HANDBOOK No. 901 ISSUE 1
PPD/EB/AUG 1969

REDIFON

Technical Information

Instruction Manual

for

100W HF SSB

TRANSPORTABLE COMMUNICATIONS STATION

TYPE GR479 A

ASSOCIATED HANDBOOKS

DRIVER-RECEIVER GR345D/GKR206—HANDBOOK No. 899-1
100W AMPLIFIER GA480A—HANDBOOK No. 898-1 PART I
AERIAL COUPLING UNIT ACU9—HANDBOOK No. 898-1 PART II
AMPLIFIER, LOUDSPEAKER 6180/R—HANDBOOK No. 903-1

HANDBOOKS: (0293) 518855 MARK ROUSON EXT. 412

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SWITCH CLEANING FLUIDS

Proprietary Switch Cleaning Fluids often contain solvents capable of dissolving the plastics used in switch parts and of absorption by paxolin switch shafts. Either effect can result in permanent damage to the switch.

The indiscriminate use of these fluids, especially in aerosol form, is not recommended. If fault conditions indicate that switch cleaning is necessary single drops must be accurately placed where appropriate.

SOLID STATE DEVICE

MOUNTING SCREW TORQUES

The permissable tightening torque for screw mounted solid state device is controlled by the type of case used. The following figures provide the torque necessary for good heat transfer without approaching the limiting torque, beyond which mechanical distortion may occur. Case types can be identified by the list of typical devices and sketches overleaf.

TO3	5Kg cm (4•3in - lbs)
MJ1006	Motorola
FT3812G	Fujisu
BDY90	Mullard
2N3055	RCA
2N6354	RCA
LC-0V-15	Lambda
LM 217K	National Semiconductor
LM 323K	National Semiconductor
LM 317K	National Semiconductor
TO66	5Kg cm (4•3in lbs)
2N5956	RCA
2N3054	RCA
T0126	3•5Kg cm (3in lbs)
MJE340	Motorola
BDX35	Mullard
TO220	6Kg cm (5in lbs)
BYW29-150	Mullard
BYW29-100	Mullard
TIP125	Texas
TIP120	Texas
µA7812UC	Fairchild
µA7912UC	Fairchild
µA7905UC	Fairchild
LM3177	National Semiconductor
MC7912	National Semiconductor
MC7912CP	Motorola
MC7905CP	Motorola
D04	14Kg cm (12in lb)
BYX61/200R	Thompson CP
BZY93C62R	Mullard
BZY93C15VR	Mullard
BYX30-200	Mullard
BYX30-300	Mullard
BZY93C33R	Mullard
DO5	28Kg cm (24in lb)
BZY91-R-C36	Mullard

Fig. 1. TO3, TO66. oval flange with two M3 nuts and screws - 5kg cm (4•3 in lb).

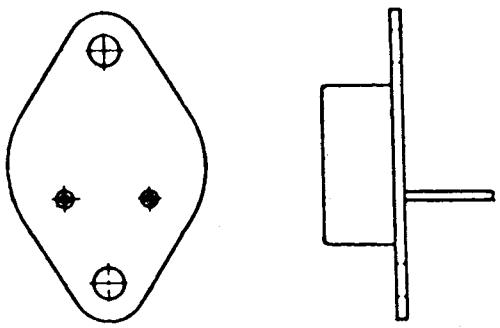


Fig. 2. TO126. Through hole plastic envelope M3 nut and screw with plain washer - 3•5kg cm (3in lb).

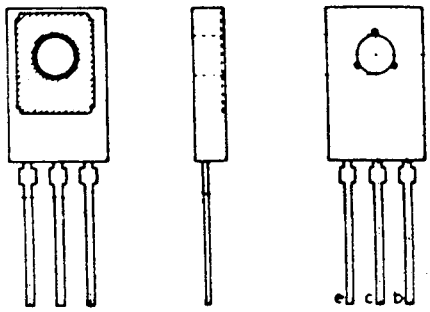


Fig. 3. TO220 Metal Tab with M3 cross recess pan head screw with lock washer - 6kg cm (5in lb).

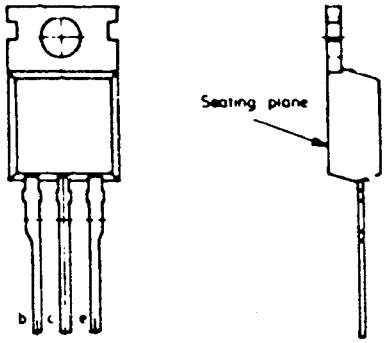
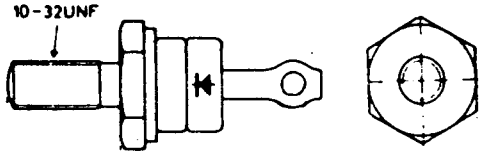


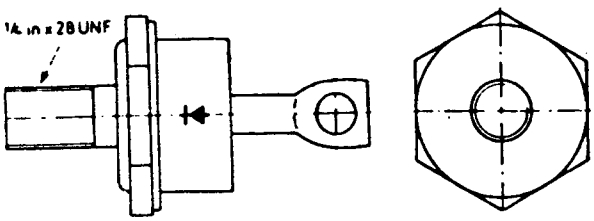
Fig. 4. DO4 Stud Mounting 3/16" nut with lock washer - 14kg cm (12in lb).

DO5 Stud Mounting 1/4" nut with lock washer - 28kg cm (24in lb).

DO-4:



DO-5.



AMENDMENT

Handbook No. & Issue... 901-1
Handbook Title... Instruction Manual for 100W HF SSB TRANSPORTABLE COMMUNIC, STATION TYPE GR.479A
Amendment Sheet No.... 1
Date of Issue... MAY 1972

Issued by Post Design Services

Page/Drg. reference	Details of Amendment(s)
Page 2-2 Para 2.11 Flexilite Lamp Assembly	At the end of the paragraph add a further sentence as follows :- The filament lamp is rated at 6 watts 24 volt, style MCC 15 m.m. round.
Line Terminating Unit FIG. 2.5	Remove and destroy the existing FIG. 2.5 and insert FIG. 2.5, reprinted MAY 1972, attached.
	NOTE TO READERS Errors and omissions discovered in this handbook should be notified to :- REDIFON TELECOMMUNICATIONS LIMITED (Post Design Services) RADIO COMMUNICATIONS DIVISION BROOMHILL ROAD LONDON. S.W.18 4JQ. Details should include :- Handbook No. and Issue Handbook Title Page/Drawing reference No. Error or omission details.

