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USER HANDBOOK
for
RADIO STATIONS
UK/PRC-351 and UK/PRC-352

WARNING

The voltages used in this equipment are high enough to endanger life

CARELESSNESS COULD BE FATAL

See First Aid instructions on page (ii) to (iv)

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FIRST AID IN CASE OF ELECTRIC SHOCK

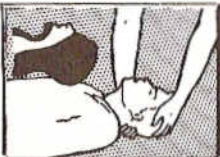
EXHALED AIR METHOD

1. SWITCH OFF. If this is not possible, PROTECT YOURSELF with dry insulating material and pull the victim clear of the conductor.

DON'T TOUCH THE VICTIM WITH YOUR BARE HANDS until he is clear of the conductor, but DON'T WASTE TIME.

2. (a) Lay the patient on his back. Quickly loosen waist band and clothing round neck. If his mouth is open, sweep a finger through his mouth to clear obstruction and remove loose dentures.

- (b) Lift the head and tilt the head backwards by putting one hand underneath the neck and the other on the crown of the head.



- (c) Hold the head tilted as far back as possible and lift up the jaw firmly, closing the lips. This keeps the victim's airway clear by straightening the breathing passage.



- (d) Take a deep breath. Open your mouth as wide as you can. Seal your lips on the victim's cheeks around his nose. Blow air into his nose until you see the chest rise (inspiration).



- (e) Remove your mouth to let him breathe out; his chest will fall (expiration).



- (f) Take another deep breath and blow again as soon as he has exhaled, and continue inflations 10 to 15 times a minute. (This is a little slower than the normal rate of 18.)

The movement of the victim's chest provides visual confirmation of the success of your efforts.

3. If you fail with the nasal route, try the mouth as follows:-

Lift the jaw and hold his mouth open slightly as you blow, keeping the head tilted well back with the other hand.

Seal your lips around his opened mouth and press your cheek against his nostrils to stop air leakage, and blow until you see the chest rise.

Continue as described in (e) and (f) page ii, until normal breathing returns or medical assistance becomes available.

DO NOT GIVE LIQUIDS UNTIL VICTIM IS CONSCIOUS

NOTE:

If after 5 or 6 effective inflations of the patient's lungs there is:-

- (i) no improvement in the colour of the face and lips
- (ii) no constriction of the dilated pupils
- (iii) no pulse to be felt in the neck or elsewhere,

this means that the heart is not beating.

Carry out EXTERNAL CARDIAC MASSAGE (see page iv)

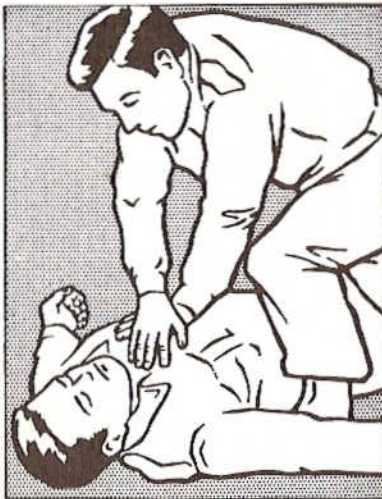
EXTERNAL CARDIAC MASSAGE

1. (a) Lay the victim on his back on the ground or on some other firm surface.
- (b) Place the heel of one hand, with the other on top of it, on the lower part of the sternum (breast bone) in the mid line of the chest: see note 1 below.

(c) Apply firm pressure vertically downwards aided by the weight of the body, about 60 times a minute.

(d) At the end of each pressure stroke, the hands are to be lifted slightly to allow full recoil of the victim's chest.

(e) Sufficient pressure should be used to depress the sternum an inch or so towards the vertebral column (spine).



2. Artificial respiration must continue simultaneously with external cardiac massage at the rate of about 5 compressions of the heart to one inflation of the lungs.

3. Massage should continue until the victim's pulse is clearly felt and the colour returns to normal, or until medical assistance arrives.

- Notes:
1. Do not attempt cardiac massage if there is obvious damage to the victim's chest wall.
 2. There is a real danger of damage to internal organs by the improper use of external cardiac massage.
 3. Particular care must be taken with infants and small children, with whom much less pressure is required to depress the sternum than in the case of adults. In these cases the fingers should be used in preference to the palms of the hands.

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PREFACE

This User Handbook has been produced in accordance with SRDE TS1530 which is the specification for conventional User Handbooks except that the title and order of the Chapters has been arranged, where appropriate, to conform to the Joint Service Specification JSP182, as shown below.

CHAPTER 1	Purpose and Planning Information (CAT.1)
CHAPTER 2	Operating Information (CAT.2)
CHAPTER 3	Installation and Preparation (CAT.4)
CHAPTER 4	Maintenance Information (Fault Location) (CAT.5)
CHAPTER 5	Work (Maintenance) Schedules (CAT.6)

IMPORTANT NOTE

USE OF SELECTIVE UNIT RF (SURF 4 WATT)
(to improve co-located performance)

1. SURF 4W will be fitted to all UK/PRC-351 and UK/PRC-352 Stations.
2. It will be electrically connected and tuned for manpack Stations.
3. It will be fitted, but not electrically connected, for Vehicle Clip-in installations which include Tuning Unit Automatic Antenna Matching (TUAAM).
4. References in this Handbook to use of the Stations without SURF 4W shall be regarded as advisory only. The references may be of use when a SURF 4W is not available or is unserviceable.
5. SURF 4W must be tuned, or range will be severely reduced.

WARNING

RF RADIATION HAZARD

High-power radio-frequency radiations can be harmful to your health. The power of the UK/PRC-352 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. The UK/PRC-351 is judged to be safe at any distance and for any period.

CONTENTS

CHAPTER 1	PURPOSE AND PLANNING INFORMATION	Page
1.1	Role	1
1.2	Frequency Coverage	3
1.3	Power Supply	3
1.4	Use with Secondary Batteries	3
1.5	Use with Primary Batteries	4
1.6	Types of Antenna	4
1.7	Carriers	4
1.8	Working Range	4
1.9	Mutual Interference	4
1.10	Inter-Operability	5
1.11	RF Power Output	5
1.12	Weights	5
1.13	Dimensions	6
CHAPTER 2	OPERATING INFORMATION	
2.1	Manpack Operation, PRC-351	7
2.1.1	Basic Station Contents	7
2.1.2	Assembly of Station	10
2.1.3	Frequency Setting Method	14
2.1.4	System Setting	15
2.1.5	Audio Gear Fitting	16
2.1.6	Carrying Position	17
2.1.7	Batteries	18
2.1.8	Remote Control	19
2.1.9	Automatic Rebroadcast and Intercom	21
2.1.10	Operator Facilities for Remote Operation	24
2.1.11	Operating Information and Techniques	29
2.1.12	Co-Located Working	33
2.2	Manpack Operation, PRC-352	34
2.2.1	Basic Station Contents	34
2.2.2	Assembly of Station	34
2.2.3	Frequency Setting Method	37
2.2.4	System Setting	37
2.2.5	Audio Gear Fitting	37
2.2.6	Carrying Position	37
2.2.7	Batteries	37
2.2.8	Remote Control	37
2.2.9	Automatic Rebroadcast	37
2.2.10	Operator Facilities for Remote Operation	37
2.2.11	Operating Information and Techniques	37
2.2.12	Amplifier RF Automatic Trip	38
2.2.13	Co-Located Working	38
2.2.14	Cable/Antenna Connecting Notes	39

		Page
2.3	Ancillary Items and their Use	41
2.3.1	Ground-Spike Antenna and Elevated Kit	42
2.3.2	Hand Generator Operation	55
2.3.3	Handset, Remote Control	57
2.3.4	Audio Extension Lead	57
2.3.5	Clansman Para. Carrier	57
2.3.6	Battery Extension Lead	57
2.3.7	External Power Supply Lead	57
2.3.8	Battery Charging	58

CHAPTER 3 'B' VEHICLE INSTALLATION AND PREPARATION

3.1	'B' Vehicle Clip-In	61
3.2	Vehicle Clip-In Interconnections	62
3.3	Vehicle Operation	63
3.3.1	Frequency Change during Radio Silence	63
3.4	Vehicle Role	63
3.5	Vehicle Working Range	64

CHAPTER 4 MAINTENANCE INFORMATION AND INSTRUCTIONS

4.1	Fault Location, PRC-351	65
4.1.1	PRC-351 Receiver Test, Local Operation	65
4.1.2	PRC-351 Transmitter Test, Local Operation	66
4.1.3	Remote Control Tests	67
4.2	Fault Location, PRC-352	70
4.2.1	PRC-352 Transmitter Test 1	70
4.2.2	PRC-352 Transmitter Test 2	71
4.2.3	PRC-352 Receiver Signal Path Test	71
4.2.4	PRC-351/2 Automatic Rebroadcast Test	71

CHAPTER 5 WORK (MAINTENANCE) SCHEDULES

5.1	Standard Troop Inspection (STI)	73
5.2	Detailed Troop Inspection (DTI)	74
5.3	Remedial Action	75
5.4	Records	76

TABLES

CHAPTER 1

1	Radio Stations UK/PRC-351/352 Items	1
2	Battery Life	3

CHAPTER 2

3	Co-located working PRC-351	33
4	Co-located working PRC-352	38

ILLUSTRATIONS

Page

Fig.		
1	The UK/PRC-351 Manpack	xii
CHAPTER 2		
2a, b	Basic Station Equipment	8, 9
3a, b, c	Mounting Radio on Carrier	10
4	Fitting Battery and SURF 4W	11
5	Connecting Headset and Handset	12
6	Fitting Whip Antenna	13
7	Frequency Setting Method	14
8	SURF 4W	14
9	System Setting	15
10	Audio Gear Fitting	16
11	Carrying Position	17
12	Batteries	18
13	Connecting Remote Handset	19
14	Automatic Rebroadcast	23
15	Amplifier RF 20W	34
16a, b	Assembly of UK/PRC-352 Station	35, 36
17	UK/PRC-351 and SURF 4W Connections	39
18	UK/PRC-352 and SURF 4W Connections	40
19	Ancillary Items	41
20	UK/PRC-352 used with Ground-Spike Antenna	42
21	Items Forming VHF Ground-Spike Antenna Assembly	44
22	Assembly of Ground-Spike Antenna	45
23	Erection of 5.4m Mast	47
24	Items forming Elevated Kit	49
25a	Assembly to top of 5.4m Mast	51
25b	Assembly for overhead suspension	53
26	Fitting Hand Generator	55
27	Graph: Hand Generator Operation	56
28	DC Charging Unit Connections	58
29	AC Charging Unit Connections	60
CHAPTER 3		
30	Typical 'B' Vehicle Clip-In	61
31	Vehicle Clip-In Interconnections	62
32	Antenna Tuning Unit (TUAAM)	64
33	Initiate Box	64

LIST OF ASSOCIATED PUBLICATIONS

	Army Code
Radio Station UK/PRC-320	61123
Radio Station UK/VRC-321	61253
Radio Station UK/VRC-322	61255
Radio Station UK/PRC-349	61646
Radio Station UK/PRC-350	61124
Radio Station UK/VRC-353	61393
Clansman Radio Control Harness	61172
Clansman Secondary Batteries, Battery Charging and Testing	61395
Clansman VHF Antennas	61388
Test Set Audio, Radio Audio Accessories	61656
Test Set, Harness Connectors, 'Clansman'	61657
Condition Test Set for Clansman Radio	61655

PURPOSE AND PLANNING INFORMATION

ROLE

1.1 The Radio Station UK/PRC-351 is based on the UK/RT-351 which is a VHF/FM manpack radio for use at platoon/company level. It is designed to interoperate, within the restrictions of frequency range, with the UK/PRC-349, UK/PRC-350 and the UK/VRC-353. The Radio Station UK/PRC-352 is based on the UK/RT-351 and an Amplifier RF 20 Watt. Both the UK/PRC-351 and UK/PRC-352 Radio Stations can be used as Manpack, Ground or Vehicle Radio Stations with Remote Control and Re-broadcast facilities. All items which may be used in the various types of Station are listed in Table 1.

TABLE 1

RADIO STATIONS UK/PRC-351/352 ITEMS

Item	NATO No.	Common Name	Qty
Transmitter-Receiver Radio RT-351, includes:-	5820-99-114-3639	Radio RT-351	1
Cover, Electrical, Plug-Socket	5935-99-626-4256	Dust Cap AF (Pattern 105)	2
Cover, Electrical, Plug-Socket	5935-99-633-6117	Dust Cap RF (BNC)	1
Battery, Secondary 3.3 Ah	6140-99-620-8057	3.3 Ah Battery	3
Amplifier Radio Frequency	5820-99-114-3640	20W Amplifier	1
Antenna	5820-99-620-8025	Whip, 1.2 metre	2
Antenna, Trailing-Wire 1.2m, consisting of:-	5820-99-620-8345	Trailing-Wire	1
Plug, Assembly, Antenna Trailing-Wire	5935-99-622-5099	Bayonet Plug	1
Antenna Element	5820-99-620-8346	Braid (cut to 1.2m)	reel
Audio Lead, Extension	5820-99-117-6142	Audio Extension Lead	1
Bag, Ancillaries	5820-99-621-9028	General Purpose Bag	1
Battery, Primary	NYA	Primary Battery	1
Battery, Secondary 1 Ah	6140-99-620-8058	1 Ah Battery	2
Cable Assembly, Switch, Electrical	5965-99-620-5667	Clansman Headset Pressel Unit	1



Fig. 1 The UK/PRC-351 Manpack

TABLE 1 (Continued)

Item	NATO No.	Common Name	Qty
Cable Assembly, Power, Electrical, 3m, 2 Conductor	5995-99-620-2113	Battery Extension Lead	1
Cable Assembly, Power, Electrical, 2.23m, 2 Conductor	5995-99-117-7435	External Power Supply Lead	1
Carrying Frame, Electrical Equipment	5999-99-620-8027	Clansman Para. Carrier	1
Charger, Battery, AC	6130-99-117-0451	AC Battery Charger	1
Charger, Battery, DC (14V)	6130-99-620-2114	14V DC Battery Charger	1
Charger, Battery, DC (28V)	6130-99-117-0450	28V DC Battery Charger	1
Frame, Packboard, Mk.II	8465-99-135-7135	GS Carrier	1
Frame, Packboard, Mk.III	8465-99-137-8564	GS Carrier	1
Generator, Electrical, Hand-Operated	5820-99-114-3390	Hand Generator	1
Handset	5965-99-620-5669	Clansman Handset, General Purpose	1
Handset, Remote Control	5965-99-620-5670	Clansman Remote Handset	1
Harness, Packboard	8465-99-135-7305	Harness for GS Carrier	1
Headset, Microphone	5965-99-620-8320	Clansman Headset, Infantry	1
Initiate Box, includes:-	5820-99-630-6488	ATU Initiate Unit	1
Cover, Electrical, Plug-Socket	5935-99-626-4256	Dust Cap AF (Pattern 105)	3
Kit, Antenna, Ground-Spike	5820-99-620-5950	Ground-Spike Antenna	1
Kit, Elevated	5985-99-630-6499	Elevated Kit	1
Plate, Adaptor, Carrier	5820-99-620-9265	Adaptor for GS Carrier	1
Selective Unit RF, 4W includes:-	5820-99-630-6142	SURF 4W	1
Cover, Electrical Plug-Socket	5935-99-633-6117	Dust Cap RF (BNC)	1

TABLE 1 (Continued)

Item	NATO No.	Common Name	Qty
Tuning Unit, Automatic Antenna Matching	5821-99-630-6156	Antenna Tuning Unit (TUAAM)	1
User Handbook	Code No. 61128		1

FREQUENCY COVERAGE

1.2 30 MHz to 76 MHz in steps of 25 kHz, providing 1841 channels for communication. The mode of operation is F3 (voice), narrow-band FM, with a deviation of ± 5 kHz.

POWER SUPPLY

1.3	Input Volts	20V to 32V	
	Input Power (max.)	Transmitter (PRC-351)	22W at 24V (900 mA max.)
		Receiver	3W at 24V (130 mA max.)
		Transmitter (PRC-352)	65W at 24V (2.8A max.)

USE WITH SECONDARY BATTERIES

1.4 Two sizes of 24-volt battery are available (see page 18), either a 1 Ah battery (catalogue No. 6140-99-620-8058) - usually used in conjunction with a Hand Generator - or a 3.3 Ah battery (catalogue No. 6140-99-620-8057) both of which are also used with the UK/PRC-320. Battery life is given in Table 2. At very low temperatures of -10°C to -40°C , the battery capacity is below normal. The battery charging time depends upon the age of the battery and its state of charge at commencement of operation; battery storage life is usually indefinite. The following battery charging units are available:

(CES 43827)	Charger Battery AC 6130-99-117-0451
(CES 43743)	Charger Battery DC (28V) 6130-99-117-0450
(CES 43741)	Charger Battery DC (14V) 6130-99-620-2114

The 14V DC Charger is for use in General Service Vehicles not 'fitted for radio'.

TABLE 2
BATTERY LIFE
(At 1:9 Transmit/Receive Ratio)

	PRC-351	PRC-352
3.3 Ah battery	17 hours	8 hours
1 Ah battery	5 hours	2 hours

USE WITH PRIMARY BATTERIES

1.5 It is expected that a primary battery will be available for future use; its main purpose will be for use with the PRC-351 and, in emergency, with the PRC-352. It will supply the PRC-351 for approximately 12 hours (at 20°C); at very low temperatures, i.e. -5°C, the battery capacity is below normal. A Battery Extension Lead is available (page 41). Battery storage life is limited.

TYPES OF ANTENNA

1.6 A 1.2 metre whip, fitting into a bayonet socket, for use with a PRC-351 manpack station; this antenna cannot be used with the PRC-352 because of the critical impedance into which the RF Amplifier has to work. A 1.2 metre trailing-wire antenna is also provided for the PRC-351.

A remote ground-spike antenna for the PRC-352; this can also be used with PRC-351 to give an extended range. An additional coaxial socket (50 ohm, Type BNC) is fitted to each radio for connection of the ground-spike antenna.

When used in a vehicle installation, the PRC-351 and 352 are connected to an antenna via a Tuning Unit, Automatic Antenna Matching.

CARRIERS

1.7 Two types of carrier are available for use (Both carriers also accept UK/PRC-320).

- (a) A GS carrier, with Adaptor, which is more generally used.
- (b) A Clansman (Para) carrier which is used where light weight is essential.

WORKING RANGE

1.8 This depends on siting, terrain and frequency; approximate ranges are as follows:- (Manpack PRC-351 with 1.2 metre Whip Antenna, Manpack PRC-352 with Ground Spike Antenna, Vehicle clip-in with 2 metre Whip Antenna and TUAAM)

	Manpack		Vehicle	
	PRC-351	PRC-352	PRC-351	PRC-352
Rolling countryside - good site:	10 to 13 km	16 km	17 km	>28 km
Rolling countryside - bad site:	3 to 7 km	9 km		
Built-up area:	4 km	5 km		

MUTUAL INTERFERENCE

1.9 The co-location of two radios, under operating conditions, requires the addition of a Selective Unit RF 4W (SURF 4W) to each radio when the proximity of the two radios is less than 20 metres (PRC-351) and 50 metres (PRC-352) at a frequency separation of 5%. When co-located with UK/PRC-320, the SURF 4W is used when proximity is less than 15 metres (PRC-351) or 50 metres (PRC-352) provided the VHF frequency is not less than 34 MHz and 32 MHz respectively. For more details see page 33 (PRC-351) and page 38 (PRC-352).

INTER-OPERABILITY

1.10 Completely satisfactory with UK/PRC-349, UK/PRC-350 and UK/VRC-353 (UK/PRC-349 and UK/PRC-350 with frequency-band restrictions). Inter-operability possible but never completely reliable with B.47, B.48, C.42 No.2, C.45 No.2 and AN/PRC-25. No plans should be made to inter-operate with A.41, A.42, C.42 No.1 or AN/ARC-44. Can be connected by twin cable (DIO) to UK/PRC-344 for automatic re-broadcast.

