CONTENTS

Page

PRELIMINARY MATERIAL

Front cover (title page) . . . . . (i)
Amendment record . . . . . .(iii)/(iv)
Contents (this list) . . . . . (v)

EQUIPMENT INFORMATION

SECTION 1 GENERAL

Chapter

1 General information
2 Allowance policy, supply and accounting arrangements
3 Portable radio pools
4 Allowances

SECTION 2 CLANSMAN EQUIPMENT

Chapter

1 General information
2 Clansman communication sets
3 Clansman accessories
4 Routine maintenance

SECTION 3 COMMERCIAL PORTABLES

Chapter

1 General information
2 Commercial portables equipment details

SECTION 4 NAVAL OUTFITS

Chapter

1 General information
2 Naval outfits radio equipment

SECTION 5 STANDARD SHORT RANGE PORTABLES (COUGAR)

Chapter

1 General information
2 Equipment technical details
3 Operating instructions
4 Upkeep and support
5 Routine maintenance

(continued)

CONTENTS (continued)

SECTION 6 MOULD RADIO COMMUNICATION SYSTEM

Chapter

1 General information
2 Equipment technical details
3 Upkeep and support

SECTION 1

GENERAL

CONTENTS

Chapter

1 General information
2 Allowance policy, supply and accounting arrangements
3 Portable radio pools
4 Allowances

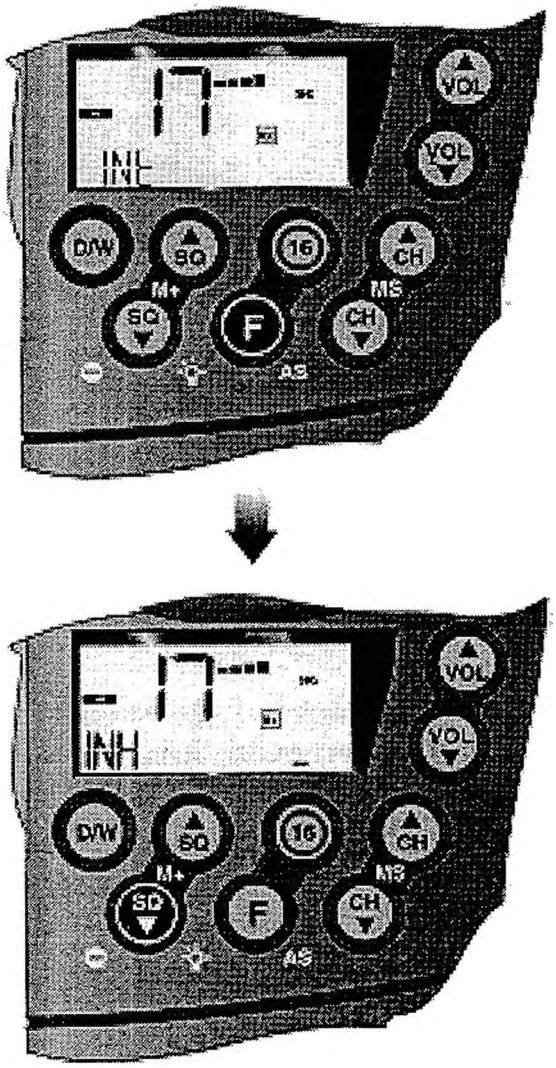


Fig 16 Inhibiting channel from scan

CHAPTER 1

GENERAL INFORMATION

CONTENTS

Para

1 Introduction
2 Equipment
3 Warnings and restrictions on use
6 List of abbreviations
7 Emergency communications arrangements
8 Policy
10 Communication requirements in an emergency
12 Emergency arrangements - major war vessels
16 Emergency arrangements - minor war vessels
18 Implementation
20 Secondary communications post

Table Page
1 Portable and mobile radio communications sets 3

INTRODUCTION

1 This BR supersedes and enlarges upon the information on portable radio equipment previously contained in BR 222 Vol 2 Chapter 15 and BR 222 (SM) Chapter 15. It contains in permanent documentation all information that was previously published in DCIs; the last comprehensive DCI issue was DCI(RN) CONF 1/83. The equipments covered are divided into five categories as follows:

(1) Clansman Equipment.
(2) Commercial Portables.
(3) Naval Outfits.
(4) Standard Short Range Portables (SSRPs).
(5) Mould.

1.1 The equipment is provided by MOD(N) for the execution of either land or maritime based military operations eg internal security, landing parties, crashboat communications, communication with civilian authorities, NBCD and upper-deck communications. The equipment is supplied for the operational needs of:

(1) HM ships, submarines and Royal Fleet Auxiliary (RFA) vessels.
(2) Royal Marine (RM) units on Maritime operations.
(3) Equipment pools.
(4) Fleet and civil shore establishments.
(5) Some Army/RAF Craft.

EQUIPMENT

2 MOD(N) provides the following equipment:

2.1 Clansman Equipment (refer to Section 2). This range of equipment is designed to meet MOD (Army) specifications for land-based mobile operations but is used within the Royal Navy to provide portable HF, VHF and UHF communications.

2.2 Commercial Portables (refer to Section 3). This equipment, mainly Philips Telecom (formerly PYE Telecommunications), is a wide range of portable, mobile, and base station equipment provided to meet the needs of individual users.

2.3 Naval Outfits (refer to Section 4). These are equipments introduced into RN service under Naval equipment nomenclatures, supplied and supported by NATO codification and standard DGST(N) procedures.

2.4 SSRPs. Equipment of the Racal Cougar family of radios has been introduced as the Standard Short Range Portable (see Section 5), superseding Stornophone UK/PRC 001-002.

2.5 It is intended that the UK/PRC 005 will be withdrawn from service leaving UK/PRC 006 as the only in-service Intrinsically Safe SSRP.

2.6 MOULD (refer to Section 6). An Army sponsored system primarily for Command and Control of home defence forces during periods of National Emergency.

WARNINGS AND RESTRICTIONS ON USE

3 Warnings and restrictions apply to portable and mobile radio equipment as follows:

WARNINGS

(1) THE VOLTAGES USED IN SOME ITEMS OF THIS EQUIPMENT ARE HIGH ENOUGH TO ENDANGER LIFE.

(2) RF TRANSMITTING EQUIPMENT MUST NOT BE USED IN RADHAZ SENSITIVE AREAS, EG MAGAZINES, CHECK SPACES, MISSILE TEST OR HANDLING ROOMS, ETC.

(3) POWER MUST BE SWITCHED OFF BEFORE ANY INTERNAL TESTS OR REPAIRS ARE ATTEMPTED. SUCH OPERATIONS MUST BE CARRIED OUT BY THE MANUFACTURER WHEN POSSIBLE, OR BY FULLY QUALIFIED, TRAINED TECHNICAL PERSONNEL.

(4) THE 1205(1) ENCAPSULATED PLB CONTAINS SIGNIFICANT QUANTITIES OF BERYLLIUM AND MERCURY, BOTH OF WHICH REPRESENT A CONSIDERABLE POTENTIAL CONTAMINATION HAZARD IN THE ATMOSPHERE OF A SUBMARINE. ON NO ACCOUNT IS THE ENCAPSULATION TO BE OPENED AT SEA. MAINTENANCE AND PERFORMANCE CHECKS ARE ONLY TO BE CARRIED OUT BY BASE STAFF ASHORE.

4 Some units operate in the VHF Military Band (between 30 MHz and 76 MHz). Frequencies in this band are used extensively by land-based Army units. Naval units using VHF equipment should guard against causing interference to other authorised users of this band.

5 Some units operate in the VHF International Maritime Mobile (IMM) Band (between 156 MHz and 174 MHz). Users must remain aware that this band is specifically for public use and is in no way restricted to military services. Owing to the growth congestion within this band, HM vessels using the band must guard against causing interference to other users, particularly on coastal waters and when passing commercial and service traffic. This band must not be used for shore-based tasks and operations.

TABLE 1 PORTABLE AND MOBILE RADIO COMMUNICATIONS SETS

MAIN GROUP	TYPE NO	TRANSMISSION AND RANGE	RF POWER	REMARKS	SECT	CHAP
Clansman Equipment						
(1)	UK/PRC 320	HF Voice and CW, 50-300 km (sky)	3 W, 30 W		2	2
(2)	UK/PRC 344	UHF Voice, 16-160 km	2 W		2	2
(3)	UK/PRC 349	VHF Voice 1 km	250 mW		2	2
(4)	UK/PRC 350	VHF Voice 5 km	2 W		2	2
(5)	UK/PRC 351	VHF Voice and Digital Data, 8 km	4 W		2	2
(6)	UK/PRC 352	VHF Voice and Digital Data, 16 km	20 W		2	2
(7)	UK/PRC 353 (Integrated Clansman 353 System)	VHF Voice, RTT Facsimile, 32 km VHF Digital Data 32 km	0.1 W, 1 W 15 W, 50 W		2	2
Commercial Portables	Various. See details in Section 3				3	
Naval Outfits						
(1)	UK/PRC 005	VHF Voice (IMM)	1 W	Obsolescent	4	2
	UK/PRC 006	VHF Voice (IMM)	1 W	Intrinsically Safe	4	2
(2)	1205(1)	VHF PLB	300 mW	Encapsulated for S/M	4	2

(continued)

5.7 Approximate range. Communications range using the UK/PRC 350 is dependent on both the type of antenna used and the terrain in which the equipment is sited. Approximate working ranges using the 1.2 m whip aerial are as follows:

Terrain	Working Range (km)	
	Manpack	Vehicle
Rolling countryside	5 to 7	4
Wooded countryside	3 to 5	2
Built-up area	4	3

Using a longer aerial or a ground-spike antenna will significantly increase communications range.

5.8 Accessories. Headsets and handsets supplied with the UK/PRC 350 are interchangeable with the UK/PRC 320 and 351 outfits in the Clansman range. In addition to these items, the UK/PRC 350 can operate using any VHF antenna designed for the Clansman range of equipment.

5.9 Operating information. The following procedure is for guidance only:

(1) Check Battery. Set the O/W/L/* system switch to * position. Background hiss heard in the headset indicates that the battery and the radio are functioning. An intermittent hiss heard in the headset indicates that the battery voltage is low, and the battery shall be changed. Set the system switch to the O position (off).

(2) Select Frequency. Set the four, decade, rotary switches to the required frequency, as indicated by the numerals visible in the apertures above the switch knobs.

(3) Set Mode. Set the system switch to the W position for whisper mode, or L for loud mode. Whisper mode provides high microphone sensitivity and low audio output level. Loud mode provides reduced microphone sensitivity and increased audio output level relative to whisper mode.

(4) Communicate. Depress the pressel switch and speak into the microphone. A sidetone should be heard in the headset when transmitting. To receive, release the pressel switch.

5.10 NSN. The NSN for the UK/PRC 350 is 5820-99-114-3638.

5.11 Handbook. The user handbook is Army Code No 61124.

5.12 CES. The CES is Army Code No 43751.

TABLE 1 PORTABLE AND MOBILE RADIO COMMUNICATIONS SETS (continued)

MAIN GROUP	TYPE NO	TRANSMISSION AND RANGE	RF POWER	REMARKS	SECT	CHAP
(3)	1205(2)	VHF SARBE	300 mW	Fitted in Liferafts	4	2
(4)	1205(3)	VHF	300 mW	Royal Marines Only	4	2
(5)	1251(1)	MF/HF Voice mcw/Autokey	3 W	Handcranked liferaft set	4	2
(6)	1253	VHF Voice (IMM)	10 W	Manpack (shoulder strap)	4	2
(7)	1260(1)	VHF Voice (IMM)	1 W	1260 with 230 V battery charger	4	2
(8)	1260(2)	VHF Voice (IMM)	1 W	1260 with 115 V battery charger	4	2
(9)	1260(3)	VHF Voice (IMM)	1 W	1260 with 115 V battery charger and channel variation	4	2
(10)	1261	UHF Voice	1 W	In protective housing for firefighters	4	2
STANDARD SHORT RANGE PORTABLES (COUGAR)	1220	VHF Voice	2 W	Basic portable	5	2
	1220	VHF Voice	20 W	Mobile Base STN	5	2
MOULD	FM 914PM	VHF Voice	15 W	Fixed or Mobile	6	2

6 The following is a list of abbreviations relevant to this BR:

A	Ampere
Ah	Ampere Hour
AM	Amplitude Modulation
CES	Complete Equipment Schedule
CGRM	Commandant General, Royal Marines
CMP	Command Maintenance Pool
CTCRM	Commando Training Centre, Royal Marines
CUP	Command User Pool
CW	Continuous Wave
Com	Command
DSWE	Director Ships Weapons Engineering
DGSW(N)	Director General, Surface Weapons (Navy)
DMS(N)	Department of Marine Services (Navy)
DOR (Sea)	Director, Operational Requirements
DSB	Double Sideband
DSM(A)	Directorate of Supply Management (Army)
ECP	Emergency Conning Position
ELCP	Extended Local Control Panel
FIR	Force Information Room
FM	Frequency Modulation
FO	Flag Officer
FONAC	FO Naval Air Command
FOSNI	FO Scotland and Northern Ireland
FRP	Fire and Repair Party
FSK	Frequency Shift Keying
ft	Feet
HF	High Frequency
Hz	Hertz
IMM	International Maritime Mobile (radio channels)
IS	Intrinsically Safe
k	Kilo (thousand)
km	Kilometre
LED	Light Emitting Diode
m	Milli (Prefix)
m	Metre
mAh	Milli Ampere Hour
m^2	Square Metre
mcw	Modulated Carrier Wave
mW	Milli Watt
M	Mega (million)
MCMV	Mine Counter Measure Vessel
MDP	Ministry of Defence Police
MF	Medium Frequency
MOD	Ministry of Defence
NBCD	Nuclear, Biological and Chemical Defence
nm	Nautical Mile
Ni Cd	Nickel Cadmium
NSN	Nato Stock Number
OOD	Officer of the Day
PLB	Personal Locator Beacon
PLR	Permanent Loan Record
PTT	Press-To-Talk
RAS	Replenish at Sea
REME	Royal Electrical Mechanical Engineers
RFA	Royal Fleet Auxiliary
rh	Relative Humidity

RM	Royal Marines
RNAS	Royal Naval Air Station
RNSD	Royal Naval Stores Depot
RNXS	RN Auxiliary Service
SARBE	Search and Rescue Beacon Equipment
SCO	Staff Communications Officer
SSB	Single Sideband
SSRP	Standard Short Range Portables
UHF	Ultra High Frequency
USB	Upper Sideband
UxE	Upkeep by Exchange
V	Volt
VHF	Very High Frequency
W	Watts
WP	Waterproof

EMERGENCY COMMUNICATIONS ARRANGEMENTS

7 The Naval Staff policy of providing emergency power supplies to a low power MF/HF Transceiver and an off-line cryptographic facility for use in an emergency was changed in 1984. The new arrangements for emergency communications are explained as follows:

Policy

8 All emergency communications in new build ships, and ships in service where it has been decided to remove the emergency diesel generator for operational reasons, will be provided by additional battery operated portable equipments. These equipments should be sited well away from the MCO, with easy access to the upper deck, and preferably be duplicated forward and aft. The primary functions of ships' emergency communications will be:

8.1 To alert ships and aircraft in company.

8.2 To co-ordinate assistance/rescue action by ships and aircraft in company.

9 The formulation of the above policy was influenced by the following factors:

9.1 Modern ships have a comprehensive system of alternative power supply arrangements and emergency cables that can provide essential supplies quickly.

9.2 When power supplies are lost to the weapon systems and sensors, the ship is unable to fight and there can be little justification in providing more than minimal distress communications. The practicality of starting a diesel generator in this type of emergency, when all other alternative power supplies have been lost, is questionable.

9.3 The evidence from Operation Corporate indicates that the damage effect of modern weapons is such that any hit which causes a 1st degree emergency is likely to render the MCO untenable and fixed emergency radio equipment unusable.

9.4 The diesel generator provided does not cover the modern requirements of full emergency communications, lacking the power to drive V/UHF systems, RATT facilities and modern off-line cryptographic equipment.

9.5 The use of modern MF/HF and UHF portable transceivers can effectively meet the requirement for salvage and survival communications.

Communication requirements in an emergency

10 There are two distinct circumstances which could deprive a ship of her normal communications:

10.1 1st Degree Emergency. Failure of the ship's power supplies for a prolonged period due to major damage to machinery/cabling or a serious defect in machinery. A ship which has suffered a failure of this magnitude is not likely to be able to restore power in a time-scale which will allow her to continue to be an effective fighting unit. Her main preoccupation will be concerned with survival and all services provided must be directed to this end. The primary function of the ship's emergency communications will therefore be:

10.1.1 To alert ships and aircraft in company.

10.1.2 To communicate with assisting/rescue ships and aircraft.

10.2 2nd Degree Emergency. Failure of ship's power supplies caused by a temporary failure of the ship's generating machinery or minor damage. This can happen to a ship at any time; however, in modern warships there is a high degree of built-in redundancy and alternative supplies can normally be made available quickly. The operational role of the ship is likely to be impaired for a limited period only and there is thus a need to maintain as normal a communication service as possible.

11 The communications called for in a 1st Degree and 2nd Degree Emergency differ widely. In a 1st Degree Emergency the requirement is to provide the minimum communications whereas in a 2nd Degree Emergency the requirement is to state an order of priority for the restoration of communication services should a choice have to be made.

Emergency arrangements - major war vessels

12 1st Degree Emergency. All major war vessels are to be provided with:

12.1 1 MF/HF portable transceiver capable of CW and voice (AM/SSB) emissions.

12.2 1 UHF portable transceiver capable of voice (AM/DSB) operation over the 225 to 399.9 MHz range.

12.3 Portable cryptographic equipment (when trials and procurement process completed).

12.4 Lifeboat survival radio.

12.5 SARBE (incorporated within survival equipment packs).

13 The portable radios are to be in addition to those provided for normal communication purposes and stowage is to be provided in the upper part of the ship and in the vicinity of the bridge or ECP (as applicable to class). A regular routine for testing and renewal of batteries is to be laid down in ship's standing orders.

14 2nd Degree Emergency.

14.1 Both normal and alternate supplies are available through a changeover switch in the MCO. If the normal supply fails, the changeover switch is put to alternate and equivalent power is provided from a different generator and cable run. In addition arrangements are available at the ship's switchboards to ensure essential supplies in an emergency; communications equipment is considered an essential supply. Also available are emergency cable runs to connect communications distribution panels to available supplies.

14.2 When, for any reason, power supplies are interrupted, the normal priority for the restoration of power is:

14.2.1 Priority 1 - HF transmission and reception.

14.2.2 Priority 2 - UHF transmission and reception.

14.2.3 Priority 3 - Broadcast reception.

15 When in company, the circumstances may require a different policy, depending on the Complan, Emcon policy and the OTC's requirements.

Emergency arrangements - minor war vessels

16 1st Degree Emergency: Minor war vessels, in the event of total power failure, are to use the portable radios from their normal allowance together with the standard fit of lifeboat survival radio and SARBE equipment to type.

17 2nd Degree Emergency: In general, minor war vessels are to be provided with connection from the communications office to alternative supplies or, where applicable, to a battery supply.

Implementation

18 The above policy will be applied to new construction ships already in service where the removal of the ship's emergency generator is necessary in order to provide space for operational enhancement.

19 Where applicable, the additional HF and UHF portable radio equipments is included in the appropriate Scales of Allowances.

Secondary communications post

20 A Secondary Communications Post is to be located well away from the Main Communications Office, with easy access to the upper deck and duplicated forward and aft where equipment allowances permit. It is recommended that the compartment be similarly located in ships of the same class.

21 Portable Radio Communications equipments are to be provided at the Secondary Communications Post as follows:

21.1 One MF/HF transceiver.

21.2 One UHF transceiver.

21.3 One SSRP.

22 In the Defence and Action States the current complan, callsigns and Emission Control state in use should also be provided.

CHAPTER 2

ALLOWANCE POLICY, SUPPLY AND ACCOUNTING ARRANGEMENTS

CONTENTS

Para

1 Introduction
2 Allowances
3 New requirements
4 Issues
Returns
5 HM ships entering refit, reserve or destoring
6 Accounting

Annex

A Layout for any proposal to increase entitlement of portable radios and associated communications equipment

INTRODUCTION

1 Equipment is provided to meet requirements authorised by DOR(Sea). These may be as existing scales of allowance (eg by Ship Type) or as approved individual requirements.

ALLOWANCES

2 Standard scales of allowance are guided by consideration of the following factors:

2.1 In HM Ships

(1) Equipment required for landing party organisation as listed in the Small Arms Training Manual (BR 1920).

(2) Individual ship requirements eg flying operations, mine-hunting, Operations Awkward.

(3) Amphibious warfare requirements.

(4) Emergency communications.

2.2 In RM Units

(1) As required by the Army Communications Equipment Committee (ACEC) and sponsored by the CGRM. This scale will normally be provisioned by MoD (Army).

(2) As required by RM manned craft, on advice from CGRM.

Detailed scales of allowance are shown in Chap 4.

NEW REQUIREMENTS

3 New requirements application procedure is as follows:

3.1 Fleet and civil shore authorities, establishment and units, including dockyard departments but excepting MoD Police, having essential and permanent need of portable communications facilities are to apply in the first instance to the local Command Flag Officer or administrative authority. Each application is to be fully investigated and must show the need to be operationally essential (as opposed to desirable) and of a permanent nature. Occasional and temporary requirements for radio communications equipment are to be met either by:

(1) loan of suitable equipment from the appropriate portable radio pool (see Chap 3, Para 6), or

(2) by loan of portable equipment already provided to a specific local service under the terms of this BR (or its predecessors).

3.2 Consequent upon investigation, those applications which are supported as permanent and operationally essential are to be forwarded by the Flag Officer or local administrative authority, together with comprehensive statement in justification to Directorate of Operational Requirements (Sea) attention (DOR(Sea)/RCA1 MoD Main Building, London, and copied to DSWE/WE102A2, SSA, Elm 3b, MoD Abbey Wood #200, PO Box 702, Bristol BS12 7DU using the format at Annex A to this Chapter.

3.3 Commercial type radio communications equipments are never to be procured locally without the express agreement of DSWE/WE102A2. Such permission will be granted only in exceptional circumstances.

3.4 Staff Communications Officers to Flag Officers in commands concerned are to be consulted in all MoD(Navy) requirements regarding radio communications for miscellaneous services.

ISSUES

4 Allowances for portable radio equipment are listed in Section 1 - Chapter 4 - Tables 1 to 4.

4.1 New Construction Ships (RN). For new construction ships a Weapon Equipment Delivery Programme (WEDP) will call up the required equipment for issue. A WEP(N) Form 94 will be raised by the equipment allocator and the following procedures will take place.

4.1.1 Clansman. Clansman equipment was initially supplied by allocation from the Army stores direct to the user. Current allocations are achieved by redeployment through Portable Radio Pools. WEP(N) Form 94 raised by the equipment allocator are issued direct to the Ship/Principal Naval Overseer (PNO) and copied to the local Portable Radio Pool and Equipment Project Manager (EPM). On receipt of the WEP(N) Form 94 Ship/PNO is to demand equipment from the local Portable Radio Pool, if the pool has insufficient stock to meet the demand it will co-ordinate the issue of equipment through other Pools.

CHAPTER 2 ANNEX A

(SECURITY CLASSIFICATION)

PROPOSAL TO INCREASE ENTITLEMENT OF PORTABLE RADIOS AND ASSOCIATED COMMUNICATIONS EQUIPMENT
(Revised 25 April 94)

PART 1

(Part 1 is to be submitted by the User in type written form to the area Flag Officer for endorsement. Hand written applications will not be considered).

Introduction

1. Name of Unit.

2. Address.

3. Address of Stores Accounting Authority. (Note all equipment will be despatched to the Unit Supply Officer who will take the equipment on charge and sub issue to the User).

4. Contact Officer for the Requirement and Telephone Number.

5. Command Authority/Headquarters.

6. Unit Role.

7. Operational/Administrative Justification for the Proposal.

8. In Service Date for Proposal.

Details of Current System (If applicable)

9. Make and Model of Existing Radio System.

10. Frequencies Currently in Use and on What Channels.

11. Channel Spacing Employed. (ie 12.5/25Khz).

12. Mode of Operation.

    a. AM/FM.

    b. Secure/Insecure.

    c. Voice/Data.

    d. Maximum classification of traffic passed.

13. Talkthrough/Repeater. Is a talkthrough or Repeater Employed? (If so give the location of the equipment, aerial, transmit and receive frequencies related to channel numbering).

(SECURITY CLASSIFICATION)

Details of New Requirement/Proposal

18. Outline Plan.

19. Frequency Requirements. (Liaise with Area Flag Officer).

a. Simplex. (Give frequencies related to channels).

b. Duplex. See para 23 below.

20. Channel Spacing Requirements. (ie 12.5/25Khz).

21. Mode of Operation.

a. AM/FM.

b. Secure/Insecure. (If secure, give details of the Cryptographic Custodian).

c. Voice/Data.

d. Maximum classification of traffic to be passed.

22. Significant Physical Obstacles In Radio Line of Site. (Are there any significant obstacles in the area to be covered that are expected to hinder communication. If so list height and distance of obstructions from both ends of the required link).

23. Talkthrough/Repeaters. Is a talkthrough or repeater to be employed? (If so give the proposed location of the equipment, aerial, transmit and receive frequencies related to channel numbering, and distance from radio outstations).

24. Power Supply Requirements. (ie 115/230VAC, 12/24VDC).

25. Interoperability. Is interoperability required with existing equipment held by other users? If so include details as outlined at para 9 - 13 above.

26. Type of Installation. (Complete as appropriate).

a. Fixed Radio Station.

i. Quantity Required.

ii. Details of Radio Control.

Local/Remote or Extended.

Remote Control Positions. (List requirements and give approximate positions from the radio).

iii. Anticipated Working Radio Path/KM.

iv. Proposed Building/Room Number.

(SECURITY CLASSIFICATION)

14. Current Power Supplies.

a. Supply. (ie 115/230VAC, 12/24VDC).

b. Emergency Backup Supply. (If applicable).

15. Type of Installation. (Complete as appropriate).

a. Fixed Radio Station.

i. Details of Radio Control.

Local/Remote or Extended.

Remote Control Positions. (List and give approximate distances from the radio).

ii. RF Power Output.

iii. Aerials.

Location. (Mast Location/Building Number).

Type of Aerial. (Omni or Directional).

Co-located Aerials. Are any other aerials co-located. If so give details of physical separation and frequencies in use.

b. Mobile Radio Station/Vehicle.

i. RF Power Output.

ii. Type of Vehicle.

iii. Other Installed Electronic Equipment.

c. Portable Radio Station/Handheld/Manpack.

RF Power Output.

16. Shortcomings/Failures of Current System.

17. Operational Penalties/Implications of:

a. Continuing with existing system.
or
b. Not enhancing existing system.

31. Funding. If the User/Command is funding the requirement include:

a. UIN of funding agency.

b. Vote No.

c. Funding department and contact details.

PART 2 (To be completed by Area Flag Officer* OR OIC Comcen Fort Southwick*/Mountwise*).
* delete as appropriate

32. I have examined this proposal and endorse it.

Date: Signature: Appointment:

PART 3 (To be completed by Command Authority).

33. I have examined this proposal and endorse it.

34. I cannot satisfy this requirement from pool or reallocated equipment.

Date: Signature: Appointment:

v. Aerials.

Location. (Proposed mast location/building).

Type of Aerial. (Omni or Directional).

Co-located Aerials. Are any other aerials co-located at the proposed site. If so give details of possible physical separation and frequencies in use.

vi. Ancillary Equipment Requirements. (ie desk microphone, fist microphone, handset, loudspeaker etc).

vii. Restrictions. State any known site enhancements/changes that may effect installation of the equipment or aerials.

b. Mobile Radio Station/Vehicle.

i. Quantities Required.

ii. Anticipated Maximum Working Radio Path/KM.

iii. Type of Vehicle.

Ancillary Equipment Requirements. (ie handset, headset, fist microphone, loudspeaker etc).

iv. Restrictions. Is there any other electronic equipment located in the vehicle. If so give details.

v. Vehicle Life. What is the anticipated life of the vehicle.

c. Portable Radio Station/Manpack/Handheld.

i. Quantities Required.

ii. Anticipated Maximum Working Radio Path/KM/M.

iii. Ancillary Requirements. (ie handset, headset, microphone, boom microphone, throat microphone, pressel switch, harness etc).

iv. Any Special Requirements. (ie size, weight, waterproofing etc).

27. Connectivity Diagram. See Appendix 1.

28. Equipment Requirements. See Appendix 2.

29. Hazards. Is there a radiation hazard to ammunition, fuel or other electronic equipment.

30. Works Service Implications. Include as enclosures written confirmation that the establishment of masts, radios, aerials, and all cabling has been agreed.

4.1.2 Cougar Type 1220. For the SSRP Cougar Type 1220 WEP(N) Form 94 raised will be issued direct to the (EPM) DSWE/WE102A2, SSA, MoD Abbey Wood, Bristol and copied to the Ship/PNO. The (EPM) on receipt of the WEP(N) Form 94 will instruct the equipment manufacturer to supply the equipment direct delivery to the ship.

4.1.3 Icom Type 1260. For the Icom Type 1260 (WEP) Form 94 raised will be issued direct to the Ship/PNO and copied to DGST(N)38B2A and (EPM) DSWE/WE102A2, Abbey Wood, Bristol. On receipt of the (WEP) Form 94 Ship/PNO will demand equipment from Naval stores following standard demand procedures.

4.1.4 Commercial Equipment. Commercial equipments will only be issued with the authority of DOR(Sea)/RCA1 MoD Main Building.

4.2 Ships Commissioning from Refit or Reserve. Ships commissioning from Refit or Reserve that have returned their initial allowance of Portable Radio equipment are to demand the allowance of Non Patterned Clansman and Cougar equipment direct from local Portable Radio Pool. All patternised equipment is to be demanded following standard Naval stores demand procedures.

RETURNS

HM ships entering refit, reserve or destoring

5

5.1 HM Ships entering Refit, Reserve or Destoring for any reason are to return all Clansman and Cougar portable W/T equipment to the nearest Portable Radio Pool. All patternised portable W/T equipment other than Clansman is to be returned to Naval stores using normal Naval stores procedures. Advice can be sought from DSWE/WE102A2, MoD Abbey Wood, Tel: 0117-9138032 for any other portable W/T equipment held which is for return.

5.2 Procedures for returning equipment (either defective or not required) are detailed in the relevant equipment sections of this BR.

ACCOUNTING

6 All equipment is to be taken on charge and a permanent record of receipts and returns maintained.

Appendices:

1. Connectivity Diagram.
2. Communications Equipment Holdings and Requirements.

(SECURITY CLASSIFICATION)

APPENDIX 2 TO PROPOSAL

COMMUNICATIONS EQUIPMENT HOLDINGS AND REQUIREMENTS

Ser	Equipment Type	Present Holding	Proposed Increase	Proposed Decrease	New Holding	Remarks
(a)	(b)	(c)	(d)	(e)	(f)	(g)

(SECURITY CLASSIFICATION)

CHAPTER 3

STANDARD MARINE WATERPROOF PORTABLE RADIO (SMWPR)

CONTENTS

Para

PORTABLE VHF RADIO DESCRIPTION
1 Purpose of the VHF IMM portable radio
2 Contact ranges
3 AXIS 250 description
Ancillary items
7 Spare rechargeable battery pack
8 Extension loudspeaker microphone
9 Leather carry case
10 Rapid charger
12 Alternative multi way charger
13 Headsets
Equipment specifications
14 Radio
15 Single way rapid charger
16 Variants
RADIO ASSEMBLY
17 Portable radio station - standard outfit
19 Single way rapid charger
21 Multi way rapid charger
22 Assembling radios
23 Operating check
RADIO OPERATION
24 Controls
25 Operating procedure
26 Channel usage plan (Frequency Plan A)
28 Guidelines on battery life
29 Changing the battery pack
RADIO MAINTENANCE
32 Maintenance overview
33 Upkeep and support
35 Radio batteries
38 Charging procedure
41 Radio functional check
45 Fault finding

Table Page

1 Frequency plan A 10
2 Standard marine waterproof portable radio components 11
3 Channel settings 18
4 Maintenance overview 20
5 Fault finding checks 22

(continued)

CONTENTS (continued)

Fig		Page
1	VHF transmission ranges	3
2	Portable VHF radio schematic	4
3	Accessory socket	5
4	Axis waterproof handheld VHF radio	6
5	Extension loudspeaker microphone	6
6	Carrying case	7
7	Single way rapid charger	7
8	Rapid charger status indicators	8
9	Alternative multi way charger	8
10	Operator controls	13
11	Volume bargraph on LCD display	14
12	Squelch bargraph on LCD display	14
13	Scrolling through channels	15
14	LCD backlighting	16
15	Entering channel into scan memory	16
16	Inhibiting channel from scan	17
17	Battery release lever in 'unlocked' position	19
18	Battery pack removal	19

Annex

A	Standard marine waterproof portable radio scale of allowances for HM Submarines, Area Flag Officers and RM Units
B	List of command portable radio pools
C	Command portable radio pools (M), Maintenance authorised holdings

PORTABLE VHF RADIO DESCRIPTION

PURPOSE OF THE VHF INTERNATIONAL MARINE MOBILE (IMM) PORTABLE RADIO

1 VHF IMM Portable Radios are supplied for use in the maritime environment on board ships and harbour craft and additionally for onshore use in ports and harbours. They are waterproof to 1M depth and drop resistant, so that they can survive in hostile marine environments and in working conditions experienced in docks and repair yards.

Contact ranges

2 VHF transmissions work on a line-of-sight basis which means that contact range is limited by the earth's curvature. The range achieved will depend partly on the transmit power, but much more on the heights of the transmitting and receiving antennas. See Fig 1.

AXIS 250 DESCRIPTION

3 The AXIS 250 Radio is manufactured by Navico Ltd in the United Kingdom and is supplied and distributed by AND Group plc. The equipment supplied is designated as model AX250S:A:NSC, and is shown in Fig 2.

4 The AXIS 250 consists of a contoured plastic case which is grey in colour. The bottom of the case houses a removable Nickel-Cadmium battery pack with built-in charging contacts. The antenna at the top of the case has a flexible rubber construction and screws into the top of the case using a heavy-duty thread.

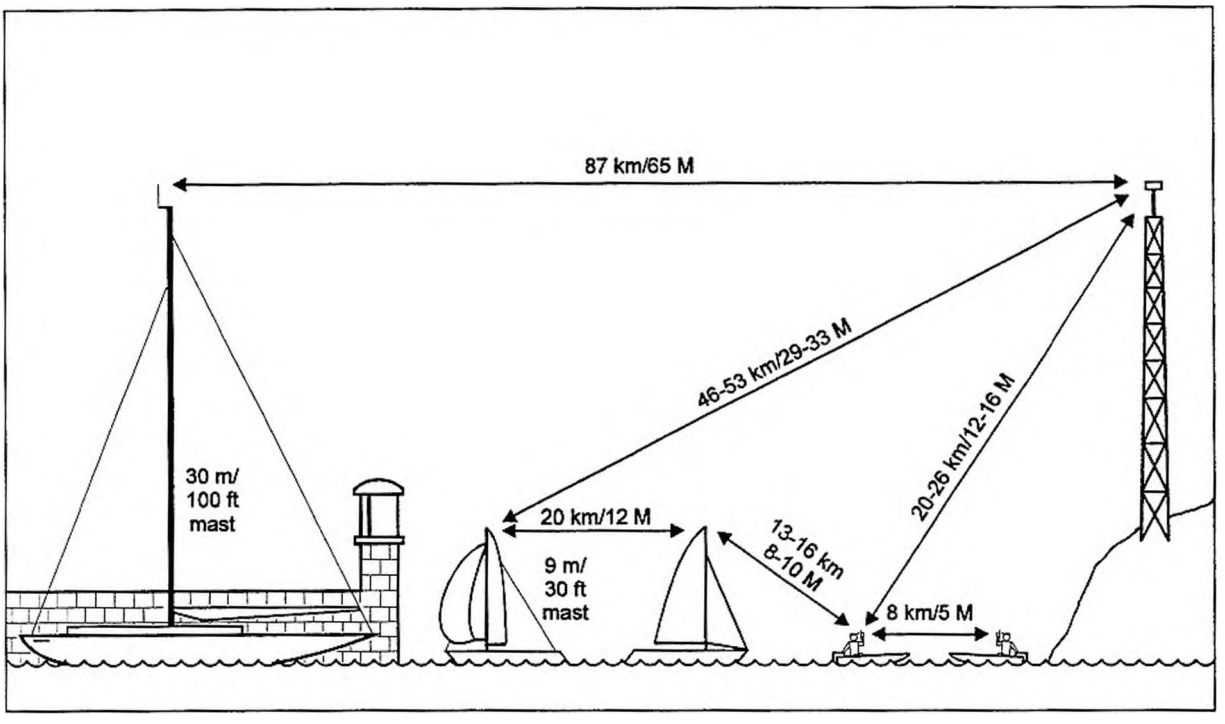
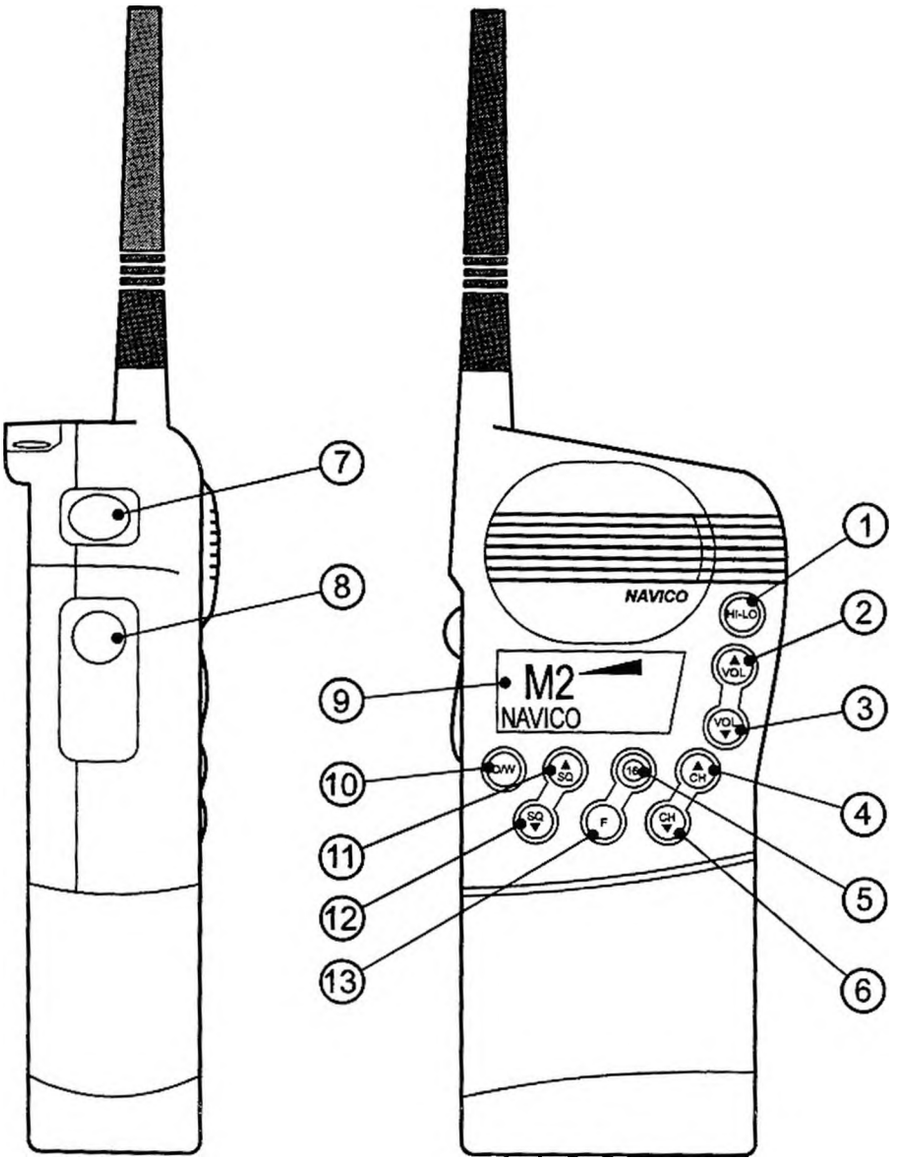


Fig 1 VHF transmission ranges



1 High/Low transmit power
2 Audio volume incease
3 Audio volume decrease
4 Channel up/*Memory scan*
5 Priority channel (16)
6 Channel down/*All scan*
7 On/Off Button
8 PTT Button
9 LCD Screen
10 Dual watch (D/W)
11 Squelch up/*Enter memory*
12 Squelch down/*Scan inhibit*
13 Function (F)/*LCD backlighting*

All functions listed in *itallics* are secondary functions accessed by pressing the Function (F) button first.

Fig 2 Portable VHF radio schematic

5 An accessory socket with splash cover is provided for connection of an extension loudspeaker microphone unit or headset (Fig 3).

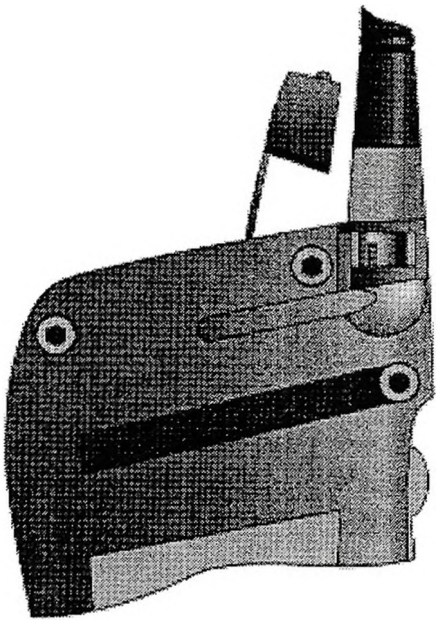


Fig 3 Accessory socket

6 The AXIS 250 employs all push button controls. An audible beep is emitted as confirmation whenever a button is pushed. The controls are illustrated in Fig 4 and described further below:

(1) ON/Off This push button turns the radio on and off.

(2) PTT The Press-To-Talk button must be held down to make a voice transmission.

(3) HI/LO This push button toggles the transmit power level between high (5W) and low (1W) .

(4) SQ up This button raises the squelch level setting.

(5) SQ down This button lowers the squelch level setting.

(6) VOL up This button increases the loudspeaker listening level to suit ambient conditions.

(7) VOL down This button decreases the loudspeaker listening level to suit ambient conditions.

(8) CH up Press button to change channel selection up as required.

(9) CH down Press button to change channel selection down as required.

(10) 16 Selects priority channel - set to channel 16 for frequency plans A and B.

(11) F This push button controls backlighting of the LCD display and when used with other buttons controls the secondary functions (Channel Scanning).

(12) DW Dual Watch - activates dual watch of a selected channel and the priority channel.

Fig 4 Axis waterproof handheld VHF radio

ANCILLARY ITEMS

Spare rechargeable battery pack

7 Each Portable Radio Station is supplied with an extra 850 mAH rechargeable battery pack, this is in addition to the battery pack already fitted in the radio. The spare battery pack should be kept charged and ready for use.

Extension loudspeaker microphone

8 Each Portable Radio Station is supplied with a loudspeaker microphone which allows the radio to be used while it is secured on a belt clip. The loudspeaker microphone has a built-in PTT switch and plugs into the accessory socket on the radio (Fig 5).

Fig 5 Extension loudspeaker microphone

Leather carry case

9 Each Portable Radio Station is also supplied with a leather carrying case which may be belt mounted or worn around the neck using the shoulder strap supplied (Fig 6).

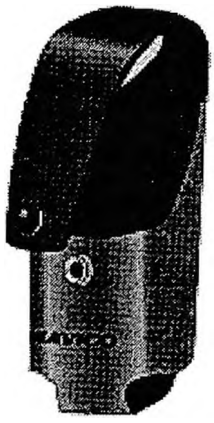
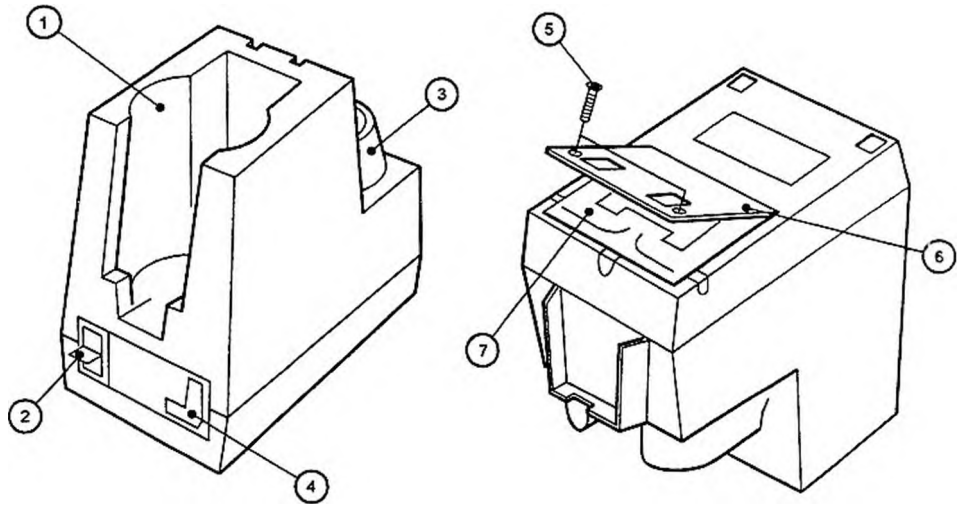


Fig 6 Carrying case

Rapid charger

10 Each Portable Radio Station is supplied with a rapid battery charger. This has two charging positions; the front position will accept either a radio or a battery pack for rapid charging; the rear position accepts a battery pack only and operates as a trickle charger. Fig 7 illustrates the rapid charger.



1 Front pocket (Rapid charge).
2 AC power On/Off switch.
3 Rear pocket (Trickle charge).
4 Charge status indicator.
5 Base cover fixing screws.
6 Base cover (access to fuses).
7 Terminal well and fuses.

Fig 7 Single way rapid charger

11 The charger will fast charge a battery pack in approximately 80 minutes, then revert to trickle charging. Charging indicator LEDs on the front of the charger indicate charging progress and highlight possible battery faults. (Fig 8).

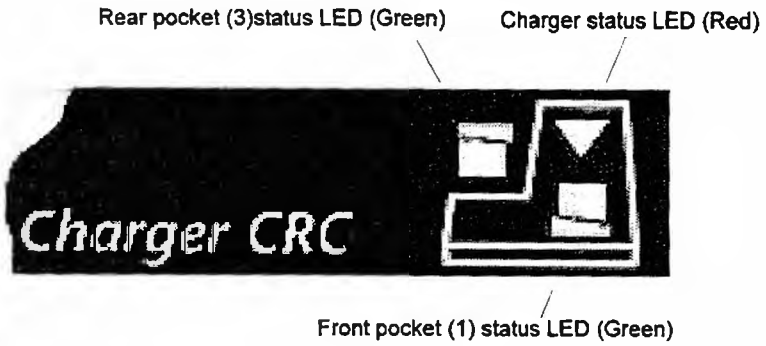


Fig 8 Rapid charger status indicators

Alternative Multi way Charger

12 When required Rapid Charger units are supplied mounted together in a bracket assembly and prewired in a four unit configuration. (Fig 9).

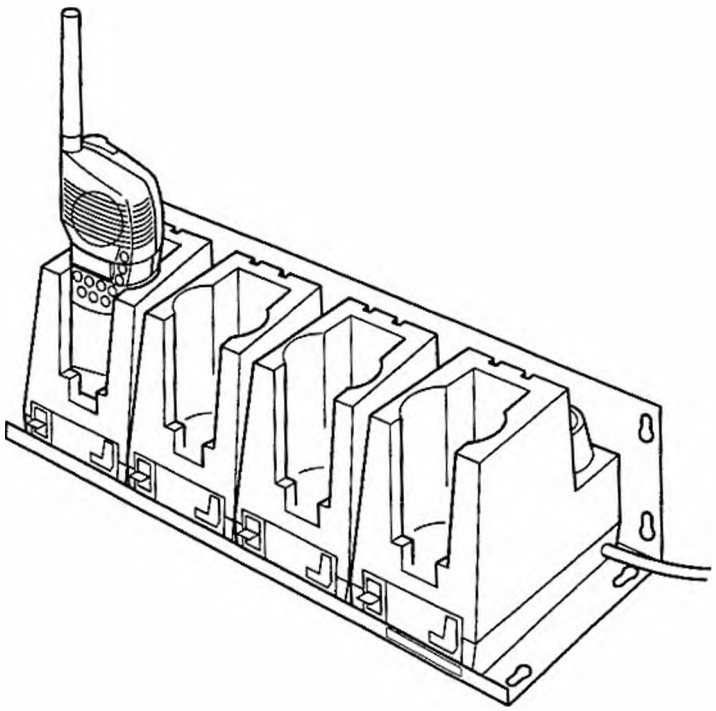


Fig 9 Alternative multi way charger

Headsets

13 A range of headsets are available for use in situations demanding such equipment. Versions with boom microphone or bone contact microphone are available. Headsets are supplied with PTT switches and plug in to the accessory socket of the radio.

Equipment specification

Radio

14 The specifications are as follows:

(1)	Approved to European specification	ETS-300-162.
(2)	Waterproof depth	1m.
(3)	Operating frequency band	135 to 174 MHz.
(4)	Number of channels (factory programmed)	up to 55 plus 16 private.
(5)	Channel spacing	25 kHz.
(6)	Communication mode	simplex and semi duplex.
(7)	Loudspeaker power	1 Watt.
(8)	Sensitivity (for 20dB SINAD)	0.5 uV.
(9)	Transmitter power (high)	5 W.
(10)	Transmitter power (low)	1 W.
(11)	Operating life (Duty Cycle 5:5:90)	8 hrs.
(12)	Operating life (Duty Cycle 10:10:80)	4.6 hrs.
(13)	Battery technology	Rechargeable Nickel Cadmium.
(14)	Battery capacity	850 mAH.
(15)	Battery charge/discharge life	300 cycles.
(16)	Weight (radio with battery fitted)	600 g.
(17)	Height (excluding antenna)	77 mm.
(18)	Width	79 mm.
(19)	Depth	42 mm.
(20)	Operating temperature	-20° C to +60° C

Single way rapid charger

15 The specifications are as follows:

(1)	Charging system	230 V.
(2)	Line input voltage	230 V ac.
(3)	Line current	50 mA.
(4)	Switch on surge (3 position charger)	1 A.
(5)	Fast charge duration	1.3 hours.

Variants

16 There are three variants (plans A, B and C) as follows:

(1) Plan A: General use 16 (IMM) channels as for the current GMDSS portable.

(2) Plan B: Full (IMM) channels (inclusive channel 0) for salvage teams, emergency crews, divers etc.

(3) Plan C: Customer programmed for users with private channel plans.

16.1 Variant plan A is shown in Table 1:

TABLE 1 VARIANT PLAN A

Channel Number	Frequency (MHz)
06	156.300
08	156.400
10	156.500
11	156.550
12	156.600
13	156.650
14	156.700
15	156.750
16	156.800
17	156.850
67	156.375
69	156.475
71	156.575
72	156.625
73	156.675
74	156.725

16.2 Variant plan B comprises all 56 International Marine Mobile (IMM) band channels inclusive of Channel 0.

16.3 Variant plan C is programmed to a user defined frequency plan subject to authorised frequency allocation.

RADIO ASSEMBLY

PORTABLE RADIO STATION - STANDARD OUTFIT

17 The components of a Standard Marine Waterproof Portable Radio (SMWPR) are shown in Table 2.

18 The User's operating instructions supplied with each radio are supplemented by this document.

Single way rapid charger

19 The single way rapid charger included in the standard outfit is supplied with a fitted power lead and 3 pin mains plug and is fused and set to operate from 230 V ac mains supply.

