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OUTFIT 2QCB

VHF (ICAO) RADIO SYSTEM

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AMENDMENT RECORD

Amdt.	Incorporated By	Date	Brief Details
1			Changes to Transmit Power and Frequency Accuracy Test and Receiver Sensitivity Test as detailed in Cat 4B.
2			Changes to the procedures given in Cat 2C, Using the PAE Programmer.

OUTFIT 2QCB VHF (ICAO) RADIO SYSTEM

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FOREWORD

1 This publication describes the Outfit 2QCB VHF (ICAO) radio system. It covers installation, operation, technical information, and maintenance (planned and unplanned).

ASSOCIATED PUBLICATIONS

Outfit 2QCB VHF (ICAO) Radio System Installation and Guidance Package.

SAFETY WARNINGS

WARNINGS

(1) LETHAL VOLTAGES. EQUIPMENTS IN OPERATIONAL USE CONTAIN LETHAL VOLTAGES AND OPERATIONS INVOLVING THE REMOVAL OF COVERS OR PANELS SHOULD ONLY BE UNDERTAKEN BY SKILLED PERSONNEL WHO ARE AWARE OF THE HAZARDS INVOLVED. THE EQUIPMENT POWER SWITCHES DO NOT ISOLATE THE INPUT SUPPLY FROM THE EQUIPMENT. LETHAL VOLTAGES ARE STILL PRESENT IN THE EQUIPMENT. TO ENSURE SAFE WORKING DURING MAINTENANCE, THE AC SUPPLY MUST BE DISCONNECTED FROM THE EQUIPMENT.

(2) BERYLLIUM/BERYLLIA. THE EQUIPMENT COVERED BY THIS HANDBOOK CONTAINS COMPONENTS INCORPORATING THE HIGHLY TOXIC MATERIAL BERYLLIUM AND/OR ITS OXIDE BERYLLIA. THE COMPONENTS CONTAINING BERYLLIA/BERYLLIUM ARE SEMICONDUCTORS CONTAINED IN THE RF PA ASSEMBLY. THESE MATERIALS ARE ESPECIALLY HAZARDOUS IF:

BERYLLIUM MATERIALS ARE ABSORBED INTO THE BODY TISSUES THROUGH THE SKIN, MOUTH OR WOUND.

THE DUST CREATED BY BREAKAGE OF BERYLLIA IS INHALED.

TOXIC FUMES ARE INHALED FROM BERYLLIA/BERYLLIUM INVOLVED IN A FIRE. REFER TO BR 2000(8) FOR FURTHER INFORMATION.

CAUTION

ESDs. The equipment covered by this handbook contains electrostatic sensitive devices (ESDs). Observe handling precautions to avoid static charges that may damage these devices.

LIST OF ABBREVIATIONS

The following abbreviations are used in this document:

A	Ampere
ac	Alternating current
AM	Amplitude modulation
C	Celsius
CSA	Canadian Standards Association
dB	Decibel
dBm	Decibels relative to 1 mW
EMC	Electromagnetic compatibility
Hz	Hertz
ICAO	International Civil Aviation Organization
kg	Kilogram
kHz	Kilohertz
mA	Milliamp
MHz	Megahertz
mm	Millimetre
PAE	Park Air Electronics
PC	Personal computer
p-p	Peak-to-peak
ppm	Parts per million
PTT	Press to transmit
RCU	Remote control unit
RF	Radio frequency
RMS	Root mean square
Rout	Output impedance
Rx	Receive (receive data)
THD	Total harmonic distortion
Tx	Transmit (send data)
U x E	Upkeep by exchange
V	Volt
VHF	Very high frequency
W	Watt

CATEGORY 1

PURPOSE AND PLANNING

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CATEGORY 1A

SUMMARY OF DATA

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PURPOSE

1 Outfit 2QCB provides two-way ground-to-air communication within the VHF aeronautical frequency band between 118 and 136.990 MHz. The primary purpose of the outfit is to allow communication between the ship and civilian aircraft using 25 kHz or 8.33 kHz spaced channel frequencies.

BRIEF DESCRIPTION

2 The outfit comprises a Park Air Electronics (PAE) T6M base station and up to four PAE T6M Remote Control Units (RCU). Fist microphones are provided for use at the base station and at each RCU. Received signals are monitored through the base station's or the RCU's built-in loudspeakers.

T6M Base Station, NSN 5820-99-471-1699

3 The T6M base station is a multichannel VHF Amplitude Modulated (AM) radio that can operate on any 25 kHz, or 8.33 kHz, spaced channel frequency between 118 MHz and 136.9916 MHz. Three operating modes are available: Normal, Priority, and Scan.

4 The radio's 'personality' is programmed into its internal memory. A default personality has been installed during manufacture; details are in RNCP4. The personality defines up to 760 channel frequencies, the required operating modes, and various secondary options.

5 The radio's software, loaded on a 3.5 inch floppy disk, and a programming lead are supplied as part of Outfit 2QCB. These two items allow the radio to be reprogrammed at any time. A laptop, or Personal Computer (PC) running Windows™ 95, 98, or 2000 must be available to reprogramme the radio.

6 In normal mode, any channel frequency programmed into the base station can be selected using the front panel scroll keys. Priority mode allows faster access to frequently used channels. If scan mode is selected, the radio scans a number of pre-defined channels searching for a 'busy' one. When a busy channel is found, and depending on the programmed options, the radio remains tuned to that channel.

7 The base station can be desktop mounted as shown in Fig 1; alternatively, the radio can be inverted within its enclosure to allow deckhead mounting as shown in Fig 2. [Note that the integral fixing plates are not shown in Figs 1 and 2.]

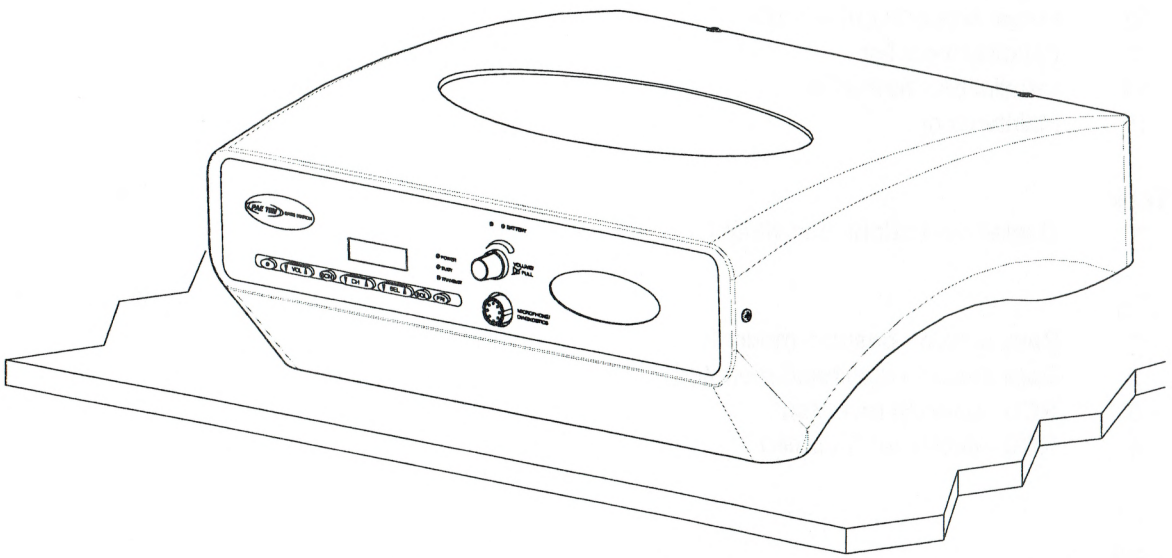


Fig 1 Base Station - Desktop Mounted

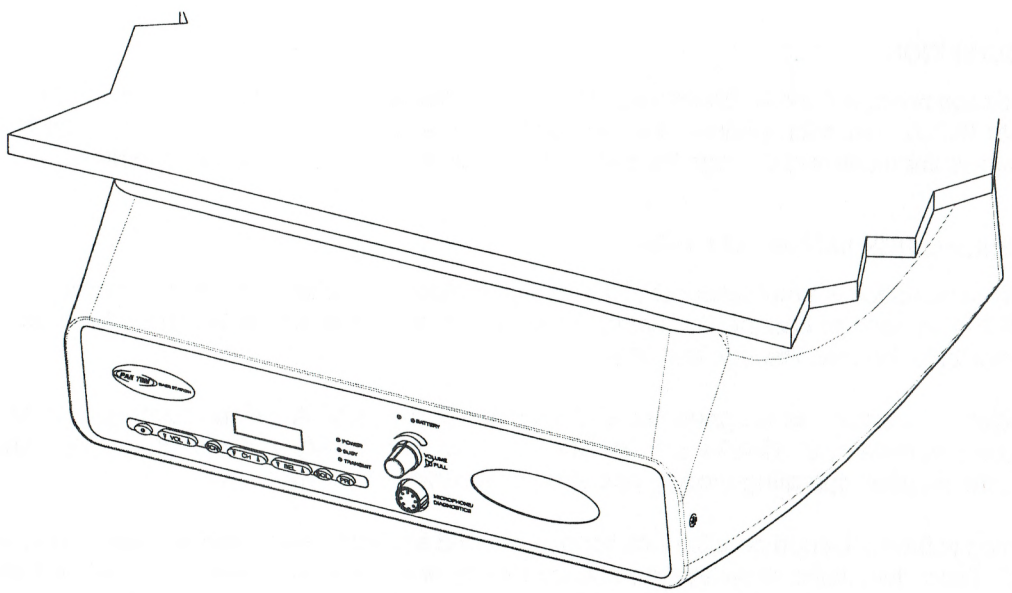


Fig 2 Base Station - Deckhead Mounted

T6M RCU, NSN 5820-99-297-5932

8 Up to four T6M RCUs can be connected to a T6M base station. An RCU allows transmissions and reception on the channel frequency currently selected at the base station. Neither the base station's operating mode, or the channel frequency, can be changed from an RCU position.

9 An intercom facility is available from the RCU's front panel. This facility allows an operator to speak to other RCU operating positions, or the base station position, without keying the transmitter.

10 The RCU can be desktop mounted as shown in Fig 3; alternatively, the RCU can be inverted within its enclosure to allow deckhead mounting as shown in Fig 4. [Note that the integral fixing plates are not shown in Figs 3 and 4.]

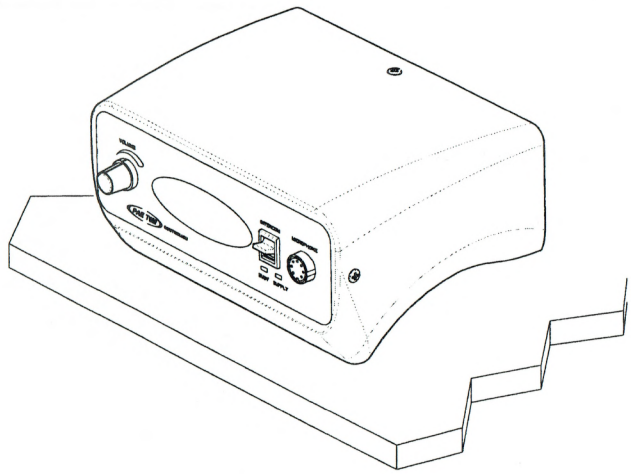


Fig 3 RCU - Desktop Mounted

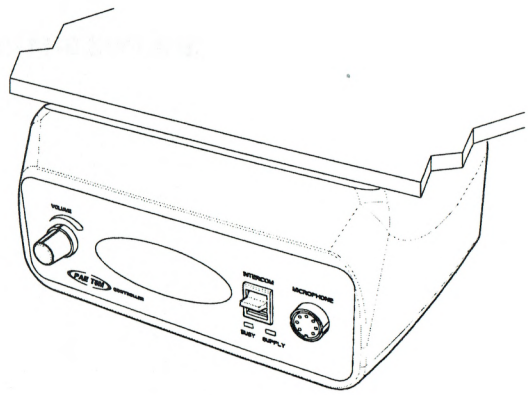


Fig 4 RCU - Deckhead Mounted

PHYSICAL DATA

11 The overall dimensions and weight are given in Table 1.

TABLE 1 OVERALL DIMENSIONS AND WEIGHT

Equipment	Height (mm)	Width (mm)	Depth (mm)	Weight (kg)
T6M Base Station	176	446	400	9 (without fixing plate) 10.5 (with fixing plate)
T6M RCU	112	220	165	2

POWER SUPPLY REQUIREMENTS

12 The following ship's power supplies are required:

12.1 115 V, 60 Hz, single phase.

ESTABLISHMENT LIST

13 S2472.

INSTALLATION INFORMATION

14 Installation specification for Outfit 2QCB is BR 9253 (4A).

MAINTENANCE

15 The Planned Maintenance Schedule number for Outfit 2QCB is PMS 9-1416-0000.

CATEGORY 1B

PERFORMANCE AND LIMITATIONS

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9	Supply
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GENERAL

1 The general parameters of Outfit 2QCB are listed below.

Operation	Simplex VHF AM transmit and receive.
Operating modes	Normal, priority, and scan.
Frequency range (25 kHz spacing)	Between 118 and 136.975 MHz.
Frequency range (8.33 kHz spacing)	Between 118 and 136.990 MHz.
Channel bandwidth	25 kHz and 8.33 kHz.
Channel increment	8.33 kHz.
Channel selection	Up to 760 frequency channels can be pre-programmed into the base station. Channel selection is available only from the base station's front panel.
Duty cycle (receive)	Continuous.
Duty cycle (transmit)	25% with a maximum transmit time of 5 minutes. Longer transmit times, or a higher duty cycle, reduces the output power by 6 dB.
Operating temperature range	Between -20°C and +55°C.
Storage temperature range	Between -40°C and +70°C.
Humidity	Can be operated in humidity up to 80%.
Maximum cable length	Cable length between the base station and RCU should not exceed 1.5 km.

BASE STATION

2 The base station's specification is given below.

Dimensions and Weight

3 The dimensions and weight of the base station are:

Width	446 mm.
Height	176 mm.
Depth	400 mm.
Weight	9 kg without fixing plate; 10.5 kg with fixing plate.

Supply

4 The base station requires the following supply:

Input voltage	115 V ac at 60 Hz single phase.
Maximum current	1.5 A.

Receive Circuit

5 The specification of the receive circuit is listed below.

Sensitivity	-104 dBm at 30% modulation depth for 10 dB (S+N):N.
Selectivity	With 8.33 kHz spacing: <6 dB at ±3 kHz; >60 dB at ±8.33 kHz. With 25 kHz spacing: <6 dB at ±8.5 kHz; >70 dB at ±25 kHz.
Intermodulation suppression	>70 dB.
Spurious response suppression	>80 dB.
Audio power output	4 W into 4 ohm integral speaker (<10% THD).
Distortion	<10% THD for 90% modulation depth.
RF input impedance	50 ohms.

Transmit Circuit

6 The specification of the transmitter is listed below.

RF output power	Adjustable between 5 and 12 W. Normally set at 8 W.
Spurious	<-46 dBm when more than 1 MHz from the carrier.
Harmonics	<-36 dBm.
Audio modulation	AM.
RF load impedance	50 ohms.

Frequency stability	±1.5 ppm.

RCU

7 The RCU's specification is given below.

Dimensions and Weight

8 The dimensions and weight of the RCU are:

Width	220 mm.
Height	112 mm.
Depth	165 mm.
Weight	2 kg.

Supply

9 The RCU requires the following supply:

Input voltage	115 V ac at 60 Hz single phase.
Maximum current	100 mA.

Connection to Base Station

10 The RCU connects to the base station through a 3-wire cable. At the RCU, the cable is terminated on the Facilities connector.

Operation from the RCU

11 Operation from the RCU is limited to transmissions and reception on the channel frequency currently selected at the base station. The base station's frequency cannot be changed from the RCU.

12 An intercom facility is available between the RCU and any other RCU, or the base station.

CATEGORY 1C

UPKEEP PLAN

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13 Contract repair statement
14 Facilities needed by fleet maintenance bases
Upkeep period statement
15 General data
16 Setting to work (STW) and harbour acceptance trials (HAT)
17 Support documentation

UPKEEP POLICY STATEMENT

1 The upkeep policy is 'upkeep by exchange (UxE)' of units. Faulty items should be returned to Naval Stores utilizing packaging from the replacement item. The items are subject to Repair Item Control List 1 (RICL1) procedures.

T6M Base Station

2 Except for one supply fuse, the T6M base station has no replaceable modules or sub-assemblies. A faulty base station must be replaced with a serviceable spare.

T6M RCU

3 Except for one supply fuse, the T6M RCU has no replaceable modules or sub-assemblies. A faulty RCU must be replaced with a serviceable spare.

Repair on Board

By ship's staff

4 Preventive maintenance and UxE unit.

By base staff

5 As for ship's staff.

By dockyard staff

6 As for ship's staff.

Repair for Ship

7 Dockyard workshop facilities are not required as all repairs are carried out by contractor.

Repair for Store

8 The equipment project manager arranges all repairs to be undertaken by the manufacturer.

Facilities on Board and Ashore

9 Normal EMR facilities are required to service this equipment.

Test equipment requirements are:

(1) Wattmeter set, NSN 6625-99-531-8989

(2) 20 dB load, NSN 6625-99-531-7069

(3) Frequency counter, NSN 6625-99-786-4628

(4) VHF signal generator, NSN 6625-99-253-9713

(5) AF wattmeter, NSN 6625-99-477-4004

(6) Test lead for connecting the base station to the AF wattmeter – local manufacture, see BR 9253, Cat 5C, Page 2, Table 2: test lead connections.

10 In addition to the test equipment list above, a laptop computer or Personal Computer (PC) running Windows™ 95, 98, or 2000 must be available to programme the base station's personality.

Weapon Maintenance Condition

11 During ship upkeep period, the equipment is to remain on board in Weapon Maintenance Condition 1a (Preserved) during refits, or Condition 1b (Preserved, unsealed) during DED etc. as defined in SSCP40 Part 2 Annex 2D.

REPAIR AND OVERHAUL FACILITIES

Dockyard Weapon Repair Facility Statement (DWRFS)

12 DWRFS WR538.

Contract Repair Statement

13 Repair and overhaul of all units is to be carried out by the contractor, Park Air Electronics Limited.

FACILITIES NEEDED BY FLEET MAINTENANCE BASES

14 Refer to Para 9.

UPKEEP PERIOD STATEMENT

General Data

15 The general data is as listed:

Power supply	115 V ac ±10%, between 45 and 65 Hz.
Consumption	T6M base station = 1.5 A. T6M RCU = 100 mA. Total = 1.6 A.
Dimensions and weight:	
T6M base station	Depth: 400 mm Width: 446 mm Height: 176 mm Weight: 9 kg without fixing plate; 10.5 kg with plate.
T6M RCU	Depth: 165 mm Width: 220 mm Height: 112 mm Weight: 2 kg.

Setting To Work (STW) and Harbour Acceptance Trials (HAT)

16 The facilities, services, and time required for STW and HAT are laid down in BR 9253, Category 4B/4C.

SUPPORT DOCUMENTATION

17 Support documentation is as listed:

Handbook	BR 9253.
E List	S2472.
DWRFS	WR538.

CATEGORY 2

OPERATING INFORMATION

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CATEGORY 2A

OPERATING INSTRUCTIONS

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INTRODUCTION

1 This category instructs how to operate Outfit 2QCB from the base station, or from an RCU.

2 The outfit provides transmission and reception on any 25 kHz, or 8.33 kHz, spaced channel frequency within the VHF aeronautical frequency band between 118 and 136.990 MHz. However, only those frequencies and operating modes that are pre-programmed into the base station can be selected. The base station can be reprogrammed at any time using the supplied software. Instructions for doing this are given in Category 2C.

3 Selection of operating mode, and channel selection, is available only at the base station. When operating from an RCU position, transmissions and reception is on the channel frequency currently selected at the base station.

4 Three operating modes are available: Normal, Priority, and Scan. In Normal mode, any frequency programmed into the system can be selected using the base station's front panel controls. Priority mode is similar to Normal mode, but allows faster selection of up to 15 frequently used channels.

5 In Scan mode, the radio scans a number of pre-defined channels searching for a 'busy' one. When a busy channel is found, and depending on the programmed options, the radio remains tuned to that channel ready for use. Scanning can be resumed at any time.

FRONT PANEL DISPLAY FOR 25 kHz AND 8.33 kHz CHANNEL SPACING

6 When selecting an 8.33 kHz channel frequency, the displayed frequency differs from the actual channel frequency. Table 1 shows the pattern used for 25 kHz and 8.33 kHz spaced channel frequencies from 118.000 MHz to 118.1916 MHz. The pattern is the same for any frequency within the base station's frequency range. The display conforms to ICAO convention for 8.33 kHz operation.

PROGRAMMABLE OPTIONS

7 A number of options can be programmed into the base station's personality. The options are detailed in the following paragraphs.

Display Blanking

8 Display blanking is applicable only to Normal and Priority modes; not Scan mode.

9 When display blanking is programmed, the base station's normal frequency display is replaced by a flashing bar if the radio is not keyed during the display blanking time period (between 10 and 300 seconds).

Example

Display blanking is programmed
Display blanking time is 60 seconds
Selected channel frequency is 121.500 MHz.

In this example, the display normally shows 121.500. If the transmitter is not keyed for 60 seconds, the display changes to a flashing bar.

Normal frequency display is reinstated when the radio is keyed, or when the VOL▲ or VOL▼ button is pressed. Note that the display can be reinstated by pressing any other button, but doing so may also alter other settings.

TABLE 1 25 kHz AND 8.33 kHz CHANNEL SPACING DISPLAYS

Actual Frequency (to 4 decimal places)	Channel Spacing	Displayed Frequency at Base Station's Front Panel
118.0000 MHz	**25 kHz**	**118.000 MHz**
118.0000 MHz	8.33 kHz	118.005 MHz
118.0083 MHz	8.33 kHz	118.010 MHz
118.0166 MHz	8.33 kHz	118.015 MHz
118.0250 MHz	**25 kHz**	**118.025 MHz**
118.0250 MHz	8.33 kHz	118.030 MHz
118.0333 MHz	8.33 kHz	118.035 MHz
118.0416 MHz	8.33 kHz	118.040 MHz
118.0500 MHz	**25 kHz**	**118.050 MHz**
118.0500 MHz	8.33 kHz	118.055 MHz
118.0583 MHz	8.33 kHz	118.060 MHz
118.0666 MHz	8.33 kHz	118.065 MHz
118.0750 MHz	**25 kHz**	**118.075 MHz**
118.0750 MHz	8.33 kHz	118.080 MHz
118.0833 MHz	8.33 kHz	118.085 MHz
118.0916 MHz	8.33 kHz	118.090 MHz
118.1000 MHz	**25 kHz**	**118.100 MHz**
118.1000 MHz	8.33 kHz	118.105 MHz
118.1083 MHz	8.33 kHz	118.110 MHz
118.1166 MHz	8.33 kHz	118.115 MHz
118.1250 MHz	**25 kHz**	**118.125 MHz**
118.1250 MHz	8.33 kHz	118.130 MHz
118.1333 MHz	8.33 kHz	118.135 MHz
118.1416 MHz	8.33 kHz	118.140 MHz
118.1500 MHz	**25 kHz**	**118.150 MHz**
118.1500 MHz	8.33 kHz	118.155 MHz
118.1583 MHz	8.33 kHz	118.160 MHz
118.1666 MHz	8.33 kHz	118.165 MHz
118.1750 MHz	**25 kHz**	**118.175 MHz**
118.1750 MHz	8.33 kHz	118.180 MHz
118.1833 MHz	8.33 kHz	118.185 MHz
118.1916 MHz	8.33 kHz	118.190 MHz

Warning Beeps

10 When programmed, the following conditions cause a warning beep to be heard when an attempt is made to key the transmitter:

10.1 The radio has a fault that prevents transmissions.

10.2 Trying to key the radio on a channel frequency that has the 'Transmit Inhibit' option set to 'Always Inhibit'.

10.3 Trying to key the radio on a busy channel that has the 'Inhibit if Busy' option selected.

10.4 Imminent transmitter time out.

11 The volume of warning beeps is set in the personality (a value between 1 and 7); the front panel volume control does not affect the beeps.

Key Beeps

12 This option, when programmed, produces a single beep whenever a button is pressed on the base station's front panel. The volume of the beep is the same as the Warning beep.

Transmit Inhibit

13 Any frequency programmed into the base station can be made 'receive only'. To achieve this, the transmit function on the channel is always inhibited, or the transmit facility can be inhibited only when the channel is busy. If warning sounds have been set, a warning is heard when an attempt is made to key the transmitter.

Maximum Transmit Time

14 A maximum continuous transmit time can be programmed into the base station's personality. The options are:

14.1 No limit.

14.2 A limit that can be set between 30 and 300 seconds.

15 If a limit has been set, and warning sounds have been set, the base station produces warning beeps 10 seconds before the transmission time expires.