RF POWER OUTPUT

1.11	PRC-351:	4 watts (nominal) into 50 ohms	over temperature range -40°C to +50°C (with solar radiation).
	PRC-352:	20 watts (nominal) into 50 ohms	

WEIGHTS

1.12	RT-351 RADIO	2.7 kg
	AMPLIFIER RF, 20W	1.48 kg
	1 Ah BATTERY	1.30 kg
	3.3 Ah BATTERY	3.54 kg
	PRIMARY BATTERY	3.54 kg (Target)
	SELECTIVE UNIT RF (SURF 4W)	0.89 kg
	CARRYING FRAME AND WEBBING	
	(a) GS and Adaptor	3.1 kg
	(b) Clansman (Para)	1.4 kg
	BAG, ANCILLARIES	0.6 kg
	(General Purpose Bag)	
	GENERATOR, DC	2.33 kg
	AC CHARGING UNIT	30.8 kg
	DC CHARGING UNIT (24V)	3.0 kg
	GROUND-SPIKE ANTENNA (in Bag)	1.7 kg
	PRC-351 BASIC STATION*	8.2 kg
	PRC-352 BASIC STATION*	11.4 kg (with Ground-Spike Antenna)

* Excluding Carrier and Bag, Ancillaries.

DIMENSIONS

1.13 RT-351 RADIO	22.2 x 9.05 x 14.0 cm
AMPLIFIER RF, 20W	22.2 x 9.5 x 8.9 cm
1 Ah BATTERY	18.4 x 7.2 x 5.2 cm
3.3 Ah BATTERY	18.4 x 7.2 x 13.3 cm
PRIMARY BATTERY	18.4 x 7.2 x 13.3 cm
SELECTIVE UNIT RF (SURF 4W)	20.2 x 7.95 x 5.2 cm
CARRYING FRAME AND WEBBING	
(a) GS and Adaptor	37.5 x 23.5 x 12 cm
(b) Clansman (Para)	20 x 18 x 9 cm
BAG, ANCILLARIES (General Purpose Bag)	23.5 x 31 x 10.2 cm
GENERATOR, DC (Handle Stowed)	21.6 x 9 x 9 cm
AC CHARGING UNIT	44.5 x 34.5 x 31.1 cm
DC CHARGING UNIT (28V)	24.1 x 16.5 x 14 cm
GROUND-SPIKE ANTENNA (in Bag)	74 x 11 x 10 cm

OPERATING INFORMATION

2.1 MANPACK OPERATION, PRC-351

2.1.1 BASIC STATION CONTENTS

Check that you have these items before going on patrol:-		Weight (kg)
1.	RT-351 Radio	2.7
2.	GS Carrier and Adaptor	3.1
3.	3.3 Ah Battery (Fully Charged)	3.54
4.	Selective Unit RF (SURF 4W) (complete with coaxial cable)	0.89
5.	Whip Antenna	0.15
6.	Trailing-Wire Antenna	0.05
7.	Headset	0.7
8.	Pressel Box for Headset	0.15
9.	Handset (General Purpose)	0.25
10.	Bag, Ancillaries	0.6
11.	Dust Cap AF (Pattern 105) (2)	-
12.	Dust Cap RF (BNC) (3)	-
13.	User Handbook	-

(Refer to pages 8 and 9)

The Bag, Ancillaries is for carrying spare batteries, headset, handset and any of the ancillaries (page 41) necessary for the required operational role.

Refer to Table 1, CHAP. 1 (pages 1 and 2) for constituent parts of Trailing-Wire Antenna. The Dust Caps remain attached to the Radio when removed from the sockets.

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SURF 4W

RT-351

3.3 Ah
BATTERY

GS CARRIER AND
ADAPTOR

TRAILING-WIRE
ANTENNA

WHIP
ANTENNA

Fig.2a Basic Station Equipment

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HEADSET

BAG
ANCILLARIES

PRESSEL
BOX

HANDSET
GENERAL
PURPOSE

DUST CAP AF
AND
DUST CAP RF (BNC)
(SMALLER VERSION)

Fig.2b Basic Station Equipment

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2.1.2 ASSEMBLY OF STATION

1. MOUNT RADIO ON GS CARRIER

The radio can also be mounted (without Adaptor Plate) on the Clansman Para carrier.

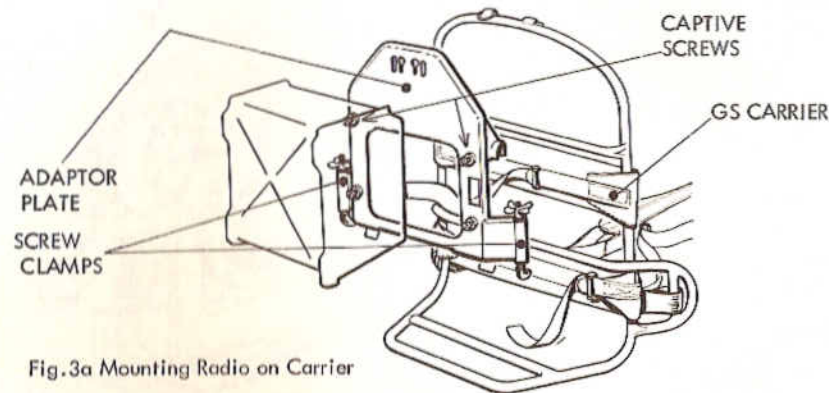


Fig.3a Mounting Radio on Carrier

Fit Radio to Adaptor Plate.

Two captive screws at the top of the radio engage in two 'keyhole' slots in the Adaptor Plate, and two slots on the radio engage with two (upper) captive screws on the Adaptor Plate. After fitting the radio, tighten all four screws.

Hook Adaptor Plate onto Carrier frame.

Secure Adaptor Plate to Carrier frame by tightening screw clamps.

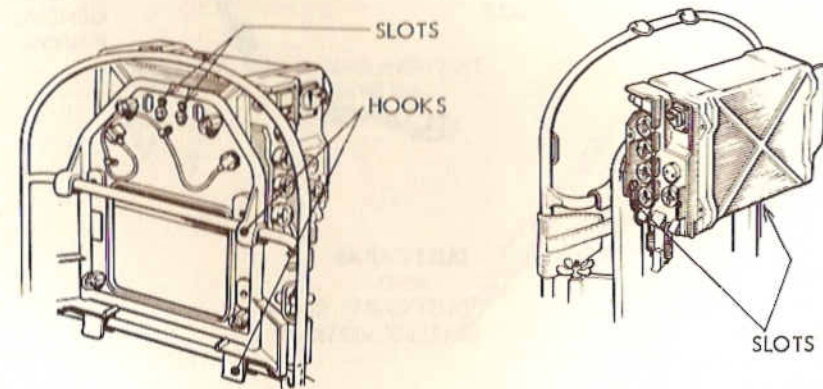
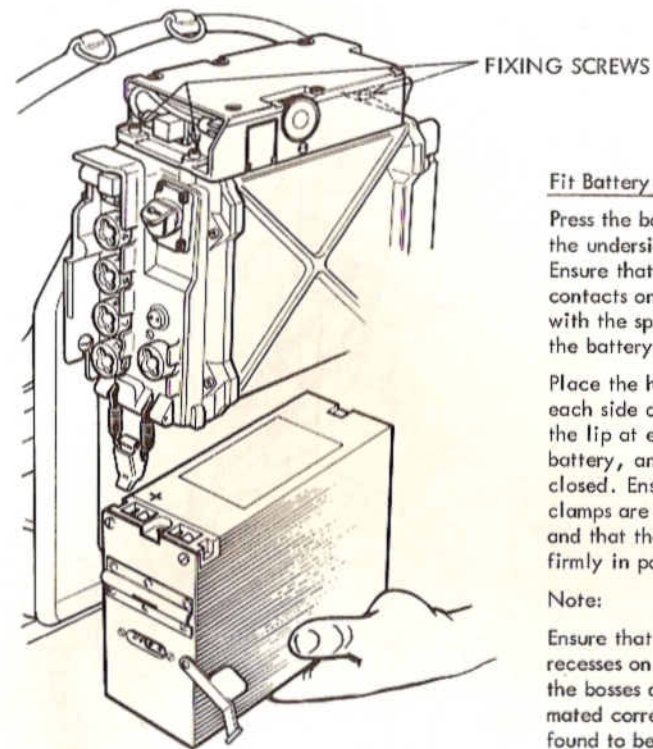


Fig.3b Mounting Radio on Carrier

Fig.3c Mounting Radio on Carrier

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2. FIT BATTERY AND SELECTIVE UNIT RF 4W TO RADIO



Fit Battery as follows:

Press the battery flat against the underside of the radio. Ensure that the electrical contacts on the radio mate with the spring contacts on the battery.

Place the hooked clamp, at each side of the radio, over the lip at each end of the battery, and snap the clamp closed. Ensure that the clamps are securely locked and that the battery is held firmly in position.

Note:

Ensure that the location recesses on the battery and the bosses on the radio are mated correctly. It will be found to be virtually impossible to fasten clamps if the battery is the wrong way round.

Fig.4 Fitting Battery and SURF 4W

Fit SURF 4W as follows:

Position SURF 4W on top of radio so that the three captive screws align with the threaded bosses in the case of the radio.

Screw down, and tighten, the three captive screws.

If the PRC-351 is to be operated with the SURF 4W (page 31), connect short coaxial cable between 1SK 1 on SURF 4W and coaxial antenna socket on radio.

NOTE: SURF 4W must be tuned, or range will be severely reduced.

**ALWAYS FIT A FULLY CHARGED SECONDARY BATTERY
OR A NEW PRIMARY BATTERY**

3. CONNECT HEADSET AND HANDSET (either socket)

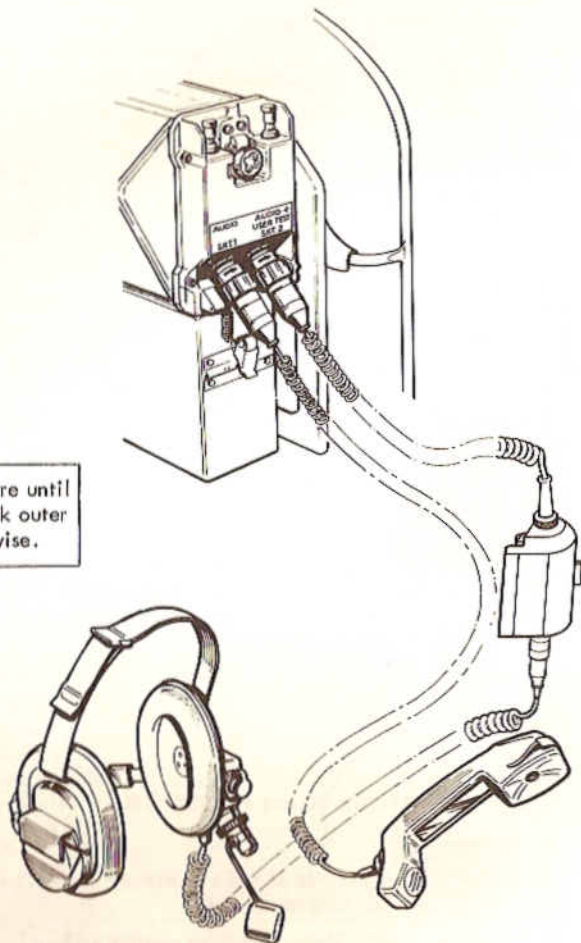
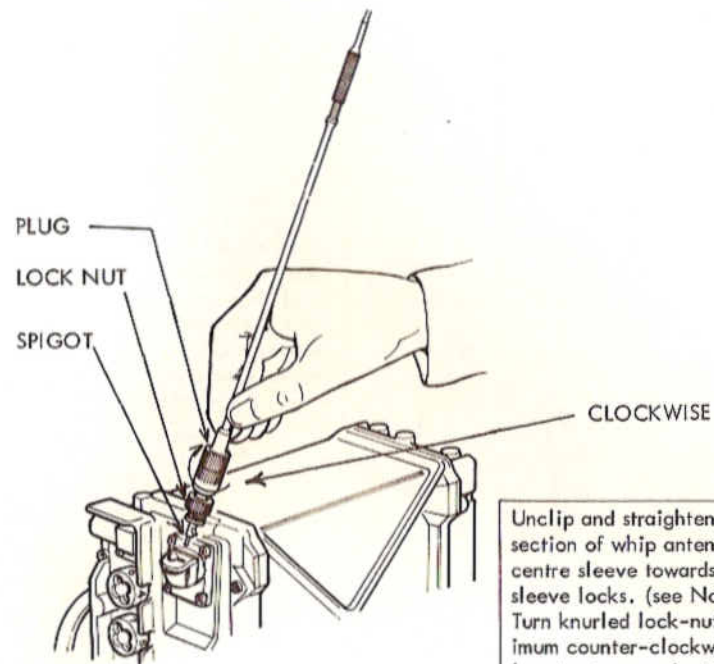


Fig.5 Connecting Headset and Handset

4. ERECT AND CONNECT WHIP ANTENNA
(Trailing-Wire antenna similarly connected)

CAUTION: Do not connect a Ground-Spike Antenna (page 42) at the same time. Range will be reduced.



Unclip and straighten folded section of whip antenna. Push centre sleeve towards tip until sleeve locks. (see Note below). Turn knurled lock-nut to maximum counter-clockwise position. Insert antenna spigot into battle socket and twist plug clockwise until correctly located. Tighten knurled lock-nut by turning clockwise.

Note: On alternative design, there is no centre sleeve; the folded section is self-straightening and locking. When re-folding the whip, pull the two sections off their taper before folding.

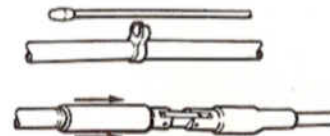
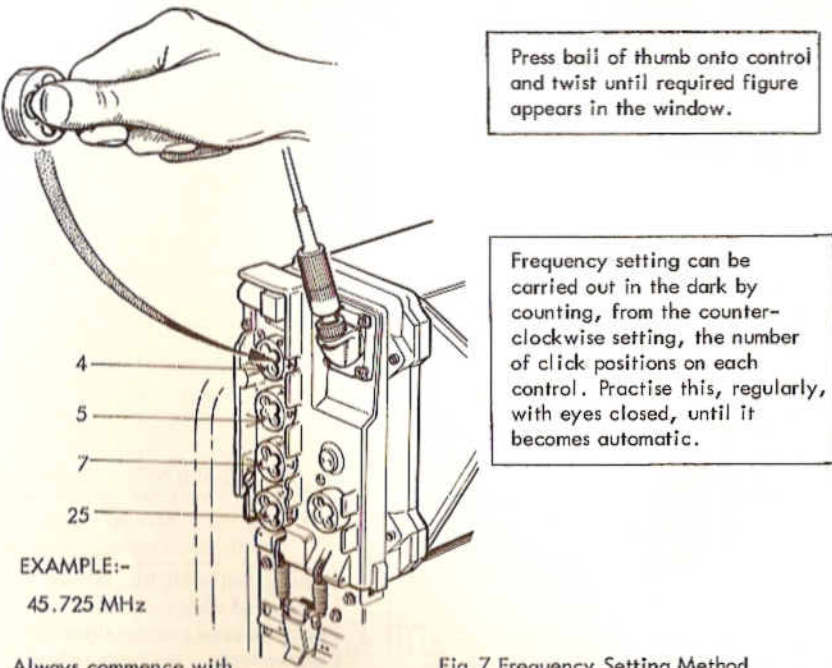


Fig.6 Fitting Whip Antenna

RESTRICTED

2.1.3 FREQUENCY SETTING METHOD

(For tuning SURF 4W - when connected - refer to page 31).



EXAMPLE:-
45.725 MHz

Always commence with the top control.

Fig.7 Frequency Setting Method

CAUTION: If SURF 4W is in use, ensure that only one antenna is connected to the manpack

SURF 4W must be tuned, or range will be severely reduced

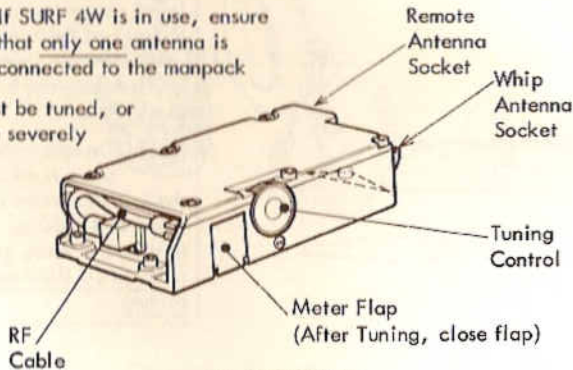
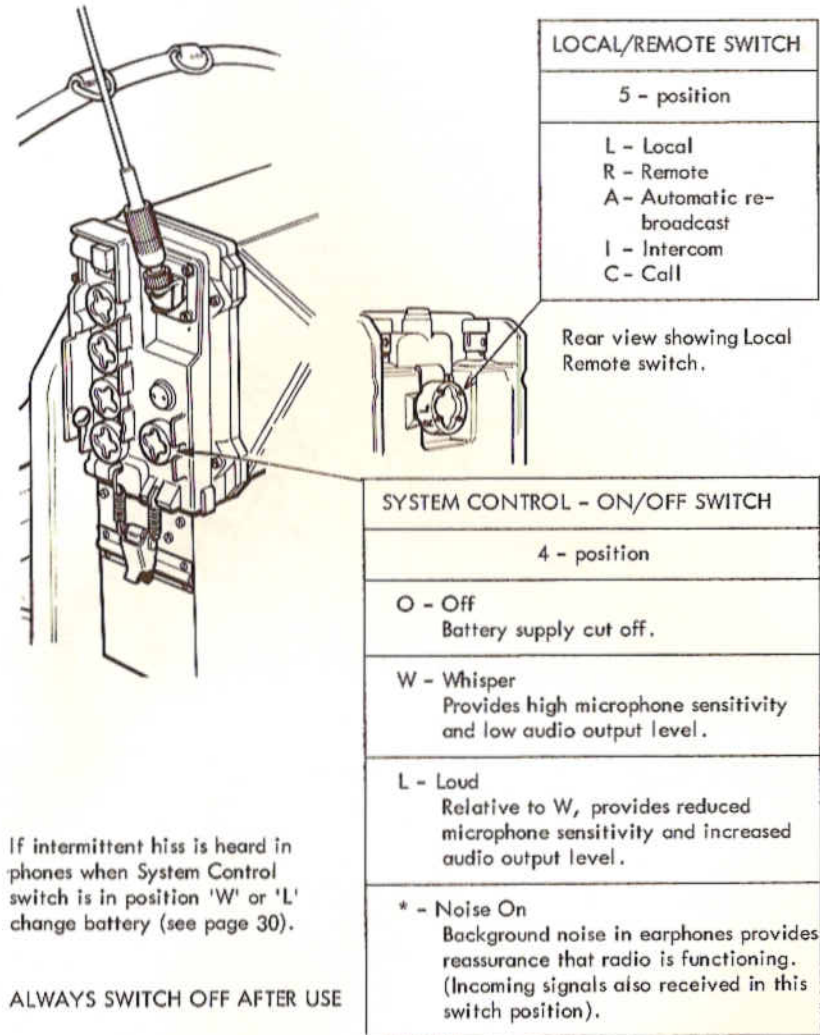


Fig.8 SURF 4W

RESTRICTED

2.1.4 SYSTEM SETTING

Rotate the System Control - On/Off switch to the appropriate position (see Table below) i.e. until required letter appears in 'window'. Rotate the Local/Remote switch until 'L' appears in window.



If intermittent hiss is heard in phones when System Control switch is in position 'W' or 'L' change battery (see page 30).