20 If required to operate from 115 V ac mains the charger must be converted before connection to power supply. The conversion procedure is as follows:-

(1) Remove the terminal well cover in the base of the charger by unscrewing two retaining screws.

(2) Set switch to reveal 115 V.

(3) Remove existing 1 A fuse and replace with 2 A fuse supplied in conversion kit.

(4) Replace terminal well cover and label the charger as set for 115 V ac.

TABLE 2 STANDARD MARINE WATERPROOF PORTABLE RADIO COMPONENTS

Qty	Type	Description
1	AX250S:A:NSC	VHF Radio Transceiver
1	ANT1	Antenna
1	BCP1	Belt Clip and Adaptor Plate
1	LDY1	Wrist Lanyard
2	NCB850	Battery High Capacity 850 mAH
1	WPSM1:GY	Extension Loudspeaker Microphone
1		User operating instruction book
1	CRC 1	Single way Rapid Charger
1	Kit	2 Amp Fuse and instructions for conversion to 115 V ac operation
1		User operating instruction book
1	LC1	Leather Carrying Case
1	SS1	Carrying strap

Multi way rapid charger

21 The multi-way charger comprises four single way charger units assembled together and mounted on a bracket suitable for shelf or bulkhead mounting. The assembly is supplied prewired with a power lead and 3 pin mains connector and is for operation from 230 V ac mains supply only.

Assembling radios

22 The radios are packed without their antenna or battery fitted. Prepare the radios for use as follows:

(1) Locate the antenna and screw it hand tight into the top of the radio. Avoid bending the antenna as this may degrade its performance.

(2) The batteries are shipped uncharged and will need charging before use. Refer to Para 38 for charging instructions. When both of the batteries have been charged, fit one of them into the radio, as detailed in Para 29. The spare may be left in the back pocket of the charger where it will be maintained in a fully charged condition.

(3) The waterproof speaker microphone connects to the socket on the top of the radio. Peel back the rubber cover and smear a little petroleum jelly onto the connector before making the connection.

(4) Attach wrist lanyard and beltclip with adaptor plate or fit carrying case and shoulder strap according to user's preference.

Operating check

23 Carry out the functional check detailed in Para 41.

RADIO OPERATION

Controls

24 The operation of any of the push buttons is confirmed by an audible beep from the unit. The operation of the controls for the Axis 250 radio is as follows -

(1) On/Off button. Pressing this button will turn the radio on and off (Fig 10). To turn the radio off it is necessary to hold the button in for two seconds, preventing the radio being accidentally switched off.

(2) PTT button. The PTT button is used to switch the radio from receive to transmit. Unlike other keys, the radio will not beep if this key is pressed, but the LCD legend will change from [Rx] to [Tx], and the bar graph will display the current battery level. If the radio will not transmit when the PTT button is pressed it may be because the selected channel is not valid for transmission.

NOTE

Transmit is also inhibited when the Dual Watch or Scanning functions are activated.

(3) High/Low transmit power button. This button will toggle the transmit power between the preset maximum level (normally 5 Watts) and low power (normally 1 Watt). The power setting selected will be indicated by either the HI or LO legend on the LCD display.

(4) Audio volume up. This button will increase the audio volume in graduated increments. The volume setting will be indicated on the LCD display by the bar graph while the button is in use (Fig 11).

(5) Audio volume down. This button will decrease the audio volume in graduated decrements. The volume setting will be indicated on the LCD display by the bar graph while the button is in use.

(6) Dual watch. The Dual Watch function enables the radio to scan between the selected channel and the priority channel (normally channel 16). To activate Dual Watch Mode, select the channel and press D/W. While the radio is in Dual Watch Mode, the D/W legend will be displayed on the LCD.

(7) REVERT Function. If D/W is pressed when CH 16 is selected, the radio will revert to the previously selected channel.

(8) Squelch up. This button will increase the receiver muting threshold (or SQUELCH) level ie a stronger signal will be required to activate the receiver. The squelch level selected is indicated by the bar chart on the LCD display while the button is in use (Fig 12).

(9) Squelch down. This button will decrease the squelch level, ie weaker signals will be able to activate the receiver. The squelch level selected is indicated by the bar chart on the LCD display while the button is in use.

(10) Channel 16. Will automatically select the priority channel (usually Channel 16) on High Power when pressed. Any function active (such as Dual Watch, Scanning etc.) will be cancelled.

(11) Channel up. This button will scroll up through the channels available, the selected channel being shown by the large digits on the LCD display (Fig 13). The Axis will automatically switch to Low Power if the selected channel is inhibited to transmit on the Low Power setting only, even if High Power is currently selected.

(12) Channel down. This button will scroll down through the channels available as Channel Up.

(13) Function key. Function (F) is used to access second level functions available, and is indicated by the F legend appearing in the LCD display for two seconds. After this time, the legend will disappear and the radio will revert to first level functions. Therefore, the subsequent buttons must be pressed within two seconds of F being pressed.

(14) Backlighting (F-F). The LCD display backlighting can be switched on by pressing F and F again within two seconds. By keeping F depressed, the radio will step through the six levels of illumination available (Fig 14). A further press will turn the backlighting off. While the backlighting is activated, the lamp legend * will be shown on the LCD display, The backighting will automatically switch off if no button is pressed for ten seconds or longer. The backlighting will re-illuminate if a button is subsequently pressed.

(15) AS - All channel scan (F-channel down). This function enables the radio to scan through each channel sequentially until a signal is detected which is above the squelch level set. Once the signal ends or drops below the squelch level, the radio will continue scanning. Pressing Channel Up will step to the next channel regardless of the signal strength. Pressing Channel Down or F-Channel Down will exit Scan Mode.

(16) M+ - memory enter (F-squelch up). This function will add the currently selected channel into the Scan Memory. The LCD display will show 'ENT' indicating that the channel has been entered into the Scan Memory. When the channel is subsequently selected, a [] legend will be shown on the bottom line of the LCD display indicating that the channel is in the Scan Memory (Fig 15). Pressing F-Squelch Up if the channel is already in the Scan Memory will remove it from the memory indicated by 'dEL' appearing on the bottom line of the LCD display.

(17) MS - memory scan (F-channel up). This function operates in the same way as the Scanning Function (F-Channel Down), except that it will only scan channels that have been entered into the Scan Memory. If no channels have been entered into the memory then this function will not be available.

(18) O - channel inhibit (F-squelch down). Since the Scanning Function operates by stopping on channels where a signal is detected, the function will lock onto a channel with a lot of interference noise, or if a channel is transmitting a continuous carrier wave signal. This will prevent the radio from continuing its scan of the other channels. The Inhibit Function allows unwanted channels to be removed from the Scanning Function while remaining available for use on the radio. Pressing F-Squelch Down will inhibit the current channel, indicated by 'INH' appearing on the bottom line of the LCD display (Fig 16). When that channel is subsequently selected, a - legend will be shown on the bottom line of the LCD display indicating that the channel is inhibited from the Scanning Function. Pressing F-Squelch Down if the channel is already inhibited will restore it to the Scan Function, indicated by 'SCAN' appearing on the bottom line of the LCD display.

(19) Mem (F-Channel Up held for two seconds). This function allows the radio to operate only on the channels held in the Scan Memory, indicated by 'MEM' shown on the LCD display. If the Scanning Function is selected, it will operate the same way as the Memory Scan Function. Pressing CH 16 or F-Channel Up held for two seconds will return the radio to normal operation.

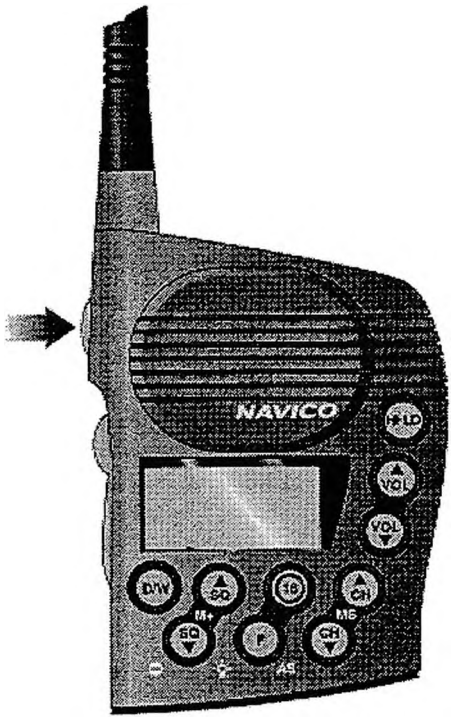


Fig 10 Operator controls

Fig 11 Volume bargraph on LCD display

Fig 12 Squelch bargraph on LCD display

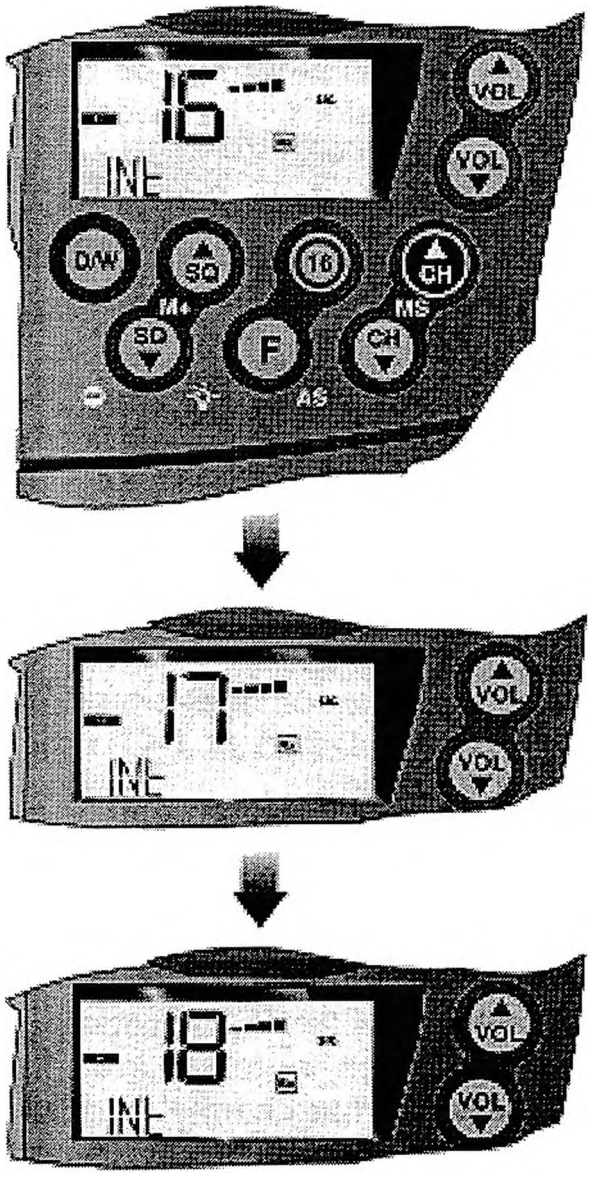


Fig 13 Scrolling through channels

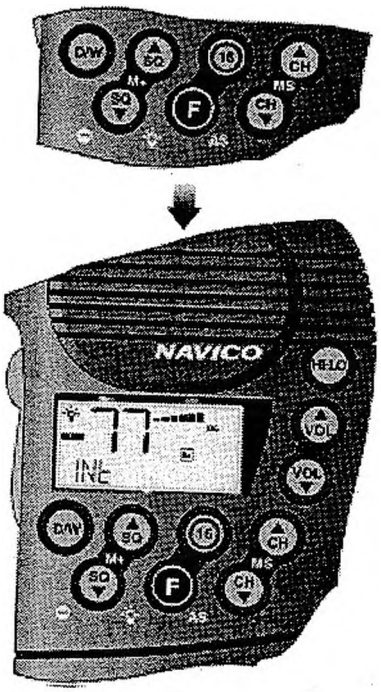


Fig 14 LCD backlighting

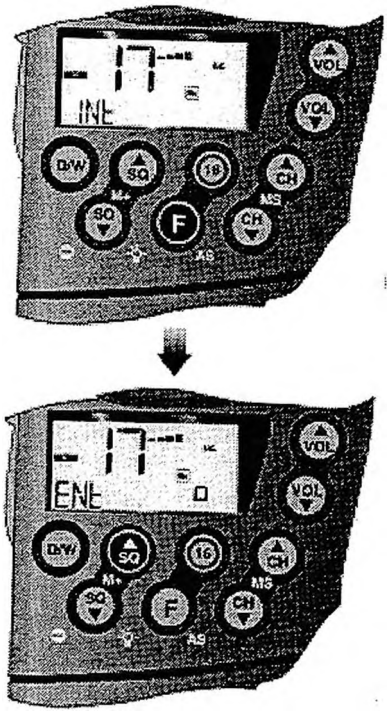


Fig 15 Entering channel into scan memory

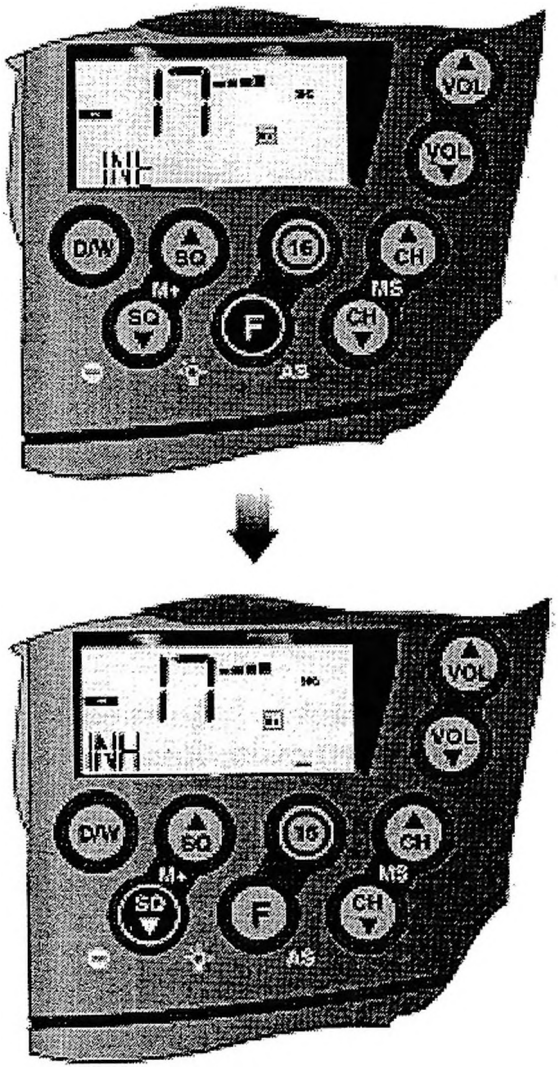


Fig 16 Inhibiting channel from scan

Operating Procedure

25 Operation is restricted to personnel trained in VHF operating procedures and authorised to use the radio.

Channel usage plan (Frequency Plan A)

26 Standard versions of the radio are factory programmed for the marine band channels indicated in Table 3. (Frequency Plan 'A') The table also indicates the preferred use for each channel and in which sequence the channels ought to be used. The table originates from the Admiralty List of Radio Signals.

27 For example, to make an INTER SHIP call you should try channel 6 first, if this is in use try channel 8, if this is in use try channel 10, etc.

TABLE 3 CHANNEL SETTINGS

Channel Setting	Inter - Ship	Port Operation	Ship Movement
6	1		
8	2		
10	3	9	10
11		3	1
12		1	3
13	4	4	5
14		2	7
15*	11	14	14
16		Distress, Safety and Calling	
17*	12	13	13
67	9	10	9
69	8	11	4
71		7	6
72	6		
73	7	12	11
74		8	8

NOTE

Channels marked * only operate on low power (1W).

Guidelines on battery life

28 Typical battery life figures are shown below. These are based on a usage profile of 10% transmitting 10% receiving and 80% squelched at a temperature of +20° C.

(1) High Power 4.5 hours

(2) Low Power 10.5 hours

NOTE

Available battery life will fall if the battery is allowed to suffer from memory effect caused by charging before battery is fully discharged.

Changing the battery pack

29 When the radio battery is discharged fit the spare battery pack as follows:

(1) Turn the release lever, on the bottom of the radio, though 180deg. until the textured side is pointing away from the recess. (Fig 17).

(2) Pull the release lever to extract the battery pack from the bottom of the radio (Fig 18).

30 Refitting is the reverse of removal, but care must be taken to ensure that the locking cam is in the open position before the battery is pushed fully home.

31 Although the radio is fully waterproof with the battery removed, it is recommended that any moisture in the battery compartment or on the battery pack, should be wiped clear with a dry cloth. If the radio has been immersed in salt water it should be rinsed in fresh water before drying.

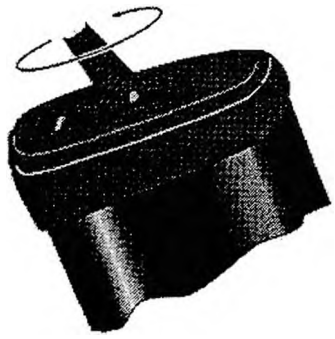


Fig 17 Battery release lever in 'unlocked' position

Fig 18 Battery pack removal

RADIO MAINTENANCE

Maintenance Overview

32 Radio maintenance consists of two preventative maintenance tasks. Each task has a maintenance procedure which is provided in Job Information Card (JIC) format. These tasks should be carried out as per the schedule below.

TABLE 4 MAINTENANCE OVERVIEW

Task	JIC	Period	Remarks
Charge batteries	See Para 38	Every Month	Every two weeks if Temperature >28°C
Functional Check	See Para 41	Every 3 months	

Upkeep and Support.

33 The SMWPR is procured as a commercial off the shelf unit (COTS) equipment and will not be codified.

34 Repair is by Upkeep by exchange only. The SMWPR is a sealed piece of equipment and is not to be opened or tampered with under any circumstances, in the event of equipment failure replacement is to be made as follows:

(1) Variant (A)

(a) The defective unit to be is returned to the nearest Command Portable Radio Pool address as per BR 8783(1) Section 3 Chapter 3 Annex B.

(b) Defective equipment is not to be returned by users to PSTO(N).

(c) Command Portable Radio Pools (M) will carry the range of equipment as per BR8783 (1) Section 3 Chapter 3 Annex C, which will be available on a one for one basis.

(d) AND Group plc will maintain a buffer stock of serviceable items to support Command Portable Radio Pools.

(2) Variant (B) and (C)

(a) The defective unit is to be returned direct to AND Group plc, Tilbury Freeport, Tilbury, Essex, RM18 7HL.

(b) Defective equipment is not to be returned to PSTO(N) or the Command Portable Radio Pools.

(c) AND Group plc will maintain a buffer stock of serviceable items to support this equipment on a one for one basis.

Radio batteries

35 Nickel Cadmium rechargeable batteries can lose up to 20% of their charge in one month when not in use. The loss is greater in higher ambient temperatures.

36 In normal use batteries should be used until near fully discharged (as indicated by the battery warning function of the radio) before being recharged. Main and spare batteries should be rotated in use.

37 The monthly battery charge procedure is required only if batteries are out of use for one month or longer.

Charging procedure

38 Battery charging procedure is as follows:

(1) Connect the charger to the mains supply and turn the charger ON at its rocker switch.

(2) With no batteries in the charger confirm that the charger status indicator illuminates with a steady Red LED.

(3) Place the Battery in the front pocket of the charger and press down to ensure contacts mate with those of the charger. Confirm that front pocket status indicator is flashing Green LED indicating charging in progress.

(4) After approximately 80 minutes the front pocket status indicator will change from flashing to steady Green LED indicating charging completed and trickle charge has begun.

(5) The battery may now be removed from the charger.

39 If the charger status indicator shows a flashing Red LED when the battery is inserted this indicates a faulty battery or a fault condition such as over temperature.

40 Batteries may be trickle charged using the rear pocket of the charger. The rear pocket status indicator shows a steady Green LED while battery is being trickle charged.

Radio Functional Check

41 This routine functional check is required only if radios are out of use for periods of one month or longer.

42 Functional checks may be performed by exchanging test calls with another VHF Portable Radio or with a local VHF base station.

43 To test call with another VHF Portable Radio:

(1) Turn on radio by pressing the On/Off button. The radio will automatically start up on its default channel usually Channel 16.

(2) Observe battery level indicator on LCD Display. Fully charged shows 7 or 8 bars; 4 bars or less is a nearly discharged battery. Replace with fully charged battery if necessary.

(3) Adjust Volume and Squelch levels by pressing the relevant up/down buttons.

(4) Select Channel by pressing CH up/down buttons to switch to a pre-arranged free intership or private channel.

(5) Press and hold the PTT button. Observe that battery level indicator is shown and [Rx] indicator changes to [Tx]. Make test call to the other radio. Release PTT button to receive call.

(6) Connect Extension Loudspeaker Microphone to the accessory socket and repeat checks.

(7) Turn off radio by pressing and holding On/Off button until radio beeps.

44 If radio fails refer to Fault Finding (Para 45).

Fault finding

45 The checks shown in Table 5 should be carried out before seeking replacement radios.

TABLE 5 FAULT FINDING CHECKS

Symptom	Possible Cause	Remedy
Radio will not switch on	*Battery not charged. *Battery not secured correctly in radio	*Re-charge battery *Ensure battery is fully locked in (see Para 29)
Scan or Memory Scan is locking on a channel without a signal.	*Noise on the channel is holding the scan.	*Increase squelch level. *Inhibit the noisy channel from scan (see Para 24).
Dual watch not being entered.	*Priority channel selected (usually CH 16).	*Exit Dual Watch.
Certain channel numbers are not obtainable.	*Some channels are restricted and are not programmed in the radio.	*Consult NSC.
Will not Transmit.	Scanning or Dual Watch function activated.	*Exit scanning or Dual Watches necessary.
Will not transmit on 5 W but OK on 1 W.	*Low voltage when full transmitting current is drawn. *Some channels are restricted to low power transmission only.	*Battery low, replace with fully charged battery. *Consult NSC.
Transmission persistently weak.	*Damaged Antenna.	*Fit replacement Antenna.

CAUTION

(1) OPENING RADIO CASE. Do not attempt to open the radio case. Components within the watertight case are not Maintainer or Operator serviceable.

(2) WATERTIGHT SEALS. Once the case is opened the watertight seals have to be replaced under controlled factory conditions and the radio then subjected to stringent tests to prove watertightness.

CHAPTER 3 ANNEX A

STANDARD MARINE WATERPROOF PORTABLE RADIO SCALE OF ALLOWANCES FOR HM SUBMARINES, AREA FLAG OFFICERS AND RM UNITS.

	Variant			Battery Charger	
	(A)	(B)	(C)	1+1	4+4
FOSM					
Submarines (S Class) *5	2			2	
(T Class) *7	2			2	
(V Class) 4	2			2	
PLYMOUTH					
HMS Drake (Command User Pool)	12			12	
HMS Drake (Contingency Pool)	4			4	
BRNC Dartmouth	10			10	
FOST Devonport	3			3	
HMS Raleigh - Jupiter Point	12			12	
The Camber (Sail Training) - RM Stonehouse	1			1	
No:1 Raiding Troop - RM Turnchapel	17			17	
No:2 Raiding Troop - RMR Poole	(7)	See Note		7	
Landing Craft Wing - RM Poole	(15)	See Note		15	
SBS - (RM Poole)	(38)	See Note		38	
Marine Salvage Unit (South)		10		10	
FONA (RNAS)					
RNAS Culdrose	16			16	
RNAS Culdrose (Sea Survival Drills)	3				1
RNAS Portland (Sea Survival Drills)	4				1
RNAS Prestwick	3				1
PORTSMOUTH					
Command User Pool	8			8	
HMS Dolphin (Training Boats)	3	See Note		3	
HMS Dolphin (Boats Officer)	5			5	
Disposal Reserve Ship Office	10			10	
Fleet Diving Unit 1	6			6	
Fleet Diving Unit 2	6			6	
Fleet Diving Unit 3	4			4	
HMS Sultan (Sea Survival Drills)	5				1
17 Port & Maritime Regiment (Royal Logistic Corps)	(5)	TBA See Note		(1)	(1)
17 Port & Maritime Regiment (School of Logistics)	(14)	TBA See Note		(14)	

	Variant			Battery Charger	
	(A)	(B)	(C)	1+1	4+4
FOSNNI/NBC CLYDE					
NTD Towed Array Section	4			4	
Command User Pool	12			12	
COMLYDE (Shiplift)	3			3	
COMCLYDE (Sail Training Centre)	4			4	
HMS Scotia	4			4	
HMS Eaglet	3			3	
SNONI	6			6	
Captain Sea & Shore Training CSS	2			2	
NACC HMNB Rosyth	2			2	
HMS Calliope	3			3	
QHM Clyde	22			22	
Clearance Diving Units		10		10	
Jetty Management Group			6		2
Marine Salvage Unit (North)		10		10	
CINCFLEET					
Contingency Pool Portsmouth	4	See Note		4	
Naval Party 1016	2	See Note		2	
HQBF GIBRALTAR					
Command User Pool	12	See Note		12	
RNHQ (Devil Towers Camp)	4	See Note		4	

NOTE

Procurement and issue of equipments to these units maybe delayed until mid 1998. Use of current portable radios should continue until replacements become available.

CHAPTER 3 ANNEX B.

LIST OF COMMAND PORTABLE RADIO POOLS.

1. Plymouth:

W007/Ursula Building
Weston Mill Lake Jetty
HMS Drake (Water Front)
HM Naval Base
Devonport
Plymouth
PL2 2BG

Tel: 01752 553740 Ext 67334

2. Portsmouth:

Command Portable Radio Pool
Captain Of The Port Stores
Building 217
HM Naval Base PP32
Portsmouth
Hants
PO1 3NH

Tel: 01705 725578

3. Yeovilton:

Command Portable Radio Pool
Ground Radio
RNAS Yeovilton
Ilchester
Somerset
BA22 8HT

Tel: 01935 840551

4. Faslane:

FOSNNI/NBC Clyde
Command Building
Command Portable Radio Pool
Clyde Submarine Base
Faslane
Helensburgh
Dunbartonshire
G84 8HL

Tel: 01435 674321 Ext 6775

5. Gibraltar:

Command Portable Radio Pool
Communications Centre
HQBF Gibraltar
HM Naval Base
Gibraltar
BFPO 52

CHAPTER 3 ANNEX C

COMMAND PORTABLE RADIO POOLS (M)

MAINTENANCE AUTHORISED HOLDINGS

	Portsmouth	Faslane	Plymouth	Yeovilton	Gibraltar	AND Group plc
Portable Tx/Rx	7	7	7	3	7	10
Leather case	7	7	7	3	7	10
LS/Mic	7	7	7	3	7	10
Wrist lanyard	7	7	7	3	7	10
Belt clip	7	7	7	3	7	10
Battery	14	14	14	6	14	10
Antenna	22	22	22	12	22	20
Charger (1+1)	7	7	7	4	7	0
Charger (4+4)	1	1	1	1	1	0

NOTE

Issues of maintenance authorised holdings will be made in two stages as listed below

(1) Year 1 - Allowance 50% of authorised holdings for year (1997/8).

(2) Year 2 - Remaining allowance available complete with Charger (4+4) for year (1998/9).

CHAPTER 4

ALLOWANCES

CONTENTS

Para

1 Introduction

Table Page

1 Allowances for HM ships, submarines and RFAs 3
2 Allowances for command pools and directors of marine services (Navy) (DMS(N)) 5
3 Allowances for flag officers, shore establishments and naval manned key points 7
4 Allowances for Ministry of Defence Police (MDP) 9
5 Allowances for exchange and permanent allowances for programming held by command maintenance pools 13
6 Locations of MOULD installations 16

INTRODUCTION

1 The following tables show scales of allowances for ships and shore authorities. Entries are made only with the approval and agreement of DOR(Sea); the tables are therefore sufficient authority for action to equip units to the scales shown.

2 Commercial Portables (see Section 3) are too varied and held by too many users to be condensed into a useful table. Commercial equipment is provided only with DOR(Sea) approval and agreement; details of approval and provision are held by DSWE/WE102A2, SSA, Elm 3b, MoD Abbey Wood #200, PO Box 702, Bristol BS12 7DU, who may be consulted on any specific location or authority.

SECTION 2

CLANSMAN EQUIPMENT

CONTENTS

Chapter

1 General information
2 Clansman communication sets
3 Clansman accessories
4 Routine maintenance

CHAPTER 1

GENERAL INFORMATION

CONTENTS

Para
1 Introduction
2 Equipment
3 Repairs

Table Page
1 REME workshops nominated to carry out Clansman repairs . . . 3

INTRODUCTION

1 The Clansman range of portable and mobile radio communications equipment is designed to meet MoD (Army) specifications for land based operations, but is used within the Royal Navy. The range is designed to meet the requirements of DEF133 Table L3 (Ground Equipment, exposed and immersible unpackaged), as follows:

(1) To store and operate over a temperature range of -40°C to +55°C (ambient) plus the effect of Solar Radiation (1130 W/m^2 for 6 hours).

(2) To withstand water immersion to a depth of 1.5 m.

(3) To store and operate at an altitude of 2,500 m.

(4) To withstand transportation at an altitude of 7,250 m.

(5) To withstand tropical exposure (84 days at 95% r.h., temperatures between +20°C and +30°C).

(6) To store and operate under conditions of heavy driving rain, salt spray, high wind, driving dust and driving snow.

(7) To withstand the corrosive effects of acid and alkaline spray, fuel oils, hydraulic oils and lubricating fluids.

(8) To withstand operational shock.

EQUIPMENT

2 Each Clansman radio communications set is supplied complete with the accessories required for its operation and is known as 'Radio Station UK/PRC...'. Mobile (vehicle type) sets will normally require one or more installation kits/audio kits in addition to the basic radio, which would have a 'UK/VRC...' designation. The make up of any particular kit is defined by a list of items called a Complete Equipment Schedule (CES). Some accessories are compatible with different types of set (ref Chap 3). The individual types of set are detailed in Chaps 2 and 3, and the accessories issued with each set should remain with that set, eg headset, battery, antenna etc.

2.1 Issues of Clansman Portables. New construction ships and ships commissioning from refit are to demand their allowance of Clansman equipment from the nearest Command User Pool. If the pool has insufficient stock to meet the demand it will co-ordinate the issue of equipment through other pools. See Section 1, Chap 2, Para 4 for details.

REPAIRS

3 All technical repairs must be administered by the portable radio pool (see Sect 1, Chap 3). The pool must carry out cosmetic repairs, or interchange accessories in order to maintain a sufficient level of operational stock. All items found to be unserviceable, having a technical defect, must be returned to the nominated REME Support Base (ref Table 1) by the pool for repair. The following notes are for guidance:

3.1 General. Initially, pools must apply in writing to Forms and Publications Branch, DSM(A), Donnington for issue of Form AB222 (Demands for Forms and Publications). The stock of Forms AB222 must then be submitted every other month to the Forms and Publications Branch, requesting forms AFG 1045, AFG 8436 and AFG 8437. These forms are used in procedures for repair and replacement.

3.2 Repair and Replacement. The procedures for Repair/Replacement are as follows:

3.2.1 Users are to return unserviceable equipment to the nearest pool or when distant from UK to any convenient pool, normally the ships base port.

3.2.2 When pools receive an unserviceable item it is to be returned to the nominated REME workshop (Ref Table 1) for repair. Form AFG 1045 must be used in quintuplicate.

3.2.3 On receipt of an unserviceable item the REME workshop will either repair and return it or, if irrepairable, issue an AFG 1043 condemnation certificate and return item (with two copies of form AFG 1043, ref Para 3.2.4) to the pool. The form AFG 1043 states that the item is either beyond repair or beyond local repair.

3.2.4 For items beyond repair or beyond local repair, the pool is to demand replacements from DSM(A), Bicester. Form AFG 8436 is to be used and must state:

(1) The MOD(A) reference number.
(2) The correct designation of the item.
(3) The reasons for the demand.
(4) The serial number and date of the AFG 1043, which should be inserted in the remarks column.

3.2.5 On receipt of the demand (form AFG 8436), DSM(A) Bicester will issue the replacement item as available and automatically raise disposal instructions for the condemned item.

3.3 Returns/Disposal. Ships entering refit, reserve or destoring for any reason are to return their Clansman equipment to the nearest Command User Pool. UNDER NO CIRCUMSTANCES IS CLANSMAN EQUIPMENT TO BE RETURNED TO DGST(N) OR TO THE ARMY.

3.4 Parts List/Spares. Complete Equipment Schedules (CES) are issued with every major Clansman communication set. The CES itemizes all the individual parts normally required to operate that set. Pools must ensure that they hold a complete and current CES library for the correct identification of spares. Copies can be obtained by written application to the Forms and Publication Branch COD Donnington, SALOP, quoting the Army Code No (refer to relevant chapter on equipment).

TABLE 1 REME WORKSHOPS NOMINATED TO CARRY OUT CLANSMAN REPAIRS

COMMAND PORTABLE RADIO	REME WORKSHOP (SUPPORT BASE)
DEVONPORT	27 District Workshops REME Southleigh View Warminster Wilts BA12 0BS Tel Boreham Mil 01985-21400 Ext 3334
FONA	18 Base Workshops REME Bovington Camp Wareham Dorset BH20 6JA Tel Bovington Mil Ext 3521
PORTLAND	
PORTSMOUTH	43 Command Workshops REME Ordnance Road Aldershot Hants GU11 2AA Tel Aldershot Mil 01252-24431 Ext 3610
ROSYTH	26 Command Workshops REME Forthside Sterling Scotland FK7 7RR Tel 01786-72881 Ext 8314
GIBRALTAR	PSTO(N) Gibraltar. All 2nd line repairs and modifications for RN and Army units to be undertaken by RMB, Gibraltar.
HONG KONG	50 Command Workshops REME ShamShuiPo Camp Kowloon Hong Kong BFPO 1

NOTE

Radio Pools are to note that all defective Clansman VRC 353 Radios are only to be sent for repair to the following address:

27 District Workshop REME
Southleigh View Warminster
Wiltshire BA12 0BS

Any VRC 353 returned for repair is to be boldly labelled: (For RN use - will be required for wideband data working).

CHAPTER 2

CLANSMAN COMMUNICATIONS SETS

CONTENTS

Para

1 Introduction
2 UK/PRC 320
3 UK/PRC 344
4 UK/PRC 349
5 UK/PRC 350
6 UK/PRC 351
7 UK/PRC 352
8 UK/PRC 353

INTRODUCTION

1 Brief operating instructions, sufficient for Naval applications, are given in this Chapter for each type of set. Full operating details are contained in the Army User Handbooks which are supplied with each set. Copies of the handbooks (and CES) can be obtained by making written application to the Forms and Publication branch, COD Donnington, SALOP, quoting Army Code No.

UK/PRC 320

2 The UK/PRC 320 is a lightweight manpack HF transceiver, primarily for landing party use.

2.1 Frequency range. The transceiver operates in the frequency range 2 MHz to 29.9999 MHz, and is tunable in 100 Hz steps to produce a total of 280,000 discrete channels.

2.2 Frequency control. Control of the transceiver's operating frequencies is achieved by a crystal-controlled frequency synthesiser, which has a frequency stability of 1 part-per-million over a period of 6 months.

2.3 Operating modes. Four operating modes are available:

(1) SSB. This is a Voice mode which utilizes USB only. Type of emission is A3J, and bandwidth is 2.7 kHz.

(2) DSB. This Voice mode uses AM (A3) emissions with a bandwidth of 6 kHz.

(3) CW(W). This is a wideband Key mode using A1 type emission. Bandwidth is 2.7 kHz.

(4) CW(N). Also a Key mode using A1 emissions, but with a narrow bandwidth of 250 kHz.

2.4 Associated aerials. The UK/PRC 320 may be operated using either a 47 m wire antenna, or a 2.4 m whip aerial.

2.5 Power output. Transmitter output power is dependent on mode of use, and may be set to either high power output, or low power output as follows:

Mode	High Power	Low Power
SSB	30 W (PEP)	3 W (PEP)
DSB	7.5 W	1 W
CW	30 W	3 W

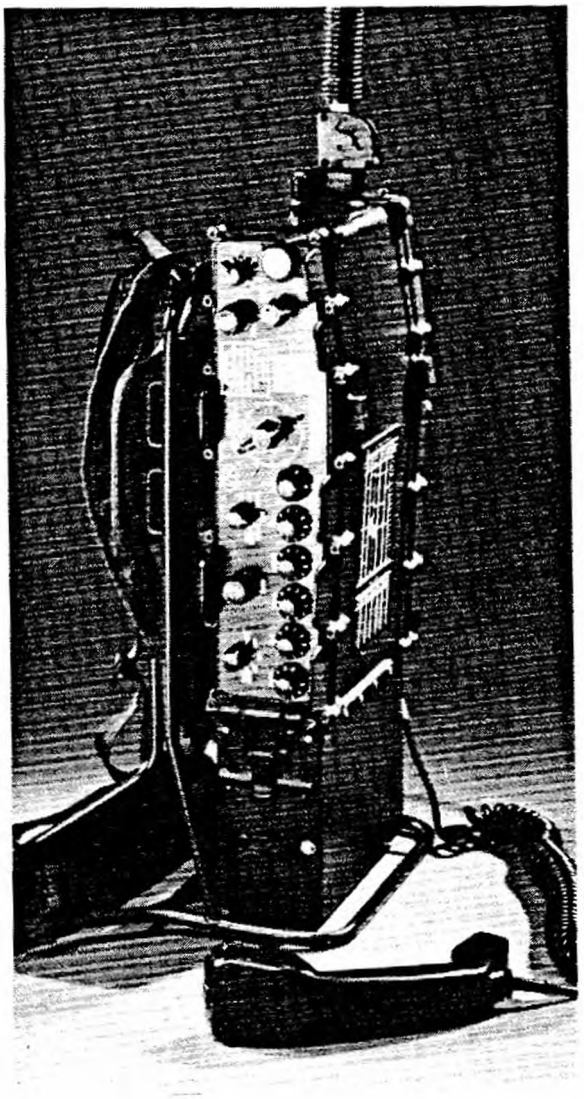
2.6 Power supply. The transceiver utilizes 24 V rechargeable batteries. A fully-charged battery will provide 12 hours operation with a send/receive ration of 1:9 in the high power mode. In addition, the transceiver may also be operated with the Clansman Hand Generator and 1 Ah battery pack.

2.7 Approximate range. Transmitter range is dependent on mode of use as follows:

(1) SSB Voice. Range approximately 50 km.

(2) CW. Range approximately 320 km using skywave transmission.

2.8 Accessories. Headsets and handsets supplied with UK/PRC 320 are interchangeable with the UK/PRC 350 and 351 outfits in the Clansman range. In addition to these items, the transceiver requires the power supply and antenna detailed above.



2.9 Operating information. The following procedure is for guidance only:

(1) Check Battery. Set to BATT CHK and CW (W or N). Depress pressel/morse key. Ensure meter needle registers on or above second mark (first mark is zero). Release pressel/more key. If needle was below second mark, replace battery.

(2) Select Frequency. Set the six, rotary, decade switches to the required frequency. Set FREQUENCY RANGE switch to the corresponding frequency band. The tone heard in the headset/handset will cease when the correct band has been selected and the frequency has stabilised.

(3) Tune Antenna Tuning Unit. Set to ANT. Set RANGE and LOAD switches to suit antenna and frequency as given in the Table on the equipment case. Depress pressel/morse key and adjust TUNE control for maximum meter reading. Adjust LOAD switch for maximum reading, selection lower number position if two give the same reading. Re-adjust TUNE control for maximum reading and release pressel/morse key.

(4) Recheck Battery (repeat step (1)).

(5) Select Transmitter Power. Set to LP (low power) or HP (high power) as required.

(6) Select Mode. Set to SSB or AM for Voice, or CW (W or N) for morse transmission.

(7) Communicate. To transmit, depress pressel and speak into microphone when in speech mode, or operate the morse key when in CW mode. A sidetone will be heard in the headset/handset when transmitting. To receive, release pressel/morse key.

(8) Adjust Volume. Adjust GAIN control for required volume level of received signal.

2.10 NSN. The NSN for the UK/PRC 320 is 5820-99-114-3188.

2.11 Handbook. The user handbook is Army Code No 61123.

2.12 CES. The CES is Army Code No 43740.

UK/PRC 344

3 The UK/PRC 344 is a lightweight manpack UHF AM transceiver replacing the Type 634. The equipment provides ground-to-ground and ground-to-air communications with beacon and rebroadcast facilities.

NOTE

The UK/PRC 344 is provided for emergency UHF communications during flying operations, and for internal security operations. It should not normally be used for ship's boats except where necessary to achieve adequate safety communications, pending the introduction of the replacement SSRP. Commanding Officers should be aware of this equipment's vulnerability to salt water ingress, its current value (approximately £10,000 in 1985) and the extreme shortage of capital stock to replace unserviceable or lost equipment. Appropriate action shall be taken to minimise the risk of damage or loss. A small stock of UK/PRC 344s will be held by the Pools (see Sect 1, Chap 4). The superseded Type 634 UHF Transceiver may be retained onboard for use as spare equipment.

3.1 Frequency range. The transceiver operates in the frequency range 225 MHz to 399.95 MHz, and is tunable in 50 kHz steps to produce a total of 3500 highly-stable speech channels.

3.2 Frequency control. Control of the transceivers operating frequencies is achieved by a crystal-controlled frequency synthesiser, which gives a frequency stability of better than ± 2 kHz.

3.3 Operating modes. The transceiver operates in the AM (A3) DSB voice mode.

3.4 Associated aerials. The UK/PRC 344 is operated using a flexible, steel-tape, omni-directional, whip aerial. It may also be operated using a 5.4 m lightweight mast antenna, a long wire antenna, or a dipole antenna, all of which form part of the Clansman system accessories.

3.5 Power output. Transmitter output power is 2 W.

3.6 Power supply. The transceiver operates using a 24 V rechargeable battery. A fully-charged battery will provide 12 hours operation with a transmit/receive ratio of 1:9.

3.7 Approximate range. Transmitter range is dependent on mode of use as follows:

(1) Ground-to-Ground. Range approximately 16 km (line of sight).
(2) Ground-to-Air. Approximate range 160 km (aircraft at 30,000 ft).

3.8 Accessories. The UK/PRC 344 will accept headsets and handsets designed for use with Clansman range of equipment. In addition, the transceiver may also be operated with the Clansman Hand Generator and 1 Ah battery pack.

3.9 Operating information. The following procedure is for guidance only:

(1) Switch On. Set the MODE switch to ON.

(2) Check Battery. An intermittent hiss will be heard in the headset/handset if the units battery voltage drops to an unserviceable level. If the intermittent hiss is present, replace the battery.

(3) Frequency Selection. Set the three, decade, rotary switches to the desired frequency as indicated by the numerals visible in the apertures above the switch knobs.

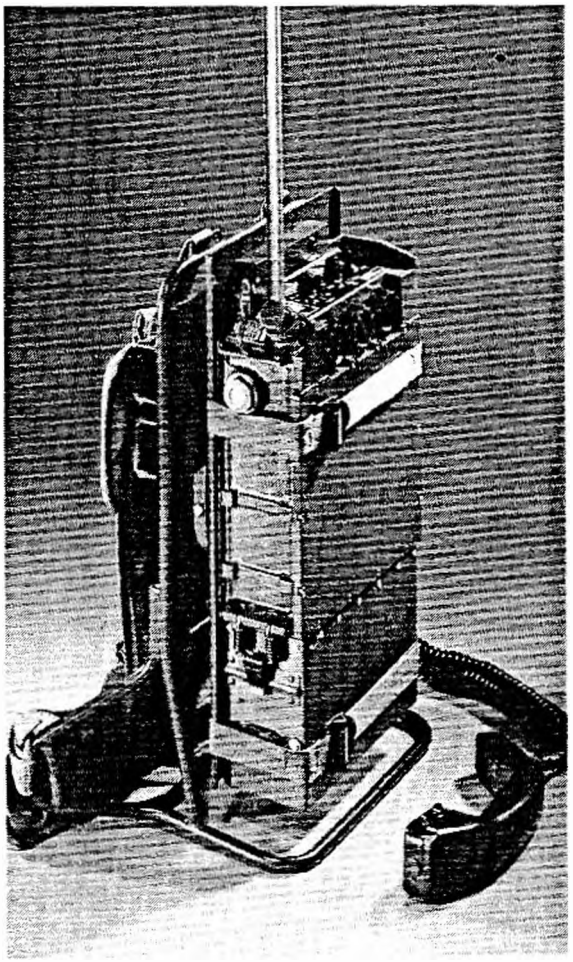
(4) Select Mode. Set the MODE switch to L (if operating the equipment locally) or R (if the remote control facility is to be used).

(5) Beacon Mode. Rotate the MODE switch to B if the set is to be used as a homing beacon.

(6) Rebroadcast Mode. Rotate the MODE switch to A for automatic rebroadcast when connected to another UK/PRC 344 transceiver.

(7) Communicate. To transmit, depress the pressel/PTT and speak into the microphone. To receive, release the pressel/PTT switch.

(8) Adjust Volume. Rotate the ON/VOLUME switch for the required volume level of received signal.



3.10 NSN. The NSN for the UK/PRC 344 is 5820-99-620-9813.

3.11 Handbook. The user handbook is Army Code No 61351.

3.12 CES. The CES is Army Code No 44930.

UK/PRC 349

4 The UK/PRC 349 is a rugged, lightweight VHF FM personal communications transceiver intended for landing party, security, and deck operations. The transceiver is small enough to be conveniently slung from the shoulder or mounted on the back or chest by means of an adjustable, quick-release holster. It may also be carried in the pocket of a combat jacket.

4.1 Frequency range. The transceiver operates in the frequency range 37 MHz to 46.975 MHz, and is tunable in 25 kHz steps to produce a total of 400 discrete speech channels.

4.2 Frequency control. Control of the transceivers operating frequencies is achieved by a crystal-controlled frequency synthesiser, which gives a frequency stability of better than ± 1 kHz.

4.3 Operating modes. The UK/PRC 349 operates in the narrowband FM Voice mode only.

4.4 Associated aerials. The transceiver may be operated using either a 0.5 m whip antenna, or 1 m sectional self-erecting antenna.

4.5 Power output. Transmitter RF output power is 220 mW.

4.6 Power supply. The transceiver power supply comprises a 12 V rechargeable battery, which will supply approximately 24 hours in a 1:1:9 send/receive/standby ratio.

4.7 Approximate range. Communications range using the UK/PRC 349 is dependent on both the type of antenna used and the terrain in which the equipment is sited. Best range is obtained using the 1 m whip aerial. Approximate working ranges are as follows:

Terrain	Working Range (km)	
	0.5 m whip	1 m whip
Rolling countryside	2.0	2.8
Wooded countryside	1.2	1.5
Built-up area	0.3	0.5

4.8 Accessories. The UK/PRC 349 will accept headsets and handsets designed for use with Clansman range of equipment. The headset supplied with the equipment incorporates a throat microphone.

4.9 Operating information. The following procedure is for guidance only.

(1) Check Battery. Set the O/W/L/* system switch to * position. Background hiss heard in the headset indicates that the battery and the radio are functioning. An intermittent hiss heard in the headset indicates that the battery voltage is low, and the battery shall be changed. Set the system switch to the O position (off).

(2) Select Frequency. Set the three, decade, rotary switches to the required frequency, as indicated by the numerals visible in the apertures above the switch knobs.

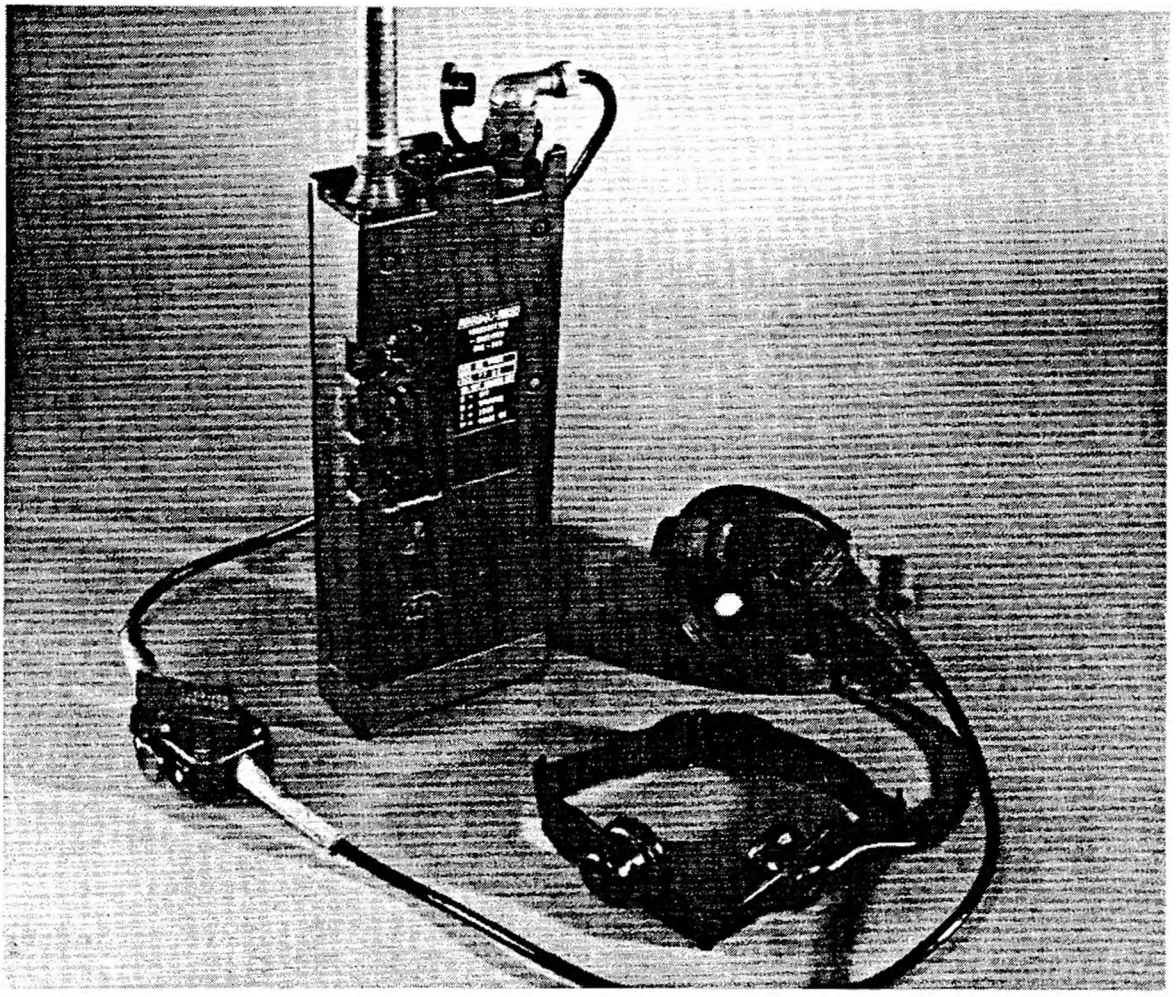
(3) Set Mode. Set the system switch to the W position for whisper mode, or L for loud mode. Whisper mode provides high microphone sensitivity and low audio output level. Loud mode provides reduced microphone sensitivity and increased audio output level relative to whisper mode.

(4) Communicate. Depress the pressel switch and speak into the microphone. A sidetone should be heard in the headset when transmitting. To receive, release the pressel switch.

4.10 NSN. The NSN for the UK/PRC 349 is 5820-99-643-4564.

4.11 Handbook. The user handbook is Army Code No 61646.

4.12 CES. The CES is Army Code No 43832.



UK/PRC 350

5 The UK/PRC 350 is a lightweight VHF FM manpack transceiver intended for landing party, boarding party, or deck operations.

