Configuring the Transmitter for Operational Use

The transmitter can be configured for use in several different ways. Typical configurations are illustrated in the following figures:

- Fig 19 Local operation. Operating the transmitter using a microphone connected to the drive assembly front panel.
- Fig 20 Remote operation. Operating the transmitter from a voice switch or remote controller.
- Fig 21 With the transmitter connected through an RSE2 equipment. RSE2 is the remote site equipment in a Park Air Multi-Access Remote Control (MARC) system. This system provides automatic and manual main/standby switching and routes BIT information to allow radio, site and system status to be displayed at the control site.
- Fig 22 With the transmitter connected through an E1 Radio Interconnect (E1-RIC). By using E1-RICs, a digital end-to-end system using E1 data streams can be configured.
- Fig 23 The transmitter is configured with a receiver to provide Mode 2 operation (note that mode 2 software must be loaded to allow this configuration).
- Fig 24 The transmitter is configured for Mode 3 operation (note that mode 3 software must be loaded to allow this configuration).

The following pages show the illustrations listed above and then detail the pin-outs for the drive assembly connectors used to configure the transmitter for the required operational usage. The Microphone/ Diagnostics and the Reference connectors are fitted to the drive assembly's front panel; other connectors, as shown in Fig 25, are fitted to the rear panel.