FAULT AND ERROR CODES

16 A number of fault and error codes are shown on the base station's display if an internal fault is detected. The codes, and their meaning, are detailed in Table 2.

TABLE 2 FAULT AND ERROR CODES

Displayed Fault or Error Code	Title	Meaning
F1	Synthesiser failure	An internal fault on the synthesiser has been detected.
F2	Unstable output	An internal fault on the power amplifier has been detected.
F4	Over temperature	This condition may occur if the transmitter's duty cycle has been exceeded, or when transmitting for long periods. The fault should clear if the base station is not keyed while it is allowed to cool.
F16 F32	Low supply voltage High supply voltage	These two fault codes indicate the internal power supply is faulty.
cErr	Critical error	This error is displayed when the base station is initially switched on and no, or a corrupted, personality is detected.

OPERATION FROM THE BASE STATION POSITION

17 The following instructions detail operation of the base station using its front panel controls and indicators. Before commencing to use the outfit, the Supply switch fitted to the base station's rear panel must be set to on. Note that there is no front panel indication as to whether the rear panel supply switch is on or off.

SWITCHING ON AND OFF

18 To switch on the base station:

18.1 Press the PWR button for approximately one second until the display reads 'On'. Then release the button.

18.2 Check that a warbling sound is heard for a few seconds and then a channel frequency is displayed.

18.3 The base station is now ready for use.

19 To switch off the base station, press the PWR button until the display reads 'Off'. Then release the button.

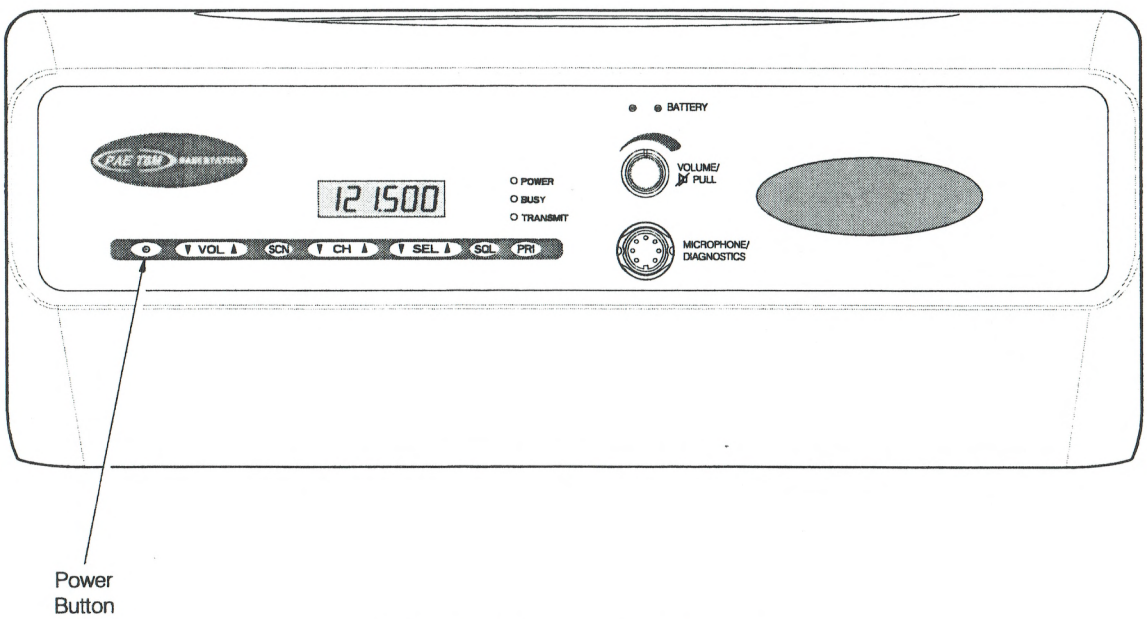


Fig 1 Base Station Front Panel

OPERATING THE BASE STATION IN NORMAL MODE

20 Operating the base station in Normal mode requires the following operations. Each operation is explained in following paragraphs.

(1) Select Normal mode if not currently selected.

(2) Select the required channel frequency.

(3) Transmit using the fist microphone, and receive using the base station's internal loudspeaker.

(4) Adjusting, if necessary, the Squelch facility.

Selecting Normal Mode

21 Normal mode is active when neither Priority mode or Scan mode is selected. If Priority mode is selected, the display shows 'P' every few seconds; if Scan mode is selected, the display shows 'Scn'. To select Normal mode if currently in Priority or Scan mode:

21.1 To select Normal mode if currently in Priority mode, press the CH▲ or CH▼ button.

21.2 To select Normal mode if currently in Scan mode, press the SCN button.

Selecting a Channel Frequency

22 To select the required channel frequency, press the CH▲ or CH▼ button to scroll up or down through the channel frequencies that are programmed into the base station. Release the button when the required frequency is displayed.

23 In conjunction with the CH▲ and CH▼ buttons, the SEL▲ and SEL▼ buttons can be used to step 10 channels at a time.

Transmitting and Receiving

24 To key the transmitter press the fist microphone's PTT button. Check that the base station's Tx indicator lights, and then speak clearly into the microphone.

25 Reception is heard through the base station's internal loudspeaker. The volume is adjusted using the front panel's rotary Volume control that must be pushed in to switch on the loudspeaker. **Users should note that the VOL▲ and VOL▼ buttons do not adjust the volume.** When a signal is received, the base station's busy indicator lights.

Switching and Adjusting the Squelch Facility

26 The base station has an adjustable squelch facility that can also be turned on and off. The squelch facility, when correctly set, mutes unwanted background noise when no signals are being received.

27 During normal use of the base station the squelch facility should be switched on. After initially setting the squelch level, there should be no reason to adjust it unless a problem is evident. The symptoms of an incorrectly adjusted squelch level are:

27.1 Background noise is continuously, or intermittently heard when no signals are being received. If this is the case, the setting is too low.

27.2 Weak signals (signals below the squelch threshold) are not being received. If this is the case, the setting is too high.

To Switch On the Squelch

28 To switch on the squelch facility:

28.1 Press the SQL button.

28.2 Check that the display shows an 'S' and the current level (a number between 1 and 20).

28.3 Check that after a few seconds the display changes to show the currently selected channel frequency. The squelch facility is now on.

To Switch Off the Squelch

29 To switch off the squelch facility:

29.1 Press the SQL button.

29.2 Check that the display shows an 'S' and the current level (a number between 1 and 20).

29.3 Press the SQL button while the display is showing 'S' and the current level.

29.4 Check that the display shows 'S OFF'.

29.5 Check that after a few seconds the display changes to show the currently selected channel frequency. The squelch facility is now off.

To Adjust the Squelch Level

30 To adjust the squelch facility:

30.1 Press the SQL button.

30.2 Check that the display shows an 'S' and the current level (a number between 1 and 20).

30.3 Press the VOL▲ button to increase the squelch threshold, or the VOL▼ button to decrease it. The squelch should be set to the lowest threshold setting (a number between 1 and 20) that eliminates background noise when no signal is being received.

30.4 After the required setting is selected, press no more buttons and check that after a few seconds the display changes to show the currently selected channel frequency. The squelch facility is now set.

OPERATING THE BASE STATION IN PRIORITY MODE

31 Priority mode allows faster access to frequently used channel frequencies. Up to 15 channel frequencies can be programmed into the base station's priority list. The Priority facility must be programmed into the base station before it can be selected, or used.

32 Operating the base station in Priority mode requires the following operations. Each operation is explained in following paragraphs.

(1) Select Priority mode if not currently selected.

(2) Select the required channel frequency.

(3) Transmit using the fist microphone, and receive using the base station's internal loudspeaker.

Selecting Priority Mode

33 Select Priority mode by pressing the PRI button. When selected, the display shows 'P' every few seconds.

Selecting a Priority Channel Frequency

34 To select the required channel frequency, press the SEL▲ or SEL▼ button to scroll up or down through the priority channel frequencies that are programmed into the base station. Release the button when the required frequency is displayed.

Transmitting and Receiving

35 To transmit, key the transmitter by pressing the fist microphone's PTT button. Check that the base station's Tx indicator lights, and then speak clearly into the microphone.

36 Reception is heard through the base station's internal loudspeaker. The volume is adjusted using the front panel's rotary Volume control that must be pushed in to switch on the loudspeaker. **Users should note that the VOL▲ and VOL▼ buttons do not adjust the volume.** When a signal is received, the base station's busy indicator lights. If the squelch facility requires adjusting, refer to para 26.

OPERATING THE BASE STATION IN SCAN MODE

37 In this mode the base station scans a number of pre-defined channel frequencies searching for a busy one. When a busy channel is found, the base station provides reception on that channel. The Scan facility must be programmed into the base station before it can be selected, or used.

Note ...

A channel is defined as busy when it is receiving a signal strong enough to override the squelch setting.

38 What happens after a busy channel is found depends on how the base station is programmed. There are two possible options: Hold and Pause.

38.1 If Hold is programmed, the base station remains tuned to the busy channel until the CH▲ button is pressed to resume scanning.

38.2 If Pause is programmed, the base station remains tuned to the busy channel for six seconds, then automatically resumes scanning. If during the six seconds the radio is keyed, or the CH▲ button is pressed, the base station remains tuned to the busy channel; scanning does not resume until the CH▲ button is pressed again.

39 The base station can be programmed with up to 15 scan groups, each containing up to 15 channel frequencies. Squelch is automatically switched on when scan mode is selected. Display blanking does not operate in scan mode.

Selecting Scan Mode

40 To select Scan mode, press the SCN button. Check that the display shows 'Scn' and a number between 1 and 15; the number corresponds to the currently selected scan group.

Selecting a Scan Group

41 When in Scan mode, the required scan group (a number between 1 and 15) is selected by pressing the SEL▲ or SEL▼ button.

Transmitting and Receiving

42 To transmit when the scan function is on hold, or pause, key the transmitter by pressing the fist microphone's PTT button. Check that the base station's Tx indicator lights, and then speak clearly into the microphone.

43 Reception is heard through the base station's internal loudspeaker. The volume is adjusted using the front panel's rotary Volume control that must be pushed in to switch on the loudspeaker. **Users should note that the VOL▲ and VOL▼ buttons do not adjust the volume.** When a signal is received, the base station's busy indicator lights. If the squelch facility requires adjusting, refer to para 26. The squelch cannot be switched off in scan mode.

OPERATION FROM AN RCU POSITION

44 The outfit can have up to four RCUs connected to a base station. Each RCU provides an operating position that can be used to transmit and receive on the frequency currently selected at the base station. The base station's frequency or operating mode cannot be changed from an RCU position.

45 In addition to normal transmit and receive facilities, an Intercom facility is provided. This facility allows an operator to speak to other RCU operating positions, or the base station position, without keying the transmitter. A fist microphone is provided for use with each RCU.

SWITCHING ON AND OFF

46 Power is switched to the RCU through the Power on/off switch fitted to the rear panel. When the power is switched on, the front panel Supply indicator is lit.

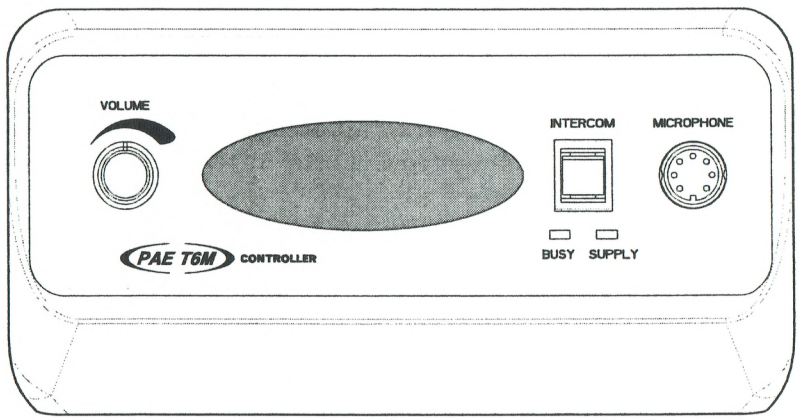


Fig 2 RCU Front Panel

TRANSMITTING AND RECEIVING

47 To key the transmitter, press the fist microphone's PTT button and then speak clearly into the microphone.

48 Reception is heard through the RCU's internal loudspeaker. The volume is adjusted using the front panel's rotary Volume control. When a signal that is above the base station's squelch threshold is received, the Busy indicator lights.

USING THE INTERCOM FACILITY

49 The intercom facility allows an operator to speak to other RCU operating positions, and the base station position without keying the transmitter.

50 To speak to other positions, press down the Intercom switch, then press the microphone's PTT switch and speak into the microphone. When finished, release the microphone's PTT switch, and then release the Intercom switch.

CATEGORY 2B

CONTROLS AND INDICATORS

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INTRODUCTION

1 This category describes the function of all front panel controls and indicators that are fitted to the T6M base station and the T6M RCU.

BASE STATION FRONT PANEL

Display (Fig 1, Item 1)

2 In Normal mode, the display shows the currently selected channel frequency. In Priority mode, the display shows the channel frequency but alternates to show a 'P' every few seconds.

3 In Scan mode, the display shows 'Scn' and the currently selected scan group (a number between 1 and 15). The display, in the event of a detected unserviceability, shows fault and error codes.

Transmit Indicator (Fig 1, Item 2)

4 A red indicator that lights when the transmitter is keyed and producing power.

Busy Indicator (Fig 1, Item 3)

5 A yellow indicator that lights when a signal, of sufficient strength to overcome the squelch circuit, is received. This indicator is always lit when the squelch facility is switched off.

Power Indicator (Fig 1, Item 4)

6 A green indicator that lights when the base station is switched on.

Microphone/Diagnostics Connector (Fig 1, Item 5)

7 A 7-pin DIN socket used to connect the fist microphone. This socket is also used to connect the base station to a laptop or PC so that the base station's personality can be programmed.

Volume Control (Fig 1, Item 6)

8 A rotary control used to adjust the volume of the internal loudspeaker. The control has an integral switch: when the control is pushed in, the loudspeaker is switched on; when the control is pulled out, the loudspeaker is switched off.

External Tx Inhibit Indicator (Fig 1, Item 7)

9 A red indicator that flashes when the external Tx inhibit facility is active. When active, the transmitter cannot be keyed on any frequency.

10 External Tx Inhibit is set, if required, by physically connecting pin 14 on the rear panel Facilities connector to earth (see Category 4A).

Battery Indicator (Fig 1, Item 8)

11 Not used in this application.

Loudspeaker Grille (Fig 1, Item 9)

12 The base station's internal loudspeaker is fitted behind this grille.

PRI Button (Fig 1, Item 10)

13 The Priority button is used to select Priority mode operation. This mode can only be selected when it is programmed into the base station's personality.

14 The Priority button is also used in the sequence to enter Test mode.

SQL Button (Fig 1, Item 11)

15 This button is used to switch on and off the squelch facility. The Squelch button is also used in the sequence to enter Test mode.

SEL▲ and SEL▼ Buttons (Fig 1, Item 12)

16 The Select buttons have different functions for different operating modes.

16.1 In Normal mode, the select buttons skip through the programmed channel frequencies 10 channels at a time. These buttons are used in conjunction with the CH▲ and CH▼ buttons to select the required channel frequency.

16.2 In Priority mode, these buttons are used to select the required Priority channel frequency.

16.3 In Scan mode, these buttons are used to select the required scan group.

17 These buttons are also used in the sequence to enter Test mode and to adjust the transmitter's output power within Test mode.

CH▲ and CH▼ Buttons (Fig 1, Item 13)

18 The Channel buttons have different functions for different operating modes.

18.1 In Normal mode, the channel buttons are used to select the required channel frequency.

18.2 In Scan mode, these buttons are used to resume scanning after a busy channel has been found and the radio is paused, or on hold.

SCN Button (Fig 1, Item 14)

19 This button is used to switch on and off Scan mode. The scan button is also used in the sequence to enter Test mode.

VOL▲ and VOL▼ Buttons (Fig 1, Item 15)

20 The Vol buttons are used to adjust the receiver's squelch threshold.

Power Button (Fig 1, Item 16)

21 The power button is used to switch on and off power to the radio circuits. When using this switch, it must be pressed, and kept pressed for approximately one second until the front panel display shows 'On' or 'Off'.

Note...

The Power button switches power to the radio circuits. The ac input supply to the base station is switched by the Power switch fitted on the base station's rear panel.

RCU FRONT PANEL

Volume Control (Fig 2, Item 1)

22 A rotary control used to adjust the volume of the internal loudspeaker.

Loudspeaker Grille (Fig 2, Item 2)

23 The RCU's internal loudspeaker is fitted behind this grille.

Intercom Switch (Fig 2, Item 3)

24 The Intercom switch, when pressed down, allows an operator to talk to other RCU positions, and the base station operating position without keying the transmitter.

Busy Indicator (Fig 2, Item 4)

25 A red indicator that lights when a signal is received, or when transmitting.

Supply Indicator (Fig 2, Item 5)

26 A red indicator that lights when the ac input supply to the RCU is connected, and the rear panel supply switch is set to on.

Microphone Connector (Fig 2, Item 6)

27 A 7-pin DIN socket used to connect the fist microphone.

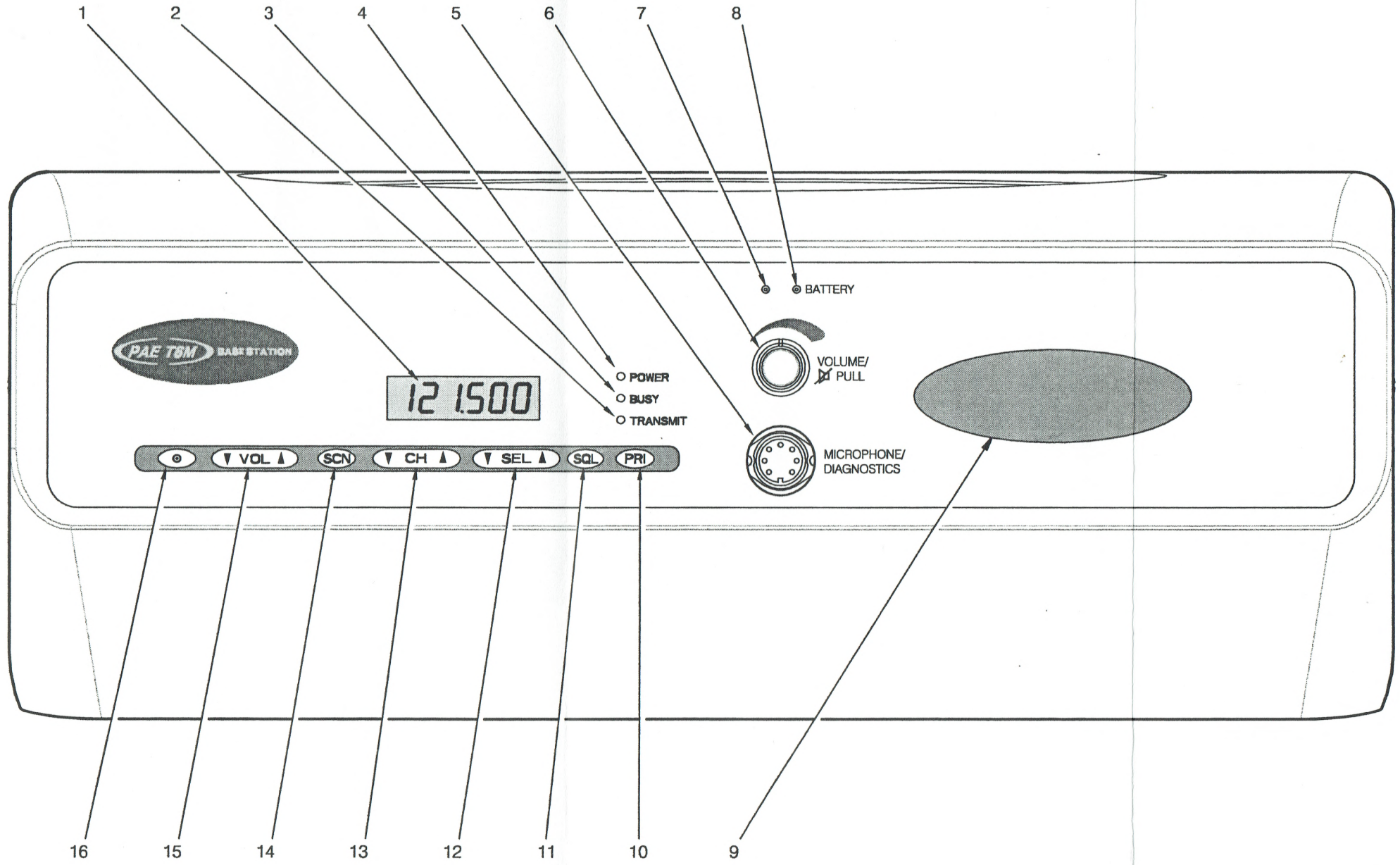


Fig 1 T6M Base Station Front Panel Layout

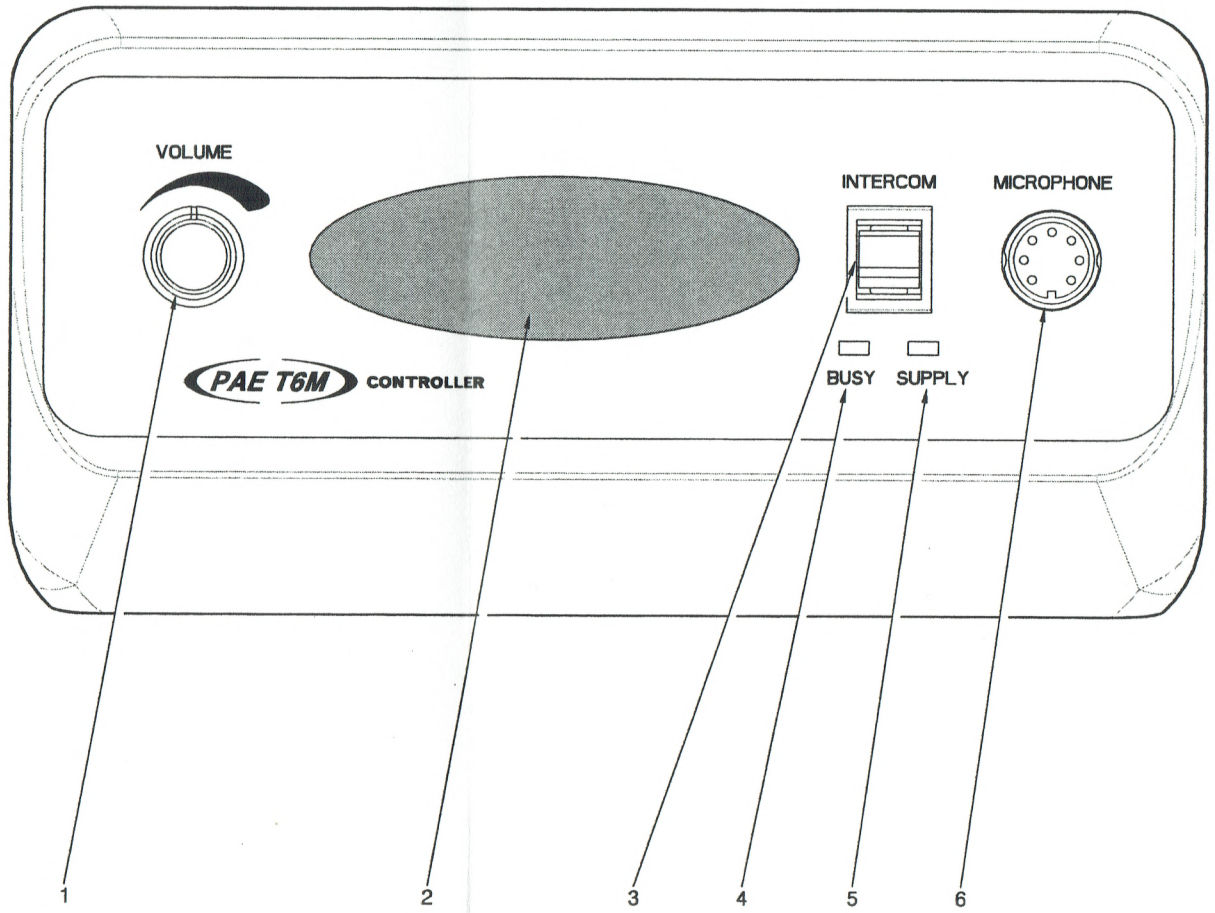


Fig 2 T6M RCU Front Panel Layout

CATEGORY 2C

USING THE PAE PROGRAMMER

CONTENTS

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1	Introduction	
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6	Uninstalling the programming software	
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10	Warning beeps	
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13	Hold on scan	
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15	Saving a personality	
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INTRODUCTION

1 During manufacture, the T6M base station is programmed with a default personality. Details are contained in RNCP4.

Note ...

A personality is the programme that defines the base station's channel frequencies, operating modes, and other options.