5.1 Frequency range. The transceiver operates in the frequency range 36 MHz to 57 MHz, and is tunable in 25 kHz steps to produce a total of 841 discrete speech channels.

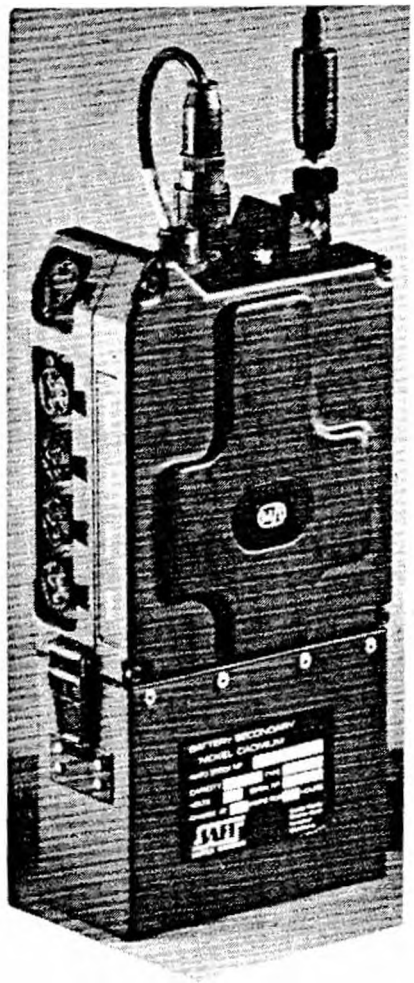
5.2 Frequency control. Control of the transceivers operating frequencies is achieved by a crystal-controlled frequency synthesiser. Frequency stability is ± 5 parts-per-million over the temperature range -40°C to +55°C.

5.3 Operating modes. The transceiver operates in the F3 narrowband FM Voice mode.

5.4 Associated aerials. The UK/PRC 350 may be operated using a 1.2 m whip antenna, a 1.2 m trailing wire antenna, or any Clansman VHF antenna eg Clansman ground-spike aerial.

5.5 Power output. Transmitter output power is 2 W.

5.6 Power supply. The transceiver power supply comprises a 15 V rechargeable battery, which will supply the set for 12 hours in a 1:9 transmit/receive/ratio.



5.7 Approximate range. Communications range using the UK/PRC 350 is dependent on both the type of antenna used and the terrain in which the equipment is sited. Approximate working ranges using the 1.2 m whip aerial are as follows:

Terrain	Working Range (km)	
	Manpack	Vehicle
Rolling countryside	5 to 7	4
Wooded countryside	3 to 5	2
Built-up area	4	3

Using a longer aerial or a ground-spike antenna will significantly increase communications range.

5.8 Accessories. Headsets and handsets supplied with the UK/PRC 350 are interchangeable with the UK/PRC 320 and 351 outfits in the Clansman range. In addition to these items, the UK/PRC 350 can operate using any VHF antenna designed for the Clansman range of equipment.

5.9 Operating information. The following procedure is for guidance only:

(1) Check Battery. Set the O/W/L/* system switch to * position. Background hiss heard in the headset indicates that the battery and the radio are functioning. An intermittent hiss heard in the headset indicates that the battery voltage is low, and the battery shall be changed. Set the system switch to the O position (off).

(2) Select Frequency. Set the four, decade, rotary switches to the required frequency, as indicated by the numerals visible in the apertures above the switch knobs.

(3) Set Mode. Set the system switch to the W position for whisper mode, or L for loud mode. Whisper mode provides high microphone sensitivity and low audio output level. Loud mode provides reduced microphone sensitivity and increased audio output level relative to whisper mode.

(4) Communicate. Depress the pressel switch and speak into the microphone. A sidetone should be heard in the headset when transmitting. To receive, release the pressel switch.

5.10 NSN. The NSN for the UK/PRC 350 is 5820-99-114-3638.

5.11 Handbook. The user handbook is Army Code No 61124.

5.12 CES. The CES is Army Code No 43751.

UK/PRC 351

6 The UK/PRC 351 is a lightweight VHF manpack transceiver compatible with the UK/PRC 350 and intended for use at landing party HQ.

6.1 Frequency range. The transceiver operates in the frequency range 30 MHz to 76 MHz, and is tunable in 25 kHz steps to produce a total of 1841 discrete speech channels.

6.2 Frequency control. Control of the transceivers operating frequencies is achieved by a crystal-controlled frequency synthesiser. Frequency stability is ± 5 parts-per-million over the temperature range -40°C to +55°C.

6.3 Operating modes. The transceiver operates in the F3 narrowband FM Voice mode.

6.4 Associated aerials. The UK/PRC 351 is operated using a 1.2 m whip antenna, a 1.2 m trailing wire antenna, or any of the VHF aerials designed for the Clansman range of equipment eg ground-spike aerial.

6.5 Power output. Transmitter output power is 4 W.

6.6 Power supply. The transceiver utilizes a 24 V 3 Ah rechargeable battery, which provide up to 12 hours operation with a transmit/receive ratio of 1:10. The Clansman Hand Generator may be used, in conjunction with a 1 Ah, Ni Cd battery, to power the set indefinitely.

6.7 Approximate range. Communications range using is usually greater than 8 km, but this will vary according to the terrain at which the equipment is sited and the type of antenna used.

6.8 Accessories. The UK/PRC 351 will accept headsets and handsets designed for use with the Clansman range. Aerials are interchangeable with the UK/PRC 350 outfit.

6.9 Operating information. The following procedure is for guidance only:

(1) Check Battery. Set the O/W/L/* system switch to * position. Background hiss heard in the headset indicates that the battery and the radio are functioning. An intermittent hiss heard in the headset indicates that the battery voltage is low, and the battery shall be changed. Set the system switch to the 0 position (off).

(2) Select Frequency. Set the four, decade, rotary switches to the required frequency, as indicated by the numerals visible in the apertures above the switch knobs.

(3) Set Mode. Set the system switch to the W position for whisper mode, or L for loud mode. Whisper mode provides high microphone sensitivity and low audio output level. Loud mode provides reduced microphone sensitivity and increased audio output level relative to whisper mode.

(4) Set Local/Remote Mode. Set the LOCAL/REMOTE switch to L (if operating the equipment locally) or R (if the remote control facility is to be used).

(5) Rebroadcast Mode. Rotate the LOCAL/REMOTE switch to A for automatic rebroadcast when connected to another UK/PRC 351 transceiver.

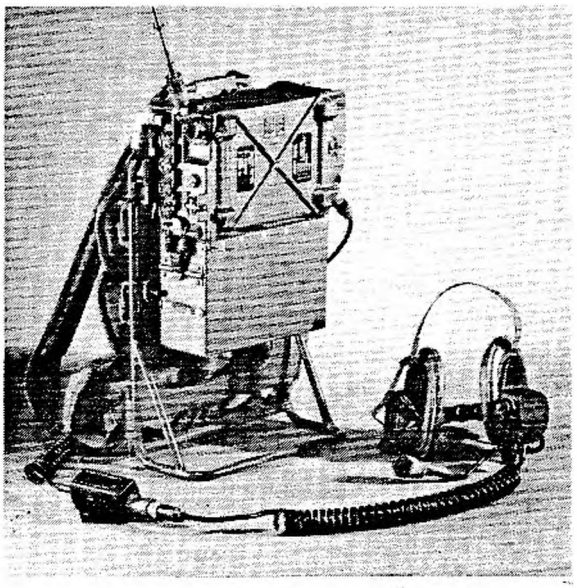
(6) Intercom Mode. When the equipment is interconnected with other radio equipment, setting the LOCAL/REMOTE switch to the I position enables the operator to communicate with other users 'Off-Air'. The C position of the switch is used to call the other network users.

(7) Communicate. Depress the pressel switch and speak into the microphone. A sidetone should be heard in the headset when transmitting. To receive, release the pressel switch.

6.10 NSN. The NSN for the UK/PRC 351 is 5820-99-114-3639.

6.11 Handbook. The user handbook is Army Code No 61128.

6.12 CES. The CES is Army Code No 43753.



UK/PRC 352

7 The UK/PRC 352 is a UK/PRC 351 equipped with a 20 W RF amplifier. It is intended for use at a landing party HQ.

7.1 Frequency range. The transceiver operates in the frequency range 30 MHz to 76 MHz, and is tunable in 25 kHz steps to produce a total of 1841 discrete channels.

7.2 Frequency control. Control of the transceivers operating frequencies is achieved by means of a crystal-controlled frequency synthesiser. Frequency stability is ± 5 parts-per-million over the temperature range -40°C to +55°C.

7.3 Operating modes. The transceiver operates in the F3 narrowband FM Voice mode.

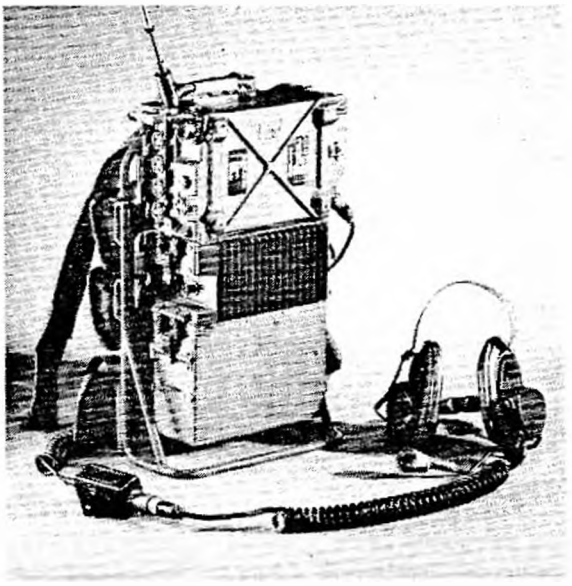
7.4 Associated aerials. The UK/PRC 352 is operated using a ground-spike aerial. This aerial must be used when the transceiver is operated with the 20 W RF amplifier. If the amplifier is removed, the equipment may be operated using the same antennas as the UK/PRC 351.

7.5 Power output. Transmitter output power is 20 W when in high power mode, or 4 W with the RF amplifier removed.

7.6 Power supply. The transceiver utilizes a 24 V 3 Ah rechargeable battery, which will provide up to 8 hours operation with a transmit/receive ratio of 1:10. The Clansman Hand Generator may be used, in conjunction with a 1 Ah Ni Cd battery, to power the set indefinitely.

7.7 Approximately range. Communication range is usually greater than 16 km, but this will vary according to the terrain at which the equipment is used.

7.8 Accessories. The UK/PRC 352 will accept headsets and handsets designed for use with the Clansman range of equipment. Aerials are interchangeable with the UK/PRC 350 outfit when operated in low power mode.



7.9 Operating information. The following procedure is for guidance only:

(1) Check Battery. Set the O/W/L/* system switch to * position. Background hiss heard in the headset indicates that the battery and the radio are functioning. An intermittent hiss heard in the headset indicates that the battery voltage is low, and the battery must be changed. Set the system switch to the O position (off).

(2) Select Frequency. Set the four, decade, rotary switches to the required frequency, as indicated by the numerals visible in the apertures above the switch knobs.

(3) Set Mode. Set the system switch to the W position for whisper mode, or L for loud mode. Whisper mode provides high microphone sensitivity and low audio output level. Loud mode provides reduced microphone sensitivity and increased audio output level relative to whisper mode.

(4) Set Local/Remote Mode. Set the LOCAL/REMOTE switch to L (if operating the equipment locally) or R (if the remote control facility is to be used).

(5) Rebroadcast Mode. Rotate the LOCAL/REMOTE switch to A for automatic rebroadcast when connected to another UK/PRC 352 transceiver.

(6) Intercom Mode. When the equipment is interconnected with other radio equipment, setting the LOCAL/REMOTE switch to the I position enables the operator to communicate with other users 'Off-Air'. The C position of the switch is used to call the other network users.

(7) Communicate. Depress the pressel switch and speak into the microphone. A sidetone should be heard in the headset when transmitting. To receive, release the pressel switch.

7.10 NSN. The NSN for the UK/PRC 352 is 5820-99-114-3640.

7.11 Handbook. The user handbook is Army Code No 61128.

7.12 CES. The CES is Army Code No 43756.

UK/PRC 353

8 The UK/PRC 353 is a VHF FM transceiver intended for use as a fixed or portable ground station at landing party HQ, or as a mobile station in landing/boarding craft.

8.1 Frequency range. The transceiver operates in the frequency range 30 MHz to 75.975 MHz, and is tunable in 25 kHz steps to produce a total of 1840 discrete channels. A switch on the front panel may be set such that the receiver is tunable in 50 kHz steps; this gives a total of 920 channels.

8.2 Frequency control. Control of the transceivers operating frequencies is achieved by means of a crystal-controlled frequency synthesiser. Frequency stability is ± 5 parts-per-million over the temperature range -40°C to +55°C.

8.3 Operating modes. The transceiver operates in F3 FM Voice mode and the F2 FM Data Mode (data rate 20 kbits/sec).

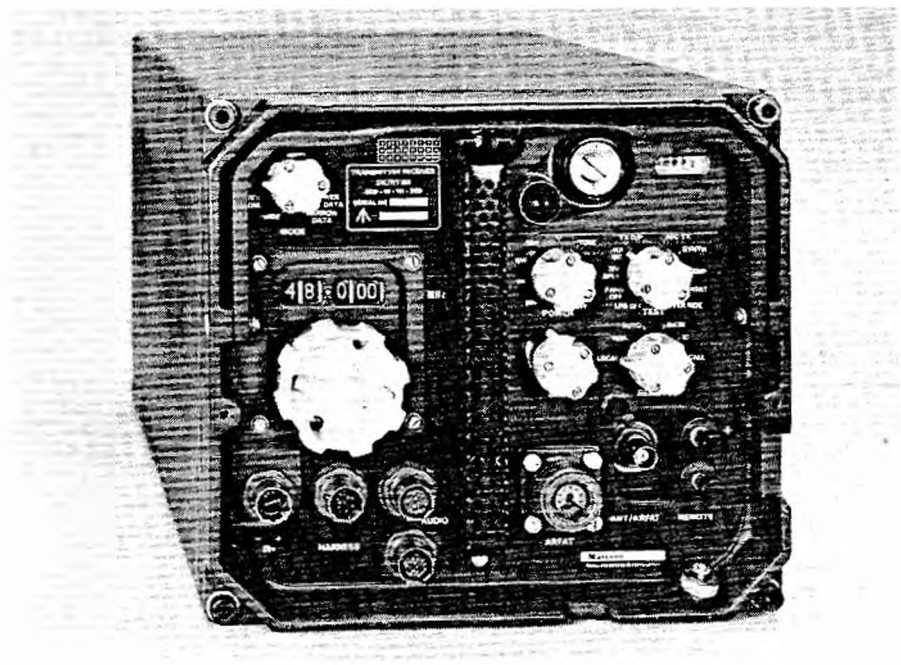
8.4 Associated aerials. The UK/PRC 353 is operated using a ground-mounted monopole aerial, a ground-spike aerial, or a 2 m whip antenna.

8.5 Power output. Transmitter output power is switchable in four steps, these being 100 mW, 1 W, 15 W and 50 W.

8.6 Power supply. The transceiver will operate with battery voltages between 21.5 V and 33 V. Current drain when transmitting is 10 A at a supply voltage of 24 V and an output power of 50 W.

8.7 Approximate range. Communications range is greater than 50 km when transmitting in high power (50 W) mode.

8.8 Accessories. The UK/PRC 353 will accept headsets and handsets designed for use with the Clansman range of equipment.



NAVICO AXIS 150/250 VHF IMM

61 The Navico Axis 150 and 250 are handheld, waterproof, personal transceivers which can be pre-programmed with 16 user channels in the International Maritime Mobile (IMM) frequency band. **NOT TO BE CONFUSED WITH THE GMDSS RADIO (YELLOW BODIED).**

62 The Navico Axis 150 is issued on a permanent basis to users who have an endorsed requirement for a waterproof IMM Band radio. The 250 is issued when the user has a dual watch requirement.

63 Parameters

63.1	Frequency range:	155 - 165 MHz
63.2	Channels (Axis 150):	16
63.3	Channels (Axis 250):	99
63.4	Channel spacing:	25 kHz
63.5	Operating mode:	F3 FM Voice
63.6	Antenna:	Flexible helical whip
63.7	RF power output (Axis 150):	1 and 5 Watts
63.8	RF power output (Axis 250):	1 and 5 Watts
63.9	Power supply:	700 mAh Ni-Cad rechargeable battery
63.10	Range:	5 km approximately (line-of-sight)
63.11	Dimensions/weight: (with battery)	Width: 69 mm Height: 177 mm Depth: 42 mm Weight: 600 g

64 Accessories

64.1 Rapid Charger Single/Multiway 240 V AC.

64.2 Waterproof speaker/microphone.

64.3 Headsets.

64.4 Leather case.

64.5 Lanyard.

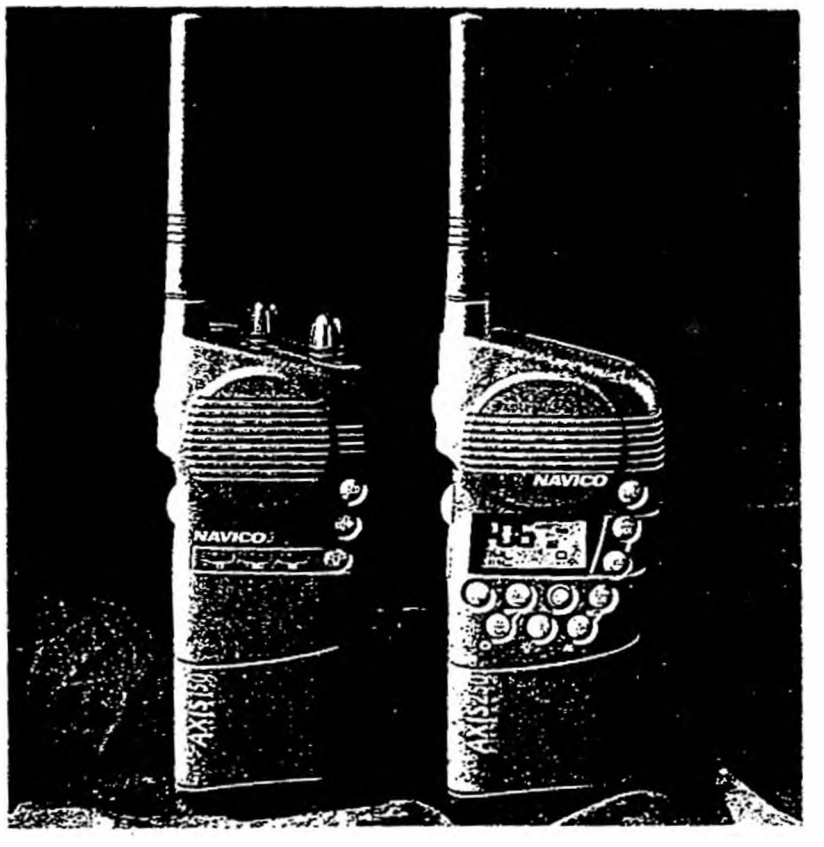
64.6 Floatation strap.

65 Issue

65.1 Issue in accordance with Section 1, Chapter 2, Paragraph 3.

66 Support

66.1 For repair/replacement contact DSWE/WE102A2, SSA, Elm 3B, MoD Abbey Wood #200, PO Box 702, Bristol BS12 7DU. Tel. 0117-9138032 (Abbey Wood Ext: 38032), Fax: 0117-9138911. Signal Address: NAVSPCOMD BATH.



Navico Axis 150 and 250

8.9 Operating information. The following procedure is for guidance only:

(1) Check Battery. Set the TEST switch to the 28 V SPLY position. Ensure that the meter indicates in the green section. This shows that the transceiver power supply is operable.

(2) Select Frequency. Set the POWER switch to the TUNE position. Rotate the tuning control to the required frequency, as indicated by the numerals visible in the windows above the switch knob. Reset the POWER switch to the desired transmit output power level (MIN, 1 W, 15 W, or 50 W).

(3) Set Mode. Set the MODE switch to the WIDE DATA or NARROW DATA position for Data transmissions. Set the MODE switch to NARROW TONE or WIDE TONE for Voice transmissions.

(4) Set Local/Remote Mode. Set the LOCAL/REMOTE switch to LOCAL (if operating the equipment locally) or REM (if the remote control facility is to be used).

(5) Rebroadcast Mode. Rotate the REMOTE switch to AUTO for automatic rebroadcast when connected to another UK/PRC transceiver.

(6) Intercom Mode. When the UK/PRC 353 is interconnected with other radio equipment, setting the REMOTE switch to the I position enables the operator to communicate with other users 'Off-Air'. The C position of the switch is used to call the other network users.

(7) Communicate. Depress the pressel switch and speak into the microphone. A sidetone should be heard in the headset when transmitting. To receive, release the pressel switch.

8.10 NSN. The NSN for the UK/PRC 353 is 5820-99-114-3159.

8.11 Handbook. The user handbook is Army Code No 61393.

8.12 CES. The CES is Army Code No 43754.

CHAPTER 3

CLANSMAN ACCESSORIES

CONTENTS

Para
1 End-fed whip antenna 30-76 MHz
2 Elevated Omni-directional broadband antenna 30-76 MHz
3 Ground mounted monopole antenna 30-76 MHz
4 VHF Ground spike antenna 30-76 MHz
6 Elevated ground spike antenna 30-76 MHz
7 Audio ancillaries
8 Infantry headset
9 Pressel switch box assembly
10 Respirator microphone
11 AFV crewmans helmet
12 Staff users headset
13 Single transducer headgear assembly
14 Headsets
15 Electric generator, hand-operated
17 Battery charging equipment
18 Battery charging

END-FED WHIP ANTENNA 30-76 MHZ

1 This antenna assembly is intended for use on all types of military vehicle. It consists of a 2 m end-fed whip antenna and an automatic matching and tuning unit (NSN 5821-99-630-6156). The matching and tuning unit is designated TUUAM (Tuner Unit Antenna Automatic Matching). The antenna assembly may be used with the following Clansman communication sets:

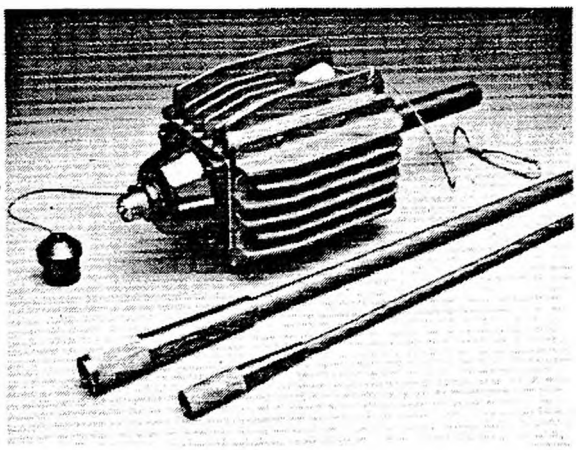
(1) UK/PRC 350
(2) UK/PRC 351
(3) UK/PRC 352
(4) UK/PRC 353
(5) Any VHF set operating in the frequency range 30 MHz to 76 MHz into a 50 ohm load.

ELEVATED OMNI-DIRECTIONAL BROADBAND ANTENNA 30-76 MHz

2 This antenna is intended for use on a lightweight 8 m or 12 m mast. It does not require antenna tuners or other adjustments for frequency. The antenna is suitable for use with the following Clansman sets:

(1) UK/PRC 350
(2) UK/PRC 351
(3) UK/PRC 352

The NSN for this antenna is 5820-99-633-7234.

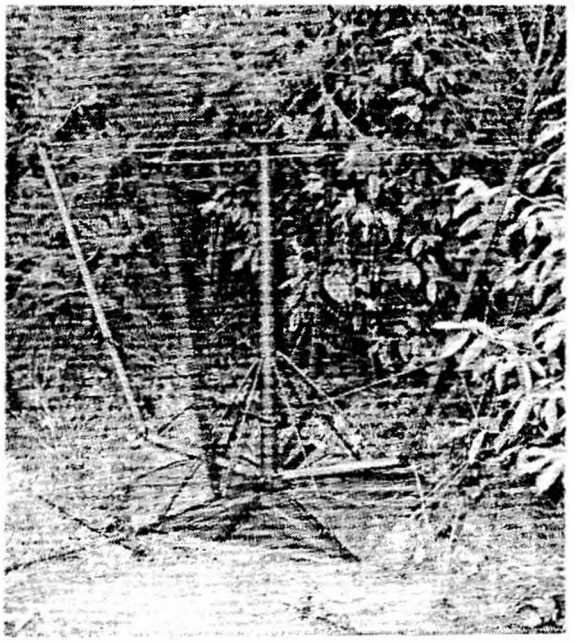


GROUND-MOUNTED MONOPOLE ANTENNA 30-76 MHz

3 The ground-mounted monopole antenna consists of a skeleton, inverted, pyramid with a total height of 1.3 m. It is self-standing, can be quickly erected in any terrain, and is easily concealed when mounted on the ground. The antenna is suitable for use with the following communication sets in the Clansman range:

(1) UK/PRC 352
(2) UK/PRC 353

The NSN for this antenna is 5820-99-620-8494.

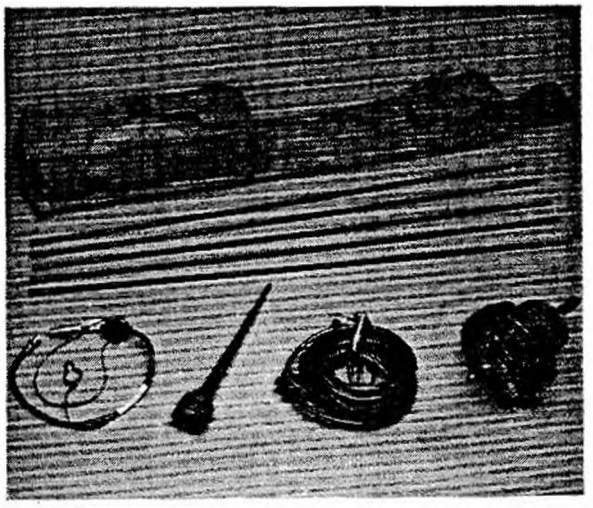


VHF GROUND SPIKE ANTENNA 30-76 MHz

4 This is a vertical rod antenna assembly comprising the following components:

(1) A steel spike, which is driven into the ground to support the antenna.

(2) A fixed matching unit, which clips onto the spike.



Antenna 5820-99-620-5950

(3) A rod antenna element in four sections. These sections are clipped together to produce a total length of 2.4 m.

(4) Two lengths of coaxial cable with plugs to suit the Clansman communications sets.

5 The antenna is suitable for use with the following communication sets in the Clansman range:

(1) UK/PRC 350
(2) UK/PRC 351
(3) UK/PRC 352

The antenna may also be used with any VHF radio set operating in the 30 MHz to 76 MHz frequency band and with a maximum power output of 20 W. The NSN for this antenna is 5820-99-620-5950.

ELEVATED GROUND SPIKE ANTENNA 30-76 MHz

6 This is the VHF ground spike antenna described in Para 4 but mounted on a 5.4 m fibre glass mast using an Elevation Installation Kit (NSN 5985-99-620-6499). The antenna may be used with the following Clansman radio sets:

(1) UK/PRC 350
(2) UK/PRC 351
(3) UK/PROC 352

AUDIO ANCILLARIES

7 The following paragraphs provide details of the audio equipment which may be used with all communication sets in the Clansman range.

Infantry headset

8 The headset is intended for use with manpack and vehicle radio sets. The headset assembly is fitted with a pair of receiver transducers mounted in foam padded circumaural earshells. A boom microphone is fitted to the left earshell. The headset is connected to the Pressel Switch Box Assembly by means of a 7-way snatch connector, and is compatible with Respirator, Anti-Gas, No. S6. NSN for the headset is 5965-99-620-8320.

Pressel switch box assembly

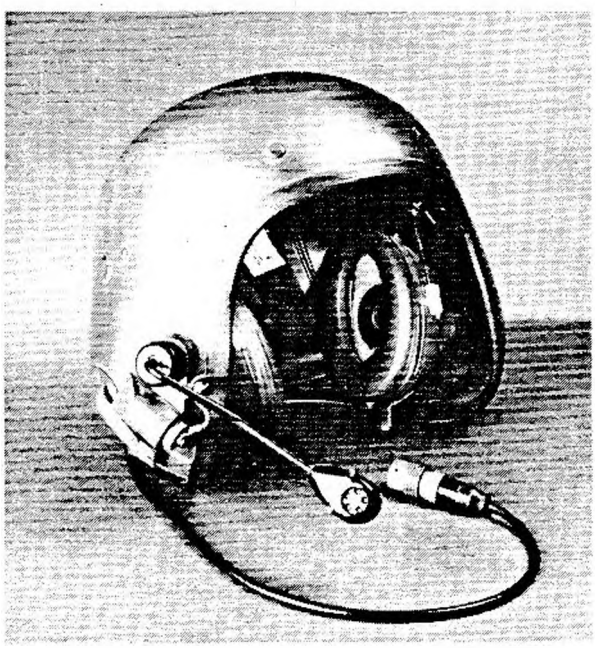
9 This assembly consists of a pressel box with snatch socket, clothing clip, and a 6-way cable fitted with a 7-way bayonet locking plug for connection to user equipment. The pressel switch is used to control the microphone and send/receive control-lines of the communication set. An auxiliary, screw-controlled, switch allows the microphone to the continuously active. NSN is 5965-99-620-5667.

Respirator microphone

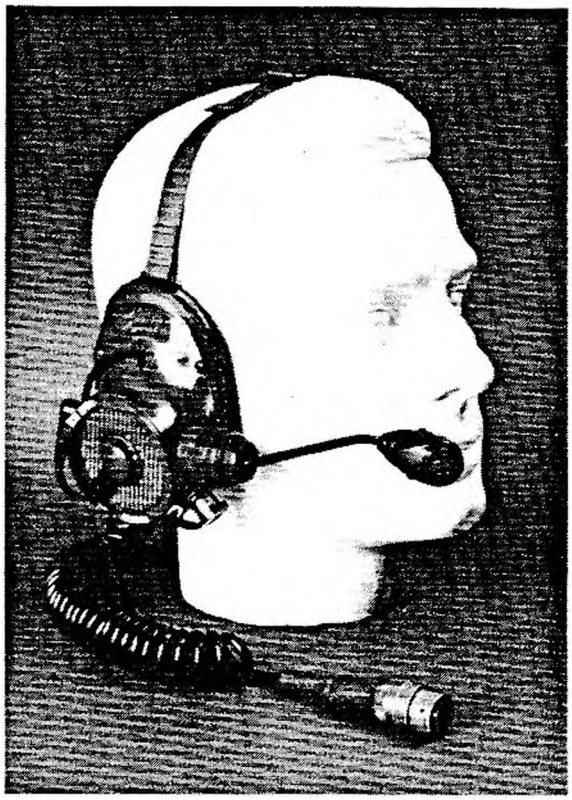
10 The microphone is intended for use with the Respirator, Anti-Gas, No. S6, and is snap fitted. The fitting allows the microphone to be snatch disconnected without disturbing the respirator. Primary function is to maintain full voice communication facilities when the use of a boom microphone is rendered ineffective due to the use of a gas respirator. NSN is 5965-99-622-5437.

AFV crewman's helmet

11 This helmet protects the AFV (Armoured Fighting Vehicle) crewman against head injury due to the serious shocks that can occur, in an AFV, when travelling at high speed over rough terrain. The helmet also incorporates a noise cancelling boom microphone. NSN for the helmet is 5965-99-620-3251.



Helmet 5965-99-620-3251



Headset 5965-99-620-5668

Staff user's headset

12 The headset is intended for use by personnel engaged in areas of continuous or intermittent noise where headsets must be worn with separately issued protective helmets. The headset incorporates an acoustic valve, which may be opened to allow the user to listen to local conversations, or use the telephone, without removing the headset. NSN for the headset is 5965-99-620-5668.

Single transducer headgear assembly

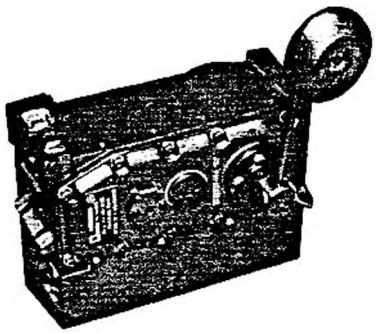
13 This assembly may be worn as a single-sided headset, or used as a hand-held microphone. The earpiece/microphone is fitted with a press-to-talk (PTT) switch, a webbing harness, and a coiled cable extending to 1 m in length. NSN for the headgear assembly is 5965-99-622-5436.

Handsets

14 The Clansman range of audio ancillaries includes three adaptions of the standard headset as follows:

(1) Handset GP
(2) Handset Remote
(3) Handset Tank Telephone

ELECTRIC GENERATOR, HAND-OPERATED



15 The Hand Generator is used, in conjunction with a 1Ah rechargeable battery, to operate Clansman radio sets in emergencies or when on long-range patrol. The generator is mounted directly onto the radio and can be turned on whenever the operator is stationary. The generator delivers an output of 28 V at 330 mA which, together with the 1Ah battery, is sufficient to operate the radio set indefinitely. NSN for the generator is 5820-99-114-3390.

16 In emergencies, the generator alone can provide sufficient current to operate the receiver or transceiver on low power mode. A lamp, fitted with a shutter, is illuminated to indicate correct generator winding speed. The generator may be used with the following communications sets in the Clansman range:

(1) UK/PRC 320
(2) UK/PRC 344
(3) UK/PRC 351
(4) UK/PRC 352

BATTERY CHARGING EQUIPMENT

17 Certain fault conditions can cause the Clansman Battery Charger (DCCU or ACCU) to continue charging after the battery has reached full charge. Overcharging can result in expansion of the battery case, with the consequent risk of explosion and injury to personnel.

17.1 Applicability. The applicable equipments are as follows:

(1) Charger, Battery, DC 28 V	Z9/6130-99-117-0450
(2) Charger, Battery, DC 14 V	Z9/6130-99-620-2114
(3) Charger, Battery, AC	Z9/6130-99-117-0451
(4) Battery, Secondary, 24 V, 3.3Ah	Z9/6140-99-620-8057
(5) Battery, Secondary, 24 V, 1.0Ah	Z9/6140-99-620-8058
(6) Cable Assembly, 4-conductor	Z42/5995-99-117-7436

17.2 Fault conditions. The following fault conditions can cause the battery charger to continue charging indefinitely:

(1) Bent or broken pins on the charging socket of the battery.

(2) Damaged pins on the connectors of the Cable Assembly.

(3) Damaged pins on the Battery Charger output socket, particularly pins c and d pushed back inside the socket.

(4) An open or short circuit inside the Cable Assembly, (usually an open circuit of lines c and d at the 'flat' plug end).

(5) An open or short circuit in one or both of the battery temperature sensing diodes (internal).

17.3 Action. Pending the results of further investigations, the action required by Command Maintenance Pools, and Ships and Establishments holding the applicable equipments is as follows:

(1) Command Maintenance Pools. Pools receiving defective batteries and charging equipments are to carry out the procedures laid down in Section 1, Chap 3, Page 3.

(2) Ships and Establishments holding the equipments. Before charging a Clansman battery, the user is to check for any damage as outlined in Para 17.2 (1), (2) and (3). Any item found to be damaged is not to be used, and is to be exchanged at the nearest Command Maintenance Pool. Any battery with a date stamp five or more years old is also to be exchanged at the nearest Command Maintenance Pool.

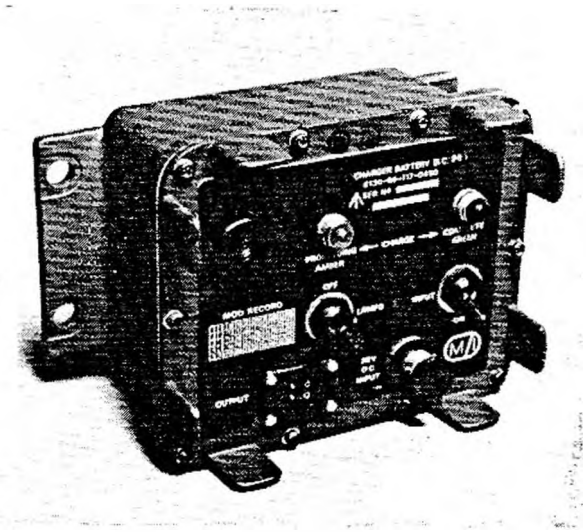
BATTERY CHARGING

WARNING

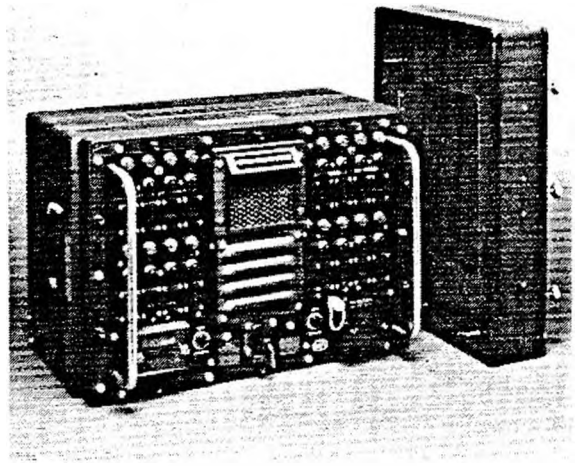
CERTAIN FAULT CONDITIONS CAN CAUSE A CLANSMAN BATTERY CHARGER TO CONTINUE CHARGING INDEFINITELY, EVEN THOUGH THE BATTERY HAS REACHED FULL CHARGE. UNDER THESE CONDITIONS THE INCREASE IN BATTERY TEMPERATURE AND EXPANSION OF ITS CASING COULD RESULT IN AN EXPLOSION, WITH THE CONSEQUENT RISK OF INJURY TO PERSONNEL.

18 Batteries for the Clansman range of communication sets may be charged from either a dc supply or an ac supply as follows:

18.1 Charging from a dc supply. The Charger Battery DC (28 V) and the Battery DC (14 V) will fully charge single discharge 3.3 Ah 24 V batteries in approximately four hours, and 1Ah 24 V batteries in approximately one hour. Each unit will operate from any source, such as a vehicle battery supply, signal battery or DC generator, at the nominal supply voltage. NSNs for the chargers are detailed in Para 17.1.



Charger 6130-99-117-0450



Charger 6130-99-117-0451

18.2 Charging from an ac supply. The Charger Battery AC is capable of charging up to sixteen mixed 1Ah and 3.3Ah nickel-cadmium batteries simultaneously. The charger is powered from a 100-120 V, 46-66 Hz, supply. Typical charging time for 3.3Ah battery is four hours. NSN for the charger is detailed in Para 17.1.

CHAPTER 4

ROUTINE MAINTENANCE

CONTENTS

Para	
1	Job information card - clean and inspect
2	Job information card - functional check
3	Job information card - Muster
4	Preventive maintenance schedule
5	Performance servicing schedule
6	Performance and servicing record

MMS 6 (April 1977)

	JOB INFORMATION CARD	Schedule No 9-1516-0000	M Op No 1
	Schedule Title CLANSMAN		
	Job Description CLEAN AND INSPECT		

RELEVANT HANDBOOKS

BR 8783(1)
BR 2000(20)
RT320 HF User Handbook Army Code 61123
RT344 VHF User Handbook Army Code 61351

TOOLS. STORES. SPARE

Electrolube Patt No 0474-914-3344

OTHER INFORMATION/INSTRUCTIONS

Clansman Radio Equipment are not Naval Stores items and should not be demanded through or returned through PSTO(N). Sets are not to be opened. Defective items can be exchanged on a one for one basis with Command Radio Pools.

SAFETY PRECAUTIONS:

1. TRANSCEIVER RT344 CONTAINS BERYLLIUM IN MODULES 1 AND 2. REF: BR 2000(20) CH 8.
2. BATTERIES CONTAIN NICKEL-CADMIUM.

JOB DESCRIPTION OR METHOD

(1) Inspect transceiver for corrosion or damage paying particular attention to knobs, switches, sockets, battery securing clips and battery connections. Clean using soapy water and cloth. Dry thoroughly - clean and lubricate aerial sockets and headset sockets using Electrolube Pat No 0474-914-3344. Inspect all ancillaries for damage to cables, plugs, aerials etc.

Issue No ORIGINAL - NOVEMBER 1990	9D/2 Side 1 of 2 sides

MMS 6A (April 1977)

	JOB INFORMATION CARD (Cont)	Schedule No 9-1516-0000	M Op No 1

Clansman Battery Charger and Batteries

(2) Inspect charger and cables for signs of damage check lamps and switches. Clean using damp cloth, dry thoroughly.

WARNING: BATTERIES CONTAIN NICKEL-CADMIUM. REF: BR 2000(20) CH 8 AND JSP 395 PLATE J12.

(3) Inspect batteries for signs of damage or leaks. Any damaged or leaking batteries to be defected and exchanged.

(4) Clean battery contacts using Electrolube Pat No 0474-914-334. Charge batteries in accordance with user handbooks.

MMS 6 (April 1977)

	JOB INFORMATION CARD	Schedule No 9-1516-0000	M Op No 2
	Schedule Title CLANSMAN		
	Job Description FUNCTIONAL CHECK		

RELEVANT HANDBOOKS

BR 8783(1)
BR 2000(20)
RT 320 HF User Handbook Army Code 61123
RT 344 VHF User Handbook Army Code 61351

OTHER INFORMATION/INSTRUCTIONS

Clansman Equipments are not Naval Stores items and should not be demanded/returned through PSTO(N).

JOB DESCRIPTION OR METHOD

Carry out functional check of equipments back to back or using ship fitted equipments in accordance with User Handbook. Defective equipment to be exchanged one for one with nearest Command Radio Pool. Ref: BR 8783, Ch 3.

Refit - Return complete clansman outfits to Command Radio Pool in accordance with BR 8783.

Issue No ORIGINAL - NOVEMBER 1990	9D/2 Side 1 of 1 sides

MMS 6 (April 1977)

	JOB INFORMATION CARD	Schedule No 9-1516-0000	M Op No 3
	Schedule Title CLANSMAN		
	Job Description MUSTER		

RELEVANT HANDBOOKS

UK/PRC 320 UK/PRC 344
BR 8783(1)

JOB DESCRIPTION OR METHOD

Muster Clansman Radio outfits in accordance with list extract from complete Equipment Schedule 43740 UK/PRC 320.
complete Equipment Schedule 44930 UK/PRC 344.

Issue No ORIGINAL - NOVEMBER 1990	9D/2 Side 1 of 1 sides

P R E V E N T I V E M A I N T E N A N C E S C H E D U L E

MMS5 (8/87)

BR NUMBER
BR 8783

MAINT OP NO	JIC	JOB DESCRIPTION	BY WHOM	PER
001		Clean and inspect.	SS	M
002		Functional check.	SS	M
003		Muster.	SS	3M

ISSUE NO ORIG-10/90

Side 1 of 1 Sides

SCHEDULE TITLE

SCHEDULE NUMBER

CLANSMAN

9-1516-0000

MMS 1B (4/88)

P E R F O R M A N C E S E R V I C I N G S C H E D U L E

SCHEDULE TITLE: CLANSMAN				PMS NO: 9-1516-0000	
LOCATION	MOP	JIC	JOB DESCRIPTION	PERIOD	
					1
	001		Clean and inspect.	M	2
					3
	002		Functional check.	M	4
					5
	003		Muster.	3M	6
					7
					8
					9
					10
					11
					12
					13
					14
					15
					16
					17
					18
					19
					20
					21
					22
					23
					24
					25
					26
					27
					28
					29
					30

Page No 1 of 1 Issue ORIG-10/90

MMS 1A REVISED 3/87

PERFORMANCE AND SERVICING RECORD

Ship *_____ Period *_____ 19_____ PMS No *_____

Equipment Identity*_____ Page No *+_____

Location* _____ Issue No/Date*+ _____

PROGRAMME →

DAY/WEEK/MONTH →	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
1																																				
2																																				
3																																				
4																																				
5																																				
6																																				
7																																				
8																																				
9																																				
10																																				
11																																				
12																																				
13																																				
14																																				
15																																				
16																																				
17																																				
18																																				
19																																				
20																																				
21																																				
22																																				
23																																				
24																																				
25																																				
26																																				
27																																				
28																																				
29																																				
30																																				
31																																				
32																																				
33																																				
34																																				
35																																				
36																																				
37																																				
38																																				
39																																				
40																																				
41																																				
42																																				
43																																				
44																																				
45																																				
46																																				
47																																				
48																																				
49																																				
50																																				
51																																				
52																																				
53																																				
54																																				

* Fill in details before removing form from log + Of associated Performance and Servicing Schedule Form

SECTION 3

COMMERCIAL PORTABLES

CONTENTS

Chapter

1 General information
2 Commercial portables equipment details

CHAPTER 1

GENERAL INFORMATION

CONTENTS

Para
1 Introduction
4 Equipment
5 New requirements
6 Repairs
7 Issues
8 Returns

INTRODUCTION

1 It is recognised that Fleet and civil shore establishments and units, within the UK and abroad, have need of permanent short-range communications facilities for essential general purpose use or for use in specific operational or security roles.

2 For a variety of reasons the military ranges of radio communication equipments, both current and projected, may be unsuitable. Consequently these needs are met by MoD provision, procurement and direct allocation of suitable commercial-type equipment (portable, mobile, and associated fixed station configurations).

3 It is MoD(Navy) policy that all new and replacement equipments for essential, permanent, and miscellaneous shore radio communication and radio alerting (paging) systems, shall be met from an approved, rationalized and standard range of commercial-type equipments.

EQUIPMENT

4 The equipment supplied is a wide range of MF, HF, VHF and UHF portables, mobiles, and base stations together with appropriate aerials and accessories.

NEW REQUIREMENTS

5 Instructions regarding new requirements can be found in Sect 1, Chap 2, Para 3.

REPAIRS

6 The 'User' is to contact the agent (see relevant Tables, Chap 2), who will normally effect repairs by using the existing contract facility. When a repair is not covered by the contract, DSWE/WE102A2 is to be consulted. Details of the equipment currently in service together with the agent and current contractual cover are given in Chapter 2.

ISSUES

7 Supply of new equipment will normally be direct from manufacturer.

RETURNS

8 The maintenance contract arrangements provide for workshop repair and return if required. The Project Manager DSWE/WE102A2 is to be informed of any equipment no longer required or beyond economical repair.

CHAPTER 2

COMMERCIAL PORTABLES EQUIPMENT DETAILS

CONTENTS

Para		
1	Introduction	
3	Racal Jaguar(U) BCC 70	
12	Park Air 4004 VHF	
23	Sailor RT2048 VHF	
36	Philips PR710 UHF	
46	Philips Base Station PRF1060 (c/w Remote Controller M81 or M82)	
50	Desk Top Station FM1100/PRX1020	
54	Mobile Station FM1100	
57	Portable Radio PRP73 and PRP20 (including I.S.)	
61	Navico Axis 150/250 VHF IMM	
67	ICOM Marine IC-M15E (for use on fishery protection vessels only)	
Table		**Page**
1	Portables	2
2	Mobiles	3
3	Base stations	5

INTRODUCTION

1 The equipment listed in the following Tables is a current assessment of Commercial outfits which are:

(1) Still in Service but becoming obsolescent.

(2) Currently supportable for the foreseeable future.

(3) Newly introduced.

2 The procedures for obtaining replacement equipment are as follows:

(1) Requests for replacement of equipment that is Beyond Economical Repair (BER) should be made through local administrative authority to DSWE/WE102A2, NSC, Elm 3b, MoD Abbey Wood PP#200, PO Box 702, Bristol BS12 7DU.

(2) Replacement for any equipments which are obsolescent/obsolete and cannot be replaced with like for like are to be considered as a "New Requirement" and will need endorsement by Area Flag Officer/DOR(Sea)/RCA2 as per the instructions at Section 1, Chap 2, Page 2, Para 3.

TABLE 1 PORTABLES

EQUIPMENT	DESCRIPTION	REPAIR AGENT
PFX	Pye VHF FM 99 Channel Synthesised	Philips Telecom Regional Service Depots
PF85	Pye VHF/UHF FM 3 Channel	
EXPF85	Pye VHF/UHF FM 3 Channel Intrinsically Safe	
P5002	Pye VHF FM 6 Channel	
P5001	Pye VHF AM 6 Channel	
PF2FMB	Pye VHF FM 3 Channel	
PF2AMB	Pye VHF AM 3 Channel	
PF2FMB2E	Pye VHF FM 3 Channel Intrinsically Safe	
PF2UB2C	Pye UHF FM 3 Channel Intrinsically Safe	
IC-M5	ICOM(UK)Ltd VHF IMM 16 Channel	DSWE/WE102A2
CQP863	Storno VHF	
PRP73	Philips 100 Channel V/UHF FM	Philips Telecom Regional Service Depots
PRP20 (I.S.)	Philips 99 Channel V/UHF FM	
AXIS 150	Navico VHF (IMM) 16 Channel (WP)	A-N-D Electronics via DSWE/WE102A2
AXIS 250	Navico VHF (IMM) 16 Channel (WP)	
MX 1000	Motorola V/UHF 10 Channel	DSWE/WE102A2
IC-M15E	ICOM(UK) Ltd., VHF/IMM with voice scrambler	DSWE/WE102A2

TABLE 2 MOBILES

EQUIPMENT	DESCRIPTION	REPAIR AGENT
FM914	Pye VHF FM 120 Channel	Philips Telecom Regional Service Depots
M294	Pye VHF FM 256 Channel	
M294	Pye VHF FM 6 Channel	
M293	Pye VHF AM 6 Channel	
M256	Pye VHF	
M206	Pye VHF	
M203	Pye VHF	
M202	Pye VHF	
M201	Pye VHF	
MF6AM	Pye VHF AM	
FM914	Pye VHF/UHF FM 120 Channel	
FTC703	YAESU VHF	DSWE/WE102A2
2057	SMC	
FM1100	Philips V/UHF FM 100 Channel	Philips Telecom Regional Service Depots

(continued)

TABLE 2 MOBILES (continued)

EQUIPMENT	DESCRIPTION	REPAIR AGENT
TRP8253S	Skanti HF Transceiver	Marconi Regional Service Depots Contract ESLIVA/0021
RT144C	Sailor VHF	
	Marlin MF	
	Sentinel	
	Apollo	
	Atlantic	
	Eddystone EB35	
	Warden	
TRP2500W	Sait VHF Tx/Rx	DSWE/WE102A2
RT2048	Sailor VHF	DSWE/WE102A2

TABLE 3 BASE STATIONS

EQUIPMENT	DESCRIPTION	REPAIR AGENT
F4002	Pye VHF FM 6 Channel	Philips Telecom Regional Service Agents
F4001	Pye VHF AM 6 Channel	
F412	Pye UHF FM	
F401	Pye VHF AM	
F402	Pye VHF FM	
F294	Pye VHF FM	
F202	Pye VHF FM	
F201	Pye VHF AM	
F60FM	Pye VHF FM	
F30AM	Pye VHF AM	
F30FM	Pye VHF FM	
F27AM	Pye VHF AM	
F15AM	Pye VHF AM	
F15FM	Pye VHF FM	
F10FM	Pye VHF FM	
FX294	Pye VHF FM	
LW15FM	Pye VHF FM	
4004	Park Air VHF (AM) Aircraft Band	DSWE/WE102A2
PRF1060	Philips V/UHF FM 6 Channel	Phillips Service Centre
FM1100/PRX1020	Philips V/UHF FM 100 Channel	

RACAL JAGUAR (U) MANPACK RADIO - BCC 70

3 The Racal Jaguar (U) is a lightweight manpack UHF AM transceiver introduced into service as a substitute for the Clansman UK/PRC344. (See Section 2 Chapter 2 Page 5 for details).

