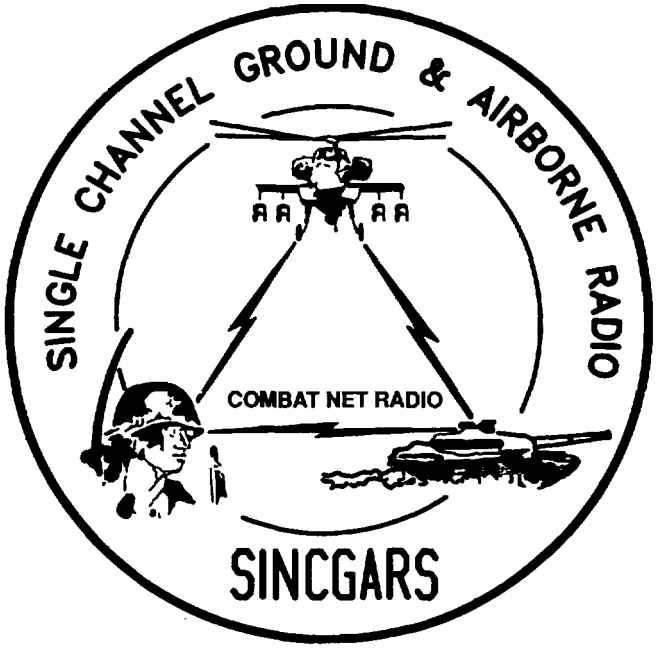
TECHNICAL BULLETIN



INSTALLATION INSTRUCTIONS FOR INSTALLATION KIT, ELECTRONIC EQUIPMENT MK-2370/VRC (NSN 5895-01-295-1920) (EIC: N/A) TO PERMIT INSTALLATION OF RECEIVER-TRANSMITTER RT-1476A/ARC-201 A(V) INTO AIR TRAFFIC CONTROL CENTRAL AN/TSW-7A

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HEADQUARTERS, DEPARTMENT OF THE ARMY

1 SEPTEMBER 1993

TECHNICAL BULLETIN

HEADQUARTERS,
DEPARTMENT OF THE ARMY

NO. 11-5820-890-20-51 **WASHINGTON, D. C. 1 September 1993**

INSTALLATION INSTRUCTIONS FOR INSTALLATION KIT, ELECTRONIC EQUIPMENT MK-2370NRC (NSN 5895-01-295-1 920)(EIC: N/A) TO PERMIT INSTALLATION OF RECEIVER-TRANSMITTER RT-1 476A/ARC-201 A(V) INTO AIR TRAFFIC CONTROL CENTRAL AN/TSW-7A

REPORTING OF ERRORS AND RECOMMENDING IMPROVEMENTS

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

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

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0.1 SCOPE

This technical bulletin provides Installation Instructions for Installation kit, Electronic Equipment MK-2370NRC, commonly referred to as the Mounting Kit (MK). The MK shall be installed into the following type of shelter(s):

- Air Traffic Control Central AN/TSW-7A

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 shelters.
- This technical bulletin does not establish quantity or types of shelters 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 11-5821-333-12 and RPSTL of TM 11-5821-333-23P.

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 11-5821-333-12 for installation, Operational (OP) Check instructions, and required maintenance procedures. Refer to TM 11-5821-333-23P for repair parts.

0.3 MAINTENANCE FORMS, RECORDS, AND REPORTS.

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

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

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

0.4 CONSOLIDATED INDEX OF ARMY PUBLICATIONS.

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

1. PURPOSE OF INSTALLATION.

The Installation Kit, Electronic Equipment MK-2370NRC (MK) contains the items needed to mount Receiver-Transmitter RT-1476A/ARC-201A(V) in an Air Traffic Control Central AN/TSW-7A.

2. END ITEM OR SYSTEM TO BE MODIFIED.

Not applicable.

3. APPLICATION TIMES.

3.1 Time for Completion of Installation. Using one person, a total of 3.5 work hours is required. Typical shelter 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 times will not reflect the typical shelter downtime.

ITEM	SECTION	TIME
Antenna AS-3900NRC	(5.1)	(0.5)
Cables	(5.2)	(1.0)

4. PREPARATION FOR INSTALLATION.

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

4.1 Preparation of Shelter. To prepare the shelter 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. Remove existing radio set items from the shelter. See TM 11-5821-259-20 and TM 11-5895-801-34.

4.1.2 List of Items to be Retained. Not applicable.

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

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

a. Keep dust covers in place on connectors.

b. Do not disassemble or modify parts in MK unless authorized to do so.

c. Keep mounting hardware covered and protected until needed.

d. When exposed to moisture, rain or salt water, keep all parts dry to prevent corrosion.

4.2.2 Unpack and Inspect Equipment.

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

All damages should be reported as prescribed by DA Pam 738-750, as contained in Maintenance Management Update.

4.3 MK, Distribution, and Consumables.

4.3.1 Items Supplied In MK and/or Required for Installation. Use Table 4-1 and figure 4-1 to identify and inventory MK parts supplied to install Receiver-Transmitters RT-1476A/ARC-201A(V).

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. MK Parts List for Installation of Receiver-Transmitters RT-1476A/ARC-201A(V)

