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Part 7 Supplement 8

DSS (ARMY) 44/8/267

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**USER HANDBOOK
FOR
CLANSMAN RADIO INSTALLATIONS
in TRUCKS, $\frac{1}{2}$ and $\frac{3}{4}$ ton, FFR and GS,
ROVER**

Part 7 Supplement 8

UK/VRC - 353Z
in FFR only

WARNING - RF RADIATION

High power RF radiation can be harmful to your health. The power of the UK/VRC-353Z is judged to be insufficient to cause ill effects, except when someone is very close to the antenna, coupled with an exposure of several minutes.

Published under the authority of
the Signal Officer-in-Chief (Army), Ministry of Defence

NOVEMBER 1979

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This supplement details the installation of Radio Station UK/VRC-353Z into trucks, $\frac{1}{2}$ and $\frac{3}{4}$ ton, FFR Rover. Operating instructions are not included.

ASSOCIATED PUBLICATIONS

The following are applicable to this installation:-

<u>MOD (ARMY) User Handbooks</u>	<u>Army Code</u>
Radio station UK/VRC-353	61393
CLANSMAN secure speech harness (Complete System)	61873
CLANSMAN Radio installations in trucks, $\frac{1}{2}$ and $\frac{3}{4}$ ton, FFR and GS, Rover	61590
INSTALLATION of UK/VRC-353	Part 7, Supp 3

SECURITY NOTES

1. The installation described in this supplement MUST NOT be varied without authority.
2. Users are reminded of the importance of connecting up the installation as instructed in this supplement and in the separate handbooks issued with the various equipment.

LACK OF ATTENTION TO DETAIL WILL WEAKEN
THE RELIABILITY OF THE WHOLE SYSTEM

SUPPLEMENT 8

THE INSTALLATION OF RADIO STATION UK/VRC-353Z
INTO TRUCKS, $\frac{1}{2}$ AND $\frac{3}{4}$ TON, FFR, ROVER

CONTENTS

	Page
Associated publications	ii
Security notes	ii
SECTION 1 INTRODUCTION	
The installation	1
Contents of kits	3
Modifications to vehicle and equipment	3
SECTION 2 INSTALLATION	
General	6
Radio station UK/VRC-353	6
Digital Master Unit	8
Interconnections	9
Bonding	12
SECTION 3 TESTING	
Testing the installation	13
Testing the radio equipment	13

ILLUSTRATIONS

Fig.		Page
1	Radio station UK/VRC-353Z installed in trucks, $\frac{3}{4}$ ton, FFR, Rover	iv
2	Single-set mounting positions	2
3	Radio table modifications	4
4	Radio table bonding modifications	5
5	Radio table equipment mounting positions	6
6	Additional requirements for the installation of Radio Station UK/VRC-353	7
7	Installation of frame, mounting electrical equipment	8
8	Block schematic	9
9	Cable routes RT-353	10
10	Cable routes DMU	11
11	Bonding lead route	12

Note...

In this supplement the terms 'equipment rack' and 'Radio table' are applied not only to the $\frac{3}{4}$ ton FFR vehicle items but also to the module rack and module table which are part of the $\frac{1}{2}$ ton FFR vehicle dismountable module.