4 The Jaguar manpack radio BCC 70 is a sophisticated UHF Transmitter Receiver with anti-jamming and secure speech facilities. AM mode is provided to allow inter-operation with existing UHF AM equipment. The radio is designed for forward area infantry role.

5 Although the Jaguar manpack has more facilities than the UK/PRC344 there is no RN operational requirement for these and therefore will not be detailed in this publication. These facilities are well covered within the user handbook which forms part of radio outfit.

6 Parameters

6.1 Frequency Range: The Transceiver operates in the frequency range 225 MHz to 399.975 MHz, and is tunable in 25 KHz steps to produce a total of 7000 channels.

6.2 Preset Channel: Facility for 8 Pre-Set Channels.

6.3 Mode of Operation: A3 DSB Voice.

6.4 Power Output: Transmitter output power 3 W.

6.5 Antenna: Omnidirectional Broadband.

6.6 Supply Voltage: 10 V to 16 dc (battery).

6.7 Weight with Battery: 7.4 kg.

6.8 Size with Battery: W230 mm x H90 mm x D365 mm.

7 Outfit Jaguar (U). Parts as listed in the following table.

Description	Qty
Racal Jaguar (U) UHF Tx/Rx (BCC70)	1
Handset (RA250)	1
Nicad Battery 12 V (MA4025A)	1
UHF Rod Assy Antenna	1
Carrying Frame	1
Battery Charger 1 Way (MA945B)	1
Battery Charger Cable (ST719115)	1
User Handbook	1
Technical Handbook	1

8 Allowance

8.1 Allowances as per Section 1 Chapter 4 Tables (1), (2), and (3) in substitution for UK/PR344 when not available.

9 Issue and returns

9.1 Racal Jaguar will only be issued with the authority of CINCFLEET/FCO.

9.2 All Racal Jaguars for return are to be addressed to:
Portable Radio Pool, Craft Support Unit, North Corner Group, HM Naval Base, Portsmouth.

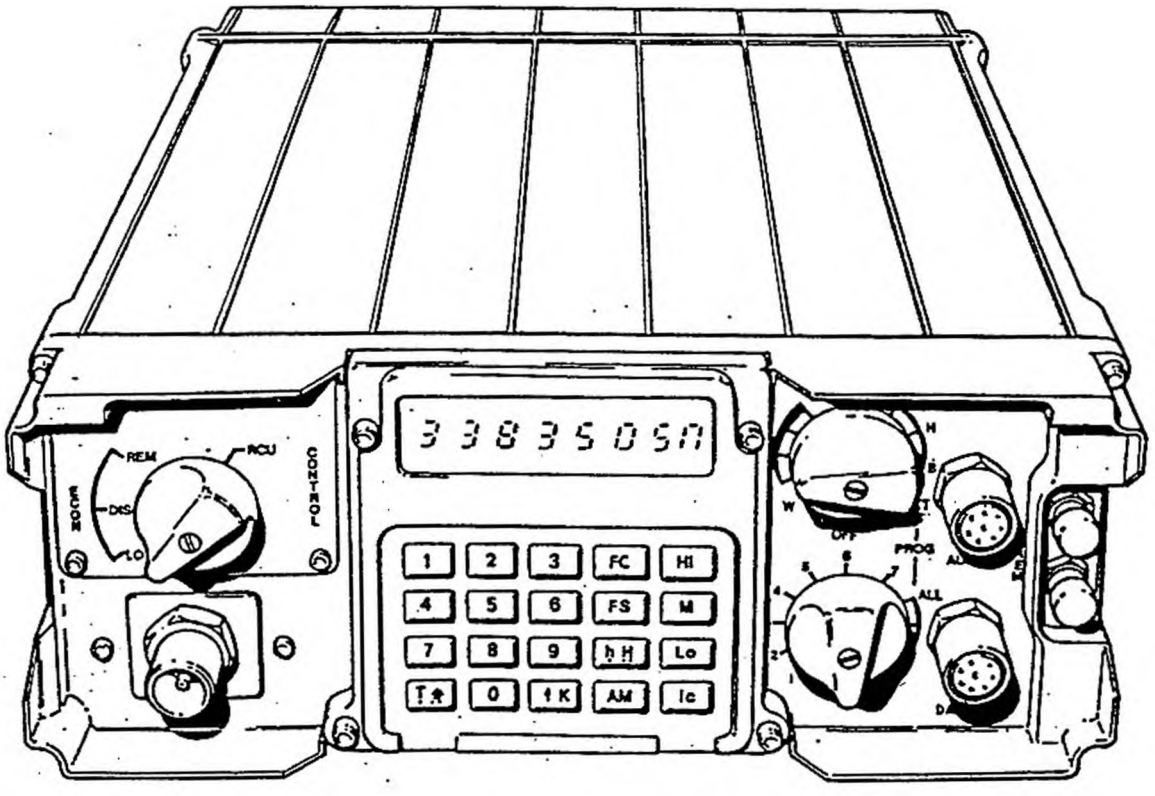
10 Accounting

10.1 All radios and ancillaries are to be taken on charge in the appropriate stores account.

11 In-service support

11.1 Defective equipment will be replaced by exchange only at Command User Pool (CUP), Ground Radio, RNAS Yeovilton. Address as detailed in Sect 1, Chap 3, Table 1. Signal address: FONA (fao Ground Radio) SIC H8M. Full details of defect are to accompany the equipment

11.2 On receipt of a defective equipment, the CUP is to arrange for its repair with RACAL RADIO LTD under contract NWE11A/0076. Further advice on repair arrangements/support can be obtained from DSWE/WE102A2, SSA, Elm 3b, MoD Abbey Wood #200, PO Box 702, Bristol BS12 7DU. Tel 0117-9138911, Fax 0117-9138911, Signal: NAVSPCOMD BATH.



Jaguar Manpack Radio - BCC 70

VHF Ground to Air Base Station Park Air Electronics (PAE) 4004

12 The PAE type 4004 is a simplex VHF (AM) ground to air base station providing 720 channel communications in the 118 - 136 MHz Aviation Band.

13 The PAE 4004 was introduced into service as an adhoc fit for Armilla deployed RN Ships to enable monitoring and communication with civilian aircraft on the Emergency VHF Airband frequency of 121.50 MHz.

14 General characteristics

14.1 Frequency Range: 118 - 135.975 MHz in 25 kHz steps.

14.2 Channel Memory: Four channel non-volatile with instant recall.

14.3 Mode: 6A3 Simplex

14.4 Power Requirements: AC 195/255 V - 97/128 V 40-60 Hz
DC 13.6 V nom negative ground.

14.5 Size: W390 mm x D260 mm x H75 mm

14.6 Weight: 5 kg

15 Transmitter

15.1 RF Output Power: 7 Watts minimum

16 Receiver

16.1 Audio Power Output: Adjustable up to 2.5 Watts

17 Outfit PAE 4004. Parts as listed in the following table:

Description	Qty
PAE 4004 VHF Tx/Rx	1
Hand Microphone	1
Power Supply Lead	1
Antenna Plug	1
Antenna Broadband	1
Antenna Mounting Clamps	1
20 Metre Connecting Cable	1
Operators Instructions	1
Technical Handbook	1

18 Allowance

18.1 Qty 1 outfit for Armilla Deployed HM Ships as directed by CINCFLEET/FCO.

19 Issues and returns

19.1 Issue/Return of complete outfit PAE 4004 (as listed Para 17) at direction of CINCFLEET/FCO.

20 Fitting policy

20.1 Equipment to be fitted by ships staff if on station or base staff during SMP under guidance from Platform authority.

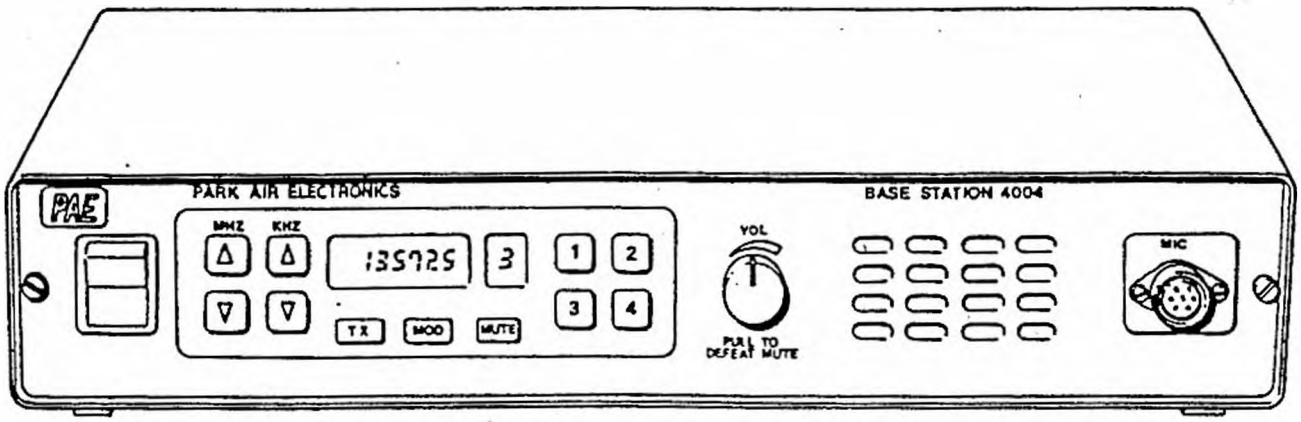
21 Accounting

21.1 All radios and ancillaries are to be taken on charge in the appropriate stores account.

22 In-service support

22.1 Defective equipment will be replaced by exchange only. The defective part to be returned to Portsmouth Portable Radio Pool address as detailed in Section 1 Chapter 3 Table 1, Signal address: NBC Portsmouth (fao Portable Radio Pool).

22.2 On receipt of a demand for replacement for defective equipment the Portable Radio Pool is to contact DSWE/WE102A2, SSA, Elm 3b, MoD Abbey Wood #200, PO Box 702, Bristol BS12 7DU. Tel 0117-9138032 (Abbey Wood Ext 38032), Fax 0117-9138911, for advice on repair arrangements. Signal address: NAVSPCOMD BATH.



VHF Ground to Air Base Station PAE 4004

VHF SCANNING TRANSCEIVER RT2048 FOR SUBMARINES

23 The Sailor RT2048 is a simplex/semiduplex VHF radiotelephone equipped with all 55 international VHF channels plus 10 private channels, full scanning facilities, Dual watch and quick channel 16.

24 The Sailor RT2048 was introduced into service for fitting to submarines to improve safety during diving manoeuvres.

25 Receiver

25.1 Frequency Range: Simplex: 154.40 - 159.15 MHz
Semi-duplex: 159.00 - 163.73 MHz

25.2 AF Power output: 6 watt/4 ohm

25.3 Scanning facilities: Flexible scanning programme with possibility of all 55 international VHF channels and 10 private channels.

26 Transmitter

26.1 Frequency Range: Simplex: 154.40 - 159.15 MHz
Semi-duplex: 159.00 - 159.15 MHz

26.2 RF output power: 25 watt
Reduced RF output: 0.5 to 1 watt

27 Power supply

27.1 Power supply of 12 V dc via 115 V/1/60 Hz V-Ironix PSU.

28 Size (Inclusive Mounting Bracket). W252 x H139 x D172 mm

29 Weight. 3.1 kg

30 RT2048 Parts. Parts as listed in the following table:

Description	Qty
RT Marine VHF Tx/Rx	1
H2055 steel universal mounting bracket	1
V-Ironix PS220c 115/1/60 to 12 V dc 6 amp PSU	1
Telephone Handset with mounting cradle	1
Power input plug with 1.5 metre cable	1
PL259 antenna input plug	1
Operators Handbook	1
Technical Handbook	1

31 Allowance

31.1 Qty 1 outfit per HM Submarine as directed by FOSM.

32 Supply arrangement

32.1 Direct delivery from manufacturer to the User.

33 Fitting policy

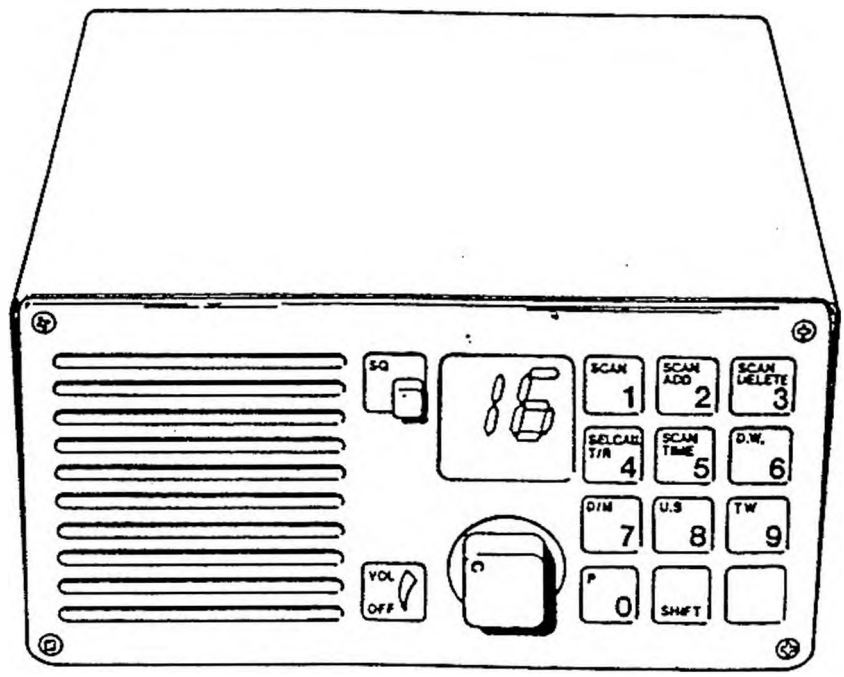
33.1 Equipment to be fitted by ships staff/base staff during SMP under guidance from Platform authority.

34 Accounting

34.1 All radios and ancillaries are to be taken on charge in the appropriate stores account.

35 In-service support

35.1 Defective equipments will be repaired by replacement by return to manufacturer. Contact: DSWE/WE102A1, SSA, Elm 3b, MoD Abbey Wood #200, PO Box 702, Bristol BS12 7DU. Tel: 0117-9138032 (Abbeywood Ext. 38032), Fax 0117-9138911, Signal Address: NAVSPCOMD BATH.



VHF Scanning Transceiver RT2048

PHILIPS PR710 UHF

36 The Philips PR710 is a hand held personal transceiver which is pre-programmed with 7 user channels.

37 The PR710 is issued to specified portable Command User Pools (CUPs) for RN and MOD Civilian use, on a short term basis, for purposes where normal radio communications facilities are not available.

38 Authority for loans is to be obtained from the local Area Flag Officer/SCO, CINCFLEET or DOR(Sea)/RCA2.

39 Parameters

39.1 Frequency Range: 403 - 430 MHz.

39.2 Channels: Seven preset simplex channels.

39.3 Channel Frequencies: 1 - 419.625 MHz
2 - 419.675 MHz
3 - 419.725 MHz
4 - 419.775 MHz
5 - 419.825 MHz
6 - 419.875 MHz
7 - 419.925 MHz

39.4 Operating Modes: F3 FM Voice.

39.5 Associated Antenna: 47 mm long, flexible Helical Whip.

39.6 RF Power Output: 4 watt.

39.7 Power Supply: 9.6 V (Hi-Capacity, 700 mAh Ni-Cad rechargeable battery).

39.8 Range: Approximately 5 km (line of sight).

39.9 Dimensions (with Battery): Width 65 mm, height 201 mm, depth 40 mm, weight 560 g.

40 Accessories: Parts as listed in the following table:

Description	Qty
Philips PR710 UHF Tx/Rx	1
47 mm Helical Antenna	1
Ni-Cad 9.6 V Battery	1
Spare Ni-Cad 9.6 V Battery	1
Carrying Case	1
Attachment Plate and Screws	1
Wrist Lanyard	1

41 Battery Chargers. There are two battery chargers available as follows:

41.1 Single Unit Rapid Charger Type BC40

41.1.1 The BC40 battery charger is capable of recharging a fully discharged standard battery to 80% of full charge in 60 minutes, followed by automatic switching to continuous trickle charge.

41.1.2 Supply Voltage: 240 V ac mains.

41.1.3 Dimensions: Width 100 mm, height 162 mm, depth 64 mm, weight 80 g.

41.2 Multi-way Rapid Charger Type BC29E

41.2.1 The BC29E battery charger is capable of recharging up to ten fully discharged standard batteries to 80% of full charge in 30 minutes, or a similar quantity of high capacity batteries in 65 minutes, followed by automatic switching to continuous trickle charge.

41.2.2 Supply Voltage: 240 V ac mains.

41.2.3 Dimensions: Width 31 cm, height 56 cm, depth 16 cm, weight 10.5 kg.

42 Allowance

42.1 Allowance as per Sect 1, Chap 4, Page 5, Table 2.

43 Issue and Returns

43.1 Philips PR710s are only to be issued from the Command User Pool (CUP) when authorised by Area Flag Officer/SCO, CINCFLEET or DOR(Sea)/RCA1.

43.2 On completion of the loan period, all equipment is to be returned to the CUP.

44 Accounting

44.1 All radios and accessories are to be taken on charge by the CUP in the appropriate stores account.

45 In-service support

45.1 Repair: All defective radios or battery chargers are to be returned to the local Philips Service Centre for repair, quoting Contract SWN22A/0470 as authority for repair.

45.2 Replacement Parts: For replacement parts/accessories and equipments reported as Beyond Economical Repair (BER) contact: DSWE/WE102A2, SSA, Elm 3b, Abbey Wood #200, PO Box 702, Bristol BS12 7DU. Tel: 0117-9138032 (Abbeywood Ext. 38032), Fax 0117-9138911, Signal Address: NAVSPCOMD BATH.

PHILIPS BASE STATION PRF1060 (c/w Remote Controller M81 or M82)

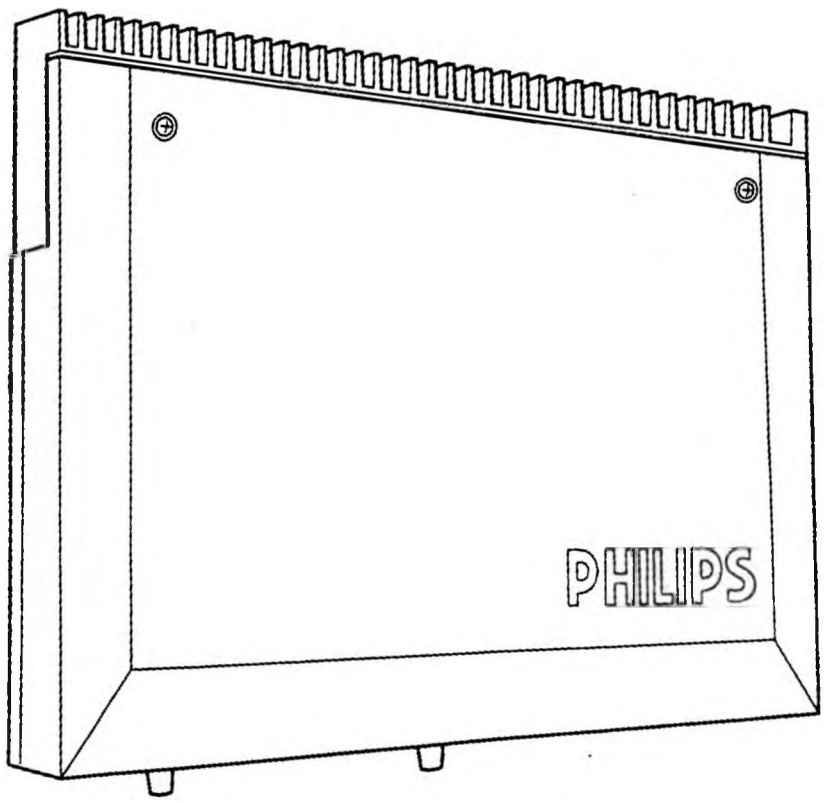
46 Type PRF1060 (with M81 or M82 Remote Controller) is a versatile microprocessor controlled, synthesiser Frequency Modulated (FM) Transceiver operating in the V/UHF bands. It can be rack or wall mounted.

47 The PRF1060 can also be used in a Talkthrough configuration.

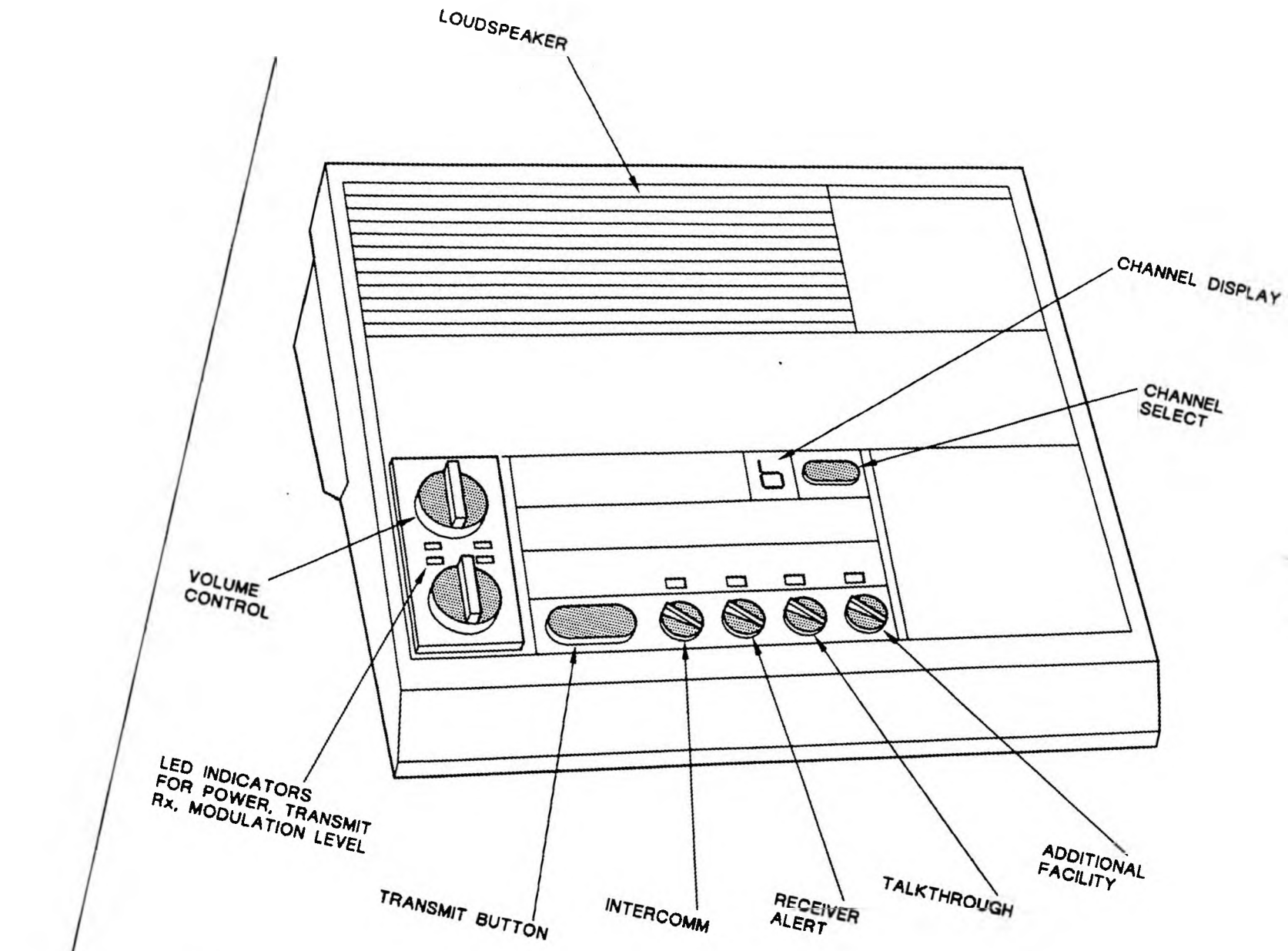
48 Parameters

48.1	Frequency Range:	VHF 68 - 88 MHz 132 - 156 MHz 146 - 174 MHz UHF 400 - 440 MHz 440 - 470 MHz
48.2	No. of Channels:	1 - 6 9 (Remote) 1 - 100 (Local)
48.3	Channel Spacing:	12.5/20/25 kHz
48.4	Operating Mode:	Phase F3E (Voice)
48.5	RF Power Output:	VHF 1 to 25 Watts programmable, 15 Watts continuous duty cycle. UHF 1 to 6 Watts programmable, continuous duty cycle 6 to 25 Watts programmable, continuous duty cycle
48.6	Power Supply:	115 VAC ±15% 230 VAC ±15%
48.7	Range:	Nominally, line of sight, terrain dependent
48.8	Dimensions(with battery if applic.)	Width: 444 mm Depth: 374 mm Height: 88 mm (90.5 mm including mount) Weight: 13 kgs
48.9	Accessories:	M81 and M82 controllers complete with built-in loudspeaker and desk top microphones.

49 The remote controllers are the operators interface with the remote transceiver. The M81 controls one radio channel on a single transceiver which can be expanded six radio channels by order whilst the M82 controls one radio channel on each of two separate transceivers only. One or two twisted pair landlines are required for connection between contollers and transceivers respectively.



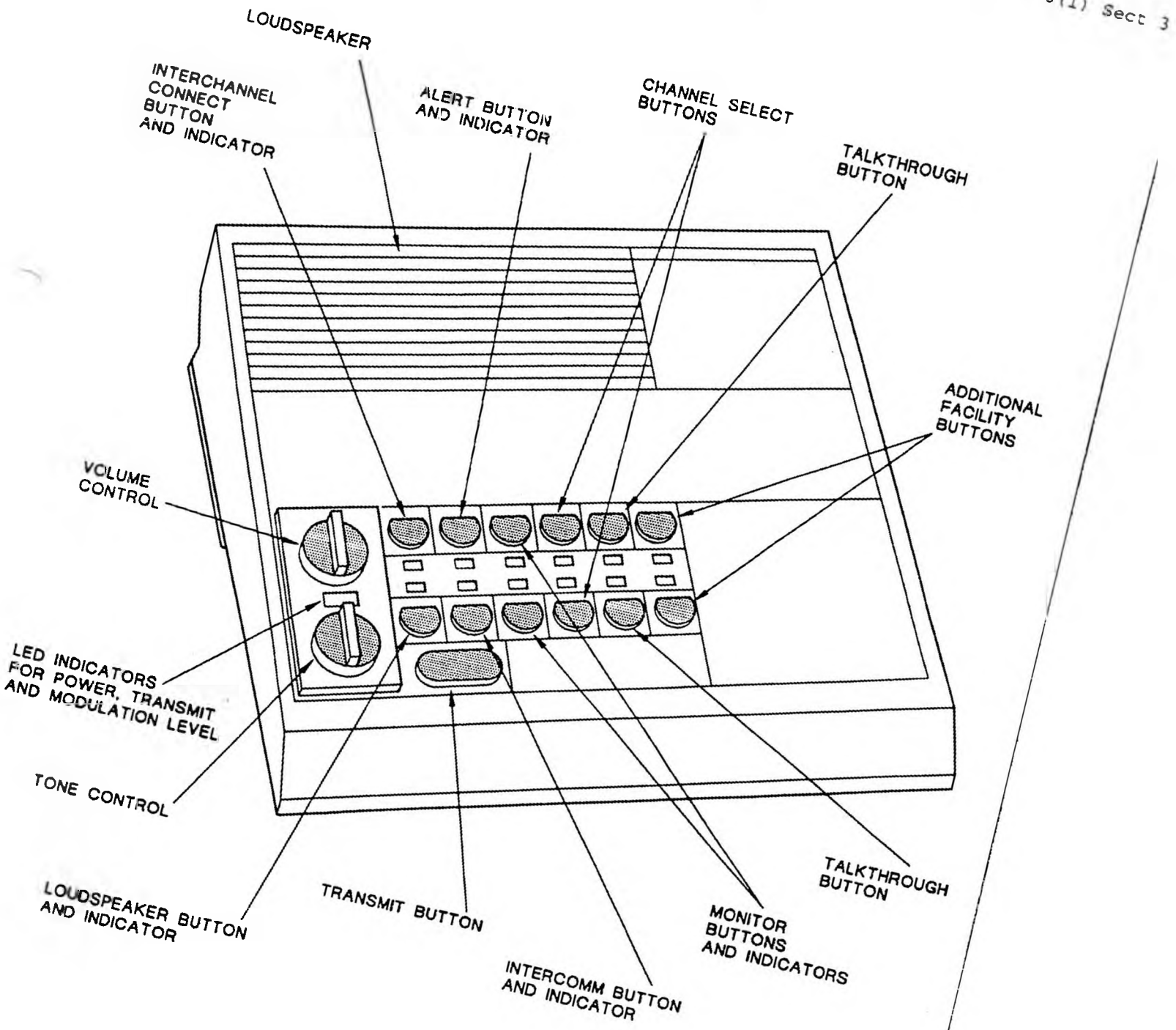
PRF1060 Fixed Base Station



NOTE

THE MORE COMMON ITEM DOES NOT HAVE THE CHANNEL SELECT OR DISPLAY BEING SINGLE RADIO CHANNEL ONLY

M81 Remote Control Unit (6 Radio Channels)



M82 Remote Control Unit

DESK TOP STATION FM1100/PRX1020

50 A Desk Top Station Radio Outfit can be any one of the 1000 Series Mobile Radios (the FM1100 is the radio currently used for desk top use as well as being used as the standard mobile) mounted on a Fixed Mobile Adaptor (PRX1020).

51 The Fixed Mobile Adaptor Type PRX1020 comprises a receptacle (for the FM1100 radio detailed at Para) which supplies power to the radio from any suitable AC input of 220-240 V or 110 V. It is compactly designed and styled to fit any office environment and offers the following features:

51.1 An integral loudspeaker.

51.2 On/Off switching of mains power supply with 'power on' indication.

51.3 Automatic changeover to external 12 V standby battery source in the event of AC power failure with standby indication.

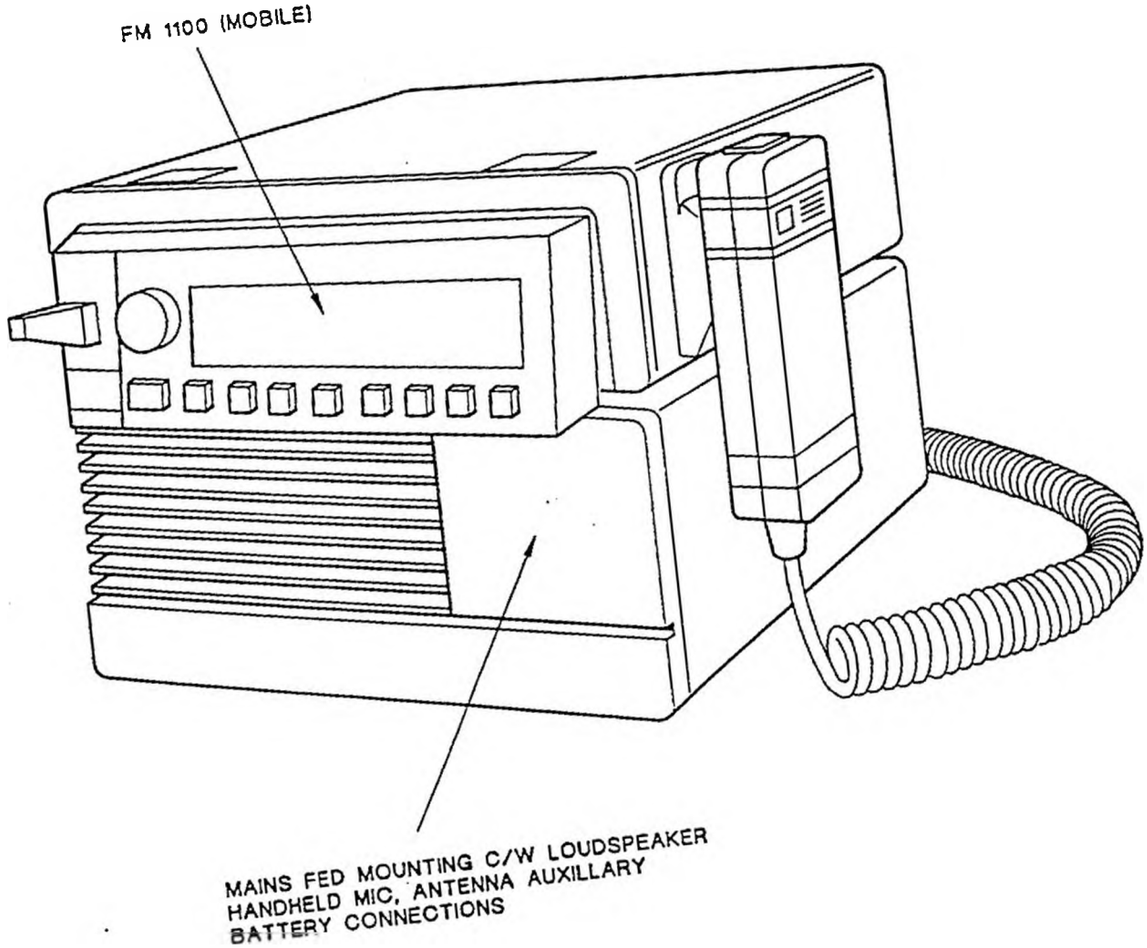
51.4 Desk top microphone option.

52 Parameters

52.1	Power supplies:	AC power input 110, 220-240 V, 50 or 60Hz ±10% DC power input 13.2 V (±5%), 6 A continuous or 8 A intermittent.
52.2	Controls and indicators:	AC power on - green Standby power on - red AC power On/Off switch
52.3	Protection:	DC output current limit <10.5 A DC output short circuit limit <3 A AC supply fuse 3A DC output fuse 10 A Automatic changeover to external battery in the event of power failure Loudspeaker
52.4	Power output:	2 W at <5% distortion
52.5	Dimensions/weight/temp:	Length - 220 mm Width - 210 mm Height - 2.7 kg Temperature range: -30°C to +60°C
52.6	External connections:	Antenna socket - BNC (50 ohm) AC power - Standard IEC Type Battery - screw terminals Microphone - Standard FM1100 type

Standby Battery

53 A 12 V NiCd or lead-acid may be used, being charged continuously in-situ. The charging rates, selected by an internal link, comprise a 250 mA supply for NiCd charging, suitable for batteries exceeding 2.5 Ah capacity. It also provides lead-acid charging rate suitable for batteries of 4 to 10 Ah capacity.



FM1100/PRX1020 Desk Top Station

MOBILE STATION FM1100

54 The FM1100 Mobile Station is one of a series of microprocessor controlled transceivers covering the complete frequency spectrum and offering many customer defined facilities (eg selective signalling) which can be field programmed.

55 Parameters

55.1	Frequency Range:	VHF 68 - 88 MHz 138 - 156 MHz 146 - 174 MHz UHF 400 - 440 MHz 425 - 470 MHz
55.2	No. of channels:	Up to 100
55.3	Channel spacing:	12.5/20/25 kHz
55.4	Operating mode:	Phase F3E (voice)
55.5	RF power output:	Software programmable per channel 68 - 174 MHz: 1, 6, 10, 15, 25 and 30 W 400 - 470 MHz: 6, 10, 15 and 25 W or 1 and 6W
55.6	Power supply	12 V DC (nominal) negative ground NOTE: 24 V DC vehicles will require a DC to DC converter
55.7	Range:	Nominally Line of Sight, terrain dependent
55.8	Dimensions with Standard Console:	Transceiver: Height 39 mm Width 185 mm Depth 210 mm Console: Height 57 mm Width 143 mm Depth 30 mm

Accessories

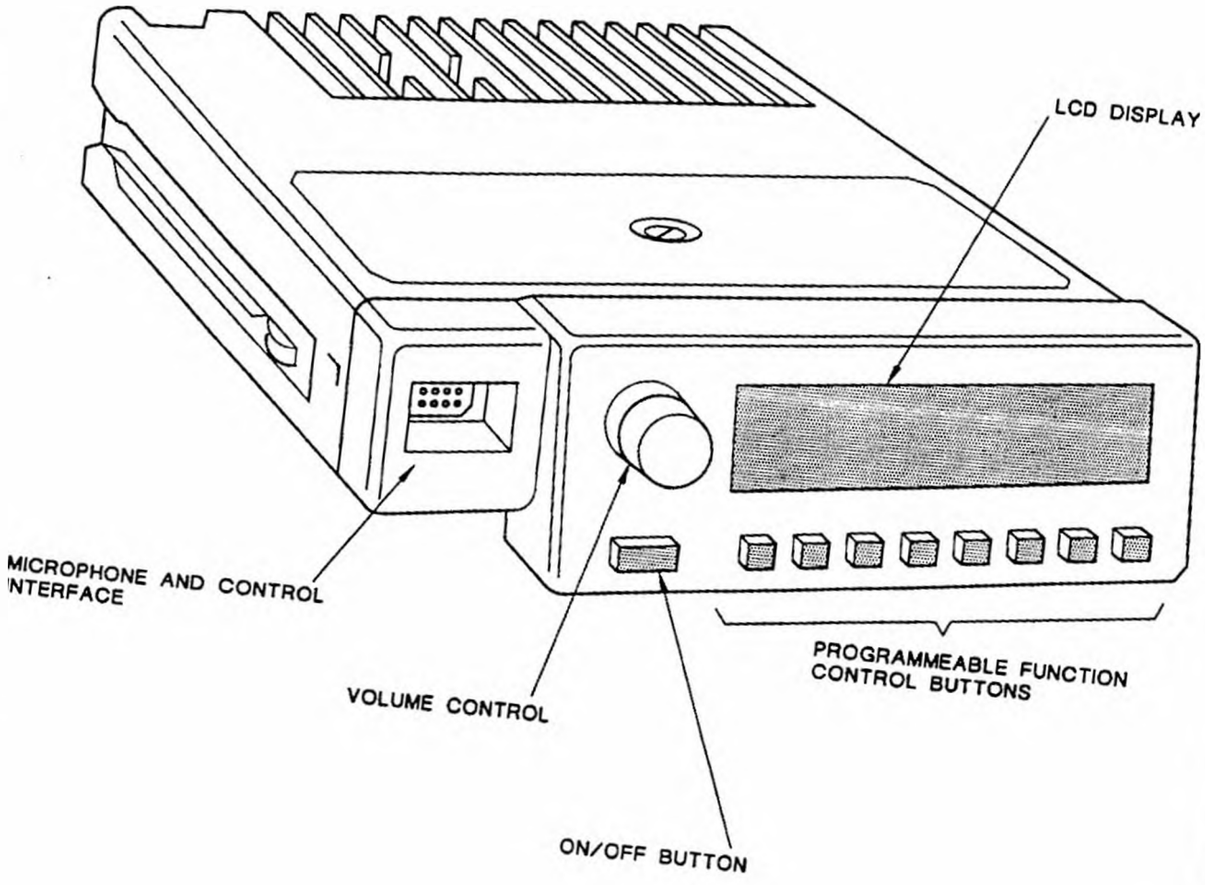
56 The accessories offered with this unit are many and have not all been listed within this document. However, the most commonly used items are as follows:

56.1 The fixed Mobile Adaptor PRX1020 (para 50 refers).

56.2 A Transportable Adaptor (allowing the transceiver to be carried and used out of a vehicle.

56.3 Remote mounting, permitting the transceiver to be isolated from its control panel to a distance of 1.5 m or 50 m.

56.4 A varied selection of loudspeakers, microhones and headsets. In the first instance seek advice from DSWE/WE102A2, SSA, Elm 3b, MoD Abbey Wood #200, PO Box 702, Bristol BS12 7DU.



Mobile Station FM1100

PORTABLE RADIO PRP73 and PRP20 (INCLUDING I.S.)

57 Currently there are a number of handheld portable radios in use, most of which are obsolete and will be replaced when the need arises or in a planned manner such as the Portsmouth replacement progamme. It is not intended to cover obsolete equipment in this document and, therefore, all technical detail and references given are applicable only to those items that can and will be procured for future use as management tools. The items that fall into this category are:

57.1 Philips PRP73 as a general purpose V/UHF FM handheld portable, covering all bands from the VHF low bands to the VHF high bands and the UHF bands.

57.2 Philips PRP20 to fill the Intrinsically Safe (I.S.) requirement, the I.S. Category being ib IIC T4. It is robustly built and sealed against water and dust to IP54. The radio is also limited to the high VHF and the UHF bands only.

58 Parameters

58.1	Frequency range (PRP73):	VHF 68 - 88 MHz 138 - 156 MHz 146 - 174 MHz UHF 400 - 425 MHz 425 - 450 MHz 440 - 470 MHz
58.2	Frequency range PRP20 (I.S.)	VHF 146 - 174 MHz UHF 403 - 440 MHz 440 - 470 MHz
58.3	No. of channels (PRP 73):	Typically 300
58.4	No. of channels (PRP20):	99
58.5	Channel spacing:	Both give choice of 12.5, 20 or 25 kHz
58.6	Operating mode:	Both Phase F3E (Voice)
58.7	RF power output (PRP73):	Programmable in steps between: 0.1 and 1 W VHF/UHF low power 0.5 and 4 W VHF high power 0.5 and 4 W UHF high power
58.8	RF power output (PRP20):	Being the intrinsically safe radio, the output is limited to 1 W in all configuration
58.9	Power supply (PRP20):	7.4 V (nominal) rechargeable Nickel Cadmium battery. A 1000 mAh single capacity battery is the only battery available for this equipment. Battery endurance for this unit is typically 10 hours Not interchangeable with PRP73 batteries

58.10 Power Supply (PRP73): 7.2 V (nominal) rechargeable Nickel Cadmium battery with three available capacities:

Lightweight: 600 mAh
Standard: 900 mAh
High Capacity: 1200 mAh

Battery endurance is variable over a wide range which is dependent on the duty cycle of the unit and capacity of battery fitted.

Typical endurance with a 5% Tx, 5% Rx and 90% Standby cycle is:

	1 W V/UHF	5 W V/UHF
Lightweight	6.7 hrs	3.6 hrs
Standard	9.4 hrs	5.1 hrs
High Capacity	15.6 hrs	8.5 hrs

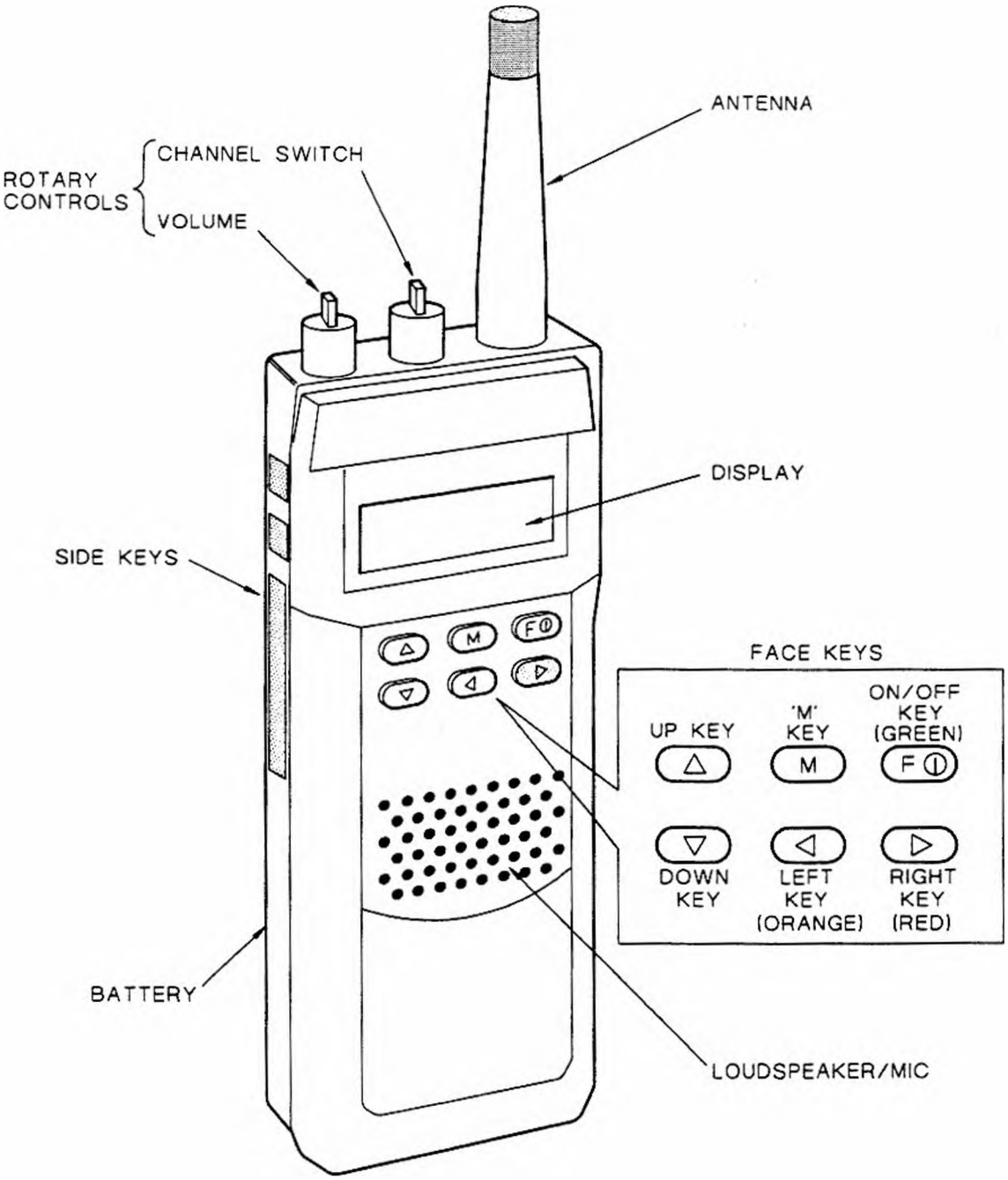
Any significant increase in use of unit will decrease the battery endurance.

Not interchangeable with PRP20 batteries

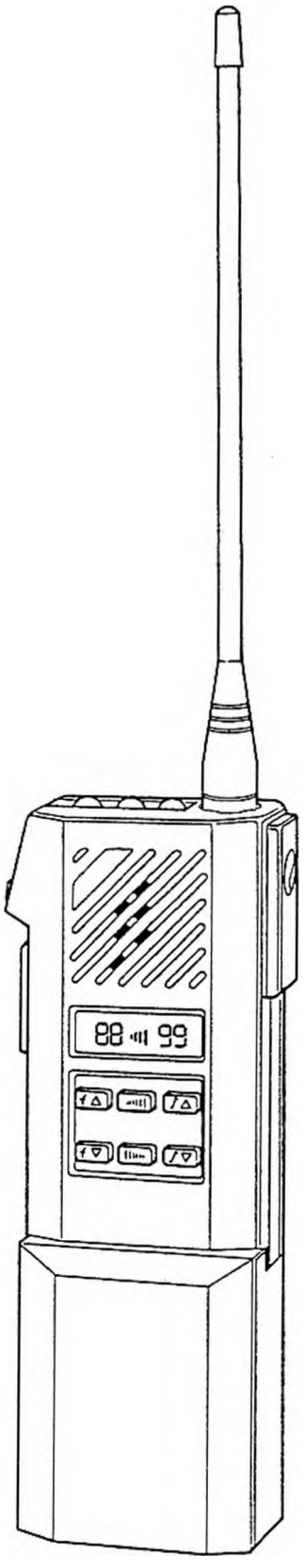
58.11 Range: Nominally line-of-sight for both units

58.12 Dimensions/weight (PRP73):
Height: 169 mm
Width: 65 mm
Depth: 37 mm with lightweight battery
39 mm with standard battery
41 mm with high capacity battery
Weight: 290 g radio only
500 g with lightweight battery
540 g with standard battery
600 g with high capacity battery

58.13 Dimensions/weight (PRP20):
Height: 175 mm
65 mm
31 mm
Weight: 500 g



Portable Radio PRP73



Portable Radio PRP20 (I.S.)

Accessories

59 Both radios have available a range of accessories dealing with carrying and alternative man/machine interfaces (eg add-on loudspeaker/microphones for lapel fitting). For the PRP73 only, a vehicle adaptor can be used to extend use to that of a pseudo mobile.

60 Both items are supported with multiway and single-way battery chargers detailed as follows:

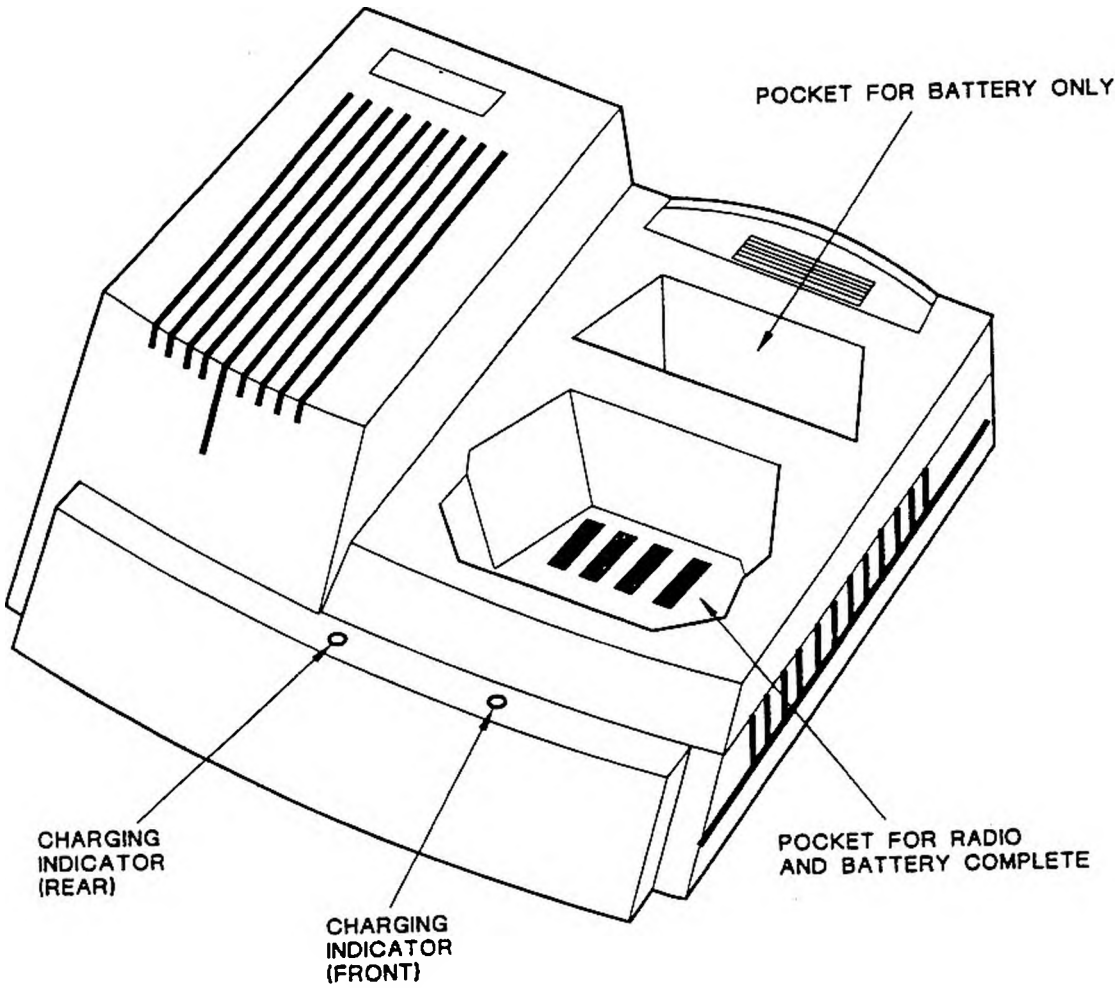
60.1 For the PRP73, there are three battery chargers currently available:

(1) PRX 7001. The PRX 7001 is a desktop charger which is a Single-way rapid charger which has two pockets. The front pocket will take a radio complete with battery, and the rear pocket will take a battery only. This charger requires a power input of 240 V AC 50/60 Hz (±10%) and will typically complete a charge in one hour.