2 A new personality can be compiled and loaded into the base station at any time using the CD-ROM based software and programming lead supplied with the outfit. A laptop computer, or PC, must be available to compile the personality. A new personality may be required for mission specific operations. After such operations, the base station should be reprogrammed with the default personality.

3 The following procedures are given in this category:

3.1 Installing the programming software onto a laptop computer, or PC.

3.2 Uninstalling the programming software from a laptop, or PC.

3.3 Creating a new personality.

3.4 Saving a personality.

3.5 Opening a saved personality.

3.6 Loading a personality into the base station.

3.7 Reading a personality from the base station.

3.8 Printing a personality report.

INSTALLING THE PROGRAMMING SOFTWARE ONTO A LAPTOP COMPUTER, OR PC

4 The programming software is supplied on a CD-ROM. The software should be installed onto NavyStar Laptop designated for the Maintainer's use.

5 The person installing the software must have Administration or Power User rights.

5.1 Log on to the laptop using the Administrator's account.

5.2 Insert the CD into the CD drive.

5.3 From the Start menu select Programs - Windows NT Explorer.

5.4 Expand the E: (CD drive) and double click e:\setup.exe to install the utility.

5.5 Follow the on-screen instructions and accept defaults as follows:

Select Next [Choose Destination Location].

Select Next [Select Program Folder].

Select Next [Start Copying Files].

Select Finish [Setup Complete].

5.6 Close Windows NT Explorer and log off to secure the laptop.

Uninstalling the Programming Software

6 The programming software can be removed from a laptop, or PC, where it was previously loaded by using the following uninstall procedure. To remove the software:

6.1 Using the mouse, left-click on the Windows Start button and select 'Settings' and then left-click on 'Control Panel'.

6.2 Identify, and then double left-click on the Add/Remove Programmes icon. A list of all software installed on the laptop (or PC) is displayed.

6.3 Highlight the Park Air Airband Radio Programmer and then left-click on the Add/Remove button. Confirm the deletion when prompted.

6.4 Select OK when complete and Cancel to exit Add/Remove Programs. Close Control Panel and log off to secure the laptop.

CREATING A NEW PERSONALITY

7 This procedure creates a new personality for use by the base station. The personality includes all channel frequencies, operating modes and options that are required when the base station is in operational use. When the personality has been compiled, it can be loaded into the radio's memory by connecting the laptop (or PC) to the base station using the programming lead supplied with the outfit. Table 1 lists the programming options, and paras 8 to 13 explain some of the options. The procedure for creating a new personality starts at para 14.

Display Blanking

8 Display blanking is applicable only to Normal and Priority modes; not Scan mode.

9 When display blanking is enabled, the base station's normal frequency display is replaced by a flashing bar if the radio is not keyed during the display blanking time period.

Example

Display blanking is enabled
Display blanking time is 60 seconds
Selected channel frequency is 121.500 MHz.

In this example, the display normally shows 121.500. If the transmitter is not keyed for 60 seconds, the display changes to a flashing bar.

Normal frequency display is reinstated when the radio is keyed, or when the VOL▲ or VOL▼ button is pressed. Note that the display can be reinstated by pressing any other button, but doing so may also alter base station settings.

Warning Beeps

10 When enabled, the following conditions cause a warning beep to be heard when an attempt is made to key the transmitter:

10.1 The radio has a fault that prevents transmissions.

10.2 Trying to key the radio on a channel frequency that has the 'Transmit Inhibit' option set to 'Always Inhibit'.

10.3 Trying to key the radio on a busy channel that has the 'Inhibit if Busy' option selected.

10.4 Imminent transmitter time out.

11 The volume of warning beeps is set in the personality (a value between 1 and 7); the front panel volume control does not affect the beeps.

Key Beeps

12 This option, when enabled, produces a single beep whenever a button is pressed on the base station's front panel. The volume of the beep is the same as the Warning beep.

TABLE 1 PROGRAMMING OPTIONS

Option	Range	Default	Notes
Display blanking	On or off	Off	See para 8.
Display blanking time	10 to 300 seconds	60 seconds	See para 8.
Maximum transmit time	30 to 300 seconds, or unlimited	180 seconds	Limits the maximum continuous transmit time.
Hold on scan mode	On or off	On	See para 13.
Key beeps	On or off	On	See para 12.
Warning beeps	On or off	On	See para 10.
Warning beep volume	1 to 7	3	See para 10.
Personality description	46 character alphanumeric string	Empty string	A free format text string that defines the radios personality.
Use channel strings	Yes or no	No	Defines whether channel frequencies are to include descriptive strings. Selecting Yes for this option reduces the maximum number of channels that can be stored from 760 to 400.
Busy on time	0.1 to 5 seconds	0.5 seconds	Squelch must be open for this time before a channel is considered to be busy.
Offset channels	On or off	On	When set to on, the radio scans for the strongest frequency within a 25 kHz channel. This option is always set to on.
Frequency	118 to 136.9916 MHz	-	Enter this in ICAO format (see Table 2); this format automatically defines the frequency and the bandwidth.
Priority channel	Yes or no	No	Up to 15 channels can be defined as priority channels.
Scan group	1 to 15 or not assigned	No scan groups assigned	Up to 15 channels can be assigned to each of 15 scan groups. A channel frequency can be included in more than one group.
Transmit inhibited	No inhibit Always inhibit Inhibit if busy	No inhibit	This option can be used to prevent the radio transmitting on any particular channel frequency.
Identification string	46 character alphanumeric string	Empty string	A free format text string that describes the channel frequency.
Base	Enabled or disabled	Enabled	**Must** be enabled for correct operation of the base station.

Hold on Scan

13 When in scan mode, what happens after a busy channel is found depends on how the base station is programmed. There are two possible options: Hold and Pause.

13.1 If Hold is programmed, the base station remains tuned to the busy channel until the CH▲ button is pressed to resume scanning.

13.2 If Pause is programmed, the base station remains tuned to the busy channel for six seconds, then automatically resumes scanning. If during the six seconds the radio is keyed, or the CH▲ button is pressed, the base station remains tuned to the busy channel; scanning does not resume until the CH▲ button is pressed again.

Procedure

14 To create a new personality, use the following procedure. If power to the laptop, or PC, is lost during the procedure, start again from the beginning.

14.1 At the laptop (or PC) run the PAE programmer software. Check that the General Page (see Fig 1) is displayed. If the Frequencies Page is displayed, select the General tab.

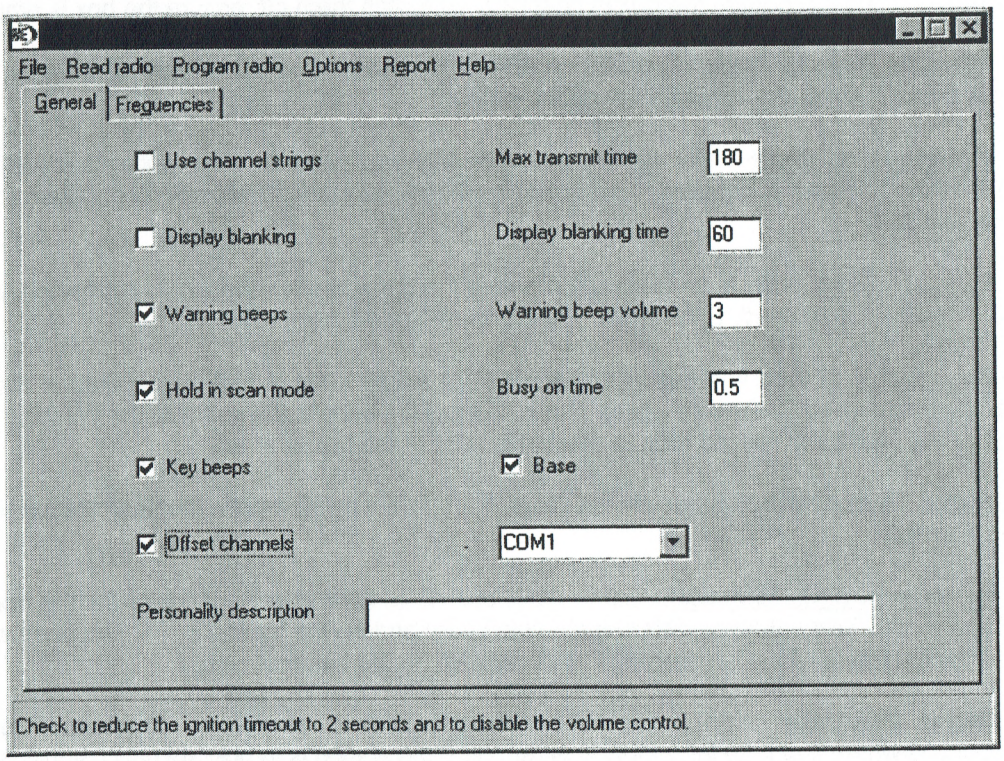


Fig 1 General Page

14.2 From the menu-bar select File then New. This action resets all options to the default value and clears all entries, except one, in the frequency table.

14.3 **Use Channel Strings.** Decide if you wish to store descriptive text for any of the channel frequencies that will be programmed. If you do, use the mouse to ensure the box is checked. If you do not wish to use this facility, use the mouse to ensure the box is empty.

Notes ...

Descriptive text is shown on the frequency list within this programme; it is not displayed at the base station.

If the Use Channel Strings facility is selected, the maximum number of channel frequencies that can be stored is reduced from 760 to 400.

14.4 **Maximum Transmit Time**. This setting alters the maximum time the transmitter can be keyed. Key in a value between 30 and 300 (seconds), or if no limit is required, enter 0. If a limit has been set, and warning beeps are set, a warning is heard 10 seconds before the base station stops transmitting.

14.5 **Display Blanking**. Display blanking is described in para 8. If you require this facility use the mouse to ensure the box is checked. If you do not wish to use this facility, use the mouse to ensure the box is empty.

14.6 **Display Blanking Time**. Enter a number between 10 and 300 (seconds). This is the time used when the display blanking facility is selected to be active. Display blanking is described in para 8.

14.7 **Warning Beeps**. Warning beeps, as described in para 10, can be set to on or off. To set them to on use the mouse to ensure the box is checked. To switch them off, ensure the box is empty.

14.8 **Warning Beep Volume**. The volume of warning beeps (if used) is represented by a figure between 1 and 7. Enter the required value in the box.

14.9 **Hold in Scan Mode**. This facility, which is only applicable to scan mode, is explained in para 13. When this box is checked, hold in scan mode is selected; if not checked, pause in scan mode is selected.

14.10 **Busy On Time**. This is the time a radio must be busy, when scan mode is selected, before the radio holds, or is paused. Enter a value between 0.1 and 5 seconds.

14.11 **Key Beeps**. When key beeps are enabled, a single beep is heard whenever a button is pressed on the base station's front panel. The volume of the beep is the same as the Warning beep. To enable this facility, check the box; to disable it, ensure the box is empty.

14.12 **Base**. This check box **must** always display a tick. If it is left empty, the base station will not operate correctly.

14.13 **COM1 or COM2 Selection**. Either Com port 1, or Com port 2, can be selected from the drop-down menu. This selection determines which com port on the laptop, or PC, the base station must be connected to when transferring the personality to the base station.

14.14 **Offset Channels**. The offset channels box should always be checked. The only circumstances where it can be left empty is when the base station is to operate only using 8.33 kHz spaced channels.

14.15 **Personality Description**. A unique name for the personality can be entered here (maximum of 46 characters).

14.16 When all fields on the General page are correctly configured, use the mouse and click on the Frequencies tab. Check that the Frequencies page is shown (see Fig 2).

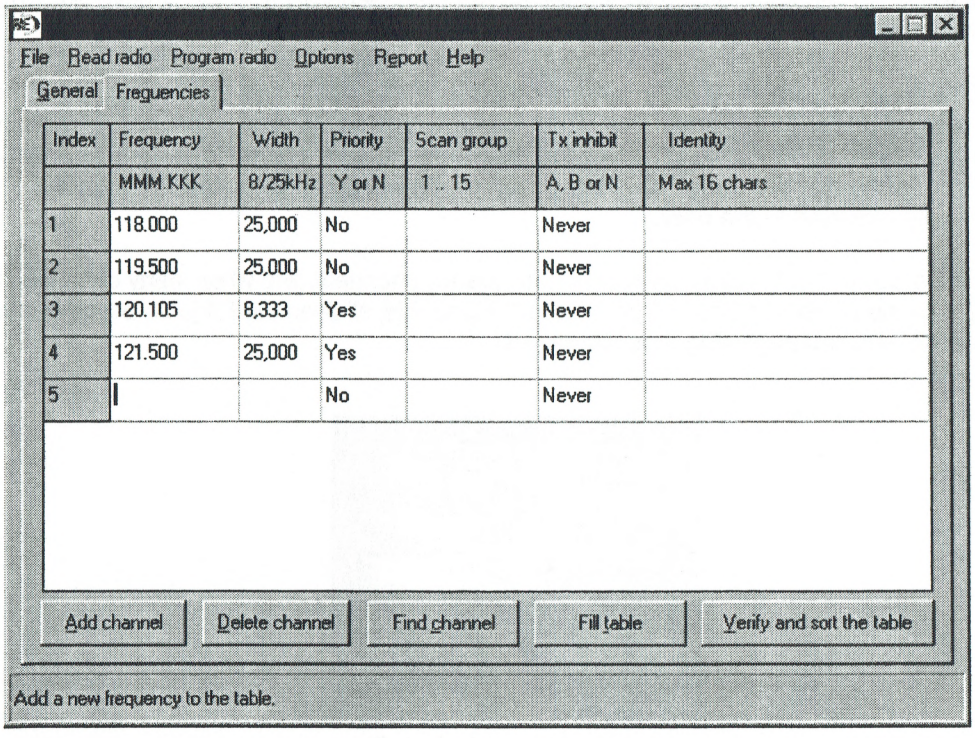


Fig 2 Frequencies Page

14.17 When the Frequencies page is first selected there will be one default frequency shown. If this frequency is required leave it as it is; if not, click in the frequency box and change the frequency to that required.

Note ...

Enter frequencies in ICAO format. The software recognises the frequency and appropriate channel spacing (width). There is no need to manually enter the channel spacing. The ICAO format is illustrated in Table 2.

14.18 If the frequency is required to be included in the Priority list, key in Y in the priority column. If not required, ensure the column reads No.

14.19 If the frequency is required to be included in a Scan group, enter the scan group number (between 1 and 15) in the scan group column. If the frequency is to be included in more that one scan group, enter the group numbers, separating each with a comma. Note that up to 15 frequencies can be included in each scan group.

14.20 The Tx Inhibit facility must now be set for the frequency. This facility determines when the base station can transmit. Three options are allowed:

- Never. Key in N. This means the inhibit function is never enabled. The transmitter can be keyed at any time, including at times when the channel is busy.
- Busy. Key in B. This means the inhibit function is enabled when the channel is busy. The transmitter can however be keyed at all other times.
- Always. Key in A. This means the inhibit function is always enabled. The channel is therefore 'receive only' and the transmitter can never be keyed.

14.21 If the Channel String option was selected from the General page, descriptive text (maximum of 16 characters) can be keyed into the Identity column.

14.22 One frequency channel entry is now complete. Further channels can be entered in the same way by clicking on the Add channel box. To delete any entered channel, highlight the frequency and click on the Delete channel box. When all the required frequency channels have been entered, click on the 'Verify and sort the table' box. Any errors made when compiling the Frequencies page are automatically identified to the user.

14.23 As an alternative to manually entering frequency channels, and when many channels must be entered, a range of frequencies can be entered. To do this, click on the Fill table box and check that the Add channels sub-page (Fig 3) is displayed.

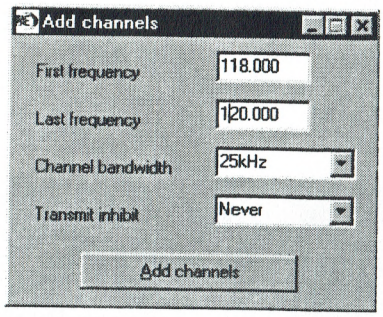


Fig 3 Add Channels Sub-Page

14.24 From the Add channels sub-page, enter the first and last frequencies in the required range. From the drop-down menu, select the channel spacing (bandwidth); this can be 25 kHz, 8.33 kHz, or both. From the drop-down menu select the Transmit inhibit condition (Always, Never, or Busy). When complete, click on the Add channels box. After the list of frequenies is displayed on the Frequencies page, any individual frequency channel can be amended, for example adding it to the priority list, as required. When all the required frequency channels have been entered, click on the 'Verify and sort the table' box. Any errors made when compiling the Frequencies page are automatically identified to the user.

14.25 When a lot of frequencies are entered and it is required to amend the entry, for example adding it to the priority list, a quick method of displaying the frequency is by clicking on the Find channel box. This displays the Find frequency sub-page (Fig 4). Enter the frequency on the sub-page and click on Find it. The frequency is then displayed on the Frequencies page. After amending the entry, click on the 'Verify and sort the table' box. Any errors made are automatically identified to the user.

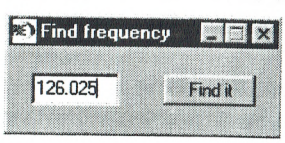


Fig 4 Find Frequency Sub-Page

TABLE 2 25 kHz AND 8.33 kHz CHANNEL SPACING DISPLAYS

Actual Frequency (to 4 decimal places)	Channel Spacing	Enter These Numerals on the Frequencies Page
118.0000 MHz	**25 kHz**	**118.000 MHz**
118.0000 MHz	8.33 kHz	118.005 MHz
118.0083 MHz	8.33 kHz	118.010 MHz
118.0166 MHz	8.33 kHz	118.015 MHz
118.0250 MHz	**25 kHz**	**118.025 MHz**
118.0250 MHz	8.33 kHz	118.030 MHz
118.0333 MHz	8.33 kHz	118.035 MHz
118.0416 MHz	8.33 kHz	118.040 MHz
118.0500 MHz	**25 kHz**	**118.050 MHz**
118.0500 MHz	8.33 kHz	118.055 MHz
118.0583 MHz	8.33 kHz	118.060 MHz
118.0666 MHz	8.33 kHz	118.065 MHz
118.0750 MHz	**25 kHz**	**118.075 MHz**
118.0750 MHz	8.33 kHz	118.080 MHz
118.0833 MHz	8.33 kHz	118.085 MHz
118.0916 MHz	8.33 kHz	118.090 MHz
118.1000 MHz	**25 kHz**	**118.100 MHz**
118.1000 MHz	8.33 kHz	118.105 MHz
118.1083 MHz	8.33 kHz	118.110 MHz
118.1166 MHz	8.33 kHz	118.115 MHz
118.1250 MHz	**25 kHz**	**118.125 MHz**
118.1250 MHz	8.33 kHz	118.130 MHz
118.1333 MHz	8.33 kHz	118.135 MHz
118.1416 MHz	8.33 kHz	118.140 MHz
118.1500 MHz	**25 kHz**	**118.150 MHz**
118.1500 MHz	8.33 kHz	118.155 MHz
118.1583 MHz	8.33 kHz	118.160 MHz
118.1666 MHz	8.33 kHz	118.165 MHz
118.1750 MHz	**25 kHz**	**118.175 MHz**
118.1750 MHz	8.33 kHz	118.180 MHz
118.1833 MHz	8.33 kHz	118.185 MHz
118.1916 MHz	8.33 kHz	118.190 MHz

Note ...

Table 2 shows a range of frequencies between 118.000 and 118.1916 MHz. The ICAO format follows the same pattern throughout the VHF aeronautical band.

SAVING A PERSONALITY

15 When a personality has been compiled, it should be saved. To do this:

15.1 From the programming menu, select File, then Save As.

15.2 When the Save As window is displayed enter a file name for the personality. The file name must have the extension .PER.

15.3 Click on Save to store the personality. Before the save process, the personality is automatically checked for any errors. If errors do exist they are highlighted to the user.

15.4 If the save is successful, the file name appears at the top of the programming window. At any time, the personality can be edited and saved using the same file name. Any locally saved personality files should be protected by copying to a floppy disk, or by copying to the user's Home drive or a folder created in their Department area.

OPENING A SAVED PERSONALITY

16 To open a previously saved personality:

16.1 From the programming menu, select File, then Open.

16.2 Select one of the personality files and click on Open.

LOADING A PERSONALITY INTO THE BASE STATION

17 Use the following procedure to load a personality into the base station:

17.1 Switch off the laptop (or PC) and the base station. Disconnect the laptop from the network.

17.2 At the base station, disconnect the microphone from the front panel connector. Replace it with the programming lead (NSN 5995-99-182-2589).

17.3 Connect the other end of the programming lead to the laptop's (or PC's) Com port 1 or Com port 2 (Fig 5). Note that the appropriate port is set in the personality. The connected port must match that stated in the personality. Check, and amend if necessary.

17.4 Switch on the base station and the laptop. At the laptop check that 'Pr' is shown on the front panel display.

17.5 Ensure the programming software is running and display the required personality on screen.

17.6 From the programming menu-bar select 'Program radio' and then 'Personality'.

17.7 The programmer automatically verifies the personality is valid and downloads it to the base station. If it is not valid the nature of the error will be displayed. The progress of the programming operation is displayed on the status line at the bottom of the programming screen.

17.8 When programming is complete, switch off the base station and laptop, remove the programming lead, and reconnect the base station's microphone.

17.9 Make the base station ready for operational use.

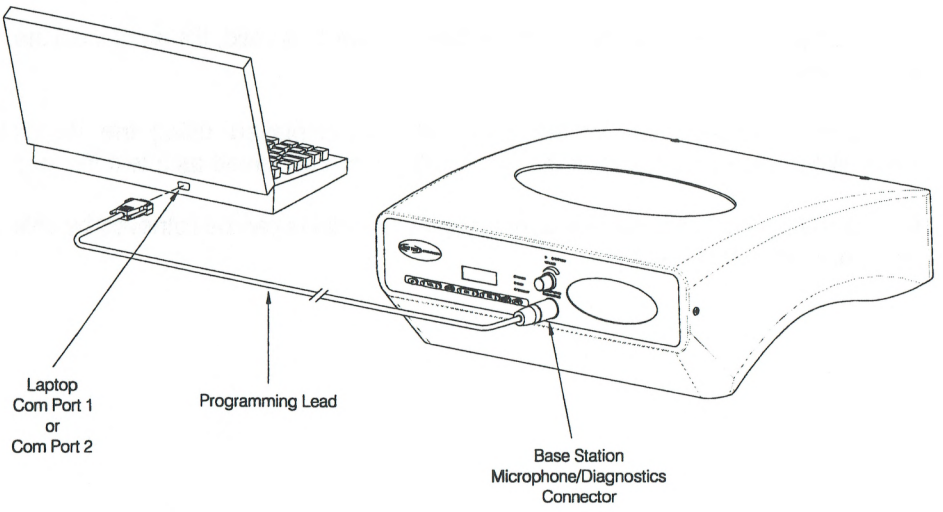


Fig 5 Connecting the Programming Lead

READING A PERSONALITY FROM THE BASE STATION

18 To read a personality from the base station:

18.1 Switch off the laptop (or PC) and the base station.

18.2 At the base station, disconnect the microphone from the front panel connector. Replace it with the programming lead (NSN 5995-99-182-2589).

18.3 Connect the other end of the programming lead to the laptop's (or PC's) Com port 1 or Com port 2 (Fig 5). Note that the appropriate port is set in the personality. The connected port must match that stated in the personality. Check, and amend if necessary.

18.4 Switch on the base station and the laptop. At the laptop check that 'Pr' is shown on the front panel display.

18.5 Ensure the programming software is running and display the required personality on screen.

18.6 From the programming menu-bar select 'Read radio' and then 'Personality'.

18.7 The progress of the read operation is displayed on the status line at the bottom of the programming screen.

18.8 When complete, switch off the base station and laptop, remove the programming lead, and reconnect the base station's microphone.

18.9 Make the base station ready for operational use.

PRINTING A PERSONALITY REPORT

19 A personality can be printed as follows:

19.1 Ensure the laptop is disconnected from the base station and is connected to the network.

19.2 From the programming menu, select Report, then Generate.

19.3 The programmer automatically verifies the personality is valid. If it is not valid the nature of the error will be displayed.

19.4 A textual representation of the personality is displayed using the Windows Notepad programme. When Notepad displays the personality it can be saved as a text file, or printed.

19.5 Previously saved Notepad files containing personalities can be retrieved by selecting Report, then Open from the menu-bar.

CATEGORY 3

SYSTEM DESCRIPTION

CONTENTS

CATEGORY 3A SYSTEM DESCRIPTION

CATEGORY 3A

SYSTEM DESCRIPTION

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INTRODUCTION

1 Outfit 2QCB provides two-way ground-to-air communication within the VHF aeronautical frequency band between 118 and 136.990 MHz. The outfit allows communication between the ship and civilian aircraft using 25 kHz or 8.33 kHz spaced channel frequencies.