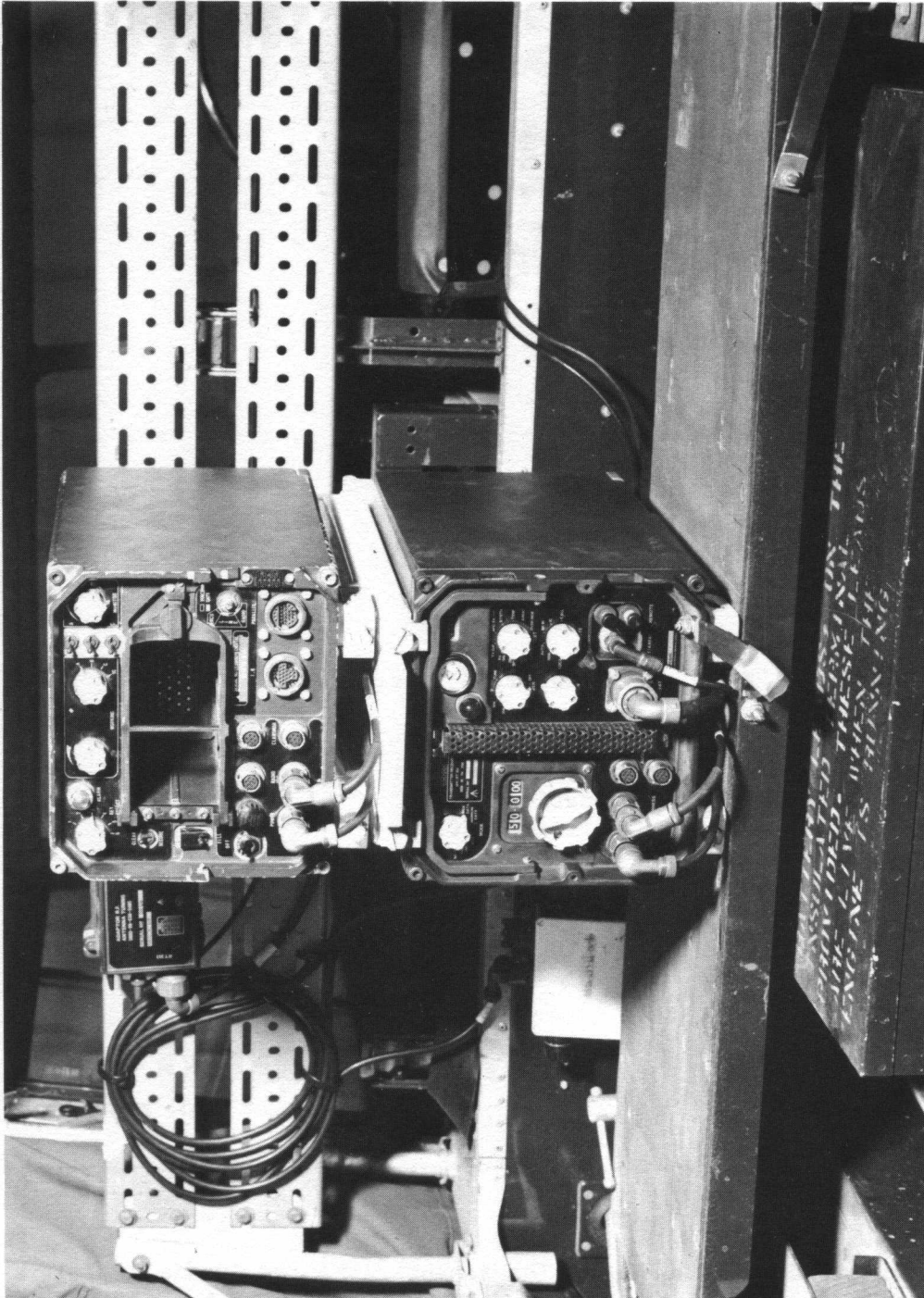


Fig. 1 Radio station UK/VRC-353Z installed in truck, $\frac{3}{4}$ ton, FFR, Rover
(DMU Bonding not shown)

Section 1 INTRODUCTION

THE INSTALLATION

1.1 All the items required for this installation are provided as CLANSMAN $\frac{1}{2}$ and $\frac{3}{4}$ ton Rover 'brick' kits. The kits appropriate to this installation are listed below.

CLANSMAN $\frac{1}{2}$ and $\frac{3}{4}$ ton Rover 'brick' kits required

Kit	CES	Function
I.K. UK/VRC-353 in FFR vehicles	44655	The radio equipment installation kit
I.K. DMU in FFR vehicles	44924	Provides DMU
Radio station UK/VRC-353	43754	Basic radio kit
I.K. distribution box CLANSMAN radio in FFR vehicles	44661	Provides fused distribution box
'B' vehicles audio gear kit	43746	Basic audio gear kit

Note: I.K. = Installation kit

This supplement contains installation instructions for these kits. Supplementary instructions only are contained for I.K. UK/VRC-353 in FFR vehicles, I.K. distribution box CLANSMAN radio in FFR vehicles and Radio station UK/VRC-353; detailed instructions being given in Supplement 3 to which reference is made in para 2.1.

NOTE

The right and left hand sides of the vehicle are those which would be assumed by a person sitting normally in the drivers seat.

1.2 This installation comprises a single-set UK/VRC-353 installation with a Digital Master Unit (DMU) and associated connectors. The RT-353 is mounted in the centre (position C) of the radio table and the DMU is secured to the top of the RT-353 using a frame, mounting electronic equipment. The ARFAT is mounted on the upper part of the equipment rack to the left of the DMU. Where Radio Station UK/VRC-353Z is to form part of a multiset installation it may be necessary to mount some of the items in positions differing from those above.