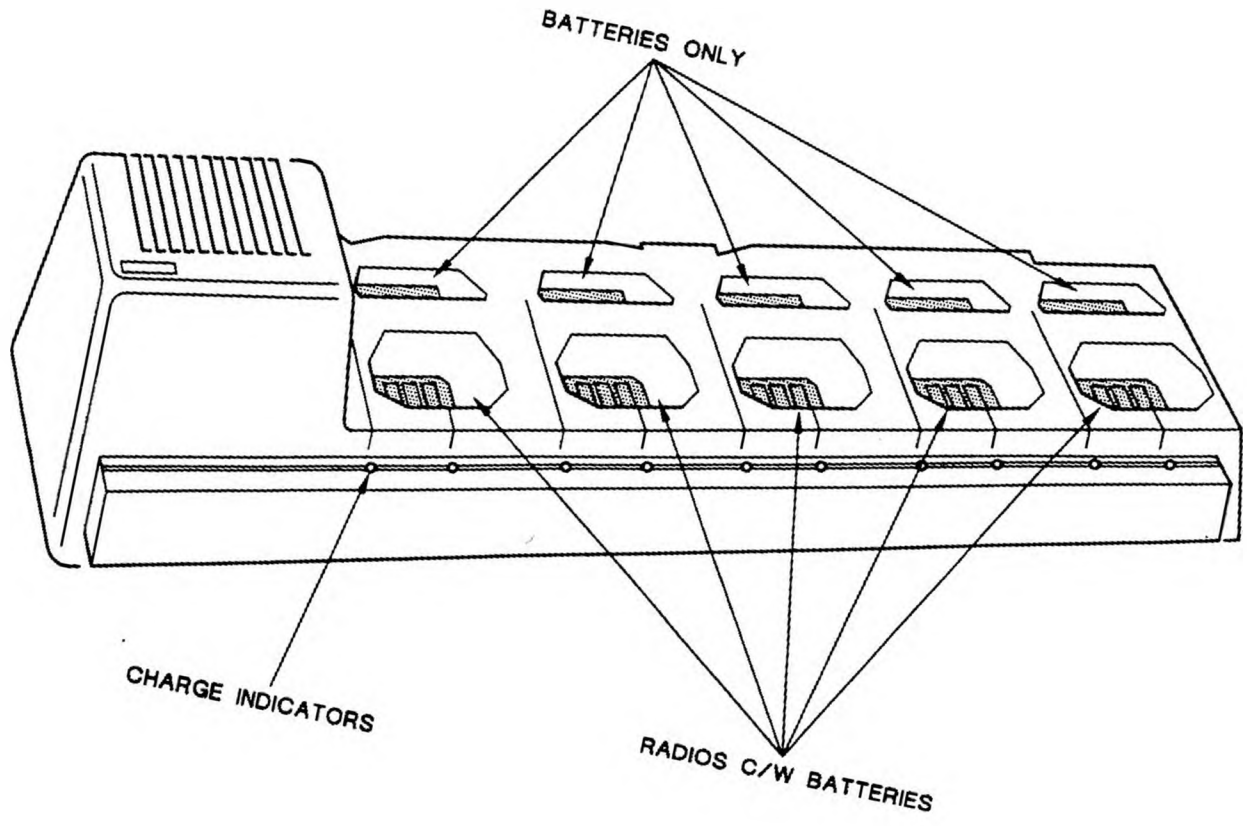
(2) PRX 7005. The PRX 7005 is a multiway rapid charger suitable for wall and shelf mounting and has 10 pockets. The front five pockets take radios complete with batteries and the rear five pockets take take five batteries only. This charger requires a power input of 240 V AC 50/60 Hz (±10%) and will typically complete a charge in one hour.

(3) PRX 7002. The PRX 7002 is an 'in vehicle' charger providing a medium rate charge (typically 8 hours) to keep charged batteries at hand when mobile (not currently part of this programme). The power input for this charger is 12 V DC vehicle, normal vehicle supplies (negative ground). For a 24 V DC vehicle, an additional DC to DC converter will be required.

60.2 For the PRP20, two chargers are available. One charger has a single pocket whilst the other has a six pocket. Both are rapid chargers and require a power input of 240 V AC 50/60 Hz.



Mains Operated Desk Top Charger (PRX7001)



Mains Operated Multi-charger (5+5) PRX7005

ICOM MARINE IC-M15E (for use on fishery protection vessels only)

67 The Icom IC-M15E is a handheld, waterproof IMM band personal transceiver with 24 programmable channels. The transceiver is capable of dual watch and can be fitted with a UT-79 Voice Scrambler Unit.

68 The IC-M15E is issued on a permanent basis to the OIC Fishery Protection Squadron for deployment on vessels undertaking fishery protection duties.

69 Parameters

69.1	Frequency Range:	Transmit: 156 - 157.5 MHz Receive: 156 - 163 MHz
69.2	Channels:	24
69.3	Channel spacing:	25 KHz
69.4	Operating mode:	FM
69.5	Antenna:	Flexible Helical Whip
69.6	Dimensions/Weight: (with battery pack)	Width: 62 mm Height: 150 mm Depth: 44 mm Weight: 460 g

70 Accessories

70.1 CM-138 Battery Pack.

70.2 BM-103 Desk Top Battery Charger (230 V).

70.3 Belt clip.

70.4 AD 43 Adaptor.

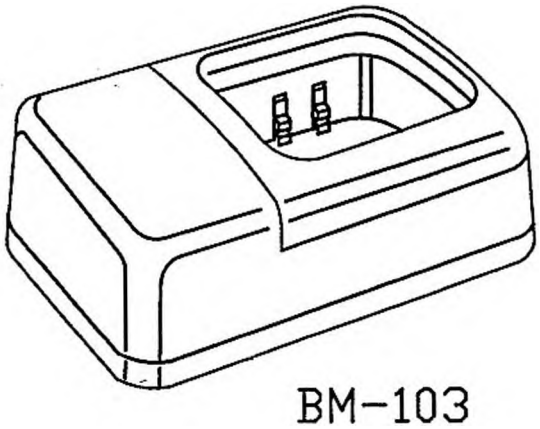
71 Issue

71.1 Issue in accordance with Section 1, Chapter 2, Paragraph 3.

72 Support

72.1 Repair and replacement will be by exchange via the OIC Fishery Protection Squadron.

72.2 Signal NAVSPCOMD BATH for the attention of DSWE/WE102A2.



BM-103

CHARGERS

AD-43

AD-43 Battery Charge Adapter:	Used for regular charging of battery packs (the same as the supplied one). Charging time: 15 to 20 hours.
BM-103 Desk Top Charger:	Used for rapid charging of battery packs. Charging time: 1 to 3 hours.
Cigarette Lighter Cable:	Connects to a ship or vehicle cigarette lighter socket for use with BM-103 or AD-43 chargers.

SECTION 4

NAVAL OUTFITS

CONTENTS

Chapter

1 General information
2 Naval outfits radio equipment

CHAPTER 1

GENERAL INFORMATION

CONTENTS

Para
1 Introduction
2 Equipment
3 Issue and return
4 Maintenance and repair

INTRODUCTION

1 This section deals with the equipments which have been given Naval Outfit nomenclature and introduced into service by standard procedures.

EQUIPMENT

2 Brief details of the equipment and its description are contained in Chap 2. Further information will be found in the individual equipment handbooks, which are identified in the descriptive text.

ISSUE AND RETURN

3 Normal stores procedures apply.

MAINTENANCE AND REPAIRS

4 Maintenance is confined to keeping the equipment clean and dry unless further details are given in the relevant handbook or planned maintenance schedules. Repair is Upkeep by Exchange (UxE) via RNSD Copenacre.

CHAPTER 2

NAVAL OUTFITS RADIO EQUIPMENT

CONTENTS

Para

1 UK/PRC 001-005
2 UK/PRC 006
3 Type 1205(1) (WARNING)
4 Type 1205(2)
5 Type 1205(3)
6 TACBE
7 Type 1251(1) - Obsolete equipment, detail removed. See DCI GEN 204/93.
8 Type 1260(1)
11 Type 1260(2)
12 Type 1260(3)
Type 1260 associated equipment
13 Loudspeaker microphone (ICOM ref IC-HM9)
14 Battery, Ni Cd (ICOM ref IC-BB3)
15 Battery charger, 230 V
16 Battery charger, 115 V
17 Type 1261
18 Battery charger, 115 V/230 V (Mfr ref JT 51/2)
20 Battery charger, 115 V/230 V Type CM-60A

UK/PRC 001-005

1 UK/PRC 001 to UK/PRC 005 Stornophone radio equipments are obsolescent. UK/PRC 001 to 004 have been replaced already by Racal Cougar radios and UK/PRC 005 will be replaced by the intrinsically safe UK/PRC 006. The Type 1260 communications set was issued as an interim measure to meet the shortfall in Stornophone support. The replacement SSRP is the Racal Cougar Communication set (refer to Section 5); a reduced allowance of 1260 is retained to provide a portable IMM capability.

UK/PRC 006

2 The UK/PRC 006 (Ascom SE 120-161 SX) is a 16 channel, VHF/FM handheld personal transceiver, intended for general purpose IMM band communications. It is certified compliant with the standard EEx ib 11C T4 for use in explosive atmospheres as specified in BS 5501 Part 7 (CENELEC 50 014).

2.1 Frequency Range. The UK/PRC 006 operates in the frequency range 146-174MHz. The transceiver is equipped with sixteen discrete, pre-programmed, voice channels, designated 1 to 16. The spot frequencies assigned to these channels are listed in the following table:

Channel	Frequency	IMM Channel	Channel	Frequency	IMM Channel
1	156.800	16	9	156.975	79
2	156.300	6	10	156.375	67
3	156.400	8	11	156.475	69
4	156.500	10	12	156.575	71
5	156.600	12	13	156.625	72
6	156.650	13	14	156.675	73
7	156.700	14	15	156.725	74
8	156.425	68	16	156.875	77

2.2 Frequency Control. Transceiver operating frequency is determined by a frequency synthesizer which is set to any 16 of 100 channels by the manufacturer using a personal computer. The frequency stability is plus or minus 5 parts per million.

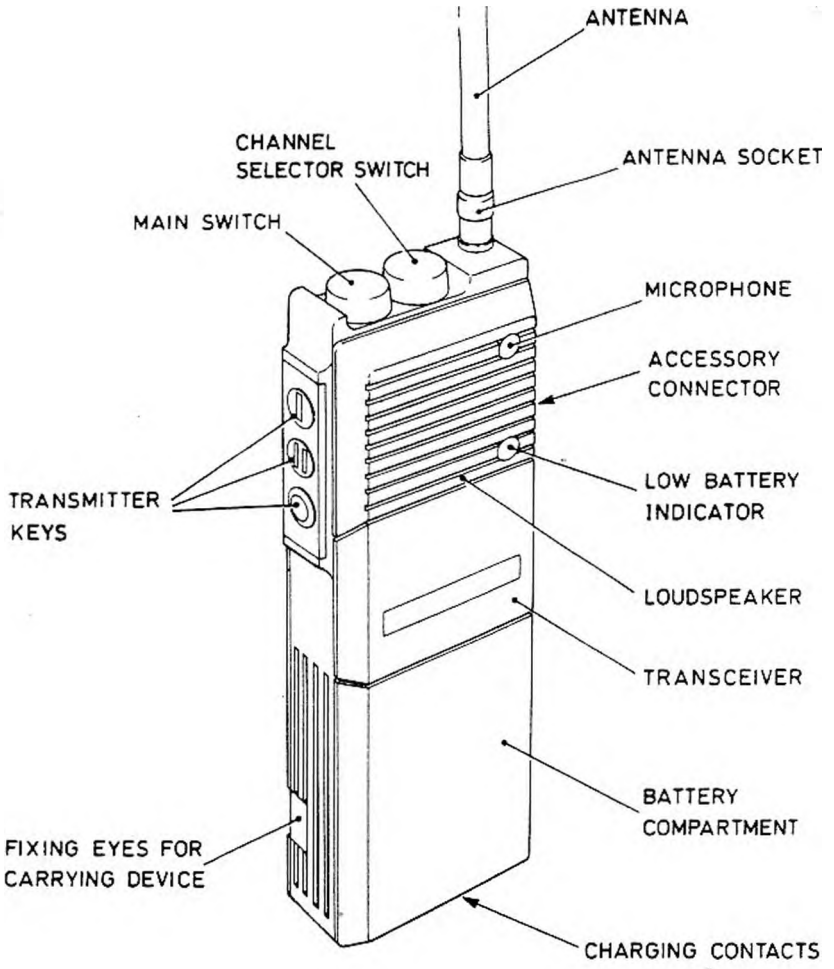
2.3 Operating Mode. The UK/PRC 006 operates in the F3 FM Voice mode.

2.4 Associated Aerial. The transceiver is operated using a 50ohm, 15cm long, helical whip antenna.

2.5 Power Output. Transmitter output power is 1W.

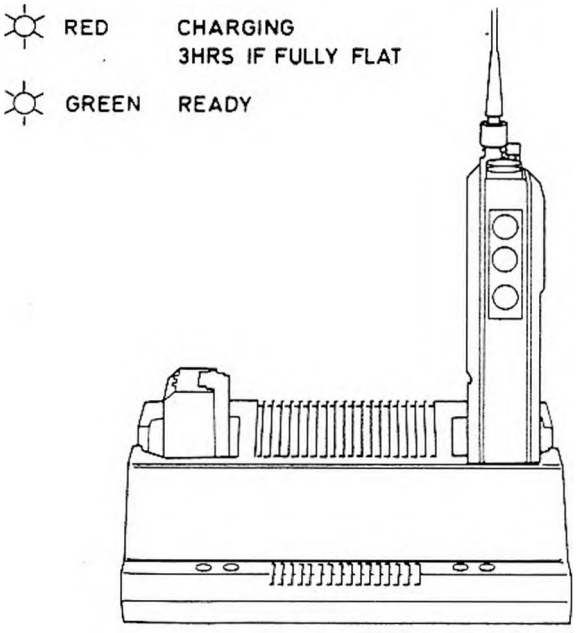
2.6 Power Supply. The UK/PRC 006 is operated using special-to-type, rechargeable, Ni-Cd battery packs. The packs are gas tight, have a nominal no-load voltage of 9.8V and a rated capacity of 750mAh. These packs are non-repairable.

2.7 Approximate Range. Transmitter range is approximately 10km (line of sight).



UK/PRC 006

2.8 Accessories. Accessories for the UK/PRC 006 include a two-way rapid battery charger, a loudspeaker/microphone, a leather carrying case and a 3 - point belt.



Battery Charger

Carrying Arrangements

2.9 Operating Information.

(1) Before switching the set on, ensure that the antenna is connected and a fully charged battery has been inserted.

(2) Select the required channel (1 to 16) by rotating the Channel switch to align the desired channel number with the mark on the transceiver case.

(3) Reset the Main switch from position 0 (Off) to one of the next four positions as appropriate. The positions of the switch are as follows:

i Off
ii Maximum Volume
iii High Volume
iv Medium Volume
v Low Volume
vi Medium Volume, Squelch Off

If no signal is heard, move the switch to the last (Medium Volume, Squelch Off) position.

(4) To transmit, hold the transceiver vertically in the hand, with the microphone 10-20cm from the mouth and press any one of the three Transmit keys; then speak at normal volume.

(5) To switch the transceiver off, rotate the Main switch anti-clockwise to the last (Off) position.

(6) Remove Battery. Although not usual practice this may be undertaken in the area where the explosive hazard exists. Release the cover of the battery compartment by firm downward pressure on the small arrow on the transceiver base, at the same time, moving the cover plate laterally away from the radio. The battery can be removed by tilting the radio smartly and catching the battery in the hand.

(7) Replace Battery. although not usual practice this may be undertaken in the area where the explosive hazard exists. Insert the charged battery into the battery compartment, so that the two round battery contacts align with the two spring contacts in the radio. Hook the two latches of the battery compartment cover into the radio front panel and lock by moving the cover plate laterally towards the radio until it clicks.

(8) Accessory Socket. The accessory socket is for connecting a loudspeaker/microphone to the radio. Always ensure the screw-in cover is replaced in the socket when the loudspeaker/microphone has been removed.

(9) Low Battery. The red LED on the front of the radio will flash when the battery pack needs replacement. Replace the battery as soon as possible.

2.10 Parts. The items which comprise the UK/PRC 006 IS VHF transceiver are listed in the following table. Items 2-7 are contained in item 1.

NSN	DESCRIPTION
0691-5820-99-0246745	Parts Kit
0618-5820-99-8637399	Radio, Handheld Intrinsically Safe
0618-6135-99-4102561	Battery
0618-5895-99-0515525	Antenna, Helical
0618-5820-99-8114825	Monophone, Hand
0618-5820-99-5531010	Case and Strap, Carrying
0618-5820-99-7946745	Belt and Strap, 3-Point
0618-5820-99-2554572	Charger Rapid, 2-Way 115V
0618-5820-99-7013775	Charger Rapid, 2-Way 240V
0618-5820-99-9745349	Cover, Screw-In

2.11 E List. The E List is S 2333.

2.12 Allowance. 3 Parts Kits and 2 Rapid Chargers per vessel, as specified in Sect 1, Chap 4, Table 1 from normal naval stores procedures.

2.13 Repair and Maintenance Policy. Onboard repair and maintenance is limited to repair by replacement of major items such as items 2 to 9 above. The only exception being replacement of the Charger mains fuse. Defective items are to be returned to PSTO(N). Repair will be undertaken by DGST(N) (Batteries should be removed from defective radios prior to dispatch.

WARNING

REPAIR OF RADIO OR MONOPHONE BY OTHER THAN THE CONTRACTOR WILL INVALIDATE THE INTRINSICALLY SAFE CERTIFICATION AND MAY RENDER THE RADIO UNSAFE TO USE.

TYPE 1205(1)

WARNING

THE 1205(1) ENCAPSULATED PLB CONTAINS SIGNIFICANT QUANTITIES OF BERYLLIUM AND MERCURY, BOTH OF WHICH REPRESENT A CONSIDERABLE POTENTIAL CONTAMINATION HAZARD IN THE ATMOSPHERE OF A SUBMARINE. ON NO ACCOUNT IS THE ENCAPSULATION TO BE OPENED AT SEA. MAINTENANCE AND PERFORMANCE CHECKS ARE ONLY TO BE CARRIED OUT BY PHASE STAFF ASHORE.

3 The Type 1205(1) is a compact, dual channel, Personal Locator Beacon (PLB) transceiver encapsulated in a glass-reinforced plastic watertight case, capable of withstanding immersion to depth of 1000 ft. Its function is to provide, in association with suitably equipped search aircraft, a means of locating personnel who have escaped from a submarine.

3.1 Frequency range. The 1205(1) transmits a beacon signal at the International Aviation UHF Distress frequency of 243.0 MHz. The equipment is fitted with an auxiliary channel for communications on the International Scene of Search frequency (282.8 MHz), but this is not available to the operator when the equipment is encapsulated.

3.2 Frequency control. Control of the PLB's operating frequencies is achieved by a crystal-controlled oscillator, which gives a frequency stability of ± 1.2 kHz.

3.3 Operating modes. The Type 1205(1) operates in the A2 AM mode. The carrier frequency is modulated by an audio tone, which sweeps from 1 kHz to 300 Hz at a sweep-rate of approximately 3 Hz.

3.4 Associated aerials. The PLB operates using a 50 ohm, helical, 29 cm long whip antenna.

3.5 Power output. Beacon transmitter output power is 300 mW minimum.

3.6 Power supply. The Personal Locator Beacon is operated using a 15 V battery pack. The battery pack is an encapsulated assembly of mercury cells. It will provide up to 24 hours continuous operation. Batteries are to be changed annually, and then only by Base Staff ashore. On no account is the watertight case to be opened at sea.

3.7 Approximate range. The approximate range at which the PLB will be detected, by a search aircraft flying at 10,000 ft is 60 nm.

3.8 Accessories. In addition to the watertight case, aerial, and battery pack, the Type 1205(1) is provided with a belt to secure the equipment to a survivor. A special to type Test Set is available for testing the PLB (see Para 3.14).

3.9 Operating information. The following procedure is for guidance only:

(1) Active Distress Beacon. To switch on the distress beacon, pull the ring attached to the activating pin located on the side of the PLB watertight case.

(2) Switch Off. To switch off the PLB, press in the activating pin.

3.10 Parts. Parts comprising the basic 1205(1) Personal Locator Beacon are listed in the following table.

NSN	Description	QTY
0618-5820-99-730-3785	Personal Locator Beacon - see Note	1
0624-5821-99-630-9247	Personal Locator Beacon	1
0618-5825-99-541-5298	Aerial	1
0691-5825-99-541-7576	Body Assembly Beacon Parts Kit	1
5J-6135-99-793-3184	Battery Pack	1

NOTE

Beacon 730-3785 has been introduced into the Naval Service in preference to 630-9247. Both types are interchangeable for 1205(1) applications.

3.11 E List. The E List is S1930.

3.12 Handbook. There is no separate BR for the equipment. Operating instructions are covered in BR 241 (Submarine Escape and Rescue Handbook).

3.13 Repair and Maintenance. Technical details and procedures for repair and maintenance are contained in Base 'Staffs Pamphlet' issued by DSWE/WE102A1C, Elm 3a, MoD Abbey Wood #200, PO Box 702, Bristol BS12 7DU.

3.14 PLB Test Set. A special to type test set used for testing the Type 1205(1). The test set is free standing and battery operated. It provides:

(1) Functional tests of all PLB transmit modes.
(2) A functional test of the PLB volume control.
(3) An on-load battery voltage check.

3.15 Parts. Parts comprising the PLB Test Set are listed in the following table.

Part No	Description	QTY
0696/6625-99-791-9130	PLB Test Set Radio	1
0672/6625-99-634-0556	PLB Test Set	1
0652/6135-99-910-1101	Battery, 1.5 V	1

NOTE

Test sets only held at HMS DOLPHIN, DEFIANCE and FASLANE.

3.16 Related handbooks. Further information concerning the PLB Test Set may be found in AP 116B-0906-6. PLB Test Set Radio information is held with the Test Set.

TYPE 1205(2)

4 The Type 1205(2) Search and Rescue Beacon Equipment (SARBE) is a portable, battery operated, personal radio beacon. It is intended for use as an emergency homing beacon for Sea Survival purposes.

4.1 Frequency range. The 1205(2) transmits a beacon signal at the International Aviation UHF Distress frequency of 243.0 MHz. The equipment is fitted with an auxiliary channel for communications on the International Scene of Search frequency (282.8 MHz); this auxiliary channel should be used only on instructions from a rescue or search aircraft.

4.2 Frequency control. Control of the SARBE's operator frequencies is achieved by a crystal-controlled oscillator, which gives a frequency stability of ± 7.5 kHz.

4.3 Operating modes. The Type 1205(2) operates in the A9 AM Mode. The carrier frequency is modulated by an audio tone, which sweeps from 1750 Hz to 300 Hz at a sweep-rate of approximately 3 Hz. If the auxiliary channel is selected for use, emission is A3 AM mode.

4.4 Associated aerials. The SARBE operates using a 50 ohm, helical, quarter wavelength whip antenna.

4.5 Power output. Beacon transmitter output power is 300 mW nominal.

4.6 Power supply. The Type 1205(2) SARBE is operated using a 12.15 V (nominal) lithium battery pack. The battery pack will provide up to 24 hours continuous operation. These batteries have a shelf life of 5 years.

4.7 Approximate range. The approximate range at which the SARBE will be detected by a search aircraft flying at 10,000 ft is 60 nm.

4.8 Accessories. An aerial extension is available for installation on NILE liferafts.

4.9 Operating information. The following procedure is for guidance only:

(1) Activate Distress Beacon. To switch on the distress beacon, pull the coloured webbing strap attached to the activating pin. This is located on the top of the SARBE. The distress beacon tone will be heard in the loudspeaker when the equipment is activated.

(2) Switch Off. To switch off the SARBE, press in the activating pin.

(3) Voice Communications. If instructed to employ the voice communications mode by rescue or search aircraft, rotate the channel switch to the AUXILIARY position. To transmit, press the PTT switch and speak into the loudspeaker. To receive, release the PTT switch.

4.10 Emergency channel testing. To test the operation of the SARBE distress beacon, proceed as follows:

(1) Raise the test lever (labelled 'Lift to Test'), and observe the indicator lights on the side of the unit. With the unit functioning normally, a flashing green indicator is seen, and the beacon tone is heard in the loudspeaker.

(2) With the test lever held in the raised position, select receive mode by pressing the RECEIVE switch. The green indicator is illuminated continuously and an audible tone heard in the loudspeaker. Check the operation of the volume control by moving VOLUME switch to the Hi position. Release the RECEIVE switch.

(3) With the test lever held in the raised position, press the TRANSMIT switch. The red indicator lamp is illuminated continuously. Whistle or shout into the loudspeaker. The red indicator lamp is extinguished, and the green indicator illuminated. Release the TRANSMIT switch and test lever.

4.11 Auxiliary channel testing. To test the operations of the SARBE auxiliary communications channel, proceed as follows:

(1) Remove the distress beacon activating pin by pulling the coloured webbing strap, and immediately rotate the channel switch to the AUXILIARY position.

(2) Raise the test lever and observe the indicator lights on the side of the unit. The green indicator is illuminated, and an audible tone heard in the loudspeaker.

(3) With the test lever held in the raised position, depress the TRANSMIT switch. The green indicator is extinguished and the red indicator illuminated. Whistle or shout into the loudspeaker. The red indicator lamp is extinguished, and the green indicator lamp illuminated. Release the TRANSMIT switch and the test lever.

(4) Rotate the channel switch to the OFF position. Partially insert the activating pin into its slot. Simultaneously rotate the channel switch to the EMERGENCY position and push the activating pin fully home. Check that no beacon tone is heard in the loudspeaker.

4.12 Battery change. Ensure that the removal of the spare battery from its waterproof envelope is carried out in such a way as to protect it from water. Remove the old battery by unscrewing anti-clockwise, when viewed from battery end. Screw in the new battery.

4.13 Parts. Parts comprising the basic Type 1205(2) SARBE are listed in the following table.

NSN	Description	QTY
0618/5825-99-716-9606	1205(2) Radio Beacon, complete with aerial	1
0618/5985-99-718-6662	Aerial	
0635/5985-99-718-6660	Aerial Extension	1
0618/6135-99-733-4940	Battery, Lithium	2

4.14 E List. The E List number is S2024R.

4.15 Handbook. There is no separate BR for this equipment.

4.16 Repair and maintenance policy. No onboard repair or maintenance will be undertaken, the life raft complete will be returned to HM Dockyard under Planned Maintenance Schedule 1-5900-00001. All beacons will be tested on issued and every five years by Naval Weapons Engineer (Monks Park). Defective items will not therefore by identified by uniformed personnel. Defective items will be identified by:

(1) HM Dockyard during routine testing/maintenance of the raft container contents by PSTO(N) Portsmouth, Devonport, and Rosyth.

(2) NWE during pre-issue checks, and five year retest.

Defective 1205(2) Kits 0618-99-716-9606 complete will be returned to RNSD Copenacre and new items demanded by PSTO(N). The contractor will undertake repair.

TYPE 1205(3)

5 The 1205(3) is identical to 1205(2) except that the voice channel is on a different frequency. The 1205(3) is identified by NATO Stock No 0618/5825-99-541-5425 and the battery by NSN 0618/6135-99-626-5879. It is issued for use by the Royal Marines.

5.1 E List. The E List Number is S2020.

5.2 Handbooks. There is no separate BR for this equipment.

TACBE

6 A similar Beacon to 1205(2) and (3), but not using distress frequencies. It is sponsored by the Army Department for tactical operations and it is used by the Royal Marines (RM). Its NATO Stock No is 5820-99-761-9223 and support arrangements are in place for the RM with the Army Department. Care must be taken not to confuse it with the 1205, particularly when returning to stores for repair.

TYPE 1251(1)

7

See Contents

TYPE 1251(1)

7

See Contents

TYPE 1260(1)

8 The Type 1260(1) is a 12-Channel, handheld, personal VHF transceiver. It is intended for general purpose upper-deck use, RAS, seaboats, ship to tug-dockyard movements, Boarding/Landing parties, NBCD, minehunting and submarine and MCMV IMM Channel 16. It is manufactured by ICOM, commercial reference IC-M12.

9 The Type 1260(1) - (3) range of equipments were introduced to meet a shortfall in Stornophone support. A replacement SSRP is now available in the form of the Racal Cougar equipment (refer to Section 4), and supersedes Stornophone except for the UK/PRC005 intrinsically safe version. Type 1260 will be retained in service to a reduced scale to maintain ships portable radio capability in the IMM band.

10 There is no intrinsically safe version of the Type 1260 equipment.

10.1 Frequency Range. The Type 1260(1) operates in the frequency range 156.3 MHz to 162.550 MHz. The transceiver is equipped with 12 discrete, pre-programmed, voice channels; 9 channels are designated in alphabetical order from A to I, and the three remaining channels are designated W/X, 16 and 6. The spot frequencies assigned to these channels are listed in the table below.

Channel	Frequency	IMM Channel Number
16	156.800 MHz	16
6	156.300 MHz	6
A	156.400 MHz	8
B	156.500 MHz	10
C	156.650 MHz	13
D	156.375 MHz	67
E	156.625 MHz	72
F	156.750 MHz	15
G	156.850 MHz	17
H	156.725 MHz	74
I	156.575 MHz	71
W/X	156.475 MHz	69

10.2 Frequency Control. Control of the transceiver's operating frequencies is achieved by crystal-controlled oscillators. This provides a frequency stability of ± 1 part-per-million.

10.3 Operating Modes. The 1260(1) operates in the F3 FM Voice mode.

10.4 Associated Aerials. The transceiver operates using a 50 ohm, 17.8 cm long, flexible, helical whip antenna.

10.5 Power Output. Transmitter output power is 1 W.

10.6 Power Supply. The 1260(1) utilizes a special to type Ni Cd rechargeable battery pack. The battery pack has a nominal output voltage of 8.4 V at a capacity of 250 mAh. Current drain when in transmit mode is 450 mA.

10.7 Approximate Range. Transmitter range is approximately 10 km (line of sight).

10.8 Accessories. Accessories for the 1260(1) include a 230 V ac battery charger and a loudspeaker/microphone.

10.9 Operating information. The following procedure is for guidance only:

(1) Select the required channel by rotating the CHANNEL switch to the desired position. Switch on the transceiver by rotating the VOLUME control to the desired volume level of received signal. Adjust radio SQUELCH control as required.

(2) Communicate. To transmit, press the PTT switch and speak into the microphone. The SEND/BATTERY indicator is illuminated when in transmit mode. To receive, release the PTT switch. Should the SEND/BATTERY indicator illuminate when in receiving mode, replace the battery.

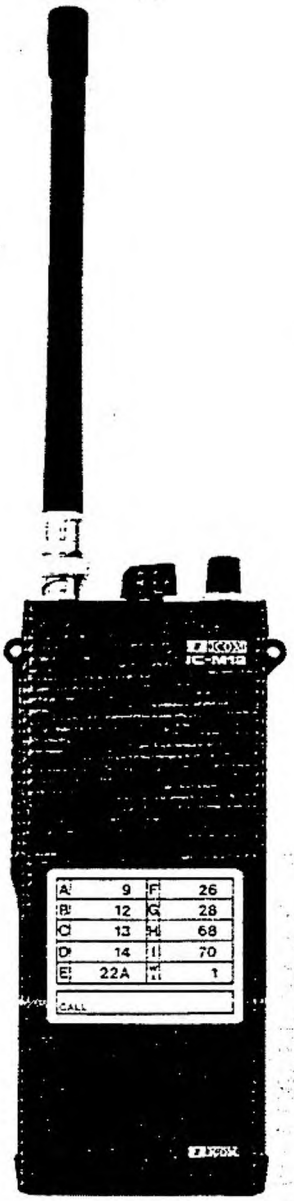
10.10 Parts. Parts comprising the basic Type 1260(1) transceiver are listed in the following table.

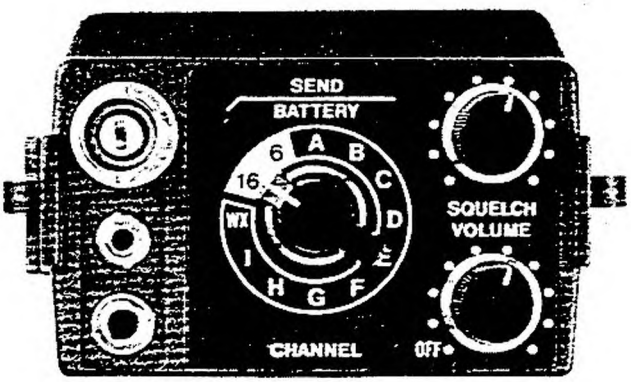
NSN	Description	QTY
0618-5820-99-772-6438	1260 Transceiver	1
0618-5985-99-772-6440	Antenna	1
0618-6140-99-772-6439	Battery, Ni Cd	2
0618-5965-99-772-6441	Speaker/Microphone	1
0618-5820-99-773-0026	Case, Transceiver	1
0618-6130-99-772-6442	Charger, Battery, 230 V	1
0618-5820-99-730-5553	Waterproof Cover	1

10.11 E List. The E List number is S2075.

10.12 Handbook. There is no separate BR for this equipment.

10.13 Repair and maintenance. Is UXE via Naval Stores.


ICOM
IC-M12
A 9
B 12
C 13
D 14
E 22A
F 26
G 28
H 68
I 70
J 1
CALL


SEND
BATTERY
6
16
A
B
C
D
E
F
G
H
I
WX
SQUELCH
VOLUME
CHANNEL
OFF

TYPE 1260(2)

11 The Type 1260(2) is identical to the Type 1260(1) with the exception that it utilizes a 115 V ac battery charger. Operational details and characteristics are otherwise identical to those of the Type 1260(1).

11.1 Parts. Parts comprising the basic Type 1260(2) transceiver are listed in the following table.

NSN	Description	QTY
0618-5820-99-772-6438	1260 Transceiver	1
0618-5985-99-772-6440	Antenna	1
0618-6140-99-772-6439	Battery, Ni Cd	2
0618-5965-99-772-6441	Speaker/Microphone	1
0618-5820-99-773-0026	Case, Transceiver	1
0618-6130-99-784-4877	Charger, Battery, 115 V	1
0618-5820-99-730-5553	Waterproof Cover	1

11.2 E List. The E List number is S2075.

11.3 Handbook. There is no separate BR for this equipment.

11.4 Repair and maintenance. Is UXE via Naval Stores.

TYPE 1260(3)

12 The Type 1260(3) is equipped with a 115 V ac battery charger, and has a different Channel Frequency Plan to that of the 1260(1) or (2). Operational details and characteristics are otherwise identical. It is intended for use during submarine surface navigation.

12.1 The Channel Frequency Plan for the Type 1260(3) is given in the following table.

Channel	Frequency	IMM Channel Number
16	156.800 MHz	16
6	156.300 MHz	6
A	156.400 MHz	8
B	156.500 MHz	10
C	156.650 MHz	13
D	156.600 MHz	12
E	156.675 MHz	73
F	156.700 MHz	14
G	156.550 MHz	11
H	156.725 MHz	74
I	156.575 MHz	71
W/X	156.475 MHz	69

12.2 Parts. Parts comprising the basic Type 1260(3) transceiver are listed in the following table.

NSN	Description	Qty
0618-5820-99-784-4816	1260 Transceiver	1
0618-5985-99-772-6440	Antenna	1
0618-6140-99-772-6439	Battery, Ni Cd	2
0618-5965-99-772-6441	Speaker/Microphone	1
0618-5820-99-773-0026	Case, Transceiver	1
0618-6130-99-784-4877	Charger, Battery, 115 V	1
0618-5820-99-730-5553	Waterproof Cover	1

12.3 E List. The E List number is S2075.

12.4 Handbook. There is no separate BR for this equipment.

12.5 Repair and Maintenance. Is UxE via Naval Stores.

TYPE 1260 ASSOCIATED EQUIPMENT

Loudspeaker Microphone (ICOM ref IC-HM9)

13 The Loudspeaker Microphone, ICOM IC-HM9, is intended for use with the Type 1260 range of communications sets. It connects to the transceiver by means of a two pin connector and coiled cable. The loudspeaker/microphone is fitted with a PPT switch.

13.1 Loudspeaker impedance. The impedance of the loudspeaker is rated as 8 ohms.

13.2 Microphone type. The microphone is of the condenser type.

13.3 NSN. 0618-5965-99-772-6441.

Battery Ni Cd (ICOM ref IC-BP3)

14 The IC-BP3 Ni Cd rechargeable battery pack is for use with the Type 1260 range of communications style.

14.1 Output voltage. Nominal output voltage is 8.4 V dc.

14.2 Capacity. Rated capacity for the IC-BP3 is 250 mAh.

14.3 Charging rate. Maximum charge current is 25 mA. Charging is by the special to type battery chargers described in Paras 16 and 17.

14.4 Charge time. Charge time is 15 hours for a full charge.

14.5 Operations.

14.5.1 Fit battery. Align the top of the battery with the guide rails on the bottom of the transceiver, and slide the battery pack fully home.

14.5.2 Charge battery. Connect the battery charger cable to the battery pack charging socket and switch on the charger. The RED LED indicator, mounted adjacent the charging socket is illuminated to indicate that the battery is being charged.

14.6 NSN. 0618-6140-99-772-6439.

Battery Charger, 230 V

15 The Battery Charger, 230 V, is intended for use with the special to type Ni Cd rechargeable batteries fitted to the Type 1260 range of communications sets.

15.1 Input voltages. The battery charger operates using mains voltage inputs in the range 220 V to 240 V ac, and with a frequency range of 50 Hz to 60 Hz.

15.2 Output voltage. Battery charger output is 13.8 V dc.

15.3 Output current. Output current is 25 mA maximum.

15.4 NSN. The NATO Stock Number for the Battery Charger, 230 V is 0618-6130-99-772-6442.

15.5 Operation. Connect the charger to the battery. Connect the charger to the mains supply, and switch on. A RED LED indicator, mounted adjacent the charging socket on the Ni Cd battery, is illuminated. Switch off and disconnect the charger after 15 hours continuous use.

Battery Charger, 115 V

16 The Battery Charger, 115 V, is intended for use with the special to type Ni Cd rechargeable batteries fitted to the Type 1260 range of communication sets. Apart from the mains input voltage rating of 115 V ac, the charger is identical to the battery charger, 230 V, described in Para 16.

16.1 NSN. The NSN for the battery charger, 115 V, is 0618-6130-99-784-4877.

16.2 Parts and items. The Battery Charger requires a two-pin connection similar to an electric shaver. Where necessary, ships should demand the following:

(1)	Socket,	0568-5935-99-761-0258
(2)	Mounting Box,	0559-5975-99-117-2033

CAUTION

Sockets used for this purpose must be clearly and permanently labelled Battery Charging Only. Electric Shock Hazard Exists If Used For Shavers.

NOTE

These items should be ordered in quantities appropriate to the allowance of Type 1260. Ships are to make up a distribution board for a 240 V ac or 115 V ac 50/60 Hz supply, as appropriate, using local resources.

TYPE 1261

17 The Type 1261 is a portable, waterproof, VHF FM radio transceiver intended for firefighting (damage control) communications. The portable radio in its waterproof case is designed to be attached to the air bottle of a breathing apparatus and connected to a Slim Tank Helmet (Part of the firefighters communications outfit). The basic radio is manufactured by ICOM, commercial reference IC-3A.

17.1 Frequency range. The transmitter operates using two spot frequencies according to the location of use aboard. These two frequencies are:

(1) 225.7 MHz (for'd FRP post)
(2) 228.7 MHz (aft FRP post)

The two frequencies correspond to settings of 570 and 870 respectively on the transceiver. The transceiver is capable of operating in the frequency range 220 MHz to 230 MHz.

17.2 Frequency control. Control of the transceiver's operating frequencies is achieved by a crystal-controlled oscillator and a digital phase-locked loop synthesiser circuit.

17.3 Operating modes. The Type 1261 is operated using the F3 FM Voice mode.

17.4 Associated aerials. The transceiver operates using a 50 ohm, flexible, 16 cm long, helical whip antenna. A leaky feeder may be used with 1261. This leaky feed may be installed where there is a need, and left permanently rigged (providing this can be achieved without adversely affecting ships' watertight or gastight integrity).

17.5 Power output. Transmitter output power is 1 W.

17.6 Power supply. The Type 1261 is operated using a special to type rechargeable Ni Cd battery pack (ICOM ref IC-BP2). The battery pack has a nominal output voltage of 7.2 V at a rated capacity of 425 mAh.

17.7 Approximate range. Transmitter range varies between ship types. For example, in a Type 42 destroyer it is possible to communicate from the SCC to any compartment in the ship. However, it may be necessary to employ the leaky feeder to improve conditions in difficult areas.

17.8 Operating information. The following procedure is for guidance only:

(1) Ensure that the 7-way Clansman connector on the STH is connected to the transceiver's audio connector. Ensure that the battery pack and antenna are connected correctly.

(2) Check that the transceiver channel selector thumbwheel switches are set to the correct frequency (570 or 580), depending on FRP location. Switch on the transceiver and adjust VOLUME control for desired sound level.

(3) To transmit, press the pressel switch and speak into the helmet's boom microphone. To receive, release the pressel switch.

17.9 Parts. Parts comprising the basic Type 1261 communications outfit are listed in the following table:

NSN	Description	QTY
0618/5820-99-783-2972	Transceiver Complete with Battery and Waterproof Case	10
0618/5820-99-783-1384	Battery, Secondary	10
0618/5820-99-783-1385	Antenna	10
0618/5820-99-783-2973	Charger, Battery, 115 V/230 V (OBSOLESCENT - SUPERSEDED BY)	1
0618/6130-99-727-8031	Charger, Battery, 115 V/230 V CM-60A (6-way)	1

17.10 E List. The E List number is S2099.

17.11 Handbook. There is no separate BR for this equipment.

Battery Charger 115 V/230 V (Mfr ref JT 51/2) - OBSOLESCENT

18 This battery charger (ref JT 51/2) is intended for use with special to type Ni Cd batteries (ICOM ref IC-BP2) utilized by the Type 1261 transceiver. The charger is capable of charging four such batteries simultaneously. It may be operated using mains voltage supplies of 115 V ac or 230 V ac with a frequency of 50/60 Hz.

18.1 Operation. Ensure that the mains selector switch is set to the position corresponding to the available mains power supply (115 V or 230 V). Insert up to four IC-BP2 batteries into the receptacles located on top of the charger, and fit the charger's protective lid.

18.1.1 Connect the battery charger to the mains supply and switch on. A battery may require up to 1.5 hours to obtain a full charge.

18.1.2 After a suitable charging period, switch off and disconnect the battery charger from the mains supply. Remove the charged batteries from the unit.

19 Battery charger JT 51/2 (NSN 0618/5820-99-783-2973) has been superseded by 6-way multi-charger Type CM-60A (NSN 0618/6130-99-727-8031). Both chargers will remain in service until repair stocks of replacement parts for the JT 51/2 are no longer available.

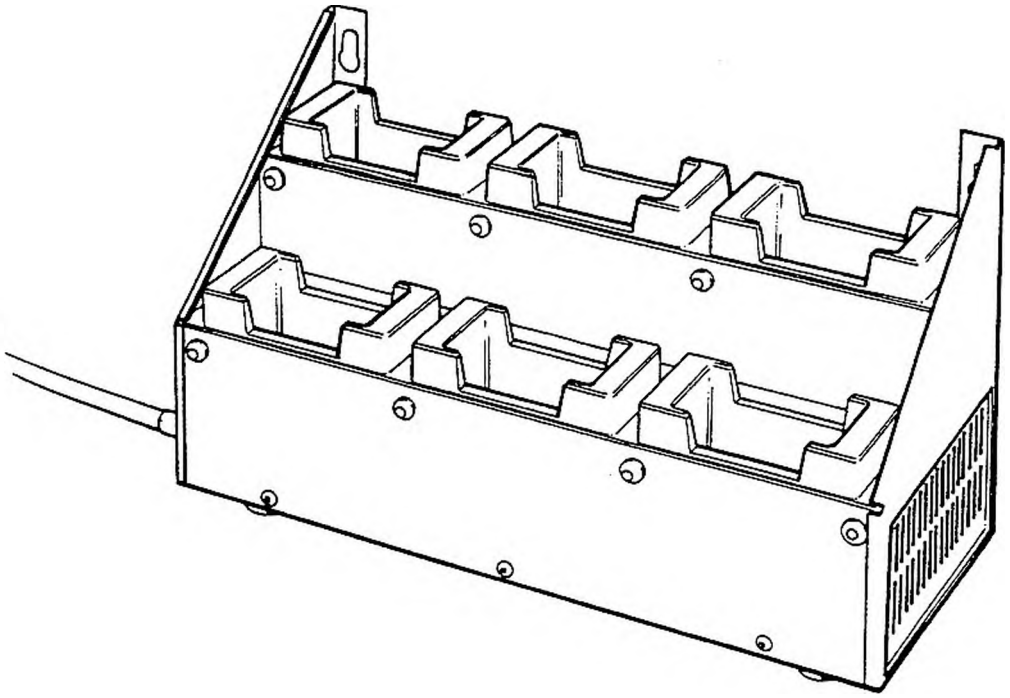
Battery Charger 115 V/230 V Type CM-60A

20 The multi-charger Type CM-60A can simultaneously charge up to six separate ICOM battery packs (BP2). Full charge detection circuits automatically detect when each battery pack is fully charged. After regular charging is complete, the CM-60A automatically selects trickle charging. Charge indicators illuminate red while the CM-60A is charging and green when the battery packs are fully charged, indicating that the packs may be removed.

20.1 Operation. Ensure that the mains selector switch is set to the position corresponding to the available mains power supply (115 V or 230 V). Insert up to six IC-BP2 batteries into the receptacles located on the charger.

20.1.1 Connect the battery charger to the mains supply and switch on. A battery may require up to five hours to obtain a full charge. Indication of a fully charged battery is given when the charge lamp changes from RED (charging) to GREEN (charged).

20.1.2 On completion of charge, batteries may be left in the charger on "Trickle Charge" or removed for connecting to a radio.



DIMENSIONS: Height - 150 mm (5.91 in.)
Width - 317 mm (12.48 in.)
Depth - 124 mm (4.88 in.)

Battery charger CM-60A

SECTION 5

STANDARD SHORT RANGE PORTABLES (COUGAR)

CONTENTS

Chapter

1 General information
2 Equipment technical details
3 Operating instructions
4 Upkeep and support
5 Routine maintenance

CHAPTER 1

GENERAL INFORMATION

CONTENTS

Para

1 Introduction
3 Equipment outline
4 Frequency management
5 Operation
6 Care and precautions (WARNING AND CAUTION)
7 Supply and return
8 Battery NiCad MA4516A

Fig Page

1 Type 8 portable station 4
2 Type 6 manpack station 5
3 Type 7 vehicle station 6
4 Type 1 base station 7
5 Type 2 base station 8
6 Type 3 base station 9
7 Type 4 base station 10

INTRODUCTION

1 In 1987 a family of portable, mobile and base station radio equipment was introduced into service to supersede Storno for ships use and other equipment used ashore for establishment security and by the Ministry of Defence Police. It was introduced under the general title of Standard Short Range Portable (SSRP). The radio selected by competition is the Racal COUGAR. In July 1991 a nomenclature of Type 1220 was issued for the Racal Cougar.

2 Introduction was by DCI RN 118/87 and subsequently a Nomenclature was issued for the Racal Cougar in July 1991 as Type 1220. Storno UK/PRC 001 to 004 have been disposed of and Storno UK/PRC 005 will be withdrawn from service following the introduction into service of the Ascom UK/PRC 006 as the intrinsically safe portable for use on the RFAs.

EQUIPMENT OUTLINE

3 The RN COUGAR Type 1220 is capable of covering the band 66-88 MHz. The constraints of aerial design limit efficient performance with any one aerial to a 3 MHz segment of the band. RN/RM/MDP frequencies are between 73 and 78 MHz. It is compatible with CLANSMAN (30-76 MHz) over that part of the range where their frequency bands overlap. The RN COUGAR is similar to the COUGAR used by the Army (UK/PRC 394) but the frequency ranges are different and the two are not compatible. More detailed technical information can be found in Chap 2 and the operating instructions are given in Chap 3.

3.1 Portable station (Fig 1). This is a portable handheld personal VHF transceiver intended for use in landing party and boarding party operations, KP and IS use ashore and for general evolutions mainly by non-communications personnel. A carrying harness is provided. The transceiver (with RF Amplifier TA4523L) is used as the central element of all the base stations.

3.1.1 Ten channels may be pre-programmed to any combination of single frequency simplex or two-frequency simplex. Channel frequencies are programmed into the transceiver by means of a Frequency Programmer (MA4073C) or a Fill Gun (MA4083C).

3.1.2 The transceiver may be fitted with an encryption module (BID 420, known as 'BRIGHT') which is programmed with cypher codes (keyfills). Two keyfills may be held at any one time. Keyfills are loaded from a BID 480/31 (NOBBLE) fill gun using an MA4549A interface unit.

3.2 Manpack (Fig 2). Previously known as the Mobile Base Station, this has the same facilities as the Portable Station but with an output of up to 20 W using the RF Amplifier TA4523L. A shoulder harness is provided.

3.3 Vehicle station (Fig 3). Similar to the Manpack but with brackets to fit into a vehicle (typically in the boot) and a remote controller designed for dashboard mounting.

3.4 Type 1 Base station (Fig 4). Similar to the Manpack but provided with a desktop mains power supply unit onto which the radio is clamped.

3.5 Type 2 Base station (Fig 5). Similar to Type 1 but with the addition of a unit connected by a telephone pair which provides remote audio facilities (but not channel change).

3.6 Type 3 Base station (Fig 6). Similar to Type 1 but with full control facilities at up to 30 metres distance.

3.7 Type 4 Base station (Fig 7). This uses the same basic configuration of transceiver with 20 W amplifier but is housed in a cabinet which also contains the necessary circuit boards to provide full remote operation and control at any distance over 4-wire telephone lines. Associated with this station is the Extended Local Control panel MA4800A.

3.8 Battery Chargers. Single and six way battery chargers are available for the batteries for the handheld radio and a five way charger for the manpack batteries.

3.9 Battery tester/conditioner. This unit will give an indication of the serviceability of the batteries for the personnel radio and when appropriate can be used to carry out a conditioning routine.

FREQUENCY MANAGEMENT

4 There are two user groups: Shore Establishments and Ships (inc RFA). Each group will have a standard channel plan except for Hong Kong which will have a unique plan. Each plan includes two channels/frequencies which are common to all for inter-group operation if needed. On initial delivery radios will be programmed for the intended user group. Portable radio pools will program replacement radios to suit the user immediately prior to issue and are provided with three fill guns and a frequency programmer for this purpose. The frequency allocations are published in RNCP 5. Details of plans will be promulgated in appropriate RNCPs and local orders. Retention of frequency programming by the radio is permanent until reprogrammed, it does not rely on a battery being fitted.

OPERATION

5 For general naval purposes, the transceiver is used as a handheld portable in single frequency clear voice mode. Ashore a typical establishment will have a single base station communicating with several portables and one or more vehicles as a single net. Current plans do not envisage the system being used for inter-establishment communications.