2 The equipment comprises a Park Air Electronics (PAE) T6M base station and up to four PAE T6M Remote Control Units (RCU). Fist microphones are provided for use at the base station and at each RCU. Received signals are monitored through the base station's or the RCU's built-in loudspeakers.

T6M Base Station

3 The T6M base station is a multichannel VHF Amplitude Modulated (AM) radio that can operate on any 25 kHz, or 8.33 kHz, spaced channel frequency between 118 MHz and 136.9916 MHz. Three operating modes are available: Normal, Priority, and Scan.

4 The radio's default personality has been programmed into its internal memory during manufacture. The personality can define up to 760 channel frequencies, the required operating modes, and various secondary options.

5 The radio's software, loaded on a 3.5 inch floppy disk, and a programming lead are supplied as part of Outfit 2QCB. These two items allow the radio to be reprogrammed at any time. A laptop, or Personal Computer (PC) running Windows™ 95, 98, or 2000 must be available to reprogramme the radio.

6 In normal mode, any channel frequency programmed into the base station can be selected using the front panel scroll keys. Priority mode allows faster access to frequently used channels. If scan mode is selected, the radio scans a number of pre-defined channels searching for a 'busy' one. When a busy channel is found, and depending on the programmed options, the radio remains tuned to that channel.

T6M RCU

7 Up to four T6M RCUs can be connected to a T6M base station. An RCU allows transmissions and reception on the channel frequency currently selected at the base station. Neither the base station's operating mode, or the channel frequency, can be changed from an RCU position.

8 An intercom facility is available from the RCU's front panel. This facility allows an operator to speak to other RCU operating positions, or the base station position, without keying the transmitter.

SYSTEM

9 The system is shown schematically in Fig 1, and the interconnections detailed in Fig 2.

10 Up to four RCUs can be connected to any base station. Connections are made through parallel connected RCU D-type sockets fitted on the base station's rear panel. The four-wire connection between the base station and each RCU carries two-wire audio and a PTT signal.

11 Fist microphones connect to the RCUs' and base station's front panel. The Microphone/Diagnostics connector at the base station serves a dual purpose. When the microphone is disconnected, a programming lead can connect the base station to a laptop, or personal computer. This lead allows a new personality to be downloaded into the radio's memory.

Optional Facilities

12 Three optional external facilities can be connected to the base station. Although not all are intended to be used by the Royal Navy immediately after initial installation, they are detailed here for possible future use. The three facilities are:

12.1 An audio output to drive an external tape recorder.

12.2 Transmit audio, received audio, and PTT lines for use with a control desk.

12.3 A transmit inhibit signal.

13 The external facilities are connected to the base station's Facilities connector (see Cat 4A, Fig 13). This connector is detailed in Table 1.

TABLE 1 BASE STATION FACILITIES CONNECTOR PIN-OUT

Base Station's Facilities Connector Pin Number	Signal	Input or Output	Description
1	Ground	-	0 V
2 3	Tape + Tape -	Output	A balanced 600 Ω twisted pair providing audio to drive a tape recording system. The output level is 0 dBm (sine wave on 600 Ω) for 85% modulation depth
4	Not connected	-	-
5 6 7 8 9 10	Control Desk Rx + Control Desk Rx - Control Desk Tx + Control Desk Tx - Control Desk PTT + Control Desk PTT -	Output Input Input	A 6-wire system comprising two 600 Ω twisted pair balanced lines for Rx and Tx audio, plus a line pair for PTT The audio line levels are 0 dBm (sine wave on 600 Ω) for 85% modulation depth. PTT can be activated either by shorting together the PTT lines, or by phantom keying on the Tx lines
11 12 13	Not connected Not connected Not connected	-	-
14	External Tx inhibit	Input	When this line is connected to 0 V, the base station cannot be keyed
15	Ground	-	0 V

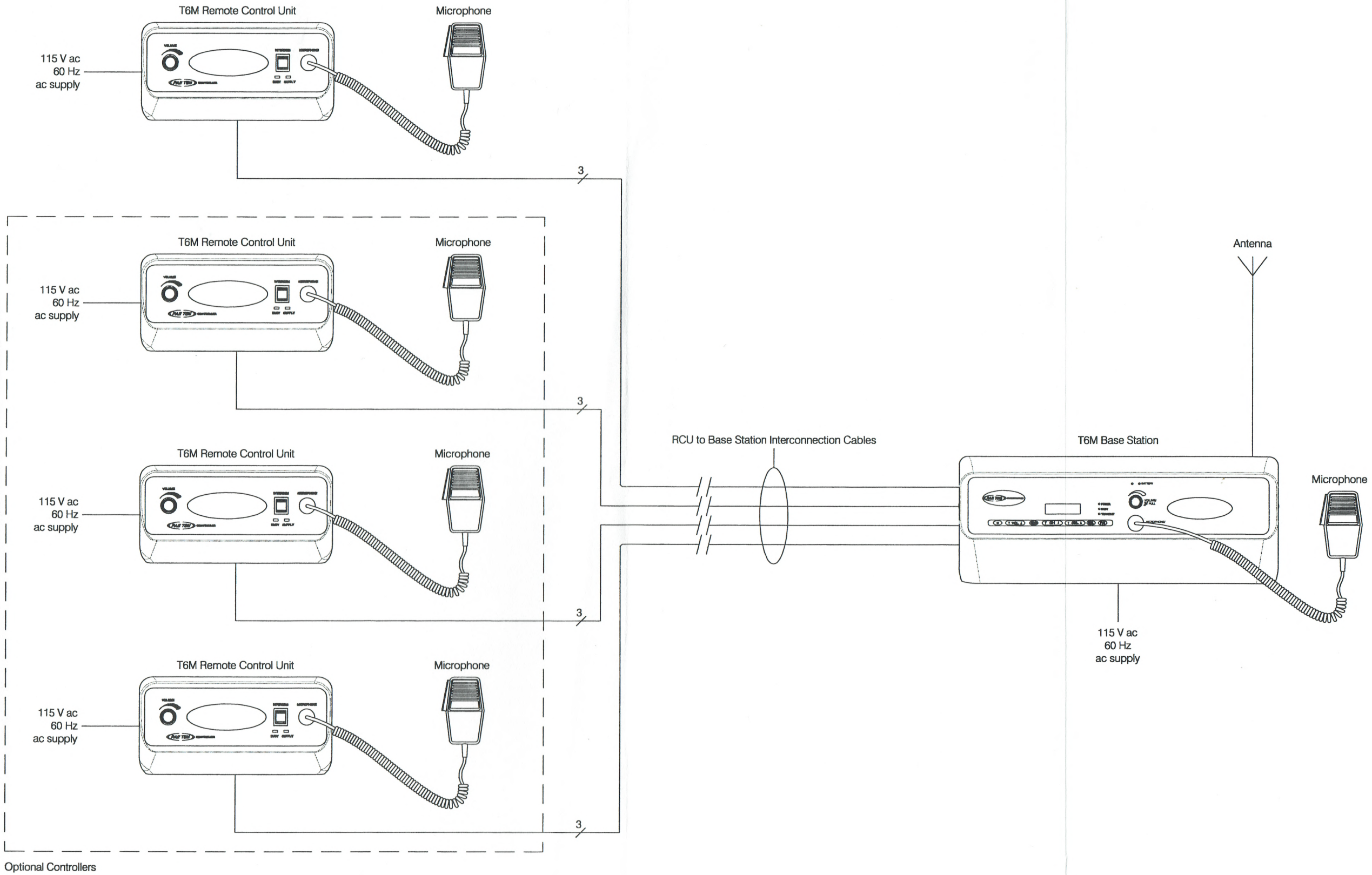


Fig 1 Outfit 2QCB Schematic Diagram

RCU		Base Station	
15-Way Facilities connector pin number	Signal	Signal	9-Way RCU connector pin number
12	Ground	Ground	1
1	Line +	Line +	2
2	Line -	Line -	3

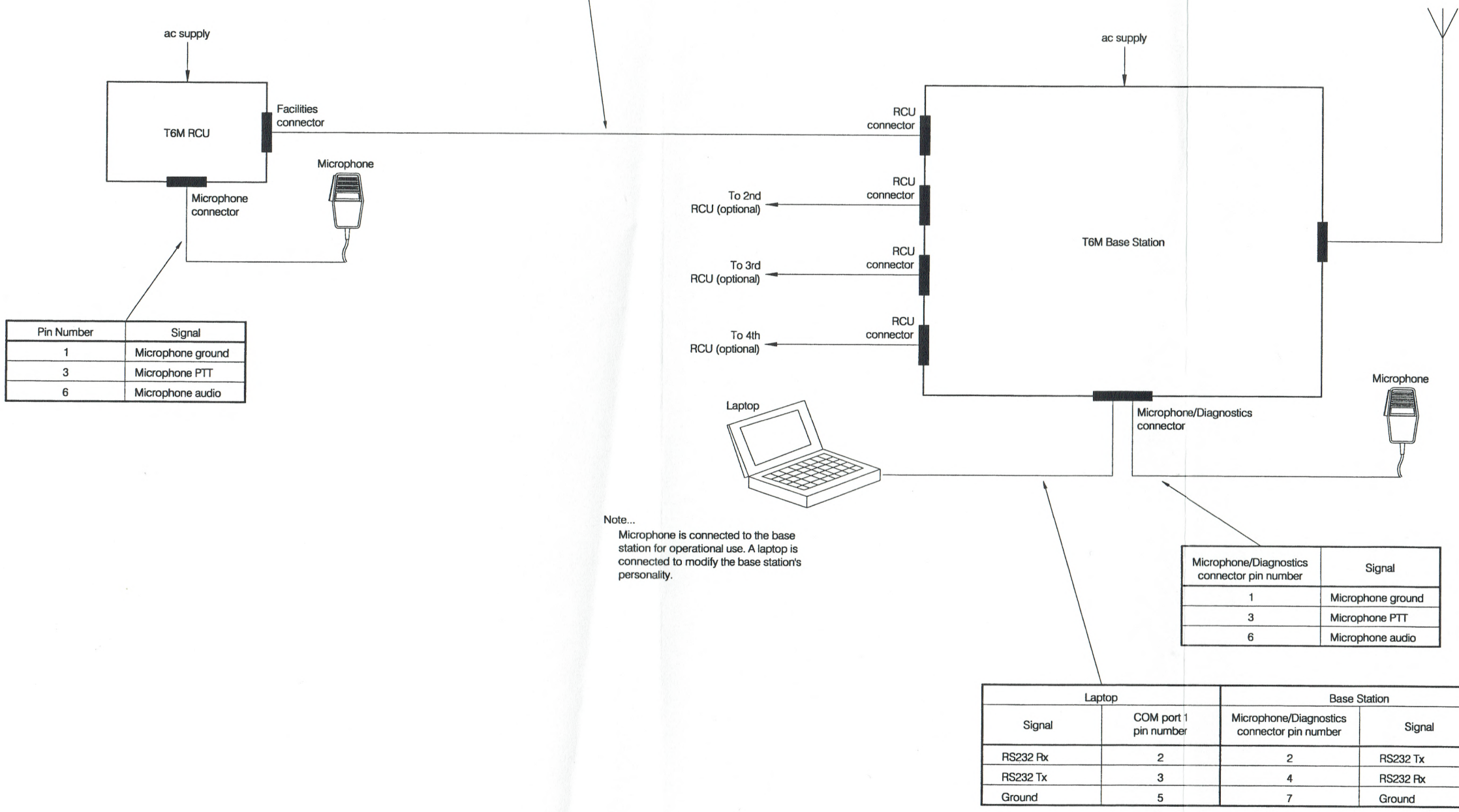


Fig 2 System Interconnection Diagram

CATEGORY 4

INSTALLATION INFORMATION

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CATEGORY 4A

INSTALLATION SPECIFICATION

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3	Siting and securing the T6M base station	
4	To fit the base station on a flat working surface (desktop mounting)	
5	To fit the base station underneath a flat working surface (deckhead mounting)	
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CHECKING THE INSTALLATION KIT

2 The items, supplied by PAE, required to install Outfit 2QCB are detailed in Table 1. Items 2 to 2-5 are supplied for each RCU.

TABLE 1 OUTFIT 2QCB INSTALLATION MATERIALS

Item Number	Description	Quantity	PAE Part Number	NATO Stock Number
Base Station:				
1	Base station, radio set	1	BT6MBSNAVY	5820-99-471-1699
1-1	Microphone, dynamic	1	24-11030301	5965-99-131-0752
1-2	Programming kit comprising: Disk program, automatic data processing Cable assembly, special purpose, electrical	 1 1	 70-T6MBSRNS 17E12600001	 7030-99-436-5094 5995-99-182-2589
1-3	Connector, socket, electrical (mates with ac input connector)	1	20-02030102S	5935-99-531-3426
1-4	15-way D-type plug (mates with Facilities connector) comprising: Connector, receptacle, electrical Shield, electrical, connector	 1 1	 20-01150100 20D09150101	 5935-99-358-5628 5935-99-014-4665
1-5	N-type connector: Connector, free, electrical	 1	 19-01030301	 5935-99-781-3401
1-6	Crimp blue - 6 mm eyelet	1	20-08010103	5940-00-230-0515
RCU:				
2	Control radio set	1	BT6MCNAVY	5820-99-297-5932
2-1	Microphone, dynamic	1	24-11030301	5965-99-131-0752
2-2	Connector, socket, electrical (mates with ac input connector)	1	20-02030102S	5935-99-531-3426
2-3	15-way D-type plug (mates with Facilities connector) comprising: Connector, receptacle, electrical Shield, electrical, connector	 1 1	 20-01150100 20D09150101	 5935-99-358-5628 5935-99-014-4665
2-4	9-way D-type plug (mates with base station's RCU connector) comprising: Connector, receptacle, electrical Shield, electrical, connector	 1 1	 20-01090100 20D09090101	 5935-99-839-6127 5935-99-657-0575
2-5	Crimp blue - 6 mm eyelet	1	20-08010103	5940-00-230-0515

INTRODUCTION

1 Installing Outfit 2QCB involves the following operations. Each operation is detailed in this category.

1.1 Checking the installation kit, as supplied by PAE, is complete.

1.2 Siting and securing the T6M base station.

1.3 Siting and securing the T6M Remote Control Unit (RCU).

1.4 Connecting one, or more, RCUs to the base station.

1.5 Connecting an antenna to the base station.

1.6 Connecting the base station chassis, and the RCU chassis, to the ship's earth.

1.7 Connecting a mains supply to the base station, and to each RCU.

1.8 Connecting a microphone to the base station, and to each RCU.

1.9 Connecting external facilities (if required) to the base station.

To Fit The Base Station on a Flat Working Surface (Desktop Mounting)

4 To fit the base station on a flat working surface, proceed as follows:

4.1 Ensure the base station is fitted within the enclosure in its normal mounting configuration (see Figs 1 and 10).

4.2 Place the base station into the required operational position. Ensure there is sufficient room at the rear to allow the connectors to be fitted and removed, and ensure the air intake and the vents are not obstructed.

4.3 Using the fixing plate as the template, drill holes in the work surface (see also Fig 12) to align with the plates fixing holes. Secure the complete assembly with six M6 screws, washers and nuts.

To Fit The Base Station Underneath a Flat Working Surface (Deckhead Mounting)

5 To fit the base station underneath a flat working surface, the base station must first be inverted within its enclosure. Fig 11 shows the inverted configuration. The fitting procedure is as follows:

5.1 Refer to Fig 14 that shows the base station in the non-inverted position. Remove and retain the two M4 panhead screws and associated washers that secure the base station within the enclosure.

5.2 Slide the base station out of the enclosure, turn it upside-down, and then slide it back into the enclosure. Refit the two M4 screws and washers. The arrangement is now that shown in Fig 11.

5.3 Place the base station, complete with fixing plate into the required operational position. Ensure there is sufficient room at the rear to allow the connectors to be fitted and removed, and ensure the air intake and the vents are not obstructed.

5.4 Using the fixing plate as the template, drill holes in the work surface (see also Fig 12) to align with the plates fixing holes. Secure the complete assembly with six M6 screws, washers and nuts.

SITING AND SECURING THE T6M BASE STATION

3 The T6M base station can be secured on any flat surface (desktop mounting). Alternatively, by inverting the base station within its enclosure, it can be fitted under a flat surface (deckhead mounting). The two configurations are shown in Figs 1 and 2. The base station's enclosure is supplied complete with an attached fixing plate. The plate, detailed in Fig 12 has six M6 clearance holes that allow fixing to the required surface.

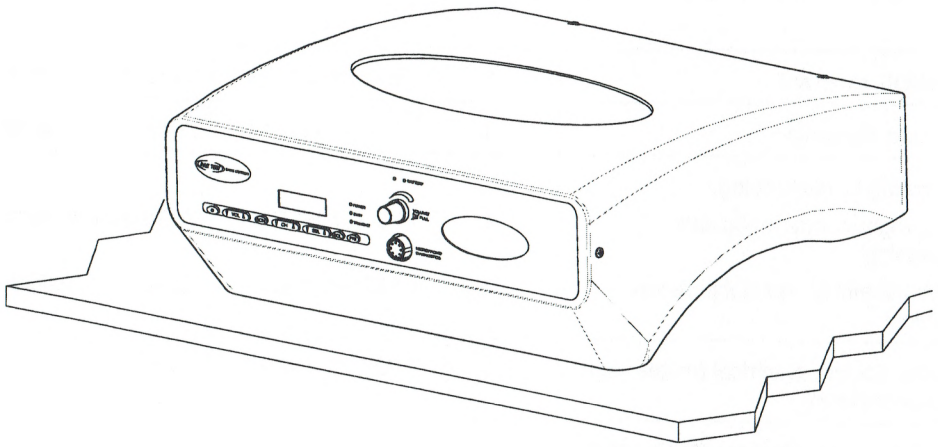


Fig 1 Base Station Normal (Desktop) Mounting

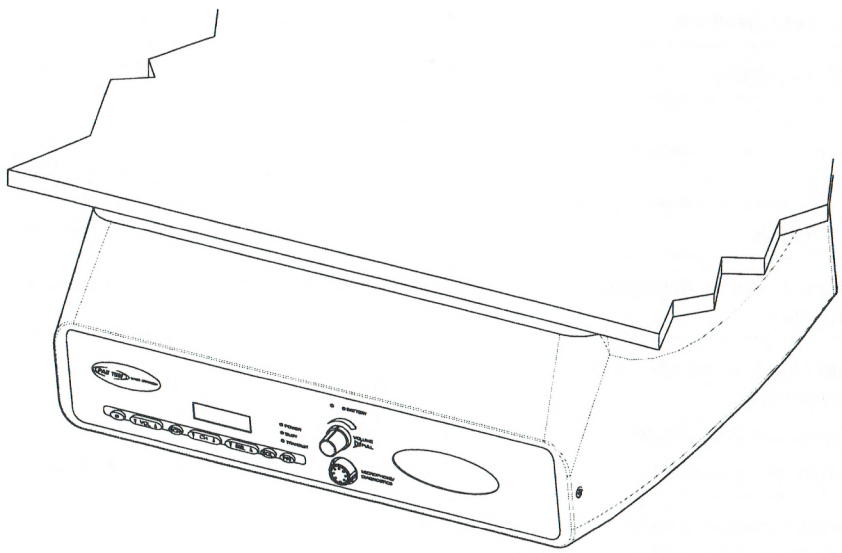


Fig 2 Base Station Inverted (Deckhead) Mounting

CONNECTING THE RCU TO THE BASE STATION

8 The RCU connects to the base station through a 3-wire screened cable. This is shown in Figs 20 and 21. At the RCU, the cable is terminated on the Facilities connector (see Fig 18), and at the base station on one of the four RCU connectors (see Fig 13). The interconnecting cable should be, or be similar to, 4-core with an overall tinned copper braided screen; each core is 7-strand, 2 mm (0.22 mm^2) covered by 0.25 mm PVC. Note that only three of the four cores are used.

9 To interconnect the RCU and base station:

9.1 At the base station, solder the three wires to the 9-way D-type plug (Table 1, item 2-4) as detailed in Table 2, Fig 20 and Fig 21. Connect the cable's braid to the D-type plug's shell as detailed in Fig 5.

Note ...

At the base station, any one of the four RCU connectors can be used; they are connected in parallel.

9.2 At the RCU, solder the three wires to the 15-way D-type plug (Table 1, item 2-3) as detailed in Table 2, Fig 20 and Fig 21. Connect the cable's braid to the D-type plug's shell as detailed in Fig 5.

9.3 If more than one RCU is used in any installation, repeat this procedure for each RCU.

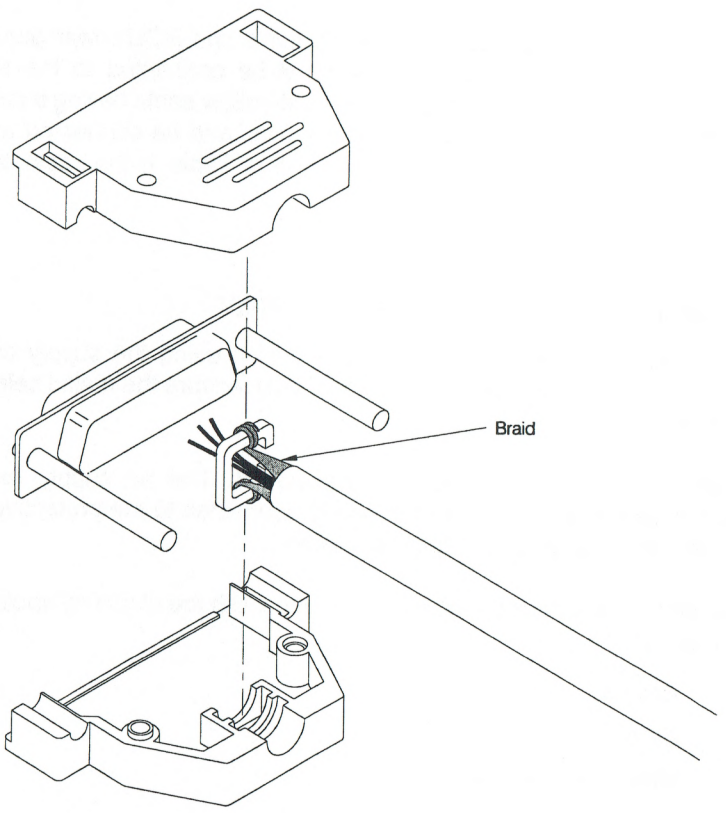


Fig 5 Cable Screen Connection to D-Type Plug's Shell

SITING AND SECURING THE RCU

6 The RCU is sited and secured in a similar way to the base station. That is, by use of the fixing plate. Figs 3 and 4 show the RCU in the normal (desktop mounting) and inverted (deckhead mounting) configurations. Fig 19 shows that the RCU is secured in its housing by three screws.

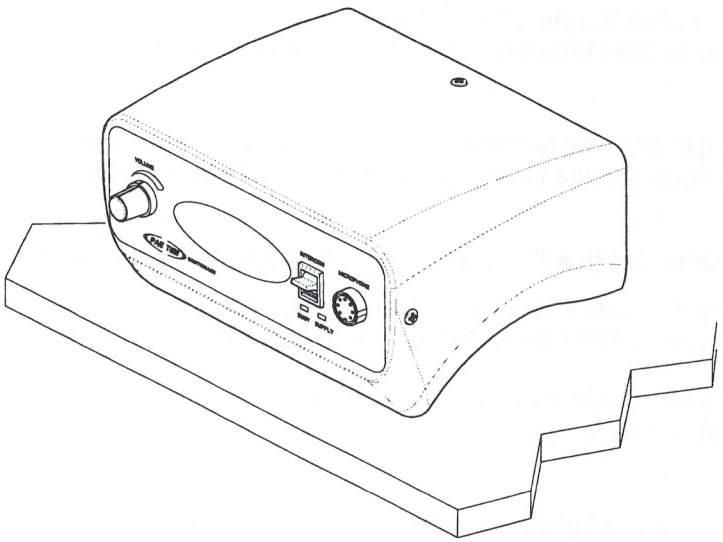


Fig 3 RCU Normal (Desktop) Mounting

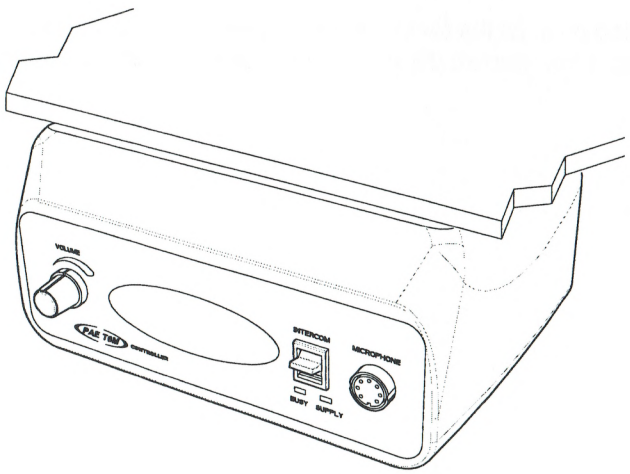


Fig 4 RCU Inverted (Deckhead) Mounting

7 The RCU is secured to the working surface by four M6 screws, washers and nuts. Fixing methods are shown in Figs 15 (desktop mounting) and 16 (deckhead mounting). The fixing plate is shown in Fig 17.