ALWAYS SWITCH OFF AFTER USE

Fig.9 System Setting

RESTRICTED

2.1.5 AUDIO GEAR FITTING



The headset must be worn correctly with the microphone approximately 1.0 cm in front of the mouth. In cold conditions, if the microphone grille becomes iced up by breath, blow hard on it to clear the ice and shake off water.



When using respirator, the headset must be worn as shown. Special points to note:- The headset must be put on after the respirator has been fitted correctly, in order not to interfere with the straps holding it in position. Connect respirator microphone to socket on headset and swing boom upwards as shown.

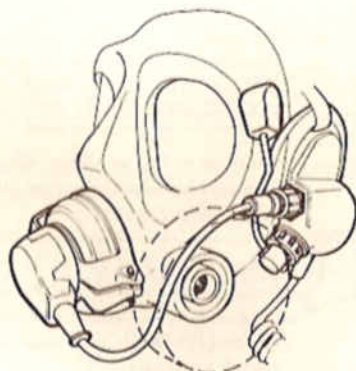


Fig. 10 Audio Gear Fitting

2.1.6 CARRYING POSITION

1. Position carrier like a rucksack, fairly high on the shoulders.
2. Adjust harness straps to give a comfortable fit.
3. Tie waist straps firmly to hold carrier close to the body. When fitted correctly, harness should feel very comfortable and should not inconvenience wearer in any way, even when carrying out strenuous activities.
4. When lying prone, crank the Whip Antenna to the vertical position for best range.
5. When using the Trailing-Wire Antenna, straighten the wire out and wear as high as possible on the shoulder for best range.



Fig. 11 Carrying Position

2.1.7 BATTERIES

Charging details are given on pages 58 to 60.

Battery Discharged Warning:

When interrupted hiss heard in phones, change battery (see page 30).

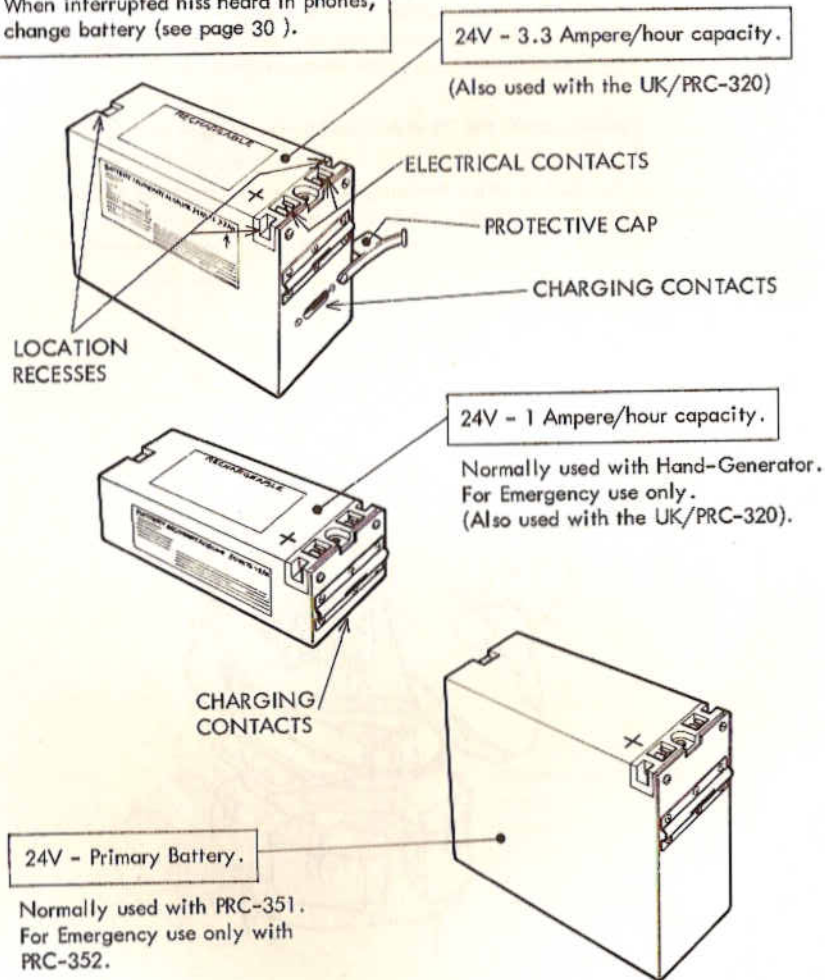


Fig. 12 Batteries

2.1.8 REMOTE CONTROL

The Local Operator has Handset (ordinary) or Headset plugged into Audio socket on the radio. The following procedure also utilizes the Intercom (Single radio) facility. The Remote Control Handset is required at the remote site.

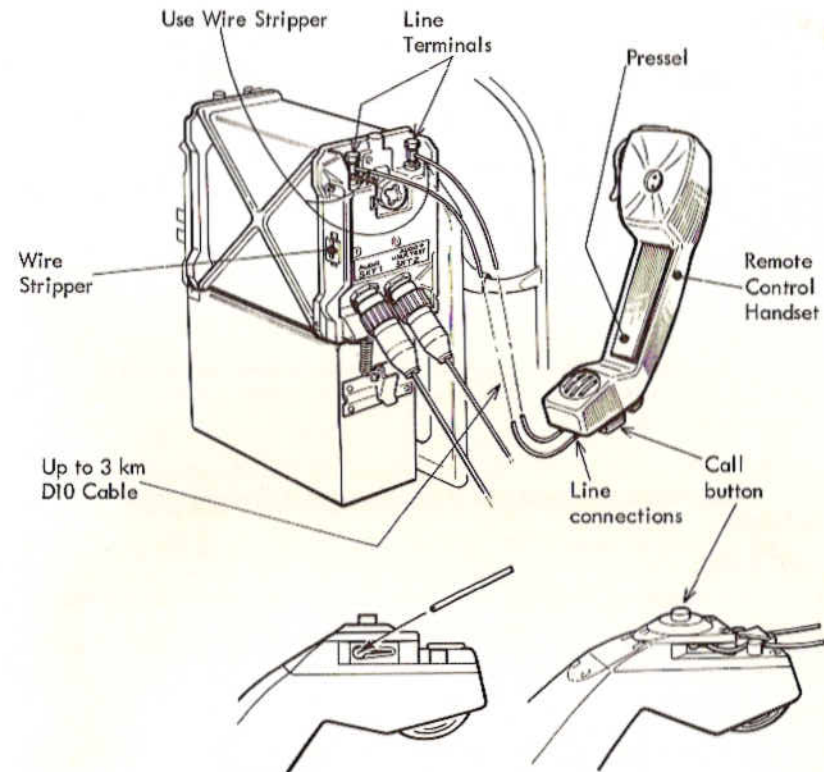


Fig. 13 Connecting Remote Handset

Local Station

Instruct radio net to Stand-by whilst remote link is being set up.

Attach the tails of the D10 cable to the Line terminals on the radio. (Use wire stripper on radio to bare ends).

Set the Local/Remote switch to the 'I' (Intercom) position.

Reel out the D10 cable to the remote position.

Attach the remote ends of the D10 cable to the Remote Control Handset (page 57). (If a tone is heard, reverse the cable connections to the Remote Control Handset).

Remote Station

Press the Call button on the Remote Control Handset, then press the pressel and speak.

Local Station

On receipt of call, press switch and reply to Remote operator.

Local and Remote Station

With pressel switches at both stations pressed, a normal telephone conversation can be held. Local operator can call remote station by momentarily setting Local/Remote switch to C (call). Reception will take place normally in the 'I' (Intercom) position except when the Local operator's pressel is operated. Transmission will not take place under any condition.

Remote Station

Instruct Local station that you are ready to take over radio net.

LOCAL STATION

Set Local/Remote switch to the Remote position. Can monitor in both directions. Can break-in and Transmit over radio net; remote operator can hear local operator's voice.

Remote Station

Communicate over radio net. When wishing to relinquish control, press Call button.

Local Station

On receipt of Call tone, set the Local/Remote switch to the 'I' (Intercom) position, and confirm that you are ready to take over the radio net.

Set the Local/Remote switch to the 'L' (Local) position; can now transmit and receive over radio net.

Remote Station

Can monitor Local operator and radio net. Can not speak to Local operator. Can not Call Local operator. Can not transmit over radio link.

2.1.9 AUTOMATIC REBROADCAST AND INTERCOM

Refer to page 23. The following procedure also utilizes the Intercom (Two radio) facility between Stations B and C. An Operator's Handset (ordinary) or Headset is plugged into the Audio sockets on each of the four radios.

IMPORTANT. Whisper (W) facility should not be used on Stations B and C. Outstations A and D must be Clansman UK/PRC-349, UK/PRC-350, UK/PRC-351/352, UK/VRC-353 or compatible foreign radios, e.g. AN/PRC-25 (USA) with a permanent modulation on 'transmit' of $150 \text{ Hz} \pm 3 \text{ Hz}$ and minimum deviation of $\pm 1.3 \text{ kHz}$. (Stations B and C are shown on page 23 as UK/PRC-352 - See Section 2; however, the UK/PRC-351 is completely satisfactory, as it is the source of the Auto-rebroadcast facility, but the range will be less).

Further information on rebroadcast is given on pages 25 to 27.

Stations A and D

Assemble the radio as detailed for UK/PRC-351 manpack (pages 10 to 13).

Set the Local/Remote switch to the 'L' position (Local).

Set the System On/Off switch to the 'L' position (Loud) or 'W' position (Whisper).

Stations B and C

Assemble the UK/PRC-352 (pages 34 to 36).

Set the System On/Off switch to the 'L' position (Loud).

Set up the appropriate frequency for each link. Ensure that the frequency separation between the two links is at least as great as the minimum required on page 38 (Co-located working).

Set the Band switch on the Amplifier RF to the appropriate range.

Set the Local/Remote switch on each radio to 'L' (Local).

Assemble the Ground-Spike Antennas (page 42) and connect the coaxial leads to the Remote Antenna socket on each radio.

Stations A and D

Set up radio communications A to B and C to D.

Station A

Station A instruct Station B to set up rebroadcast to Station D via Station C.

Station B

Acknowledge instructions from A and request A to 'stand-by'.

Set the Local/Remote switch to position 'I' (Intercom).

Connect the D10 cable to the Line terminals on the radio.

Reel out the D10 cable to Station C position.

Station C

Attach the D10 cable from B to the Line terminals on radio. If 'tone' heard in own headphones, reverse the line connection at the terminals (on one radio only). Switch to 'I' (Intercom) and notify B, over line, that the land line is 'through', and to standby for instructions to advise A to call D.

Set own Local/Remote switch to 'L' (Local).

Call D, state that rebroadcast link is now ready and to standby for call from A.

Set Local/Remote switch to 'A' (Auto-rebroadcast).

Station B

Monitor transmission from C to D. When concluded, set Local/Remote switch to 'L' (Local). Call A and advise that the rebroadcast link is now ready and that D is standing by to be called.

Set Local/Remote switch to 'A' (Auto-rebroadcast).

Station A

Communicate with Station D.

Stations A and D

Before speaking over the rebroadcast link, allow one second to elapse after operating the pressel.

Stations B and C

Monitor transmissions in both directions.

When rebroadcast link is operating satisfactorily, Stations B and C can be left unattended.

This facility may require the use of the SURF 4W for Stations B and C if their antennas are spaced less than 50 metres apart. See pages 33 and 38, Co-located Working. SURF 4W must be tuned, or range will be severely reduced.

IMPORTANT: Outstations A and D must be Clansman UK/PRC-349, UK/PRC-350, UK/PRC-351/352, UK/VRC-353 or compatible foreign radios, e.g. AN/PRC-25 (USA) with a permanent modulation on 'transmit' of 150 Hz \pm 3 Hz and minimum deviation of \pm 1.3 kHz.

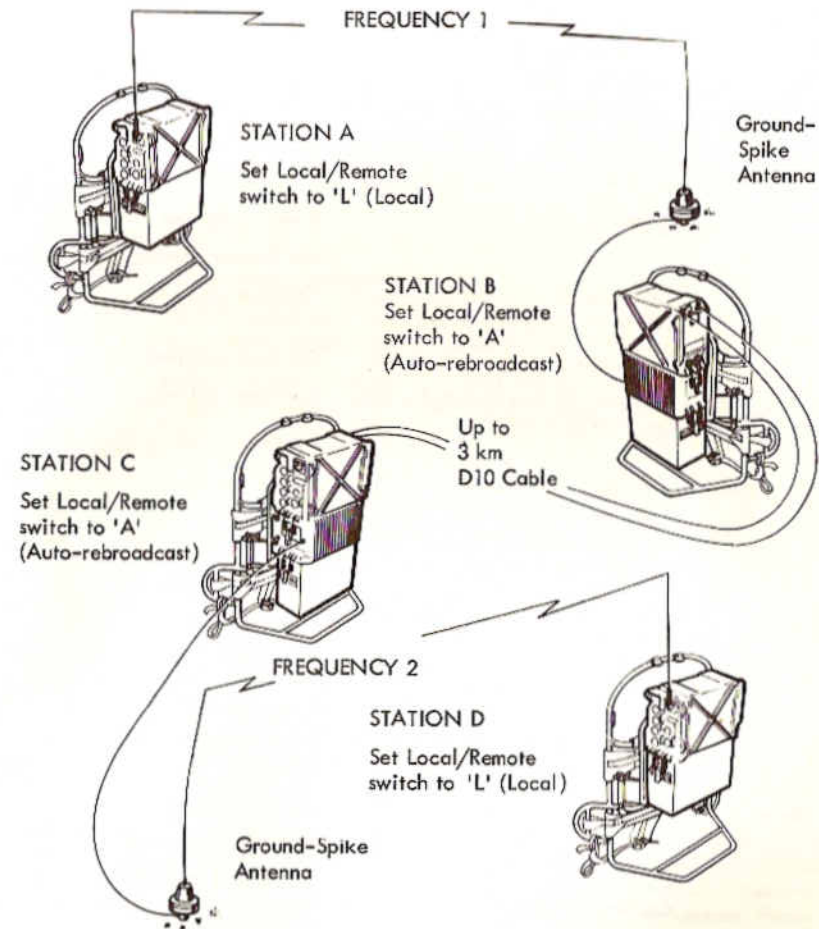


Fig. 14 Automatic Rebroadcast

2.1.10 OPERATOR FACILITIES FOR REMOTE OPERATION

A fuller description of the facilities available to the Local and Remote Operators is given below.

The Local/Remote switch has five positions:-

- L - Local
- R - Remote Control
- A - Auto-rebroadcast
- I - Intercom
- C - Call

The following describes the facilities when a UK/PRC-351 is used with another UK/PRC-351 or a Clansman Remote Handset. (It is also applicable to UK/PRC-352).

(1) L - Local

On/Off switch can be L (Loud) or W (Whisper).

Local Operator

Remote Operator

(with Remote Handset)

- | | |
|---|--------------------------------|
| (i) Can transmit.
Can hear sidetone. | (i) Can hear sidetone. |
| (ii) Can receive. | (ii) Can hear received signal. |
| (iii) Can call, by switching to C.
Can hear own call tone. | (iii) Can hear call tone. |
| | (iv) Cannot transmit or call. |

NOTE: If (a) the radio is manned only by the Local Operator
 (b) the radio net consists wholly of Clansman Stations
 (i.e. transmitter with 150 Hz permanent modulation)
 (c) the radio squelch is being opened by interference from non-Clansman sources (e.g. Larkspur transmitters)
 then a more satisfactory squelch operation can be secured by switching to A - Auto.

(2) R - Remote Control

On/Off switch can be L (Loud) or W (Whisper)
 If a tone is heard on connecting the Remote Handset, reverse the twin line cable connections to the Handset.

Local Operator

Remote Operator

(with Remote Handset)

- | | |
|---|--------------------------------|
| (i) Can transmit.
Can hear sidetone. | (i) Can hear local operator. |
| (ii) Can receive. | (ii) Can hear received signal. |
| (iii) Can call by switching to C. | (iii) Can hear call tone. |

- | | |
|--|--|
| (iv) Can hear Remote Operator. | (iv) Can transmit.
Can hear sidetone. |
| (v) Can hear call tone.
Cannot simultaneously hear received signal. | (v) Can call, by pressing Call button.
Can hear call tone. |
| (vi) Operates pressel and speaks simultaneously:-
(a) Hears own sidetone. | (vi) Operates pressel and speaks simultaneously:-
(a) Hears own sidetone at lower level than (b) below. |
| (b) Hears Remote Operator at lower level than (a) above. | (b) Hears Local Operator's speech at level L or W, according to On/Off switch position. |
| (c) Can transmit and modulate transmitter. | (c) Cannot modulate transmitter. |

i.e. the Local Operator over-rides the Remote Operator.

(3) A - Automatic Rebroadcast

On/Off switch must be at L (Loud) for correct operation. (If one radio is at L and the other at W, distortion and low modulation will occur).

Radio B is joined to radio C by twin line (D10 up to a max. length of 3 km). When the line is connected, Call tone may be heard; the remedy is for ONE of the operators to reverse the line wires. The Operator's Handset (ordinary) or Headset is plugged into the audio sockets.

The outstation transmitters must be Clansman type (or with compatible 150 Hz modulation).

<u>Situation</u>	<u>Operator B</u>	<u>Operator C</u>
(i) Radio B receiving a signal from outstation (and radio C transmitting by rebroadcast action).	(i)(a) Hears signal. (b) Operates pressel and speaks. Radios B and C go to transmit. Only Operator B's speech is transmitted (on both transmitters). Hears own sidetone.	(i)(a) Hears signal. (b) Hears Operator B.
	(c) Operates pressel and speaks. Transmits on radio B only; hears own sidetone. Hears Operator C.	(c) Operates pressel and speaks. Transmits on radio C only; hears own sidetone. Hears Operator B.

NOTE: Para.(i) (c) implies simultaneous operation.

<u>Situation</u>	<u>Operator B</u>	<u>Operator C</u>
	(i)(d) Maintains pressel in operation. Hears call tone (which is not transmitted). Can still transmit and modulate radio B.	(i)(d) Releases pressel. Switches to C-Call. Hears own call tone. Stops transmission on radio C.
	(e) Releases pressel. Switches to C-call. Stops transmission on radio B. Hears both call tones.	(e) Hears both call tones.
	(f) Has switched back to A-Auto. Hears call tone.	(f) Switches to C-call. Hears own call tone. Stops transmission on radio C.
(ii) Radio B on receive (no signal). Radio C on receive (no signal).	(ii)(a) Operates pressel and speaks. Radios B and C go to transmit; only Operator B's speech is transmitted (on both transmitters). Hears own sidetone.	(ii)(a) Hears Operator B.
	(b) Operates pressel and speaks. Transmits on radio B only. Hears own sidetone. Hears Operator C.	(b) Operates pressel and speaks. Transmits on radio C only. Hears own sidetone. Hears Operator B.
	(c) Has released pressel. Hears call tone from Operator C. Hears own call tone (both tones at approx. 2 kHz).	(c) Has released pressel. Switches to C-call; hears both call tones.

NOTE: Para. (ii) (b) implies simultaneous operation.

(4) (a) I - Intercom (Two radio)

Radios B and C joined by twin line.

Operator's handset (ordinary) or headset plugged into audio sockets.

<u>Situation</u>	<u>Operator B</u>	<u>Operator C</u>
(i) Radio B receiving signal from outstation. Radio C receiving signal from outstation.	(i)(a) Hears both radios. (b) Operates pressel and speaks. Stops reception radio B. Hears radio C. Hears sidetone. (c) Operates pressel and speaks. Stops reception radio B. Cannot hear radio C. Hears sidetone. Hears Operator C (duplex).	(i)(a) Hears both radios. (b) Hears Operator B. Hears radio C. (c) Operates pressel and speaks. Stops reception radio C. Cannot hear radio B. Hears sidetone. Hears Operator B. (duplex). (d) Switches to C. Hears both call tones. Cannot hear radio C.
(ii) Both radios on receive (no signal)	(ii)(a) Hears nothing; receiver noise muted. (b) Hears both call tones. Hears receiver B noise.	(ii)(a) Hears nothing; receiver noise muted. (b) Switches to C. Hears both call tones.