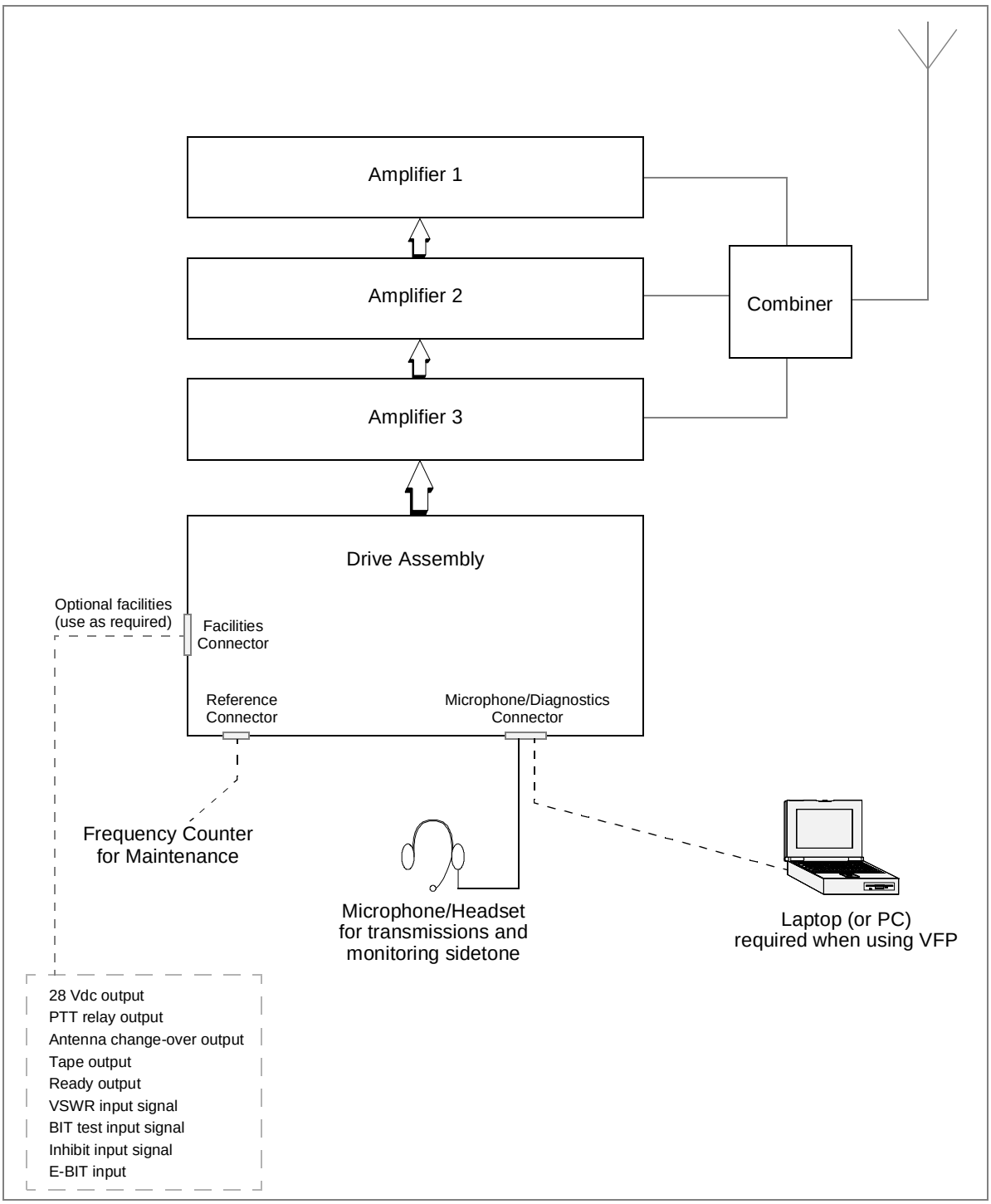


Fig 19 Transmitter Configured for Local Operation

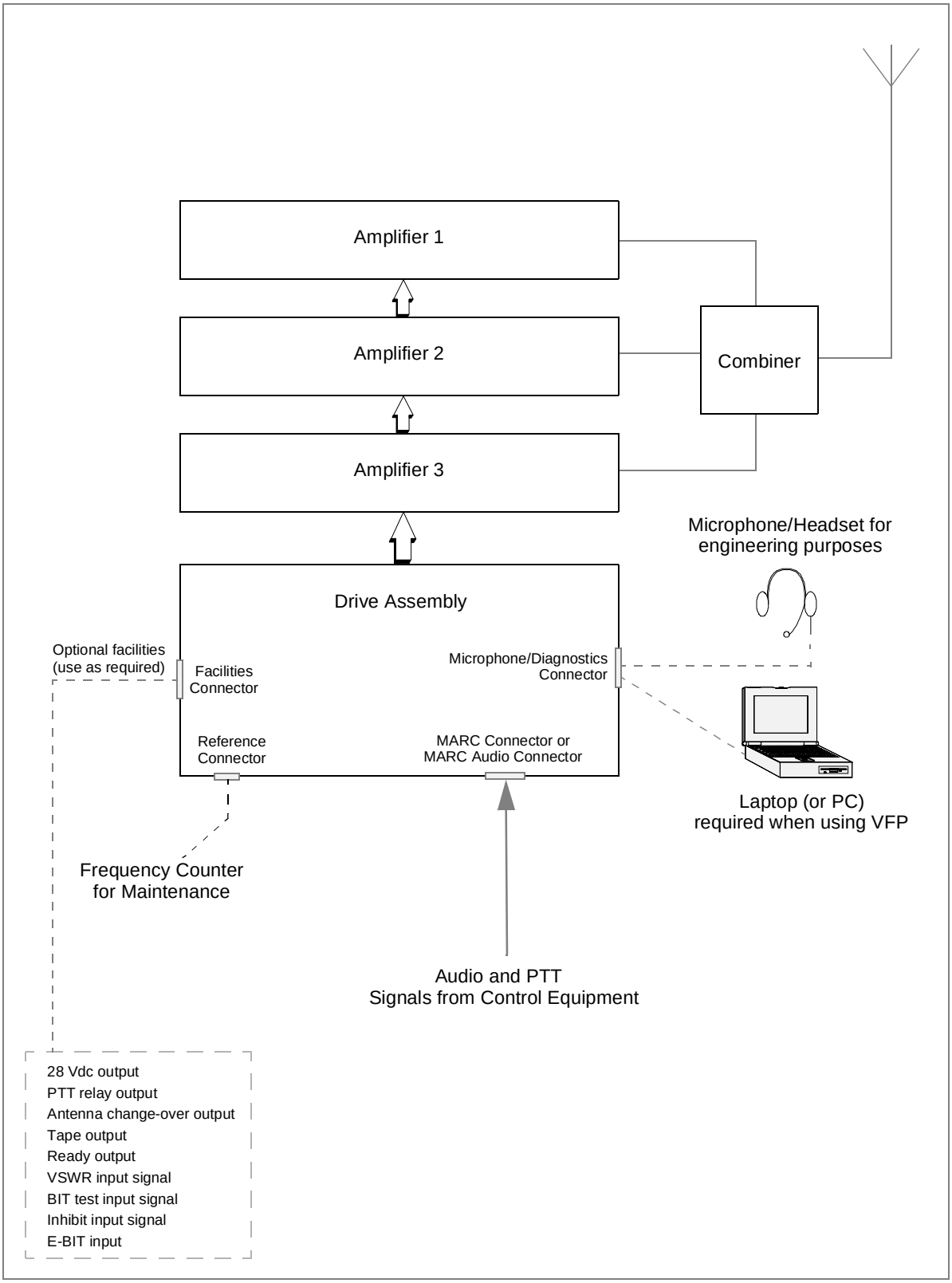


Fig 20 Transmitter Configured for Remote Operation

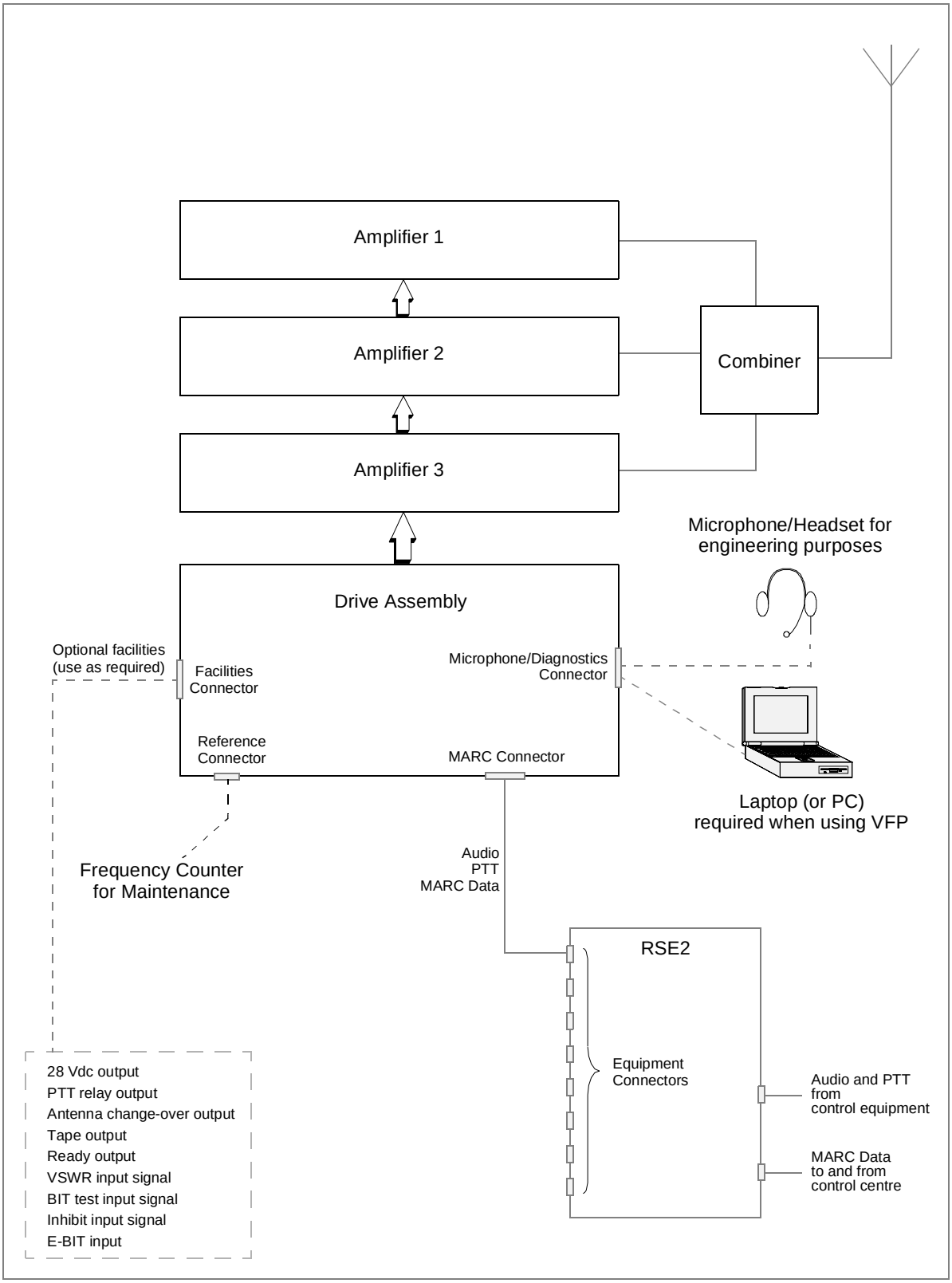


Fig 21 Transmitter Configured for use with a MARC RSE2

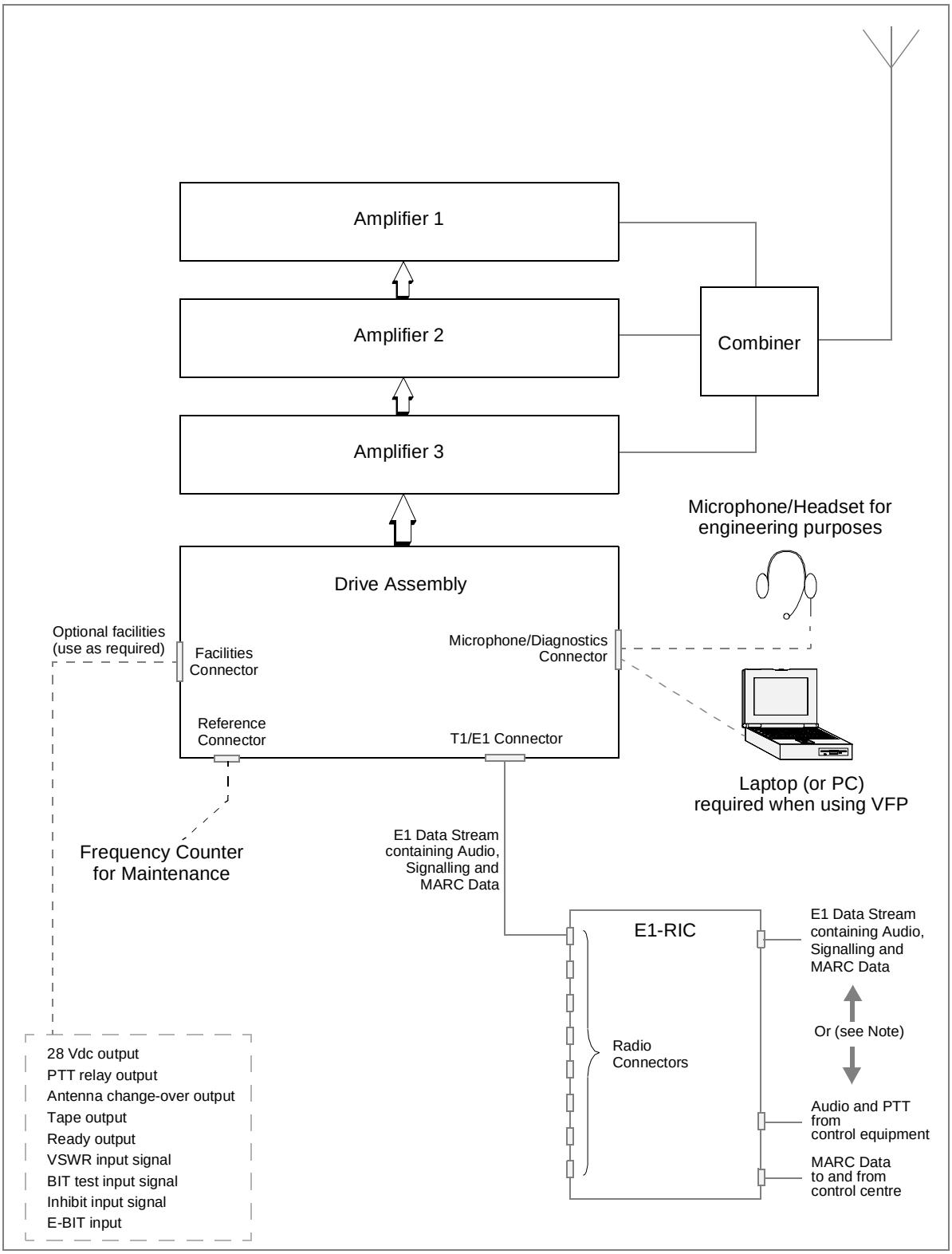


Fig 22 Transmitter Configured for use with an E1-RIC

Note:

E1-RIC can be used in an E1 digital end-to-end system, or using 4-wire E and M lines.