(E. Briggs. P.D.S. Engineer)

CONTENTS

ILLUSTRATIONS

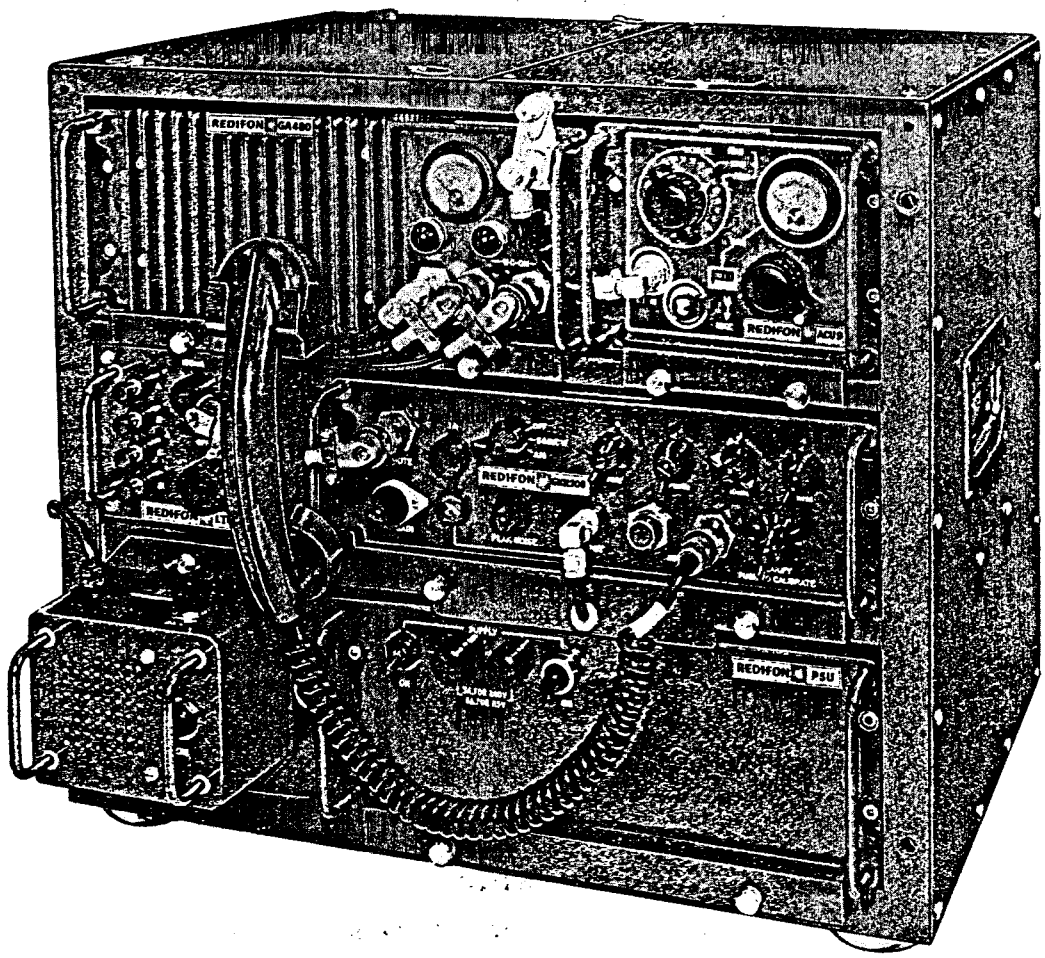


PLATE 1 GR479A HF SSB TRANSPORTABLE COMMUNICATIONS STATION 901-1

1 INTRODUCTION

The Redifon type GR479A equipment is a complete HF SSB transportable communications station. It is made up of a number of standard units of equipment and is basically a combination of driver-receiver, 100W linear amplifier and aerial coupling unit.

The equipment is housed in a compact mounting frame which is totally enclosed and is provided with shock mounts and carrying handles. For transit, the control face is protected by a removable cover.

Power supply at 24V d.c. (negative earth) is obtained from an external source or from an AC power unit included in the mounting frame.

This handbook describes the system and gives intructions for the installation, connecting up and operation of the equipment: the main items of equipment are dealt with in separate handbooks.

The GR479A System is comprised of the following items:—

(1) Frame Assembly type 6663/A
(2) Driver-Receiver GR345D/GKR206 type 6659/A
(3) 100W Linear Amplifier GA480A type 6652/A
(4) Aerial Coupling Unit ACU9 type 6680/A
(5) Remote Control Unit type 6675/A
(6) Line Terminating Unit type 6676/A
(7) AC Power Unit type 6662/A
(8) Loudspeaker Amplifier type 6180/R
(9) Hand Microtelephone type 5458/A
(10) Boom Microphone and Headset type 5457/C
(11) Telegraph Key type 5459/A
(12) Connecting Cables (listed in chapter 3 Installation)

2 DESCRIPTION

The GR479A station is comprised of a number of equipment units assembled in a transportable, frame assembly. The equipment units are described in separate handbooks; these are referred to below.

2.1 FRAME ASSEMBLY

The mounting frame is of fabricated and welded sheet steel construction. The sides are enclosed by panels and a detachable front cover protects the operating control face of the equipment during transit. The fixed base plate is provided with shock mounts which allow simple four hole fixing.

Access to the equipment and the rear connections is obtained by removing the top and rear panels: these are fitted with quick release fasteners.

The equipment units are secured at the front by clamp screws and at the rear by flanges on the frame which engage with the feet of the units.

With all removable items stowed and the front cover fitted in position, the station is suitable for transportation. Fold-flat carrying handles are provided on the side panels. The dimensions and weight of the frame complete with equipment and accessories are: —

Height	*Width*	*Depth*	*Weight*
18in	21in	18½in	150lb
(46cm)	(53cm)	(47cm)	(69kg)

2.2 LAYOUT OF EQUIPMENT

The location of the principal units of equipment within the frame assembly is shown in Plate 1 and Fig. 2.1: Fig. 2.2 shows the rear view of the frame assembly.

2.3 INTERCONNECTIONS

The units are interconnected by cable assemblies, supplied terminated with plugs or sockets and cut to the required length. These are listed in chapter 3, Installation.

The interconnections are shown in Fig. 2.3.

2.4 DC DISTRIBUTION PANEL

The panel is part of the main frame assembly and permanent cabling is run from the distribution panel to fixed sockets on the frame which complete the supply connections to the units when they are pushed into position in the frame.

The distribution panel has terminals and a socket marked DC IN for the connection of an external 24V source, or an AC power unit. When the AC power unit is not used, its DC OUT cable is removed from the DC IN socket and is parked for safety in the Stowage socket on the distribution panel.