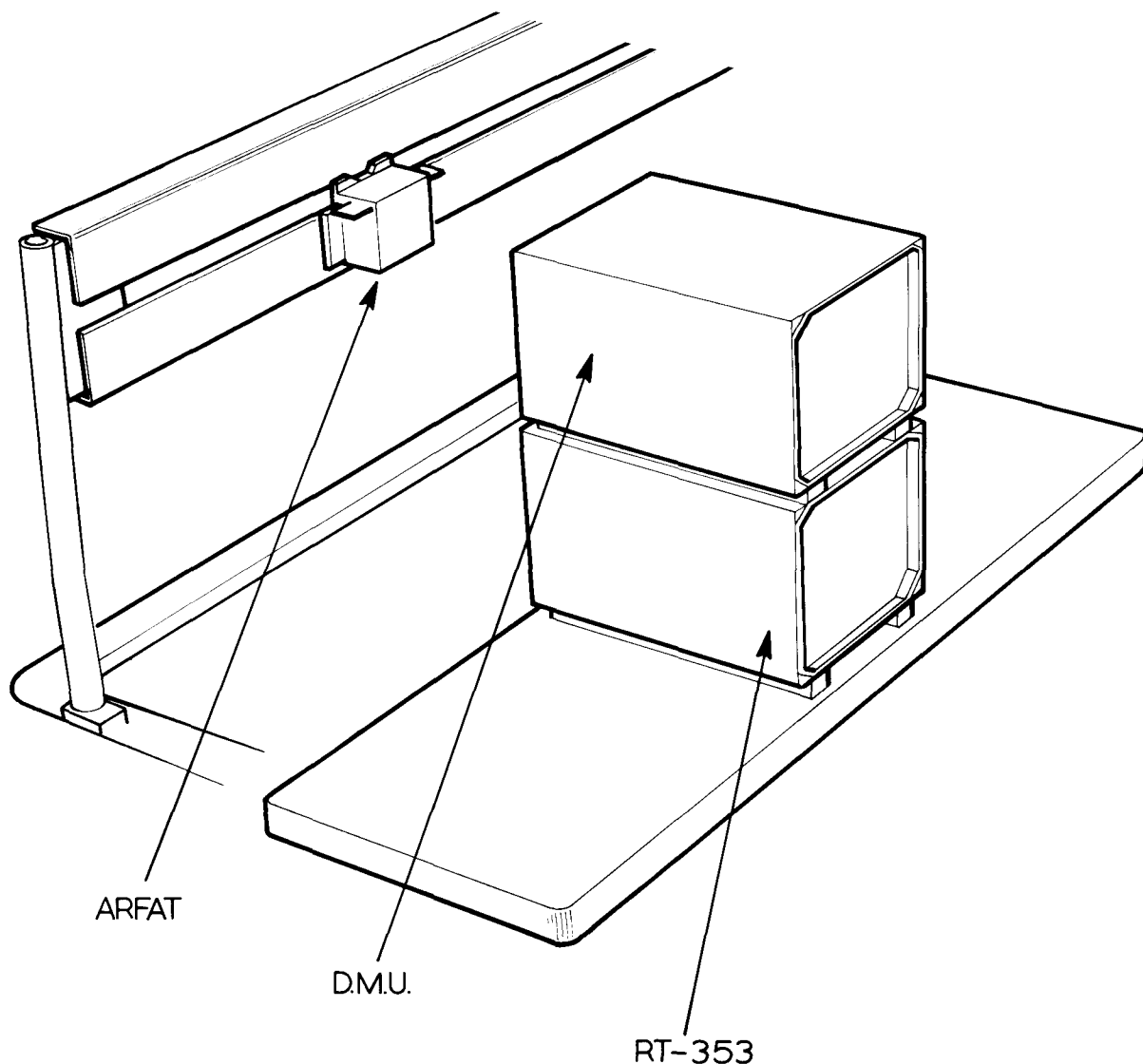


Fig. 2 Single-set mounting positions

1.3 Before attempting to install the kits ensure that they are complete (para 1.4) and that all appropriate modifications are embodied in the vehicle and equipment (Para 1.5). In general, nuts, bolts etc. for main items will be found in linen bags tied to the item. Nut and bolt pairs will usually be supplied with two plain washers and one spring washer.

CONTENTS OF KITS

1.4 The main items of Installation Kit DMU in FFR vehicles are listed below and at the head of the appropriate installation instructions in the next section. The main items of the kits associated with the single-set UK/VRC-353 are detailed in Supplement 3. For a complete list of kit parts refer to the appropriate CES (para 1.1).

Main items of installation kit DMU in FFR vehicles

Item	Name	NATO Stock No.	Qty	Remarks
1	Frame, mounting electrical equipment	5975-99-637-9502	1	
2	DMU	5810-99-637-9686	1	
3	Cable assembly power, electrical	5995-99-652-1803	1))) See fig. 8
4	Cable assembly power, electrical	5995-99-637-9887	1))
5	Cable assembly power, electrical	5995-99-637-9615	1	For 'C' set working in Multiset fit only
6	Clamp loop		4	stowed in linen bag attached to item 4
7	Lead, electrical		1	Part No. SD3/263996/1
8	Lead, electrical		1	Part No. SD3/263988/1
9	Washer, shakeproof external tooth	5310-99-100-6941	12) 2 only required in) this installation) for earth bonding
10	Sleeve, spacer	5365-99-637-9758	4) of ARFAT))
11	Bolt, hex hd. M8 x 45 lg	5306-99-122-5255	4))

MODIFICATIONS TO VEHICLE

1.5 The following modifications to the vehicle are essential to ensure adequate earth bonding of the installation. This does NOT constitute authority to embody the modifications.

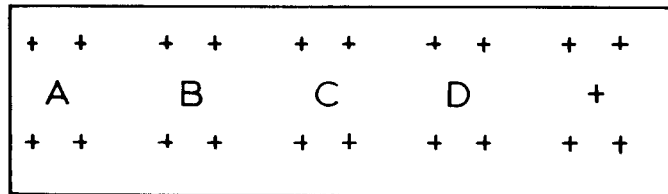
1. The bottom steel plate of the main radio table should be earth bonded by drilling the radio table and using the single counter-sunk screw assembly to attach an earth braid from the plate to the table framework. For $\frac{3}{4}$ ton vehicles use the existing earth stud on the underside of the table framework. For $\frac{1}{2}$ ton vehicles use the stud at the righthand end of the front of the table framework. (See fig. 4).

2. The main equipment rack should be earth bonded to the supports by use of external teeth, shakeproof washers. For $\frac{3}{4}$ ton vehicles remove in turn each of the 8 off nuts, bolts, plain and spring washers holding the slotted angle to the uprights and position a shakeproof washer on the bolt between the plain washer under the head of the bolt and the slotted angle. For $\frac{1}{2}$ ton vehicles carry out a similar operation omitting the bolt securing the outermost antenna support bracket but positioning 2 off shakeproof washers per bolt to abut the painted surfaces of both the rack and support bracket. Additionally bond the tubular struts between rack and table at each end by positioning a shakeproof washer to abut the painted surfaces of the bracket or equipment table, as appropriate, before replacing the plain washers and nuts.

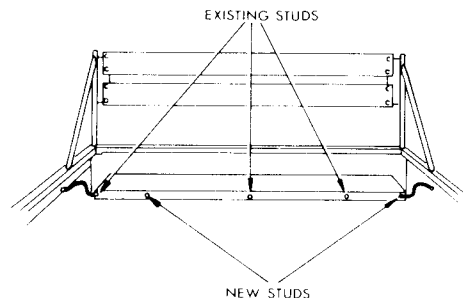
3. The main radio table should be modified to incorporate an additional 2 earth bonding terminals. All five terminals should also be fitted with wing nuts. The left and righthand terminals should be bonded to the sides of the vehicle (See fig. 3).

These modifications are detailed in EMERs Wheeled Vehicles Q027 mod. instructions.

1.6 It is considered that DMUs used in this application require definite earth bonding via a lead, electrical to a bonding point on the vehicle furniture. DMUs will be modified in due course to incorporate an earth bonding point. Frames, mounting electrical equipment (5975-99-637-9502) are now being supplied fitted with an earth bonding point. Frames without this earthing point MUST NOT be used. Details of bonding requirements are given in para 2.5.