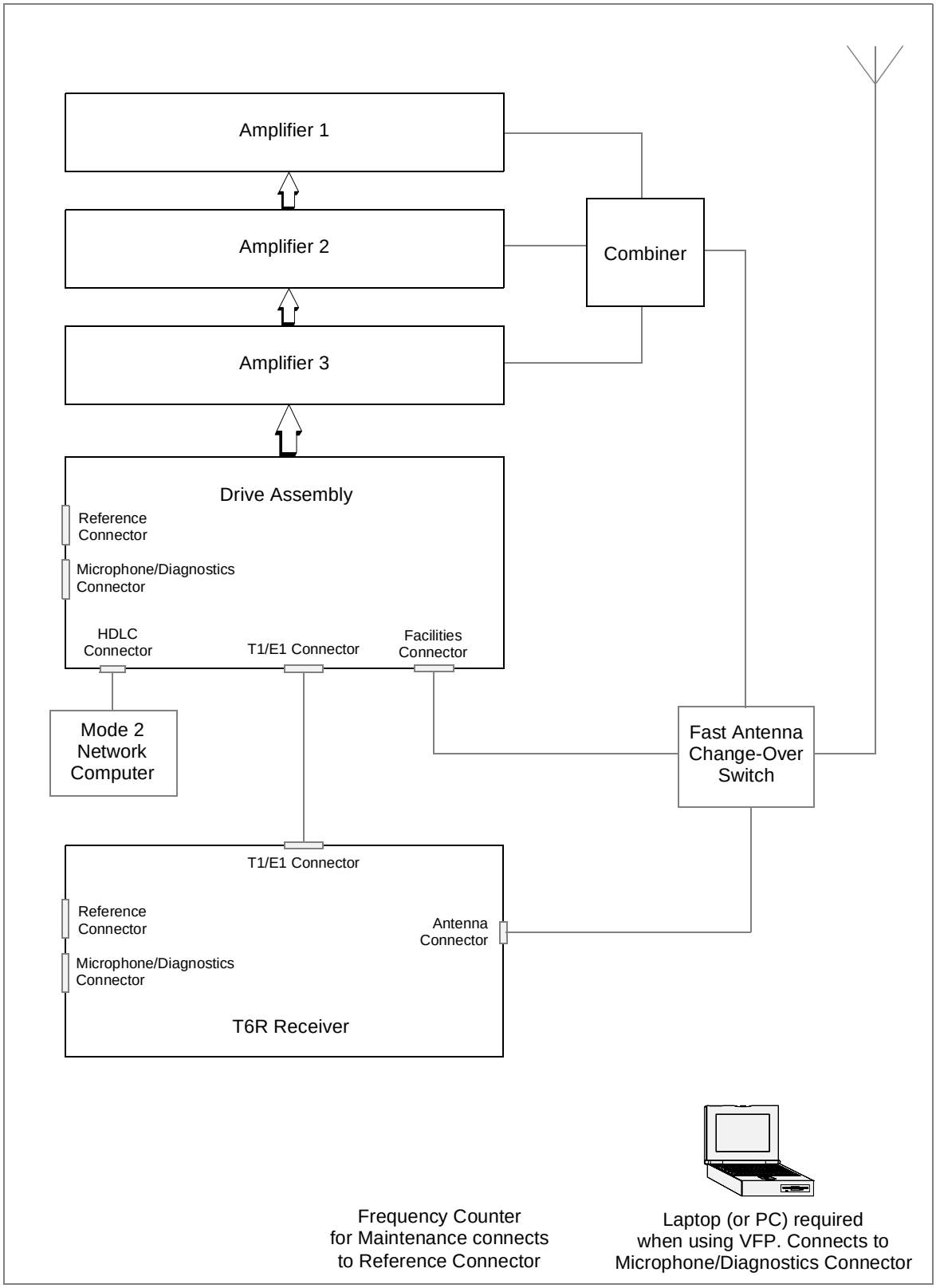


Fig 23 Transmitter Configured with Receiver for Mode 2 Operation

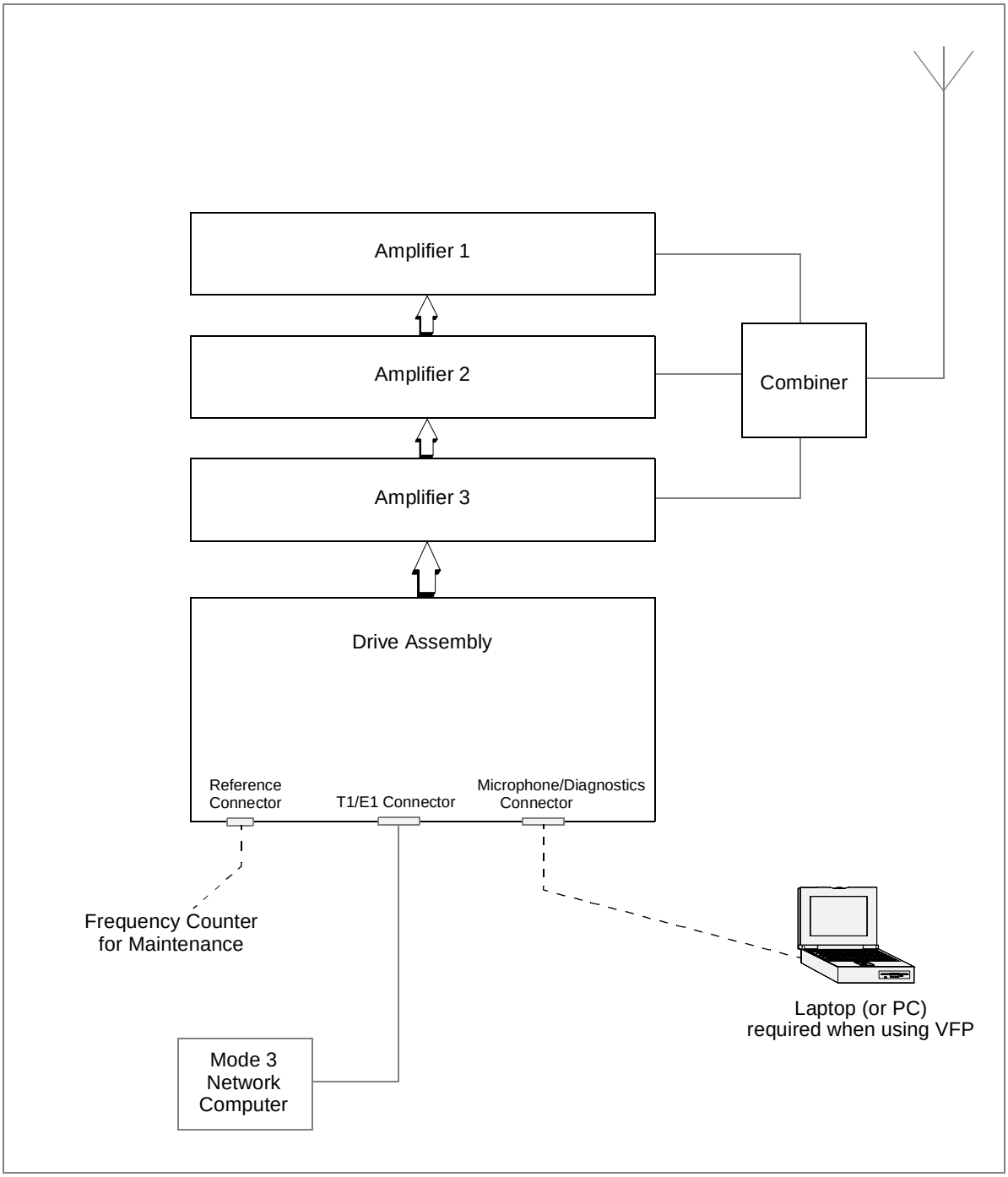
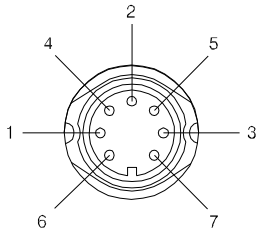


Fig 24 Transmitter Configured for Mode 3 Operation

Front Panel Connectors

Microphone/Diagnostics Connector

The Microphone/Diagnostics connector is a self-locking 7-way DIN socket used for connecting a microphone, microphone/headset or PC. The connector pin-out is detailed in Table 16.



Pin-out of the Microphone/Diagnostics connector looking into the mating face of the chassis mounted socket.

A suitable free plug is detailed in Table 14 on page 70.

Table 16 Microphone/Diagnostics Connector

Pin Number	Signal	Characteristic	Usage
1	Microphone ground	0 V.	Microphone/Headset
2	Transmit data	RS232. 115200 baud, 8 data bits, 1 stop bit, no parity, no handshaking.	PC
3	Microphone PTT	0 V to PTT.	Microphone/Headset
4	Receive data	RS232. 115200 baud, 8 data bits, 1 stop bit, no parity, no handshaking.	PC
5	Sidetone	–	Microphone/Headset
6	Microphone input	To ensure correct VOGAD operation, the following microphone input levels are required: Passive setting: between 2 and 35 mV Active setting: between 8 and 140 mV.	Microphone/Headset
7	Ground	0 V.	PC

Reference Connector

The Reference connector is an SMB plug used to monitor the radio's reference frequency. It monitors the frequency at a level of 100 mV (±50 mV) with less than -10 dBc harmonics.