Other facilities on the distribution panel are a ½A fuse and two d.c. output sockets for supply to the Flexilite lamp and the line terminating unit.

2.5 AC POWER UNIT TYPE 6662/A

Handbook No. 898 Part I refers.

2.6 DRIVER-RECEIVER GR345D/GKR206

Handbook No. 899 refers.

The driver-receiver is a development of the GR34 lightweight manpack transmitter-receiver and provide the recommended r.f. drive input to the GA408A linea amplifier, viz 100mW.

2.7 100W LINEAR AMPLIFIER GA480A

Handbook No. 898 Part I refers.

2.8 AERIAL COUPLING UNIT ACU9

Handbook No. 898 Part II refers.

2.9 REMOTE CONTROL SYSTEM

Remote control facilities are provided by a remot control unit at the remote location and a line terminatin unit in the frame assembly.

Remote Control Unit type 6675/A

The circuit diagram is shown in Fig. 2.4. The uni is stored during transit in the upper rear stowage com partment of the frame assembly.

The unit is provided with two audio sockets for th connection of microphone, headphone/handset, key an press-to-talk switch: remote on/off switching is not pro vided. Local audio level is set by an AF Gain control Four spring loaded terminals are provided for the con nection of lines back to the line terminating unit in th main equipment.

Line Terminating Unit

The circuit diagram is shown in Fig. 2.5. The remot control lines are terminated at four spring loaded ter minals on the unit.

The output socket marked Control is connected b a cable assembly to one of the two Control sockets o the 100W linear amplifier. The other Control socket o the linear amplifier is connected by cable assembly to th driver-receiver Remote socket: this completes the remot control wiring.

A Remote On/Off switch on the unit effects th necessary circuit changes from local to remote operation

Note. For remote operation, a link is required to be mad on the driver-receiver GKR206, as detailed in the GKR20 handbook No. 899-1 para. 4.9 (a). The link is made be tween pins A and C on AF board P28427/L situate behind the Remote audio control socket on the GKR206

Power supply for the remote control system is ob tained from plug PL1 on the 24V distribution panel at th rear of the frame which is connected to plug PLA at the back of the line terminating unit: protection is given b fuse FS1 on the front panel of the line terminating unit

2.10 AMPLIFIER LOUDSPEAKER TYPE 6180/R

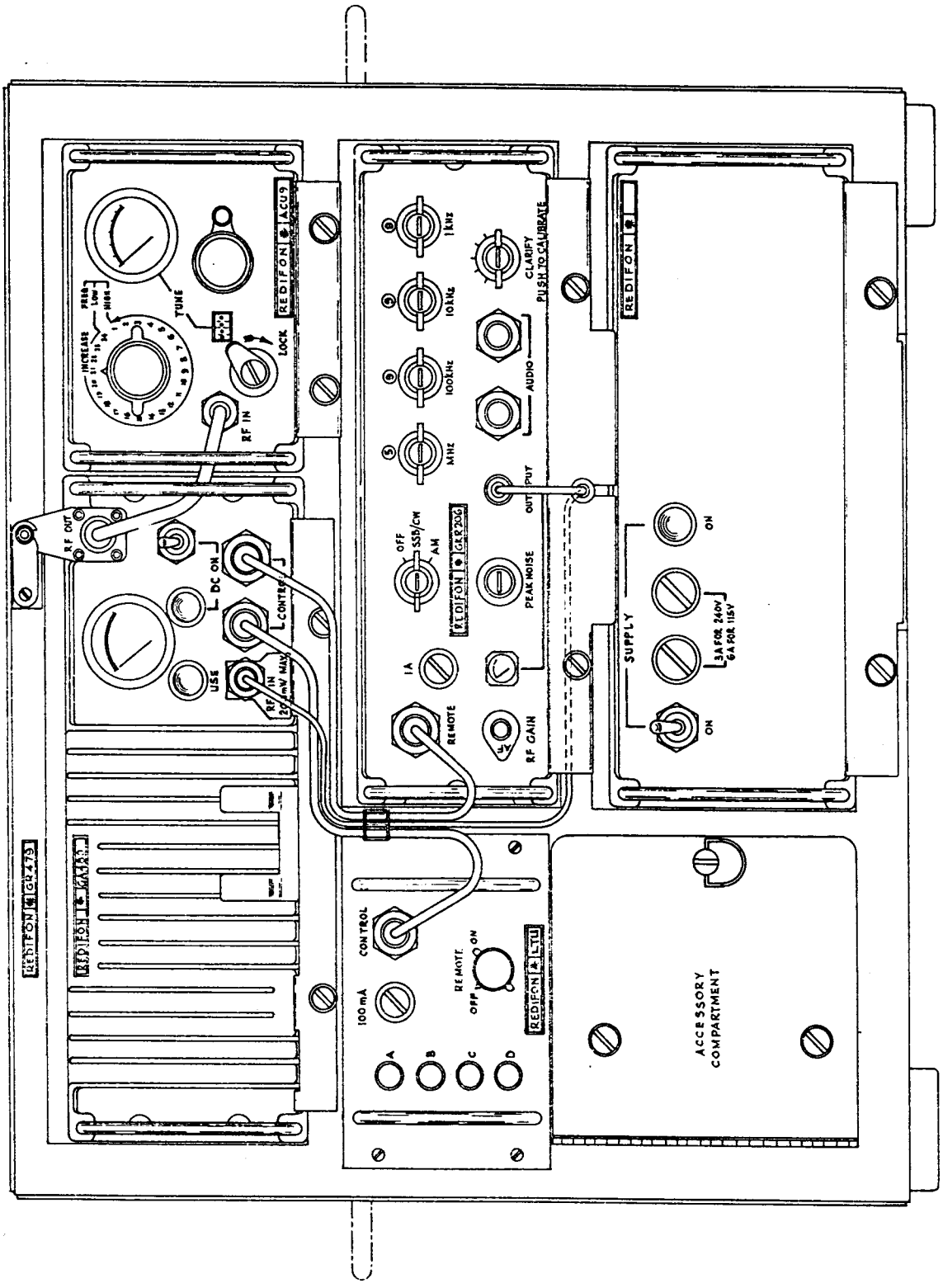
Handbook No. 903-1 refers.

The amplifier loudspeaker unit is stored in the upper rear stowage compartment. When in use, it is mounted on the hinged cover of the accessory compartment.

The unit is used with radiotelephone equipment that require an amplified audio output.

2.11 FLEXILITE LAMP ASSEMBLY

The lamp assembly is beneath the top access panel of the frame assembly. The lamp is supplied from a socket on the DC distribution panel and is protected by the adjacent 1A fuse. The On/Off switch is on the base of the lamp fitting. The filament lamp is rated at 6 watts, 24 volt, style MCC 15 m.m. round.