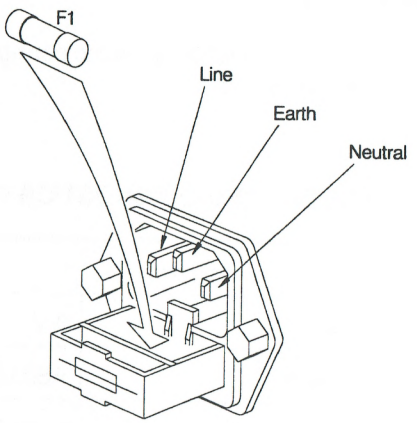


Fig 6 Base Station's Chassis AC Connector

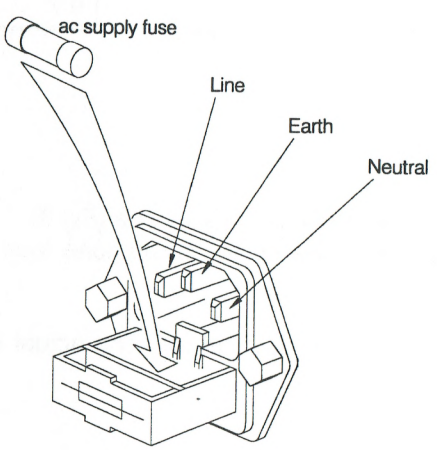


Fig 7 RCU's Chassis AC Connector

TABLE 2 RCU TO BASE STATION INTERCONNECTIONS

RCU		Base Station	
15-Way Facilities Connector Pin Number	**Signal**	**Signal**	**9-Way RCU Connector Pin Number**
12	Ground	Ground	1
1	Line +	Line +	2
2	Line -	Line -	3

CONNECTING AN ANTENNA

10 A suitable antenna must be connected to the base station's Antenna connector (see Fig 13). The N-type connector (Table 1, item 1-5) should be used to connect the feeder cable; the connector is designed to accept UR67 or RG213 coaxial cable that has an overall diameter of approximately 10 mm. The antenna and feeder cable are supplied under local arrangements. Fig 22 shows the RF cable to N-type connector termination.

CONNECTING THE CHASSIS STUDS TO EARTH

11 A chassis stud, marked ⏚ is fitted to the base station's and RCU's rear panel. In order not to compromise the equipment's EMC the chassis studs must be connected to the ship's earth. The connection should be made using a single tri-rated, green-and-yellow cable having a cross-sectional area of 2.5 mm^2. The cable should have CSA and UL1015 approval, and be connected to the chassis stud through an M6 eyelet. The M6 eyelets are items 1-6 and 2-5 of Table 1; the cable can be crimped, or soldered, to the eyelet.

CONNECTING THE BASE STATION'S AND RCU'S AC SUPPLY

12 A 115 V ac supply must be connected to the base station using the supply connector provided (Table 1, item 1-3). Before connecting the ac supply to the RCU, ensure the mains selector on the RCU's rear panel is set to 110 V (see Fig 18).

13 The T6M base station and RCU are class 1 equipment. The ac supply cable must have a green-and-yellow protective earthing conductor electrically connected to the protective earthing terminal of the equipment connector, and the supply output connector.

14 The ac supply cable should be colour coded in accordance with the electrical appliance (colour code) regulations for the UK. That is:

Line:	Brown
Neutral:	Blue
Earth:	Green-and-yellow

15 Connectors are shown in Figs 6 and 7. After connection has been made, ensure the connector retaining clip is fitted.

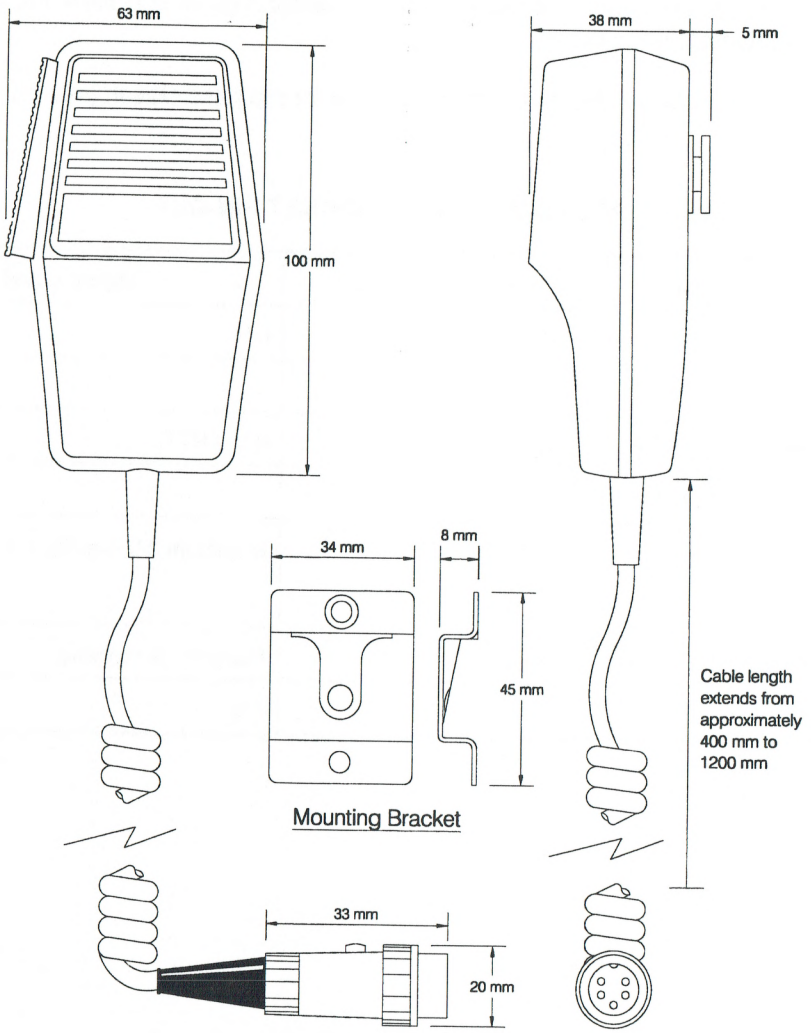


Fig 8 Fist Microphone

CONNECTING A MICROPHONE TO THE BASE STATION

16 The supplied microphone (Table 1, item 1-1) plugs directly into the base station's Microphone/Diagnostics connector (see Fig 13).

17 For information only, the pin-out of the Microphone/Diagnostics connector is given in Table 3. Fig 20 shows the connections used for the microphone circuit.

TABLE 3 BASE STATION MICROPHONE/DIAGNOSTICS SOCKET PIN-OUT

Pin Number	Signal	Input or Output	Signal Level
1	Microphone ground	Input	0 V
2	RS232 Tx	Output	RS232
3	Microphone PTT	Input	0 V = PTT
4	RS232 Rx	Input/output	RS232
5	Sidetone and receiver audio monitor	Output	Maximum 1 V rms. Rout = 200 Ω
6	Microphone audio	Input	Passive microphone
7	Ground	-	0 V

Securing the Microphone Bracket

18 A microphone bracket is supplied with each fist microphone (Fig 8). The bracket should be fitted to any convenient vertical surface, noting that the coiled microphone lead extends from approximately 400 mm to 1200 mm.

19 Two screws secure the bracket to the chosen surface. The actual bracket should be used as a template for drilling the two screw holes.

CONNECTING A PC TO THE BASE STATION

20 To modify the base station's personality, the microphone is disconnected from the Microphone/Diagnostics connector and is replaced by an RS232 cable connected to a laptop, or PC. The cable is part of the programming kit (Table 1, item 1-2). For information only, Fig 20 shows the connections used for the RS232 cable.

CONNECTING EXTERNAL FACILITIES

23 Three optional external facilities can be connected to the base station. Although not all are intended to be used by the Royal Navy immediately after initial installation, they are detailed here for possible future use. The three facilities are:

23.1 An audio output to drive an external tape recorder.

23.2 Transmit audio, received audio, and PTT lines for use with a control desk.

23.3 A transmit inhibit signal.

24 The external facilities are connected to the base station's Facilities connector (see Fig 13). This connector is detailed in Table 5.

TABLE 5 BASE STATION FACILITIES CONNECTOR PIN-OUT

Base Station's Facilities Connector Pin Number	Signal	Input or Output	Description
1	Ground	-	0 V
2 3	Tape + Tape -	Output	A balanced 600 Ω twisted pair providing audio to drive a tape recording system. The output level is 0 dBm (sine wave on 600 Ω) for 85% modulation depth
4	Not connected	-	-
5 6 7 8 9 10	Control Desk Rx + Control Desk Rx - Control Desk Tx + Control Desk Tx - Control Desk PTT + Control Desk PTT -	Output Input Input	A 6-wire system comprising two 600 Ω twisted pair balanced lines for Rx and Tx audio, plus a line pair for PTT The audio line levels are 0 dBm (sine wave on 600 Ω) for 85% modulation depth. PTT can be activated either by shorting together the PTT lines, or by phantom keying on the Tx lines
11 12 13	Not connected Not connected Not connected	-	-
14	External Tx inhibit	Input	When this line is connected to 0 V, the base station cannot be keyed
15	Ground	-	0 V

CONNECTING A MICROPHONE TO THE RCU

21 The supplied microphone (Table 1, item 2-1) plugs directly into the RCU's Microphone connector (see Fig 18). For information only, the pin-out of the Microphone connector is given in Table 4. Fig 20 shows the connections used for the microphone circuit.

22 A microphone bracket should be fitted in the same way as for the base station (see para 18).

TABLE 4 RCU MICROPHONE SOCKET PIN-OUT

Pin Number	Signal	Input or Output	Signal Level
1	Microphone ground	Input	0 V
2	Not connected	-	-
3	Microphone PTT	Input	0 V = PTT
4	Not connected	-	-
5	Sidetone and receiver audio monitor	Output	Maximum 3 V p-p. Rout = 200 Ω
6	Microphone audio	Input	Passive microphone
7	Ground	-	0 V

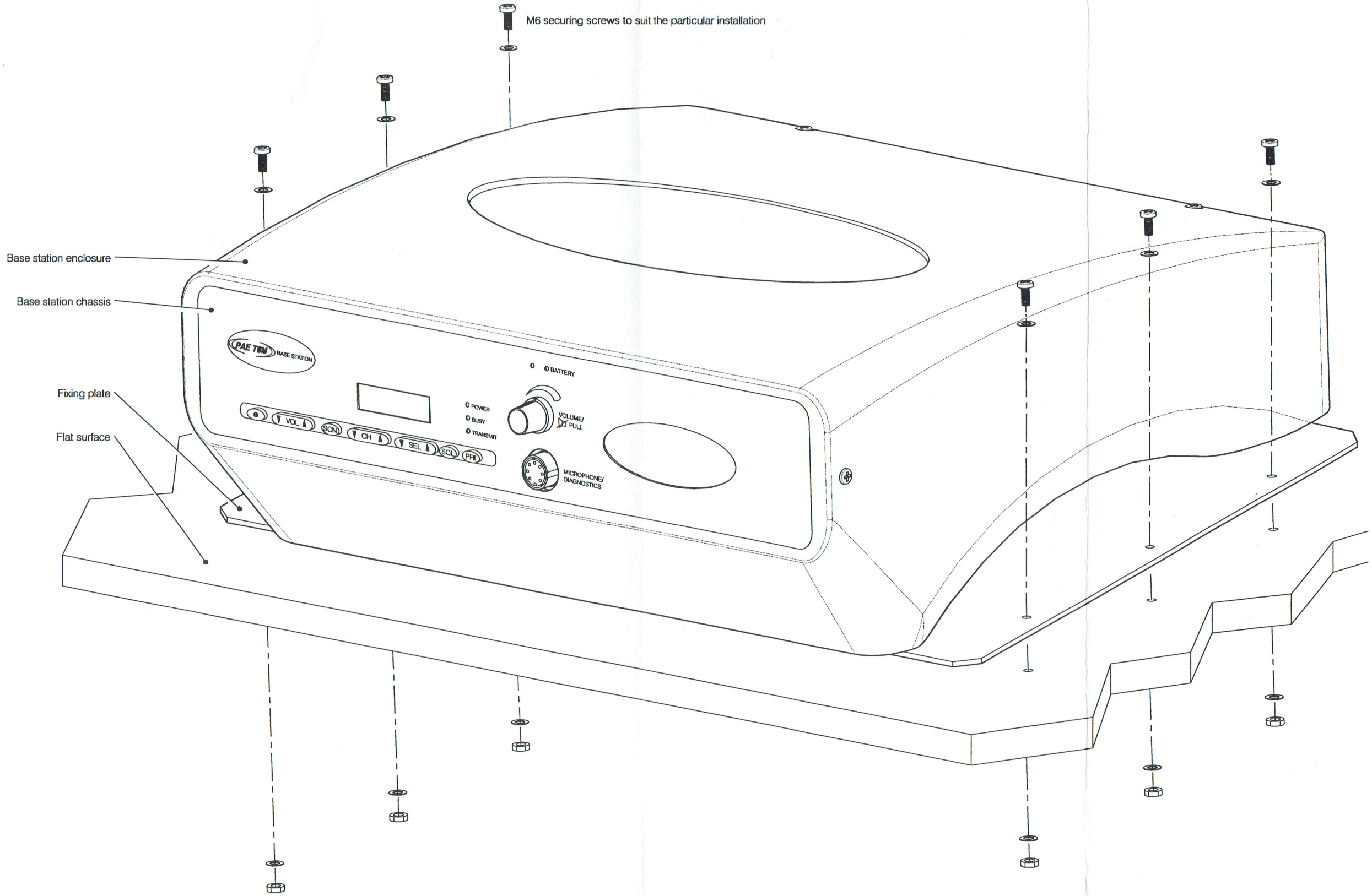


Fig 10 Base Station Fixing - Desktop Mounting

CONNECTING A DC SUPPLY INPUT

25 Although not intended to be used by the Royal Navy, the base station can operate using a 12 V dc input supply, or it can be used as a backup to the 115 V ac input. The DC Input connector fitted to the rear panel (see Fig 13) is used for this supply.

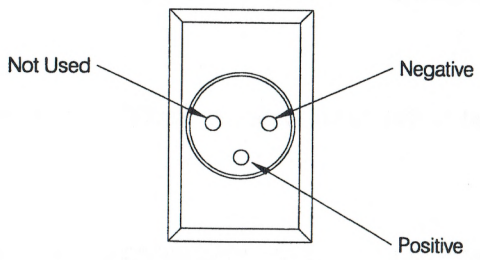


Fig 9 DC Input Connector

26 The RCU can also operate from a dc supply in the range 15 to 32 V with a negative ground. The dc input is connected through the rear panel Facilities connector pin 11 (+) and pin 12 (-).

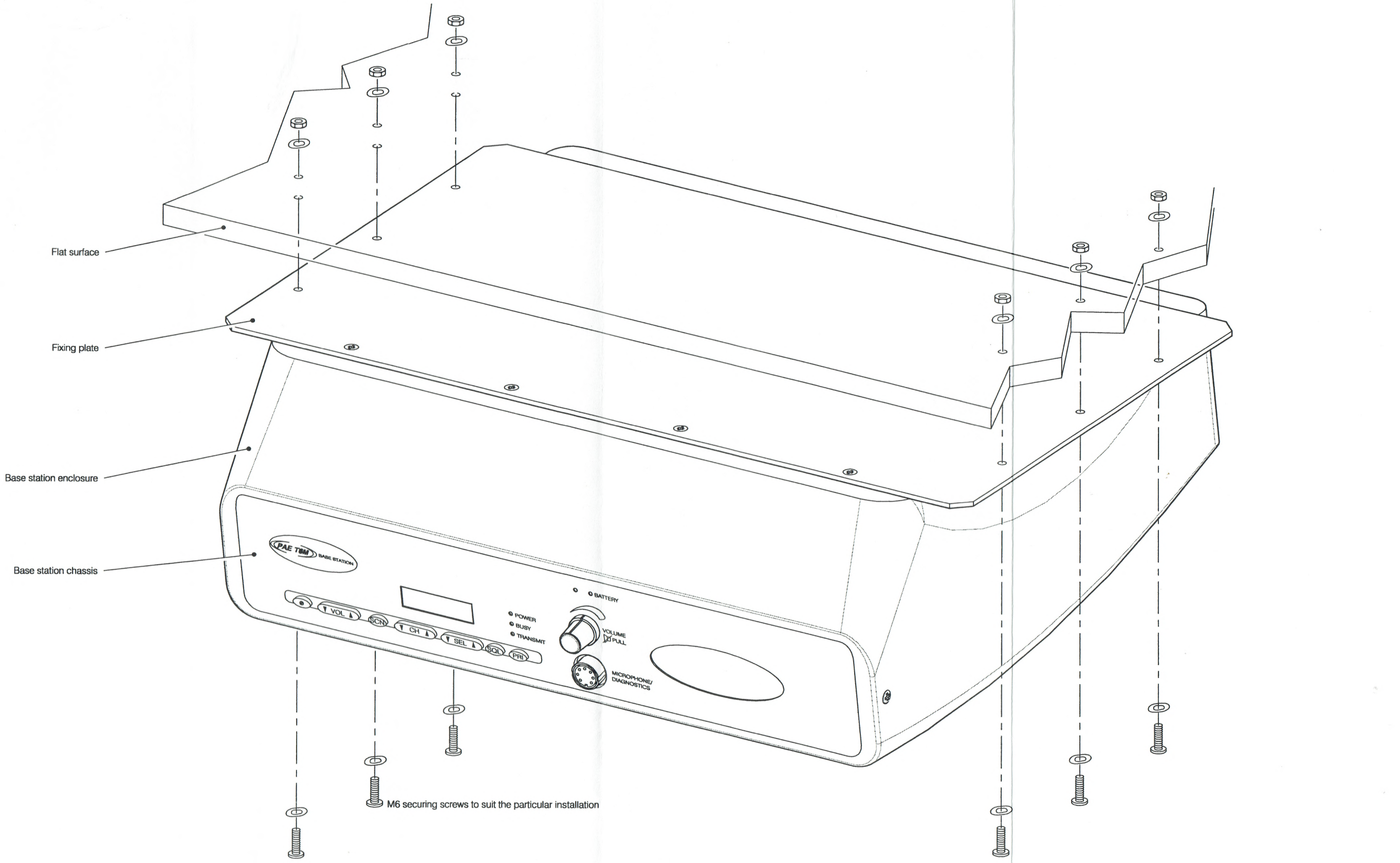
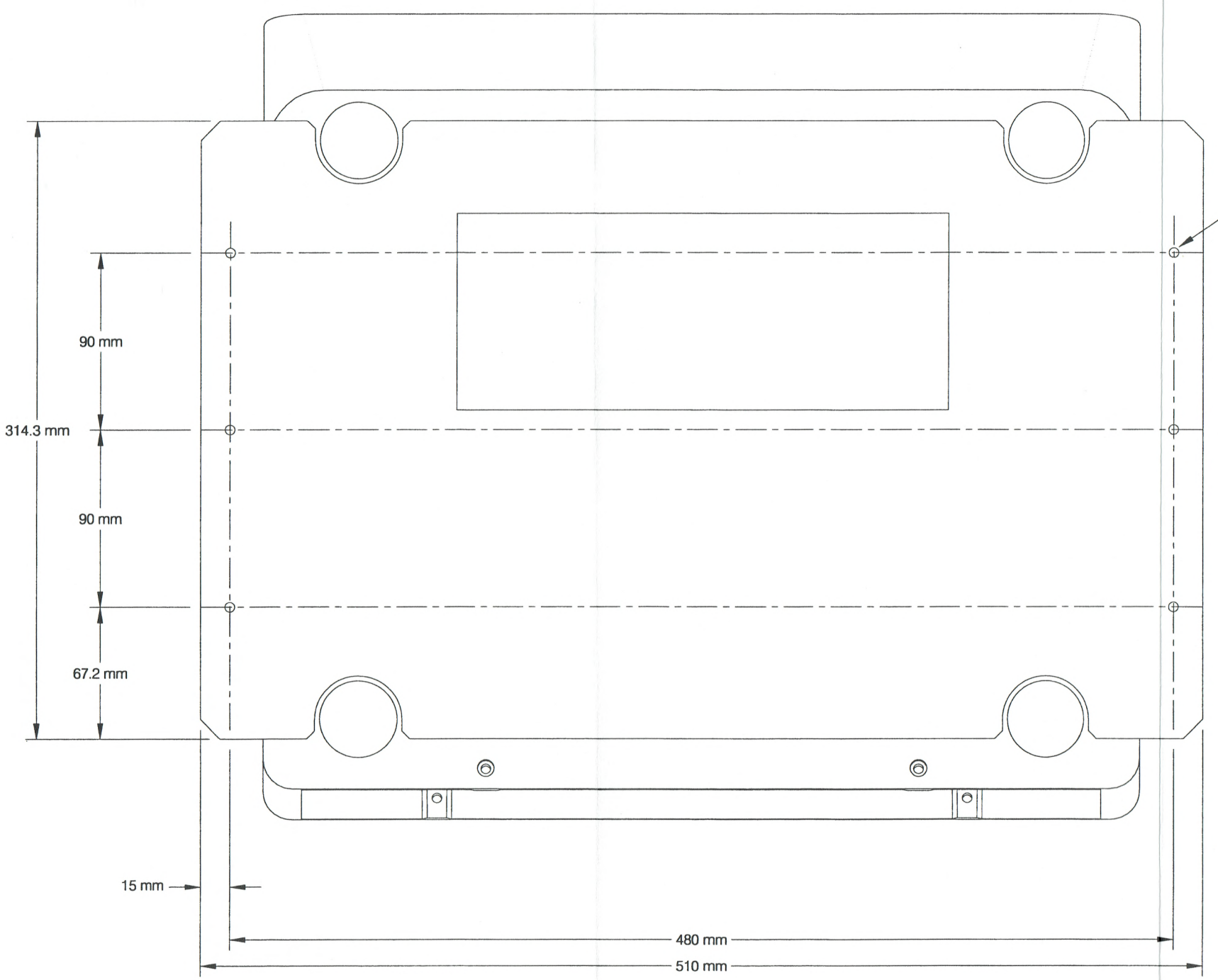


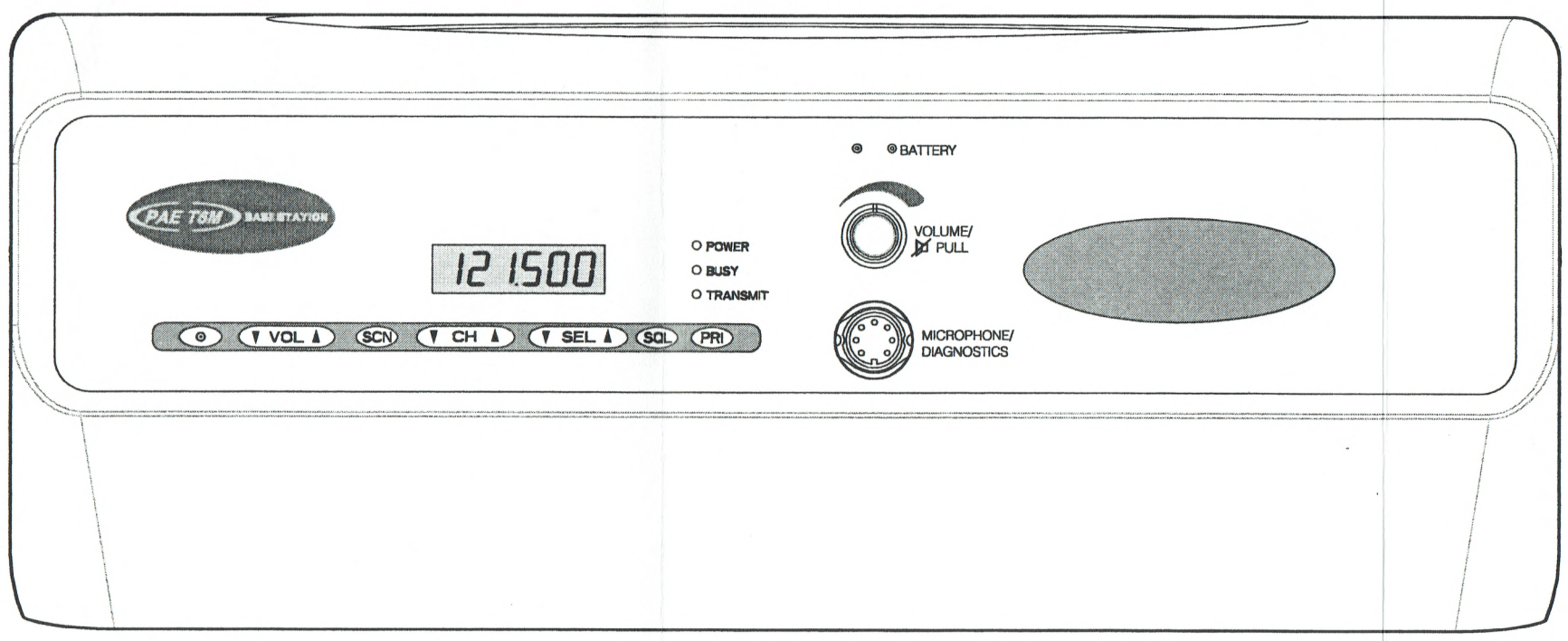
Fig 11 Base Station Fixing - Deckhead Mounting



The fixing plate thickness is 3 mm.