Rear Panel Connectors

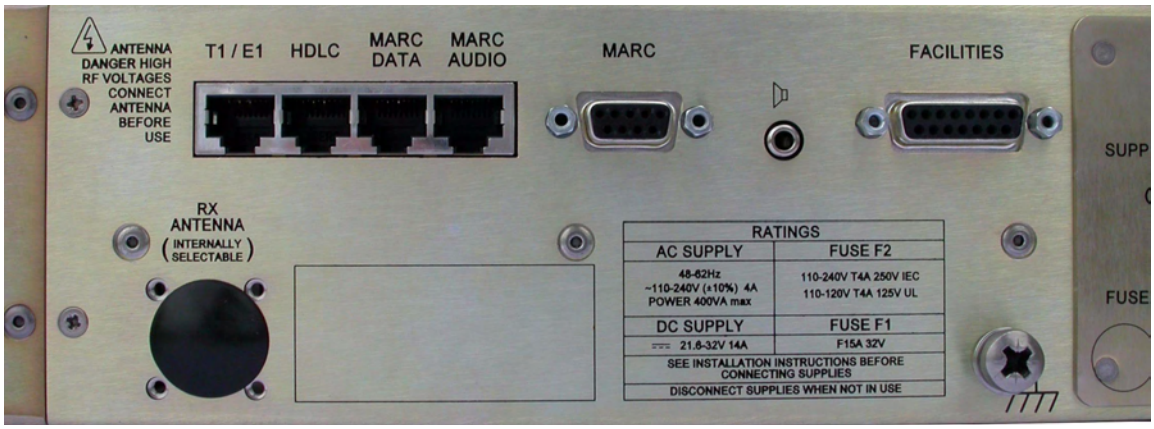


Fig 25 Drive Assembly External Signal Connectors

Table 17 Rear Panel Connector Usage

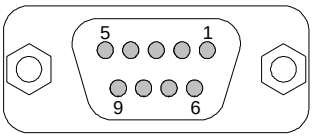
Connector	Type	Usage
External speaker	3.5 mm stereo jack	Connects an external loudspeaker for monitoring sidetone.
MARC	9-way D-type	Used to connect to a MARC remote site equipment RSE2 Used to connect a T6 controller or hub Used to terminate external audio and PTT signals when a remote site equipment or T6 controller is not used.
MARC audio	RJ48	Used as an alternative to the MARC connector for terminating external audio and PTT signals.
MARC data	RJ48	Used as an alternative to the MARC connector for terminating data signals to and from a compatible data system.
Facilities	15-way D-type	Provides a number of optional facilities that can be used as required. Table 24 on page 95 lists the facilities.
T1/E1	RJ48	Used for connecting the radio to a Mode 3 network computer, connecting a transmitter and receiver together as a Mode 2 base station, or for connecting to a digital voice and data network.
HDLC	RJ48	Used to connect to a Mode 2 network computer.

MARC Connector

The MARC connector is a 9-way D-type socket used to connect the transmitter to a MARC remote site equipment, or it can also be used for normal remote operation.

As an alternative to using this connector, the RJ48 style MARC Audio and MARC Data connectors can be used to provide the same functions.

The MARC connector pin-out is shown below and detailed in Table 18.



Pin-out of MARC connector looking into the mating face of the chassis mounted socket.

A suitable free plug is detailed in Table 14 on page 70.

Table 18 MARC Connector

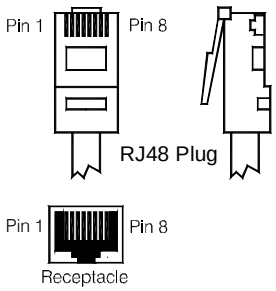
Pin Number	Signal	Characteristic
1	Ground	0 V.
2 3	Audio line in (+) Audio line in (-)	Balanced 600 ohm, -30 to +10 dBm. Phantom keying can be superimposed on the audio lines. See Fig 27.
4	PTT input	Remote PTT signal input. See Fig 26.
5	Output supply	This output is between 21.6 and 32 Vdc (nominally 28 V) fused at 500 mA.
6 7	Data in (+) Data in (-)	RS422 differential asynchronous data at 9600 baud, 8 data bits, 1 stop bit, no parity, no handshaking.
8 9	Data out (+) Data out (-)	RS422 differential asynchronous data at 9600 baud, 8 data bits, 1 stop bit, no parity, no handshaking.

Note:

The line level figures shown for the MARC connector are the limits when testing the transmitter using a sine wave; the line level will be 10 dB above the line level setting. See the information supplied under the heading ‘Line Level Setting’ in Operation.

MARC Audio Connector

The MARC Audio connector is an 8-way RJ48 socket. It can be used as an alternative to the MARC connector for audio and PTT connections. The connector pin-out is shown below and detailed in Table 19.



Numbering is shown looking from the top of the connector.

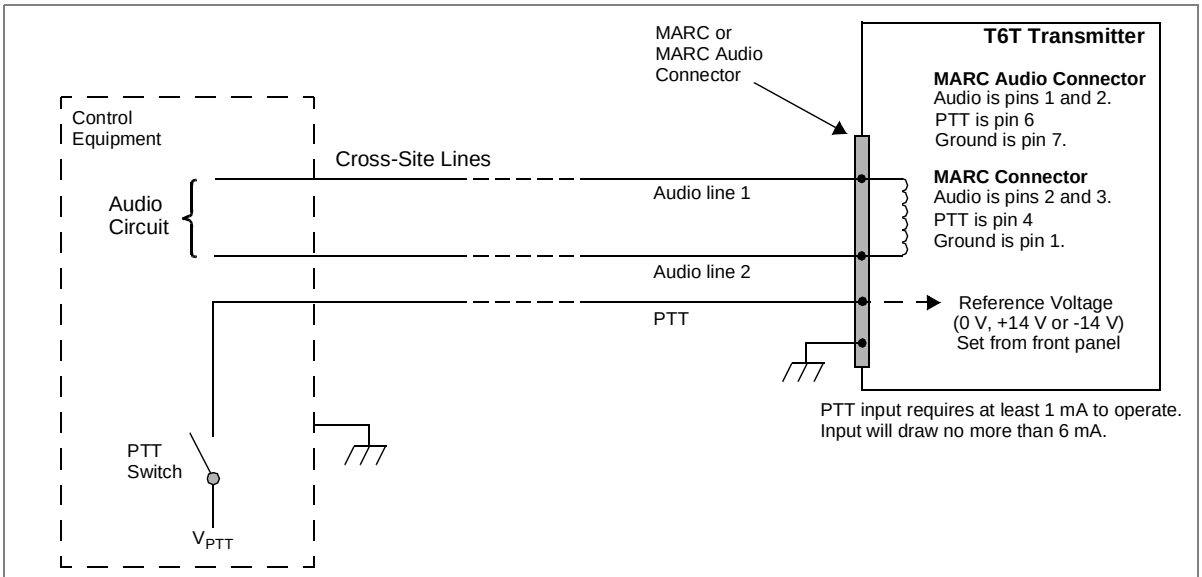
The top is being viewed when the lever is on the bottom.

Table 19 MARC Audio Connector

Pin Number	Signal	Characteristic
1	Audio line in (-)	Balanced 600 ohm, -30 to +10 dBm.
2	Audio line in (+)	Phantom keying can be superimposed on the audio lines. See Fig 27.
3	Fast antenna change-over/PTT (output)	Open collector NPN transistor grounding output, 200 mA maximum, configurable normally open or normally closed.
4	Not used	-
5	Not used	-
6	PTT (input)	Remote PTT signal input. See Fig 26.
7	Ground	0 V.
8	Not used	-

Note:

The line level figures shown for the MARC Audio connector are the limits when testing the transmitter using a sine wave; the line level will be 10 dB above the line level setting. See the information supplied under the heading ‘Line Level Setting’ in Operation.