NSN	ITEM DESCRIPTION AND PART NUMBER	QUANTITY IN MK	SMR CODE	FIGURE ITEM NO.
5985-01-297-2971	Antenna AS-3900/VRC (A3017899-1)	3	PAOOFA	4-1, 1
5305-00-847-1159	Screw, Cap, Hexagon (3/8-16 x 1 3/4 in) MS35307-365 (8 Not Used)	12	PAOZZA	
5310-00-913-8881	Nut, Hexagon (3/8-16 in) MS51971-3 (8 Not Used)	12	PAOZZA	
5310-00-061-1258	Washer, Lock, Internal/External-Toothed (3/8 in) MS45904-76 (12 Not Used)	24	PAOZZA	
5310-00-889-2527	Washer, Lock, Internal/External-Toothed (5/16 in) MS45904-72 (4 Not Used)	6	PAOZZA	
5306-00-225-9086	Bolt, Machine (5/16-24 x 5/8 in) MS90726-31 (Not Used)	3	PAOZZA	
5330-01-205-2864	Gasket (A3013655-1)	3	PAOZZA	
5995-01-219-7024	Cable Assembly, Radio Frequency CG-3856/VRC (4 FT, 0 IN) (A3014032-2)	1	PAOZZA	4-1, 4
5935-01-035-5650	Adapter, Connector M55339/07-00029	3	PAOZZA	4-1, 2
5935-00-259-0205	Adapter, Connector M55339/20-00201	1	PAOZZA	4-1, 3
5340-00-079-7837	Clamp, Loop (1/4-13/64 in) MS21333-67	3	PAOZZA	
4020-01-341-8795	Fiber Rope Assembly, Single Leg (A3167672-1)	1	PAOZZA	4-1, 6
5310-00-934-9759	Nut, Plain, Hexagon (No. 8-32) MS35649-284	2	PAOZZA	
5310-00-934-9751	Nut, Plain, Hexagon (No. 10-32) MS35650-302	3	PAOZZA	
5305-00-701-5060	Screw, Machine (No. 8-32 x 7/16) MS51958-44	2	PAOZZA	
5305-01-006-2052	Screw, Machine (No. 10-32 x 5/8) MS51849-65	3	PAOZZA	
5305-00-269-2808	Screw, Cap, Hexagon (3/8-24 x 1 3/4) MS90726-65	4	PAOZZA	
5975-00-111-3208	Strap, Tiedown, Electrical Components MS3367-5-9	10	PAOZZA	
5310-00-809-8546	Washer, Flat (No. 10) MS27183-8	3	PAOZZA	
5310-00-045-3296	Washer, Lock (No. 10) MS35338-43	3	PAOZZA	
5310-00-061-0004	Washer, Lock, Internal/External-Toothed (No. 8) MS45904-57	6	PAOZZA	
5995-01-304-0793	Wiring Harness (A3018972-1)	3	PAOZZA	4-1, 5

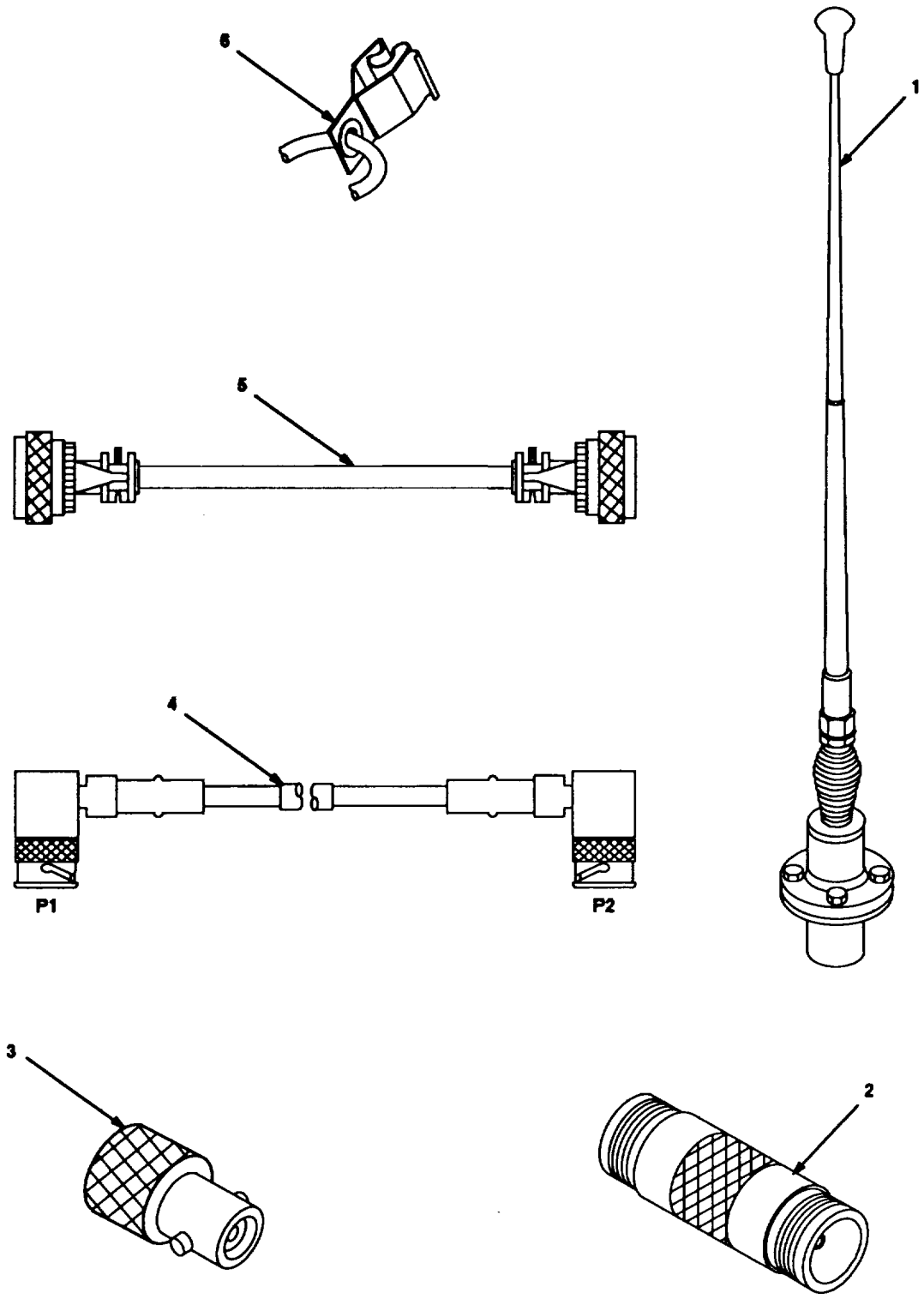


Figure 4-1. MK Illustrated Parts List

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

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

NOMENCLATURE	NSN	QUANTITY
Radio Set*		1
Pocket Knife, Electrician's	5110-00-240-5943	1
Screwdriver, No. 2 Point Phillips, 4 in	5120-00-234-8913	1
Screwdriver, 1/4 in Flatblade, 4 in	5120-00-222-8852	1
Pliers, Round Nose	5120-00-240-6172	1
Pliers, Diagonal Cutting	5110-00-965-0974	1
Wrench, Open/Box: 11/32 in	5120-00-278-0342	1
3/8 in	5120-00-228-9504	1
1/2 in	5120-00-228-9506	1
9/16 in	5120-00-228-9507	1
Handle, Socket Wrench	5120-00-240-5364	1
Socket:1/2 in	5120-00-237-0977	1
9/16 in	5120-00-227-6704	1

* Use radio Issued with your shelter 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 shelter 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.