901-1 GR479A—FRONT VIEW FIG. 2.1

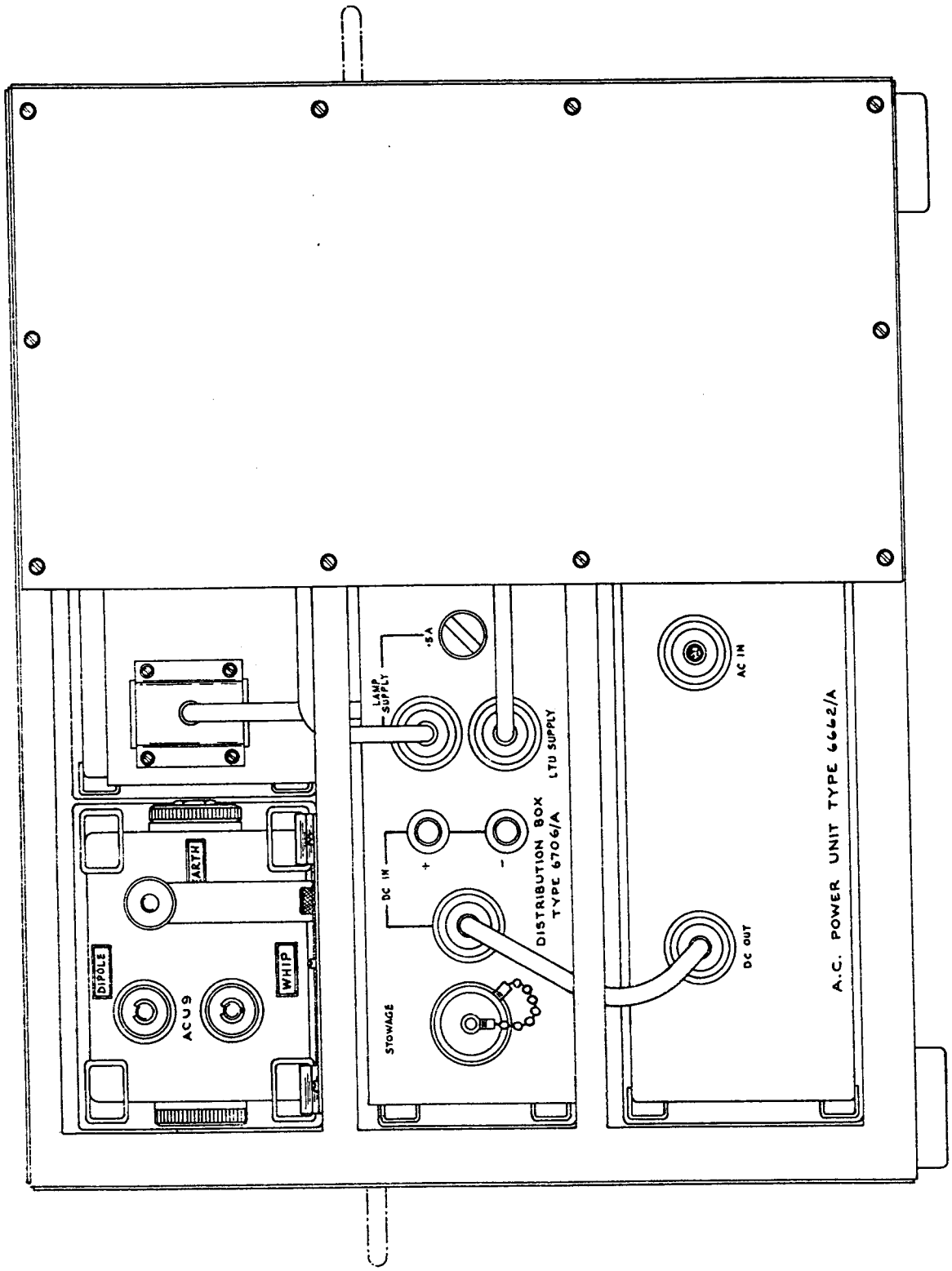
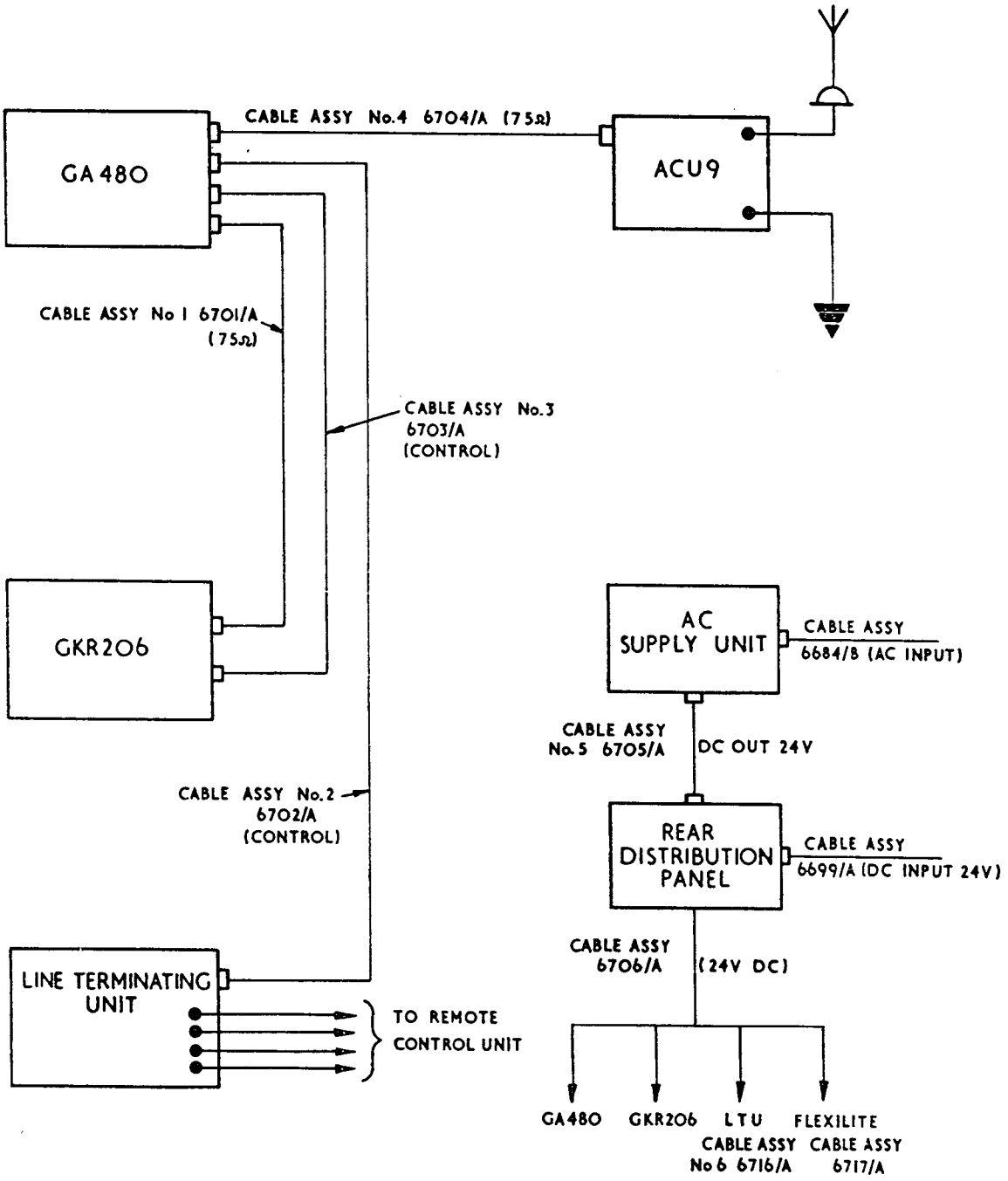