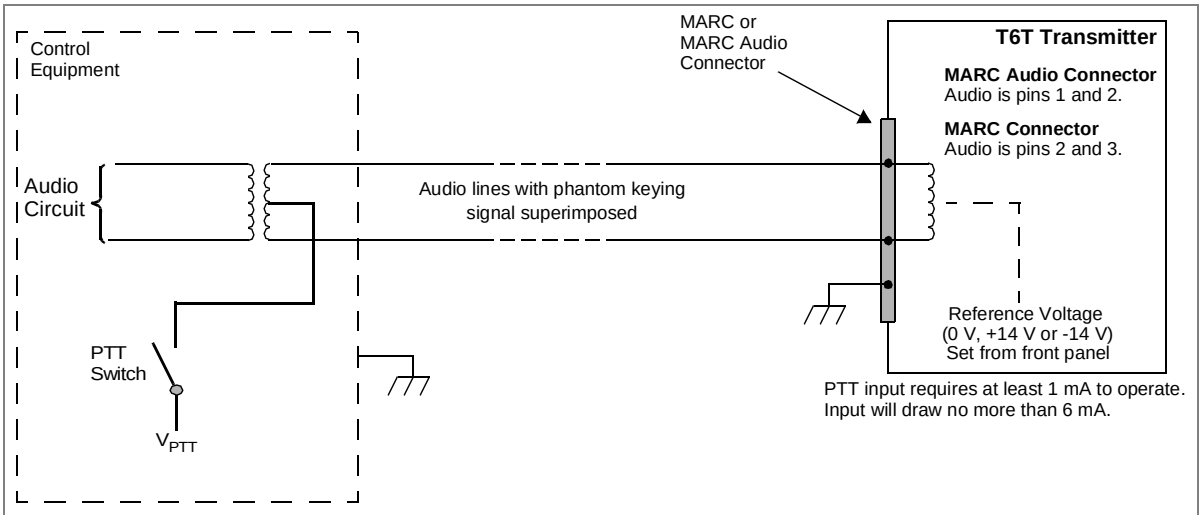


The transmitter reference voltage (0 V, +14 V or -14 V) is selected from the Polarities screen:

- PTT is active when V_{PTT} differs from the transmitter reference voltage by more than 10 V.
- PTT is inactive when V_{PTT} differs from the transmitter reference voltage by less than 1 V.
- Maximum value of V_{PTT} is ±60 V with respect to transmitter reference voltage.

Example:
To use 0 V as the keying potential, V_{PTT} = 0 V; set transmitter reference voltage to +14 V; set PTT In to STD.

Fig 26 Remote Keying



To reduce the number of cross-site lines between the control site and the transmitter, phantom keying may be employed. This method has the keying potential (V_{PTT}) superimposed on the audio lines instead of using a separate line.

The transmitter reference voltage (0 V, +14 V or -14 V) is selected from the Polarities screen:

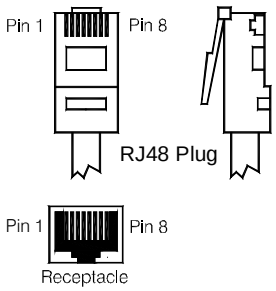
- PTT is active when V_{PTT} differs from the transmitter reference voltage by more than 10 V.
- PTT is inactive when V_{PTT} differs from the transmitter reference voltage by less than 1 V.
- Maximum value of V_{PTT} is ±60 V with respect to transmitter reference voltage.

Example:
To use 0 V as the keying potential, V_{PTT} = 0 V; set transmitter reference voltage to +14 V; set PTT In to STD.

Fig 27 Phantom Keying

MARC Data Connector

The MARC Data connector is an 8-way RJ48 socket. It can be used as an alternative to the MARC connector for data connections. The connector pin-out is shown below and detailed in Table 20.



Numbering is shown looking from the top of the connector.

The top is being viewed when the lever is on the bottom.

Table 20 MARC Data Connector

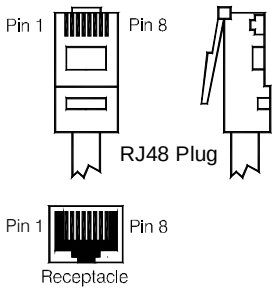
Pin Number	Signal	Characteristic
1 2	Data in (-) Data in (+)	RS422 differential asynchronous data, 9600 baud, 8 data bits, 1 stop bit, no parity, no handshaking.
3	Not connected	-
4 5	Data out (+) Data out (-)	RS422 differential asynchronous data, 9600 baud, 8 data bits, 1 stop bit, no parity, no handshaking.
6	Remote supply on/off	0 V to switch off. Note: Rear panel switch must be in the On position for this function to operate.
7	Ground	0 V.
8	Output supply	This output is between 21.6 and 32 Vdc (nominally 28 V) fused at 500 mA.

T1/E1 Connector

The T1/E1 8-way RJ48 socket is used to:

- Connect voice, signalling and RCMS data to a digital network
- Connect a Mode 3 network computer
- Connect a transmitter and receiver together when the receiver is configured as part of a Mode 2 base station.

The connector pin-out is shown below and detailed in Table 21.



Numbering is shown looking from the top of the connector.

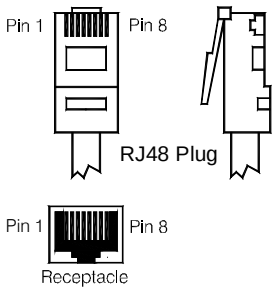
The top is being viewed when the lever is on the bottom.

Table 21 T1/E1 Connector

Pin	Signal	Characteristic
1	RRing	T1 - Balanced 100 ohm (±10%), 1.544 Mbits per second (±50 ppm), AMI/B8ZS Coding. E1 - Balanced 120 ohm (±10%), 2.048 Mbits per second (±50 ppm), AMI/HDB3 Coding. Protected with 28 V differential and common mode clamp and 1.25 A fuse in each line.
2	RTip	
3	Not connected	-
4	TRing	T1 - Balanced 100 ohm (±10%), 1.544 Mbits per second (±50 ppm), AMI/B8ZS Coding. E1 - Balanced 120 ohm (±10%), 2.048 Mbits per second (±50 ppm), AMI/HDB3 Coding. Protected with 28 V differential and common mode clamp and 1.25 A fuse in each line.
5	TTip	
6	Remote on/off	An input that is primarily used by a Park Air E1-RIC equipment to switch the radio on and off (0 V = off, 5 V = on). For this facility to work, the radio's rear panel Supply switch must be set to on and the E1-RIC must be powered from an external source.
7	Ground	0 V.
8	20 to 35 Vdc (nominally 28 V)	Output supply used to power an E1-RIC.

HDLC Connector

The HDLC connector is an 8-way RJ48 socket used for connecting to a Mode 2 network computer. The connector pin-out is shown below and detailed in Table 22.



Numbering is shown looking from the top of the connector.

The top is being viewed when the lever is on the bottom.

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Table 22 HDLC Connector

Pin	Signal	Characteristic
1	HDLC RX A (input)	RS422 differential synchronous data, 128 kbytes per second (±50 ppm).
2	HDLC RX B (input)	
3	HDLC CL A (output)	RS422 differential synchronous data, 128 kbytes per second (±50 ppm).
4	HDLC TX B (output)	RS422 differential synchronous data, 128 kbytes per second (±50 ppm).
5	HDLC TX A (output)	
6	HDLC CL B (output)	Pair to pin 3.
7	Ground	0 V.
8	Output supply	This output is between 21.6 and 32 Vdc (nominally 28 V) fused at 500 mA.

External Speaker

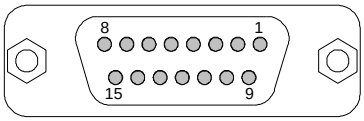
The External Speaker connector is a 3.5 mm stereo jack used for connecting an external speaker to the transmitter to provide sidetone. This speaker should be a high impedance active type.

Table 23 External Speaker

Pin	Signal	Characteristic
Tip	Speaker drive (output)	0 to 3 V pk-pk. Connected directly to Ring.
Ring	Speaker drive (output)	0 to 3 V pk-pk. Connected directly to Tip.
Sleeve	Ground	0 V.

Facilities Connector

The Facilities connector is a 15-way D-type filtered socket used for connecting to associated parts of a system. The connector pin-out is shown below and detailed in Table 24.