(4) (b) I - Intercom (Single radio)

Remote Operator has remote handset connected by twin line to radio. If a tone is heard on connecting the remote handset, reverse the twin line cable connections at the handset.

Local Operator has handset (ordinary) or headset plugged into audio sockets.

<u>Situation</u>	<u>Local Operator</u>	<u>Remote Operator</u>
(i) Radio receiving signal.	(i)(a) Hears signal. (b) Hears Remote Operator. Hears signal at higher level than hears Remote Operator. (c) Operates pressel and speaks. Hears own sidetone. Stops reception of signal; does not transmit (does not energize transmit oscillator).	(i)(a) Hears signal. (b) Operates pressel and speaks. Hears own sidetone; hears signal at higher level than sidetone. (c) Has released pressel. Hears Local Operator. Does not hear received signal.

<u>Situation</u>	<u>Local Operator</u>	<u>Remote Operator</u>
	(i)(d) Operates pressel and speaks; hears Remote Operator (duplex);hears own sidetone; stops reception of signal; does not transmit (does not energize transmit oscillator).	(i)(d)Operates pressel and speaks; hears Local Operator (duplex); hears own sidetone; cannot hear signal; does not transmit (does not energize transmit oscillator).
NOTE: Para. (i) (d) implies simultaneous operation.	(e) Has released pressel; hears call tone; hears received signal in back-ground.	(e)Has released pressel; operates Call button; hears own call tone; hears received signal in back-ground.
	(f) Switches to C-Call. Hears call tone.	(f) Has released pressel and call buttons; hears call tone.
(ii) Radio on receive (no signal)	(ii)(a) Hears nothing. Receiver noise muted.	(ii)(a) Hears nothing. Receiver noise muted.
	(b) Hears Remote Operator.	(b)Operates pressel and speaks. Hears own sidetone.
	(c) Operates pressel and speaks; hears own sidetone; does not transmit (does not energize transmit oscillator).	(c)Has released pressel; hears Local Operator.
	(d)Operates pressel and speaks; hears Remote Operator (duplex). Hears own sidetone. Does not transmit (does not energize transmit oscillator).	(d)Operates pressel and speaks; hears Local Operator (duplex). Hears own sidetone. Does not transmit (does not energize transmit oscillator).

NOTE: Para. (ii) (d) implies simultaneous operation.

<u>Situation</u>	<u>Local Operator</u>	<u>Remote Operator</u>
	(e) Has released pressel; hears call tone; hears Receiver noise.	(e) Has released pressel; operates Call button; hears own call tone; hears Receiver noise.
	(f) Switches to C-Call.	(f) Has released pressel and call buttons. Hears call tone.

(5) C - Call

Use of this position has been described under clauses (1) to (4) above.

2.1.11 OPERATING INFORMATION AND TECHNIQUES

1. PRC-351, Transmitter Check Procedure

Carry out this check at 31, 47, 49 and 75 MHz (approx.).

- Connect the battery and headset/handset to the radio.
- Insert whip antenna into bayonet socket.
- Set the Local/Remote switch to 'L' (Local).
- Set the System Control switch to 'L' (Loud).
- Depress the pressel switch and speak into the microphone.
- Sidetone should be heard in the headset/handset.
- If no sidetone is heard, refer to CHAP.4, page 66.
- Repeat with System Control switch at 'W'.
- For the check in the Remote position, using the Remote Handset, see page 19.
- For the check in Auto-Rebroadcast and Intercom., connect a second radio and see page 21.

2. PRC-351, Receiver Check Procedure

Carry out this check at 31, 47, 49 and 75 MHz (approx.).

- Connect the battery and headset/handset to the radio.
- Set the Local/Remote switch to 'L' (Local).
- Set the System Control switch to 'N' (Noise-on).
- A loud continuous 'hiss' should be heard in headset/handset.
- If no 'hiss' is heard, refer to CHAP.4, page 65.
- For the check in the Remote position, using the Remote Handset, see page 19.
- For the check in Auto-Rebroadcast and Intercom., connect a second radio and see page 21.

3. Whisper Facility

When the radio is used in close proximity to enemy positions, the System Control switch should be set to 'W'. Microphone sensitivity is 'high' and audio output level is 'low'. The Operator's voice is thus less likely to be overheard by an enemy listener, as the Operator can produce full modulation and range with an unvoiced whisper. Received signals are also less likely to be overheard. Even at low audio output, a received signal may be heard at 5 metres distance (Headset worn on head) or 15 metres (Headset off head).

Under conditions of high ambient noise, e.g. gunfire or in a noisy vehicle, the System switch should be set to 'L' (Loud); hold the microphone close to the mouth and speak loudly.

For normal use, in reasonably quiet surroundings, set the System switch to 'W' (Whisper) as this will result in clearer speech and the best performance at limit range.

4(a). Battery 'Low' Warning

As the battery approaches exhaustion, which in the case of a secondary battery may cause damage, an interrupted hiss is heard in the headset when the System Control switch is set to either 'W' or 'L'. The interrupted hiss will be noticed first when the pressel switch is released following a period of transmission, i.e. when the radio reverts to the 'listening out' (receive) state. It is then necessary to fit a new primary or a fully charged secondary battery. It is very important that the radio is switched OFF after use because, with the Handset and Headset disconnected, there is NO INDICATION that it may be ON. Information on battery charging is given on pages 58 to 60.

4(b). Batteries - Wading in Sea Water

If sea water is allowed free access to the battery contacts, they will be quickly eaten away and the battery will become discharged.

Keep spare batteries taped up, and press the protection cap over the charging socket fully home.

Similar corrosion of the spring contacts on the Amplifier RF 20 watt can occur if the Amplifier is not correctly mated to the RT-351.

BEFORE WADING with the radio ensure that:-

- (i) the protection cap over the charging socket on the battery is fully home.
- (ii) the rubber seal is present on the RT-351 and the Amplifier.
- (iii) the seal is in good condition and there is no grit on its surface or on the battery or top face of the Amplifier.
- (iv) the battery is properly mated to the RT-351 or to the Amplifier, and the Amplifier is properly mated to the RT-351.

- (v) when possible, the cavity around the battery contacts and the spring contacts on the Amplifier is packed with petroleum jelly or grease.

DURING WADING, do not meddle with the battery as this can allow sea water into the contacts.

AFTER WADING, when possible, remove the battery and Amplifier and wipe the contacts (unless greased) and surfaces dry. When possible, wash with fresh water and dry.

5. Selective Unit RF (SURF 4W)

The SURF 4W is used under conditions of co-located working of two radios (page 33). If not already fitted, proceed as follows:-

- (a) Remove the antenna (if fitted) from the radio.
- (b) Fit the RF Selective Unit (page 11).
- (c) Unclip, from the SURF, the short coaxial lead and connect as shown on pages 35 and 36.
- (d) Connect the required antenna as follows:-
 - (i) Whip or Trailing-Wire to battle antenna socket on the SURF;
 - or (ii) Ground-Spike to coaxial socket on the SURF.

CAUTION: Never connect more than one antenna to the radio.

- (e) Set the System Control switch to 'W'.
- (f) Select a frequency.
- (g) Press Handset/Headset Pressel Switch.
- (h) Raise the meter cover on the Selective Unit RF and adjust the thumb-wheel 'tuning' control for a peak meter deflection (about 3/4 full scale).

Note: (The marking 'Hi' means towards 76 MHz; the marking 'Lo' means towards 30 MHz).

The meter is permanently illuminated for tuning in the dark; the meter flap should be snapped shut after tuning.

CAUTION: Care must be taken to make antenna connections to the SURF 4W. False-tune deflections may occur on the SURF meter if no antenna is connected. Check the tuning position of the thumb-wheel control occasionally; when the air temperature is very low (-30°C), this should be done half-hourly.

6. Automatic Rebroadcast

IMPORTANT: Outstations A and D (below) must be Clansman UK/PRC-349, UK/PRC-350, UK/PRC-351/352, UK/VRC-353 or compatible foreign radios e.g. AN/PRC-25 (USA) with a permanent modulation on 'transmit' of 150 Hz \pm 3 Hz and a minimum deviation of \pm 1.3 kHz.

The rebroadcast facility can be used for the following purposes:-

- (a) Where an obstacle occurs between the two ends of a link which could affect VHF communications, e.g. a ridge of hills; these could be surmounted by the cable and the radio link resumed on the far side of the hills.
- (b) To extend a link so that communication can be attained over a greater distance than a normal link would be expected to cover.
- (c) To be able to communicate with a net on another frequency while remaining on one's own net frequency.

Rebroadcast requires the use of two additional UK/PRC-351/2 stations in a link. These additional stations (lettered B and C in the illustration on page 23 are set-up in strategic positions preferably near the centre of the total link distance to be covered. They can be up to 3 km apart and are connected together by a pair of D10 cable. If a cable pair is cross connected, a 'call' tone is heard in the User's headset; this is corrected by transposing the pair of cables connected to the line terminals, at one rebroadcast station only. The rebroadcast stations B and C can be left unattended after they have been initially set-up, as the rebroadcast process is automatic, i.e. receipt of a signal at station B from station A causes station C to be switched to Send; the audio signal from station B is then used to modulate station C. A similar process is used in the opposite direction.

However when the B and C stations are manned, the operators at these stations can hear transmissions in both directions. When a signal is being received and rebroadcast, either operator can put both B and C stations to transmit (by pressing his pressel) and interrupt the rebroadcast. The radio link A and B must operate on a different frequency than that used on the C to D link. The minimum frequency difference permitted is related to the distance separating B and C stations, i.e. 3 km separation 25 kHz frequency difference permissible. For closer working, see pages 33 and 38 (Co-located working).

7. Inter-Operability

Completely satisfactory with UK/PRC-349, UK/PRC-350 and UK/VRC-353 with frequency-band restriction. Inter-operability possible but never completely reliable with B.47, B.48, C.42 No.2, C.45 No.2 and AN/PRC-25. No plans should be made to inter-operate with A.41, A.42, C.42 No.1 or AN/ARC-44. Can be connected by twin cable (D10) to UK/PRC-344 for automatic rebroadcast.

8. 'Noise-On' Setting of System Control Switch

This setting position is marked with an asterisk (*) on the switch (see page 15). It may be used:-

- (a) to confirm that the battery and Receiver are satisfactory - a loud hiss will be heard in the absence of a signal. Confirmation is particularly useful when signals have not been heard for some time. There is no hindrance to receipt of signals in this position.

- (b) to confirm that signals are not being received on 'L' or 'W' because the channel is being jammed by an interfering transmitter. If so, proceed as follows:- firstly, check that the battery and Receiver are satisfactory by switching to 'Noise-On' and changing a few channels, in turn, say 1 MHz away. Satisfactory performance is indicated by the presence of hiss (provided there is no signal on the channels being tried). Secondly, switch back to the original channel; if there is then no hiss, jamming is taking place by means of an unmodulated carrier.

2.1.12. CO-LOCATED WORKING

The co-location of two or more radios requires the addition of a Selective Unit RF (SURF) to each VHF radio (except PRC-349) in order to achieve minimum distance spacing.

For PRC-350 use SURF 2W
 For PRC-351 use SURF 4W
 For PRC-352 use SURF 4W
 For PRC-320 SURF not needed.

TABLE 3

CO-LOCATED WORKING PRC-351

PRC-351 (Ant. Whip 1.2m) co-located with:-	Approx. minimum distance between antennas (metres) (frequency difference in %)							
	Radios on ground				Radios on men			
	Without SURF's		With SURF's		Without SURF's		With SURF's	
	m.	%	m.	%	m.	%	m.	%
PRC-350 (Ant. Whip 1.2m)	15	5	5	5	2-5	5	2	5
	5	10	2	10	-	-	-	-
PRC-351 (Ant. Whip 1.2m)	20	5	5	5	20	5	2	5
	-	-	2	10	-	-	-	-
PRC-352 (Ant. Ground Spike)	50	5	15	5	50	5	15	5
	-	-	-	-	-	-	-	-
PRC-320 (Ant. Whip 2.4m)	15	-	2	-	15	-	2	-
	(VHF above 34 MHz)		(VHF above 33 MHz) SURF not needed on PRC-320		(VHF above 34 MHz)		(VHF above 34 MHz) SURF not needed on PRC-320	
PRC-349	-	-	-	-	-	-	2.5	5

SURF's must be tuned, or range will be severely reduced.

2.2 MANPACK OPERATION, PRC-352

2.2.1 BASIC STATION CONTENTS

The UK/PRC-352 is a UK/PRC-351 with the addition of an Amplifier RF, 20 watt (Fig. 15 below) which comes into operation on 'transmit' only. Hence, the Basic Station Contents as shown on pages 7 to 9 now include the Amplifier RF (see 2.2.2 below) and the Ground-Spike Antenna (page 42).

2.2.2 ASSEMBLY OF STATION

IMPORTANT: The PRC-352 cannot be used on High-Power Transmit with a whip antenna. The Remote Ground-Spike Antenna is used (see page 42), and thus the PRC-352 can only operate on high-power as a fixed station or at the halt for mobile stations. For mobile use, the battle antenna is fitted and the radio is operated on 'low' power as a PRC-351.

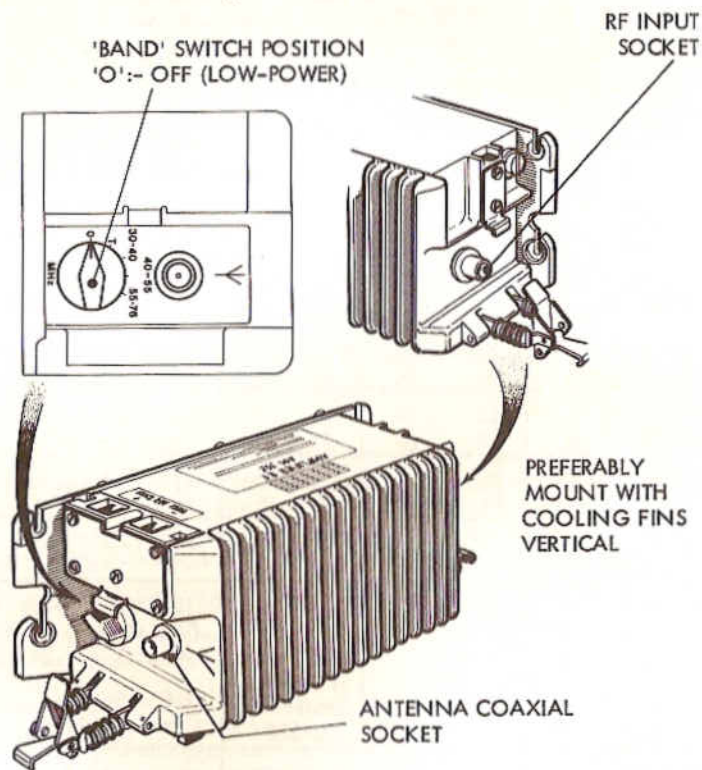


Fig. 15 Amplifier RF 20W

1. Use with SURF 4W

Mount radio on carrier as shown on page 10. Fully slacken the four captive screws holding the RT-351 to the Adaptor Plate.

Unclip the lower coaxial connector, held on the Adaptor Plate, and push it through the cut-away portion (Fig. 16b) on the right-hand side - ready for connection to the Amplifier. Hold the Amplifier against the Adaptor Plate with the fins vertical and the band switch on the left-hand side.

Locate the two lower fixing slots on the Amplifier into the two remaining captive screws on the Adaptor Plate; do not tighten these screws yet.

NOTE: The two upper fixing slots are never used.

The Amplifier should be flat against the Adaptor Plate.

As when fitting a battery, slide the Amplifier up until the lugs (2 left-hand side) on the RT-351 engage with the slotted recesses in the top of the Amplifier.

NOTE: The satisfactory completion of the above instruction requires careful manipulation of both the RT-351 and the Amplifier in order to engage properly the lugs on the radio with the recesses in the Amplifier

Place the hooked clamp, at each side of the radio, over the lip at each end of the Amplifier; snap the clamp closed.

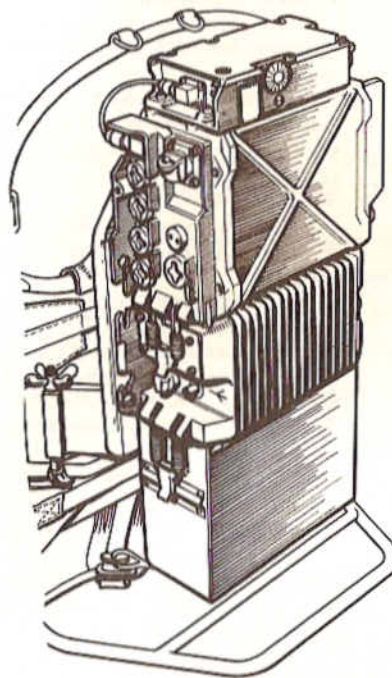


Fig. 16a Assembly of UK/PRC-352 Station

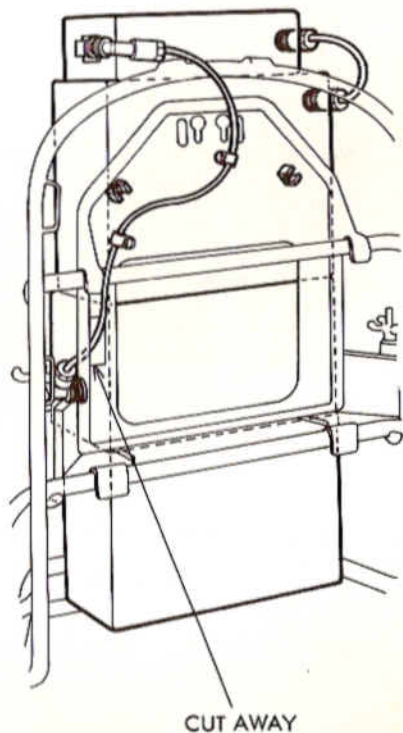


Fig. 16b Assembly of UK/PRC-352 Station

Ensure that the Amplifier is correctly mated with the radio and tighten the six captive screws holding both to the Adaptor Plate. Fit the battery to the Amplifier in the manner described on page 11.

Unclip the upper coaxial connector held on the Adaptor Plate and connect it to the RF Output socket on the SURF 4W. Connect the lower coaxial connector to the RF Input socket on the Amplifier RF.

Unclip the short coaxial connector stowed on the SURF 4W and connect to the RT-351 as shown.

Connect the feeder from the remote antenna to the antenna socket on the Amplifier. (Refer to page 40).

2. Use Without SURF 4W

The method of assembling the RT-351 and Amplifier RF to the carrier is as above.

Disconnect and stow the short coaxial connector onto the SURF 4W. Unclip the coaxial cable held on the Adaptor Plate and connect it between the Antenna Output socket on the RT-351 and the RF Input socket on the Amplifier.

Connect the feeder from the remote antenna to the antenna socket on the Amplifier. (Refer to page 40).

2.2.3 FREQUENCY SETTING METHOD

Set up frequency as detailed on page 14. In addition, set the Band switch on the Amplifier to the appropriate range (see page 34).

2.2.4 SYSTEM SETTING

Carry out system setting as detailed on page 15.

2.2.5 AUDIO GEAR FITTING

Fit handset and headset as shown on page 12 and 16

2.2.6 CARRYING POSITION

Position the carrier as shown on page 17 .

2.2.7 BATTERIES

Information on batteries is contained on page 18 .

2.2.8 REMOTE CONTROL

Information on remote control operation is contained on pages 19 and 20 .

2.2.9 AUTOMATIC REBROADCAST

Information on automatic rebroadcast is contained on pages 21 to 23 .

2.2.10 OPERATOR FACILITIES FOR REMOTE OPERATION

Information is given on pages 24 to 29 .