FIG. 2.2 GR479A—REAR VIEW 901-1



GR479A INTERCONNECTIONS

FIG. 2.3

COMPONENTS LIST

REMOTE CONTROL UNIT

Resistors

R1	1·5kΩ ± 20% ¼W Electrosil TR5
R2	1kΩ ± 10% ¼W Colvern CLR 1206/11S (LIN)
R3	12kΩ ± 2% ¼W Electrosil TR5
R4	33kΩ ± 2% ¼W Electrosil TR5
R5	680Ω ± 2% ¼W Electrosil TR5
R6	560Ω ± 2% ¼W Electrosil TR5
R7	1kΩ ± 2% ¼W Electrosil TR5
R8	4·7kΩ ± 2% ¼W Electrosil TR5
R9	270Ω ± 2% ¼W Electrosil TR5
R10	270Ω ± 2% ¼W Electrosil TR5

Capacitors

C1	0·01µF −20% +80% 500V Erie 7004/811
C2	0·01µF −20% +80% 500V Erie 7004/811
C3	1µF ±10% 160V Waycom Tropyfol M
C4	2·2µF ±20% 35V Union Carbide K2R2J35S
C5	47µF ±20% 20V Union Carbide K47J20S
C6	47µF ±20% 20V Union Carbide K47J20S
C7	0·01µF −20% +80% 500V Erie 7004/811
C8	0·01µF −20% +80% 500V Erie 7004/811
C9	1µF ±10% 160V Waycom Tropyfol M
C10	2·2µF ±20% 35V Union Carbide K2R2J35S
C11	10µF ±20% 35V Union Carbide K10J35S
C12	10µF ±20% 35V Union Carbide K10J35S
C13	10µF ±20% 35V Union Carbide K10J35S
C14	3300pF ±2% 125V GEC PF/AB
C15	8200pF ±2% 125V GEC PF/AD
C16	0·1µF ±2% 100V STC PMAO-1M100
C17	2·2µF ±20% 35V Union Carbide K2R2J35S
C18	0·01µF ±20% 100V STC PMAO-01M100