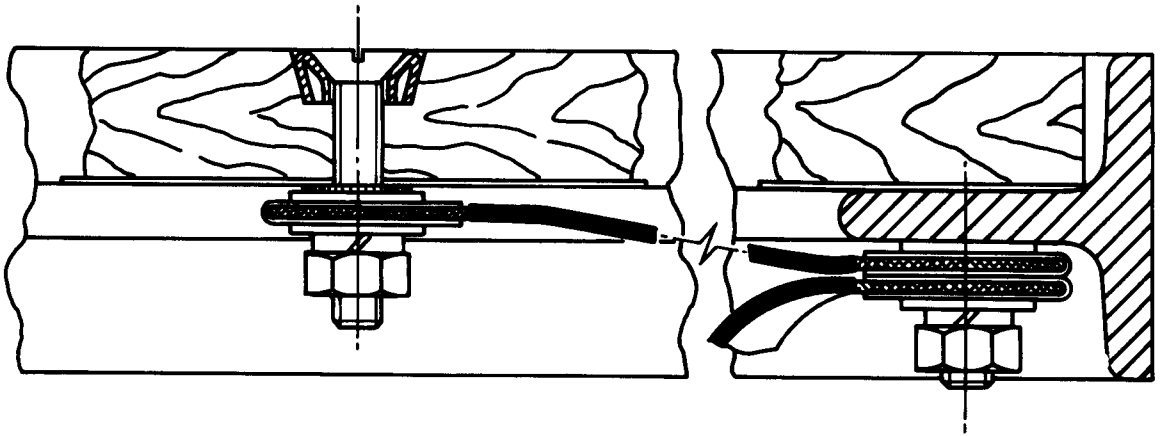


Radio table position holes

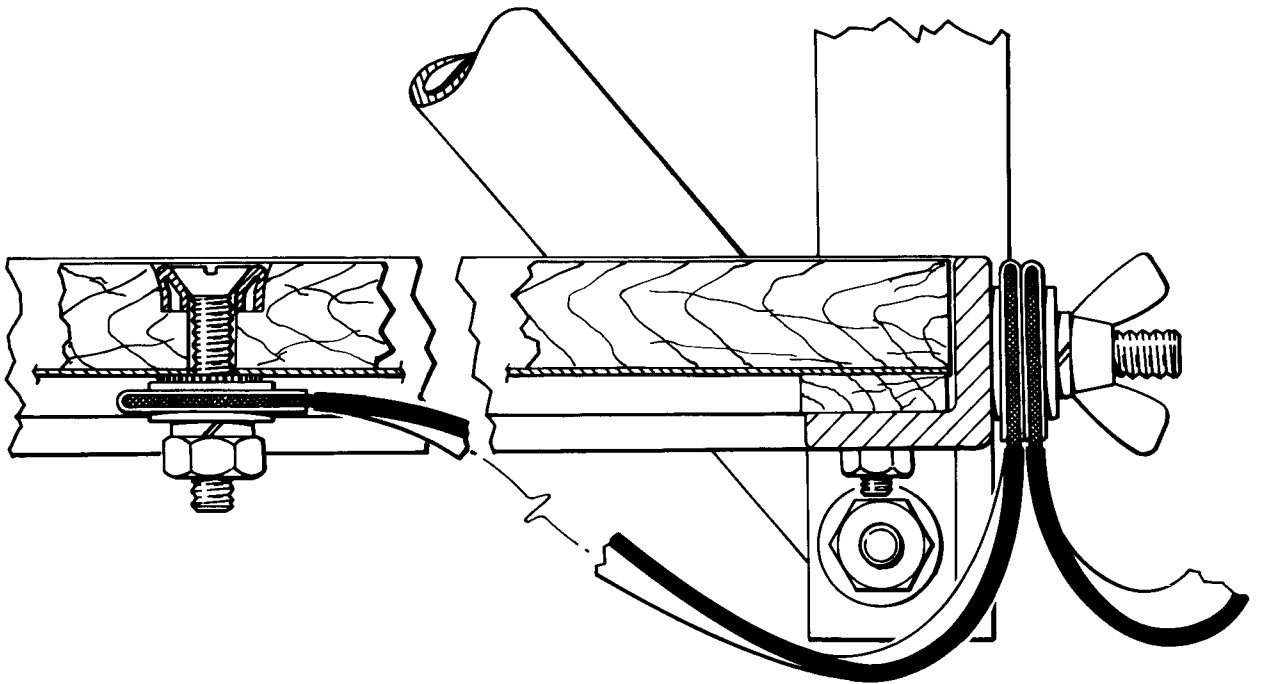


Additional earthing studs

Fig. 3 Radio table modifications



Earth bonding arrangement, $\frac{3}{4}$ ton



Earth bonding arrangement, $\frac{1}{2}$ ton

Fig. 4 Radio table bonding modifications

Section 2 INSTALLATION

GENERAL

2.1 The radio set may be mounted in any one of five positions on the radio table (A to E in fig. 5). The centre position on the radio table (position C in fig. 5) is the preferred position for single set installations. When the set is part of a multiset installation however the number of positions available for the radio equipment will be restricted. Suitable positions for use in multiset installations are given in Part 8 Supplement 1, together with any special instructions.

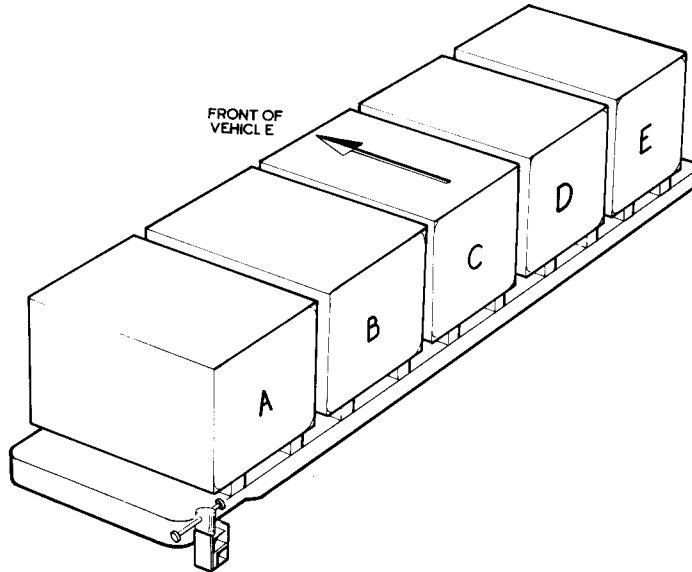


Fig. 5 Radio table equipment mounting positions

RADIO STATION UK/VRC-353

2.2 Install the following kits as detailed in supplement 3, incorporating the additional requirements listed below.

Kit	CES
Installation kit radio station UK/VRC-353 in FFR vehicles	44655
Installation kit distribution box CLANSMAN radio in FFR vehicles	44661
Radio station UK/VRC-353	43754