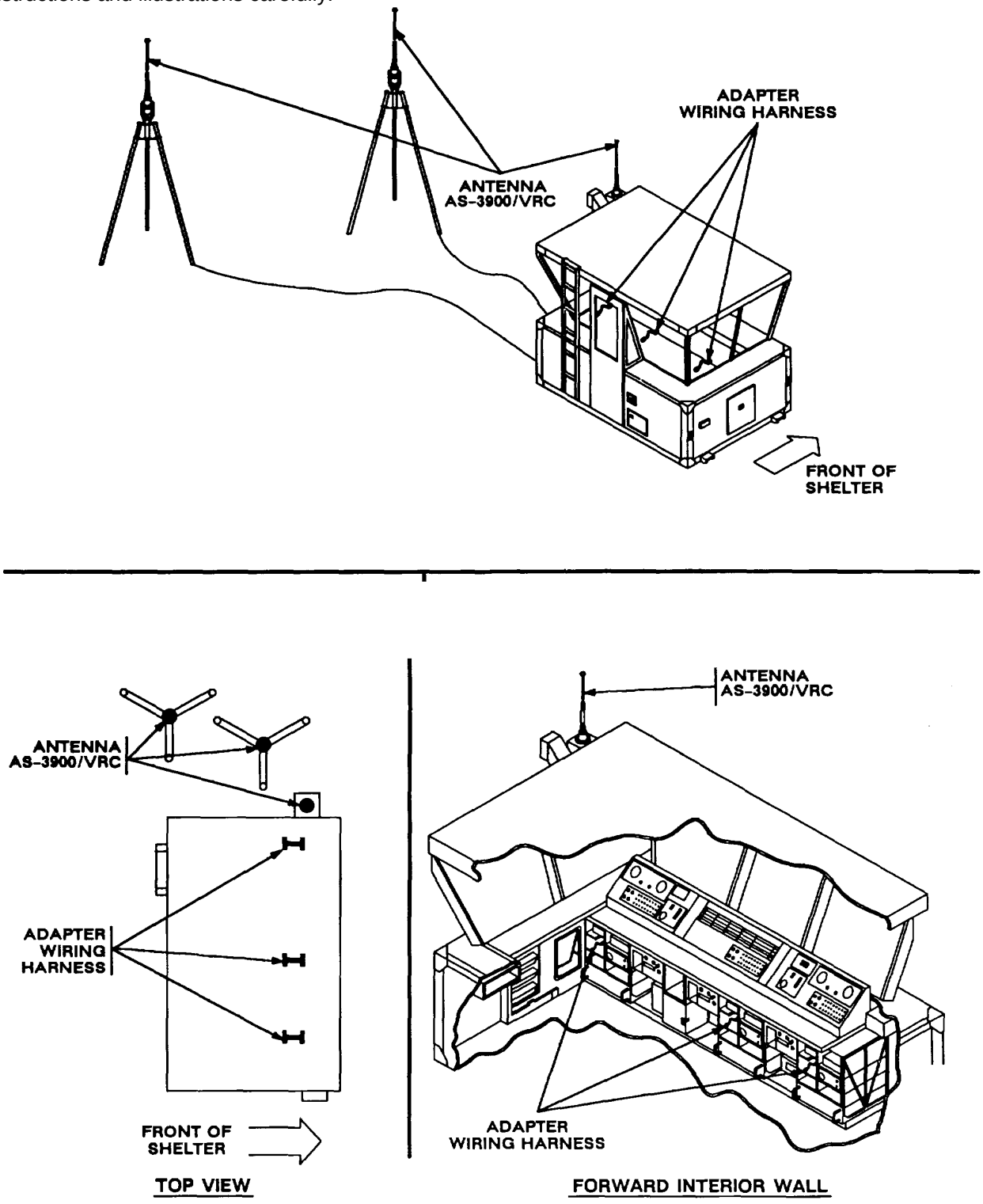


Figure 5-1 (1). MK and Radio Installation: MK Equipment Locations

5. INSTALLATION PROCEDURES. Continued

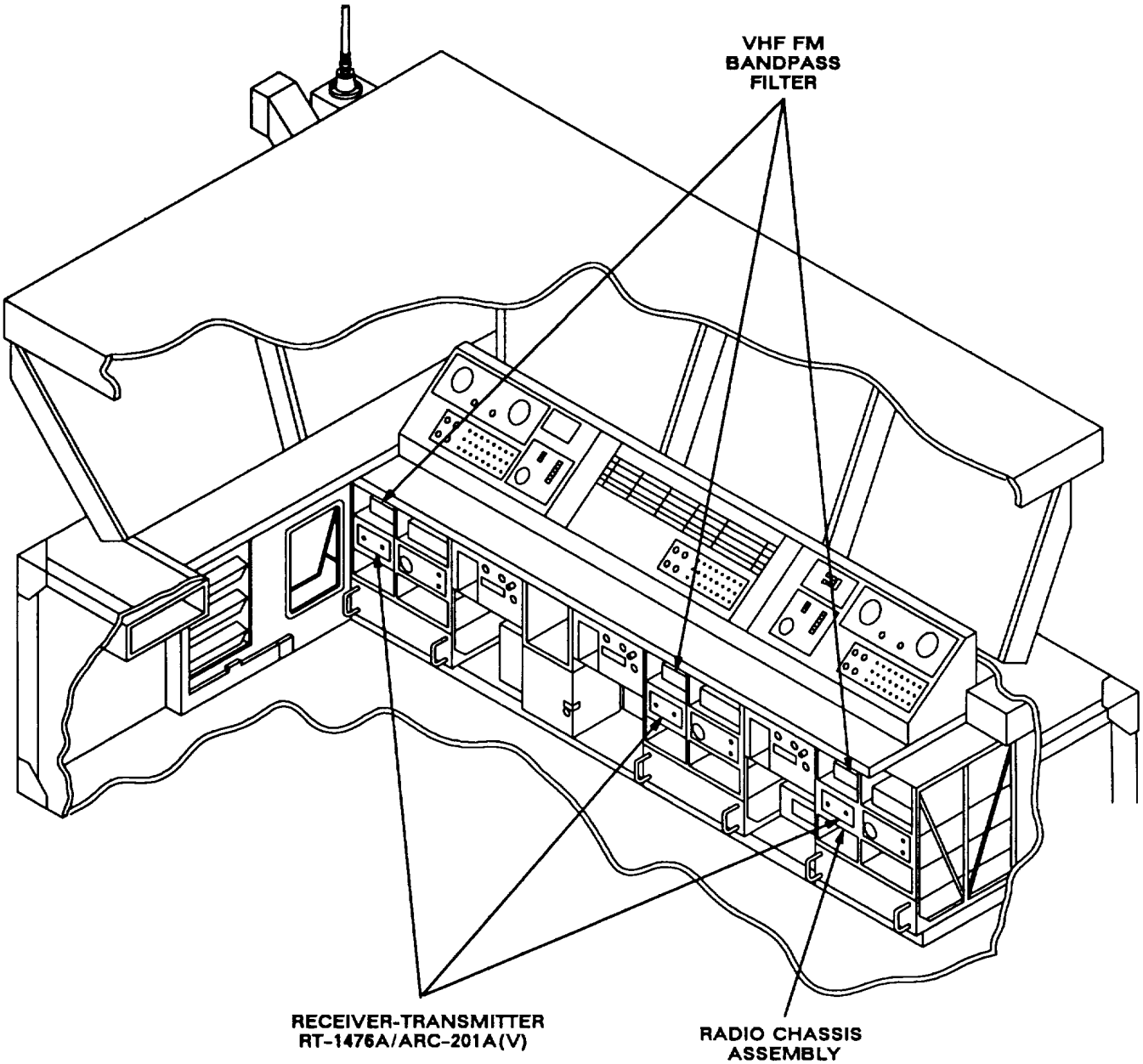


Figure 5-1 (2). MK and Radio Installation: Radio Equipment Locations

5.1 Installation of Antenna AS-3900/VRC (antenna). Perform the following procedures to install antennas on the shelter and two tripods. See figure 5-1 (1) for locations**.**

5.1.1 Installation of Antenna Base. Use steps a thru d to install shelter antenna base. Use steps e thru i to Install both tripod antenna bases.

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.	Gasket (3).	Place on existing antenna bracket and aline mounting holes. See figure 5-2 (1).	
b.	Antenna base (7).	Place on top of gasket (3) and antenna bracket; then aline mounting holes.	
c.	Four cap screws (1), eight internal/external-toothed (IET) washers (2) and four nuts (4).	Install and secure to antenna base (7) and antenna bracket.	Tools: 9/16 in open/box wrench and 9/16 in socket.