Fig 12 Base Station Fixing Plate Detail

Front View



Rear View

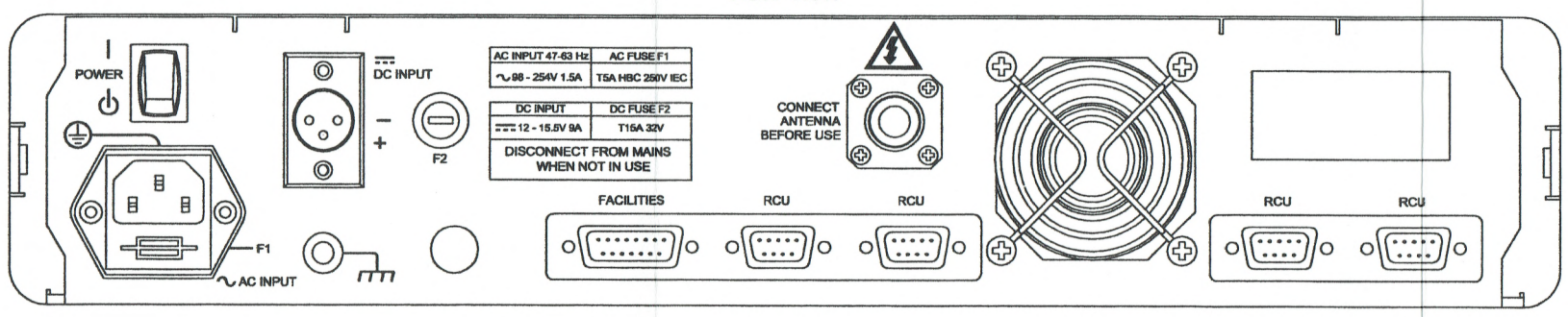
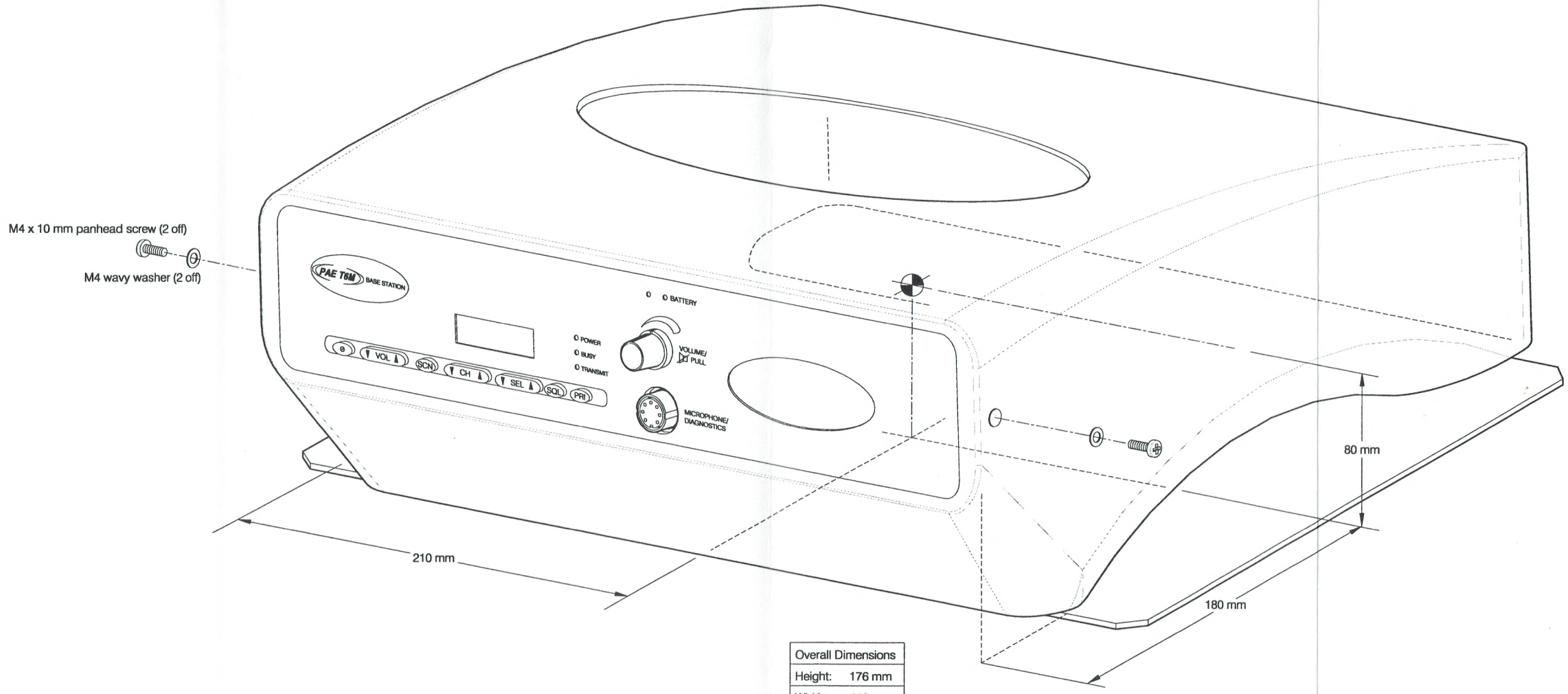


Fig 13 Base Station - Front and Rear Views



Overall Dimensions	
Height:	176 mm
Width:	446 mm
Depth:	400 mm

Centre of gravity

Fig 14 Base Station - Enclosure Securing Detail

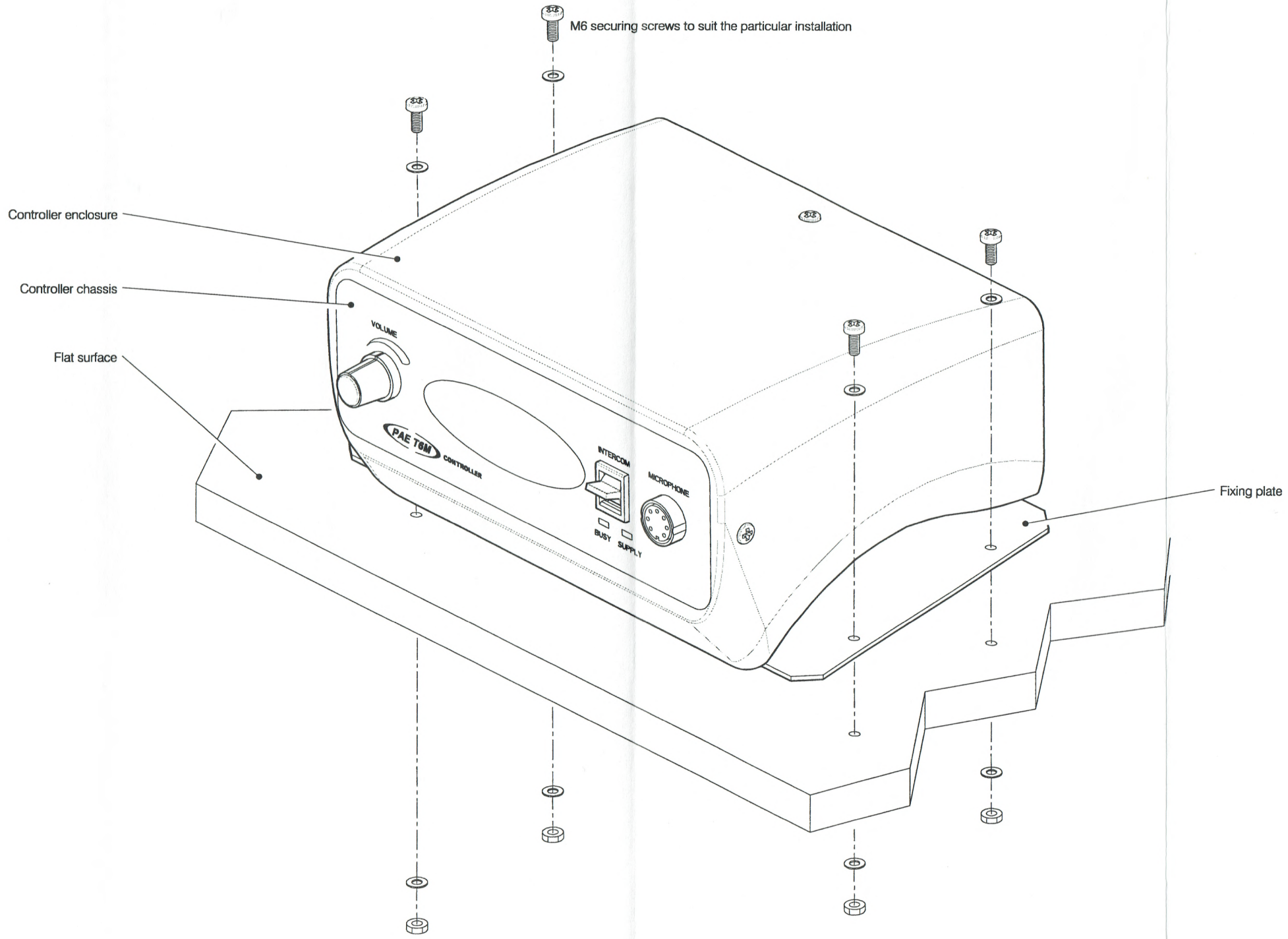


Fig 15 RCU Fixing - Desktop Mounting

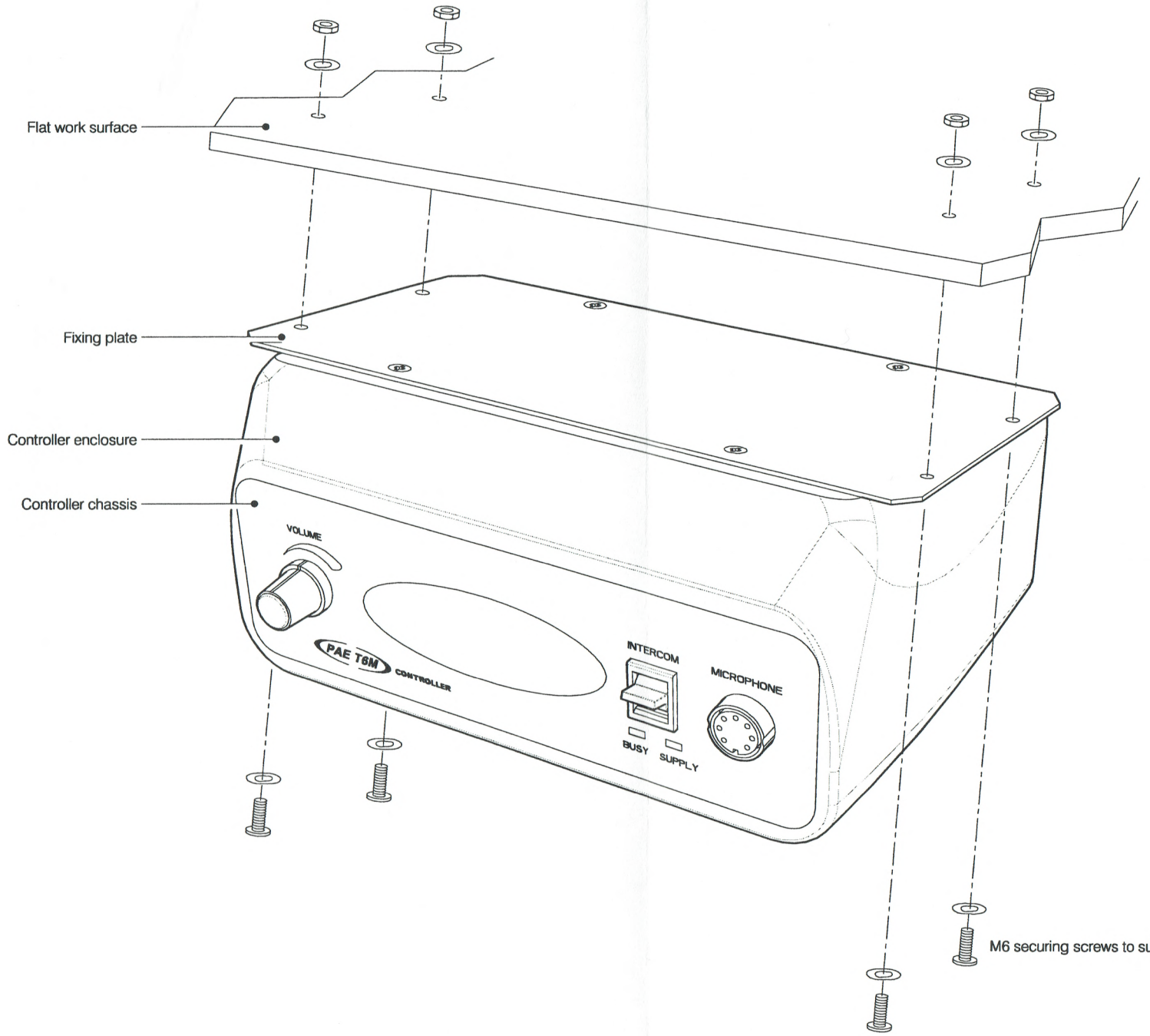
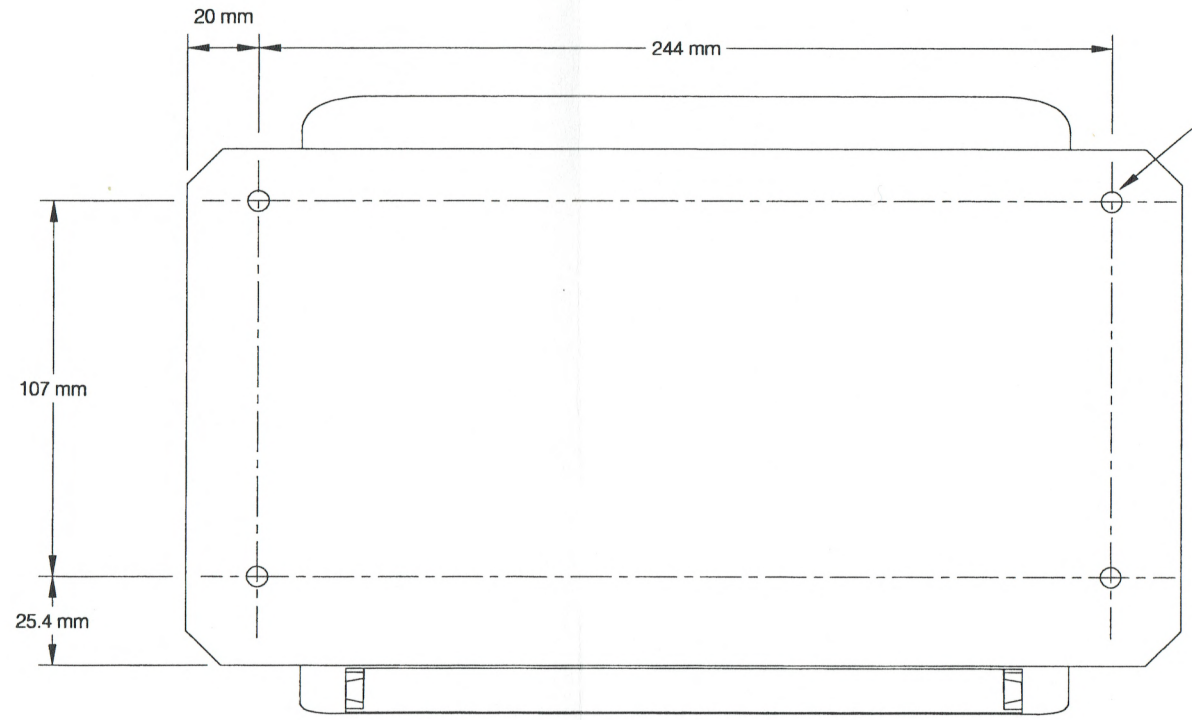


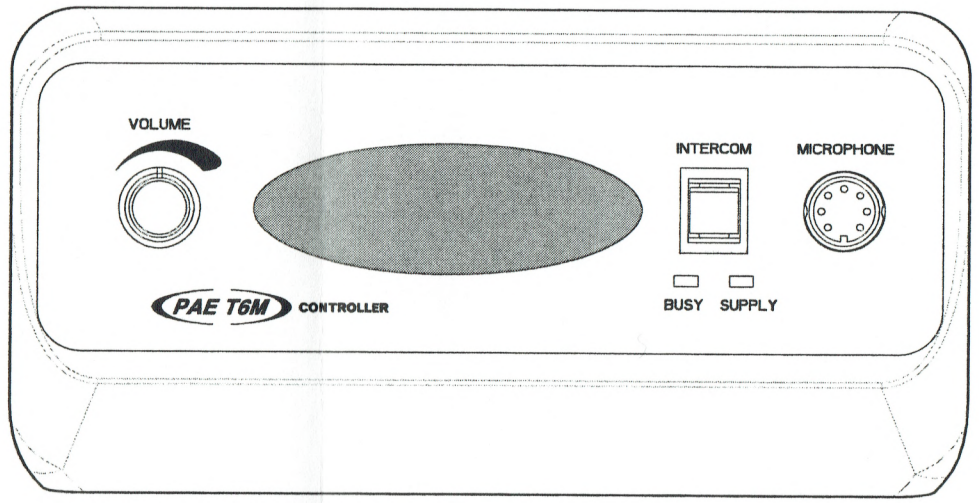
Fig 16 RCU Fixing - Deckhead Mounting



The fixing plate thickness is 3 mm.

Fig 17 RCU Fixing Plate Detail

Front View



Rear View

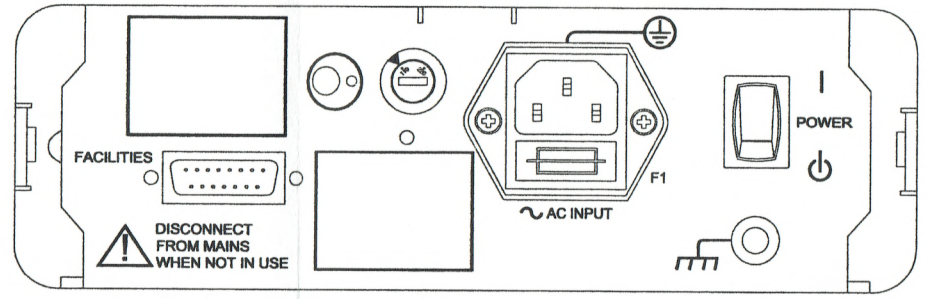
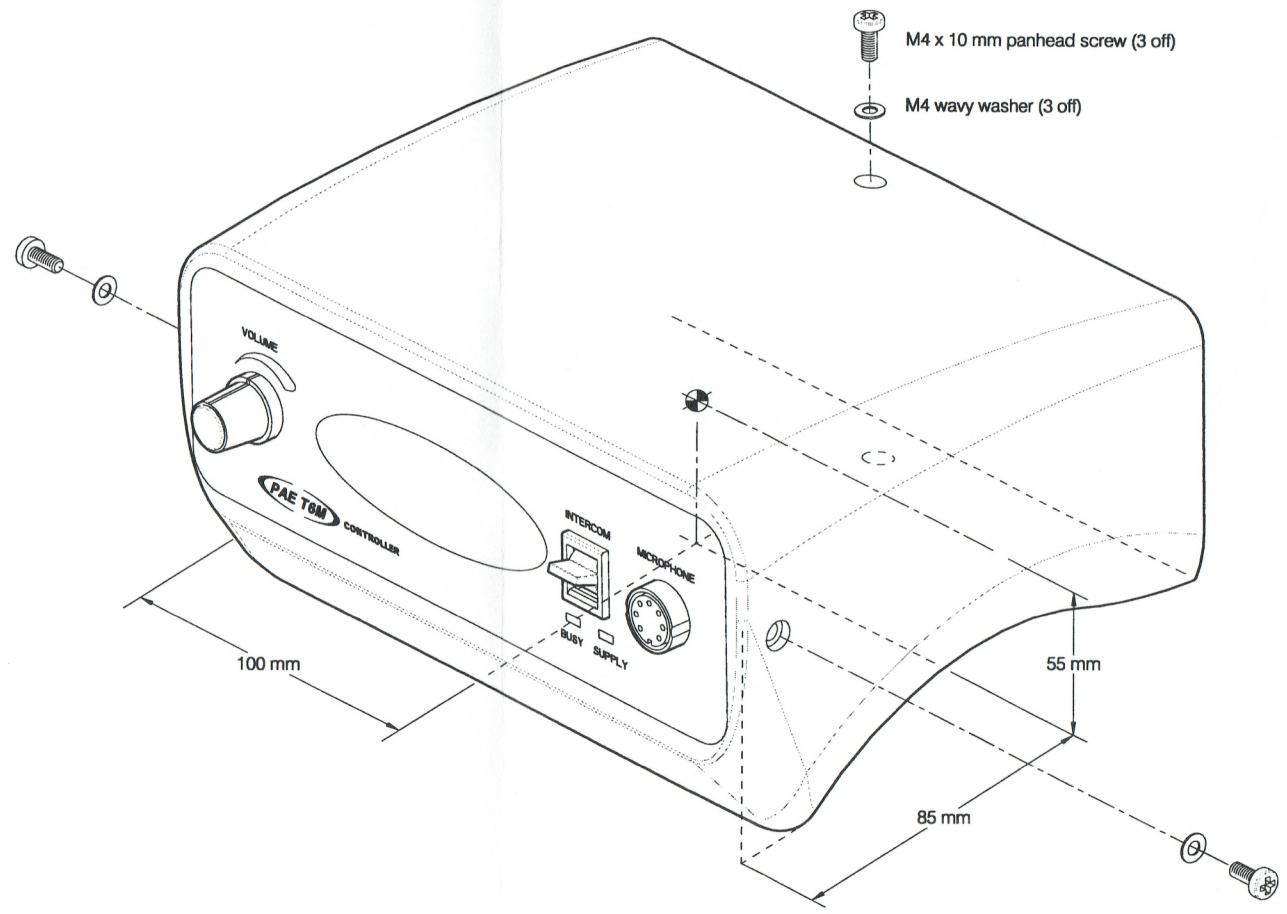


Fig 18 RCU - Front and Rear Views

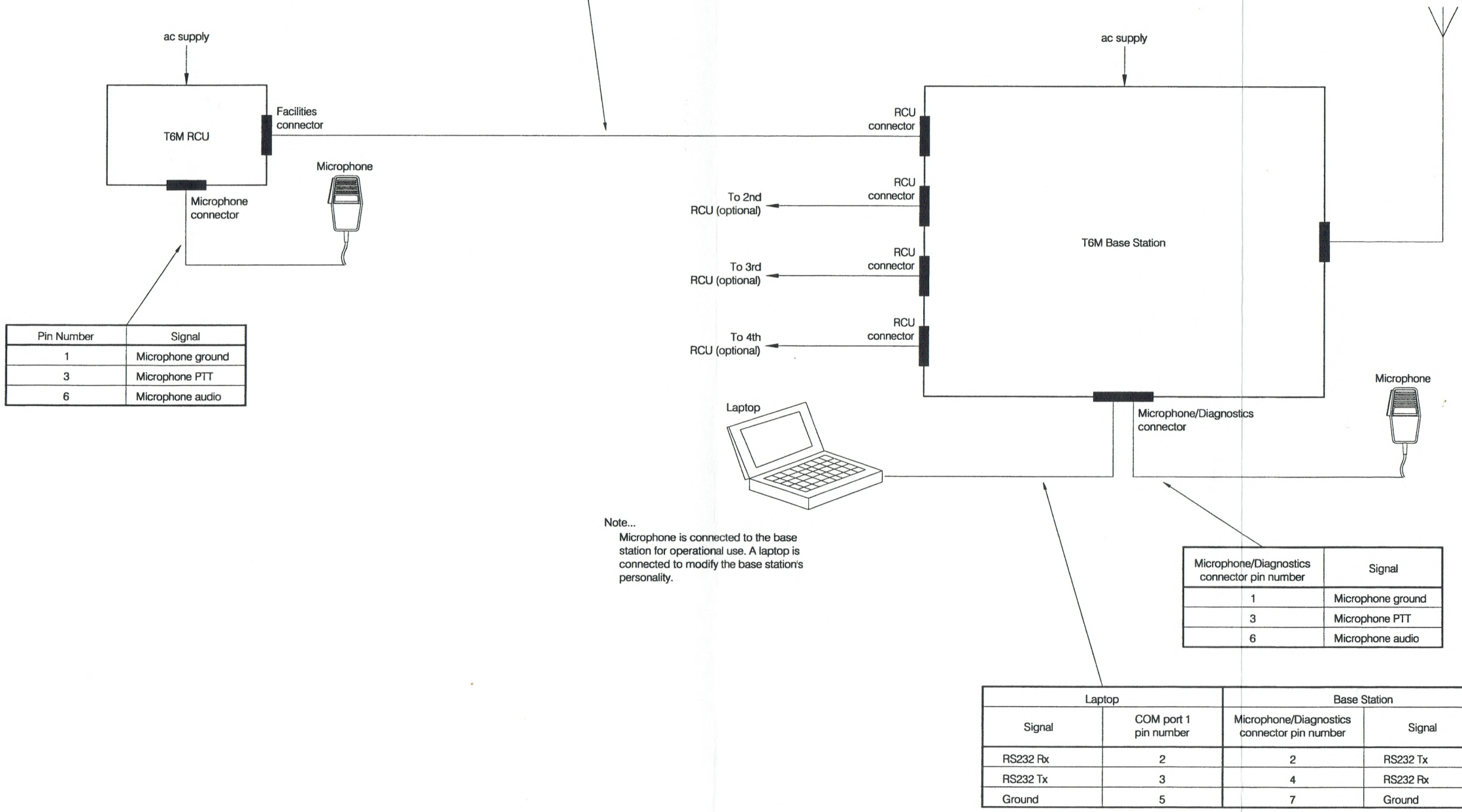


Overall Dimensions	
Height:	112 mm
Width:	220 mm
Depth:	165 mm

Centre of gravity

Fig 19 RCU - Enclosure Securing Detail

RCU		Base Station	
15-Way Facilities connector pin number	Signal	Signal	9-Way RCU connector pin number
12	Ground	Ground	1
1	Line +	Line +	2
2	Line -	Line -	3



Pin Number	Signal
1	Microphone ground
3	Microphone PTT
6	Microphone audio

Note...
Microphone is connected to the base station for operational use. A laptop is connected to modify the base station's personality.