Diodes

MR1	STC RAS 310AF
MR2	Mullard BZY96C5V7
MR3	Mullard BZY96C4V7

Integrated Circuit

VX1	Fairchild µA702C

Transistor

VT1	Mullard 2N1613

Transformers

T1	To Redifon Specification SR/T2699
T2	To Redifon Specification SR/T2699

Sockets

SKA	Thorn PTO7A-10-6S
SKB	Thorn PTO7A-10-6S

Terminals

A B C and D	Painton 501465

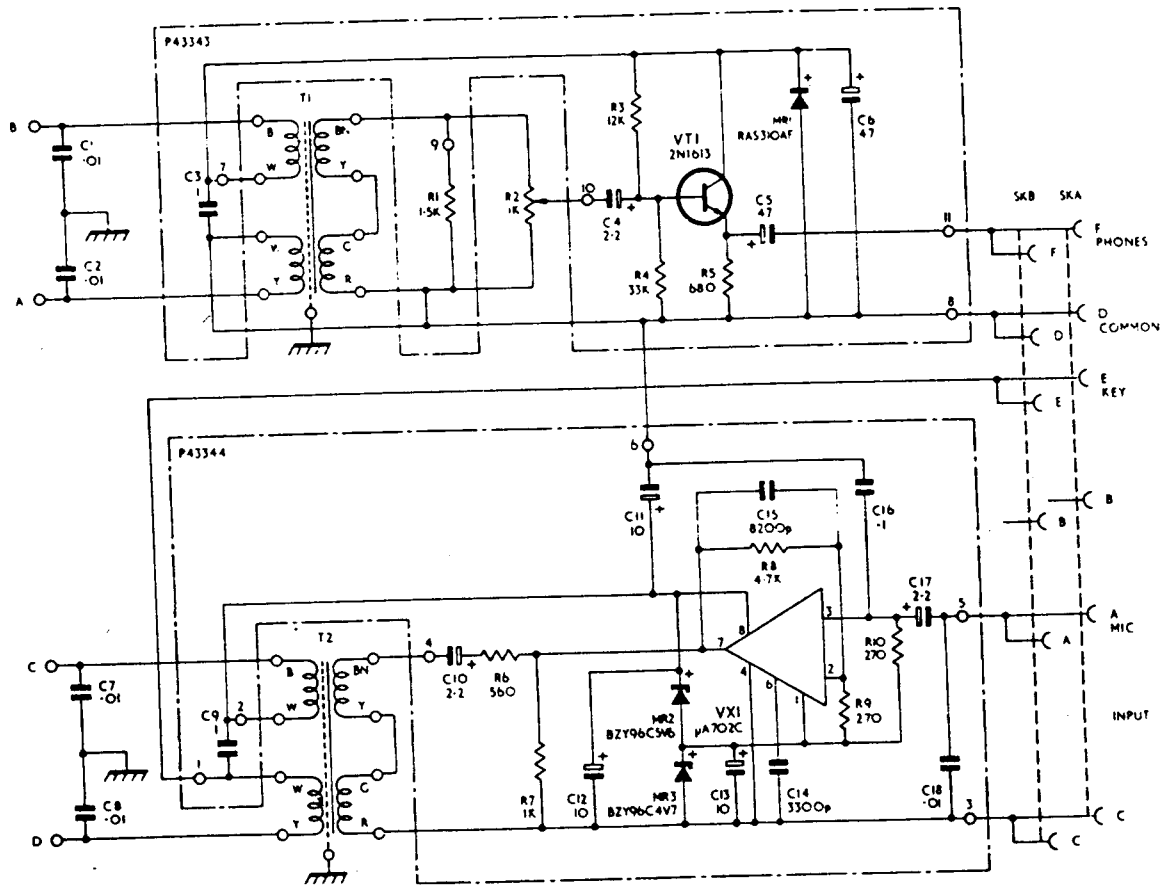


FIG. 2.4 REMOTE CONTROL UNIT

CDA6675/1-1
901-1

COMPONENTS LIST

LINE TERMINATION UNIT

Resistors

R1	3·3kΩ ±2% ¼W Electrosil TR5
R2	4·7kΩ ±2% ¼W Electrosil TR5
R3	12kΩ ±2% ¼W Electrosil TR5
R4	33kΩ ±2% ¼W Electrosil TR5
R5	1kΩ ±20% ¼W Plessey GMK5A (LIN) No. 404/8/00405/010
R6	1·5kΩ ±2% ¼W Electrosil TR5
R7	470Ω ±2% ¼W Electrosil TR5

Capacitors

C1	47µF ±20% 35V Union Carbide K4J35S
C2	0·1µF ±20% 100V STC PMAO·1M100
C3	2·2µF ±20% 35V Union Carbide K2R2J35S
C4	0·01µF −20% +80% 500V Erie 7004/811
C5	0·01µF −20% +80% 500V Erie 7004/811
C6	47µF ±20% 35V Union Carbide K47J35S
C7	2·2µF ±20% 35V Union Carbide K2R2H35S
C8	2·2µF ±20% 35V Union Carbide K2R2J35S
C9	10µF ±20% 35V Union Carbide K10J35S
C10	0·01µF −20% +80% 500V Erie 7004/811
C11	0·01µF −20% +80% 500V Erie 7004/811

Relays

RLA	Hellerman Deutsch HDD1.A.E2 E.03
RLB	Hellerman Deutsch HDD1.A.E2 E.03

Fuse

FS1	100mA Beswick Anti-Surge TDC 134

Diodes

MR1	Mullard BZY93 C39R
MR2	STC RAS310AF
MR3	Texas 1S44

Transistor

VT1	Mullard 2N1613

Transformers

T1	To Redifon Spec. SR/T2699
T2	To Redifon Spec. SR/T2699

Switch

SA	To Redifon Spec. OP9418/S

Socket

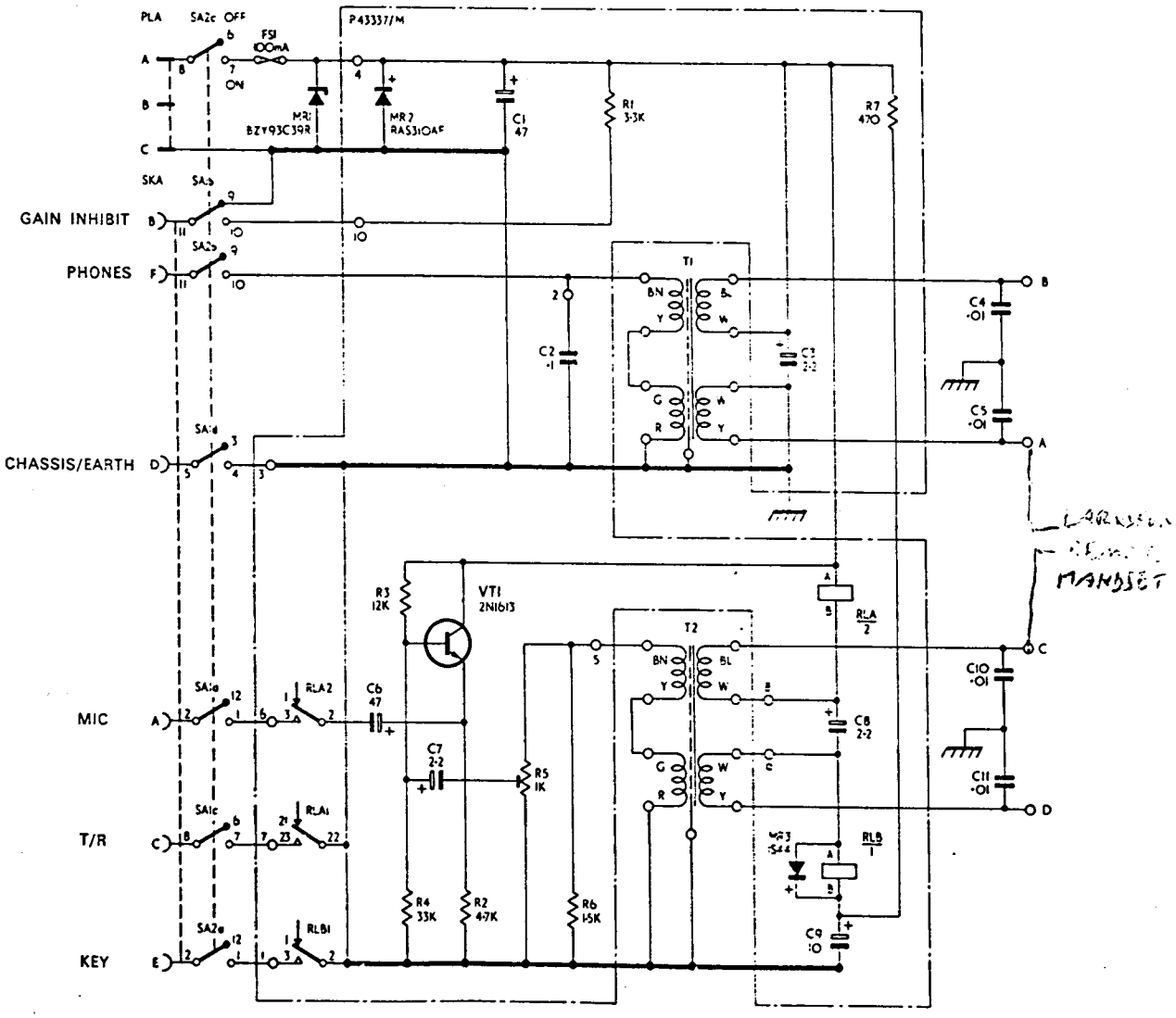
SKA	Thorn PT07A-10-6S

Plug

PLA	Plessey 508/1/07341/220

Terminals

A B C and D	Painton 501465



3 INSTALLATION

3.1 UNPACKING

On receipt, the front cover and the top and rear access panels should be removed and stored: provision is made inside the front cover for stowing the access panels.