d.	Ground strap (6), two IET washers (5) and existing bolt.	Install and secure to lower left hole in antenna bracket and shelter.	Tools: 1/2 in socket.

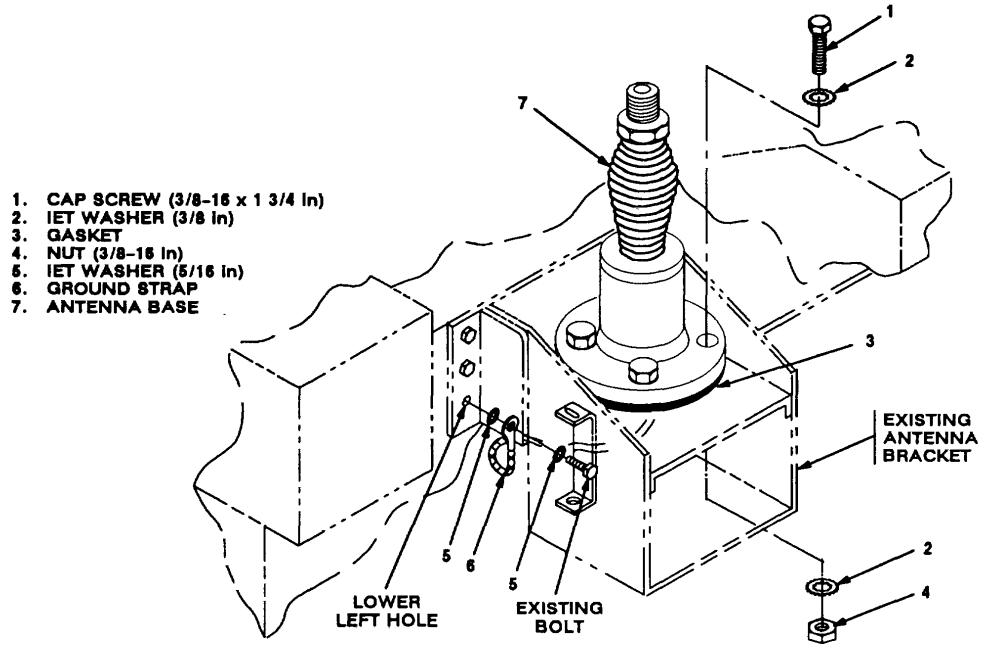


Figure 5-2 (1). Antenna Base Installation: Shelter

5.1.1 Installation of Antenna Base. Continued

ITEM		ACTION	REMARKS
e.	Gasket (4).	Place on tripod adapter assembly; then aline with mounting holes and studs. See figure 5-2 (2).	
f.	Antenna base (3).	Place on top of gasket (4) and adapter assembly; then aline with mounting holes and studs.	
g.	Two cap screws (1) and two IET washers (2).	Install and secure to antenna base (3) and adapter assemby.	Tools: 9/16 in socket.
h.	Ground strap (7), pan-head machine screw (8), three IET washers (6) and nut (5).	Install and secure to existing hole in adapter assembly. See figure 5-2 (2), detail A.	Tools: Phillips screwdriver and 11/32 in open/box wrench.
i.	Existing tripod RF cable.	Connect and secure to antenna base (3) connector J1.	