2.2.11 OPERATING INFORMATION AND TECHNIQUES

PRC-352 Transmitter Check Procedure

Carry out this check at the following approximate frequencies: 35, 47 and 65 MHz.

- (a) Remove the plug from the coaxial antenna socket on the PRC-351 radio.
- (b) Carry out the PRC-351 Transmitter check procedure on page 29; if satisfactory, reconnect the coaxial plug to the antenna socket on the PRC-351 and proceed as follows.
- (c) Connect a Ground-Spike Antenna, by its coaxial plug, to the coaxial Antenna socket on the Amplifier RF.
- (d) Set the Local/Remote switch to 'L'.
- (e) Set the System Control switch to 'L'.
- (f) Set Band switch to 'T' (Test). Operate Pressel and speak into microphone. ABSENCE OF SIDETONE indicates correct performance. If sidetone is heard, refer to page 70.
- (g) For each test frequency, set the Band switch on the Amplifier RF to the appropriate position.

- (h) Depress the pressel switch and speak into the microphone.
- (i) Sidetone should be heard in the Headset.
- (j) If no sidetone is heard, refer to page 71, para.4.2.2.

The remainder of Operating Information and Techniques is contained on pages 30 to 33 (para.3 to 8).

2.2.12 AMPLIFIER RF AUTOMATIC TRIP (SWITCH-OFF)

If the Ground-Spike Antenna is disconnected, or short-circuited to earth whilst on 'transmit', the automatic trip may operate. Sidetone will be lost and the transmit power level will be reduced to that of the PRC-351.

The trip may also operate when the Ground-Spike Antenna is mismatched by being close to such objects as e.g. a metal fence or a man in a standing position. The remedy is to change the conditions around the antenna viz. move away from the offending object, then release the pressel and re-operate it.

The Amplifier RF will also trip 'off' when the battery voltage is low - less than 18 volts - but previous warning of this will have been given by an interrupted hiss in the Headset/Handset.

2.2.13 CO-LOCATED WORKING

The co-location of two or more radios requires the addition of a Selective Unit RF (SURF) to each VHF radio (except PRC-349) in order to achieve minimum distance spacing.

For PRC-350 - use SURF 2W.
For PRC-351 - use SURF 4W

For PRC-352 - use SURF 4W
For PRC-320 - SURF not needed.

TABLE 4
CO-LOCATED WORKING PRC-352

PRC-352 (Antenna Ground-Spike) co-located with:-	Approx. minimum distance between antennas (metres) (frequency difference in %) Radios on ground.			
	Without SURF's		With SURF's	
PRC-350 (Ant. Whip 1.2m)	50 metres	5%	15 metres	5%
PRC-351 (Ant. Whip 1.2m)	50 metres	5%	15 metres	5%
PRC-352 (Ant. Ground-Spike)	50 metres	5%	15 metres	5%
PRC-320 (Ant. Whip 2.4m)	50 metres (VHF above 32MHz. HF below 26MHz).		20 metres (VHF above 32MHz) 15 metres (VHF above 32MHz, HF below 27MHz) SURF not needed on PRC-320.	
PRC-349			15 metres	5%

SURF's must be tuned, or range will be severely reduced.

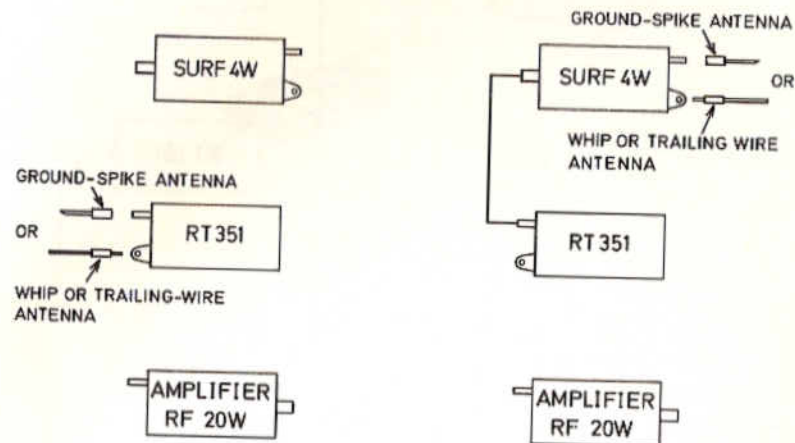
2.2.14 CABLE/ANTENNA CONNECTING NOTES

1. When a UK/PRC-352 is used as a PRC-351 with a whip, trailing-wire or ground-spike antenna connected to the RT-351 or SURF 4W, the essential cable interconnections are shown below.

CAUTION: ENSURE THAT NO INTERCONNECTING CABLES, OTHER THAN THOSE SHOWN, ARE FITTED AND THAT THE BAND SWITCH ON THE AMPLIFIER RF IS SET TO 'O' (OFF). ALSO, ONLY THE REQUIRED ANTENNA SHOULD BE FITTED. UNUSED CABLES MUST BE SUITABLY STOWED.

- (a) Whip or ground-spike antenna connected to RT-351 (SURF 4W not in use).

- (b) Whip or ground-spike antenna connected to SURF 4W.



SURF 4W must be tuned, or range will be severely reduced.

Fig. 17 UK/PRC-351 and SURF 4W Connections

2. When a UK/PRC-352 (with or without the SURF 4W) is used with a ground-spike antenna connected to the Amplifier RF, the essential cable interconnections are shown below.

CAUTION: ENSURE THAT A WHIP OR TRAILING-WIRE IS NOT FITTED, AND THAT THE 'BAND' SWITCH ON THE AMPLIFIER RF IS SET TO THE APPROPRIATE POSITION. UNUSED CABLES MUST BE SUITABLE STOWED.

(a) Without SURF 4W

(b) With SURF 4W

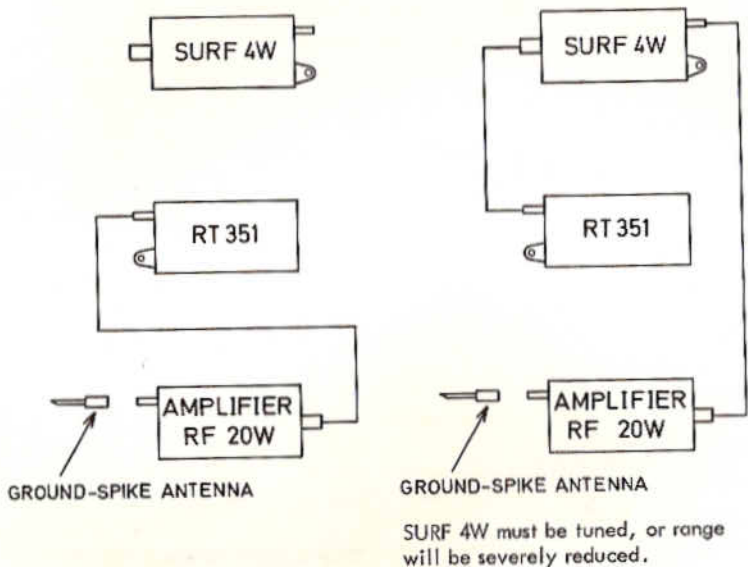
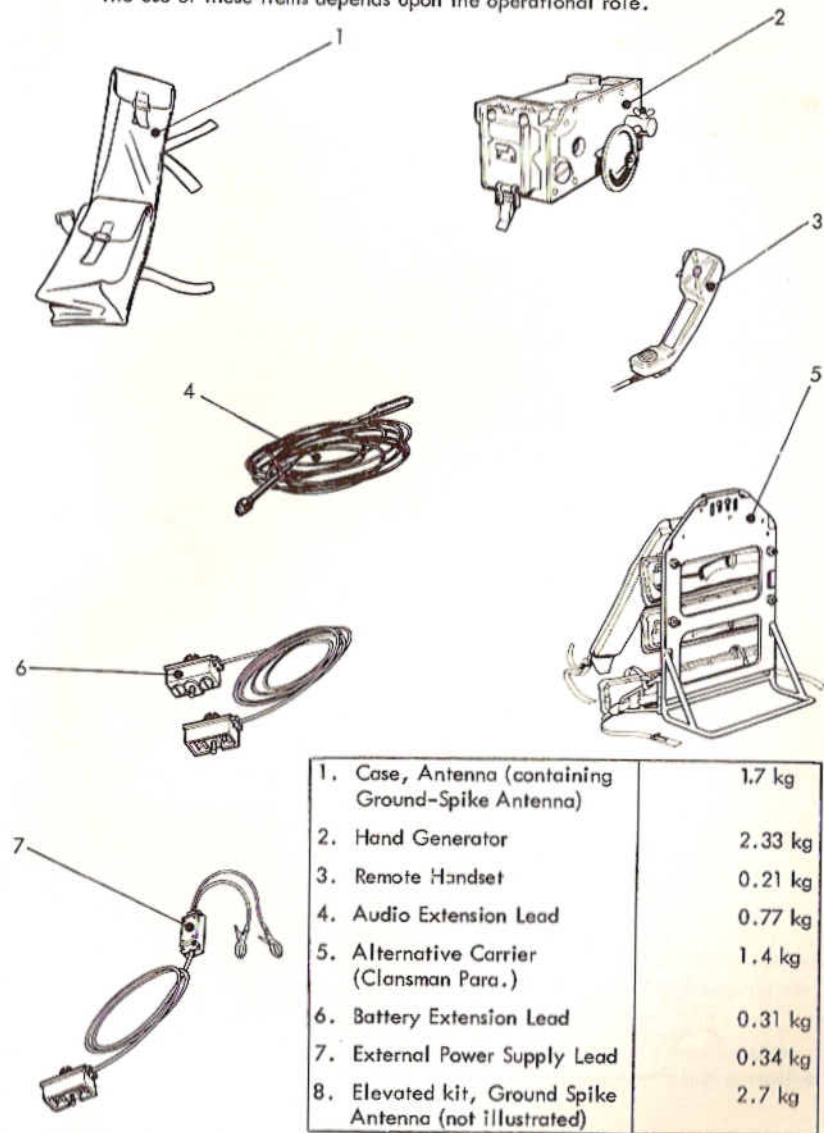


Fig. 18 UK/PRC-352 and SURF 4W Connections

2.3 ANCILLARY ITEMS AND THEIR USE

The use of these items depends upon the operational role.



1. Case, Antenna (containing Ground-Spike Antenna)	1.7 kg
2. Hand Generator	2.33 kg
3. Remote Handset	0.21 kg
4. Audio Extension Lead	0.77 kg
5. Alternative Carrier (Clansman Para.)	1.4 kg
6. Battery Extension Lead	0.31 kg
7. External Power Supply Lead	0.34 kg
8. Elevated kit, Ground Spike Antenna (not illustrated)	2.7 kg

Fig. 19 Ancillary Items

2.3.1 GROUND-SPIKE ANTENNA AND ELEVATED KIT

2.3.1.1. GROUND-SPIKE ANTENNA

Description

1. This antenna is the lightest ground type which can be used with the UK/PRC-352. It can also be used with the UK/PRC-351 (and UK/PRC-350). The advantages to be gained are as follows:-

- a. The antenna is a better radiator than a whip; therefore, in general, greater range should be obtained.
- b. The antenna can be placed where it is relatively inconspicuous, whilst the radio can be operated from a sheltered position (Fig.20, below). This facility has advantages over the 'audio extension' facility in so far that switching and limited frequency control of the radio may be carried out without the User leaving protective shelter.



Fig.20 UK/PRC-352 used with Ground-Spike Antenna

2. The Ground-Spike Antenna may also be mounted on a 5.4 metre mast, or tree, giving a further improvement in range. The Elevated Antenna Kit 5985-99-630-6499 is required; see pages 46 to 54.

3. The Antenna (Fig.21) consists of a rod radiator, matching unit, ground-spike and connecting cables. The rod radiator is provided by four identical elements (together with one spare element) which plug into each other and into the top of the matching unit. The number of elements used depends upon the frequency band to be covered. A fabric carrying case (page 44) is provided to house the antenna.

Note: The 400 mm cable assembly is not required.

4. When erected, the distance from the top of the antenna to the ground is approximately 2.4m (4 elements), 1.85m (3 elements) or 1.3m (2 elements).

Assembly

5. At the chosen site, preferably an open site with damp earth, assemble and erect the antenna as follows (Fig.22), removing each item from the carrying case only when the item is required.

- a. Drive the ground spike into the ground until the blockage clearance hole is approximately 4 cm above the surface.

Note: A captive dust cover is fitted to the cable socket on the matching unit. To prevent ingress of dirt, do not remove this cap from the socket until the instant of making a connection; the cap should then be fitted to the stowage position provided.

- b. Connect the 'straight' plug at the end of the 6m cable to the socket on the matching unit. Fit the cable strainer over the matching unit base stub.
- c. Fit the matching unit base stub into the hole in the head of the ground spike.
- d. Select a number of antenna elements according to the frequency band thus:

Frequency band	Number of Elements
30-53MHz	4
52-71MHz	3
70-76MHz	2

- e. Plug the selected elements into each other, plugging the first element into the socket on top of the matching unit. In each case, press the element firmly home into the receiving socket.

CAUTION: The elements must not be bent over but must be withdrawn from the matching unit in order to add or remove sections.

RESTRICTED

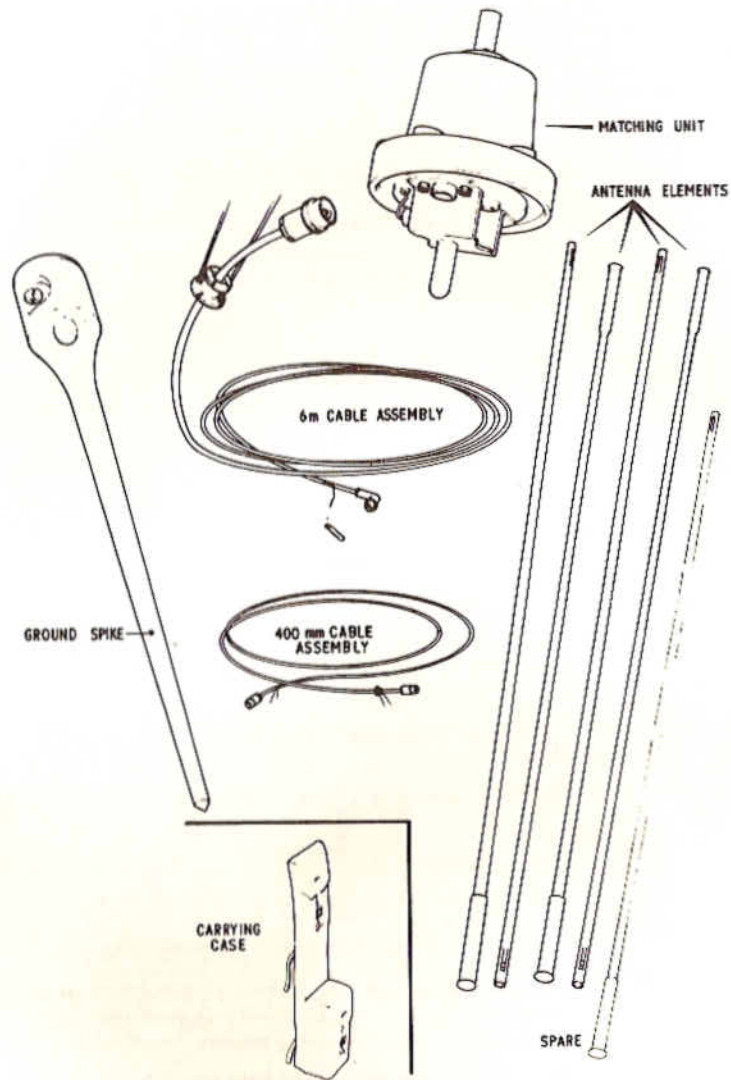


Fig.21 Items Forming VHF Ground-Spike Antenna Assembly

RESTRICTED

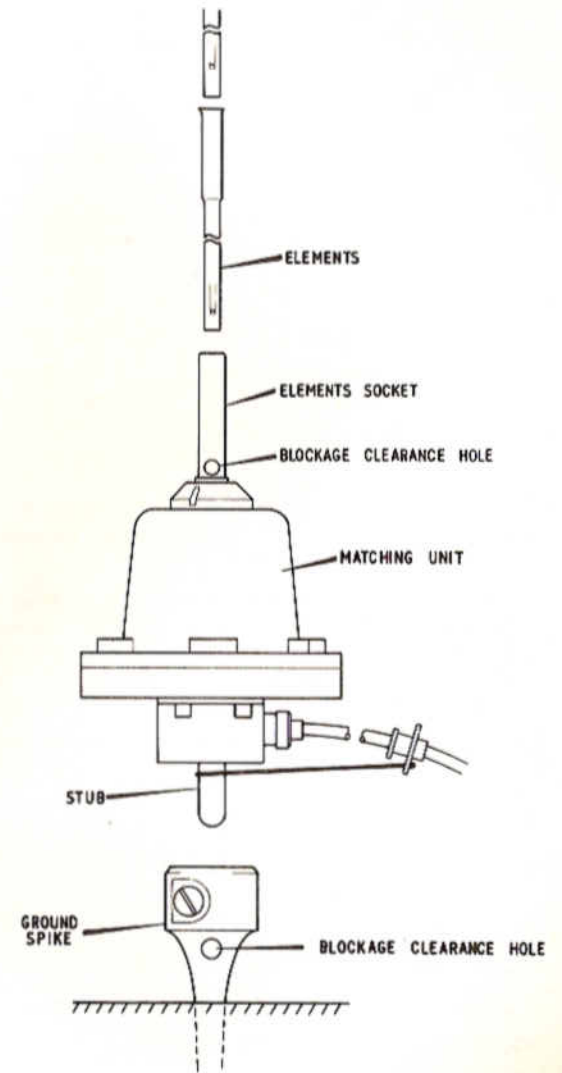


Fig.22 Assembly of Ground-Spike Antenna

- f. Connect the antenna to the radio by fitting the right-angle plug on the 6m cable to the antenna socket on the radio, and attach the cable strainer to the nearest suitable part of the radio.
- g. The antenna is now ready for use.

Dismantling

6. Dismantling of the antenna is carried out in the reverse order to that described for assembly. In particular:
- Every item should be wiped clean of mud and debris before it is stowed in the carrying case. Pay particular attention to cleaning the blockage clearance hole in the matching unit and the ground spike.
 - Fit the protective dust cap to the coaxial connector on the matching unit.
 - Check that all items are present before closing the carrying case.