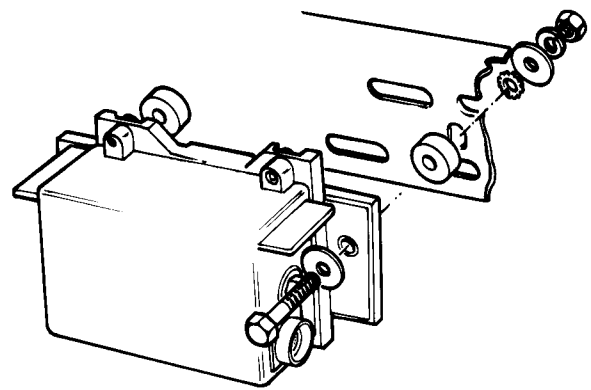
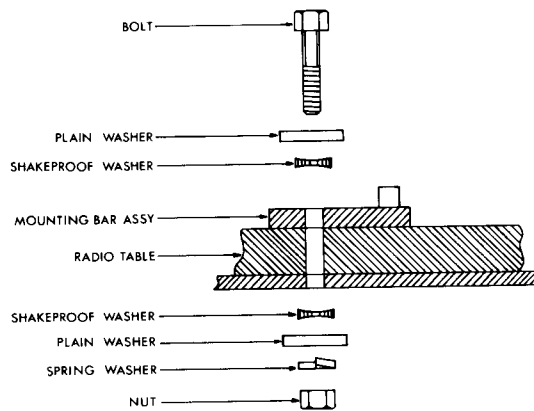


Fig. 6 Additional requirements for the installation of Radio Station UK/VRC-353

1. Install the RT-353 in the appropriate position (Position C for single-set installations) on the radio table. To ensure that the mounting bar assembly rigid, is earth bonded to the radio table, use the shakeproof washers provided with the DMU installation kit. These must be positioned on each of the bolts (as shown in fig 6A) to secure the mounting. Before sliding the RT-353 onto the mounting assembly, rigid, position cable assembly, lead electrical (5995-99-637-0916) between the mounting bars. The two ends of the cable assembly are identical.

2. Install the ARFAT on the upper part of the equipment rack (to the left of RT-353 for single-set installations) allowing sufficient room for the DMU to be installed. Instead of the rubber gaskets and bolts supplied with the Radio Installation Kit for fitting the ARFAT to the equipment use the longer bolts and metal spacer sleeves supplied with the DMU Installation Kit. Position 1 off washer, shakeproof external tooth (5310-99-100-6941) from the DMU Installation Kit on each securing bolt between the equipment rack and plain washer as in fig. 6B. (The surplus bolts, spacer sleeves and shakeproof washers are for use only with a rebroadcast station).

3. Connect the wing-mounted equipment to the ARFAT as detailed in supplement 3: all other connections are detailed in para 2.4 of this supplement.

DIGITAL MASTER UNIT

2.3 Items required

Name	NATO Stock No.	Qty	Remarks
Frame, mounting electrical equipment	5975-99-637-9502	1	
Digital Master Unit	5810-99-637-9686	1	

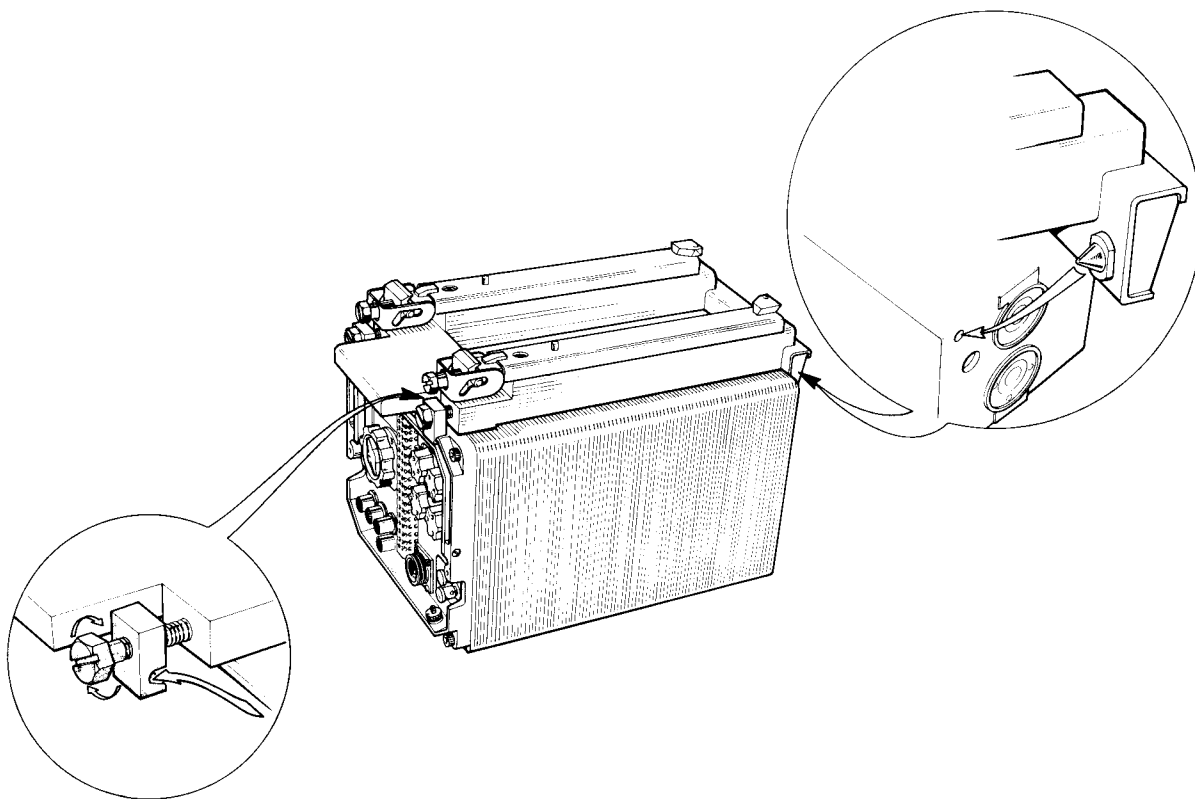


Fig. 7 Installation of frame, mounting electrical equipment

1. Secure the frame, mounting electrical equipment (5975-99-637-9502) to the top of the RT-353 as in fig. 7.
2. Slide the Digital Master Unit onto the frame, mounting, electrical equipment and secure with the screw-operated clamps.