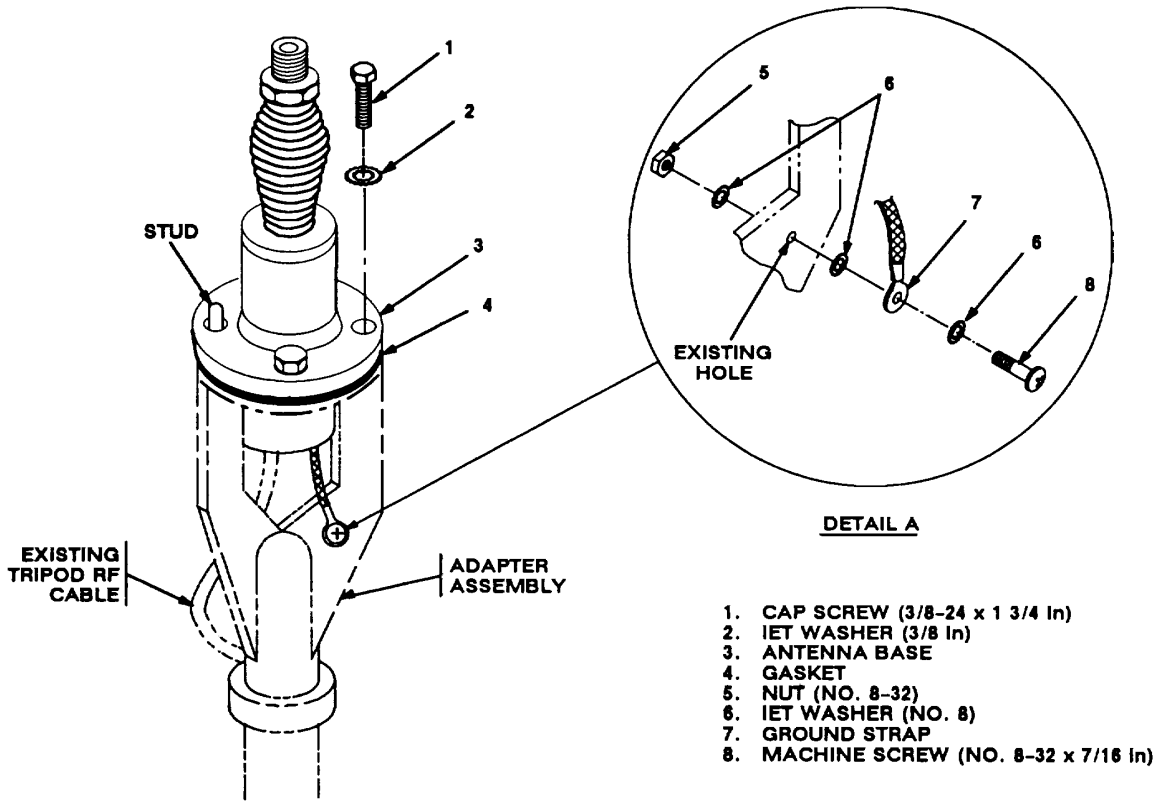


Figure 5-2 (2). Antenna Base Installation: Tripods

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.	

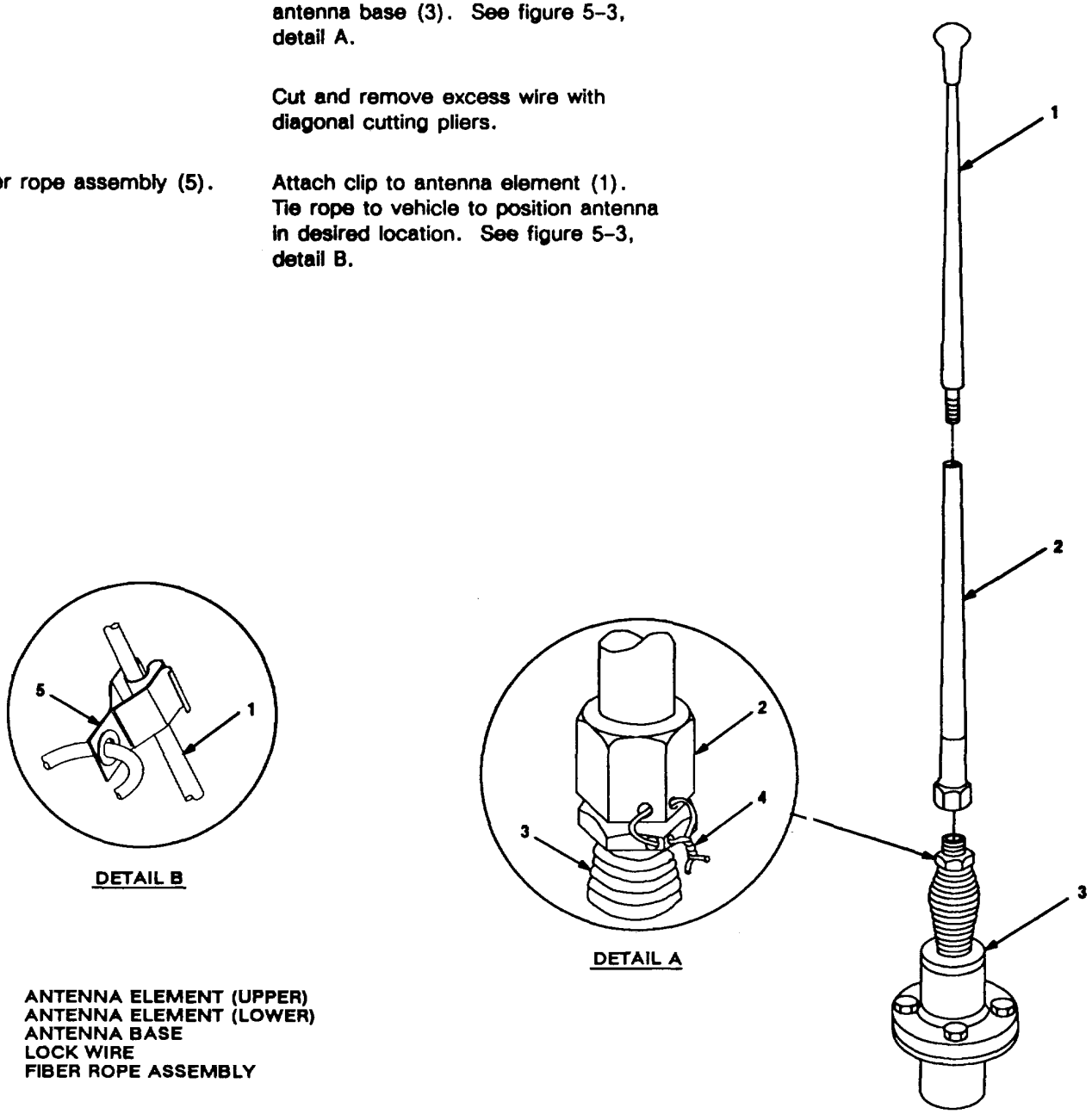


Figure 5-3. Top Antenna Assembly Installation

5.2 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 and tiedown straps.

