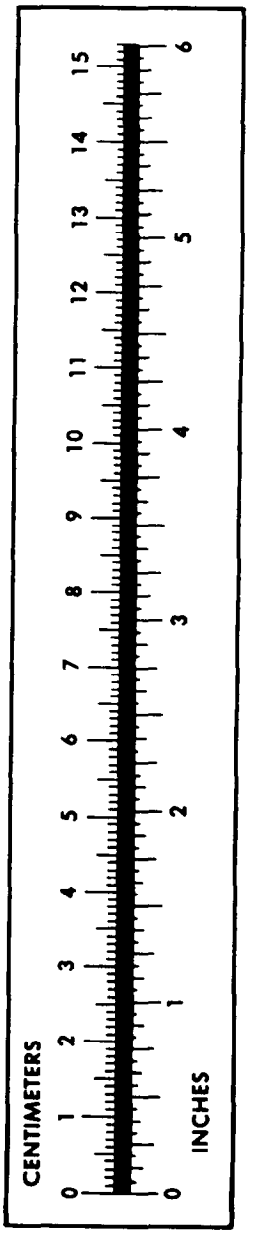
TEMPERATURE

5/9(°F - 32) = °C
212° Fahrenheit is evuivalent to 100° Celsius
90° Fahrenheit is equivalent to 32.2° Celsius
32° Fahrenheit is equivalent to 0° Celsius
9/5C° + 32 =°F

APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Square Inches	Square Centimeters	6.451
Square Feet	Square Meters	0.093
Square Yards	Square Meters	0.836
Square Miles	Square Kilometers	2.590
Acres	Square Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Milliliters	29.573
ıts	Liters	0.473
arts	Liters	0.946
allons	Liters	3.785
Ounces	Grams	28.349
Pounds	Kilograms	0.454
Short Tons	Metric Tons	0.907
Pound-Feet	Newton-Meters	1.356
Pounds per Square Inch	Kilopascals	6.895
Miles per Gallon	Kilometers per Liter	0.425
Miles per Hour	Kilometers per Hour	1.609

TO CHANGE	TO	MULTIPLY BY
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Square Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Square Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
ers	Gallons	0.264
ms	Ounces	0.035
ograms	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton-Meters	Pounds-Feet	0.738
Kilopascals	Pounds per Square Inch	0.145
lometers per Liter	Miles per Gallon	2.354
meters per Hour	Miles per Hour	0.621



PIN: 072249-000