INTERCONNECTIONS

IT IS ESSENTIAL FOR THE SATISFACTORY OPERATION OF THIS INSTALLATION THAT THE CABLES ARE ROUTED EXACTLY AS DETAILED BELOW.

2.4 A block schematic diagram is given in fig. 8. All connections at the wing-mounted equipment should have been made as detailed in supplement 3. All other connections should be made as detailed below. Clips for securing the cables to the equipment rack are stowed in linen bags attached to the cable assemblies, power, electrical (5995-99-637-9887).

Cable assemblies

Ref	Description	NATO Stock No.	From	To
202	Cable assembly power electrical	5995-99-637-9887	Dist'n box	DMU
601	Cable assembly power electrical	5995-99-652-1803	RT-353	DMU

Note: Cable assemblies 101, 102, 103, 201, 1201 are detailed in supplement 3.

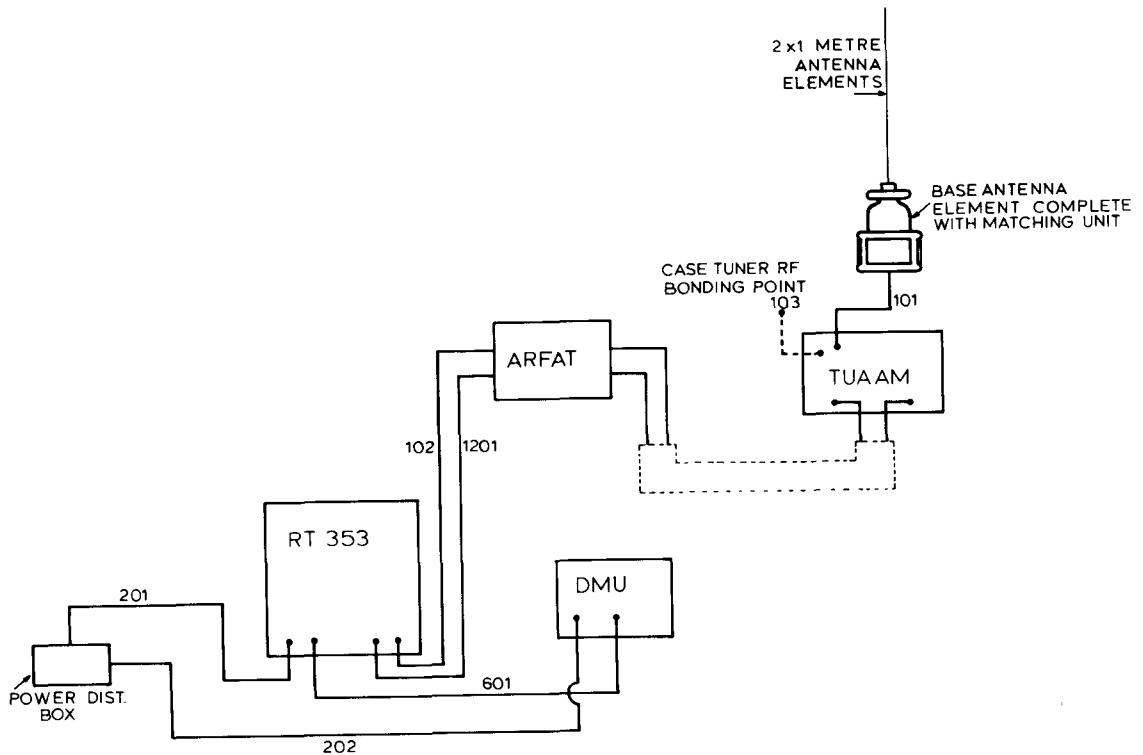


Fig. 8 Block schematic

Note...

When the distribution box is connected to the FFR 'RADIO' terminals the three outlet sockets are LIVE.