2.3.1.2 ELEVATED KIT (Including 5.4m Mast)

Description

- The Elevated Kit (5985-99-630-6499) enables the VHF Ground Spike Antenna Assembly to be used in an elevated position, thereby increasing the range over that provided by the ground mounted configuration.
- The kit provides an adaptor to enable the antenna to be fitted to the top of a 5.4m mast (NATO code no. 5820-99-621-9027), three lengths of cable for lower elements, an inductor unit arranged to attach to the mast and a 20m cable to connect the inductor to the radio in case the 6m cable supplied with the antenna is not long enough (Fig.24 refers).
- A cord assembly provides for an alternative arrangement whereby the antenna can be suspended from any convenient overhead projection such as the branch of a tree.
- A fabric carrying case is provided to house the kit. The carrying case measures approximately 0.3m x 0.1m x 0.2m; its weight when loaded with the antenna is 2.7 kg.
- The 5.4m mast comprises six tubular sections which, when fitted together, are supported by three pairs of guys. For ease of transport, the mast is supplied as a kit containing the following items:-

(1)	Mast section assembly (section), 5820-99-621-9017	6 off
(2)	Guy assembly (guy), 5820-99-621-9018	6 off
(3)	Stake, peg assembly (stake), 4030-99-621-9019	5 off

GUY PLATE

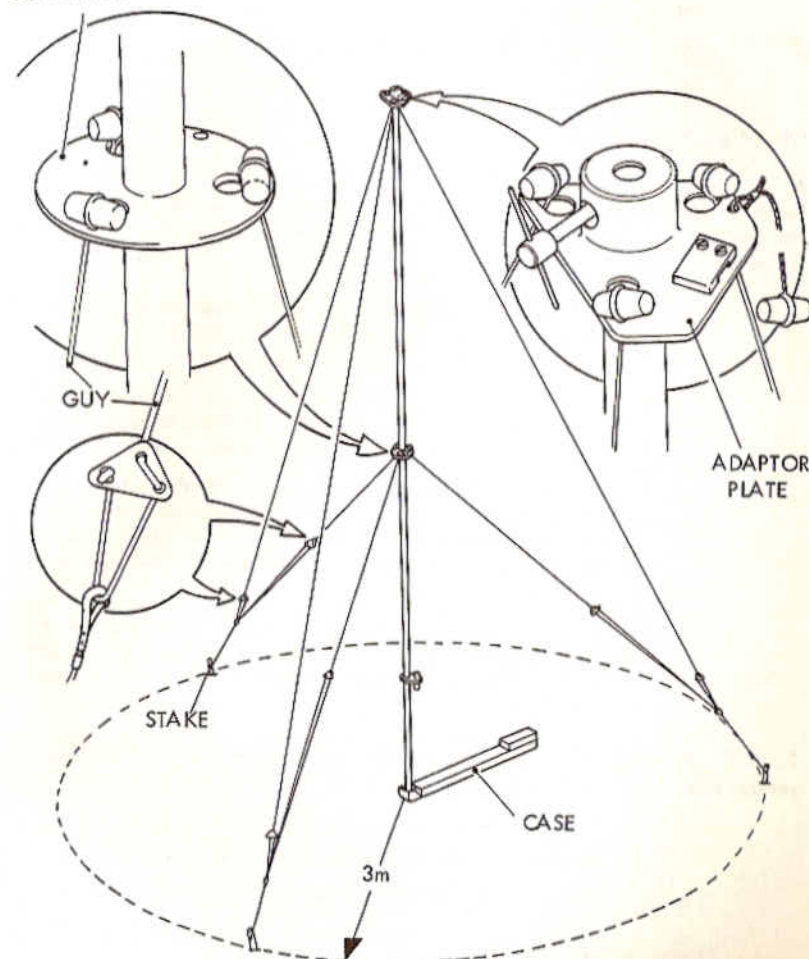


Fig 23 Erection of 5.4m Mast

(4)	Adaptor, mast assembly (adaptor), 5820-99-621-9020	1 off
(5)	Plate, guy (guy plate), 5820-99-621-9021	2 off
(6)	Former, 5820-99-621-9022	3 off
(7)	Plate, tie (tie plate), 5820-99-621-9023	1 off
(8)	Case, mast (case), 5820-99-621-9024	1 off

Assembly (Including 5.4m Mast)

6. Choose a site which provides an unobstructed space, from the ground to a height of approx. 8m and which provides a ground space of approx. 6m square for the erection of the mast, guys etc. Assemble, but do not raise, the 5.4m mast as follows:

- a. Remove all items from the case and fit together the six sections, interposing a guy plate between the third and fourth and the tie plate between the two lowermost sections.
- b. Fit to the top of the mast the adaptor plate; secure it to the mast by inserting the toggle (attached to the adaptor) in the appropriate hole in the mast centre plate.
- c. Remove the guys from the formers on which they are wound and feed the guy toggles through the underside of the elongated holes in the guy plate and adaptor plate. Locate the toggles so that they will not pull through the holes when the guys are under tension.
- d. Drive into the ground three of the stakes, equally spaced in a circle of 6m diameter. In soft ground, dig holes for the stakes and embed them to a depth sufficient to withstand the tension of the guys.

7. Assemble the elevated kit (Fig.24) to the 5.4m mast as follows (Fig.25a); remove each item from the relevant carrying case only when the item is required.

- a. Fit the matching unit base stub into the hole in the head of the adaptor. Tighten the locking key on the adaptor.
- b. Fit the inductor unit to the top segment of the 5.4m mast.
- c. According to the frequency band, note the number of antenna elements required thus:

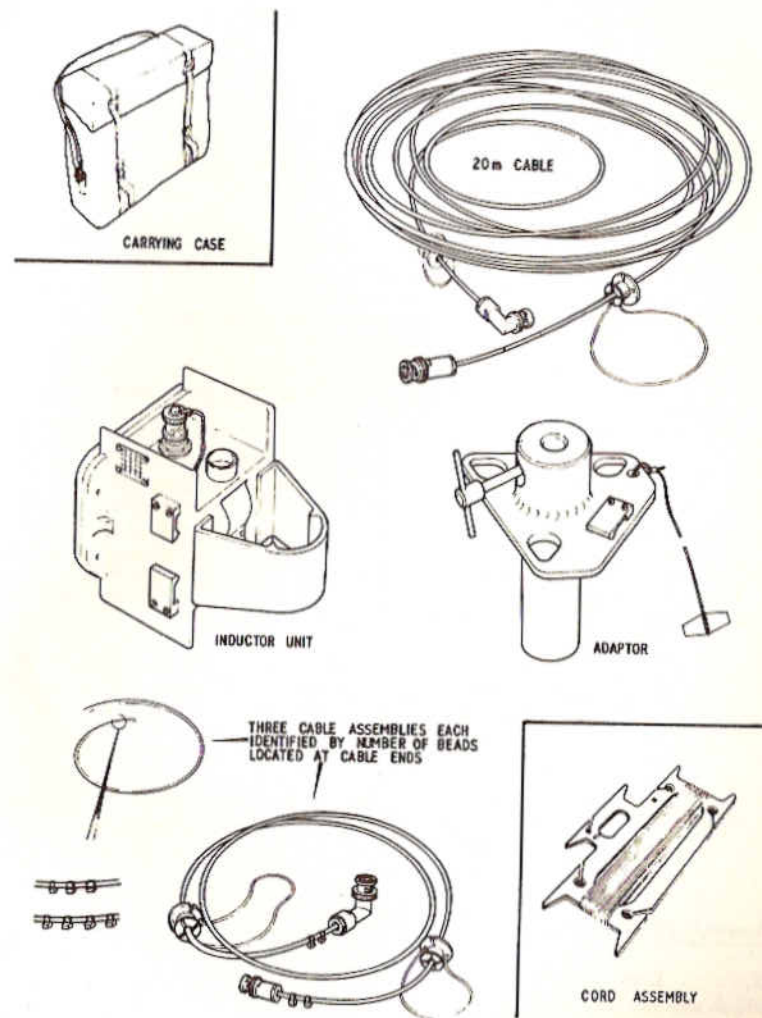


Fig 24 Items Forming Elevated Kit

Frequency band	Number of Elements
30-53MHz	4
52-71MHz	3
70-76MHz	2

- d. Select the coaxial cable which has, at its ends, a number of beads equal to the number of elements required. Connect this cable (see NOTE) between the connector on the matching unit and that on the inductor unit.

NOTE: A captive dust cover is fitted to each cable socket on the matching unit and the inductor unit. To prevent ingress of dirt, do not remove the cap from a socket until the instant of making a connection; the cap should then be fitted to the receptacle provided.

- e. Attach the cable strainers to the clips on the adaptor and inductor respectively.
- f. According to the distance to the radio, select either the 6m or the 20m cable. Connect the "straight" plug at one end of the cable to the socket on the inductor unit and attach the cable strainer clip to the grip on the inductor unit.
- g. Take the required number of antenna elements, plug the elements into each other, plugging the first element into the socket on top of the matching unit.
- h. Stand the base of the mast on the reinforced lid of the case in the centre of the circle and attach the loop at the end of the upper and lower guy of each pair to a stake by means of its hook. Raise the mast/antenna assembly and tighten the guys. (Fig. 23 refers).
- i. Connect the antenna to the radio as instructed on Page 46 para.f, reading 20m cable for 6m cable if appropriate.
- j. The antenna is now ready for use.

Assembly (Suspension from Convenient Overhead Projection)

8. Choose an overhead projection which is at a convenient height and which will not fray or cut a cord passed over it.
9. Proceed as follows (Fig.25b), removing each item from the relevant carrying case only when the item is required:

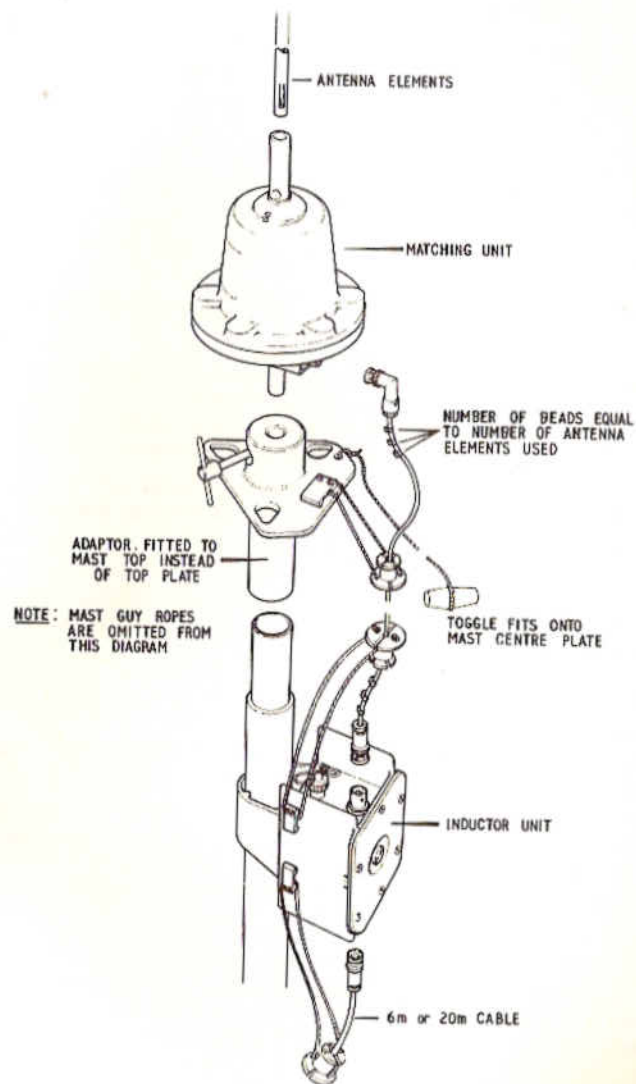


Fig 25a Assembly to top of 5.4m Mast

- a. Uncoil approx. 2m of cord from the cord assembly.
- b. Take the plate at the extreme end of the cord and place it over the matching unit base stub. Place the stub into the hole in the head of the adaptor and tighten the locking key.
- c. Carry out the assembly procedures (Page 50) given in para 7 (c) to (g) but, before plugging the first antenna element into the matching unit, place the second plate on the cord over the stub on top of the matching unit.
- d. Take the spring clip on the cord and insert it into the blockage clearance hole on the matching unit.
- e. Fully uncoil the cord and pass the free end over the selected projection.
- f. Support the antenna in a vertical position by hand. At approx. 1m from the antenna end, gently pull the cord upwards so as to draw the plate from the stub on top of the matching unit to as far along the antenna as the cord will permit.
- g. Pull the free end of the cord to take up all slack; the hand support of the antenna may now be removed, provided the cord is not released.
- h. Raise the antenna to the desired height by pulling on the cord, taking care to avoid damaging the antenna on any projection and ensuring that cable strainers prevent weight being taken by connectors.

NOTE: The inductor unit should be allowed to come free of the ground.

- i. Securely fasten the free end of the cord to any convenient fixture.
- j. Connect the antenna to the radio as instructed in para f. (Page 46), reading 20m cable for 6m cable as appropriate.
- k. The antenna is now ready for use.

Dismantling

10. Dismantling of the antenna, the elevated kit and the 5.4m mast (if relevant) is carried out in the reverse order to that described for assembly. In particular:

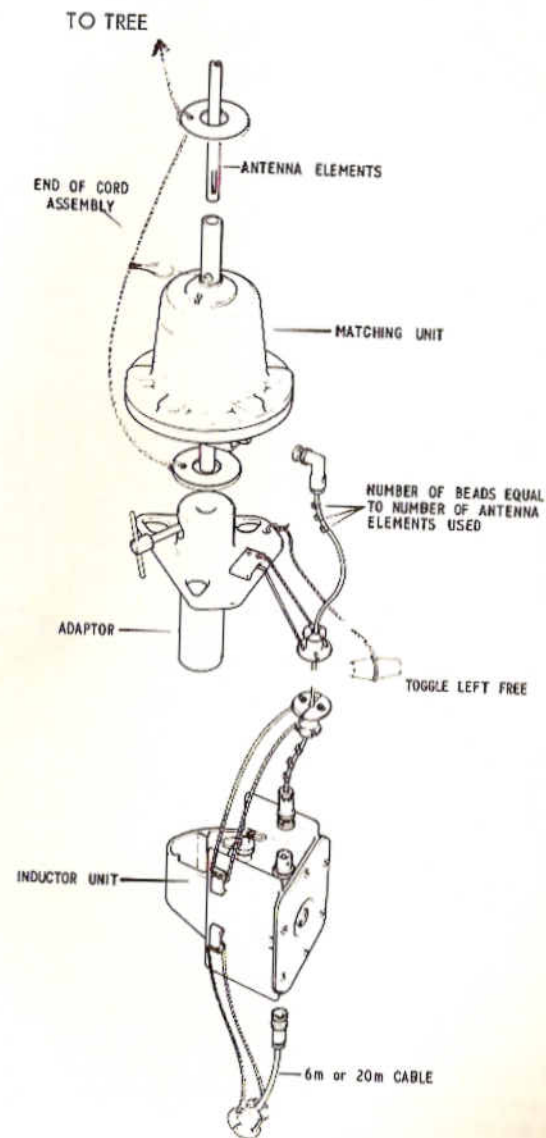


Fig 25b Assembly for Overhead Suspension

- a. Every item should be wiped clean of mud and debris before it is stowed in the carrying cases. Pay particular attention to clearing the blockage clearance hole in the matching unit.
- b. Fit the protective dust cap to the coaxial connectors on the inductor unit and the matching unit.
- c. Check that all items are present, and in the correct case, before closing the cases.

2.3.2 HAND GENERATOR OPERATION

The Hand Generator is intended for use with the PRC-351.

1. Remove the existing battery.
2. Fit the Hand Generator and, in turn, a 1 Ah battery in the same manner as shown on page 11.
3. Loosen the wing nut retaining the generator handle. Set the handle to the winding position and re-tighten the wing nut.
4. Turn the handle clockwise. As the turning speed is increased, the generator indicator lamp (provided with a sliding shutter for night operation) will glow until a speed is reached at which the lamp extinguishes. Continue turning at this speed. There is no advantage in turning faster (Refer to page 56).

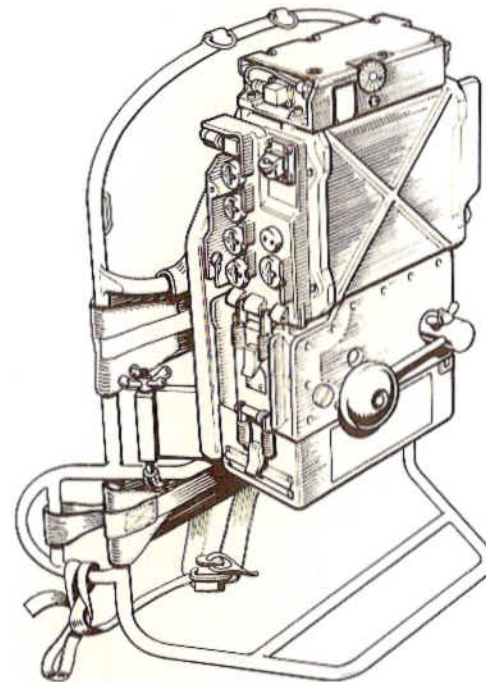


Fig. 26 Fitting Hand Generator

NOTE: In an emergency, the generator alone (without the battery) will power the radio in the receive mode. It is necessary to wait until the generator is up to normal speed before switching on the radio.

The Hand Generator is provided to prolong the life of a radio battery, between charges, under conditions where the AC or DC charging units are not available. It is normally used with a 1 Ah battery but can be used with a 3.3 Ah battery. (If so, PRC-352 must be removed from the GS carrier.)

The generator is intended to float charge the battery whilst the radio is in operation and, assuming the normal 1:9 Transmit/Receive ratio, the output of the generator is sufficient to keep the battery fully charged.

However when this ratio is exceeded, the load causes the state of battery charge to fall; it will therefore be necessary to keep turning the generator handle after the radio has been switched off, so that the battery is re-charged ready for the next period of operation. (See Fig.27).

Immediately the generator handle is turned the indicator lamp on the generator glows until, as the speed of rotation is increased, a point is reached where the indicator lamp extinguishes; at this point the correct charging rate has been attained and the generator should continue to be turned steadily at this speed.

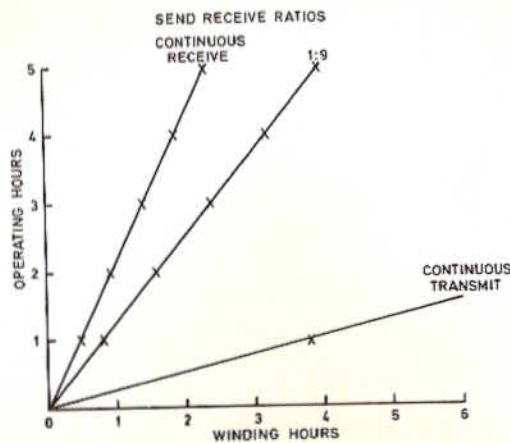


Fig.27 Graph: Hand Generator Operation with PRC-351

It is convenient for the generator to be used (by a second person turning the handle) whilst the radio is set up as a ground station.

Fig. 27 (above) compares the operating time of a PRC-351 with the amount of time spent turning the generator handle in order to keep the battery charged.

When a PRC-352 equipment is in operation the current drain on Transmit is so great that the winding time, necessary to recharge, makes the use of the Hand Generator impractical. If however the Transmit periods are kept short, and the Transmit/Receive ratio does not exceed approximately 1:10, a useful extension of battery life can be achieved.

2.3.3 HANDSET, REMOTE CONTROL

This Handset (see also page 19) is used for control of the radio from distances up to 3 km and is connected to the radio by twin wires (D10 is commonly used). See pages 19 and 20 for details of the facilities.

Insert each wire into the hole in the metal cable stripper and pull it hard along the Vee cutting slot. If the wire pulls out, re-insert with about $\frac{1}{2}$ inch of the insulated covering beyond the slot and pull again. Loop the wire between the circular boss and the triangular piece to take the pulling strain.

To TRANSMIT, operate the hand-pressel switch.

To CALL, press the small button at the microphone end of the Handset Housing. (If the Call button switch fails, apply a short-circuit across the bare wires with a knife blade or piece of wire; there is no harmful voltage on these wires).

2.3.4 AUDIO EXTENSION LEAD

An audio extension lead is provided to enable the radio to be operated remotely up to a distance of 10 metres. This facility is useful in circumstances where it is desirable for the radio to be operated from a good radio site whilst the operator takes advantage of Local cover. The extension lead is connected as follows:-

1. Remove the Headset from the Headset socket on the radio.
2. Connect the plug on the extension lead to the Headset socket on the radio.
3. Connect the Headset to the socket on the extension lead.
4. Site the radio in a suitable open position, and pay out the extension lead to the chosen sheltered position.

2.3.5 CLANSMAN PARA. CARRIER

The radio is fitted in exactly the same manner as to the Adaptor Plate on the GS Carrier.

2.3.6 BATTERY EXTENSION LEAD

In extremely cold weather the efficiency of the primary battery is reduced and the output voltage will fall; therefore, a battery extension lead is provided in order that the battery may be placed inside the combat jacket, where the User's body heat will keep the battery at a working temperature. The extension lead should be used at air temperatures below -5°C . The socket at the radio end of the lead, and the plug at the battery end, can only be connected in one position; tighten the knurled screws after connection.