WARNING

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

ITEM		ACTION	REMARKS
a.	RF cable (3) and connector P1.	Connect and secure to shelter antenna base (1) connector J1. See figure 5-4 (1).	
b.	RF cable (3) connector P2.	Insert through opening in back of existing antenna bracket.	
c.	Connector adapter (2).	Connect and secure to antenna entry panel FM 1 connector.	
d.	RF cable (3).	Connect and secure to connector adapter (2).	

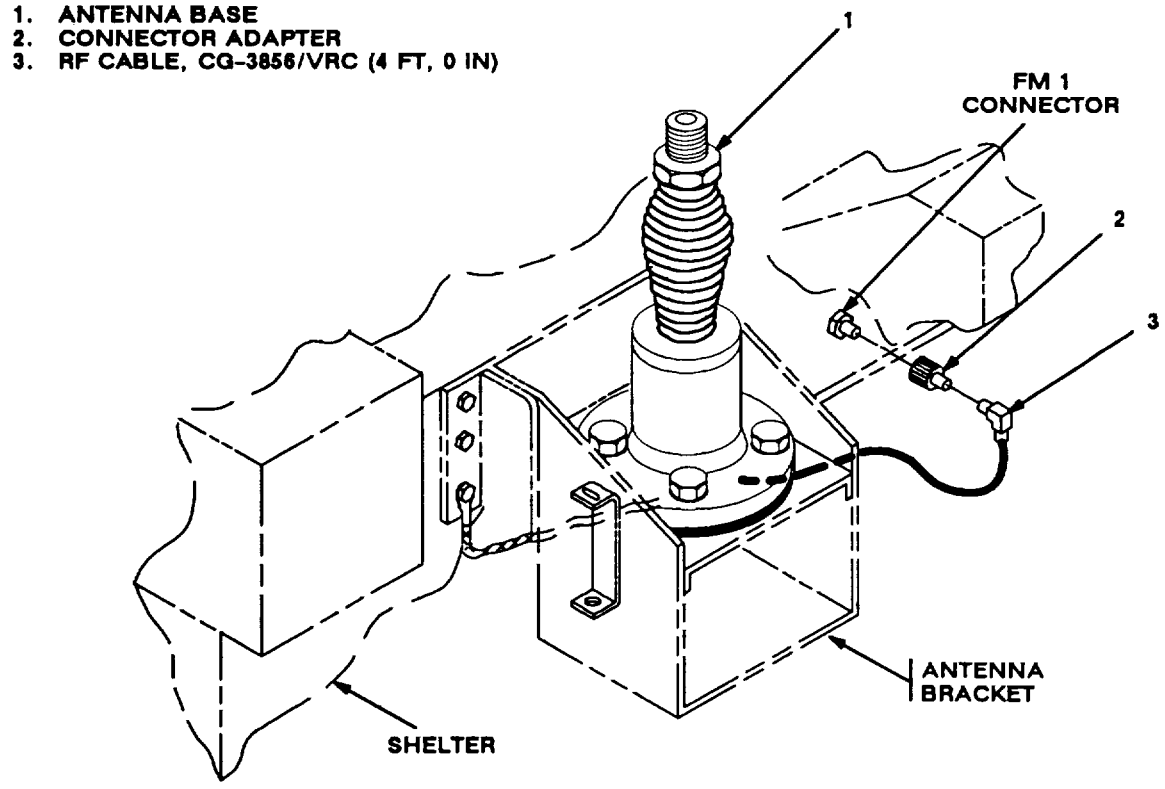
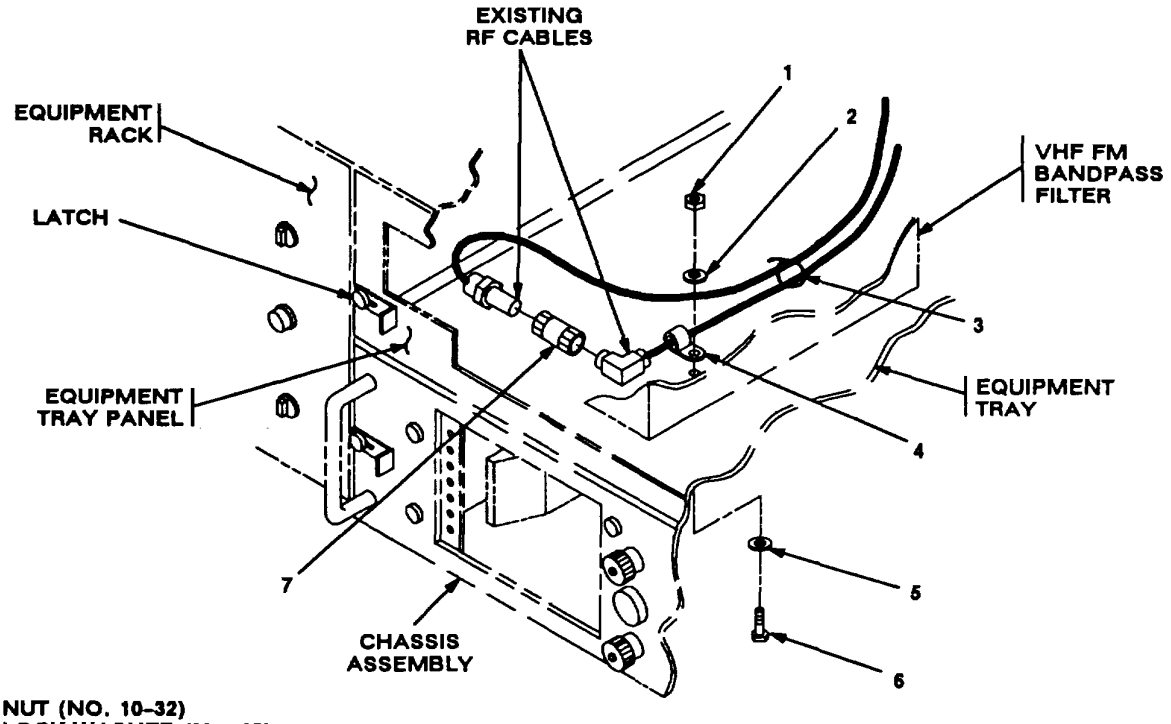