CARE AND PRECAUTIONS

6 Cougar transceivers are splashproof. If a set is saturated by sea water, it should be rinsed in fresh water with a little detergent added, the aerial, handset and battery should be removed and all connections cleaned and dried.

WARNINGS

(1) **SSRPs ARE NOT TO BE USED IN RADHAZ SENSITIVE AREAS, EG MAGAZINES, CHECK SPACES, LOADING AREAS OR MISSILE TEST AND HANDLING ROOMS UNLESS SPECIFIC CLEARANCE HAS BEEN GIVEN BY THE AUTHORITY RESPONSIBLE FOR RADHAZ PRECAUTIONS.**

(2) **COUGAR IS NOT INTRINSICALLY SAFE AND SHOULD NEVER BE USED IN THE PRESENCE OF INFLAMMABLE GASES OR FUMES NOR WITHIN EMPTY FUEL TANKS.**

CAUTION

The radio has little internal protection against strong RF fields and care should be taken to ensure that the sets are not used close to high power radio or radar transmitting aerials.

SUPPLY AND RETURN

7

7.1 Initial issues will normally be despatched from the manufacturer direct to the user (DGST(N) may be involved purely for assistance with transport). All radios and ancillaries supplied are to be taken on charge in the appropriate stores account and transferred to a permanent loan record (PLR); equipment serial numbers are to be recorded on the PLR form. When BID 420 is fitted and programmed, the requirements of BR 4005 are to be followed.

7.2 The Cougar equipment and ancillary items are generally not codified but are identified under Manufacturers Part Numbers as shown in Chap 2. Items are not to be returned to DGST(N) under any circumstances. All transactions for replacement or return are to be conducted with replacement pools as detailed in Section 1.

BATTERY NiCad MA4516A

8

8.1 The battery NiCad MA4516A is codified NSN 6140-99-253-6548. Transactions for demands and returns are as per Para 7.2 ie conducted with replacement pools as detailed in Section 1.

8.2 Replacement pools are to conduct all transactions for the replacement and return of Batt NiCad NSN 6140-99-253-6548 with DGST(N). Under no circumstances are these Batteries to be returned to the manufacturer.

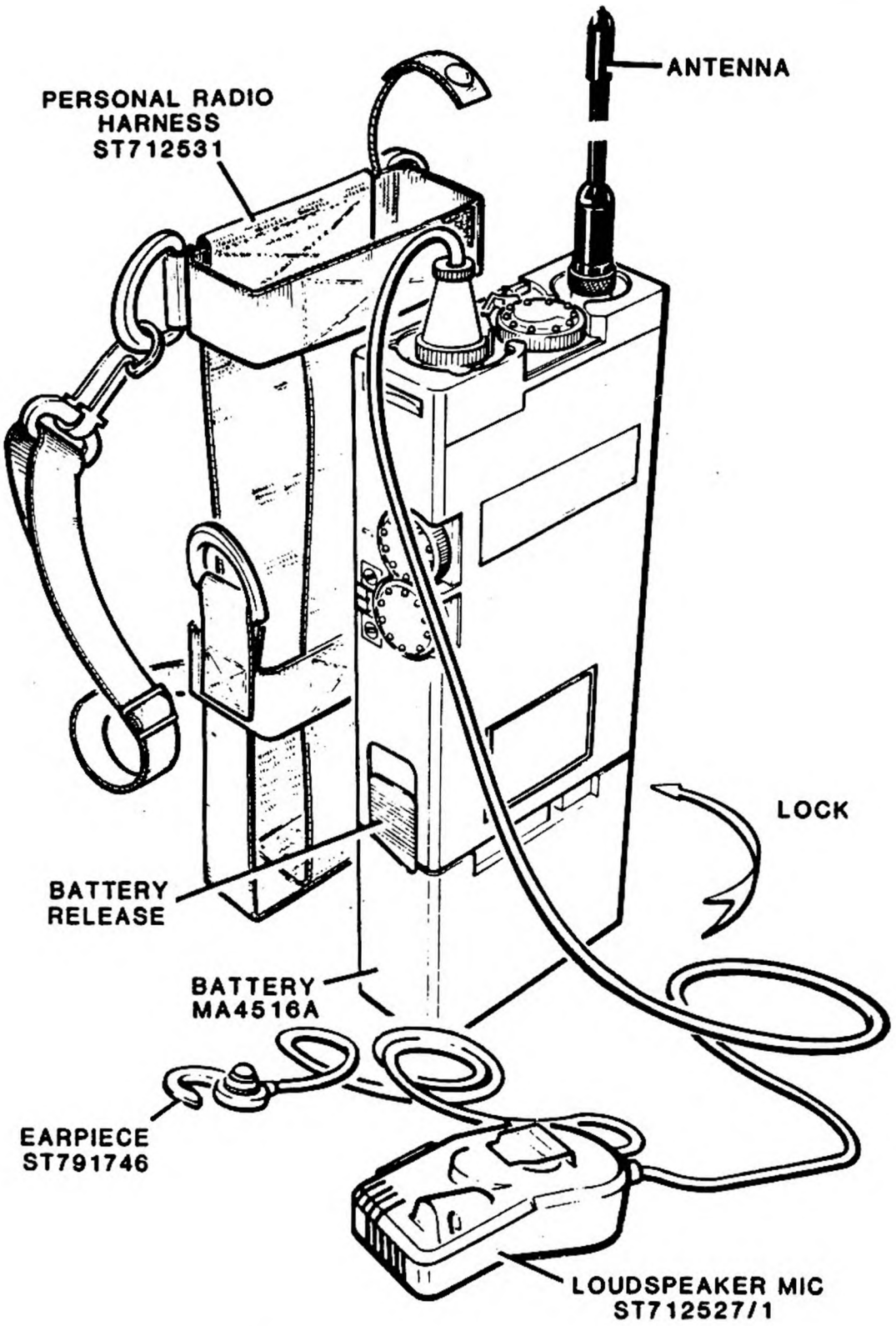


Fig 1 Portable station

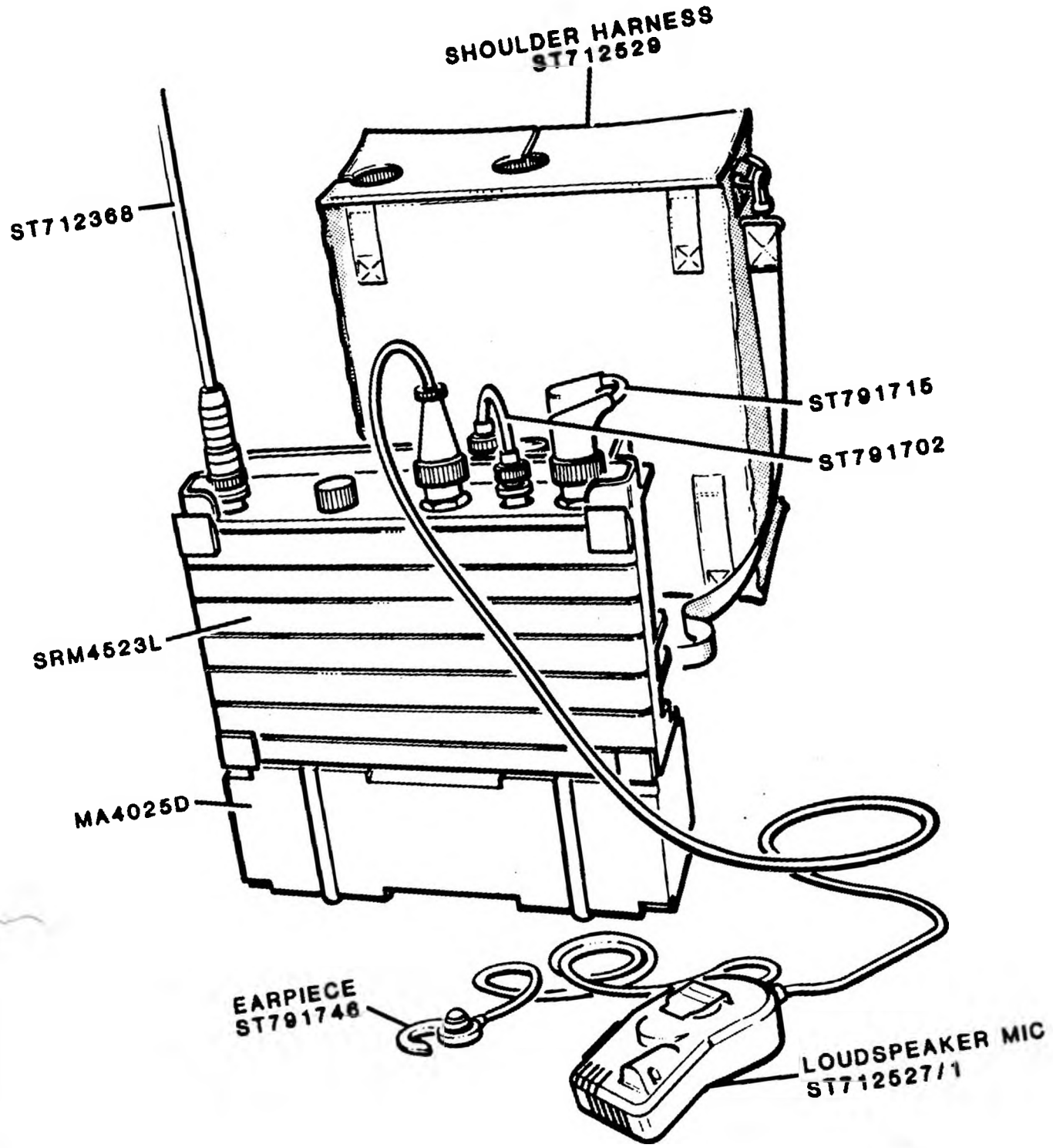


Fig 2 Manpack

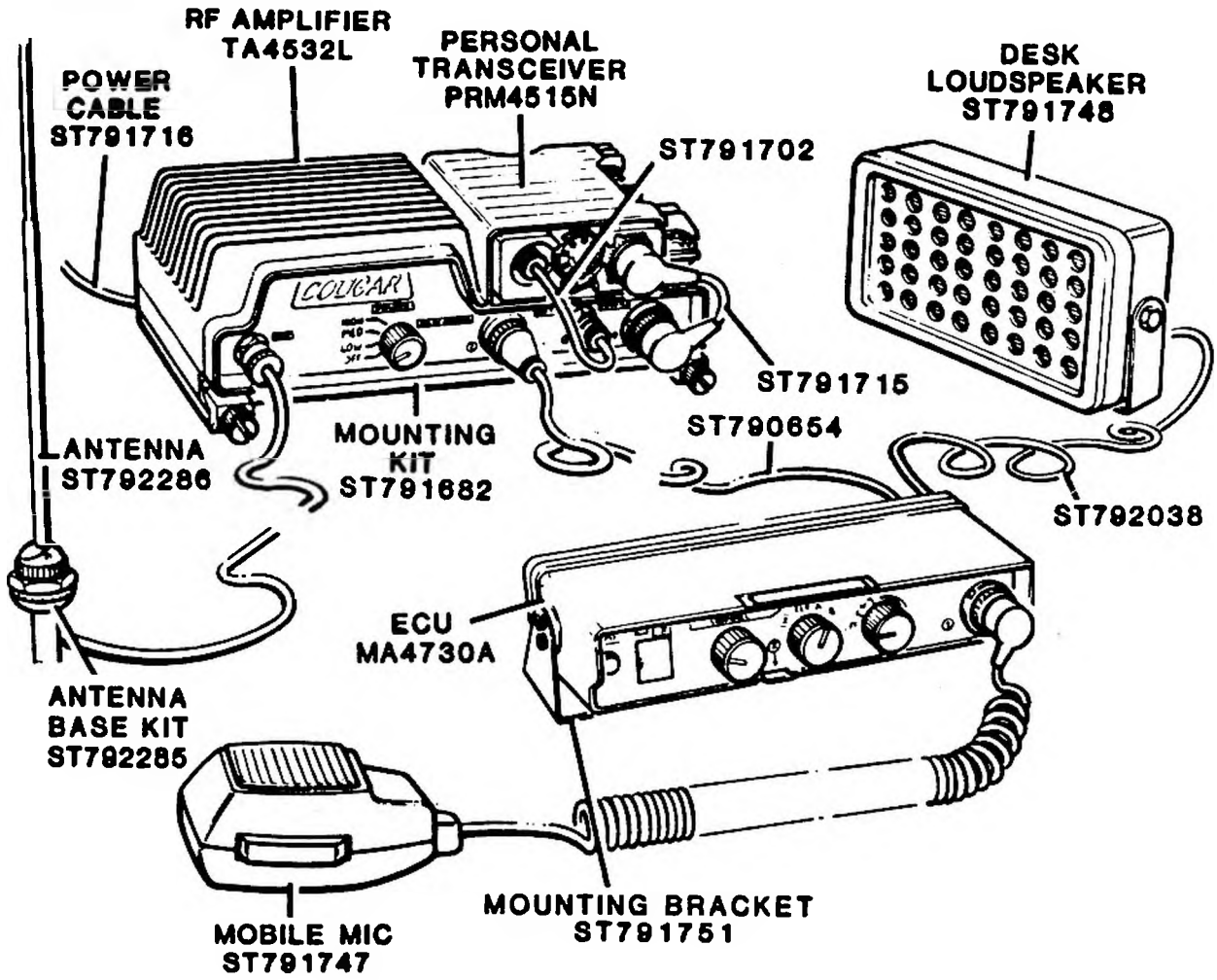


Fig 3 Vehicle station

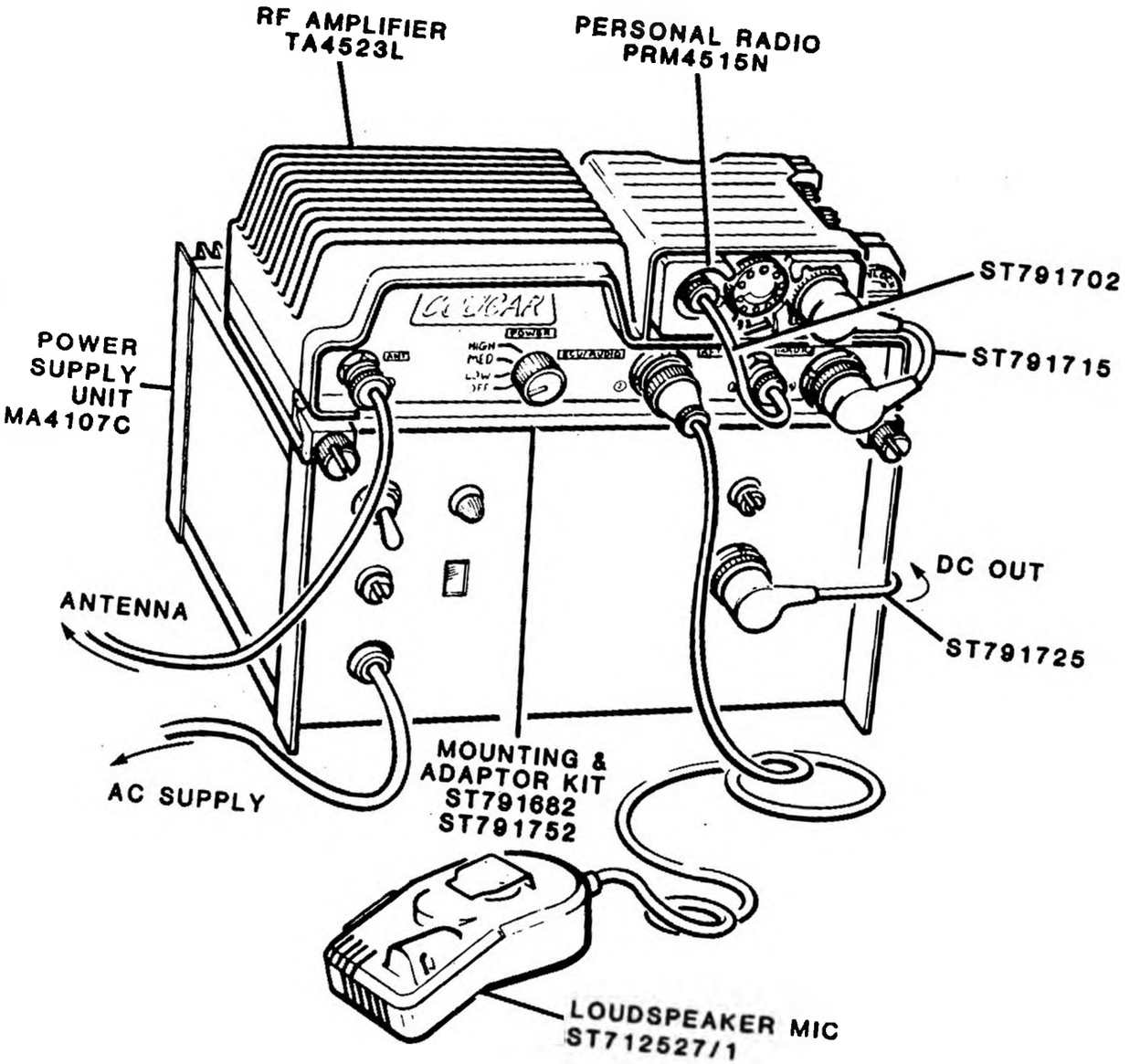


Fig 4 Type 1 base station

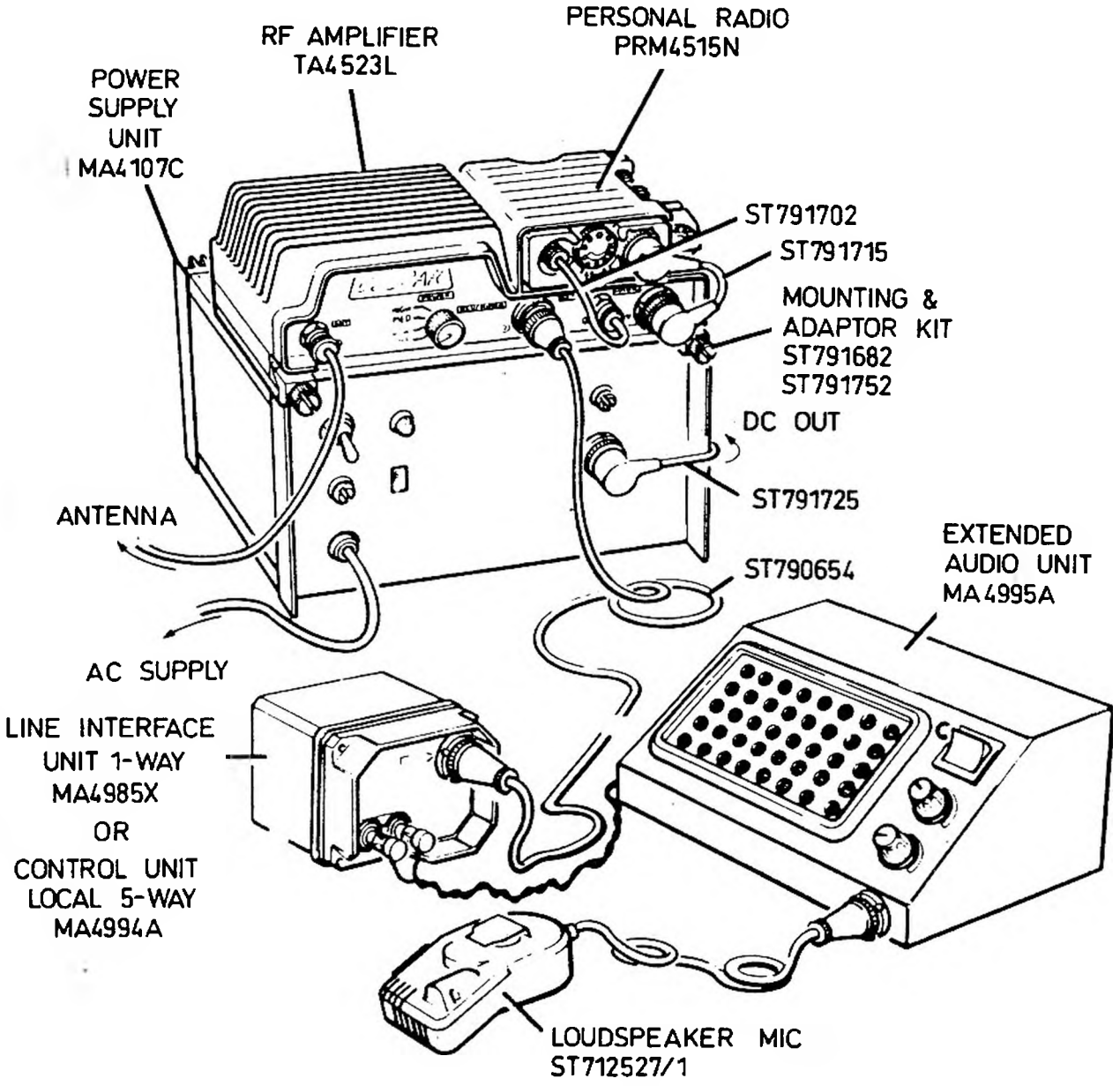


Fig 5 Type 2 base station

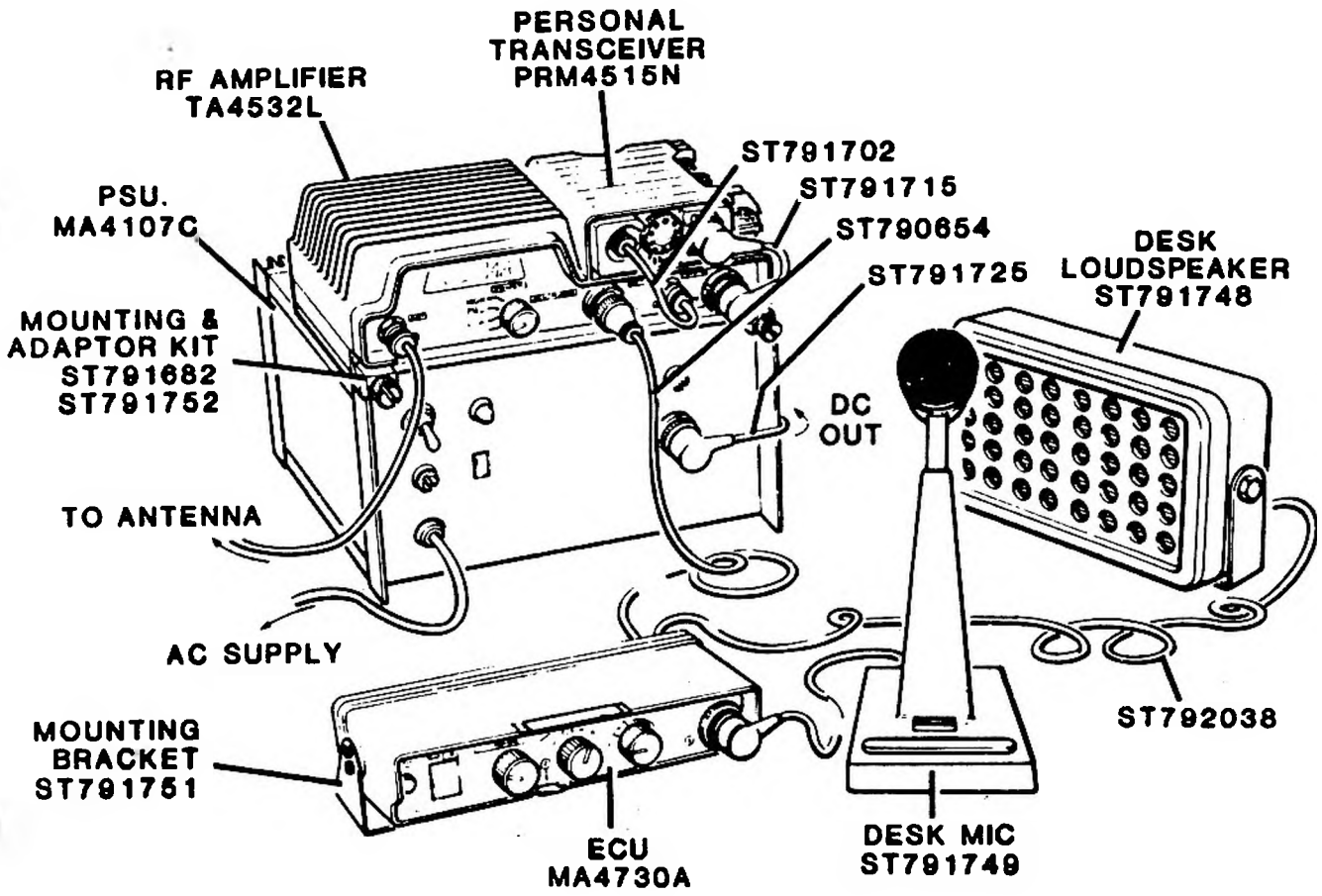


Fig 6 Type 3 base station

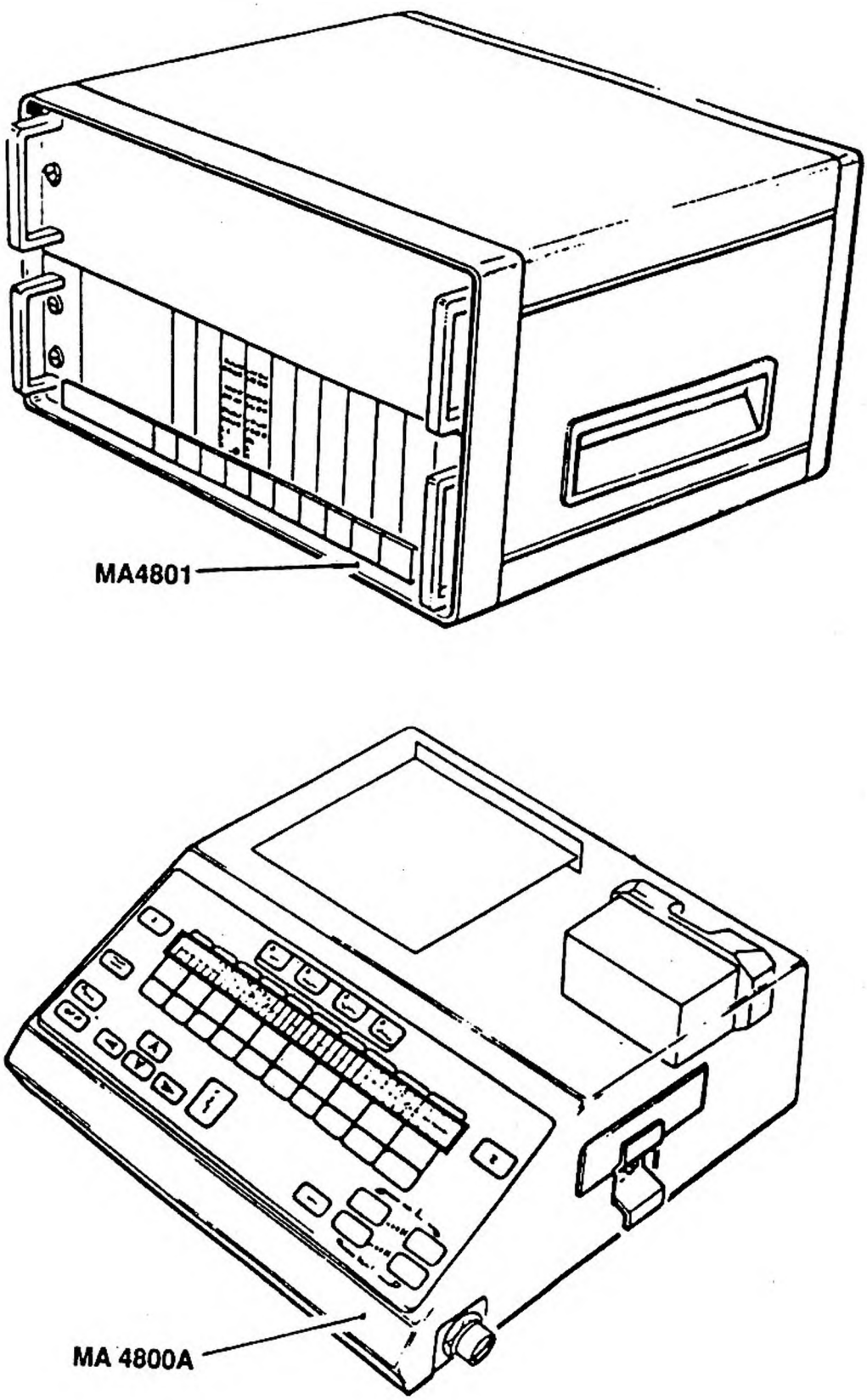


Fig 7 Type 4 base station

CHAPTER 2

EQUIPMENT TECHNICAL DETAILS

CONTENTS

Para

1 Introduction
2 Transceiver PRM 4515 N2 CAW
3 Amplifier TA4523L
4 Manpack
6 Extended control unit MA 4730A
7 Extended audio unit MA 4995A
10 Local control unit MA 4985X
11 5-way local control unit MA 4994A
12 Station item list
13 Base station (remote control) MA 4801
14 Extended local control panel MA 4800A
15 Frequency programmer MA 4073C
16 Fill gun MA 4083C
18 Battery charger MA 4517A
19 Battery charger MA 4518A
20 Battery charger MA 4529A
21 Battery conditioner (tester) MA 4519A
22 Battery 6140-99-253-6548/Racal No MA 4516AS
24 Battery MA 4025D

Table Page

1 Station item list 9
2 Type 4 base station parts list 10
3 Cougar parts list 20

INTRODUCTION

1 This chapter provides technical details of individual equipments used to make up the portable, mobile and base stations. Table 3 lists the Cougar parts, cross referenced to Racal part/drawing numbers.

TRANSCEIVER PRM 4515 N2 CAW

2 The type number shown defines the version of Cougar used by RN/RM/MDP. It is abbreviated to PRM 4515N for convenience in the text. The transceiver operates in the frequency range 68 MHz to 88 MHz. Frequency selection can be made in 12.5 kHz increments but a 25 kHz bandwidth is required for 16 K bit/sec digitised speech transmission and the receiver is open to a 25 kHz bandwidth regardless of mode. Ten discrete channels may be programmed into the transceiver.

2.1 Frequency control. Control is achieved by a crystal oscillator based frequency synthesiser which gives a frequency stability of better than plus or minus 10 parts per million.

2.2 Operating modes. The PRM 4515N operates in the F3E narrow-band FM mode (clear speech), and F1E FM 16 K bit/sec data mode (secure speech).

2.3 Associated aerials. The transceiver is operated using a 50 ohm, helical, whip antenna.

2.4 Power output. Transmitter RF output power is 2 W.

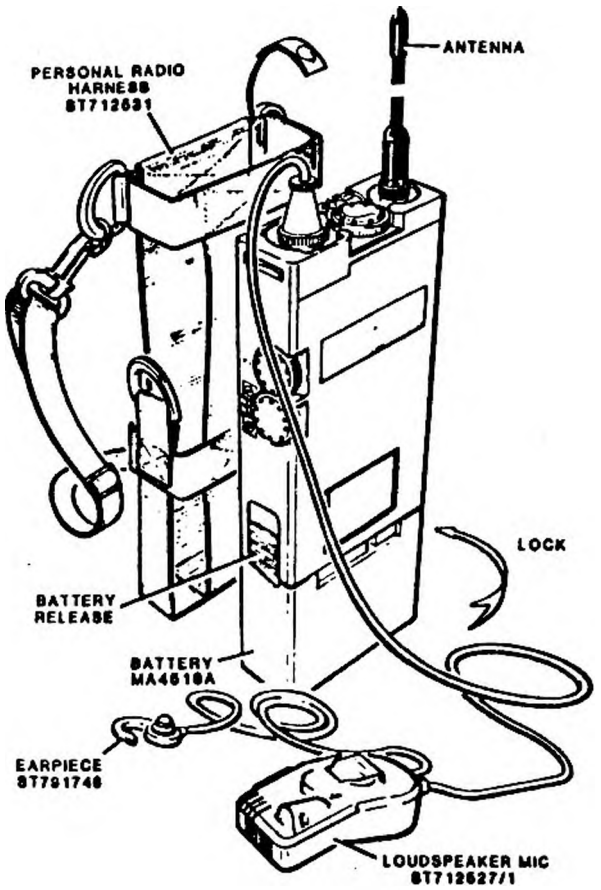
2.5 Power supply. The transceiver power supply comprises a 500 mAh 10 V rechargeable battery pack (MA 4516A), which will supply the set for approximately 8 hours in a 1:9:10 send/receive/standby ratio at 20°C.

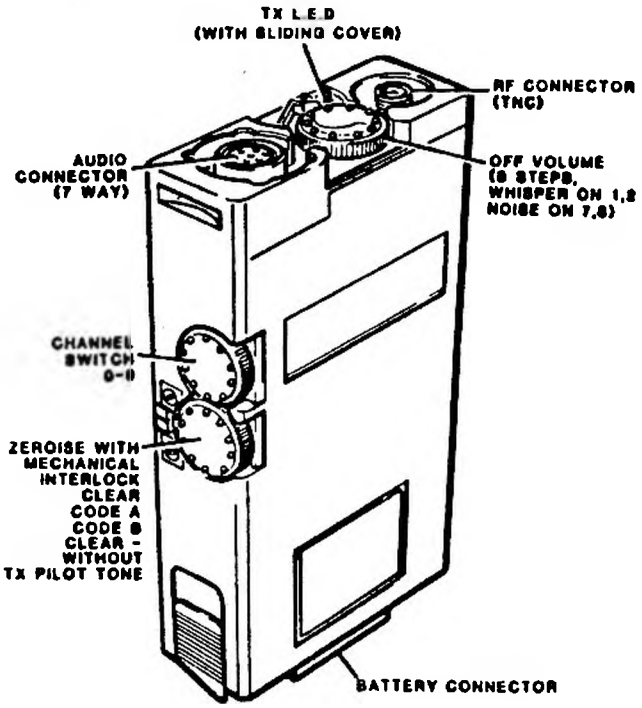
2.6 Approximate range. Communications range using the PRM 4515N is dependent on both the type of antenna used and the terrain in which the equipment is sited. Approximate range is 2.5 km portable to portable.

2.7 Accessories. The PRM 4515N is normally provided with a handheld loudspeaker/microphone.

2.8 Parts. Parts comprising the basic PRM 4515N portable communications set are listed in the following table.

Racal Part No	Description	Qty
PRM 4515N	VHF Transceiver, 2 Watt	1
MA 4516A	Ni Cd Battery, 10 V	2
ST 712532	Helical Antenna	1
ST 712527/1	Loudspeaker/Microphone	1
ST 712531	Personal Radio Harness	1
ST 791746	Earpiece	1
	Operators Card	1





DIMENSIONS and WEIGHT: (Inc Battery)	Height	Width	Depth	Weight
	213 mm (8.38 in)	75 mm (2.95 in)	30 mm (1.18 in)	0.8 kg (1.76 lb)

Transceiver PRM 4515N

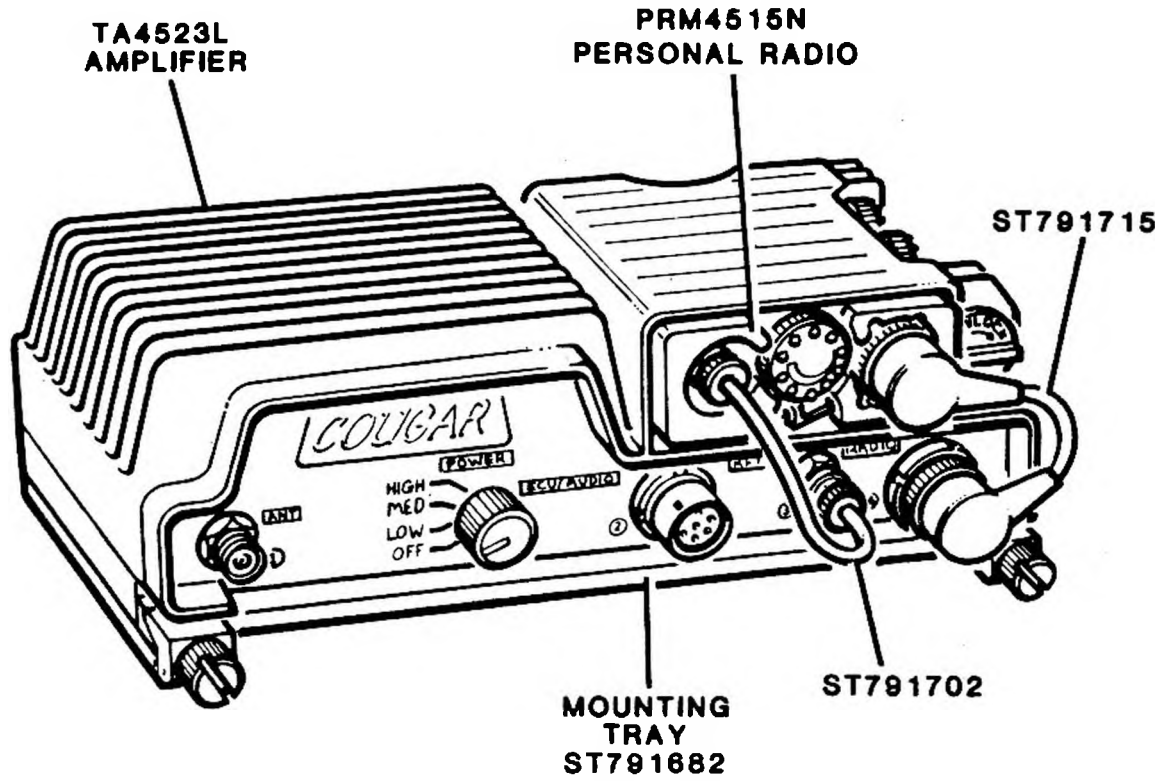
AMPLIFIER TA 4523L

3 This is the 20 W RF amplifier used in the Manpack, Vehicle Station and Base Stations. The portable radio slots into the amplifier unit to produce a 20 W transceiver (SRM 4523N); the amplifier cannot be used alone. The radio is secured in the amplifier unit with a single clamp and connected by two short cables.

3.1 Frequency range. The frequency range and bandwidth etc are those of the basic radio. Transmitter RF output power is switchable in three steps; Low (2 W), Med (10 W) and High (20 W).

3.2 Power supply. The TA 4523L requires a 12 V dc supply at 5.6 A max. Depending on the application this may be provided by a fitted battery (MA 4025D), a vehicle battery or a mains supply unit.

3.3 Communications range. The range using the SRM 4523N is dependent on both the type of antenna used and the terrain in which the equipment is sited. A portable will normally receive a manpack at ranges up to 10 km and a base station using a simple mast mounted antenna at up to 20 km (Replies from the portable may not be heard at these ranges because of its weaker transmissions).



DIMENSIONS AND WEIGHT:	Height	Width	Depth	Weight
(Inc Battery)	75 mm	230 mm	240 mm	5.2 kg
	(2.95 in)	(9.05 in)	(9.44in)	(11.46 lb)

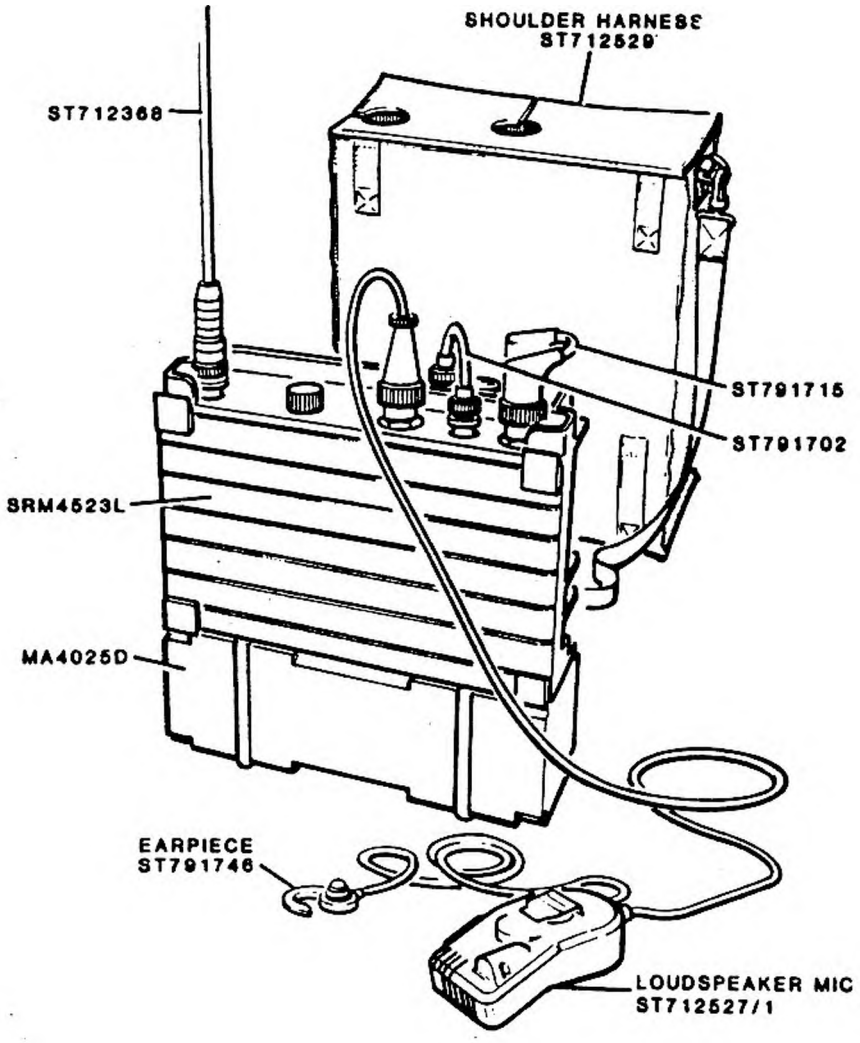
SRM 4523N

MANPACK

4 The technical details of the radio transceiver and amplifier, are as given in Paragraphs 2 and 3. Endurance from a fully charged battery is 8 hours for a transmit/receive/standby ratio of 1:9:10 at 20°C.

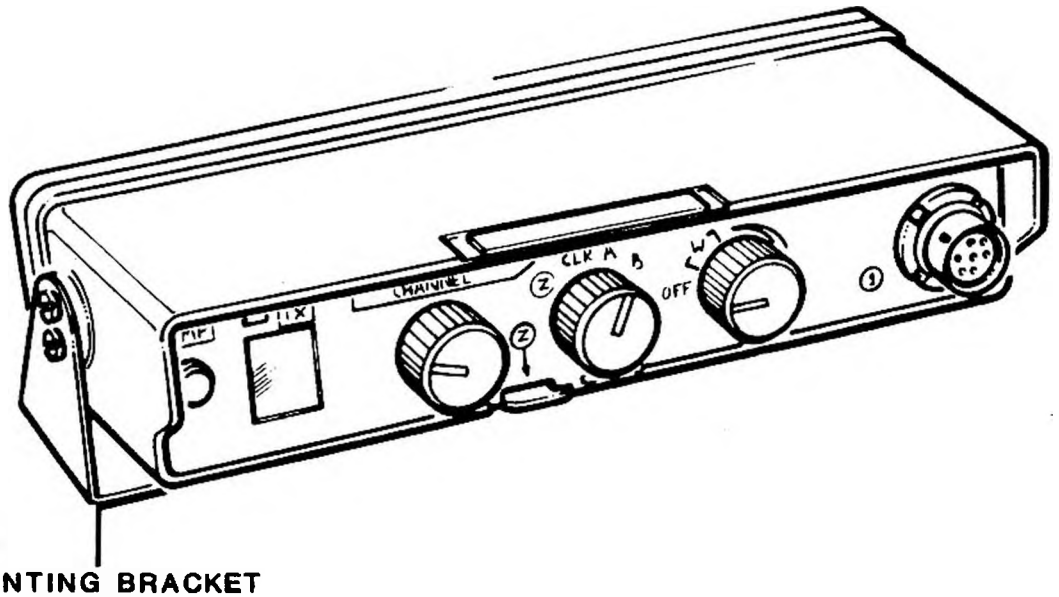
5 Parts comprising the Manpack are listed in the following table.

Racal Part No	Description	Qty
SRM 4523N	Portable Communications Set	1
ST 712368	Whip Antenna	1
ST 712529	Shoulder Harness	1
ST 791715	Cable DC/AF (4523 to 4515)	1
ST 791702	Cable RF (4523 to 4515)	1
ST 791746	Earpiece	1
ST 712527/1	Loudspeaker/Microphone	1
MA 4025D	Ni Cad Battery 12 V 4 Ah	2
	Operators Card	1



EXTENDED CONTROL UNIT MA 4730A

6 The Extended Control Unit MA 4730A (ECU) is used with the SRM 4523N communication set. It enables the functions of the PRm 4515N secure personal ratio to be controlled from a distance of up to 30 m over a multicore cable. The ECU overrides all local controls of the SRM 4523N radio/amplifier assembly. The ECU receives its power from the SRM 4523N via the multicore cable.



MOUNTING BRACKET ST791751

DIMENSIONS and WEIGHT: Height - 50 mm (1.96 in)
Width - 190 mm (7.48 in)
Depth - 105 mm (4.13 in)
Weight - 0.8 kg (1.76 lb)

Extended control unit MA 4730A

EXTENDED AUDIO UNIT MA 4995A

7 The Extended Audio Unit (EAU) enables remote operation and monitoring (but not control) of a Cougar SMT base station. It has an integral speaker with amplifier and a connector for microphone (or loudspeak/microphone) with pressel. There are independent volume controls for the internal loudspeaker and the external connection.

8 The unit may be connected to the radio either by a 7-way cable to a maximum length of 200 m or using an MA 4985X Local Control Unit by a telephone pair with a loop resistance not exceeding 400 ohms, typically 3 km max.

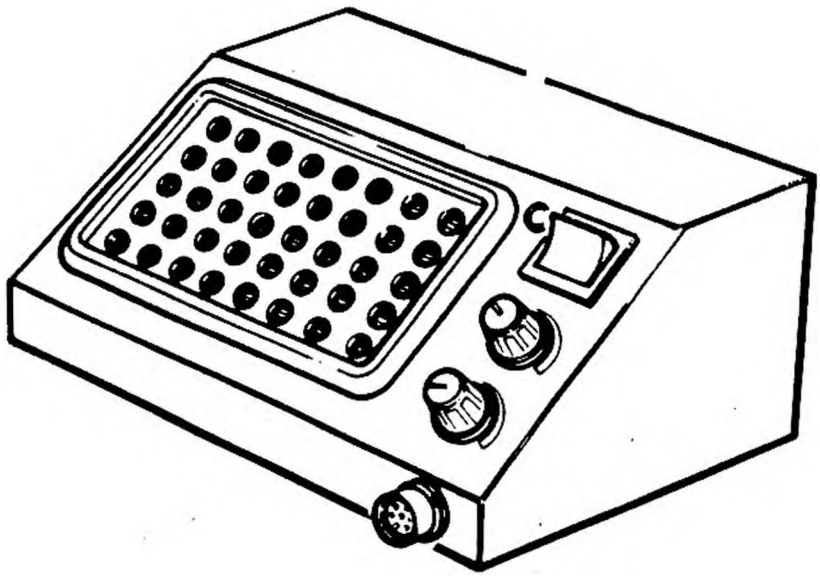
9 The EAU requires an ac mains supply of either 240 V/115 V nominal (internal fuse 250 mA anti surge), or a 12 V dc supply (internal fuse 1 A quick acting).

LOCAL CONTROL UNIT MA 4985X

10 This unit is designed to interface the Audio and PTT functions of a Cougar SMT base station to a telephone pair for connection to a remote unit (see Para 8 above). It is connected to the SMT by a 7-way cable and receives its power from this connection.

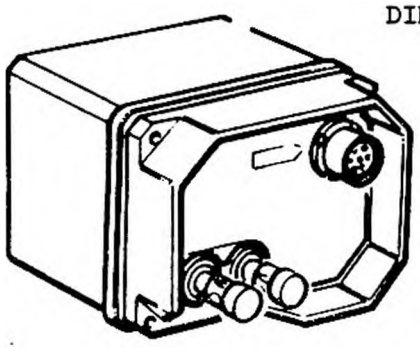
5-WAY LOCAL CONTROL UNIT MA 4994A

11 This unit is essentially similar to the MS 4985X described above but provides connections for up to five remote units in parallel.



DIMENSIONS and WEIGHT: Height - 121 mm (4.76 in)
Width - 208 mm (8.18)
Depth - 214 mm (8.42 in)
Weight - 2.7 kg (5.95 lb)

Extended audio unit MA 4995A



DIMENSIONS and WEIGHT: Height - 75 mm (2.95 in)
Width - 85 mm (3.34)
Depth - 75 mm (2.95 in)
Weight - 0.65 kg (1.43 lb)

Local control unit MA 4985X

STATION ITEM LIST

12 The unit make up of stations other than the portable or manpack stations are given in Table 1.

TABLE 1 STATION ITEM LIST

UNITS	STATION TYPE			VEHICLE
	1	2	3	
LCU		1		
T/R	1	1	1	1
SMT	1	1	1	1
MIC			1	
L/S			1	1
Cab 1			1	1
EAU		1		
PSU	1	1	1	
ECU			1	1
Mtg 1	1	1	1	1
AK	1	1	1	
Mtg2			1	1
Cal	1	1	1	1
Ca2	1	1	1	1
Ca3	1	1	1	
Ca4		1	1	1
Ca5				1
S/M	1	1		
MMic				1
VAnt				1

NOTE

Table 1 Units given short title, refer to Table 3 for full title.

BASE STATION (REMOTE CONTROL) MA 4801

13 The MA 4801 together with one or more Extended Local Control Panels (ELCP) and audio accessories provides a base station with remote control facilities over 4-wire telephone lines; this is known as a Type 4 Base Station. Parts comprising the Type 4 Base Station with one, two or three Controllers, are listed in Table 2.

13.1 The MA 4801 comprises a Radio Tray Assembly and a Network Radio Control Unit housed in a Cabinet Assembly with a Connector Panel Assembly carrying the interconnections.

13.2 The Radio Tray Assembly is essentially just a sliding tray or drawer carrying an SRM 4523L, fitted in the upper half of the Cabinet Assembly.

13.3 The network Radio Control Unit occupies the lower half of the Cabinet Assembly and consists of a number of PECs in slot-in housings connected by edge connectors to a mother board, together with a power supply assembly. The PECs perform the functions necessary to code/decode serial control data, manage parallel controllers and interface to control lines.

EXTENDED LOCAL CONTROL PANEL MA 4800A

14 The Extended Local Control Panel (ELCP) is the remote controller used with the MA 4801 base station. It is a desk top unit with a touch keypad front panel. From it the user can control and monitor all functions of the radio. It requires an ac mains supply.