2.3.7 EXTERNAL POWER SUPPLY LEAD (for emergency use)

This lead is for emergency use to supply the radio when the normal battery is not available. Connect one end to the PRC-351 or PRC-352 in place of the battery. Connect the 'alligator' clips at the other end to a DC source between 20V and 32V.

If the radio fails to operate, reverse the clip connections.

IMPORTANT: To be certain of not damaging the radio, the DC source must be a battery of 20V to 32V not connected to anything else. Any type of battery is satisfactory (the radio can be permanently damaged if the battery is being 'float' charged in vehicles, especially General Service vehicles, or if the battery is connected to e.g. the horn, windscreen wiper etc).

2.3.8 BATTERY CHARGING

1. DC Charging Unit

The DC Charging Units are of two types, one operating from a 14V DC and the other from a 28V DC supply. They are intended to float-charge a manpack secondary battery when the manpack is being used in a vehicle-mounted role.

Both will charge one 24V secondary battery, and both are equipped with 'charging' and 'charge-completed' lamps.

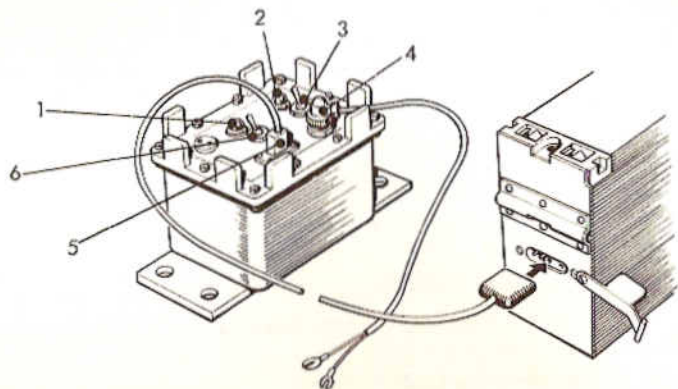


Fig.28 DC Charging Unit Connections

NOTE: No damage will occur to the battery or charger if a fully-charged battery is left on charge. Only one battery at a time can be charged.

- Connect the DC INPUT plug (4), via the charging cable, to the DC supply (14V or 28V); ensure correct polarity.
- Connect the OUTPUT connector (5), via the charging cable, to the battery.
- Set the INPUT switch (3) to ON.
- Set the LAMPS switch (6) to the 'down' position.

The CHARGE PROCEEDING (Yellow) lamp (1) will glow to indicate that the battery is properly connected and is being charged.

When the battery is fully charged, the lamp (Yellow) will extinguish and the CHARGE COMPLETE (Green) lamp (2) will glow. The approximate charging times (from flat) are:-

1 Ah battery, 1½ hours
3.3 Ah battery, 4 hours

- Except when connecting a battery, or inspecting its state of charge, set the LAMPS switch to OFF.

2. AC Charging Unit

The AC Charging Unit operates from 100-125V or 200-250V, 50-60 Hz AC mains supply, and can charge simultaneously up to 16 manpack 24V secondary batteries. It is equipped with 'charging' and 'charge-completed' lamps.

- Remove the cover from the charging unit.
- Adjust the voltage selector panel (8) to correspond with the available mains supply (page 60).
- Remove the cover from the AC mains fuse (4) and ensure that it is of the correct rating, i.e. 20A for a 100-125V supply or 10A for a 200-250V supply.
- Open the sliding vent at the rear of the charging unit.
- Using the AC charging unit supply cable, connect the INPUT plug (6) to the AC mains supply.
- Set the LAMPS switch (7) 'down' (on).
- Using the battery charging cables, connect the charging connector of each battery to be charged to an outlet connector (3) and set the MAINS switch (5) 'down' (on). Each outlet has an associated amber lamp (1) which will glow to indicate that the battery is properly connected and is being charged. When the battery is fully charged, the lamp will extinguish and an associated green lamp (2) will light.
- The approximate charging times from flat are:-

1 Ah battery, 1½ hours
3.3 Ah battery, 4 hours
- Except when connecting the batteries, or inspecting their charge state, set the LAMPS switch to OFF.
- Replace charged batteries with discharged ones (there is no need to switch off when doing so). No damage to the battery or the charging unit will occur if a fully charged battery is left on charge.

WARNING
ELECTRIC SHOCK
AC MAINS VOLTAGE CAN ENDANGER HUMAN LIFE

All reasonable precautions for the safety of personnel have been taken in the design of this equipment. Always switch the power off before making internal adjustments.

CARELESSNESS COULD BE FATAL

For first aid in case of electric shock, see the instructions on pages ii to iv.

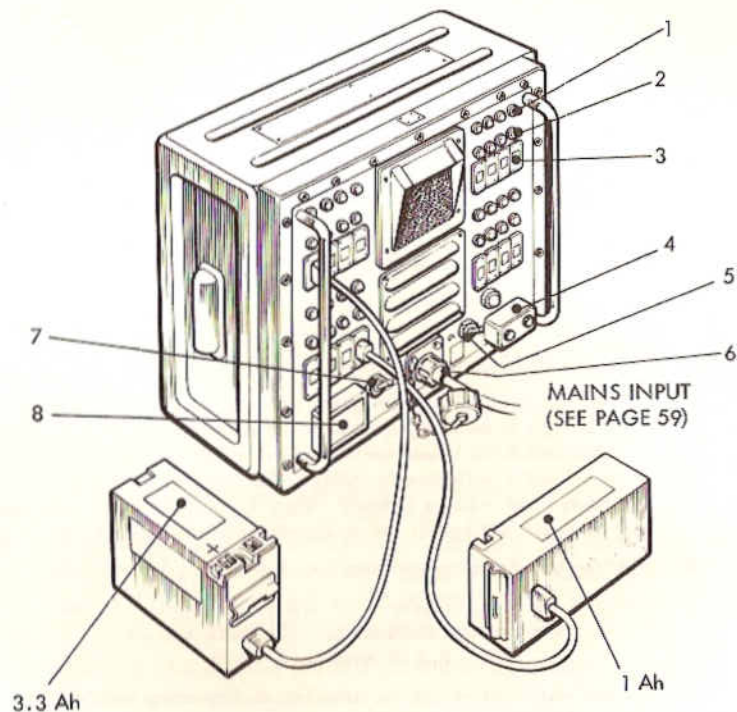


Fig. 29 AC Charging Unit Connections

VEHICLE INSTALLATION AND PREPARATION

3.1 'B' VEHICLE CLIP-IN

The manpack (fitted to GS Carrier) is clamped to a frame (frame, electrical equipment 5820-99-620-9619) which is fitted vertically to slotted angle pieces within the rear of the vehicle. To fit the manpack to the frame, proceed as follows:-

- (a) Loosen the three hinged wing-nuts on the frame and tilt them back.
- (b) Referring to the diagram below, position the manpack carrier as shown.
- (c) Tilt the hinged wing-nuts forward and tighten until the carrier is securely clamped.
- (d) Connect the 1 metre cable (Fig.31, page 62) from the DC Charging Unit to the charging socket on the manpack 3.3 Ah battery.

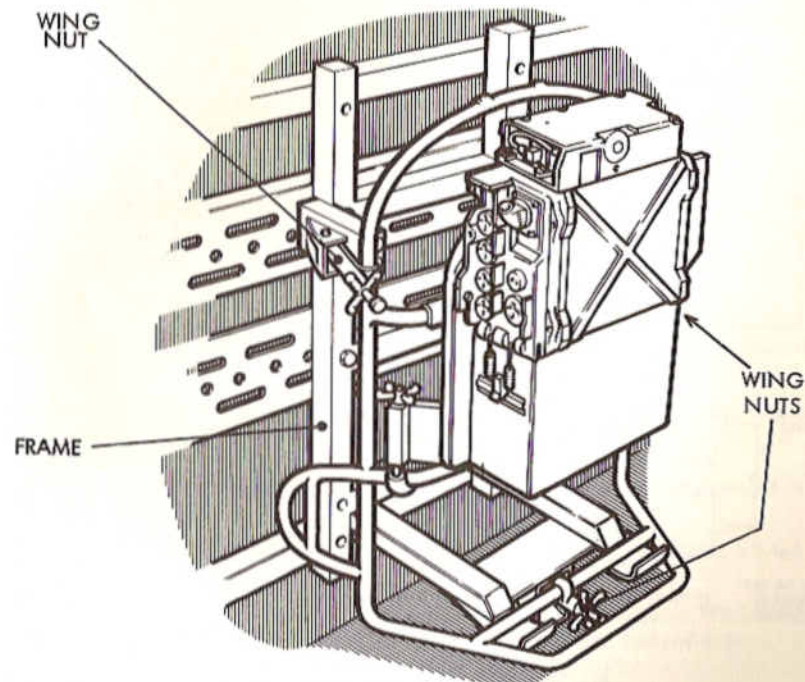


Fig. 30 Typical 'B' Vehicle Clip-In

- (e) Connect the RF cable from the RF IN socket on the TUAAM to the RF OUT socket on the 20W RF Amplifier.
- (f) Connect the control cable from the Initiate Box to SKT2 (grey ring) on the RT-351 radio.
- Note that this cable MUST NOT be connected to SKT1 on the radio.
- (g) Connect headsets to SKT1 on the radio and/or to the AUDIO socket on the Initiate Box.

The remaining cable connections in the vehicle installation will already have been made.

3.2 VEHICLE CLIP-IN INTERCONNECTIONS

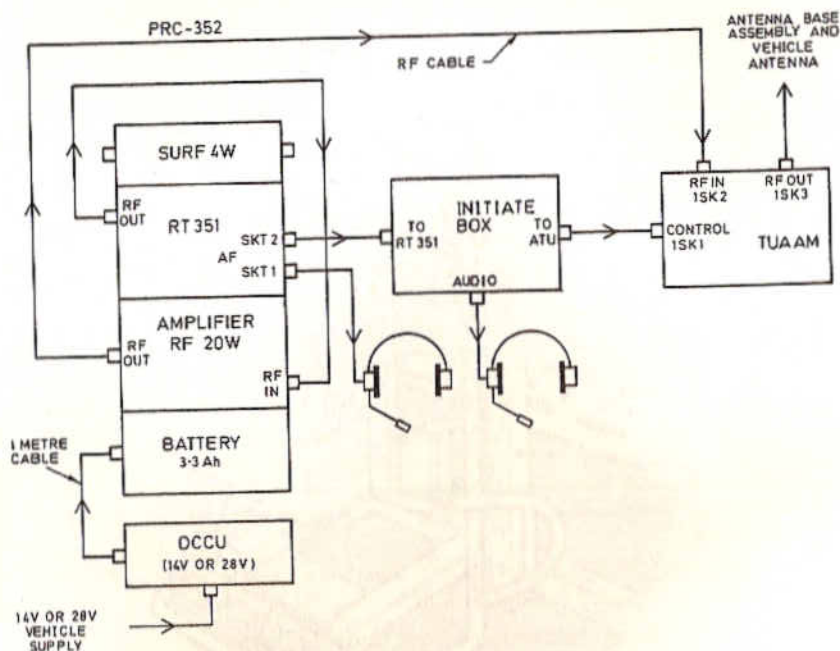


Fig. 31 Vehicle Clip-In Interconnections

3.3 VEHICLE OPERATION

The switch on the Initiate Box is normally set to 'N' (see 3.3.1). Operation is similar to that of the basic manpack when connected to a remote antenna; however, either when switching on or making a frequency change, the TUNE pushbutton on the Initiate Box must be depressed and released in order to tune the TUAAM to the new frequency. An amber lamp glows during the tuning sequence (3 sec. approx.) and then extinguishes to show that the Station is ready for operation. The connection of an unsuitable antenna, or no antenna connection, or no RF cable connection to the RF IN socket, will be indicated by the amber lamp glowing for about 10 seconds before extinguishing. In this event, switch off the RT-351, correct the fault and restart the tuning sequence.

CAUTION: Ensure that the RT-351 is not switched to 'I' (Intercom) or 'C' (call) when a tuning sequence is to be initiated.

A red lamp on the Initiate Box glows when the RT-351 is switched on. When leaving the vehicle, ensure that this lamp is extinguished by switching off the RT-351.

3.3.1 FREQUENCY CHANGE DURING RADIO SILENCE

For normal operation, the switch on the Initiate Box is set to 'N' (normal). If, during a period of radio silence, it becomes necessary to change the operating frequency, set the switch on the Initiate Box to 'S' (silent) before operating the TUNE pushbutton.

The TUAAM will then tune into an internal dummy load. On completion of the tuning sequence, the TUAAM automatically reconnects the antenna for reception. When ordered to break radio silence, switch to 'N' and retune by operating the pushbutton before attempting to transmit.

3.4 VEHICLE ROLE

PRC-351 and PRC-352 radio equipments can be clipped into vehicles and operated on the move using the vehicle antenna and ancillary equipment.

Multiple set vehicle installations are possible combining Clansman and non-Clansman equipments. Separate Handbooks cover the Clansman Harness and interconnections with the Larkspur Harness (Army Codes 61172 and 60968 respectively); therefore descriptions of the various installations are not covered in this Handbook.

However as an example of what is entailed in vehicle operation, a brief description of one type of installation is as follows:

A PRC-352 mounted on its manpack carrier is clipped into an FFR Landrover installation. The installation contains a TUAAM, an Initiate Box and a 2-metre vehicle whip antenna (see Fig31, page 62).

Provision is made for the connection of a DCCU (direct current charging unit) to the Clansman battery so that it can be receiving a charge whilst installed.

3.5 VEHICLE WORKING RANGE

This depends on siting, terrain and frequency. With a 2-metre Antenna Whip and TUAAM approximate ranges are:- PRC-351, 17 km; PRC-352, > 28 km.

NOTE: The Initiate Box MUST be connected to SKT2 (marked with grey ring) on the RT-351. Use SKT1 (RT-351) for connecting one set of headgear and, if needed, the alternative outlet on the Initiate Box for a second set of headgear.

The 2-metre whip antenna is mounted on the Antenna Base Assembly.

NOTE: The SURF 4W must not be connected in vehicle installations. Also, never connect more than one antenna to the installation.

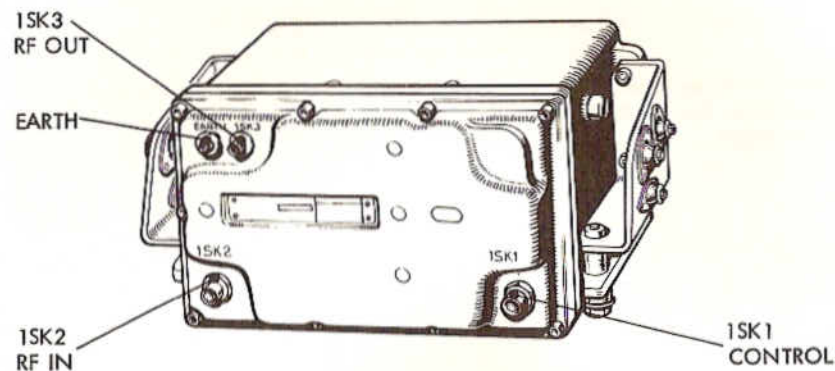


Fig. 32 Antenna Tuning Unit (TUAAM)

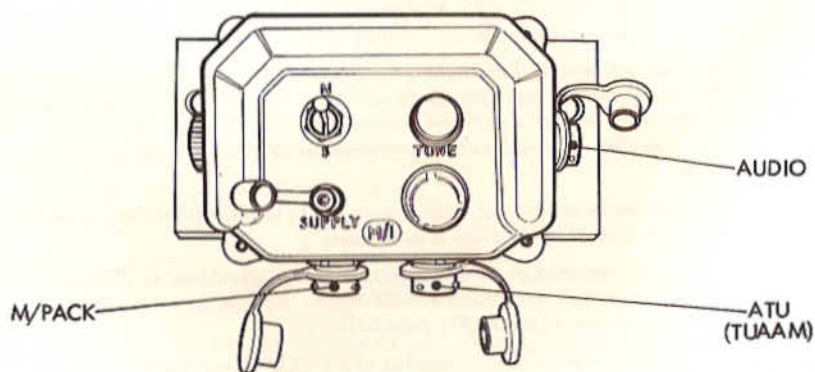


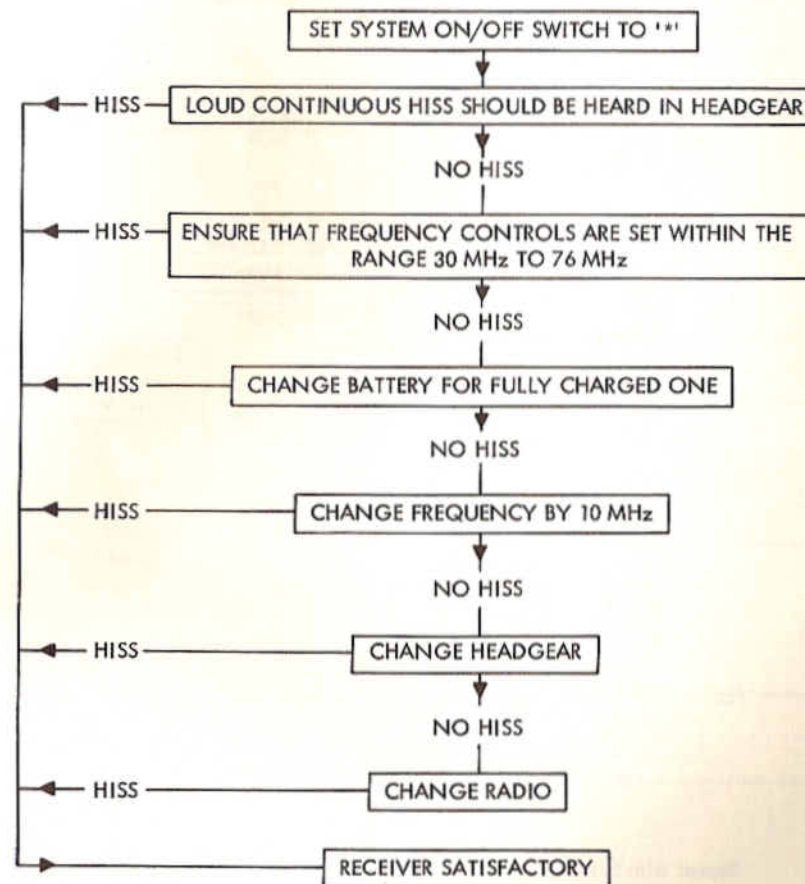
Fig. 33 Initiate Box

MAINTENANCE INFORMATION AND INSTRUCTIONS

4.1 FAULT LOCATION

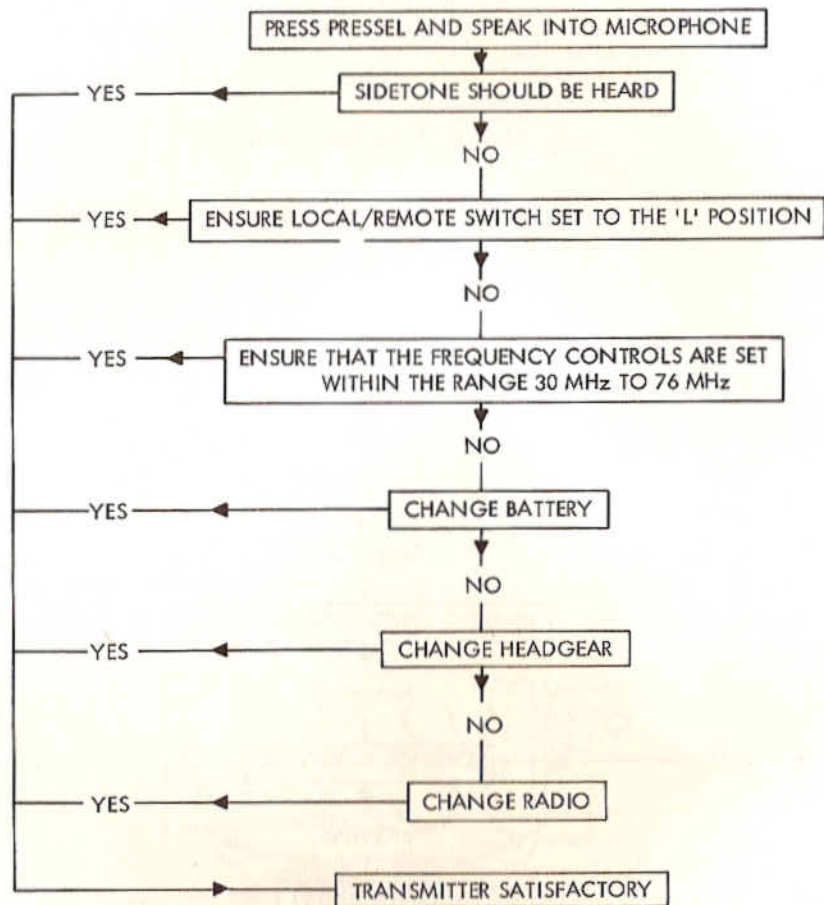
4.1.1 PRC-351 RECEIVER TEST, LOCAL OPERATION

This procedure should be carried out at four frequencies approximately 31, 47, 49 and 75 MHz. Connect the battery and headset to the radio. Set the Local/Remote switch to the 'L' position.