Figure 5-4 (1). Cable Installation: Exterior RF Cabling (Shelter Only)

5.2 Installation of Cables. Continued

ITEM		ACTION	REMARKS
e.	Equipment tray panel.	Release two latches and pull panel part way out from equipment rack. See figure 5-4 (2).	
f.	Connectors of existing RF cables.	Disconnect from existing VHF FM bandpass filter. See figure 5-1 (2) for location (s).	
g.	Existing VHF FM bandpass filter.	Remove from equipment tray. See figure 5-4 (2).	
h.	Existing RF cable connectors.	Connect and secure to connector adapter (7).	
i.	Loop clamp (4), machine screw (6), flat washer (5), lock washer (2) and nut (1).	Wrap clamp around existing RF cable; then install to existing hole in equipment tray.	Tools: Flatblade screwdriver and 3/8 in open/box wrench.



1. NUT (NO. 10-32)
2. LOCK WASHER (No. 10)
3. TIEDOWN STRAP
4. LOOP CLAMP (1/4-13/64 in)
5. FLAT WASHER (NO. 10)
6. MACHINE SCREW (NO. 10-32 x 5/8 in)
7. CONNECTOR ADAPTER

Figure 5-4 (2). Cable Installation: Interior Cabling

5.2 Installation of Cables. Continued

ITEM		ACTION	REMARKS
J.	Tiedown strap (3).	Wrap around existing RF cables and secure. See figure 5-4 (2).	
k.	Equipment tray panel.	Push back into equipment rack and secure with the latches.	
l.	Chassis assembly.	Release two latches and pull chassis assembly part way out from equipment rack. See figure 5-4 (3).	
m.	Existing RF cable clamp	Remove from chassis assembly. and alignment bracket.	
n.	Adapter wiring harness (1) connector P2.	Connect and secure to existing VHF FM cable.	
o.	Chassis assembly.	Push back into equipment rack and secure with two latches.	
p.	Steps e through o.	Repeat for two remaining locations.	

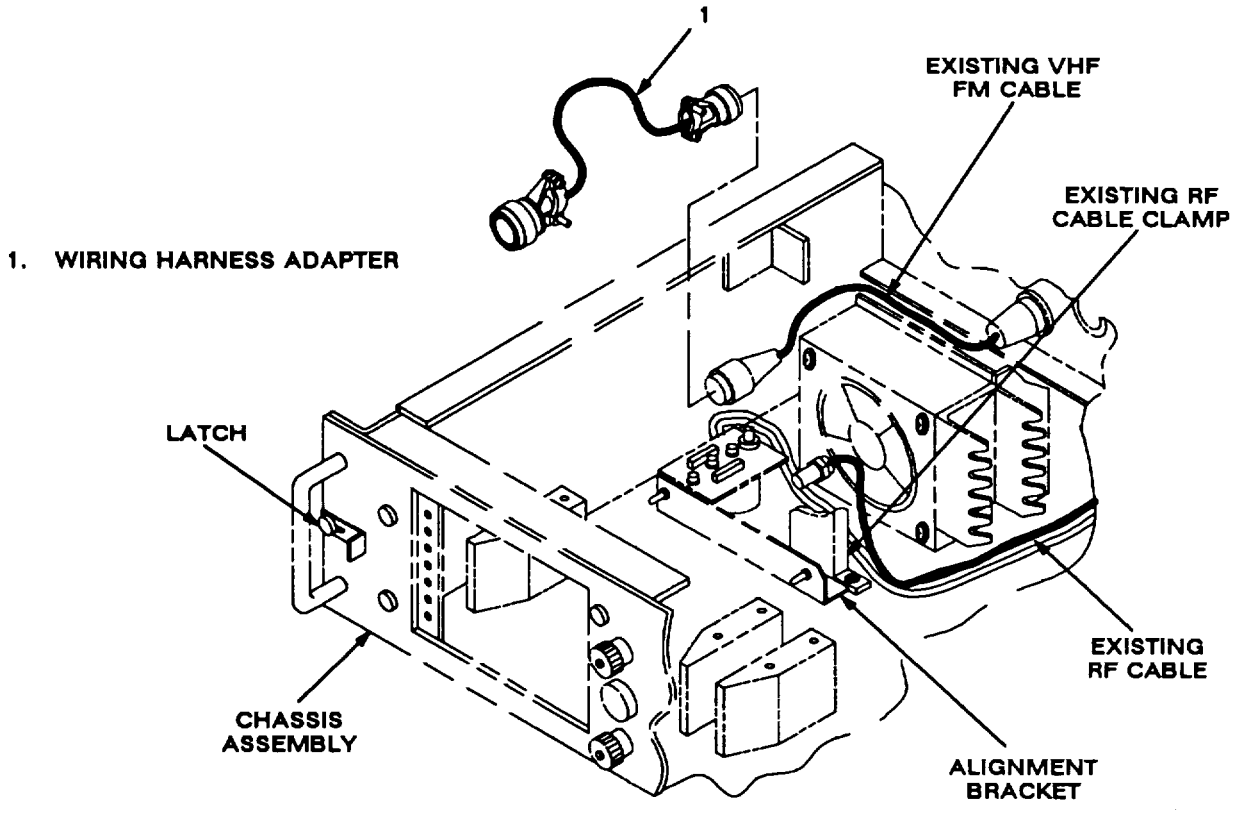
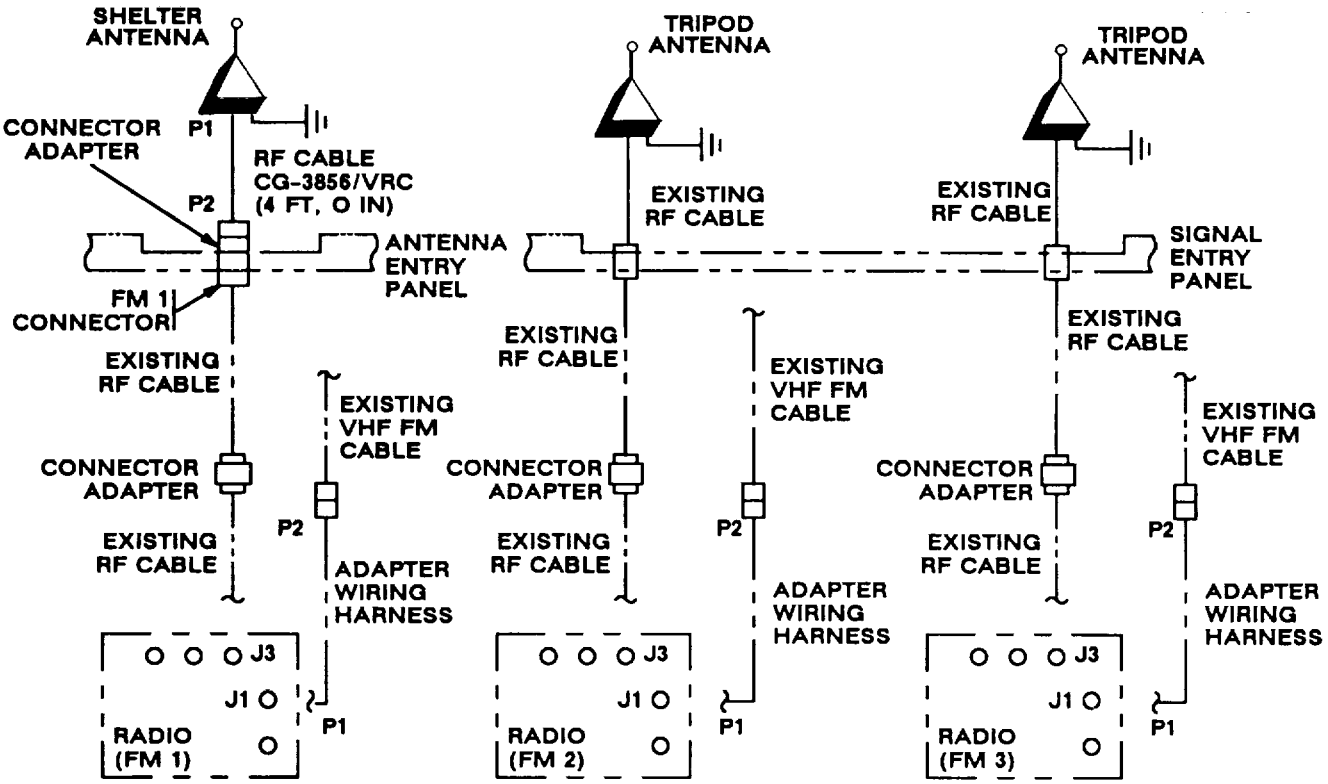