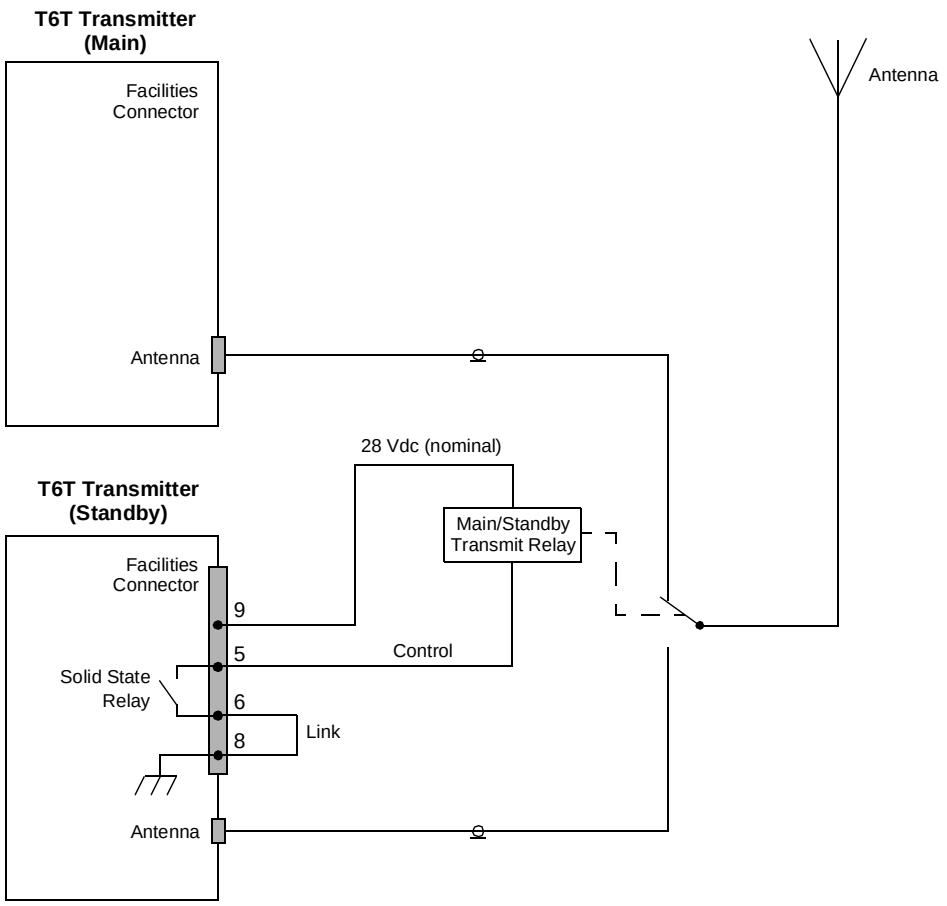


Pin-out of Facilities connector looking into the mating face of the chassis mounted socket.

A suitable free plug is detailed in Table 14 on page 70.

Table 24 Facilities Connector

Pin Number	Signal	Characteristic
1	Ground	0 V.
2	E-BIT (input)	An external BIT input that connects from any ancillary equipment having a compatible BIT alarm output. When this input is active, the transmitter's front panel Alarm indicator flashes and an E-BIT message is displayed on the LCD. The input is TTL having a 4.7 kohm pull-up resistor to 5 V. The input is configurable from the front panel to be active high or low.
3	PTT output	Grounding solid state relay. +60 to -60 V, ac or dc, 100 mA maximum, configurable normally open or normally closed. Activated 35 ms (±1 ms) before the start of the power ramp up to allow for the antenna relay pull-in time.
4	External VSWR input	Used to indicate an external VSWR fault. TTL input with 4.7 kohm pull-up to 5 V. Configurable active high or low.
5	Antenna change-over (output)	Solid state relay linked to pin 6. See Fig 28 for further detail.
6	Antenna change-over common (output)	Solid state relay linked to pin 5.
7	Not used	-
8	Ground	0 V.
9	Output supply	This output is between 21.6 and 32 Vdc (nominally 28 V) fused at 500 mA.
10	Inhibit (input)	Active signal prevents the transmitter keying. TTL with 4.7 kohm pull-up to 5 V. Configurable active high or low.
11	BIT interruptive test (input)	Active signal initiates a BIT test. TTL with 4.7 kohm pull-up to 5 V. Configurable active high or low. Must be asserted for >300 ms.
12	Not used	-
13	Ready (output)	An output that is active when the radio is ready to transmit and no faults are detected. Open collector NPN transistor grounding output, 200 mA maximum, configurable normally open or normally closed.
14	Tape (output)	An audio output for connection to a recording system. 0 dBm fixed output into 600 ohm for 90% modulation depth.
15	Reserved (output)	Do not connect to pin 15 unless advised to do so by Park Air.



Example

This example shows the Antenna Change-over Output configured to control the antenna switching between main and standby transmitters. The potential on Facilities connector pin 6 is switched through to pin 5 when the standby transmitter is keyed; in this example, pin 6 is linked to ground. This energizes the Main/Standby Transmit Relay to route the standby transmitter to the antenna.

Other Configurations

The antenna change-over output can be configured in other ways to suit the user's requirement subject to:

- Pin 6 can be any potential between -60 and +60 V, ac or dc
- The maximum current drawn must not exceed 100 mA
- The output at pin 5 is configurable normally open or normally closed from the Polarities screen
- The internal solid state switch activates 35 ms before the start of the power ramp to allow for the antenna relay pull-in time.

Fig 28 Example: Using the Antenna Change-over Output

Maintenance

Introduction

This topic gives the scheduled and unscheduled maintenance procedures for the T6T 300 watt VHF transmitter and shows how to use the Virtual Front Panel (VFP).

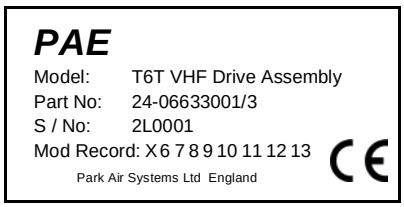
Scheduled Maintenance	A scheduled maintenance procedure is given on page 100. Park Air recommends that this task be completed every twelve months.
Unscheduled Maintenance	Normally, the T6T transmitter is considered a Line Replaceable Unit (LRU) and should be replaced with a serviceable spare if a fault occurs. The faulty transmitter should then be returned to Park Air for repair. In certain circumstances, Park Air Customer Support may suggest that the user change one of the transmitter modules. Dismantling and assembly instructions are therefore given under the heading Unscheduled Maintenance starting on page 104.
Using the VFP	Operating parameters can be set from the drive assembly's front panel, or by using the VFP. Some additional functions are available from the VFP. See page 126.

Configuration

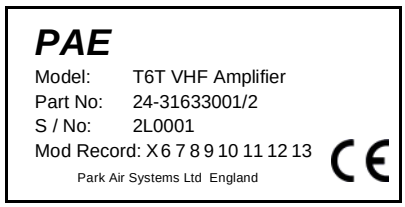
T6 radios are configured in respect of hardware and software.

Hardware Configuration

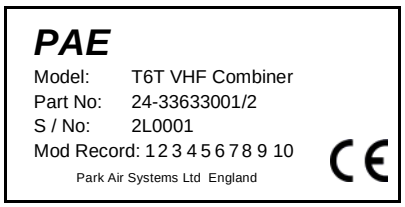
The transmitter consists of a drive assembly, three amplifiers and a combiner. Each has an identification label showing the model, part number, serial number and the modification state. The modification state identifies the hardware configuration.



Drive Assembly Label



Amplifier Label



Combiner Label

Software Configuration

A white label fitted to the top cover lists the radio's software configuration.

In this example there are three fills: AM-Voice, Mode 2 and Mode 3.

Software Configuration		2K1234
Part Order No.	B63300HS	
Software	Mode	Part No.
Fill 1	AM_VOICE	65-00000465
Fill 2	2	65-00000466
Fill 3	3	65-00000467
Fill 4		

Software Configuration Label

Replacement Modules

To ensure compatibility when replacing a radio or a module, the configuration should be the same (see the previous headings: Hardware Configuration and Software Configuration).

Spare modules received from Park Air are supplied with a Spares Instruction that details the configuration of the module and any special instructions. If in any doubt regarding the suitability of spare modules contact Park Air Customer Support.

Scheduled Maintenance

Park Air recommends that scheduled maintenance is carried out at twelve-monthly intervals. Scheduled maintenance comprises the following checks:

Number	Check	Tools/Test Equipment Required
1	Ensure the equipment is clean and that external connectors are securely fitted.	Camel hair brush/clean lint-free cloths.
2	Check and reset (if required) the transmitter's internal frequency reference.	VHF frequency counter.
3	Perform a BIT interruptive test.	
4	Perform an ac and dc change-over check (if both supplies are connected).	

Cleaning and Checking Security of Connectors

Remove all dust and dirt from the equipment exterior using a lint-free cloth and camel hair brush. Check all external connections are secure and free from damage.

Setting the Transmitter Internal Reference Frequency

To set the transmitter internal reference frequency, use the following procedure. Note that references to the switch in the procedure mean the Scroll/Select switch.

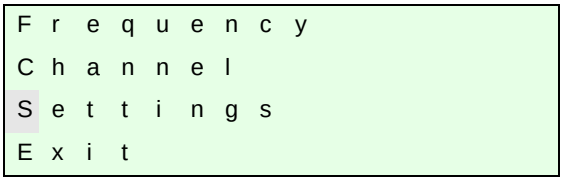
(1) If the transmitter operates with 5-offset carrier (that is, set with a 4 kHz or 8 kHz offset) reset the offset to zero.

(2) Connect a frequency counter to the front panel Reference connector.