4.1.2 PRC-351 TRANSMITTER TEST, LOCAL OPERATION

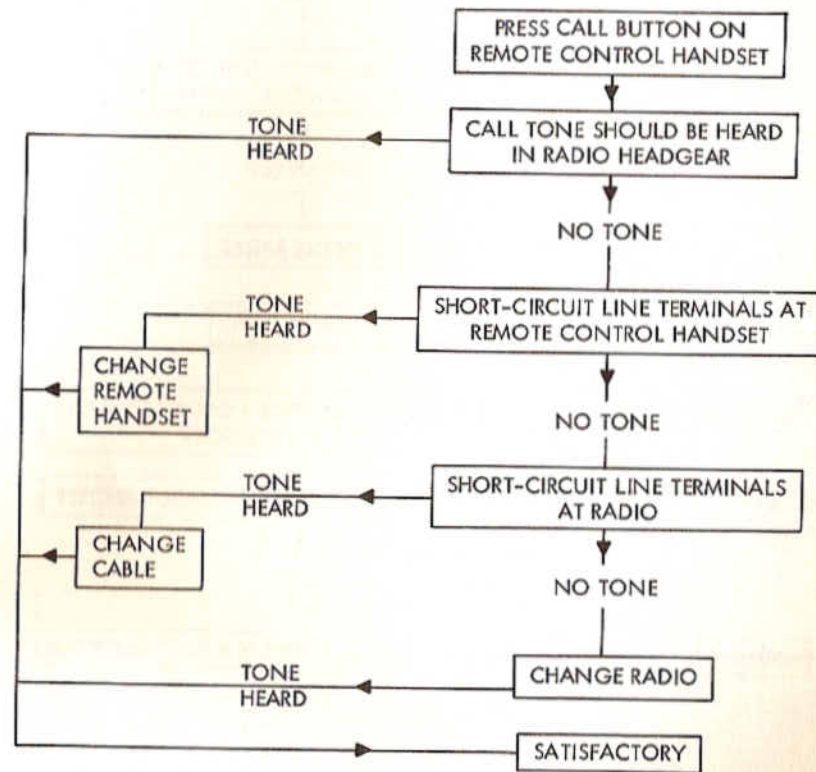
This procedure should be carried out at four frequencies, approximately 31, 47, 49 and 75 MHz. Fit whip antenna into antenna socket. Set the Local/Remote switch to the 'L' position. Set the System - On/Off switch to the 'L' position.



Repeat with System - ON/OFF switch at 'W'.

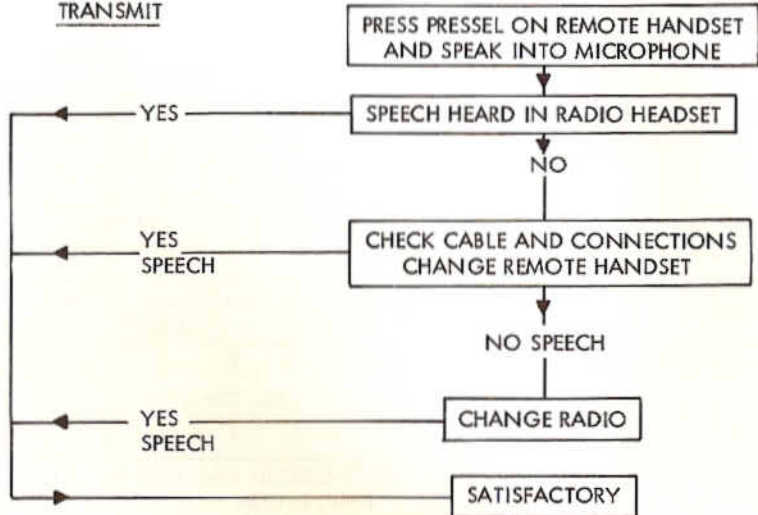
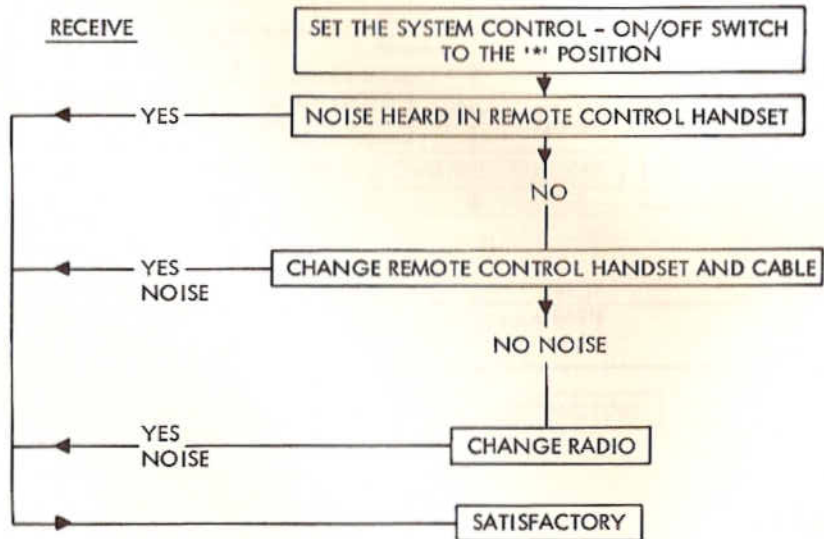
4.1.3 REMOTE CONTROL TESTS

Test radio for Local Operation as detailed on pages 65 and 66. Leave Headset/Handset attached to radio. Connect Remote Control Handset using short length of cable. Set the Local/Remote switch to the 'R', 'A', and 'I' positions in turn.

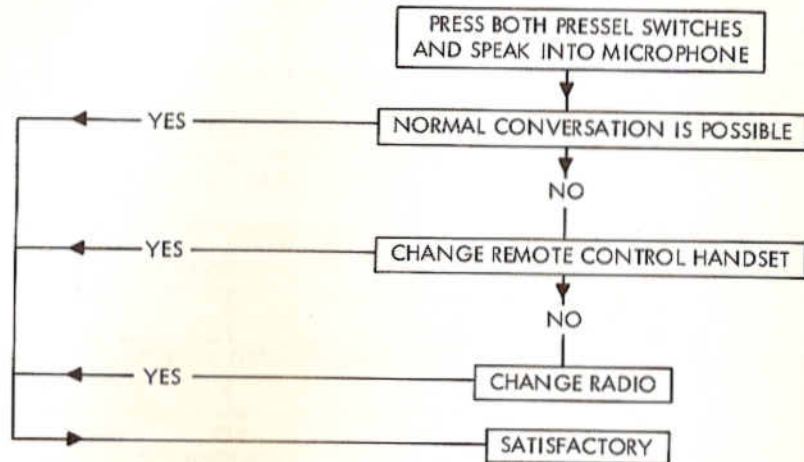
1. Call Test

2. Speech Test on Remote

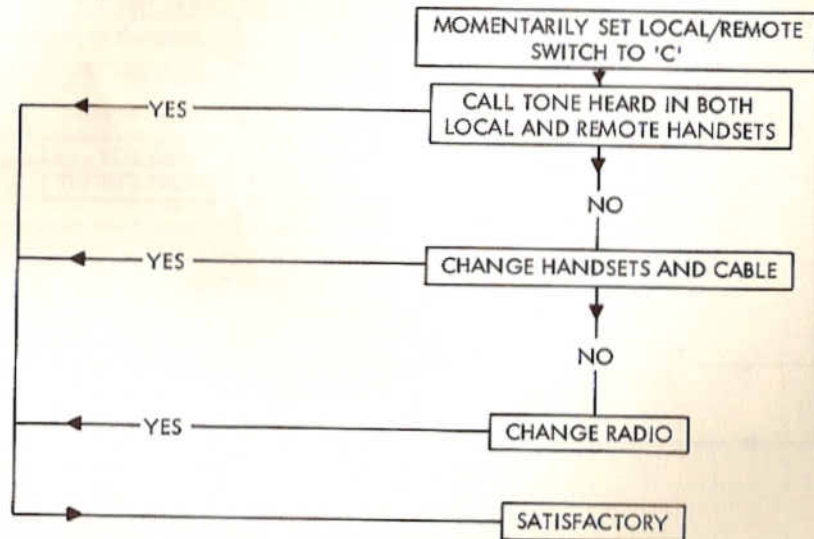
Set the Local/Remote switch to the 'R' position.

TRANSMITRECEIVE3. Speech Test on Intercom

Set the Local/Remote switch to the 'I' position.

4. Call Test on Intercom

Set the Local/Remote switch to the 'I' position. Carry out Test on page 67 then:-



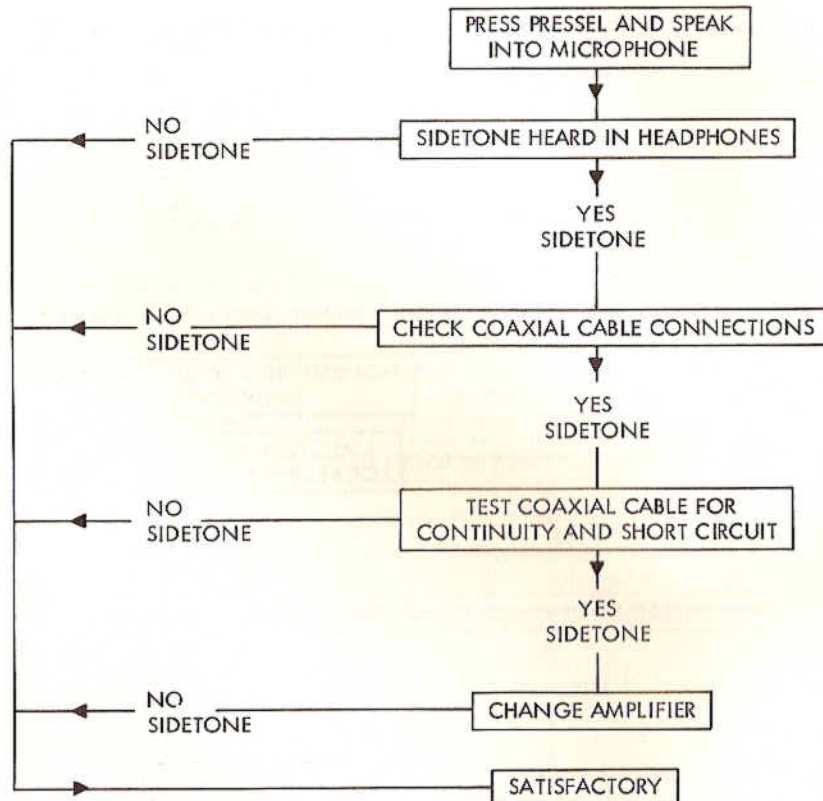
4.2 FAULT LOCATION, PRC-352

4.2.1 PRC-352 TRANSMITTER TEST 1

Disconnect the coaxial cable to the Amplifier RF by removing the plug from the coaxial antenna socket on the radio.

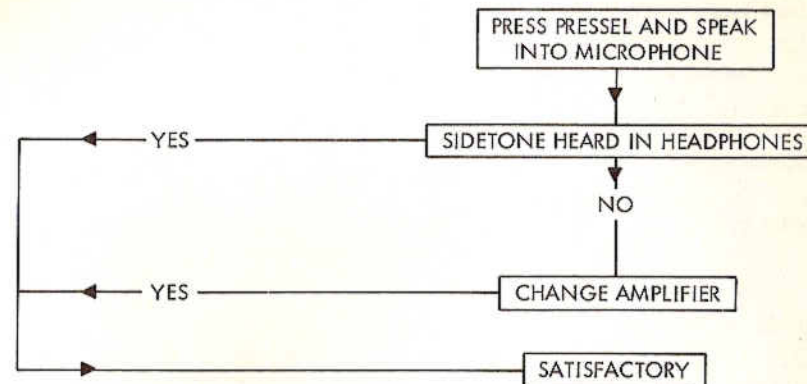
Carry out the fault location procedure detailed for the PRC-351; if satisfactory, reconnect cable and proceed as follows:

The ground-spike antenna need not be connected. Set the Local/Remote switch to the 'L' position. Set the System Control - On/Off switch to the 'L' position. Set the Band switch on the Amplifier RF to the 'T' position.



4.2.2 PRC-352 TRANSMITTER TEST 2

Connect ground-spike antenna. Set the frequency controls on the radio to 35 MHz, 47 MHz and 65 MHz in turn. Set the Band switch to each of the three frequency bands in turn. Carry out the following procedure on each of the selected frequencies.



4.2.3 PRC-352 RECEIVER SIGNAL PATH TEST

The PRC-352 receiver signal path cannot be fully tested unless a signal is received at the ground-spike antenna i.e. a second radio set available.

4.2.4 PRC-351/2 AUTOMATIC REBROADCAST TEST

The automatic rebroadcast position of the Local/Remote switch can only be fully tested using a complete rebroadcast system (four stations). Set up stations according to procedure detailed on pages 21 to 23.

If fault occurs: each station check all connections to cables, etc., and carry out Fault Location procedure on their equipment. If fault persists change radio at station B and C in turn.

Page 72 has been deliberately left blank.

WORK (MAINTENANCE) SCHEDULES

5.1 STANDARD TROOP INSPECTION (STI)

The following checks are to be applied daily when the radio is in frequent use, or weekly when used infrequently.

1. Check, against the CES, that the equipment is complete.
2. The UK/PRC-351 and 352 are sealed equipments and the user should NOT attempt to open them.
3. Clean and dry the equipment, particularly around the battery connections on the radio and Amplifier RF.
4. Check that the battery contact springs on the battery and Amplifier RF are not broken; after cleaning the springs they are to be coated with petroleum jelly.
5. If, possible, check that the batteries are fully charged. The voltage with 10 ohms load should be approx. 24 - 26V.
6. Remove any dirt from plugs, sockets, knobs and terminals.
7. Check all switches and knobs to ensure they turn easily and perform their functions.
8. Examine all CES items for physical damage, frayed ends or damaged insulation on headset/handset.
9. Check serviceability of antennas - 1.2m whip, trailing-wire and ground-spike. If necessary, clean the electrical contacts on the ground-spike antenna elements using emery cloth.
10. Connect the battery, antenna and audio gear. If using as a PRC-351, ensure that the coaxial cable for the amplifier is disconnected at the PRC-351 end.
11. Switch the radio to the test frequency; turn the Local/Remote switch to 'L' (local) and the System Control switch to '*' (noise on). A loud hiss should be heard proving the Receiver is serviceable.
12. Turn the System Control switch back to 'L' (loud) and operate the pressel; sidetone should be heard proving the Transmitter is serviceable.
13. Fit and check the SURF 4W in accordance with para.5 of Sect. 2.1.11 (page 31).
14. When used as a PRC-352, disconnect the whip or trailing-wire antenna. Connect the coaxial cable between the antenna coaxial socket on the PRC-351 and the input of the RF Amplifier.
15. Connect a ground-spike antenna to the antenna socket on the RF Amplifier.

16. Turn the Band switch on the Amplifier RF to the 'T' (test) position and operate the pressel; sidetone should NOT be heard. This checks the coaxial connector between the radio and amplifier for continuity.
17. Repeat para. 11.
18. Turn the Band switch to the correct frequency range and operate the pressel; sidetone should be heard. Lack of sidetone indicates that the amplifier is unserviceable.
19. Connect a remote handset to the remote terminals; turn the Local/Remote switch to 'R' (remote); set the System Control switch to '**' (noise on); a loud hiss should be heard in the remote handset.
20. Switch back to 'L' (loud) and operate the pressel; sidetone should be heard in the remote handset and the local handset.
21. To check the 'call' facilities:
 - (1) Remote Operator to Local Operator. Operate the 'call' button on the remote handset and a tone should be heard in the local operators headset/handset.
 - (2) Local Operator to Remote Operator. Switch the Local/Remote switch to 'C' (call) and a tone should be heard in the remote handset.
22. To check the 'intercom' facilities, switch the Local/Remote switch to 'I' (Intercom):
 - (1) Local Operator to Remote Operator. Operate the pressel switch and speech should be heard by the remote operator.
 - (2) Remote Operator to Local Operator. Operate the pressel switch and speech should be heard by the local operator.
 - (3) In the event of a signal being received, this will be heard by both the local and remote operators so long as the local operator's pressel is not operated.
23. To check the 'rebroadcast' facilities, set the Local/Remote switch to 'A' and refer to Sect. 2.1.9. Three additional radios are required for this check. One of these radios is linked by 2-wire cable and must be a UK/PRC-351 or 352, or a UK/VRC-353. The other two radios are used as outstations and must be a UK/PRC-349, UK/PRC-350, UK/PRC-351 or 352, or a UK/VRC-353.

5.2 DETAILED TROOP INSPECTION (DTI)

The following checks are to be applied at least once per month.

In addition to the actions required in the Standard Troop Inspection, the following shall also be performed:-

Connect the 50 ohm Antenna socket of the radio under test to the Condition Test Set (CTS) which, in turn, is connected to a known good PRC-351/352. The CTS is to be plugged into Audio SKT2 on the radio. The setting of the attenuators on the CTS, at which the received signal is just intelligible (QRK 3), are compared with the settings advised. If the settings are different, the radio under test should be sent to the Workshop.

5.3 REMEDIAL ACTION

1. Transmitter-Receiver RT-351, Amplifier RF (20W)

Replace the protective covers for the Audio and RF sockets in the event of damage or loss (CHAP. 1, Table 1).

2. Antenna, Trailing-Wire

Replace the 1.2 metre wire (CHAP. 1, Table 1). In emergency, any copper or aluminium wire is satisfactory; iron or steel wire is not satisfactory.

3. Man-pack Carrier (GS or Clansman)

If the tubing becomes bent, by dropping or crushing, so that the battery or Amplifier cannot be attached to the radio, it is permissible to bend carefully back into position.

4. Selective Unit RF (SURF 4W)

If the meter cover becomes damaged so that it cannot be closed, it is permissible to remove it. However, after tuning, tape should be applied to obscure the illuminated scale and protect the glass.

5.4 RECORDS

The purpose of this Record page is to provide evidence that maintenance has been done before REME inspection. The User MUST adhere to the requirements of this Record page.

<u>Date of Check</u>	<u>Radio Serial No.</u>	<u>User's Name</u>	<u>Faults Found</u>	<u>Action Taken</u>
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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 is 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 equipments 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. (AFG3660 is the form to use).