If the remote control unit and the amplifier loudspeaker are to be used, they should be removed from the rear upper stowage compartment in the frame assembly. The amplifier loudspeaker should be attached to the front of the accessory compartment door (see Plate 1) and the input lead plugged into one of the Audio sockets on the GKR206.

3.2 POSITIONING OF EQUIPMENT

The GR479A station is intended for bench or vehicular installation.

The equipment should be positioned so that the controls are easily accessible to the operator, at the same time ensuring good ventilation all round.

Initial installation will require access to the rear of the frame assembly for making the aerial connection to the aerial coupling unit and connections as required, to the AC power unit and DC distribution panel. Space must be allowed for the withdrawal of units from the front of the frame assembly. Fig. 3.1 gives the fixing centres of the frame assembly.

3.3 INTERCONNECTIONS

The equipment will normally be received with the interconnections completed and it should only be necessary to check the tightness of the connectors. The interconnections are shown in Fig. 2.3 and the cable assemblies concerned are listed below.

Cable Assembly		*Function*	*Length*	
No	*Type*		*in*	*cm*
1	6701/A	GKR206 to GA480A (75Ω coaxial)	20	51
2	6702/A	GA480A to Line Terminating Unit (control)	17	43
3	6703/A	GKR206 to GA480A (control)	17	43
4	6704/A	GA480A to ACU9 (75Ω coaxial)	6½	16
5	6705/A	AC Power Unit to Distribution Board (24V DC out)	13	33
6	6716/A	Line Terminating Unit (DC supply)	13	33
	6717/A	Flexilite (DC supply)	36	1m
	6684/B	AC input to AC Power Unit	78	2m
	6699/A	DC input to Distribution Board	78	2m

3.4 EXTERNAL CONNECTIONS

Earth Connection

An earth terminal is provided at the rear of the main frame: the earth connection should be made with flexible braided wire strip, not less than 1in wide. An earth connection should also be made to the ACU9 earth terminal. These connections should be as short as possible but must not restrict movement of the unit on its shock mountings.

Aerial Connection

The connection between the aerial and the aerial coupling unit should be as short as possible. Where lengths in excess of 12 inches cannot be avoided, it is preferable to use low capacity coaxial cable; the insulation must be capable of withstanding a potential difference of 6000 volts. A minimum clearance of 2 inches should be maintained between the aerial feeder and metallic objects, throughout its length.

Remote Control Cabling

The line terminating unit should be connected to the remote control unit by DON 10 field telephone cable (maximum length 1 mile), taking care to connect terminals 1 to 1 etc.

Other cable may be used provided the loop resistance does not exceed 600Ω.

3.5 AERIALS

Recommended aerials are the vertical whip, dipole or end-fed wire.

Whip Aerial

The vertical whip aerial is the only type suitable for mobile installation: the length recommended is 12 feet for frequencies down to 2·0MHz and 8 feet down to approximately 3·0MHz.

The aerial mount should be bolted to a robust and rigid support to withstand whipping of the aerial in motion. It should be positioned as high as possible to achieve the best performance and to reduce the risk of shock to personnel.

Dipoles

For fixed station installation, the half-wave dipole, centre fed with 52·75Ω coaxial or balanced twin feeder, is simple to erect and will provide good performance up to a range of 1500 miles, dependent upon height, operating frequency and time of day.

The dipole is essentially a single frequency aerial with bi-directional characteristics, maximum radiation and reception occurring at right angles to the aerial wire.

The overall aerial length in feet is determined by dividing 468 by the operating frequency in MHz.

End-Fed Wire Aerials

End-fed wire aerials with electrical lengths of quarter wavelength or less, or just short of any odd number of quarter wavelengths, are recommended where space is limited.

The wire may be erected vertically, sloping or in inverted L configuration. Aerial length is calculated by dividing 234 by the operating frequency in MHz: the lead-in cable from the aerial termination to the aerial coupling unit must be included in the overall length.

3.6 ELECTRICAL INTERFERENCE—PRECAUTIONS

Precautions should be taken to minimise interference from ignition and other electrical systems and to eliminate noise caused by locally generated static. The following notes should assist in obtaining the best performance from the equipment; they apply in many respects to installation in vehicles and small marine craft.

Feeders and Cables

Feeders and cables should be as short as possible and be kept well away from other electrical wiring.

Ignition Interference

Sparking plugs and distributor points should be kept clean and correctly adjusted. Suppressors should be fitted to the plugs and at the point where the h.t. lead from the ignition coil enters the distributor. It is advisable to maintain maximum separation between ignition leads and other wires which might conduct interference to places outside the motor compartment. To operate the receiver at maximum sensitivity, it may be necessary to use screened ignition leads, screened plugs and to enclose the distributor in a metal box bonded to earth.

Generator Interference

This type of interference can be reduced by fitting a 1μF capacitor between the generator output lead and the frame of the generator. Should this prove inadequate, an h.f. choke may be included in series with the output lead. The wire used in the construction of the choke must be of adequate current carrying capacity, and the choke should be rigidly mounted.

Voltage Regulator Interference

Noise emanating from the voltage regulator contacts may be suppressed by fitting a capacitor of 0·02μF and a resistor of 4·7Ω in series across the contacts.

Wheel Static

If wheel static is troublesome, static collectors will effect a remedy. For advice on the availability of static collectors, it is recommended that the vheicle manufacturer or dealer be consulted.

Front wheel static collectors fit under the dust cap and bear against the end of the stub-axle: to ensure good electrical contact, the bearing point should be wiped clean and kept free of grease. Rear wheel collectors are in the form of brushes making contact with the inside of the brake drum.

Tyre Static

A simple remedy for tyre static is to render the inside of the tyre conductive by treating it with aluminium paint; wide bands should be painted at intervals around the inside of the tyre, each band extending right across the tyre from edge to edge.

Anti-static powder injected into the inner tube is a further remedy.