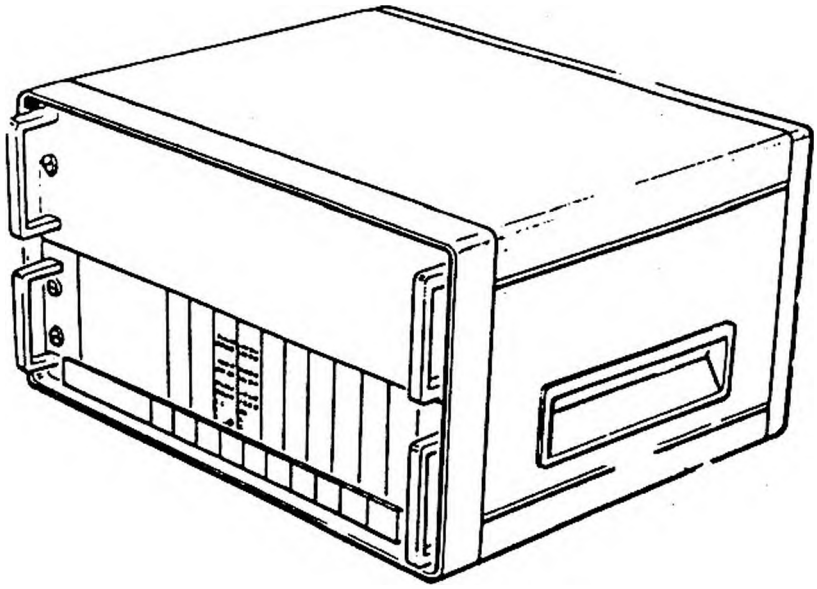
TABLE 2 TYPE 4 BASE STATION PARTS LIST

ITEM	PART NUMBER	DESCRIPTION	CONTROLLER(S) ONE Qty	TWO Qty	THREE Qty
1	MA 4800A	ELCP (c/w 4-wire line interface)	1	2	3
2	MA 4801A)		1	-	-
	MA 4801B)	Base Station, comprising items 3 to 6	-	1	-
	MA 4801C)		-	-	1
3	ST 792424/001	. Radio Tray Assembly comprising:	1	1	1
	ST 792426	. . Radio Tray	1	1	1
	TA 4523L	. . Amplifier Unit	1	1	1
	PRM 4515 N2 CAW	. . Personal Tx/Rx	1	1	1
	ST 791682	. . Mounting Kit	1	1	1
	ST 791715A	. . Cable DC/AF	1	1	1
	ST 791702-0015	. . Cable RF	1	1	1

(continued)

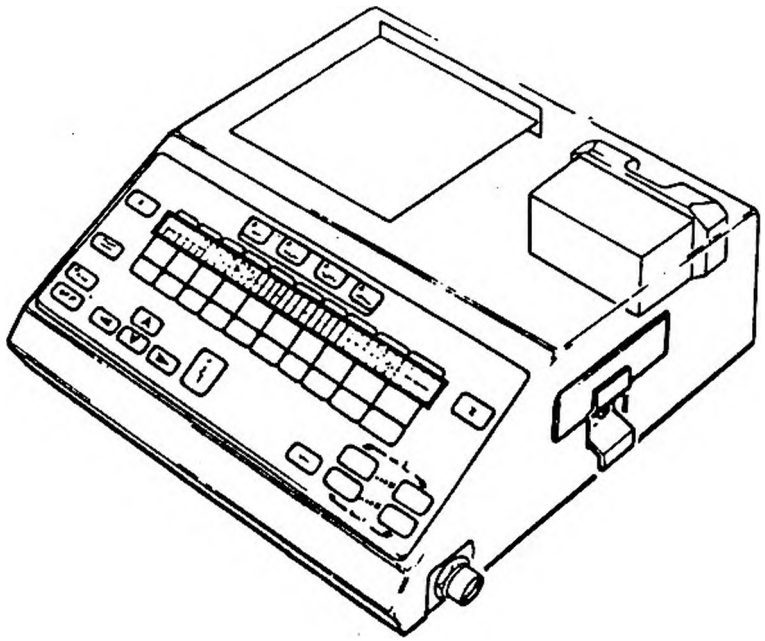
TABLE 2 TYPE 4 BASE STATION PARTS LIST (continued)

ITEM	PART NUMBER	DESCRIPTION	CONTROLLER(S) ONE Qty	TWO Qty	THREE Qty
4	ST 792425/001)		1	-	-
	ST 792425/002)	.Network Radio Control Unit comprising:	-	1	-
	ST 792425/003)		-	-	1
	ST 792427	. .Card Nest Assembly	1	1	1
	ST 792430	. .Radio Interface Board Assembly	1	1	1
	ST 792433	. .Station Control Board Assembly	1	1	1
	ST 792434	. .4-wire Interface Board Assembly	1	2	3
	ST 792429	. .Power Supply Assembly	1	1	1
	ST 792431	. .Central Control Board Assembly	-	1	1
5	ST 792428	.Cabinet Assembly	1	1	1
6	ST 792595	.Connector Panel Assembly	1	1	1
7	ST 791749	Desk Microphone	1	2	3
8	ST 791748	Desk Loudspeaker	1	2	3
9	ST 792038 -0100 OD	Cable AC	1	2	3



DIMENSIONS and WEIGHT: Height - 298 mm (11.73 in)
Width - 514 mm (20.23)
Depth - 440 mm (17.32 in)
Weight - 31 kg (68.34 lb)

Base station MA 4801



DIMENSIONS and WEIGHT: Height - 105 mm (4.13 in)
Width - 268 mm (10.55)
Depth - 325 mm (12.80 in)
Weight - 5.3 kg (11.68 lb)

Extended local control panel MA 4800A

FREQUENCY PROGRAMMER, MA 4073C

15 The Frequency Programmer is used to prepare channel frequencies for the PRM 4515N personal radio set. It can also set up keys for a Racal commercial crypto system; this is not used in RN/RM/MDP applications. Although the programmer can store 30 channels only 10 are required for Cougar.

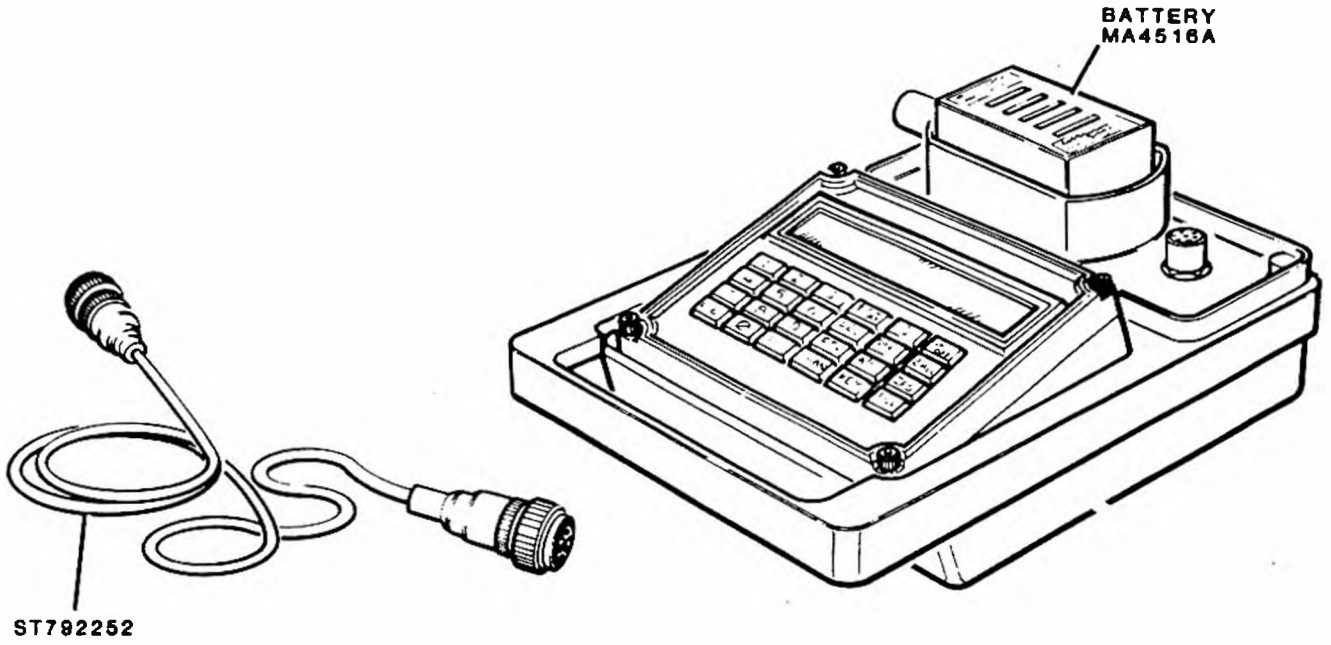
15.1 The programmer power supply is provided by the rechargeable 10 V, 0.5 Ah battery MA 4516A (as used in the portable station). If the unit is left unattended for more than 30 seconds, it will automatically switch itself off. The programmed data is stored in non-volatile memory and is not lost even if the unit is switched off or the battery removed.

15.2 The data can be loaded either directly to the radio or to a Fill Gun (MA 4083C), using interconnecting cable ST 792252.

FILL GUN MA 4083C

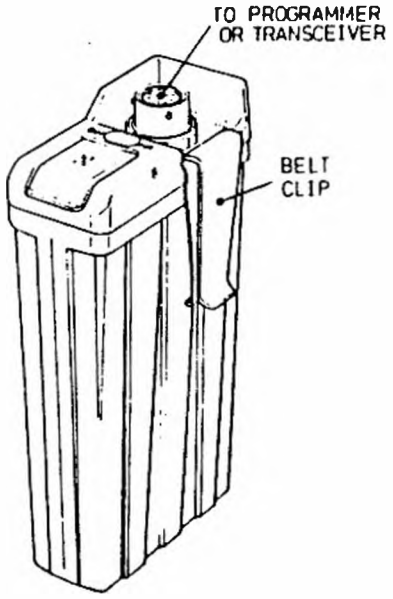
16 The Fill Gun MS 4083C is used to store a channel plan (frequency data) from an MA 4073C Frequency Programmer, or another Fill Gun. The data is then available to be transferred to a PRM 4515N personal radio transceiver.

17 The Fill Gun is fitted with an internal lithium battery used to maintain the stored data held in the volatile RAM. The battery has a normal life span of five years.



DIMENSIONS: (Exc Battery)	Height - 100 mm (3.93 in) Width - 180 mm (7.08 in) Depth - 243 mm (9.56 in)
WEIGHT (Inc Battery):	3.2 kg (7.05 lb)

Frequency programmer MA 4073C



DIMENSIONS and WEIGHT:	Height - 140 mm (5.51 in) Width - 75 mm (2.95 in) Depth - 35 mm (1.37 in) Weight - 0.4 kg (0.88 lb)

Fill gun MA 4083C

BATTERY CHARGER MA 4517A

18 This is a single way battery charger for the portable radio batteries type MA 4516A. Charge time is approximately 3 hours for a fully discharged battery. Batteries are charged at either High Rate (230 mA) or Trickle Rate (50 mA). The batteries are fitted with thermistor protection circuits which ensure that High Rate charging can only occur when the battery is within 10°C of the charger temperature (charger temperature is defined as +5°C to 40°C). Thus Hot or Cold batteries will only receive a trickle charge. After a full charge the charger will continue charging the battery at the trickle rate.

18.1 The charger is factory preset to either 230 V or 115 V nominal ac mains supply. At 230 V the current drain is approximately 60 mA.

18.2 The battery charger is equipped with three LED indicators as follows:

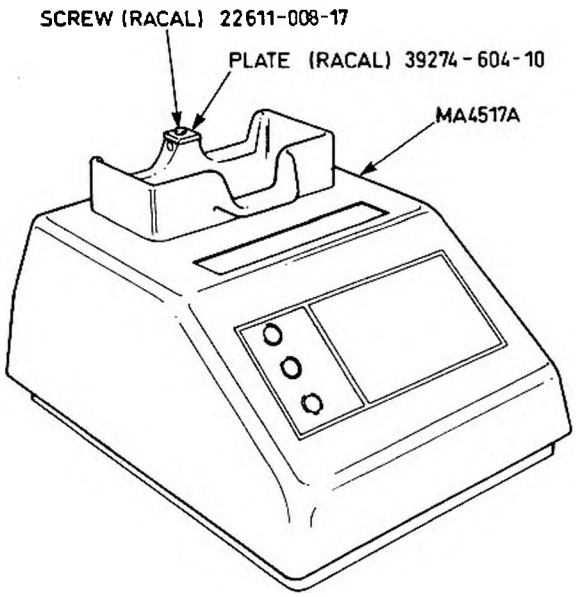
(1) A red LED; when illuminated indicates that the battery is being charged at the High Rate.

(2) A green LED; when illuminated indicates that the battery is ready for use and being trickle charged.

(3) An amber LED; when illuminated indicates that the battery to be charged is outside the charger temperature limit.

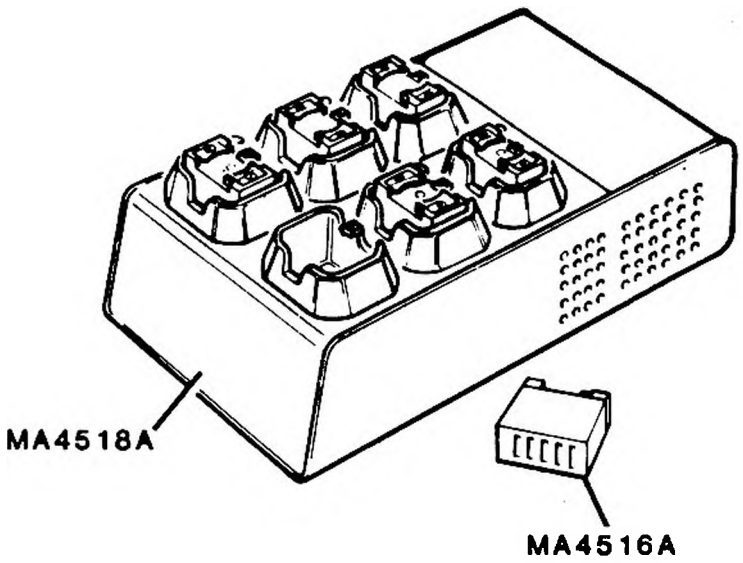
BATTERY CHARGER MA 4518A

19 This is essentially a six way version of the MA 4517A described above. Total current drain from a 230 V supply is approximately 220 mA. Characteristics and indicators are otherwise identical.



DIMENSIONS and WEIGHT: (Exc Battery)
Height - 140 mm (5.51 in)
Width - 120 mm (4.72 in)
Depth - 186 mm (7.32 in)
Weight - 1.7 kg (3.74 lb)

Battery charger MA 4517A



DIMENSIONS and WEIGHT: (Exc Batteries)
Height - 150 mm (5.90 in)
Width - 233 mm (9.17)
Depth - 406 mm (15.98 in)
Weight - 6 kg (13.23 lb)

Battery charger MA 4518A

BATTERY CHARGER MA 4529A

20 This is a five way battery charger of batteries MA 4025D used with the manpack radio. Charge time is approximately 3 hours for a fully discharged battery. Batteries are charged at either High Rate (1.8 A) or Trickle Rate (400 mA). The batteries are fitted with thermistor protection circuits which ensure that High Rate charging can only occur when the battery is within 10°C of the charger temperature. The charger will only provide High rate charging over the range +5°C to +40°C. Thus Hot or Cold batteries will only receive a trickle charge. After a full charge the charger will continue charging the battery at the trickle rate.

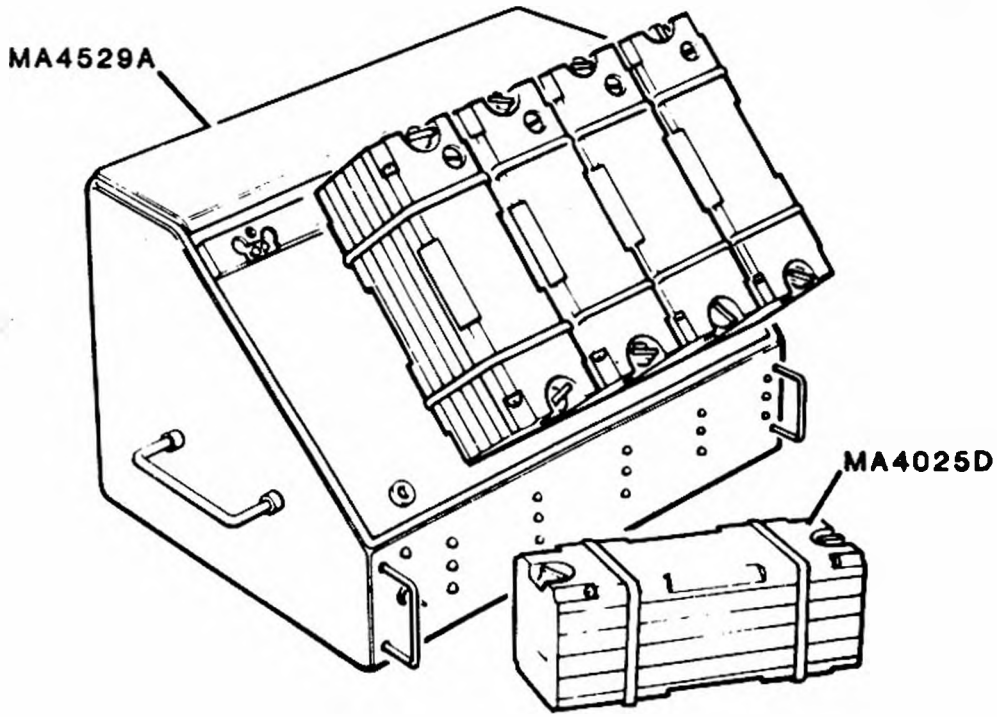
20.1 The charger is factory preset to either 230 V or 115 V nominal ac mains supply. A red LED provides Mains On indication. At 230 V the current drain is approximately 1 A.

20.2 The battery charger is equipped with three LED indicators at each battery station as follows:

(1) A red LED; when illuminated indicates that the battery is being charged at the High Rate.

(2) A green LED; when illuminated indicates that the battery is ready for use and being trickle charged.

(3) An amber LED; when illuminated indicates that the battery to be charged is outside the charger temperature limit.



DIMENSIONS and WEIGHT (Exc Batteries):
Height - 255 mm (10.04)
Width - 530 mm (20.86)
Depth - 405 mm (15.95 in)
Weight - 12.55 kg (27.67 lb)

Battery charger MA 4529A

BATTERY CONDITIONER (TESTER) MA 4519A

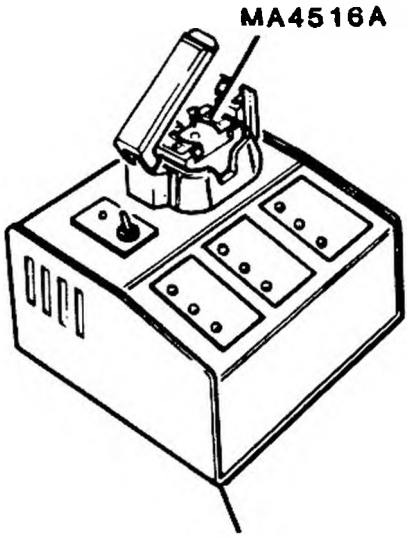
21 This unit is designed to perform a charge/discharge cycle on the portable radio battery MA 4516A and to give an indication of the serviceability of the battery. The battery is then fully recharged to complete the conditioning cycle. If the condition is indicated as PASS the battery is ready for use when the CHARGED indicator shows. If the condition is indicated as only FAIR or REJECT the cycle will be replaced twice more if the battery is left in position. If a PASS indication is not obtained at the end of this the battery should be replaced.

21.1 LED indicators identify the progress of the cycles. One set of indicators show whether it is on cycle 1, 2 or 3. Another set show CHARGED (ie charge/discharge/recharge complete), CHARGING (this will show at the start as well as the end of the full cycle) and DISCHARGING. A third set indicates the battery condition at the end of a discharge cycle as PASS, FAIR (50-75% of design capacity) or REJECT.

21.2 Each charge or discharge element of a cycle requires three hours. The complete programme of initial charge followed by three cycles of discharge/charge will therefore take twenty-one hours.

21.3 The thermistor protection arrangement operates as for the battery chargers described in Paras 18 and 20.

21.4 The unit is factory preset to either 230 V or 115 V nominal ac mains supply. At 230 V the current drain is approximately 60 mA.



DIMENSIONS and WEIGHT: (Exc Batteries)
Height - 200 mm (7.87 in)
Width - 196 mm (7.71 in)
Depth - 128 mm (5.03 in)
Weight - 2.2 kg (4.85 lb)

Battery conditioner (tester) MA 4519A

BATTERY 6140-99-253-6548 (RACAL PART NO: MA 4516A)

22 This battery is used on the portable radio PRM 4515N and also the frequency programmer MA 4073C. Output is 10 V nominal and the rated capacity is 500 mAh at 20°C. It will operate over the range -20°C (at 50% capacity) to +55°C (at 80% capacity). Storage temperatures are -40 to -55°C. It is predicted that after 500 charge/discharge cycles the capacity is likely to fall below 70% of the initial specification.

23 The battery is fitted with a thermistor protection circuit to ensure that fast charging can only occur when the battery temperature is within safe limits. The discharge current is limited to a safe value in case of short circuit.

DIMENSIONS:

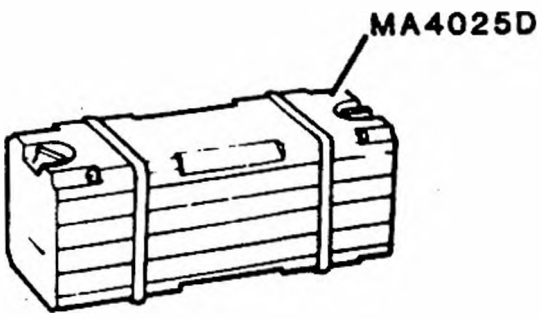
75 mm x 68 mm x 30 mm
(2.95 in) x (2.67 in) x (1.18 in)

Weight: 0.26 kg (0.57 lb)

BATTERY MA 4025D

24 This battery is used on the manpack radio. Output is 12 V nominal and the rated capacity is 4 Ah at 20°C. It will operate over the range -20°C (at 50% capacity) to +55°C (at 80% capacity). Storage temperatures are -40 to +55°C. It is predicted that after 300 charge/discharge cycles the capacity is likely to fall below 70% of the initial specification.

25 The battery is fitted with a thermistor protection circuit to ensure that fast charging can only occur when the battery temperature is within safe limits. A fuse is fitted to provide protection against excessive current drain.



DIMENSIONS:

230 mm x 85 mm x 75 mm
(9.05 in) x (3.34 in) x (2.95 in)

Weight: 2.45 kg (5.4 lb)

TABLE 3 COUGAR PARTS LIST

SHORT TITLE	DESCRIPTION	RACAL PART NO
PSU	AC Power Supply Unit	MA 4107C
AK	Adaptor Kit (for 4523/PSU)	ST 791752
SMT	Amplifier Applique Unit 20 W	TA 4523L
Ant2	Antenna for manpack	ST 712368
Ant1	Antenna for PRM4515	ST 712532
Bat2	Battery (for manpack)	MA 4025D
Bat1	Battery (for personal)	MA 4516A (NSN 6140-99-253-6548)
Cond	Battery Conditioner	MA 4519A
Cab	Cabinet Assy	ST 792428
Cab1	Cable AF (for L/S)	ST 792038-0100-DO
Ca4	Cable Control	ST 790654
Ca3	Cable DC (for 4523/PSU)	ST 791725
Ca5	Cable DC Supply (SMT/Vehicle Battery)	ST 791716
Ca2	Cable DC/AF (SMT Radio)	ST 791715A
Ca1	Cable RF (for 4523/4515)	ST 791702A
CNA	Card Nest Assembly	ST 792427
CCB	Central Control Board (up to 3 ELCP)	ST 792431
Ch1	Charger (1 way, for personals)	MA 4517A
Ch3	Charger (5 way, for manpacks)	MA 4529A
Ch2	Charger (6 way, for personals)	MA 4518A
CPA	Connector Panel Assy	ST 792595
L/S	Desk and Vehicle Loudspeaker	ST 791748
Mic	Desk Microphone	ST 791749
EAU	Extended Audio Unit	MA 4995A
ECU	Extended Control Unit	MA 4730
ELCP	Extended/Local Control Panel	MA 4800A
LCU	Local Cont Unit (I/F to 2 wire line, one way)	MA 4985X
MMic	Mobile Microphone	ST 791747
Mtg1	Mounting Kit (for TA 4523L)	ST 791682
Mtg2	Mounting Kit (for 4730)	ST 791751
T/R	Personal Radio	PRM 4515 NS CAW
PSA	Power Supply Assembly	ST 792429
RIB	Radio Interface Board	ST 792430
Tray	Radio Tray	ST 792426
S/M	Speaker/Microphone	ST 712527/1
SCB	Station Control Board	ST 792433
VAnt	Veh Ant (Base ST 792285 and Whip ST 792286)	
LIM	4 Wire Line I/F Module (Sched D circuits)	ST 792434
5Way	5 Way Local Cont Unit (I/F to 2 wire line)	MA 4994A

CHAPTER 3

OPERATING INSTRUCTIONS

CONTENTS

Para

1 Introduction
4 Setting up channel frequencies for the Cougar PRM 4515N
5 Using the MA4073C Fill Gun

Operating Cards Page

Portable transceiver 3
Manpack/mobile/base stations 4
Single way charger 7
Six way charger 8
Five way charger 9
Conditioner 10
Programmer/fill gun 11

INTRODUCTION

1 An Operators Card is supplied with the initial issue of each radio station or main item of equipment. The simplicity of design and operation of the equipment are such that these cards are normally all that any user requires.

2 The cards are reproduced for ready reference in the following order:

(1) Portable Transceiver.

(2) Manpack/Mobile/Base Stations.

(3) Single Way Charger.

(4) Six Way Charger.

(5) Five Way Charger.

(6) Conditioner.

(7) Programmer/Fill Gun.

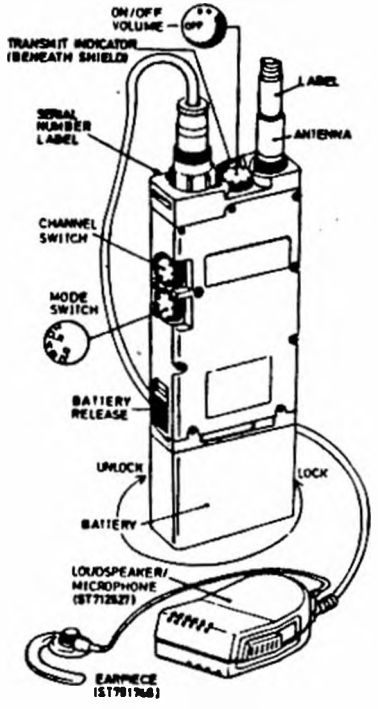
The references to use Cipher (Crypto) are generally written around the Racal commercial system. If speech encryption is introduced for RN/RM/MDP use it will be BRIGHT and specific instructions on its use will be issued at the time.

3 The fully remote controlled stations, generally referred to as Type 4, will have their own operating and diagnostic instructions but these are not available at the time of writing this book.

OPERATORS CARD
VHF LOW BAND PERSONAL TRANSCEIVER PRM4515N

COUGARNET

Communications System



Personal Transceiver

RACAL
The Electronics Group

PRELIMINARY PROCEDURE

1 Fit charged MA 4516A battery to transceiver and twist clockwise to lock.

2 If channel frequency filling is to be carried out, see Operator s Card for MA 4073C/MA 4083C.

3 If cipher code loading is to be carried out, see Operator's Card for loading cipher codes.

CAUTION:
WHEN THE BATTERY IS REMOVED, CIPHER CODES (UNLIKE CHANNEL FREQUENCIES) ARE NOT PERMANENTLY STORED IN THE TRANSCEIVER. THE CIPHER CODES ARE RETAINED HOWEVER FOR AT LEAST 15 MINUTES (TYPICALLY SEVERAL HOURS).

4 When 2 and 3 have been completed, fit the transceiver with battery into the harness and strap to body.

5 Connect the antenna (screw fixing) and loudspeaker/microphone (bayonet fixing) to the transceiver.

NB:
The antenna is identified by a label at its base, and must be correct for the channel frequencies used. (See Technical Handbook).

OPERATING INSTRUCTIONS

6 Select the required channel number (0 to 9).

7 Select the required mode:

CLR Clear, with 150 Hz tone on Tx

A Secure, Key A

B - Secure, Key B

CLO - Clear, without 150 Hz tone on Tx

NB:
In non-secure mode CLR is normally selected. The 150 Hz tone can be disabled by switching to CLO.

8 Set the Off/Volume switch, as required:

Pos'n	Symbol	Function
1	OFF	Off.
2		Whisper i/p to microphone. Audio o/p low level.
3		Whisper i/p to microphone. Audio o/p higher level.
4 to 7		Normal i/p to microphone. Audio o/p increasing levels.
8		Normal i/p to microphone. Squelch open, audio o/p reduced.
9		Normal i/p to microphone. Squelch open, audio o/p max.

9 To transmit, press the PTT switch on the loudspeaker/microphone. The transmit indicator on the radio will illuminate, but can be covered, by sliding the shield, if required.

10 An earpiece can be plugged into the bottom of the loudspeaker/microphone. This will break the circuit to the loudspeaker and will, on Tx, allow the alarm tones to be heard.

ALARM SIGNALS

11 Continuous tone; indicates failure of secure mode. Fault may be cleared by PTT input; press PTT. Could be due to absence of cipher code, therefore re-load.

12 Continuous two-tone.

(a) Transmitter has timed-out. Release PTT switch.

(b) Mode switch set to A or B when cipher module not fitted. Use clear mode.

(c) Selected channel not working. Switch Transceiver off and on, and re-try; or use another channel

13 Rapid pulses of noise heard in standby; transmit-indicator flashing when transmitting. Indicates low battery-voltage. Change battery.

BATTERY-REMOVAL

14 To remove the battery; slide-back the battery-release catch, then twist battery anticlockwise.

CIPHER-CODES ERASURE

15 To erase the cipher codes, press-in the mechanical interlock and briefly set the Mode switch to Z (zeroise). The Transceiver does not need to be switched-on, nor to have a battery fitted.

RACAL
The Electronics Group

RACAL-TACTICOM LIMITED
P.O. BOX 112
472 Basingstoke Road
READING
BERKS
RG2 0QF

Issue 1
Dec 86-3600

COUGARNET

Communications System

INSTALLATION AND OPERATOR'S CARD

TA4523 IN STATIC, MOBILE AND TRANSPORTABLE STATIONS

INTRODUCTION

1 The TA 4523 provides RF Amplification and a regulated supply for the PRM 4515 Personal Radio. The TA 4523 and PRM 4515 form an SRM 4523, which can be used as a static, mobile or transportable (SMT) station.

2 Refer to the Operator s Card of the PRM 4515 for its operation and alarm signals.

ASSEMBLY OF SRM 4523

3 Ensure that the discs on the knobs of the PRM 4515 and TA 4523 are the same colour (the colour determines the frequency band).

4 Set the locking mechanism on the front of the TA 4523 to unlock (fully clockwise).

5 With the side mounted knobs of the PRM 4515 to the right, slide the PRM 4515 into the housing of the TA 4523. Turn the locking mechanism fully anticlockwise to secure the PRM 4515 in position.

6 Connect the PRM 4515 antenna socket to the RF IN (3) socket of the TA 4523 using cable 791702 (TNC connectors).

7 Connect the PRM 4515 audio socket to the radio (4) socket of the TA 4523 using cable 791715.

SRM 4523 Controls

8 The one extra control provided by the TA 4523 other than those on the PRM 4515 is the power switch:

OFF - Power Off.

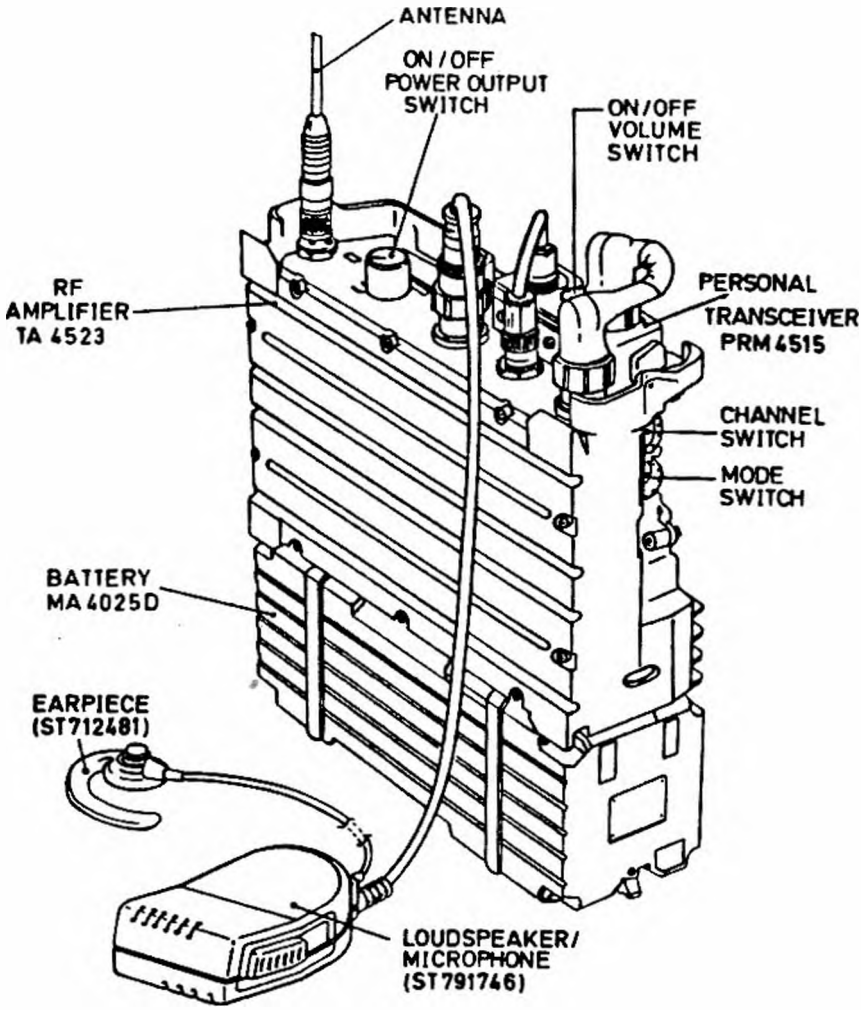
LOW 2 Watts Nominal Tx Power.

MED 10 Watts Nominal Tx Power.

HIGH - 20 Watts Nominal Tx Power

9 Set the PRM 4515 controls as shown on the Operator's Card for the PRM 4515. Set the volume control to a position other than Off.

RACAL
The Electronics Group



Transportable Station

TRANSPORTABLE STATION

10 Attach the MA 4025D battery in position on the bottom face of the SRM 4523, turning the screw-in bolts until they are finger-tight.

11 Connect the antenna to the ANT (1) socket (TNC) and loudspeaker/microphone to the ECU/AUDIO (2) socket.

NB:
The antenna is identified by a label at its base and must be correct for the channel frequencies used (see Technical Handbook).

12 An earpiece can be plugged into the bottom of the loudspeaker/microphone. This will break the circuit to the loudspeaker and will, on transmit, allow the alarm tones to be heard.

13 There are two carrying harnesses, shoulder or back worn, which have the same bag. To fit the transportable station into the bag:

(1) Loosen the securing strap around the middle of the bag.

(2) Unbutton and unfold the two flaps on the top of the bag.

(3) Slide the transportable (battery end first) into the bag, so that the PRM 4515 side switches are accessible through the cut-out in the side of the bag.

(4) Attach and button in position the two top flaps around the antenna and loudspeaker/microphone connector.

(5) Tighten the securing strap to hold the transportable station firmly in position in the bag.

MOBILE (VEHICLE) STATION

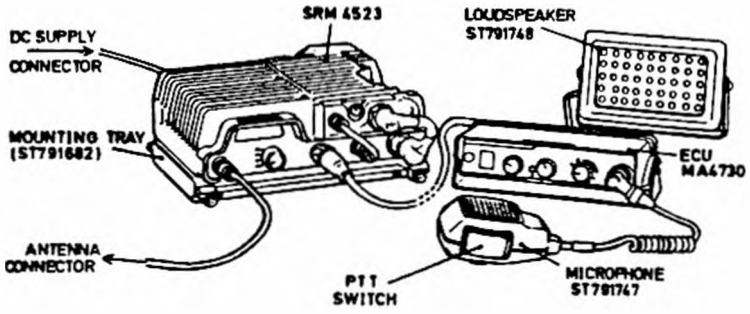
14 Secure the mounting tray (791682) for the SRM 4523 to the vehicle by the four bolts. Slide the SRM 4523 into the mounting tray and secure with the two clamps.

15 Connect the D.C. supply cable assembly (791716) to the 12 volt vehicle battery. Screw the connector assembly (contains 6.3 A fuse) of the cable to the rear panel of the SRM 4523, over the battery contacts.

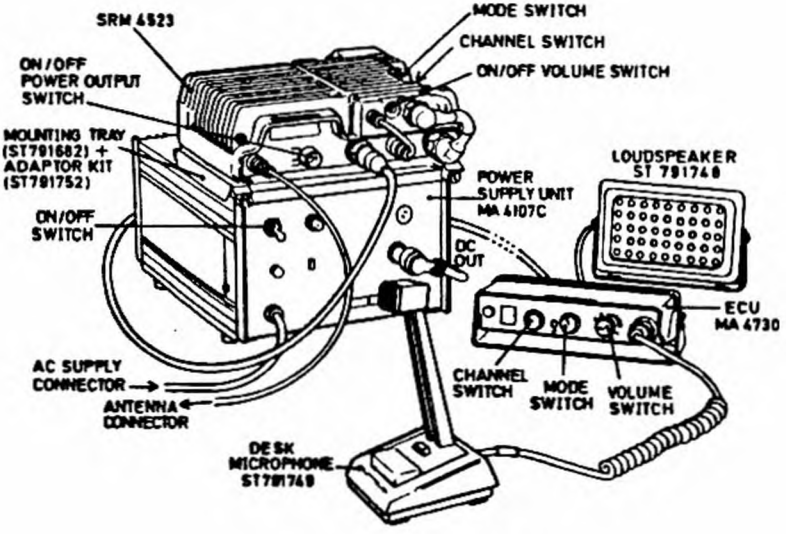
16 Connect the antenna cable to the SRM 4523 ANT (1) socket (TNC fixing). There are three options for mounting the vehicle antenna boot, panel or magnetic mount.

17 Secure the mounting bracket for the extended control unit (ECU) MA 4730 to the vehicle by the two bolts. Fit the ECU to the bracket with the four screws adjusting its position as required.

18 Connect the cable (790654) from the SRM 4523 ECU/AUDIO (2) socket to the rear ECU socket SMT (2).



Mobile (Vehicle) Station



Static (Base) Station

19 Secure the loudspeaker to the vehicle by two screws and adjust its position as required.

20 Connect the cable (792038) to the two screw terminals at the back of the loudspeaker, and to the rear ECU socket LS (3).

21 Connect the vehicle microphone to the front audio-fill (1) socket of the ECU. Secure the microphone storage bracket to the vehicle as required.

ECU CONTROLS AND DISPLAY

22 Volume control is the same as the one for the PRM 4515 - refer to Operator's Card. However the volume control will only switch the PRM 4515 ON if both the PRM 4515 and the TA 4523 are switched ON.

23 Mode control is similar to the one on the PRM 4515 - refer to Operator's Card.

NB:
The PRM 4515N has mode facility CLO. This is not obtainable on the ECU. Therefore set to CLR on ECU and change to CLO on PRM 4515N.

24 The channel number display and Tx indicator is switched ON and OFF using the push button lamp switch.

25 A seven segment display shows channel number and:

(1) Flashes to indicate equipment failure.

(2) Indicates ECU power up self test being carried out - one, two or three horizontal bars illuminating for 10 seconds indicates ECU failure.

(3) When frequencies are being filled, shows F.

STATIC (BASE) STATION

26 The mounting tray (791682) is bolted onto the top of the MA 4107C power supply with adaptor kit (791752) - note spacers between mounting tray and MA 4107C.

27 Slide the SRM 4523 into the mounting tray and secure with the two clamps.

28 Ensure that the mains select switch and supply fuse rating on the MA 4107C conforms with the A.C. mains supply.

29 Connect the D.C. supply cable (791725) to the D.C. OUT socket of the MA 4107C. Screw the connector assembly (contains 6.3 A fuse) to the rear of the SRM 4523, over the battery contacts.

30 Connect the antenna cable to the SRM 4523 ANT (1) socket. (TNC fixing).

31 If used without an ECU, connect the loudspeaker/microphone to the ECU/AUDIO (2) socket.

32 If using an ECU, connect the cable (790654) from the SRM 4523 ECO/AUDIO (2) socket to the rear ECU socket SMT (2).

33 On the ECU connect the loudspeaker by connecting the cable (792038) to the two screw terminals at the rear of the loudspeaker and to the rear ECU socket LS (3).

34 On the ECU connect the desk microphone to the AUDIO-FILL (1) socket.

35 Connect the A.C. supply connector to the mains.

LOADING FREQUENCIES AND CIPHER CODES

36 Frequencies and cipher codes can be loaded into the SRM 4523 or ECU AUDIO-FILL sockets - see Operator's Handbook/Card for the MA 4073C/MA 4083C. and the Operator's Card for Loading Cipher Codes.

CAUTION:
WHEN THE SUPPLY IS REMOVED, OR ANY OF THE SYSTEM UNITS SWITCHED OFF CIPHER CODES (UNLIKE CHANNEL FREQUENCIES) ARE NOT PERMANENTLY STORED IN THE TRANSCEIVER. THE CIPHER CODES ARE HOWEVER RETAINED FOR AT LEAST 15 MINUTES (TYPICALLY SEVERAL HOURS).

CIPHER CODE ERASURE

37 (1) TRANSPORTABLE

On the PRM 4515, press in the mechanical interlock and briefly set the Mode switch to Z. The PRM 4515 does not need to be switched on, nor to have power supplied to it.

(2) STATIC AND MOBILE

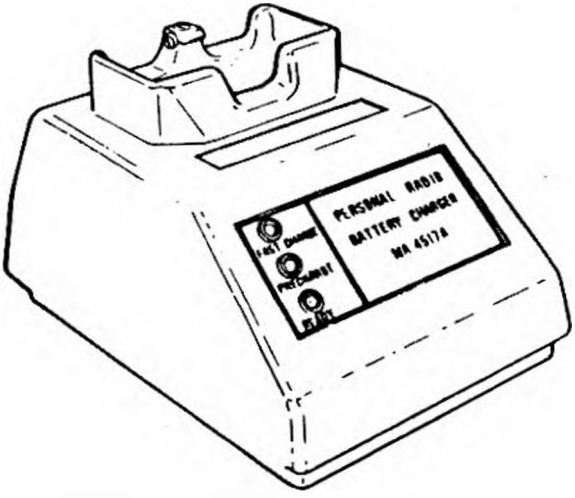
Set the ECU Volume switch to any ON position, slide down the mechanical interlock and briefly set the MODE switch to Z (zeroise). If not powered-up carry out the Transportable procedure.

RACAL-TACTICOM LIMITED
PO BOX 112
472 Basingstoke Road
READING
BERKS
RG2 OQF

Issue 1
Dec 86-700

SINGLE WAY BATTERY CHARGER MA 4517A

OPERATORS CARD



MA 4517A
SINGLE BATTERY CHARGER

1 The MA 4517A Charger charges one MA 4516A Battery at a time, as detailed:

(1) Connect and switch on an AC supply to the MA 4517A.

(2) Insert the battery (either way round) into the battery socket on the MA 4517A.

(a) Confirm that the FAST CHARGE (red) LED illuminates; this indicates that the battery is being charged at a high rate (230 mA nominal).

2 At the high rate, a fully discharged battery is fully charged after approximately 3 hours. When the battery is fully charged:

(1) The FAST CHARGE LED is switched off.

(2) The READY (green) LED illuminates; this indicates that the battery is being charged at a trickle rate (50 mA nominal).

(3) The battery is now ready for use.

3 Note that high rate charging is not possible unless the battery temperature is within 10°C of the Charger temperature; and that the Charger's high rate charging temperature range is from +5°C to +40°C.

4 If the PRECHARGE (amber) LED illuminates when the battery is inserted into the Charger, it indicates that the battery temperature is NOT within 10°C of the Charger temperature.

(1) Batteries that are cooler are charged at the trickle rate.

(2) Batteries that are hotter are not charged at all.

5 When the cooler/hotter battery temperature comes within 10°C of the Charger temperature:

(1) The PRECHARGE LED is switched off.

(2) The FAST CHARGE LED illuminates.

(3) High rate charging starts.

NOTE: When the battery temperature is within 10°C of the Charger, the Charger automatically reverts to fast charge.

WARNING

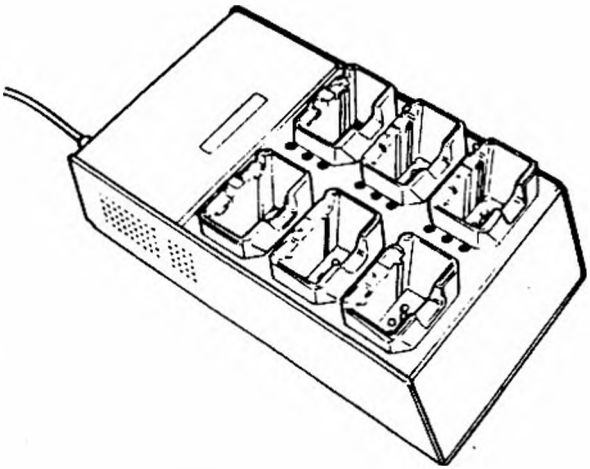
There is a requirement for most armies to charge batteries quickly in the field, under widely varying ambient temperature conditions. Whilst this is normally safe there are rare occasions when a battery cell or cells may have deteriorated, and may fail to vent. It is possible in these circumstances that cell disintegration or even explosion may occur. It is therefore recommended that, as a precaution, batteries being charged should be isolated away from non-essential personnel.

RACAL-TACTICOM LIMITED
P.O. Box 112
472 Basingstoke Road
Reading, Berks RG2 0QF
England

Tel: Reading(01734) 875181 Telex: 848011
Grams: TACTICOM READING

SIX WAY BATTERY CHARGER MA 4518A

OPERATORS CARD



MA4518A SIX WAY BATTERY CHARGER

1 Up to six MA 4516A Batteries can be charged simultaneously on the MA 4518A, as detailed:

(1) Connect and switch on an AC supply to the MA 4518A.

(2) Insert the batteries (either way round) into the battery sockets on the MA 4518A.

(a) With each battery fitted, confirm that the relevant FAST (red) LED illuminates; this indicates that the battery is being charged at a high rate (230 mA nominal).

2 At the high rate, a fully discharged battery is fully charged after approximately 3 hours. When the battery is fully charged:

(1) The relevant FAST LED is switched off.

(2) The relevant READY (green) LED illuminates; this indicates that the battery is being charged at a trickle rate (50 mA nominal).

(3) The battery is now ready for use.

3 Note that high rate charging is not possible unless the battery temperature is within 10°C of the Charger temperature; and that the Charger's high rate charging temperature range is from +5°C to +40°C.

4 If the PRECHARGE (amber) LED illuminates when the battery is inserted into the Charger, it indicates that the battery temperature is NOT within 10°C of the Charger temperature.

(1) Batteries that are cooler are charged at the trickle rate.

(2) Batteries that are hotter are not charged at all.

5 When the cooler/hotter battery temperature comes within 10°C of the Charger temperature:

(1) The PRECHARGE LED is switched off.

(2) The FAST CHARGE LED illuminates.

(3) High rate charging starts.

NOTE: When the battery temperature is within 10°C of the Charger, the Charger automatically reverts to fast charge.

WARNING

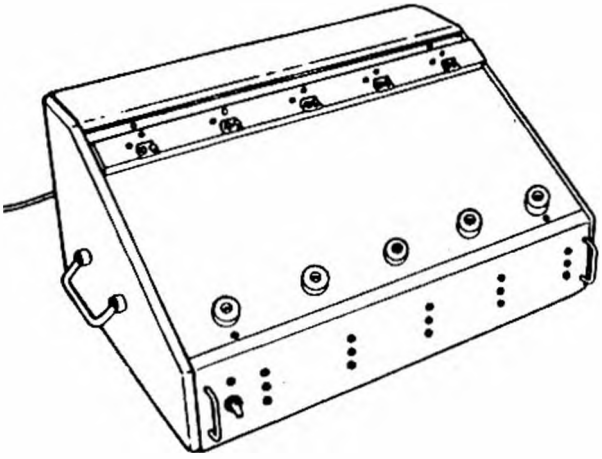
There is a requirement for most armies to charge batteries quickly in the field, under widely varying ambient temperature conditions. Whilst this is normally safe there are rare occasions when a battery cell or cells may have deteriorated, and may fail to vent. It is possible in these circumstances that cell disintegration or even explosion may occur. It is therefore recommended that, as a precaution, batteries being charged should be isolated away from non-essential personnel.

RACAL-TACTICOM LIMITED
P.O. Box 112
472 Basingstoke Road
Reading, Berks RG2 0QF
England

Tel: Reading(01734) 875181 Telex: 848011
Grams: TACTICOM READING

FIVE WAY BATTERY CHARGER MA 4529A

OPERATORS CARD



MA 4529A FIVE WAY BATTERY CHARGER

Note that the MA 4529A Transportable Five Way charger is not to be operated outside the temperature range specified: +5°C to +40°C.

1 Up to five MA 4025D Batteries can be charged simultaneously on the MA 4529A, as detailed:

(1) Connect an AC supply to the MA 4529A and set the mains switch to ON; confirm that the mains on indicator (red) illuminates.

(2) Locate each battery to be charged in position (the correct way round) on the MA 4529A and screw in the securing bolts until they are finger tight.

(3) As each battery is secured, confirm that the relevant FAST CHARGE (amber) LED illuminates; this indicates that the battery is being charged at a high rate (1.6 Amp nominal).

2 At the high rate, a fully discharged battery is fully charged in approximately 3 hours. When the battery is fully charged:

(1) The relevant FAST CHARGE LED is switched off.

(2) The relevant READY (green) LED illuminates; this indicates that the battery is being charged at a trickle rate (320 mA nominal).

(3) The battery is now ready for use.

3 Note that high rate charging is not possible unless the battery temperature is within 10°C of the Charger temperature. If the relevant PRECHARGE (amber) LED illuminates when a battery is fitted to the Charger, it indicates that the battery is NOT within 10°C of the Charger temperature.

(1) Batteries that are cooler are charged at the trickle rate.

(2) Batteries that are hotter are not charged at all.

4 When the cooler/hotter battery temperature comes within 10°C of the Charger temperature:

(1) The PRECHARGE LED is switched off.

(2) The FAST CHARGE LED illuminates.

(3) High rate charging starts.

NOTE: When the battery temperature is within 10°C of the Charger, the Charger automatically reverts to fast charge.

WARNING

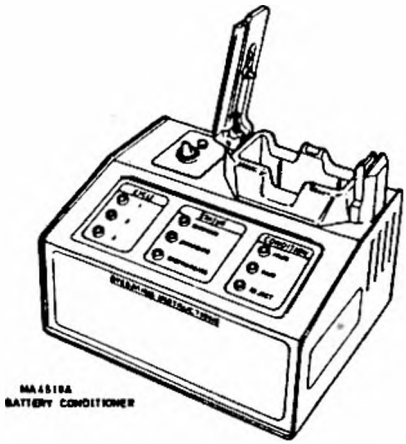
There is a requirement for most armies to charge batteries quickly in the field, under widely varying ambient temperature conditions. Whilst this is normally safe there are rare occasions when a battery cell or cells may have deteriorated, and may fail to vent. It is possible in these circumstances that cell disintegration or even explosion may occur. It is therefore recommended that, as a precaution, batteries being charged should be isolated away from non-essential personnel.

RACAL-TACTICOM LIMITED
P.O. Box 112
472 Basingstoke Road
Reading, Berks RG2 0QF
England

Tel: Reading(01734) 875181 Telex: 848011
Grams: TACTICOM READING

BATTERY CONDITIONER MA 4519A

OPERATORS CARD



If an MA 4516A Battery does not charge fully, or has reduced discharge capability, the battery may be re-conditioned on the MA 4519A, as detailed.

(1) Connect an AC mains supply to the MA 4519A and set the MAINS switch to ON; confirm that the mains on indicator (red) indicator illuminates.

(2) Insert the battery into the battery socket on the MA 4519A and clamp into position.

2 Confirm that:

(1) The CYCLE 1 (green) LED illuminates.