Microphone/Diagnostics connector pin number	Signal
1	Microphone ground
3	Microphone PTT
6	Microphone audio

Laptop		Base Station	
Signal	COM port 1 pin number	Microphone/Diagnostics connector pin number	Signal
RS232 Rx	2	2	RS232 Tx
RS232 Tx	3	4	RS232 Rx
Ground	5	7	Ground

Fig 20 Interconnection Diagram



Facilities connector is shown looking at the chassis connector from the rear of the equipment.

RCU		Base Station	
Facilities connector pin number	Signal	Signal	RCU connector pin number
12	Ground	Ground	1
1	Line +	Line +	2
2	Line -	Line -	3

RCU connector is shown looking at the chassis connector from the rear of the equipment.

Fig 21 RCU to Base Station Interconnection

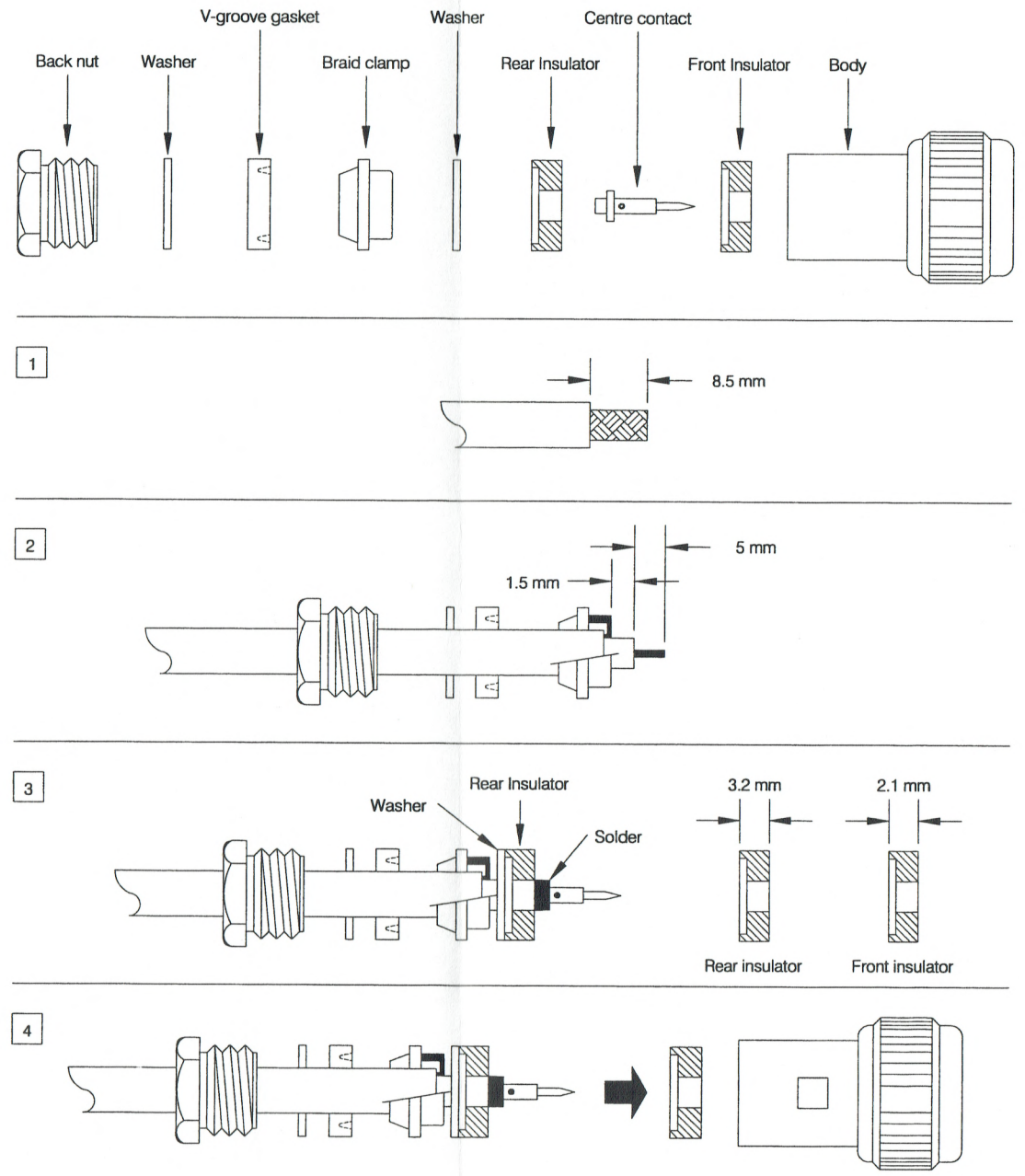


Fig 22 RF Cable Termination at the N-type Connector

CATEGORY 4B

PREPARATION FOR ACCEPTANCE

CONTENTS

Para		
1	Object	
2	Introduction	
4	Test equipment	
5	Test lead	
6	Transmit power and frequency accuracy test	
7	Receiver sensitivity test	
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2	Test lead connections	2
3	Test lead parts list	2
Fig		**Page**
1	Transmit power and frequency accuracy test - test equipment connection	3
2	Base station front panel power button location	3
3	Receiver sensitivity test - test equipment connection	5

OBJECT

1 The object of Preparation for Acceptance (PFA) is to ensure that Outfit 2QCB is ready, in all respects, for Harbour Acceptance Trials (HAT).

INTRODUCTION

2 Outfit 2QCB consists of a T6M base station and up to four T6M RCUs. PFA involves initially setting up the base station followed by a functional test. When this has been successfully completed, the system is functionally checked from each RCU position.

3 A PFA record sheet is provided on page 7. This sheet allows the results of various checks to be recorded.

TEST EQUIPMENT

4 The test equipment required during PFA is listed in Table 1.

TRANSMIT POWER AND FREQUENCY ACCURACY TEST

6 To check the base station's transmit power, and the accuracy of the carrier frequency, carry out the following procedure:

6.1 Isolate power from the base station and connect the test equipment as shown in Fig 1. Ensure the wattmeter is switched to forward power.

6.2 Reconnect the power and ensure the base station's rear panel Power switch is set to on.

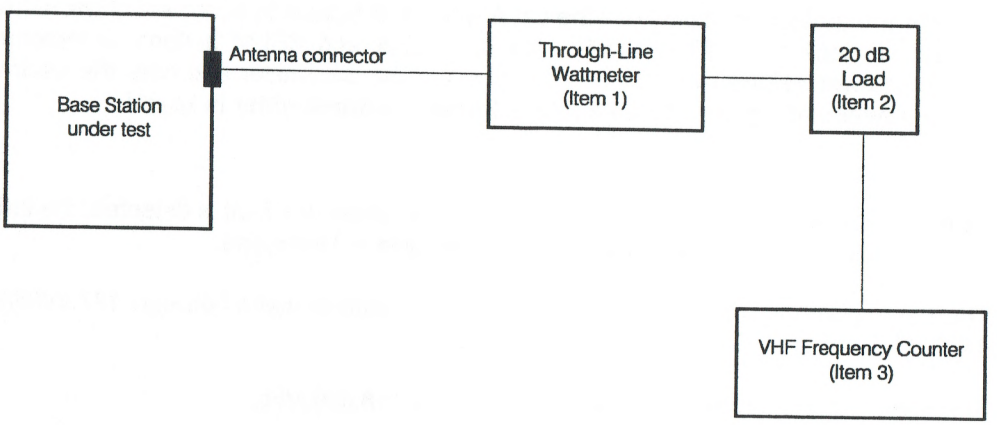


Fig 1 Transmit Power and Frequency Accuracy Test - Test Equipment Connection

6.3 To enter Test mode switch on the base station by pressing, and keeping pressed, the front panel Power button (see Fig 2). Without releasing the Power button, press and release the SQL button, then the SCN button, and finally the PRI button. Release the Power button.

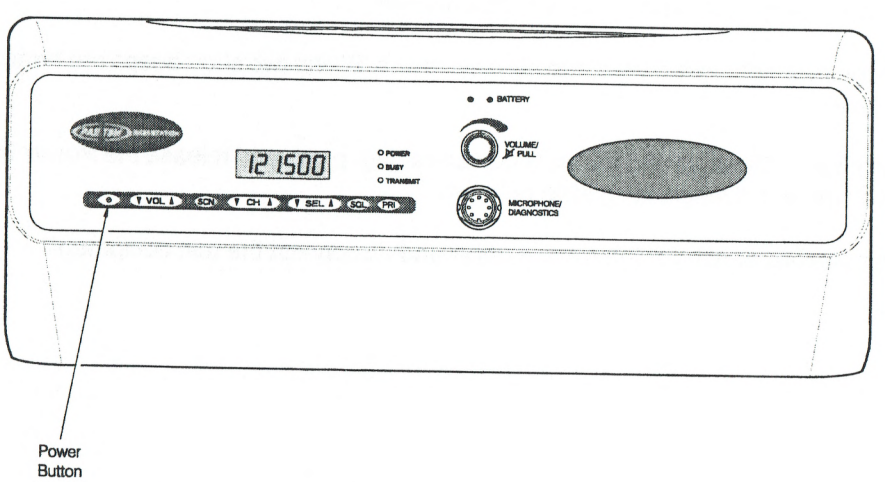


Fig 2 Base Station Front Panel Power Button Location

TABLE 1 LIST OF TEST EQUIPMENT

Item	NSN	Description
1	6625-99-531-8989	Wattmeter set (or equivalent).
2	6625-99-531-7069	20 dB load.
3	6625-99-786-4628	VHF frequency counter (or equivalent).
4	6625-99-253-9713	VHF signal generator.
5	6625-99-477-4004	AF wattmeter.
6	Not applicable	Test lead for connecting the base station to the AF wattmeter (see para 5). Local manufacture.

Test Lead

5 The test lead (Table 1, item 6) connects the base station to the AF wattmeter during receiver sensitivity tests. The lead connections are detailed in Table 2 and the parts required to manufacture the lead are listed in Table 3.

TABLE 2 TEST LEAD CONNECTIONS

7-Pin DIN Plug (connects to base station's Microphone/Diagnostics connector)	AF Wattmeter Connector
Pin 5, receiver audio monitor	Input
Pin 7, earth	0 V

TABLE 3 TEST LEAD PARTS LIST

Item	Description	NSN
1	7-pin DIN plug (part number L1904A7FP)	5935-99-003-7505
2	Jack plug (black) 4 mm	5935-99-742-1598
3	Jack plug (red) 4 mm	5935-99-742-1597
4	AF cable, 2 metre length	6145-00-866-2302

RECEIVER SENSITIVITY TEST

7 To check the base station's receiver sensitivity carry out the following procedure:

7.1 Isolate power from the base station and connect the test equipment as shown in Fig .

7.2 Reconnect the power and ensure the base station's rear panel Power switch is set to on.

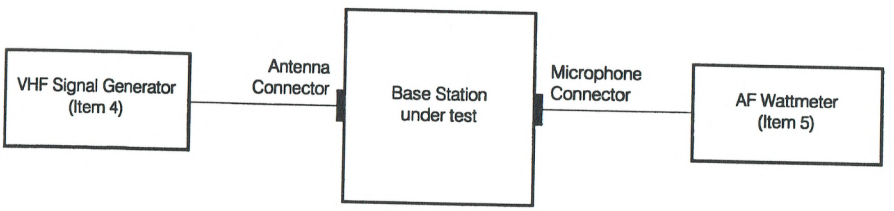


Fig 3 Receiver Sensitivity Test - Test Equipment Connection

7.3 Adjust the signal generator to operate at 118.000 MHz with an RF level of -100 dBm and a 1 kHz tone modulated at 30%.

7.4 At the base station's front panel press the squelch (SQL) button. Check that the display shows an 'S' and a number between 1 and 20. This number is the squelch level setting.

7.5 Adjust the squelch level, by pressing the VOL▲ and VOL▼ buttons, until the display shows a level of 2.

7.6 Switch off the base station by pressing and then releasing the front panel power button.

7.7 Repeat Paras 6.3 and 6.4 to enter Test mode.

7.8 Press SQL to select the test frequency 118.000 MHz.

7.9 Adjust the volume control until a reference reading (approximately mid-scale) is shown in the AF wattmeter. Note the reading in dB.

7.10 Set the signal generator's modulation to off.

7.11 Increase the sensitivity of the AF wattmeter until a reading is obtained. Note the reading in dB.

7.12 Check that the difference in readings noted in paras 7.9 and 7.11 are not less than 10 dB.

7.13 Repeat paras 7.3 to 7.12 for test frequencies of 127.500 MHz and 136.975 MHz.

7.14 Carry out a functional check of the system from each remote position in turn with the signal generator's modulation switch set to on. At each remote position check that a 1 kHz tone can be heard.

7.15 Press the microphone's PTT button and speak into the microphone. Check that the Busy indicator lights at all remote positions, that audio can be heard, and that the base station is keyed. Switch the signal generator's modulation switch to off.

7.16 On completion, switch off the base station and disconnect the test equipment. Restore the base station ready for operational use.

6.4 Check that the display shows tESt and after a few seconds it changes to show the current power level setting (a number between 1 and 240 representing approximately 6 to 12 watts).

6.5 Press the SQL button to select the test frequency 127.500 MHz. The test frequency is displayed for a couple of seconds and the display then reverts to the power setting.

Note ...

Using the SQL key to select a test frequency always selects a 25 kHz spaced channel. Squelch is automatically switched off in Test mode.

6.6 Key the transmitter and note the wattmeter's reading. It should be between 6 and 12 watts. If it is not within this range, adjust in accordance with Para 6.7. If it is within range, go to Para 6.8.

6.7 With the transmitter de-keyed, use the CH▲ and CH▼ buttons to increment or decrement the power setting in steps of 1. Alternatively, use the SEL▲ and SEL▼ buttons to increment or decrement the power setting in steps of 10. Then key the transmitter and note the wattmeter's reading. **The power setting cannot be adjusted when the transmitter is keyed.**

Note ...

The transmit indicator lights when the transmitter is keyed. If a fault is detected, the indicator does not light. No fault codes, however, are displayed in Test mode.

6.8 Key the transmitter and check that the frequency counter reads between 127.499808 and 127.500192 MHz.

6.9 Press the SQL button to select the test frequency 118.000 MHz.

6.10 Key the transmitter and check that the wattmeter reads between 6 and 12 watts. Check that the frequency counter reads between 117.999823 and 118.000177 MHz.

6.11 Press the SQL button to select the test frequency 136.975 MHz.

6.12 Key the transmitter and check that the wattmeter reads between 6 and 12 watts. Check that the frequency counter reads between 136.974745 and 136.975205 MHz.

6.13 To save the new power setting in the base station's memory, press and keep pressed the front panel Power button (see Fig 2). Without releasing the Power button, press and release the PRI button, then the SCN button, and finally the SQL button.

6.14 When the new setting is saved, the display shows 'S' and two short beeps are heard. Release the Power button.

6.15 To switch off without saving the new power setting, press and release the Power button. The display shows 'nS' and a single long tone is heard.

6.16 On completion, switch off the base station and disconnect the test equipment.

PREPARATION FOR ACCEPTANCE RECORD SHEET

OUTFIT 2QCB

Installation: HMS _____

Equipment serial numbers:

T6M base station _____

No. 1 T6M RCU _____

No. 2 T6M RCU (if fitted) _____

No. 3 T6M RCU (if fitted) _____

No. 4 T6M RCU (if fitted) _____

Date of installation: _____

Acceptance Authority	Setting to Work Authority
Signed: _____	Signed: _____
For: _____	For: _____
Date: _____	Date: _____

This sheet is to be completed during Preparation for Acceptance. The results of the checks carried out should be recorded overleaf.

Intentionally Blank

CATEGORY 4C

ACCEPTANCE TRIALS

CONTENTS

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	HARBOUR ACCEPTANCE TRIALS	
1	Object	
3	Prerequisites	
4	Special precautions	
5	Time required	
6	Conduct	
	SEA ACCEPTANCE TRIALS	
7	Equipment	
8	Performance standard	
	Channel checks	
9	Prerequisites	
11	Facilities	
12	Conduct	
14	Frequencies	
15	Ship-air range trial	
18	Facilities	
21	Air move signals	
22	Range trial procedures	
23	Range trial frequency	
25	Conduct	
Table		Page
1	Test frequencies	3

HARBOUR ACCEPTANCE TRIALS

OBJECT

1 The purpose of the Harbour Acceptance Trial (HAT) is to ensure the Outfit 2QCB meets the performance criteria laid down in the specification document. The HAT ensures satisfactory performance, as far as can be ascertained with the ship in harbour, and verifies that the equipment is ready for the commencement of Sea Acceptance Trials (SAT).

2 Full live signal testing is not undertaken during the HAT phase; such tests are conducted during sea trials.

Test Results

Item Number	BR 9253, Cat 4B	Test	Result
1	Para 6.7	Power output at 127.500 MHz	
	Para 6.10	Power output at 118.000 MHz	
	Para 6.12	Power output at 136.975 MHz	
2	Para 6.8	Frequency accuracy at 127.500 MHz	
	Para 6.10	Frequency accuracy at 118.000 MHz	
	Para 6.12	Frequency accuracy at 136.975 MHz	
3	Para 7.12	Receiver sensitivity at 127.500 MHz	
	Para 7.12	Receiver sensitivity at 118.000 MHz	
	Para 7.12	Receiver sensitivity at 136.975 MHz	

CHANNEL CHECKS

Prerequisites

9 The prerequisites for the SAT are:

9.1 HAT satisfactorily completed and all outstanding defects made good.

9.2 Facilities for control of consort or sea trials range.

10 Outfit 2QCB to be set up on the frequencies shown in Table 1, or as issued in Trial's Orders both on the ship and in the consort/sea trials range. The frequencies listed in Table 1 apply to operation in Normal mode.

Facilities

11 Consort or sea trials range to be fitted with VHF communication equipment capable of operating with 25 kHz and 8.33 kHz channel spacing.

11.1 Consort or sea trials range is required to provide voice communication with the ship using the frequencies detailed in Table 1 or as issued in Trial's Orders.

Conduct

12 With Outfit 2QCB in Normal mode at 25 kHz channel spacing, establish communication with the consort/sea trials range on the first test frequency.

13 At any range from three to fifteen miles, carry out checks on all relevant equipment on all of the channels listed in Table 1, or as issued in Trial's Orders. Sample channel checks should be carried out from both the base station and RCU positions.

FREQUENCIES

14 Table 1 lists the frequencies to be tested, together with the channel designation, and is to be promulgated to the consort/sea trials range well in advance of the actual trial so that the equipment may be set up accordingly.

TABLE 1 TEST FREQUENCIES

Test Frequency Number	VHF Frequency (MHz)
1	118.000
2	127.500
3	136.975

PREREQUISITES

3 The prerequisites for the HAT are:

3.1 The Preparation for Acceptance procedure has been satisfactorily completed in accordance with BR 9253, Cat 4B, and the Preparation for Acceptance (PFA) Record Sheet has been completed, signed and presented to the Trials Authority.

3.2 Ship's electrical power supplies are to be available.

3.3 Remote lines and user positions are tested and available.

3.4 Test equipment, as detailed in BR 9253, Category 4B, Table 1, and associated handbooks available.

3.5 On board spares supplied and available.

SPECIAL PRECAUTIONS

4 RADHAZ and SAFE-TO-TRANSMIT procedures are to be observed.

TIME REQUIRED

5 Half a day.

CONDUCT

6 Carry out checks and measurements as detailed in BR 9253 (4B), recording their satisfactory completion/measurement on the Weapons Equipment Performance Record Sheet (WEPRS).

SEA ACCEPTANCE TRIALS

EQUIPMENT

7 The equipment is as listed:

Outfit 2QCB

BR 9253

Inst Spec BR 9253, Cat 4A.

PERFORMANCE STANDARD

8 No separate Trials Acceptance Schedules required.

CONDUCT

25 Establish communication with the aircraft on the allocated frequency.

26 Inform the pilot that, as this is an Equipment Proving Trial, he is responsible for his own safety; that if voice contact is lost, he is to turn as soon as convenient and close on the ship in order to regain contact.

27 Instruct the aircraft to fly out from the ship on a suitable bearing and at a height of 15,000 ft.

28 Check that communication can be established with the aircraft at frequent intervals, or at least every two minutes.

29 Plot the aircraft's position continuously and inform the pilot of any relevant information regarding firing areas etc.

30 Instruct the aircraft to orbit at 100 miles, and carry out range trials on the Outfit 2QCB on the allocated frequency.

31 On completion, advise the aircraft to return to base.

32 Record the results of the Range Trial together with details of associated antennas.

SHIP-AIR RANGE TRIAL

15 The facilities for controlling the trials aircraft are:

15.1 Safety circuit manned.

15.2 VHF communications available.

16 VHF equipment to be checked and set up on the frequencies shown in Table 1, or as issued in Trial's Orders.

17 No abnormal weather conditions that prevent the aircraft flying at 15,000 ft to a range of 100 miles from the ship.

FACILITIES

18 Trials aircraft fitted with VHF communication equipment capable of operating with 25 kHz and 8.33 kHz bandwidth.

19 One aircraft run to a distance of 100 miles at 15,000 ft. The aircraft is required to orbit at this range.

20 Ships at sea with freedom to manoeuvre, clear of high land masses to a minimum range of five miles and a clear bearing out to 110 miles on the bearing on which the trials aircraft is to be flown.

AIR MOVE SIGNALS

21 It is important that Air Move Arrival and Air Move Departure signals are made to the aircraft's base immediately they are due.

RANGE TRIAL PROCEDURES

22 A thorough knowledge of the Trials procedure is required and close liaison with the trials aircraft and its base are essential to a satisfactory trial.

RANGE TRIAL FREQUENCY

23 A frequency as issued in Trial's Orders. This is to be promulgated to the aircraft's administrative authority well in advance of the actual trial to ensure that the equipment on the trials aircraft is set up.

24 The expected range may be calculated from the formula:

Range in miles = $1.23 (ph_1 + ph_2)$

where,

h_1 = height of antenna, in feet, on board the trials ship.

h_2 = height of aircraft, in feet.

Note ...

The expected range may be modified by prevailing propagation conditions, antenna radiation patterns, and when the height of the ship's antenna approaches sea level.

CATEGORY 5

MAINTENANCE INFORMATION

CONTENTS

CATEGORY 5A	DIAGNOSTIC MAINTENANCE
CATEGORY 5B	CORRECTIVE MAINTENANCE
CATEGORY 5C	PREVENTIVE MAINTENANCE

CATEGORY 5A

DIAGNOSTIC MAINTENANCE

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4	Fault and error codes	
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1	Base station fault diagnosis	2
2	Base station fault and error codes	3/4

INTRODUCTION

1 This category gives guidance regarding fault finding on Outfit 2QCB. Fault finding is to unit level, that is the base station and RCU. Repair is by exchange of unit. Before attempting to diagnose any fault condition, ensure the base station's current personality does not inhibit any expected function.