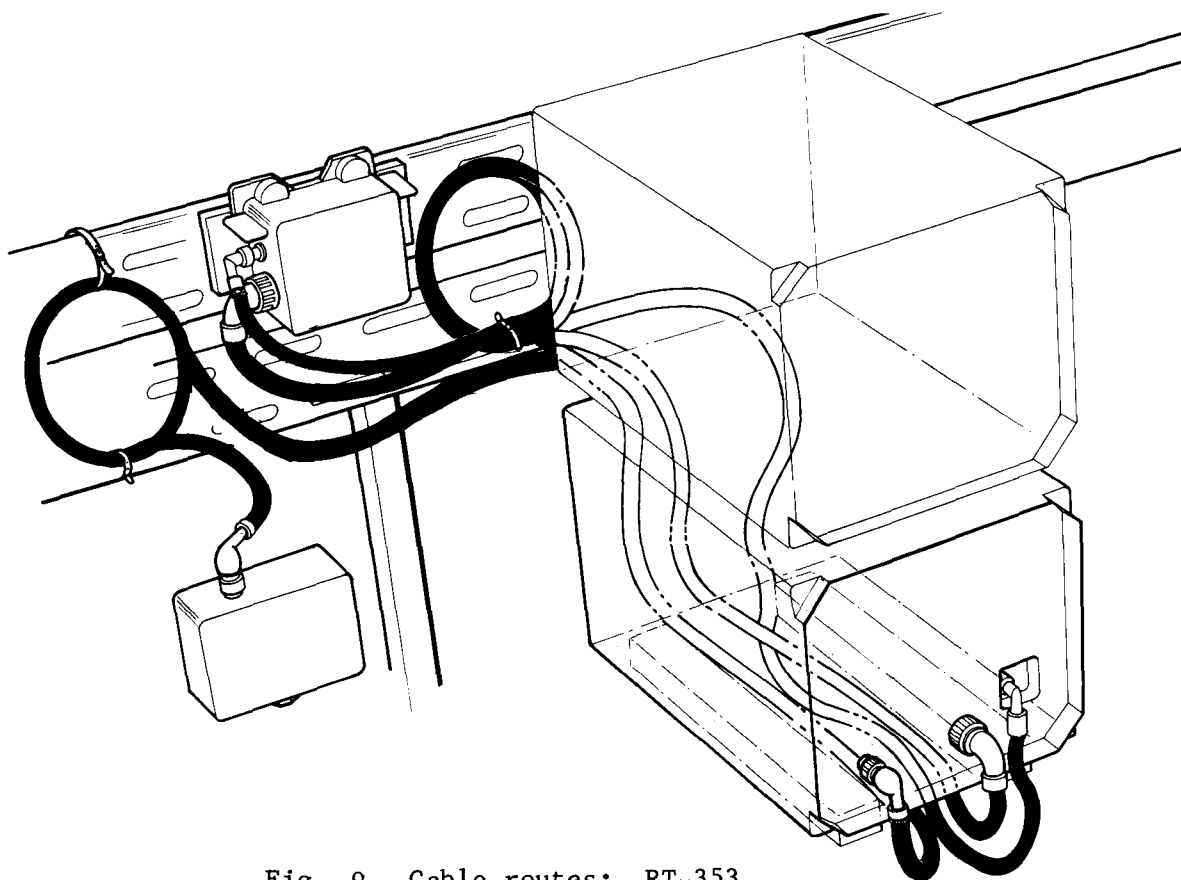


Fig. 9 Cable routes: RT-353

1. Make sure the switch on the RT-353 front panel is set to OFF.
2. Connect the 2-pin plug marked 28V on the RT-353 front panel to a 2-pin socket on the distribution box using cable assembly, power electrical (5995-99-637-9887) from the UK/VRC-353 installation kit. Pass the cable under the RT-353 and clip it to the underneath of the equipment rack. Coil up the surplus cable length and clip it to the equipment rack above the distribution box. See fig. 9.
3. Connect the 12 pin plug/socket marked ARFAT on the RT-353 front panel to the 12 pin plug/socket marked RT-353 on the ARFAT using cable assembly, lead electrical (5995-99-637-0916) from the UK/VRC-353 installation kit. This cable assembly should already be positioned under the RT-353. Coil up the surplus length and clip it to the equipment rack to the left of the ARFAT as in fig. 9.
4. Connect the coaxial socket marked ANT/TURF on the RT-353 front panel to the coaxial socket marked RT-353 on the ARFAT using cable assembly RF (5995-99-637-9538). Pass the cable under the RT-353 and clip it to the rack with cable assembly, lead electrical (5995-99-637-0916) already fitted.
5. Connect the cables from the wing-mounted equipment to the sockets marked TUAAM on the ARFAT. These cables are already installed in the vehicle and are stowed in an open box behind the lefthand front seat. Clip the cables to the top and lefthand side of the equipment rack, and stow the surplus length in the open box behind the seat.