Brake Static

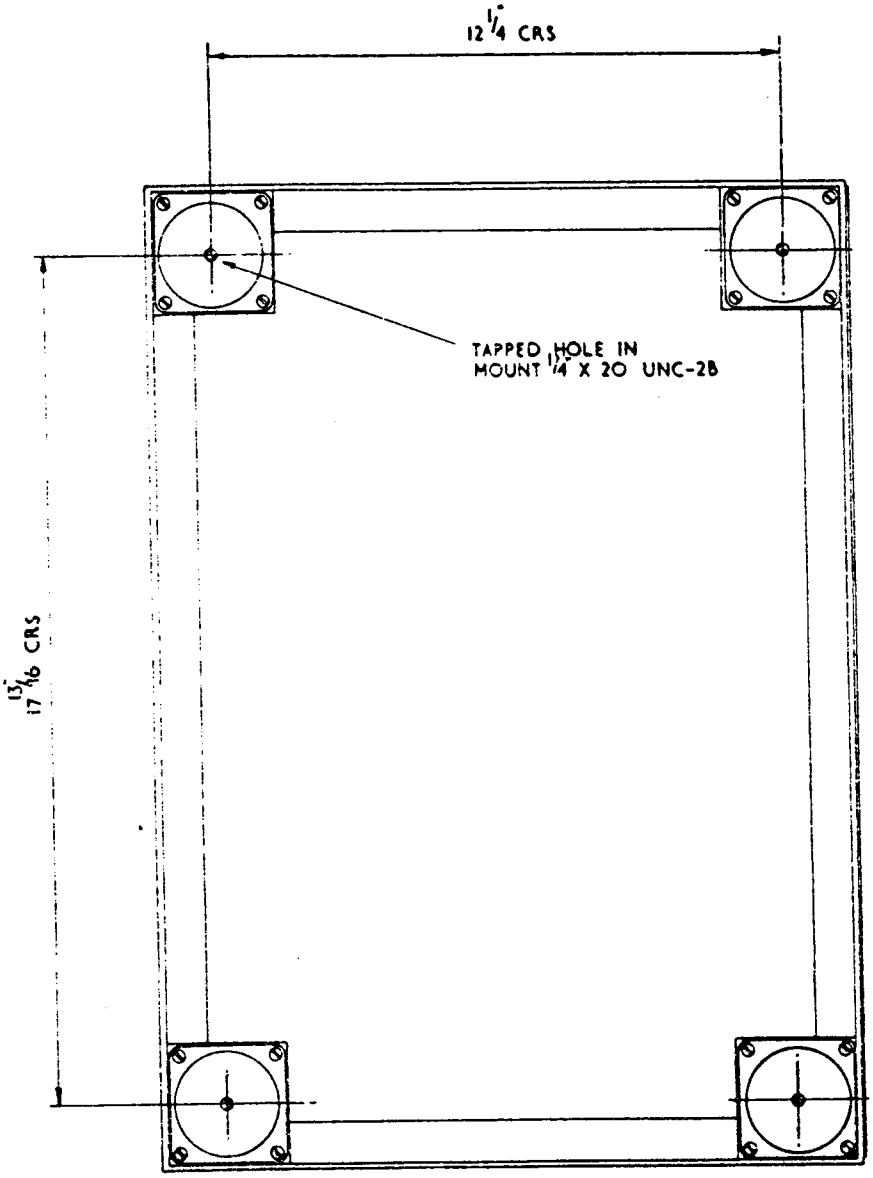
When interference is noticed during the application of brakes, the brake shoe pivots should be examined. Scrape away any paint under the pivots and coat them with graphited grease to improve conductivity from the brake shoes to the chassis. Should the interference persist, metallised brake linings should be fitted.

Electrical System

Wiring emerging from the motor compartment including that to dashboard instruments and switches, sometimes carries r.f. interference and it may be necessary to decouple all such wires.

Bonding

Some parts of particular vehicles may be found to be inadequately bonded to the chassis thereby carrying interference. All insulated parts, such as those mounted in nylon bushes, should be earthed to chassis by heavy gauge braid. Structural items, such as the steering column, exhaust pipe and the motor compartment bulkhead should be checked in this respect.



901-1 FRAME ASSEMBLY—FIXING CENTRES FIG. 3.1

4 OPERATING INSTRUCTIONS

It is assumed that the installation and connecting up of the equipment has been completed as described in chapter 3.

4.1 PRELIMINARIES

Driver-Receiver GKR206

(1) Plug in the handset or headset, and the morse key.

(2) Turn the AF/RF Gain controls fully clockwise.

(3) Set the Frequency Selection controls to the required frequency.

(4) Set the Function switch to AM.

Linear Amplifier GA480A

(5) See that the amplifier is switched OFF.

Aerial Coupling Unit ACU9

(6) Unlock and set the Tune control to 250.

(7) Set the Load switch: to 20 for frequencies below 4MHz; to 12 for frequencies above 4MHz.

Line Terminating Unit

(8) Set the Remote switch to OFF.

4.2 OPERATION

(a) Switch on the AC power unit: the red lamp should light and the GKR206 meter should read in the green scale area.

(b) Push in and turn the Peak Noise control for maximum noise in the earphone. Release the control.

(c) Adjust the AF Gain control for a comfortable listening level.

(d) Ensure that the GF Gain control remains at maximum.

(e) Push in and adjust the Calibrate control for zero beat in the earphone; then release the control.

(f) Depress the Press-to-talk switch: the GKR206 meter should read up-scale.

(g) Switch on the GA480A: the red and green lamps should light and the GA480 meter should indicate.

(h) Observe the ACU9 meter and adjust the Load switch for maximum indication.

(j) Adjust the Tune control for a further increase in meter reading.

(k) Readjust the Load and Tune controls alternately for maximum indication.

(l) Check that the GA480A meter reads between 8·5 and 10A.

(m) Release the Press-to-talk switch.

(n) Select the required service on the GKR206; then reduce the RF Gain control counter-clockwise until the received signals just commence to decrease.

(p) On SSB, adjust the Clarify control to resolve clear speech: do not push in the control.

Note. If the GA480A green USE lamp goes out, transmission will continue with the GKR206 output only. During prolonged receive-only conditions, the GA480A should be switched off.

4.3 REMOTE OPERATION

(a) Switch the Remote switch on the line terminating unit to ON.

(b) Use the Press-to-talk switch on the remote handset or headset and the AF Gain control on the remote control unit. With the Remote switch in the ON position, the AF Gain control on the driver-receiver is in-operative.

4.4 AMPLIFIER LOUDSPEAKER

The amplifier loudspeaker may be used at the main equipment position or at the remote control unit.

(a) Plug the input connector into the audio socket on the GKR206 or on the remote control unit. Switch ON and adjust the AF Gain control (on the amplifier loudspeaker) as required.

(b) Switch OFF when not required, to conserve the battery.

5 MAINTENANCE

Maintenance procedures for the main items of equipment will be found in the relevant handbooks:—

Driver-Receiver GKR206—Handbook No. 899-1

Linear Amplifier GA480A—Handbook No. 898-1

Aerial Coupling Unit ACU9—Handbook No. 898-1

In general, the only routine maintenance required is a check on the tightness of connectors and the maintenance of cleanliness.