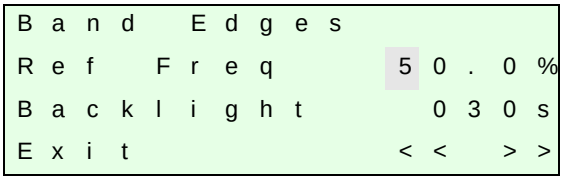
(3) From the Main screen, press the switch to display the Control screen. Turn the switch until Settings is highlighted. Press the switch.

(4) Ensure the Settings screen is displayed. Turn the switch until Ref Freq is highlighted, then press the switch.

(5) With Ref Freq selected turn the switch clockwise or anti-clockwise until the frequency counter reads 20.950000 MHz ±10 Hz, then press the switch.



Control Screen



Settings Screen

(6) Turn the switch clockwise until Exit is highlighted, then press the switch. You are returned to the Main screen.

(7) Disconnect the frequency counter.

(8) If 5-offset carrier operation is required, complete the procedure Setting a 5-Offset Carrier Frequency on page 101.

Setting a 5-Offset Carrier Frequency

If a 5-offset carrier frequency is required, set the offset using the following procedure:

(1) Connect a 50 ohm frequency counter, through a 60 dB attenuator, to the combiner's Antenna connector.

(2) Set the required 25 kHz channel frequency; for example, 124.500 MHz.

(3) From the AM-Voice Mode Settings Screen set the required offset (+4 kHz, -4 kHz, +8 kHz or -8 kHz); for example, a +4 kHz offset to give an operating frequency of 124.504 MHz.

(4) From the Settings screen select Ref Freq and press the Scroll/Select switch.

(5) Key the transmitter and adjust the reference frequency using the Scroll/Select switch until the frequency counter displays the required operating frequency; for example, 124.504 MHz.

(6) When the frequency counter displays the exact operating frequency, press the Scroll/Select switch and stop keying the transmitter.

Disconnect the test equipment and reconnect the antenna.

To Initiate a BIT Test

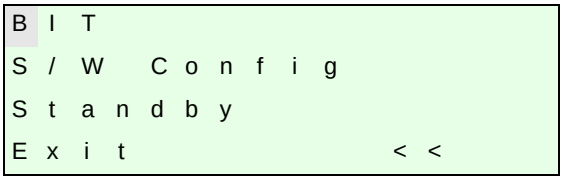
An interruptive BIT test cannot be initiated in Mode 2 or Mode 3.

During an interruptive BIT test, the transmitter radiates modulated carrier waves at the set power. Users should therefore obtain the necessary authority before initiating a test.

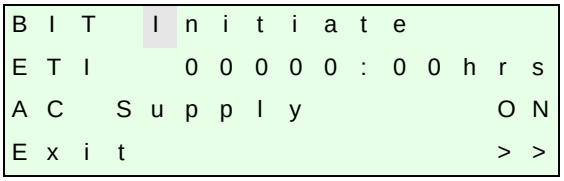
If the test is to be carried out with the antenna disconnected, ensure a load is fitted to the transmitter's Antenna connector.

In order to test the line input stages, an internally generated 1 kHz tone is injected into the line input circuit. Any other audio present on the line input will cause the test to be inaccurate. Therefore the transmitter MUST NOT be keyed during the test.

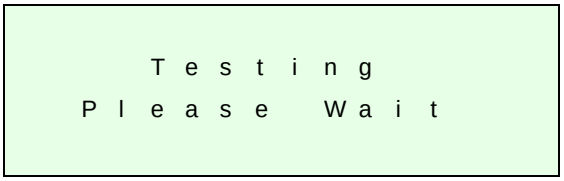
(1) From the Main screen, press the switch to display the Control screen. Turn the switch until BIT is highlighted. Press the switch.



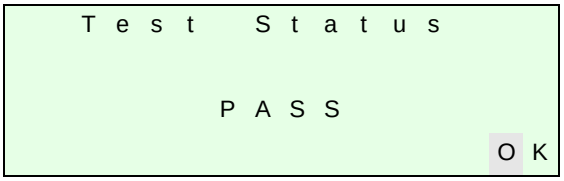
(2) Ensure the BIT menu is displayed. Turn the switch until BIT Initiate is highlighted. Press the switch.



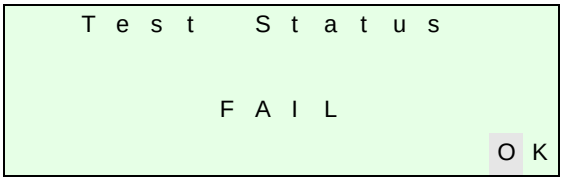
(3) During the test, which takes approximately two seconds, the Testing screen is displayed.



(4) After the test, either a Pass or Fail screen is displayed. Selecting OK takes the user back to the BIT screen.



(5) If fail is displayed, scroll through the screen to check the cause of the failure.



AC and DC Change-over Check

If both ac and dc input supplies are connected to the transmitter, carry out the following check:

(1) Confirm that both ac and dc supplies are connected to the transmitter. Ensure that the rear panel Supply switches are set to the I (on) position.

(2) Confirm that the front panel Ready indicators are lit, the LCD is illuminated, and the transmitter is operational.

(3) Switch off the ac supply from its source.

(4) Check that the transmitter continues to operate correctly from the dc supply. If accessed, the front panel BIT screen will show AC Supply as off, and DC Supply as on. The value of the dc supply is also shown.

Unscheduled Maintenance

WARNING  **Dangerous Voltage**

The instructions given in this topic involve connecting dangerous voltage to the transmitter. Maintenance should be carried out only by suitably qualified personnel.

When an ac supply is connected, dangerous voltage is present within the transmitter. Care must be taken by personnel to avoid accidental contact with exposed circuitry during maintenance or alignment procedures.

When the Supply switch is set to the Standby position, dangerous voltage is still present in the transmitter's internal power supply circuitry. To ensure safe working, both ac and both dc input supplies must be disconnected from the transmitter.

WARNING  **Beryllium Hazard**

The output transistors used in the power amplifier (PA) contain the toxic material beryllium. Although no procedures in this documentation instruct component removal, users should be aware that there could be a hazard should the output transistors become damaged.

Caution  **ESDs**

The T6T transmitter circuitry contains Electrostatic Sensitive Devices (ESDs). Personnel must be aware of the precautions necessary to prevent damage to such devices.

Caution  **Unauthorized Modifications**

Changes or modifications made to this equipment that are not expressly approved by Park Air, or parties authorized by Park Air, could void the user's authority to operate the equipment.

Caution  **Repairs**

When carrying out repairs to the PA module, care must be taken not to damage the gasket. If the strips become damaged, they must be replaced. Failure to comply with this instruction may compromise the transmitter's Electromagnetic Compatibility (EMC) and breach European Commission regulations.

When screws are inserted into the PA casting care must be taken not to exceed a torque of 6 lbs/inch when tightening. This applies when replacing the top and bottom covers and during the refitting of the PA modules.

Introduction

This topic provides the user with detailed instructions on the removal and replacement of modules within the drive assembly and amplifiers. A faulty combiner must be replaced. When removing or refitting modules, observe antistatic handling precautions. Do not change any potentiometer (or link) settings unless detailed in these instructions. Potentiometers have been set using specialist equipment.

Molex KK Connectors

To remove Molex KK type connectors:

- Free the locking mechanism on the connector by moving one side of the connector up, then move the other side up (see Fig 29). The upward motion should only be as far as needed to free the locking mechanism
- DO NOT pull the cable to free the connector
- Note that KK type connectors are designed to be removed in this manner to free the locking mechanism. Do not use this procedure with non-KK type connectors as damage to the connector may occur.

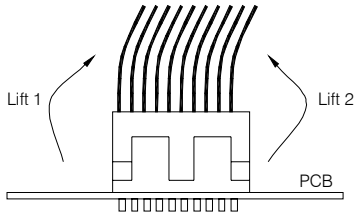


Fig 29 Molex KK Type Connector

Tools, Materials and Test Equipment Required

The following tools, materials and test equipment should be made available to complete the maintenance tasks described in this topic.

❑ Personal Computer (PC) ❑ General Purpose Tool Kit (including a 1.5 mm Allen key) ❑ 5 mm Nut Spinner ❑ Camel Hair Brush ❑ Clean Lint-free Cloths	❑ Frequency Counter ❑ Power Meter ❑ Dummy Load ❑ PC to Radio Interconnection Lead (Park Air part number 17E12600001) ❑ SMB to BNC Lead for Reference Frequency (Park Air part number 17K11000004)

T6T VHF Amplifier Procedures

Top and Bottom Covers

One of the top cover screws is covered with a warranty label that should not be tampered with unless Park Air Customer Support has advised otherwise. When authorisation has been made the following procedures should be followed.