FAULT FINDING

2 Outfit 2QCB comprises five elements:

(1) the ship's supply.

(2) a T6M base station.

(3) the base station's antenna circuit.

(4) one or more T6M RCUs.

(5) the interconnection between each RCU and the base station.

3 Simple fault finding techniques should quickly establish which of the five elements is unserviceable. A logical step-by-step sequence is:

3.1 Establish the base station and antenna system are serviceable by using the Base Station Fault Diagnosis - Table 1.

3.2 When the base station is proven serviceable, check transmission and reception from each RCU. Failure from an RCU position indicates the RCU, or the cable to the base station is unserviceable.

TABLE 2 BASE STATION FAULT AND ERROR CODES

Displayed Fault or Error Code	Meaning	Remedial Action
F1	Synthesiser failure	An internal fault on the synthesiser has been detected. Isolate power from the base station and reconnect the power after a few minutes. If the fault persists, condition the base station unserviceable, and replace with a serviceable spare.
F2	Unstable output	An internal fault on the power amplifier has been detected. Isolate power from the base station and reconnect the power after a few minutes. If the fault persists, condition the base station unserviceable, and replace with a serviceable spare.
F4	Over temperature	This condition may occur if the transmitter's duty cycle has been exceeded, or when transmitting for long periods. The fault should clear if the base station is not keyed while it is allowed to cool.
F16 F32	Low supply voltage High supply voltage	These two fault codes indicate the internal power supply is faulty. Isolate power from the base station and reconnect the power after a few minutes. If the fault persists, condition the base station unserviceable, and replace with a serviceable spare.
cErr	Critical error	This error is displayed when the base station is initially switched on and no, or a corrupted, personality is detected. The base station's personality should be reprogrammed as detailed in Cat 2C.

TABLE 1 BASE STATION FAULT DIAGNOSIS

Symptom	Check
No front panel indicators lit.	Ensure input ship's supply is available and connected. Ensure rear panel Power switch is set to on. Ensure the front panel Power button (base station only) is set to on. Ensure the ac supply input fuse (located in rear panel ac connector) is not ruptured.
Fault, or error code displayed at front panel.	Fault and error codes are displayed on the front panel to indicate faults detected by the radio module. These codes are detailed in Table 2.
Transmit function not operating correctly. Transmit inhibit indicator flashing.	External transmit inhibit facility is deliberately or inadvertently enabled. This facility is enabled when pin 14 on the base station's Facilities connector is grounded (see Cat 4A Table 5).
Transmit function not operating correctly. No fault code displayed.	Ensure that fist microphone is fully serviceable. Complete the 'Transmit Power and Frequency Accuracy Test' detailed in Cat 5C. If the test fails, replace the base station. If the 'Transmit Power and Frequency Accuracy Test' is OK, the fault is probably in the antenna system.
Receive function not operating correctly. No fault code displayed.	If some signals are not being received, refer to the operating instructions (Cat 2A) and check the squelch level is correctly set. Complete the 'Receiver Sensitivity Test' detailed in Cat 5C. If the test fails, replace the base station. If the 'Receiver Sensitivity Test' is OK, the fault is probably in the antenna system.

FAULT AND ERROR CODES

4 A number of fault and error codes are shown on the base station's display if an internal fault is detected. The codes, their meaning, and remedial action are detailed in Table 2.

CATEGORY 5B

CORRECTIVE MAINTENANCE

CONTENTS

Para
1 Introduction
2 Replacing the base station
3 Replacing the RCU

INTRODUCTION

1 Corrective maintenance is by exchange of unit. The units that can be exchanged are:

1.1 Base station, radio set, 5820-99-471-1699.

1.2 RCU (control radio set) 5820-99-297-5932.

REPLACING THE BASE STATION

2 To replace the base station:

2.1 Isolate power from the base station.

2.2 Remove the following connectors from the base station's rear panel:

- ❑ AC supply connector
- ❑ Antenna connector
- ❑ Facilities connector (if used)
- ❑ RCU connector(s). Up to four RCU connectors may be used.

2.3 Unscrew the base station's fixing plate from the desktop, or deckhead. Six screws are used to secure the fixing plate. Retain the securing screws.

2.4 Remove the base station, complete with integral fixing plate, from the operational position.

2.5 Secure the replacement base station in the operational position by securing it to the desktop, or deckhead, using the six screws removed in step 2.3.

2.6 Make the following connections to the base station:

- ❑ RCU connector(s). Up to four RCU connectors may be used
- ❑ Facilities connector (if used)
- ❑ Antenna connector
- ❑ AC supply connector.

2.7 Restore power to the base station.

2.8 Refer to Cat 2C and ensure the required personality is programmed into the base station.

CATEGORY 5C

PREVENTIVE MAINTENANCE

CONTENTS

Para		
1	Introduction	
2	Test equipment	
3	Test lead	
4	Transmit power and frequency accuracy test	
5	Receiver sensitivity test	
Table		**Page**
1	List of test equipment	1
2	Test lead connections	2
Fig		**Page**
1	Transmit power and frequency accuracy test - test equipment connection	2
2	Receiver sensitivity test - test equipment connection	4

INTRODUCTION

1 The procedures given within this category should be carried out in accordance with the Maintenance Schedules detailed in Category 6.

TEST EQUIPMENT

2 The test equipment necessary to complete the schedules are listed in Table 1.

TABLE 1 LIST OF TEST EQUIPMENT

Item	NSN	Description
1	6625-99-531-8989	Wattmeter set (or equivalent).
2	6625-99-531-7069	20 dB load.
3	6625-99-786-4628	VHF frequency counter (or equivalent).
4	6625-99-253-9713	VHF signal generator.
5	6625-99-477-4004	AF wattmeter.
6	Not applicable	Test lead for connecting the base station to the AF wattmeter (see para 3). Local manufacture.

2.9 Perform a functional test from the base station, and each RCU position.

2.10 Return the unserviceable unit to the manufacturer through normal channels.

REPLACING THE RCU

3 To replace the RCU:

3.1 Isolate power from the RCU.

3.2 Remove the following connectors from the RCU's rear panel:

- ❑ AC supply connector
- ❑ Facilities connector.

3.3 Unscrew the RCU's fixing plate from the desktop, or deckhead. Four screws are used to secure the fixing plate. Retain the securing screws.

3.4 Remove the RCU, complete with integral fixing plate, from the operational position.

3.5 Secure the replacement RCU in the operational position by securing it to the desktop, or deckhead, using the four screws removed in step 3.3.

3.6 Make the following connections to the RCU:

- ❑ Facilities connector
- ❑ AC supply connector.

3.7 Restore power to the RCU.

3.8 Perform a functional test from the RCU position.

3.9 Return the unserviceable unit to the manufacturer through normal channels.

4.5 Press the SQL button to select the test frequency 127.500 MHz. The test frequency is displayed for a couple of seconds and the display then reverts to the power setting.

Note ...

Using the SQL key to select a test frequency always selects a 25 kHz spaced channel. Squelch is automatically switched off in Test mode.

4.6 Key the transmitter and note the wattmeter's reading.

4.7 With the transmitter de-keyed, use the CH▲ and CH▼ buttons to increment or decrement the power setting in steps of 1. Alternatively, use the SEL▲ and SEL▼ buttons to increment or decrement the power setting in steps of 10. Then key the transmitter and note the wattmeter's reading. **The power setting cannot be adjusted when the transmitter is keyed.**

Note ...

The transmit indicator lights when the transmitter is keyed. If a fault is detected, the indicator does not light. No fault codes, however, are displayed in Test mode.

4.8 Key the transmitter and check that the frequency counter reads between 127.499808 and 127.500192 MHz.

4.9 To save the new power setting in the base station's memory, press and keep pressed the front panel Power button. Without releasing the Power button, press and release the PRI button, then the SCN button, and finally the SQL button.

4.10 When the new setting is saved, the display shows 'S' and two short beeps are heard. Release the Power button.

4.11 To switch off without saving the new power setting, press and release the Power button. The display shows 'nS' and a single long tone is heard.

4.12 Enter test mode again by pressing, and keeping pressed, the front panel Power button. Without releasing the Power button, press and release the SQL button, then the SCN button, and finally the PRI button. Release the Power button.

4.13 Check that the display shows tESt and after a few seconds it changes to show the current power level setting.

4.14 Press the SQL button to select the test frequency 118.000 MHz.

4.15 Key the transmitter and check that the wattmeter reads between 6 and 12 watts. Check that the frequency counter reads between 117.999823 and 118.000177 MHz.

4.16 Press the SQL button to select the test frequency 136.975 MHz.

4.17 Key the transmitter and check that the wattmeter reads between 6 and 12 watts. Check that the frequency counter reads between 136.974745 and 136.975205 MHz.

4.18 On completion, switch off the base station and disconnect the test equipment.

RECEIVER SENSITIVITY TEST

5 To check the base station's receiver sensitivity carry out the following procedure:

5.1 Isolate power from the base station and connect the test equipment as shown in Fig 2.

5.2 Reconnect the power and ensure the base station's rear panel Power switch is set to on.

Test Lead

3 The test lead (Table 1, item 6) connects the base station to the AF wattmeter during receiver sensitivity tests. The lead connections are detailed in Table 2. For the test lead parts list, refer to BR 9253, Cat 4B, Page 2, Table 3.

TABLE 2 TEST LEAD CONNECTIONS

7-Pin DIN Plug (connects to base station's Microphone/Diagnostics connector)	AF Wattmeter Connector
Pin 5, receiver audio monitor	Input
Pin 7, earth	0 V

TRANSMIT POWER AND FREQUENCY ACCURACY TEST

4 To check the base station's transmit power, and the accuracy of the carrier frequency, carry out the following procedure:

4.1 Isolate power from the base station and connect the test equipment as shown in Fig 1. Ensure the wattmeter is switched to forward power.

4.2 Reconnect the power and ensure the base station's rear panel Power switch is set to on.

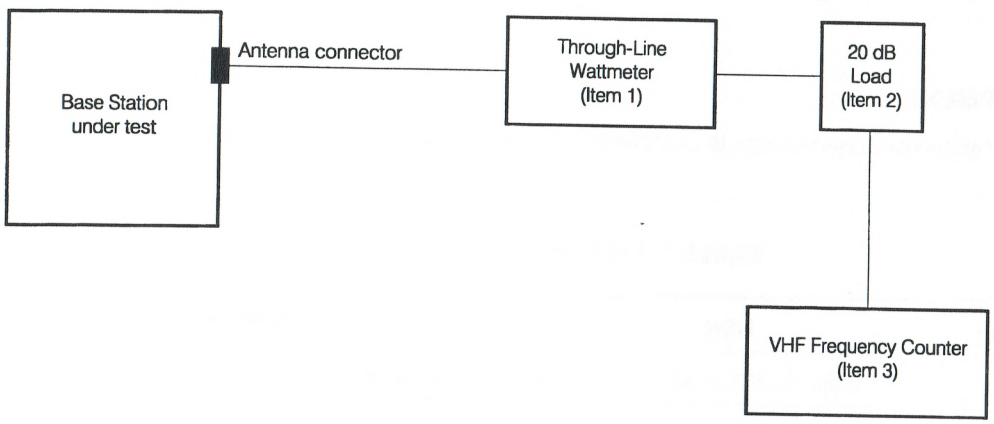


Fig 1 Transmit Power and Frequency Accuracy Test - Test Equipment Connection

4.3 To enter Test mode switch on the base station by pressing, and keeping pressed, the front panel Power button. Without releasing the Power button, press and release the SQL button, then the SCN button, and finally the PRI button. Release the Power button.

4.4 Check that the display shows tESt and after a few seconds it changes to show the current power level setting (a number between 1 and 240 representing approximately 6 to 12 watts).

CATEGORY 6

MAINTENANCE SCHEDULES

CONTENTS

CATEGORY 6A MAINTENANCE SCHEDULES

5.3 Adjust the signal generator to operate at 118.000 MHz with an RF level of -100 dBm and a 1 kHz tone modulated at 30%.

5.4 At the base station's front panel press the squelch (SQL) button. Check that the display shows an 'S' and a number between 1 and 20. This number is the squelch level setting.

5.5 Adjust the squelch level, by pressing the VOL▲ and VOL▼ buttons, until the display shows a level of 2.

5.6 Adjust the volume control until a reference reading (approximately mid-scale) is shown in the AF wattmeter. Note the reading in dB.

5.7 Set the signal generator's modulation to off.

5.8 Increase the sensitivity of the AF wattmeter until a reading is obtained. Note the reading in dB.

5.9 Check that the difference in readings noted in paras 5.6 and 5.8 are not less than 10 dB.

5.10 Repeat paras 5.3 to 5.9 for test frequencies of 127.500 MHz and 136.975 MHz.

5.11 On completion, switch off the base station and disconnect the test equipment. Restore the base station ready for operational use.

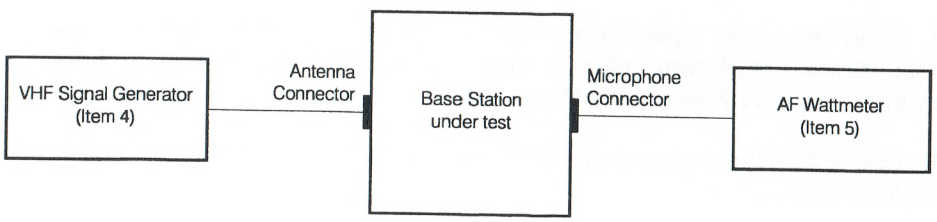


Fig 2 Receiver Sensitivity Test - Test Equipment Connection

CATEGORY 6A

MAINTENANCE SCHEDULES

CONTENTS

Para
1 Introduction
2 Maintenance routines

Table
1 Maintenance routines Page 1/2

INTRODUCTION

1 Maintenance routines are required to upkeep Outfit 2QCB.

MAINTENANCE ROUTINES

2 The maintenance routines and periodicity are as detailed in Table 1.

TABLE 1 MAINTENANCE ROUTINES

Maintenance Operation Number	Job Description	By Whom	Periodicity	Location of Details (BR 9253, Cat 5C)
1	Base station power output check	SS	6M	Para 4
2	Base station frequency accuracy check	SS	6M	Para 4
3	Base station sensitivity check	SS	6M	Para 5

CATEGORY 7

PARTS LIST

CONTENTS

CATEGORY 7A PARTS LIST

CATEGORY 7A

PARTS LIST

CONTENTS

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1	Introduction	
4	Installation kits	
Table		**Page**
1	Outfit 2QCB parts	2
Fig		**Page**
1	Base station parts	3/4
2	RCU parts	5/6

INTRODUCTION

1 This category details Outfit 2QCB replaceable parts.

2 Repair of the base station and RCU is limited to replacement of the complete unit, except where supply fuses have ruptured. Neither the base station or RCU has any replaceable modules or assemblies.

3 Table 1 lists all replaceable items. These items are illustrated in Figs 1 and 2.

INSTALLATION KITS

4 Two installation kits are available: one for the base station and one for the RCU. The NATO stock number for each kit and the contents are:

4.1 Base station installation kit, NSN 5895-99-728-6042 (PAE part number 70-T6MBSINS). This kit contains items 1-3 to 1-6 as listed in Table 1.

4.2 RCU installation kit, NSN 5895-99-943-2561 (PAE part number 70-T6MCINST). This kit contains items 2-2 to 2-5 as listed in Table 1.

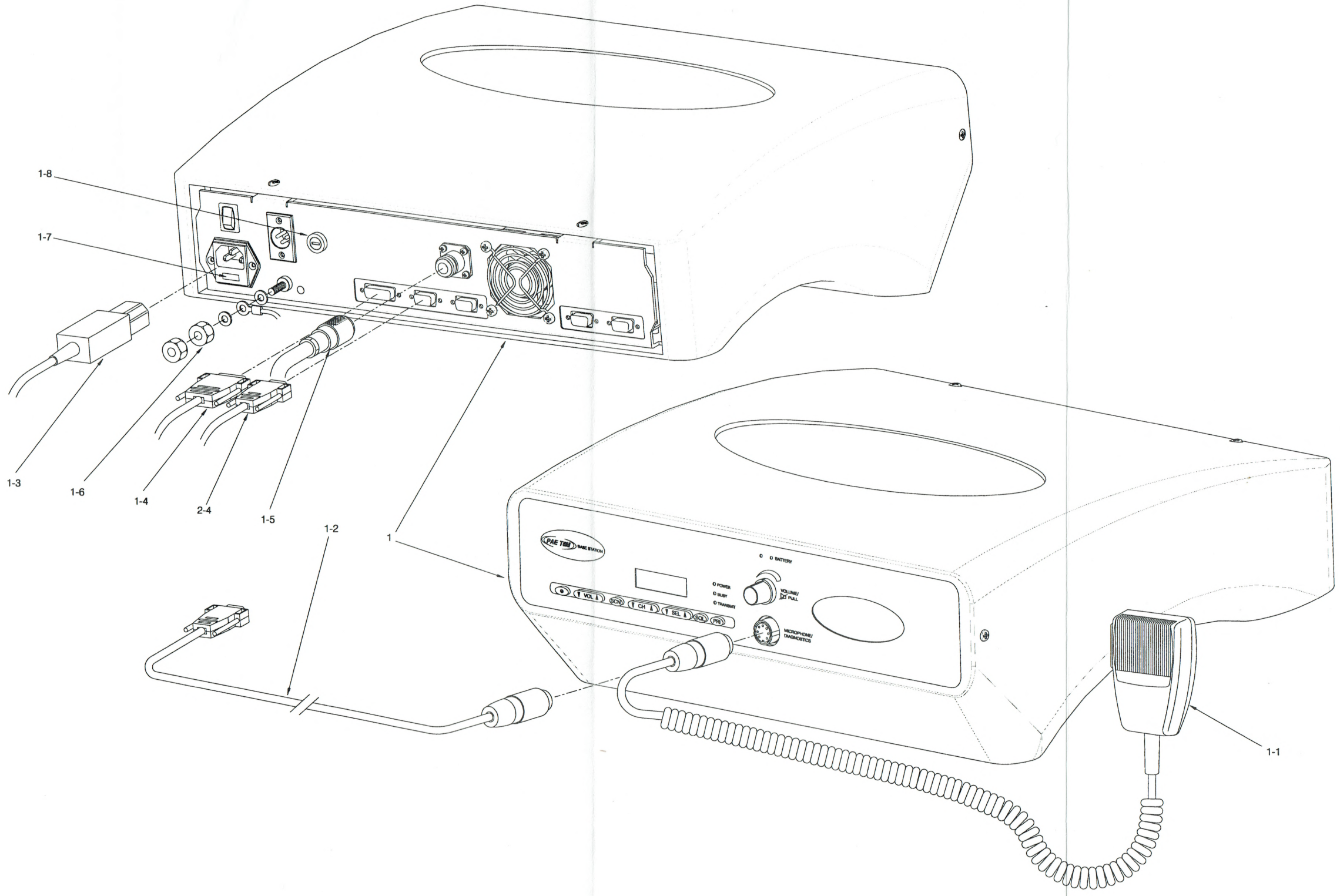


Fig 1 Base Station Parts

TABLE 1 OUTFIT 2QCB PARTS

Item Number	Description	Quantity	PAE Part Number	NATO Stock Number
Base Station:				
1	Base station, radio set	1	BT6MBSNAVY	5820-99-471-1699
1-1	Microphone, dynamic	1	24-11030301	5965-99-131-0752
1-2	Programming kit comprising: Disk program, automatic data processing Cable assembly, special purpose, electrical	 1 1	 70-T6MBSRNS 17E12600001	 7030-99-436-5094 5995-99-182-2589
1-3	Connector, socket, electrical (mates with ac input connector)	1	20-02030102S	5935-99-531-3426
1-4	15-way D-type plug (mates with Facilities connector) comprising: Connector, recepticle, electrical Shield, electrical, connector	 1 1	 20-01150100 20D09150101	 5935-99-358-5628 5935-99-014-4665
1-5	N-type connector: Connector, free, electrical	 1	 19-01030301	 5935-99-781-3401
1-6	Crimp blue - 6 mm eyelet	1	20-08010103	5940-00-230-0515
1-7	Fuse F1, T5A	1	29F01140102S	5920-99-252-1738
1-8	Fuse F2, T15A	1	29-01350201	5920-99-951-6966
RCU:				
2	Control radio set	1	BT6MCNAVY	5820-99-297-5932
2-1	Microphone, dynamic	1	24-11030301	5965-99-131-0752
2-2	Connector, socket, electrical (mates with ac input connector)	1	20-02030102S	5935-99-531-3426
2-3	15-way D-type plug (mates with Facilities connector) comprising: Connector, recepticle, electrical Shield, electrical, connector	 1 1	 20-01150100 20D09150101	 5935-99-358-5628 5935-99-014-4665
2-4	9-way D-type plug (mates with base station's RCU connector) comprising: Connector, recepticle, electrical Shield, electrical, connector	 1 1	 20-01090100 20D09090101	 5935-99-839-6127 5935-99-657-0575
2-5	Crimp blue - 6 mm eyelet	1	20-08010103	5940-00-230-0515
2-6	Fuse F1, T125mA	1	29F01490102S	5920-99-299-0079

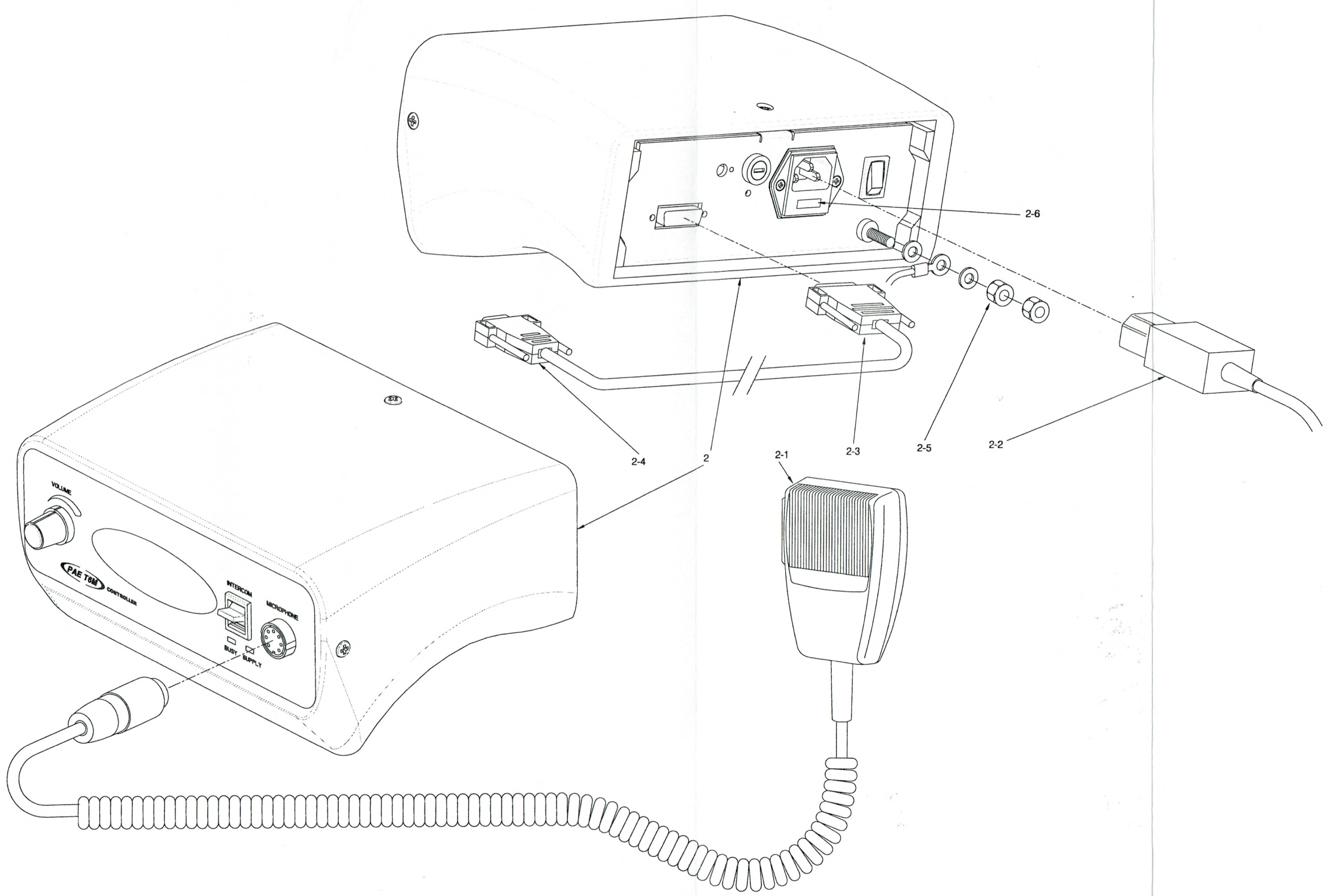


Fig 2 RCU Parts