(2) The CHARGING (amber) LED illuminates; this indicates that the battery is being charged at a high rate (230 mA nominal).

3 After approximately 3 hours, confirm that:

(1) The CHARGING LED is switched off.

(2) The DISCHARGING (red) LED illuminates; this indicates that the battery is being discharged at a nominal 230 mA.

(3) The CYCLE 1 LED remains illuminated.

4 After a further approximately 3 hours (end of charge/discharge cycle), confirm that one of the following LEDs illuminate:

(1) PASS (green)
Indicates that the battery is serviceable; the battery is then charged again. When the battery is fully charged, the CHARGED (green) LED illuminates; the battery is then ready for use.

(2) FAIR (amber)
Indicates that the battery is useable, but of limited capacity; approximately 50 to 75% of fully charged.

(3) REJECT (red)
Indicates that the battery is unuseable.

5 If a FAIR or REJECT battery is left in position on the Conditioner:

(1) The CYCLE 1 LED is switched off.

(2) The CYCLE 2 LED illuminates.

(3) The charge/discharge cycle is repeated.

6 At the end of the second cycle, if the battery is still FAIR or REJECT and is left in position on the Conditioner, the cycle is repeated for a third time. The CYCLE 2 LED is switched off; the CYCLE 3 LED illuminates.

7 At the end of the third cycle (regardless of PASS/FAIR/REJECT state), if left in position on the Conditioner, the battery is charged again.

8 Note that high rate charging is not possible unless the battery temperture is within 10°C of the Charger temperature: and that the Charger's high rate charging temperature range is from +5°C to +40°C. If the battery temperature is not within 10°C of the Conditioner temperature, it is charged at a trickle rate until it comes within the temperature limits.

WARNING

There is a requirement for most armies to charge batteries quickly in the field, under widely varying ambient temperature conditions. Whilst this is normally safe there are rare occasions when a battery cell or cells may have deteriorated, and may fail to vent. It is possible in these circumstances that cell disintegration or even explosion may occur. It is therefore recommended that, as a precaution, batteries being charged should be isolated away from non-essential personnel.

RACAL-TACTICOM LIMITED
P.O. Box 112
472 Basingstoke Road
Reading, Berks RG2 0QF
England

Tel: Reading(01734) 875181 Telex: 848011
Grams: TACTICOM READING

USER HANDBOOK

MA 4073C

PROGRAMMER

RACAL — TACTICOM LIMITED

P.O. Box 112
472 Basingstoke Road
Reading, Berks. RG2 0QF
England

Tel: Reading(01734) 875181 Telex: 848011
Grams TACTICOM READING

Prepared by Group Technical Handbooks
Racal Group Services Limited

1983

THE QUEEN'S AWARD FOR EXPORT ACHIEVEMENT TO RACAL TACTICOM LTD

RACAL
The Electronics Group

Ref. TH 8224
Issue: 1.2 87-50

Printed in England

CONTENTS

Para		Page
1	INTRODUCTION	1
4	POWER SUPPLIES	1
6	TYPES OF STORED DATA	1
10	BITE	2
11	MEMORY	2
12	CONTROL FUNCTIONS	3
13	USER OPTION DIODES	3
14	PROGRAMMER LOADING INSTRUCTIONS	4
15	CHANNEL FREQUENCY ENTRY	4
18	FORMAT SELECTION	5
19	KEY VARIABLE ENTRY	6
23	RADIO (OR FILL GUN) FILLING INSTRUCTIONS	7
24	Filling Procedure - All Channels	7
25	Filling Procedure - Single Channel (Transmit and Receive)	7
26	Filling Procedure - Single Channel (Transmit or Receive)	8
27	Filling Procedure - Key Variables	8
28	Fill Failure	8
29	ZEROISING	9
30	Zeroising Entire Contents	9
31	Zeroising Channel Frequencies Only	9
32	Zeroising Key Variables Only	10
33	RADIO SOCKET	10

ILLUSTRATIONS

Frontispiece MA 4073C Programmer
Fig 1 MA 4073C Control Panel

INTRODUCTION

1 The MA 4073C Programmer is a channel and key variable data storage and loading device used with Racal Programmable Transceivers in the COUGAR range. Data to be stored is entered via a keyboard, and can be verified on a display prior to storing in the internal memory. Stored data is 'filled' (loaded) into the transceiver (or other unit) via a cable connection.

2 If required, channel and key variable data can be loaded separately into MA 4083C Fill Gun which is then used to load the radio.

3 The Programmer is suitable for use with the Racal PRM 4515 Personal and SRM 4523 Static, Mobile and Transportable COUGARNET radios, and with the BCC 584D Control and Display Unit (CDU).

POWER SUPPLIES

4 During a radio FILL operation power to both units (the Programmer and the radio) can be supplied from either the Programmer battery or the radio battery. It is recommended that the Programmer battery is fitted and the radio battery is removed.

NOTE:

A Programmer battery must be fitted when filling an MA 4083C Fill Gun.

5 The Programmer uses an MA 4516A 10 V battery mounted on the unit. The battery is charged using an MA 4517A single battery charger or an MA 4518A six-way battery charger. No provision is made for battery charging in situ.

TYPES OF STORED DATA

6 The Programmer can store the following data:

Thirty transmit channel frequencies.

Thirty receive channel frequencies.

Four Key Variables (encryption/decryption codes).

7 The transmit and receive channel frequencies can be in the range 0 to 999.999 MHz. The actual frequencies stored must be suitable for the radio to be loaded i.e.

PRM 4515L or SRM 4523L VHF Transceiver	68 MHz to 88 MHz. 10 channels.

PRM 4515N or SRM 4523N VHF Transceiver	68 MHz to 88 MHz. 10 channels. (The Tone ON/OFF function is inoperative when filling this radio).
PRM 4515H or SRM 4523H VHF Transceiver	132 MHz to 174 MHz. 10 channels. (Individual radios operate in a 20MHz segment of the band).
PRM 4515U or SRM 4523U UHF Transceiver	380 MHz to 470 MHz. 10 channels. (Individual radios operate in a 20 MHz segment of the band).
BCC 584D	30 Channels

8 The four Key Variables each consist of 36 digits (0 to 7). The Key Variables can be specifically programmed or programmed automatically using a random number generator.

9 After entering the data into the MA 4073C it is recommended that the chosen radio be experimentally filled and any errors shown by the MA 4073C corrected. This should be repeated until no error messages are given on the Programmer.

BITE

10 At switch-on the unit carries out Build In Test Equipment (BITE) functions to check that it is operating correctly. A fault condition is indicated on the display as:

(1) RAM DATA ERROR, or

(2) MAIN RAM FAULT, or

(3) NOVRAM (non-volatile RAM) FAULT (see para 11).

If a RAM DATA ERROR is indicated the unit should be zeroised and re-loaded. The other fault indications cannot be cleared without dismantling and repairing the unit.

MEMORY

11 The unit uses non-volatile memory devices therefore data stored in the unit is retained at switch-off, or when the battery is removed.

CONTROL FUNCTIONS

12 The front panel controls provide the following functions:

ON OFF	:	Turns the unit on and off.
Z ALL	:	Initialises memory erase.
Z FD	:	In channel entry mode enables a single frequency to be zeroised.
FILL	:	Initialises data fill.
A V	:	Alters display brightness; 3 levels are provided. On power up the middle brightness is selected.
RND	:	In key entry mode provides a means of entering a complete key via a random number routine.
A/D	:	In key mode provides a means of scrolling through keys A to D or for the examination of the key data.
KEY	:	Selects key entry mode.
T ON OFF	:	Selects 150 Hz pilot tone option for transmitter.
F RX	:	In channel entry mode displays the receive frequency for the selected channel.
F TX	:	In channel entry mode displays the transmit frequency for the selected channel.
CHAN	:	Selects channel entry mode.
EXEC	:	Stores data shown on the display into memory, steps on to next function or initiates ZERO or FILL function.
CE	:	Clears data entered via number keys before commitment to memory, or returns display to main menu.

USER OPTION DIODES

13 Diodes are fitted within the unit which are set, during manufacture, to send twelve logic '1' bits as the first part of the keyfill data. The logic sense can be changed by removal of diodes D10 to D21 on the Control and Interface board. See Technical Manual for instructions.

PROGRAMMER LOADING INSTRUCTIONS

14 Data is loaded into, and stored in the Programmer Unit as follows:

ENTER	DISPLAY
ON/OFF	<CHAN/KEY> (If error signal is given see 'BITE', para 10)

Facilities available are: CHANnel frequency entry (para 15)
KEY variable entry (para 19)
ZALL (Zeroise memory complete) (para 29)
ON/OFF

NOTE:
The unit is automatically switched off approximately forty seconds after the last key entry. The unit can be switched off using the ON/OFF key.

CHANNEL FREQUENCY ENTRY

15 At switch-on the unit sets itself to the format in use at switch-off. Format 1 allows 5 digit frequencies to be entered, format 2 allows 6 digit frequencies to be entered (para 18).

ENTER	DISPLAY
CHAN	CHAN ** <SELECT>
00 to 29 (channel number)	00 to 29
FTX or FRX	CH xx FTX (or FRX)* * * * * (xx: Channel No; * * * * *: Frequency (if already programmed))
4 or 5 DIGITS Dependent on format (para 18).	Channel Frequency.

NOTES:
(1) The final frequency digit in the display is automatically entered. The last digit entered must not be 4 or 9.

(2) If a channel frequency is to be cleared (without entering a new frequency) enter ZFD.

16 To clear an error in a new entry enter CE. The EXEC, CHAN, KEY and FILL functions are disabled until the correct number of frequency digits have been entered.

BR 8783 note: 5-digit means four digits entered at the keypad plus the final digit entered automatically by the programmer. This is Format 1 which is appropriate for frequencies below 100 MHz and therefore to be used for RN/RM/MDP Cougar.

17 When a new frequency entry is complete

ENTER	DISPLAY
EXEC	CH xx FTX * * * * * * (receive frequency example)

If a transmit frequency has been selected the status of the pilot tone setting is given

<TONE> ON <EX>
or <TONE> OFF <EX>

If the status is correct then

EXEC	CH xx FRX * * * * * *

To change the status

T ON / OFF

EXEC	CH xx FRX * * * * * *

FORMAT SELECTION

18 As given in para 15, a five digit or a six digit channel frequency format can be selected. The procedure is as follows, and must be carried out following a Zeroise procedure (para 29).

NOTES:

(1) If the Zeroise procedure has not been carried out the format selected prior to switch-off will be retained.

(2) If format 2 is in use frequencies below 100 MHz can be entered by entering a leading zero.

ENTER	DISPLAY
(Zeroise procedure)	FORMAT<1/2>
1 (for 5 digit frequencies i.e. below 100 MHz)	<100 MHz <EX/CE>
OR	
2 (for 6 digit frequencies i.e. 100 MHz and above)	>100 MHz <EX/CE>

ENTER	DISPLAY
EXEC (to enter)	Channel frequency
OR	
C/E (to change)	CHAN/FILL

KEY VARIABLE ENTRY

19 Each key consists of 36 octal digits (0 to 7). The thirty-six digits can be individually entered (using the keypad) or the complete key can be a pseudo-random number entered by pressing RND.

NOTE:

When entering a key from the keypad all 36 octal digits must be entered.

20 To view an existing key:

ENTER	DISPLAY
KEY	<A/D> A <EX/FI>
EXEC (for Key A)	<A/D> TO SCROLL
OR	
A/D (successively for Keys B to D)	<A/D> B/C/D <EX/FI>
EXEC	<A/D> TO SCROLL
A/D (successively) for	A1 = first 12 digits of 36 digit key
	A2 = second 12 digits of 36 digit key
	A3 = third 12 digits of 36 digit key (and finally exit viewing)

21 At this stage new keys can be entered (see para 19).

EXEC, CHAN, KEY and FILL functions are disabled until 36 digits have been entered. The display auto scrolls on the thirteenth and twenty-fifty entries. The cursor (*) disappears after the 12th, 24th and 36th entry, but remains active. The CE key deletes the number to the left of the cursor on the current line only.

22 To complete a key entry from the keypad press EXEC after the last (36th) digit. The unit responds with:

ENTER	DISPLAY
	VIEW/SAVE ? 1/2
1 To view key	
OR	
2 To enter keys in memory	

RADIO (OR FILL GUN) FILLING INSTRUCTIONS

23 A radio (or fill gun) is loaded as follows:
Remove radio battery (see para 4). Connect radio and switch on, or connect fill gun. If an error message is given during filling the filling procedure should be repeated.

N.B. Channel data and key variable data must be entered into the radio or Fill Guns in two separate operations.

Filling Procedure - All Channels

24

ENTER	DISPLAY
CHAN	CH * * SELECT
FILL	CH ALL FILL
EXEC	>----< followed by
(or CE to return	<CHAN/KEY>
to menu)	(or fault indication, para 28)

Filling Procedure - Single Channel (Transmit and Receive)

25

ENTER	DISPLAY
CHAN	CH * * SELECT
Channel No (0 to 29)	CHnn SELECT
FILL	CHnn ALL FILL
EXEC	>----< followed by
(or CE to return	<CHAN/KEY>
to menu)	(or fault indication, para 28)

Filling Procedure - Single Channel (Transmit or Receive)

26

ENTER	DISPLAY
CHAN	CH * * SELECT
CHAN NO (0-9 or 0-29)	CHnn SELECT
FRX OR FTX	CHnn FTX (or FRX)
FILL	CHnn FTX (or FRX) FILL
EXEC	>----< followed by
(or CE to return to menu)	<CHAN/KEY> (or fault indication, para 28)

Filling Procedure - Key Variables

27

ENTER	DISPLAY
KEY	<A/D>A EX/FI
FILL	ALL KEYS FILL
EXEC	>----< (during loading)
(or CE to return to menu)	<CHAN/KEYS> (loading successful) (or fault indication, para 28)

Fill Failure

28 A fill failure is indicated as follows:

DISPLAY		
RADIO FAIL (during channel or key filling)	indicates	(a) the radio is not connected (b) the radio is switched off (c) the radio is otherwise faulty (d) BCC 584D CDU not set to radio (keyfill only).
NO RADIO ALARM (during key filling)	indicates	(a) the radio is set to CLEAR (b) the radio or programmer may be faulty (c) an alarm signal path is not provided by the radio system (d) a crypto module is not fitted to the radio.
KEY FILL FAIL (during key filling)	indicates a corruption of data.	

ERROR Txx Ryy P (during channel fill)	indicates a transmit channel xx failed, receive channel yy failed or a pilot tone select command failed. NOTE: only the lowest failed channel number is shown.
NO CHANNEL DATA (during channel fill)	Indicates no data in store

NOTE:

Press CE to return to main menu or press CHAN, KEY or select required function.

Press EXEC to send data again.

ZEROISING

29 Three levels of memory erasure are available:

(1) Erase entire contents (channel frequencies and keys).

(2) Erase channel frequencies only.

(3) Erase key variables only.

Zeroising Entire Contents

30

ENTER	DISPLAY
CE	<CHAN/KEY> (must be displayed before zeroising)
ZALL	SURE ? <EX/CE>
EXEC (must be entered within five seconds)	<CHAN/KEY>

Zeroising Channel Frequencies Only

31

ENTER	DISPLAY
CHAN	CHAN ** <SELECT>
ZALL	SURE ? <EX/CE>
EXEC (must be entered within five seconds)	<CHAN/KEY>

Zeroising Key Variables Only

32

ENTER	DISPLAY
KEY	<A/D> A <EX/FI>
ZALL	SURE ? <EX/CE>
EXEC (must be entered within five seconds)	<CHAN/KEY>

NOTE:
Prior to entering EXEC any Zeroising action can be cancelled by (a) waiting longer than five seconds, or (b) entering CE.

RADIO SOCKET

33 The pin connections of the RADIO socket are as follows:

Pin A	Set fixed level audio.
Pin B	Not Used.
Pin C	Supply positive.
Pin D	1 kHz alarm tone.
Pin E	Ground.
Pin F	Data.
Pin G	Framing Pulse.

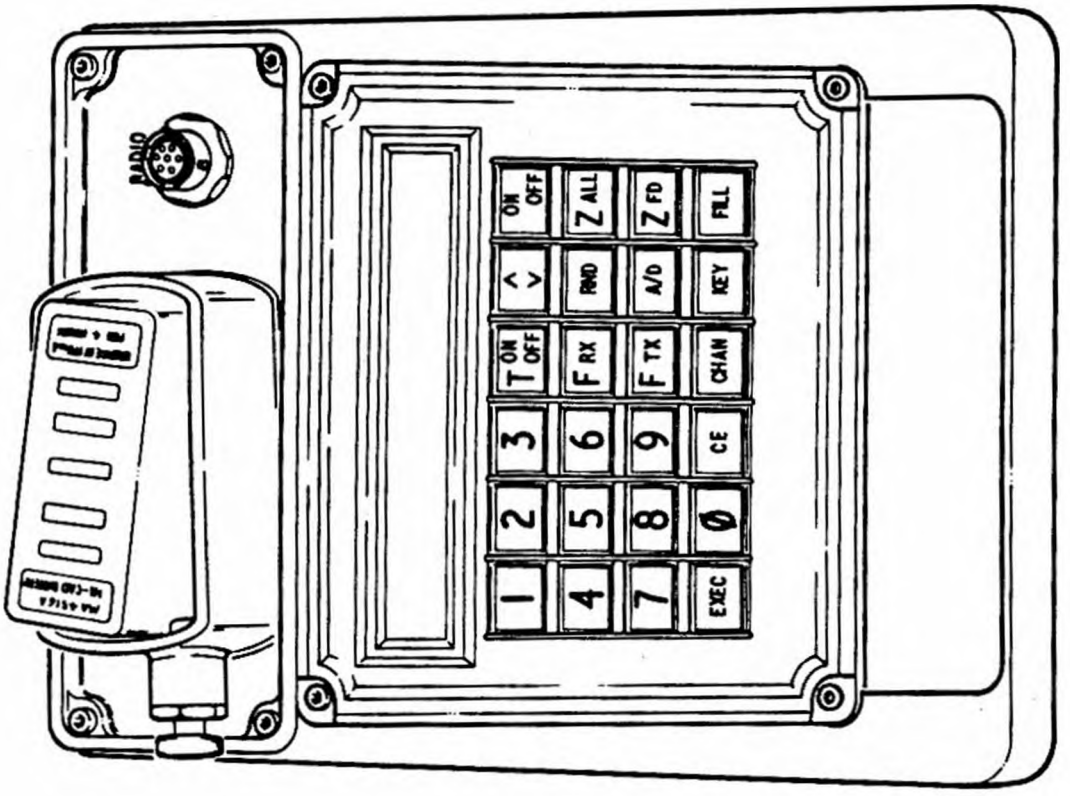


Fig 1 MA 4073C Control Panel

RACAL TH8224

SETTING UP CHANNEL FREQUENCIES FOR COUGAR PRM 4515N

4

4.1 Connecting equipment. The Programmer MA 4083C is powered from MA 4516A battery (as fitted to Cougar PRM 4515N).

Information entered into the Programmer will be retained, whether a battery is connected or not. To connect battery, pull back the securing pin and insert battery into the top of the Programmer. Turn clockwise to lock. (See BR 8783, Sect 5, Chap 3, Page 16, Fig 1).

The Programmer is switched on by use of the on/off button on the key pad. It will switch off automatically 40 seconds after the last key stroke. If this happens, any information that has been entered properly will not be lost, but the sequence being used at the time will have to be started again.

Do not connect radio until instructed to do so.

4.2 Formatting. The Programmer has two formats available to the user.

Format 1: For programming freq < 100 MHz
Format 2: For programming freq > 100 MHz

The Cougar PRM 4515 in general use by the RN and MDP, operates between 66 and 88 MHz, so Format 1 is required.

The Programmer will stay in the format it was last used in and if this is unknown to the user it would be advisable to zeroise (reset) the Programmer, thus enabling the required Format to be entered.

The zeroise operation will erase all the frequencies currently held in the Programmer memory and all channels will have to be reprogrammed.

4.3 **Zeroising**

(1) Turn unit on (press on/off).

(2) Press CHAN.

(3) Press Zall.

(4) Press EXEC (this button must be pressed within 5 seconds of pressing 'Zall'. If not, start again).

If the operation was successful the display will read:

< CHAN / KEY >

If not, start again.

4.4 Channel frequencies

4.4.1 Channel frequency setting

(1) Switch on Programmer. (Press on/off).

	DISPLAY READING	PRESS	
(2)	CHAN / KEY	CHAN	
(3)	FORMAT 1/2	1	NOTE
(4)	<100 MHz EX/CE	EXEC	The Programmer will not prompt you to select required format (3 and 4) if unit has not been zeroised first.
(5)	CHAN ** SELECT	Enter channel number required eg '00' Frx	
(6)	CHAN 00 SELECT		
(7)	Input the first four figures of the receiver frequency required on that channel. The last figure is automatically entered. The fourth figure cannot be 4 or 9.		

	DISPLAY READING	PRESS	
(8)		EXEC	
(9)	CH 00 FTX	(Nos)	(enter first four figures of transmitter frequency required on that channel. (Same rules as (7) apply)).
(10)		EXEC	
	TONE ON EX	Tone/off	(to select 150 Hz tone on or off).
(11)		EXEC	
(12)			
(13)	If further channels need to be programmed then:		
(14)	CHAN / KEY	CHAN	Repeat from step (5) for all channels

4.4.2 Checking channel frequencies. Channel frequencies can be checked by pressing 'CHAN' selecting channel required eg 00 and pressing Frx to view the receiver frequency, followed by repeated pressing of the 'EXEC' key to obtain transmitter frequency and tone on/off selection.

At this point mistakes can be rectified by simply overwriting the frequencies that are wrong. After making any changes press 'EXEC'.

4.5 **Transferring information to radios (filling)**

(1) Switch off Programmer.

(2) Disconnect battery and microphone/speaker from radio and connect to Programmer with cable provided.

(3) Select CLR on radio and switch on.

(4) Turn Programmer on.

PRESS

(5) CHAN.

(6) FILL.

(7) EXEC.

The display will read '>------<' for approximately 1½ seconds, then will revert to 'CHAN/KEY' if the fill operation was successful.

(8) The next radio can now be attached and filled in the same way.

4.6 Error correction. If the frequency information is not transferred to the radio properly an error statement will occur.

An explanation of all error statements can be found in BR 8783, Section 5, Chap 3, Page 16, Para 28.

USING THE MA4073C FILL GUN

5 To fill the gun from a MA4073C programmer, proceed as follows:

5.1 Fit a battery to the programmer.

5.2 Lift the 'Z' button guard on the gun and press the 'Z' button, located beneath the guard, to erase all previous data.

5.3 Connect the gun to programmer using Cable, Part No. 792252. The fill gun indicator should indicate a flashing red condition.

5.4 On the programmer, press ON, CHAN, FILL, EXEC. The fill gun indicator should momentarily indicate a steady red condition before changing to a steady green condition. The channel data is now permanently entered into the gun until such time as the 'Z' button is pressed again or the internal Lithium cell expires.

6 To load channel frequencies into a Cougar, proceed as follows:

6.1 Fit a battery to the radio.

6.2 Connect Cable, Part No. 792252 between the fill gun and the microphone socket on the radio.

6.3 Set the radio ON switch to the 1st volume position. The fill gun indicator will indicate, in turn, a momentarily green condition followed by a steady red condition for 3 to 4 seconds and finally a steady green condition.

6.4 The radio is now ready for use.

NOTE

Press the 'Z' button on the fill gun only to erase the contents.

CHAPTER 4

UPKEEP AND SUPPORT

CONTENTS

Para

1 Policy
2 Diagnosis/call out
3 Exchanges

POLICY

1 Cougar is supported through portable radio pools by an exchange procedure of one serviceable item for one defective item (one-for-one). It is simple equipment and no special expertise or technical knowledge is expected of the user in identifying defective items. A call-out contract has been arranged with the manufacturer to provide assistance in case of difficulty or for defects which cannot be rectified by simply replacement (eg cabling on installed systems). Pools return defective items to the manufacturer and receive replacement serviceable items in exchange; it is not a repair and return system. With a few exceptions the equipment is not NATO codified and DGST(N) does not hold or issue stock.

1.1 Cougar Bright. All queries regarding Cougar Bright should be addressed to:

Centre 326, SETT 6
Bldg 2/12, WEW, PP30
HMNB Portsmouth PO1 3NH

Telephone: 01705-822351, Ext 25738

DIAGNOSIS/CALL OUT

2

2.1 Users are to attempt initial diagnosis of any apparent fault by comparison (eg one radio against another) or substitution (eg fitting a known good transceiver into a suspect base station). This will usually enable a defective item to be identified and it can then be exchanged at a portable radio pool. If for any reason this diagnosis cannot be accomplished then contractor call out can be considered, as follows:

2.2 MDP users are to contact the Force Information Room (FIR) in the first instance if contractor assistance is required. If FIR approves then the user will contact Racal. RN/RM users are to obtain the approval of the Officer delegated by the Command (usually the OOD) before contacting Racal. Contract reference NWE11A/0220 is to be quoted. For all users the contractor will maintain a register of calls and provide a job number if required. Contact points are:-

RACAL Communications Systems Ltd
Tactical Systems Division
Western Road
Bracknell
Berkshire RG12 1RG

Telephone (office hours): 01344-385376
Fax: 01344-481367/860021
Telephone (silent hours): 01734-421519 (emergencies only)

The contractor will normally attend within 24 hours. In considering the urgency of need users should note that attendances at weekends or Bank Holidays are charged at twice the normal rate.

EXCHANGES

3

3.1 The general procedures for setting up and management of portable radio pools and transactions with users are given in Sect 1. Pools are to return defective equipment to:

Racal International Freight Services
4 Acre Road
Reading
Berkshire
RG2 OPD
(Attn Mr G Webb)

3.2 The contractor will normally despatch replacements within one full working day of receiving defective items at the above address. The replacements will be sent to the pool from which the contractor received the defective items; no attempt is to be made to have items sent directly to individual users. Returns are to be accompanied by Form S549. Returns should be batched in a sensible manner to avoid a multitude of consignments of one or two items, however defective items should not be held for more than four weeks. The aim is to economise on transport etc costs without putting the pool in a stockout situation.

CHAPTER 5

ROUTINE MAINTENANCE

CONTENTS

Para

1 Job information card - after use routine
2 Job information card - clean and inspect
3 Job information card - clean and inspect battery chargers (6M)
4 Preventive maintenance schedule

MMS 6 (April 1977)

	JOB INFORMATION CARD	Schedule No 9-1520-0000	M Op No 1
	Schedule Title COUGARNET COMMUNICATIONS OUTFIT		
	Job Description AFTER USE ROUTINE		

RELEVANT HANDBOOK

BR 8783(1)

TOOLS, STORES, SPARES

Electrolube 0474-914-3344

OTHER INFORMATION/INSTRUCTIONS

WARNING:

COUGAR RADIOS AND ACCESSORIES ARE NOT NAVAL STORES ITEMS AND SHOULD NOT BE RETURNED THROUGH PSTO(N). COMMAND RADIO POOLS ARE THE ONLY SOURCE OF SUPPLY/RETURN.

JOB DESCRIPTION OR METHOD

Wash radio body in soapy water to remove any salt deposits and dry thoroughly. Clean and lubricate plugs and sockets using Electrolube Pat No 0474-914-3344.

Refit Ref BR 8783

Return Cougar outfit complete to nearest Command Radio Pool. See BR 8783 Chapter 3.

Issue No ORIGINAL - NOVEMBER 1990	9D/2 Side 1 of 1 sides

MMS 6 (April 1977)

	JOB INFORMATION CARD	Schedule No 9-1520-0000	M Op No 2
	Schedule Title COUGARNET COMMUNICATIONS OUTFIT		
	Job Description CLEAN AND INSPECT (M)		

RELEVANT HANDBOOK

BR 8783(1)
BR 2000(20)

TOOLS, STORES, SPARES

Electrolube 0474-914-3344

OTHER INFORMATION/INSTRUCTIONS

WARNING

CONTACT REPAIR ITEMS, DO NOT ATTEMPT TO OPEN RADIOS. DEFECTIVE ITEMS SHOULD BE EXCHANGED ON A ONE FOR ONE BASIS WITH THE NEAREST COMMAND RADIO POOL. REF: BR 8783 CH 3.

SAFETY PRECAUTIONS

BATTERIES CONTAIN NICKEL-CADIUM - IF BROKEN THEY SHOULD BE SEALED IN CONTAINER AND ANY WHITE SALT DEPOSIT ETC SHOULD NOT BE TOUCHED

JOB DESCRIPTION OR METHOD

Clean with damp cloth. Inspect for signs of damage or corrosion.

Issue No ORIGINAL - NOVEMBER 1990	9D/2 Side 1 of 1 sides

MMS 6 (April 1977)

	JOB INFORMATION CARD	Schedule No 9-1520-0000	M Op No 3
	Schedule Title COUGARNET COMMUNICATION OUTFIT		
	Job Description CLEAN AND INSPECT BATTERY CHARGERS (6M)		

RELEVANT HANDBOOK

BR 8783(1)

TOOLS, STORES, SPARES

Electrolube 0474-914-3344

OTHER INFORMATION/INSTRUCTIONS

WARNING:

COUGAR REPAIR ITEMS. DEFECTIVE ITEMS SHOULD BE EXCHANGED WITH COMMAND RADIO POOLS.

JOB DESCRIPTION OR METHOD

Inspect for signs of damage and clean using a damp cloth. Clean contacts using Electrolube Pat No 0474-914-3344.

P R E V E N T I V E M A I N T E N A N C E S C H E D U L E

MMS5 (8/87)

BR NUMBER
BR 8783

MAINT OP NO	JIC	JOB DESCRIPTION	BY WHOM	PER
001		After use routine.	SS	SO
002		Clean and inspect (M).	SS	M
003		Clean and inspect battery chargers (6M)	SS	6M

SECTION 6

MOULD RADIO COMMUNICATION SYSTEM

CONTENTS

Chapter

1 General information
2 Equipment technical details
3 Upkeep and support

CHAPTER 1

GENERAL INFORMATION

CONTENTS

Para

1 Introduction
2 Mould system description
3 Equipment description
6 Operation
8 Care and precautions
10 Supply and return
12 Classification

Table Page

1 Fixed outstation item list 2
2 Vehicle installation kit item list 2

Fig Page

1 Items comprising fixed outstation 4
2 Items comprising vehicle installation kit 5/6

INTRODUCTION

1 Under the authority of MER 85/83 (a Sea Systems requirement), various RN centres of interest have been provided with radios to enable access to the MOULD communications system, which is for command and control of defence forces during periods of National Emergency. MOULD was introduced into service under DCI RN 231/889.

MOULD SYSTEM DESCRIPTION

2 MOULD is an Army sponsored project (GSR 3670) providing a UK wide communications system comprising fixed and mobile repeaters (hilltop sites), plus fixed, mobile and portable stations. RN users are provided with fixed stations plus, in certain locations, an installation kit for a vehicle.

EQUIPMENT DESCRIPTION

3 Both fixed and mobile stations use a Philips FM 914PM radio telephone together with a CU 91PM control unit. The radio is programmed to operate on up to 250 channels on either a single frequency simplex net, or a two frequency 'talkthrough' net via a repeater.

4 The fixed installation (see Fig 1) comprises the radio telephone together with a Fixed Outstation Installation Kit comprising a power supply unit, housing assembly (including loudspeaker), power lead and other ancillary items. An external aerial is also installed. See Table 1 for detailed items list.

TABLE 1 FIXED OUTSTATION ITEM LIST

ITEM	DESCRIPTION	PART NO	NSN (NOT FOR USE WITH NAVAL STORES)
1	Radiotelephone FM914PM		5820-99-661-6640
2	Control Unit CU91PM		5820-99-788-7304
3	Handset and Lead Assy		5965-99-620-9632
4	Fixed Outstation Installation Kit Comprising:	AT 14571	Y1/5820-99-739-6203
	Console Assy (Desk)	AT 14570	5820-99-792-2260
	Cable Assy (Power)	AT 70079	Z42/5995-99-661-6703
	Cable Assy (Coaxial)	CT 60058	5995-99-762-6686
	Power Supply Unit AC90	AT 00830	Y2/5820-99-787-7303
	Bagged Items (Miscellaneous minor hardware)	AT 36901	
5	70-82.3 MHz VHF Wide Band End Fed Omnidirectional Antenna WDT70		5820-99-661-2912
	or		
	75-88 MHz VHF Wide Band End Fed Omnidirectional Antenna WDT80		5820-99-661-2911

5 The Vehicle Installation Kit (see Fig 2) comprises handset rest, cradle assembly, loudspeaker, aerial and other ancillary items but excludes the radio, control unit and handset. When operation of the mobile is required, the radio and control unit must be withdrawn from the fixed outstation and inserted into the vehicle installation. See Table 2 for detailed items list.

TABLE 2 VEHICLE INSTALLATION KIT ITEM LIST

ITEM	DESCRIPTION	PART NO	NSN (NOT FOR USE WITH NAVAL STORES)
1	Mobile Installation Kit Comprising:	AT 29645	Z1/5895-99-661-6642
	Cable Assy (Power)	AT 70079	Z42/5995-99-661-6703
	Cable Assy (Speaker)	AT 70080	5995-99-661-6704
	Cable Assy (Control)	AT 70081	Z42/5995-99-787-7306
	Speaker Assy	AT 10877/05	5965-99-117-0782
	Cradle Assy	AT 12836	5820-99-620-9633
	Bracket Assy (Long)	AT 14689	5820-99-742-8189
	Bracket Assy (Short)	AT 14690	
	Antenna Assy	AT 36036	Y2/5820-99-787-7305
	Bagged Items (Miscellaneous minor hardware)	AT 29649	5820-99-796-0748

OPERATION

6 Operating instructions are in Army Equipment Support Publication (AESP) 5820-F-402-201 which is issued to all RN MOULD users.

7 Instructions regarding the operational use of MOULD, including assignment of frequency and exercise schedules, will be issued by Area Flag Officers in consultation with army district commanders.

CARE AND PRECAUTIONS

8 This is a low power VHF radio and negligible personnel RADHAZ exists. The equipment is powered from mains electricity supply; no unusual safety hazards exist.

9 There is a hazard to Electro-Explosive Devices (EEDs) which may be of particular concern when the equipment is mounted in a vehicle. Reference should be made to BR 2924 (Radio Hazards in the Naval Service) for further information. It should be noted that a typical minimum safe distance to be observed between the radio aerial and a DAMAGED or OPEN device is 200 ft (61 m) (a device may be OPENED during test or repair procedures).

SUPPLY AND RETURN

10 All equipment supplied is to be taken on charge in the appropriate stores account and transferred to a Permanent Load Record (PLR). The equipment has been codified; NATO stock numbers are given in Tables 1 and 2 (see Note).

NOTE

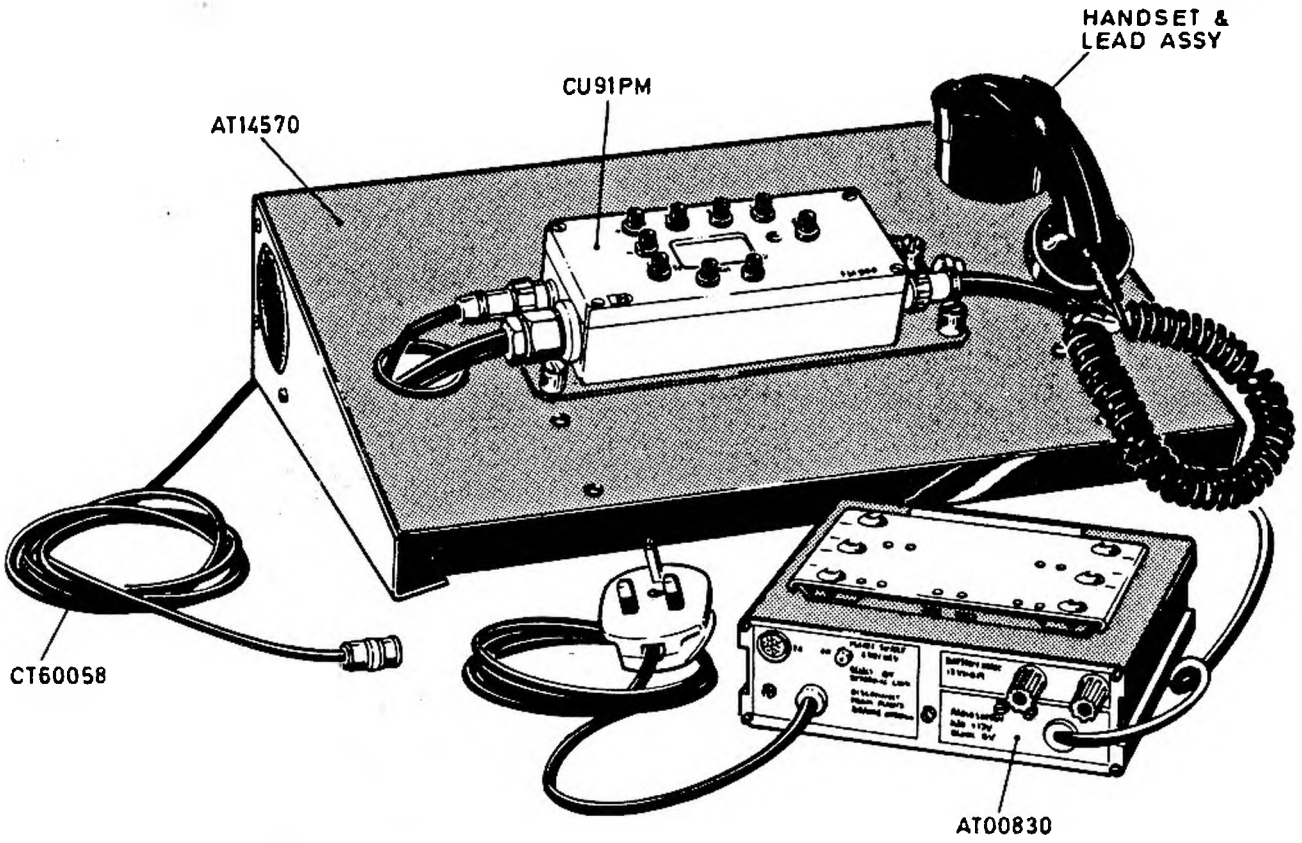
Support is by the Army department and the items will **not** be introduced to Naval Stores.

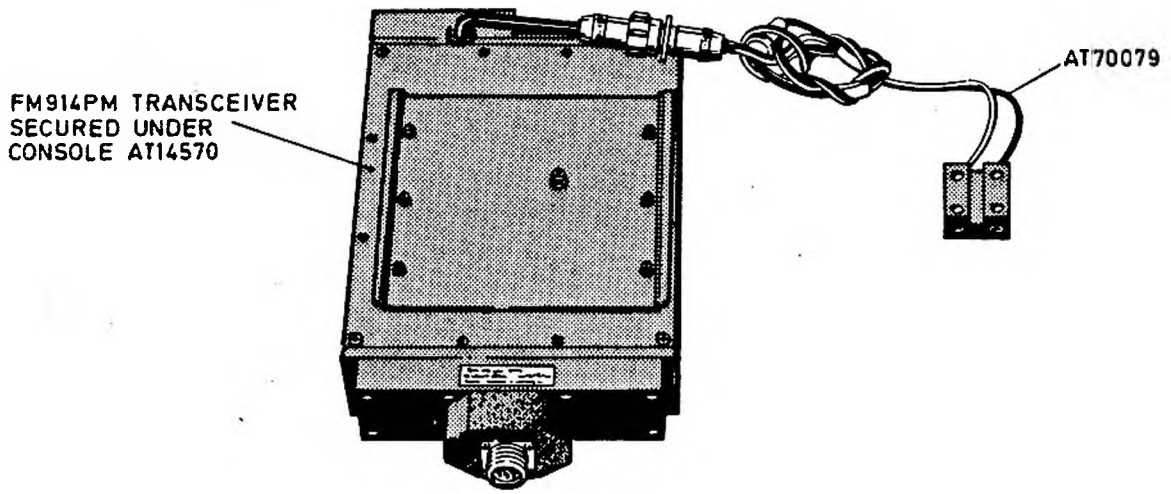
11 Initial allocation is without demand. Subsequent transactions for repair or replacement are to be conducted with the Army following the procedures given in the chapter on upkeep and support. UNDER NO CIRCUMSTANCES IS ANY PART OF THIS EQUIPMENT TO BE PERMANENTLY REMOVED OR DISPOSED OF WITHOUT PRIOR CONSULTATION WITH CINCNAVHOME/CCO.

CLASSIFICATION

12 Aspects of the MOULD project are classified as follows:

Existence of project	Restricted
Operational use	Restricted
Operating instructions	Unclassified
Location of hilltop sites	Restricted
Location of RN outstations	Restricted
Upkeep and support arrangements	Restricted
Equipment performance	Unclassified





	Radiotelephone	Control Unit
DIMENSIONS and WEIGHT:	Height - 52 mm (2.1 in)	65 mm (2.6 in)
	Width - 175 mm (6.9 in)	187 mm (7.4 in)
	Depth - 339 mm (13.3 in)	40 mm (1.6 in)
	Weight - 3.4 kg (7.5 lb)	270 g (9.5 oz)

Fig 1 Items comprising fixed outstation

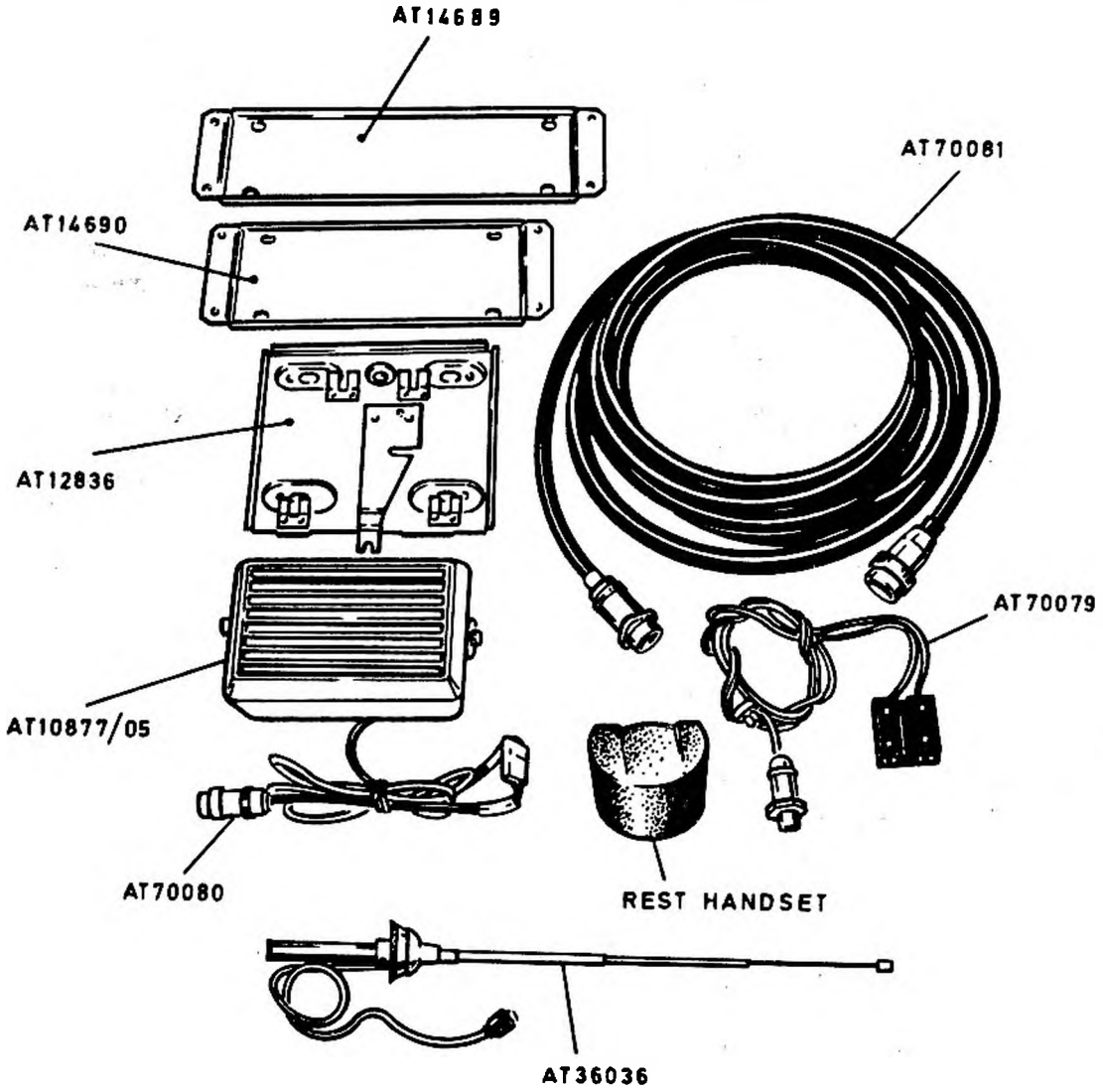


Fig 2 Items comprising vehicle installation kit

CHAPTER 2

EQUIPMENT TECHNICAL DETAILS

CONTENTS

Para

1 Introduction
2 Technical parameters

INTRODUCTION

1 The FM 914 is a frequency modulated VHF transceiver operating in the band 68 - 88 MHz. Up to 250 channel frequencies (which may be simplex or two-frequency reboardcast (talkthrough)) are set by a preprogrammed EPROM. Reprogramming is not a user operation. A SELCALL (selective calling) module is an option in the MOULD system but is not provided or required for any RN users.

TECHNICAL PARAMETERS

2 The technical parameters are as follows:

2.1 General

Input voltage		13.8 V dc
Current consumption	Receive	Standby: less than 800 mA Full audio: less than 1.2 A
	Transmit	15 W: less than 5.0 A 8 W: less than 3.5 A 1 W: less than 2.0 A
Frequency band		68 - 88 MHz
Channel spacing		12.5 kHz
No of channels		Up to 250 (maximum)
Operating temperature		-10 to +60°C
Duty cycle		1 min transmit then 4 mins receive ie 1:4
Frequency stability		± 10 ppm, -10 to +60°C

2.2 Receiver

Audio output		greater than 3.5 W into 4 ohms greater than 5.5 W into 2 ohms (measured at 10% distortion at 1 kHz)
Audio distortion		less than 10% at 3 W
Audio frequency response		within +1 and -3.5 dB of 6 dB/ octave from 300 Hz to 3 kHz
Sensitivity		greater than 12 dB SINAD for 0.35 V pd
Squelch threshold	'L' 'H'	0.25 V to 0.8 V less than 1.5 V

2.3 Transmitter

Power output	(high)	15 W ± 10%
	(mid)	8 W ± 10%
	(low)	1 w ± 10%
Spurious emissions		less than 0.25 W
Audio sensitivity		6 mV pd input for 1.5 kHz deviation ± 300 Hz
AF distortion		less than 3% for 1 kHz modulating frequency at 60% system deviation
Frequency error		± 500 Hz
Transmit duration limiter		2 mins 45 secs approximately

2.4 Power supply unit AC90PU

Voltage (input)	240 V ac ± 10%, 50 Hz
Voltage (output)	13.8 V (nominal)
Output current	8 A at 1:4 duty cycle
Output ripple	less than 25 mV from zero to full load

CHAPTER 3

UPKEEP AND SUPPORT

CONTENTS

Para

1 Documentation
2 Repair policy and in-service support

Table Page

1 Locations and telephone numbers 2

DOCUMENTATION

1 Army Equipment Support Publication (AESP) 5820-F-402-201, entitled 'Pye VHF FM Mobile Radiotelephone Type FM914PM Operating Information' has been issued to all recipients of MOULD installations. It contains all the technical data, operating instructions and diagnostic procedures required by the user.

2 AESP 5820-F-402-811 (Modification Instructions) and AESP 5820-F-402-821 (General Instructions) will also be issued to users in due course.

REPAIR POLICY AND IN-SERVICE SUPPORT

3 The repair policy is diagnosis and exchange of defective unit by the user, with REME/Contractor back up if needed.

4 In case of apparent equipment failure, the user is to attempt diagnosis and rectification by following the procedures at Paras 86/87 and Annex B of the AESP (note diagnosis chart on Annex B Page 2).

5 Defective equipment is to be forwarded to he appropriate REME workshop (see Table 1) for repair or replacement. AFG 1045 (Army Form General) procedure is to be used; workshops have been directed to provide the forms and advise on their use (see Para 8 below).

6 In the exceptional case of the user being unable to rectify the system by exchanging defective units, contractor assistance should be requested through the local area Army District Commander, S02 Comms. The contact telephone numbers are listed in Table 1. These numbers are manned continuously but calls in silent hours should only be made when the urgency warrants such action and can be supported in writing. Expected response is 72 hours routine, 24 hours exercise or emergency from time of Army call to contractor to rectification of defect.

7 In addition to the repair arrangements outline above, an annual inspection will be performed by the contractor to ensure that the system is operating satisfactorily.

8 Army department authority for this policy is set out in Logistic Executive (Army) Equipment Management Policy Letter No 174, confirmed by Headquarters United Kingdom Land Forces letter 1317-13 G4 Main 25 July 1988.

TABLE 1 LOCATIONS AND TELEPHONE NUMBERS

NOTES

(1) DISTRICTS refers to Army districts

(2) REGIONS refers to MOULD regions

DISTRICT/REGION	REME WORKSHOP/DISTRICT COMMANDER
Scotland/Region 1	26 District Workshop Telephone 01786 72881 Ext 8290 Mr R Eley, Chief Planner Army District Commander S02 Comms/MOULD Controller Telephone: Edinburgh (0131) 336 1761 Ext 2118 or 2119
NE District/Region 2	41 District Workshop Telephone: 01904 59811 Ext 2873 Mr M Le Moine, Planning Manager Army District Commander S02 Comms/MOULD Controller Telephone: York (01904) 59811 Ext 2499 or 2599
E District/Regions 3 & 4	36 District Workshop Telephone: 01206 657121 Ext 2458 Mr R Braddy, Supt, Tels. Army District Commander S02 Comms/MOULD Controller Telephone: COLCHESTER (01206) 5121 Ext 2484
London District/Region 5	30 District Workshop Telephone (0101) 345 2611 Ext 339 Capt P Todd, OIC Production Army District Commander S02 Comms/MOULD Controller Telephone London (0101) 930 4466 Ext 2442 or 2414
SE District/Region 6	43 District Workshop Telephone Aldershot (01252) 24431 Ext 3610 Mr P Strudwick, OIC Tels Section Army District Commander S02 Comms/MOULD Controller Telephone Aldershot (01252) 24431 Ext 2448 or 2447

(continued)

TABLE 1 LOCATIONS AND TELEPHONE NUMBERS (continued)

DISTRICT/REGION	REME WORKSHOP/DISTRICT COMMANDER
SW District/Region 7	27 District Workshop Telephone Warminster (01985) 21400 Ext 3268 Mr J Gilbert, OIC Production Planning Army District Commander S02 Comms/MOULD Controller Telephone Bulford (019803) 3371 Ext 2370
Wales/Region 8	34 Base Workshop Telephone (01952) 503144 Ext 685 Mr E Rigby, Branch Manager Electrical Repair Army District Commander S02 Comms/MOULD Controller Telephone Brecon (01874) 3111 Ext 234 or 301
Western/Region 9	34 Base Workshop Telephone (01952) 603144 Ext 685 Mr E Rigby, Branch Manager Electrical Repair Army District Commander S02 Comms/MOULD Controller Telephone Shrewsbury (01743) 52234 Ext 227 or 243
NW District/Region 10	42 District Workshop Telephone (0151) 1236 8080 Ext 2775 Mr P Sullivan, Supt (E & I) Army District Commander S02 Comms/MOULD Controller Telephone Preston (01772) 716543 Ext 2499