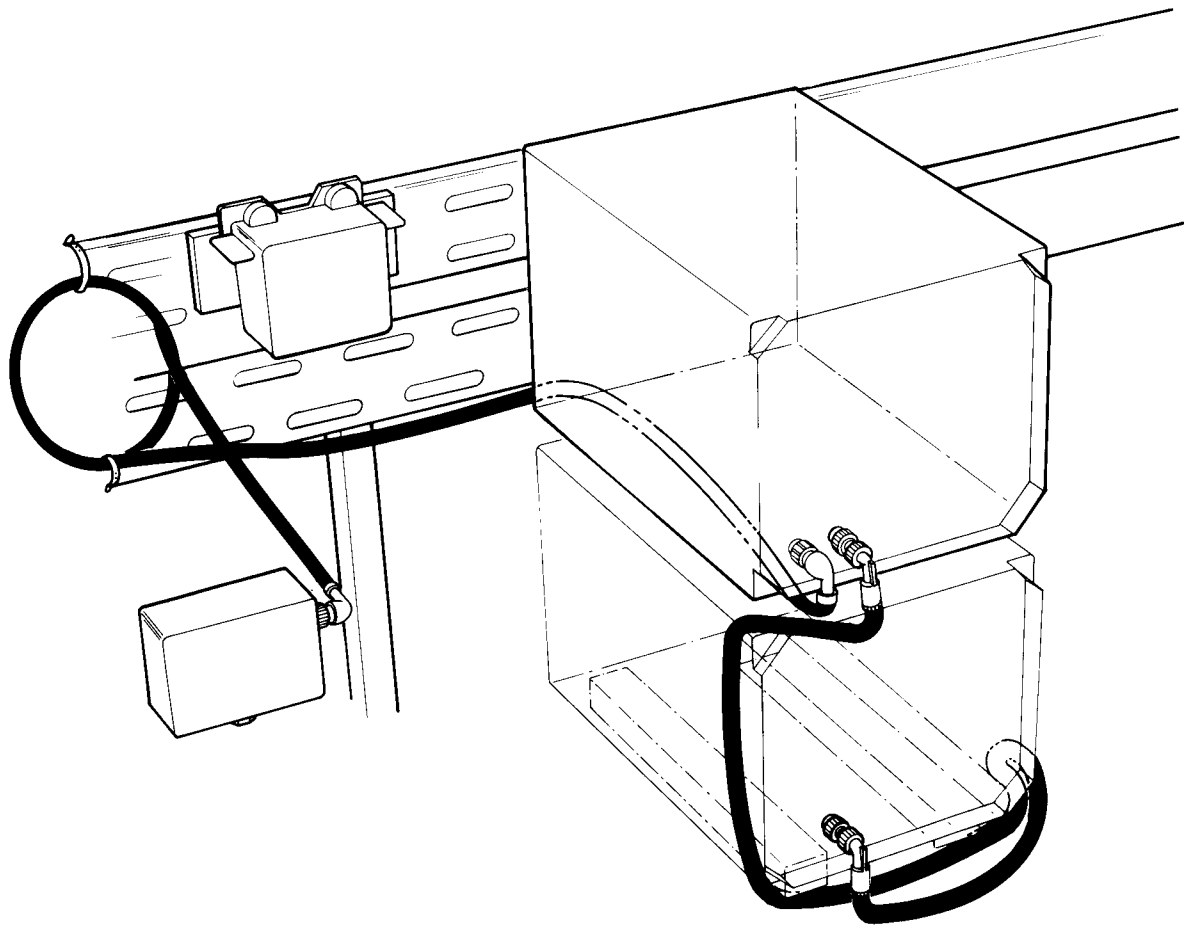


Fig. 10 Cable routes: DMU

6. Ensure that the power switch on the DMU front panel is set to OFF.
7. Connect the 2-pin plug marked POWER on the DMU front panel to a 2-pin socket on the distribution box, using cable assembly, power electrical (5995-99-637-9887) from the DMU installation kit. Pass the cable assembly under the DMU and clip it to the underneath of the equipment rack. Coil up the surplus length and clip it to the equipment rack above the distribution box as in fig. 10.
8. Connect the plug marked HARNESS on the RT-353 front panel to the socket marked RADIO on the DMU front panel using cable assembly power electrical (5995-99-652-1803). Pass the cable around the left side of the front panel of the RT-353 and connect the other end to the front panel socket. Double the excess length of this cable into a loop and pass it along the lower front edge of the RT-353 with the loop portion of the cable positioned around the right side as fig. 10.

BONDING

IT IS ESSENTIAL TO THE SATISFACTORY OPERATION OF THIS INSTALLATION THAT THE FOLLOWING POINTS ARE OBSERVED:

1. The ARFAT and mounting bar assembly is installed using washers, shakeproof external tooth as detailed in para 2.2.
2. The RT-353 radio and wing-mounted equipment are bonded as detailed in Part 7 Supplement 3.
3. The DMU must be bonded as detailed below. UNDER NO CIRCUMSTANCES SHOULD AN UNBONDED DMU BE USED.

2.5 Two leads, electrical (SD3/263996/1 and SD3/263988/1) are provided with the DMU installation kit to bond the DMU to the same point on the radio table as the RT-353. This is shown in fig. 11.

1. Secure one end of lead, electrical (SD3/263996/1) to the bonding point on the radio table to which the RT-353 is already bonded.
2. Secure the other end to the earth bonding point on the frame, mounting electrical equipment (5995-99-637-9502) as in fig. 11.
3. Secure one end of lead, electrical (SD3/263988/1) to the earth bonding point on the DMU .
4. Secure the other end to the earth bonding point on the frame, mounting, electrical equipment (5995-99-637-9502) as in fig. 11.

Note...

If the DMU has not been modified to incorporate the earth bonding point, then as an interim measure only, lead electrical (SD3/263996/1) may be connected to the frame, mounting, electrical equipment (5995-99-637-9502) and disregard lead, electrical (SD3/263988/1).

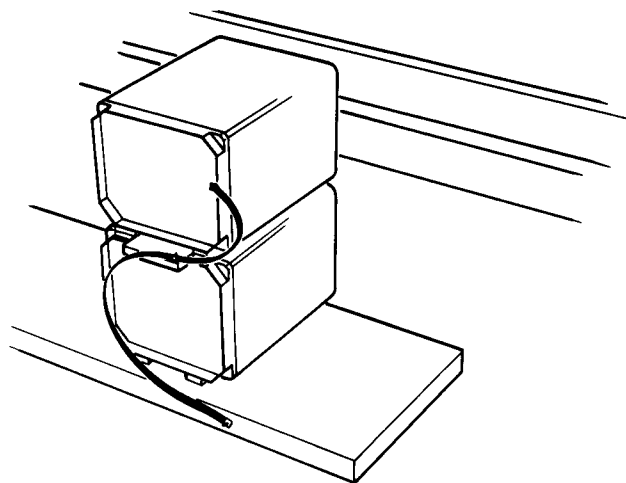


Fig.11 Bonding lead route

Section 3 TESTING

TESTING THE INSTALLATION

3.1 After the kits have been installed the following checks should be carried out:-

1. Inspect all fittings ensuring all nuts and screws are securely tightened.
2. Check that connectors are correctly fitted and are secured to vehicle or equipment rack to prevent accidental damage. Connector locking rings should be firmly tightened by hand.
3. Ensure the equipment is clean and dry.
4. Ensure that the antenna feeder cable does not touch any metal parts of the installation.
5. COMMUNICATIONS SECURITY . To meet TEMPEST requirements an earth bonding check of this installation should be carried out before operation. The responsible REME authority should be requested to carry out this check to ensure that the following maximum bonding resistances are not exceeded:

25 milliohms between any part of the installation and the vehicle chassis.

2 milliohms across any individual earth bond connection.

Note...

Although a maximum overall bonding resistance of 25 milliohms is quoted, in practice, typical values of 5 milliohms can be achieved and every effort should be made to attain this figure.

TESTING THE RADIO EQUIPMENT

3.2 Check the radio equipment for serviceability as detailed in the appropriate User Handbook.

IDEAS SUGGESTIONS DEFECTS

YOU are the user of this equipment—can it be improved?

If you have any good suggestions about this or ANY Signals equipment, The Ministry of Defence Army Department are interested.

Ideas and Suggestions

If you can suggest:

- (a) an improvement in design or shape,
- (b) a better method of installation, operating, or servicing,
- (c) other equipment which might do the job better,

the procedure is quite simple—pass it to your OC or Adjutant for transmission to the local Chief Signal Officer.

It will remain YOUR idea.

See the Signal Equipment Performance Report (AF B63), details for completion of which are found on the cover of the pad.

Defects

If there is something wrong with the equipment AS IT STANDS, other than a fair wear and tear fault, it is a defect.

Again, don't keep it to yourself, pass it to your OC. The procedure for him to follow is given in EMER Management N200. (AFG 3660 is the form to use).

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