Figure 5-4 (3). Cable Installation: Wiring Harness Adapter

5.3 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 shelter.	
c.	Loop clamps.	Check that all have been properly installed and tightened.	
c.	Protective covers.	Insure that all installed cables are covered when not in use or connected.	
d.	Radio issued with shelter.	Install and connect cables. See TM 11-5821-333-12 for installation and Operational (OP) Check instructions.	
e.	MK line replaceable units.	See TM 11-5821-333-23P for Repair Parts and Special Tools List (RPSTL) Information.	

5.3 Post-Installation and Checkout. Continued



CABLE ASSEMBLY	FROM			TO		
	CABLE CONN.	UNIT	UNIT CONN.	CABLE CONN.	UNIT CONN.	UNIT
CG-3856/VRC (4 FT, 0 IN)base	P1	Shelter antenna	J1	P2	Connector adapter	
Existing RF Cable (FM 1)		Connector adapter				
Existing RF Cable (FM 1)		Connector adapter			Radio (FM 1)	J3
Adapter wiring harness	P2	Existing VHF FM cable (FM 1)	P1		Radio (FM 1)	J1
Existing RF Cable (FM 2)		Tripod antenna base	J1			
Existing RF Cable (FM 2)					Connector adapter	
Existing RF Cable (FM 2)		Connector adapter			Radio (FM 2)	J3

Figure 5-6**. Cable Diagram**

5.3 Post-Installation and Checkout. Continued

CABLE ASSEMBLY	FROM			TO		
	CABLE CONN.	UNIT	UNIT CONN.	CABLE CONN.	UNIT	UNIT CONN.
Adapter wiring harness	P2	Existing VHF FM cable (FM 2)		P1	Radio (FM 2)	J1
Existing RF Cable (FM 3)		Tripod antenna base	J1			
Existing RF Cable (FM 3)		Connector adapter				
Existing RF Cable (FM 3)		Connector adapter			Radio (FM 3)	J3
Adapter wiring harness	P2	Existing VHF FM cable (FM 3)	P1		Radio (FM 3)	J1

Figure 5-6. **Cable Diagram.** 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 72550	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 11-5820-890-1 0-1	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 11-5820-89020-4	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:

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

Official:

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

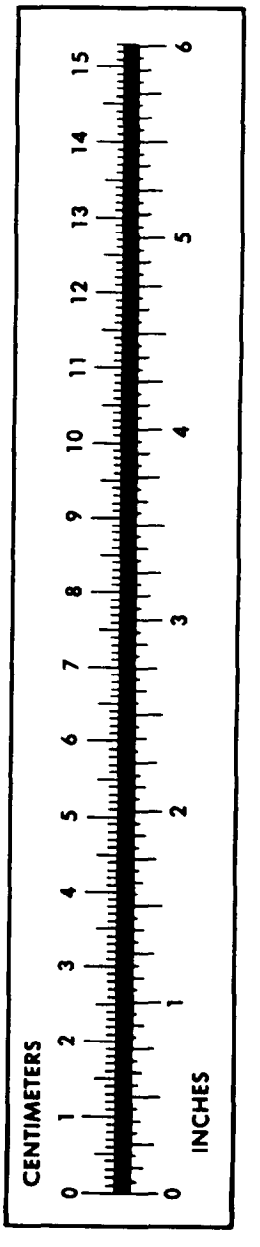
TEMPERATURE

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



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