To remove the top cover, locate and unscrew the 19 countersunk screws securing the top cover to the mainframe. Access can then be gained to the Interface module and PSU Regulation module.

To remove the bottom cover, locate and unscrew the 15 countersunk screws securing the bottom cover to the mainframe. Access can then be gained to the Combiner BIT module.

Removal and refitting of the following modules requires both top and bottom covers to be removed:

- Power Supply modules
- Combiner BIT module
- PA modules
- Front Panel assembly PCB.

Removing and Refitting the Interface Module

The Interface module is located as shown in Fig 34. A module removal diagram is shown in Fig 37.

WARNING  **Dangerous Voltage**

Dangerous voltage is present within the T6T VHF amplifier. Care must be taken by personnel to avoid accidental contact with exposed circuitry when the covers are removed and power is applied to the radio.

Removal

Ensure that the amplifier is isolated from the ac and dc input supplies. Disconnect the drive assembly cables at CN5 and CN8. Disconnect the antenna cable to the Combiner. Then proceed as follows:

(1) Unscrew the 19 countersunk screws and remove the amplifier top cover.

(2) Locate the Interface module and disconnect the following connectors:

- CN2 10-way connector (10-way loom from Combiner BIT module CN15)
- CN3 SMB connector (coaxial cable from Combiner BIT module CN27)
- CN4 SMB connector (coaxial cable from Combiner BIT module CN16)
- CN6 15-way connector (15-way ribbon cable from PSU Regulation module CN1)
- CN7 10-way connector (10-way ribbon cable from Front Panel PCB).

(3) Gain access to the rear of the amplifier. Using a 5 mm nut spinner tool, remove the four screwloc 8 mm-4-40 UNC stud spacers and wavy washers that secure the Interface module connectors CN5 and CN8 to the rear panel.

(4) Also at the rear of the amplifier, remove the two M3 x 8 mm screws that secure the blanking plate and the Interface module.

(5) Remove the five M3 x 8 mm screws that secure the module to the amplifier mainframe.

(6) Remove the module from the chassis.

Refitting

To refit the Interface module, proceed as follows:

(1) Place the module in position. Ensure no wires are trapped by the module.

(2) Ensure the module interface connectors CN5 and CN8 are located correctly and are aligned with the screw holes in the rear panel. Fit the four screwloc 8 mm-4-40 UNC screws and wavy washers, previously removed, but leave them loose.

(3) Fit the two M3 x 8 mm screws, previously removed, that secure the blanking plate and Interface module, but leave them loose.

(4) Fit the five M3 x 8 mm screws, previously removed, that secure the module to the transmitter mainframe, but leave them loose.

(5) Using a 5 mm nut spinner tool, tighten the four screwloc 8 mm-4-40 UNC screws and wavy washers that secure the connectors; then tighten all seven M3 x 8 mm screws that secure the module to the amplifier mainframe.

(6) Refit the following connectors to the module:

- CN2 10-way connector (10-way loom from Combiner BIT module CN15)
- CN3 SMB connector (coaxial cable from Combiner BIT module CN27)
- CN4 SMB connector (coaxial cable from Combiner BIT module CN16)
- CN6 15-way connector (15-way ribbon cable from PSU Regulation module CN1)
- CN7 10-way connector (10-way ribbon cable from Front Panel PCB).

(7) Connect the drive assembly cables at CN5 and CN8. Connect the antenna cable to the Combiner.

(8) Re-establish the ac and/or dc supplies.

(9) Switch power on at the radio using the rear mounted Supply switch.

(10) Ensure the front panel Ready indicator is lit and the Alarm indicator is unlit.

(11) Carry out the Calibrate routine using the Virtual Front Panel (VFP), as detailed in the procedure To Calibrate the Transmitter on page 130.

(12) Carry out a BIT interruptive test as detailed in the procedure To Initiate a BIT Test on page 102.

(13) Set the rear panel Supply switch to Standby and remove the VFP connector. Isolate the amplifier from the ac and/or dc supplies.

(14) Refit the amplifier top cover. The transmitter can now be returned to service.

Removing and Refitting the PSU Regulation Module

The PSU Regulation module is located as shown in Fig 34. A module removal diagram is shown in Fig 38.

WARNING  **Dangerous Voltage**

Dangerous voltage is present within the T6T VHF amplifier. Care must be taken by personnel to avoid accidental contact with exposed circuitry when the covers are removed and power is applied to the radio.

Removal

Before attempting to remove the PSU Regulation module, ensure that the amplifier is isolated from the ac and dc input supplies. Disconnect the drive assembly cables at CN5 and CN8. Disconnect the antenna cable to the Combiner. Then proceed as follows:

(1) Unscrew the 19 countersunk screws and remove the transmitter top cover.

(2) Locate the PSU Regulation module and remove the three M3 x 8 mm captive washer screws that secure the module to the amplifier mainframe.

(3) Carefully raise the module to gain access to the module connectors.

(4) Disconnect the following connectors:

- CN6 6-way connector (6-way to 10-way loom to Combiner BIT module CN12)
- CN4 14-way connector (14-way ribbon cable to Interface module CN6)
- CN3 3-way connector (part of loom to Combiner BIT module CN7)
- CN7 3-way connector (3-wire loom to rear panel On/Off switch)
- CN2 2-way connector (part of loom to Combiner BIT module CN7)
- CN1 4-way connector (part of loom to Combiner BIT module CN7).

(5) Remove the module from the chassis.

Refitting

To refit the PSU Regulation module, proceed as follows:

(1) While holding the module in position, connect the following connectors:

- CN1 4-way connector (part of loom to Combiner BIT module CN7)
- CN2 2-way connector (part of loom to Combiner BIT module CN7)
- CN7 3-way connector (3-wire loom to rear panel On/Off switch)
- CN3 3-way connector (part of loom to Combiner BIT module CN7)
- CN4 14-way connector (14-way ribbon cable to Interface module CN6)
- CN6 6-way connector (6-way to 10-way loom to Combiner BIT module CN12).

(2) Locate the module in position. Ensure no wires are trapped by the module.

(3) Secure the module to the amplifier mainframe using the three M3 x 8 mm captive washer screws removed during disassembly.

(4) Connect the drive assembly cables at CN5 and CN8. Connect the antenna cable to the Combiner.

(5) Re-establish the ac and/or dc supplies.

(6) Switch power on at the radio using the rear mounted Supply switch.

(7) Ensure the front panel Ready indicator is lit and the Alarm indicator is unlit.

(8) Carry out a BIT interruptive test as detailed in the procedure To Initiate a BIT Test on page 102.

(9) Set the rear panel Supply switch to Standby. Isolate the amplifier from the ac and/or dc supplies.

(10) Refit the amplifier top cover. The amplifier can now be returned to service.

Removing and Refitting the Power Supply Modules

The Power Supply modules are located as shown in Fig 34. The removal diagram is shown in Fig 39.

WARNING  **Dangerous Voltage**

Dangerous voltage is present within the T6T VHF amplifier. Care must be taken by personnel to avoid accidental contact with exposed circuitry when the covers are removed and power is applied to the radio.

Removal

Before attempting to remove the Power Supply modules, ensure that the amplifier is isolated from the ac and dc input supplies. Disconnect the drive assembly cables at CN5 and CN8. Disconnect the antenna cable to the Combiner. Then proceed as follows:

(1) Remove the amplifier top and bottom covers as described on page 106.

(2) Support the amplifier on its side.

(3) Locate the power supplies. From the bottom half of the unit remove the two M4 x 8 mm countersunk screws that secure each power supply to the amplifier mainframe. These screws are accessed through clearance holes in the Combiner BIT module. During this operation support the power supply from the top half of the unit.

(4) Withdraw each power supply from the chassis sufficient to allow access to the power terminal blocks taking care not to damage the ac terminal plastic supply guard.

(5) Remove the CN4 connectors (PSU-1 and PSU-2 to the Combiner BIT module, CN10 and CN11 respectively).

(6) Disconnect the dc wires from the power supply terminal block (PSU-1 and PSU-2 to the Combiner BIT module, CN1 and CN3 respectively).

(7) Slide back the terminal block cover and disconnect the ac wires from the three connector terminal block (marked L N E).

(8) Carefully remove each power supply from the transmitter.

Refitting

To refit the Power Supply modules:

(1) With the amplifier on its side hold each power supply near to its securing position in the top half of the radio.

(2) Slide back the terminal block cover and connect the ac wires to the three connector terminal block (marked L N E); brown to terminal L, blue to terminal N and yellow/green to terminal E.

(3) Connect the dc wires to the eight connector terminal block, red to terminal 1 and terminal 2 and black to terminal 5 and terminal 6.

(4) Connect CN4.

(5) Taking care not to damage the plastic supply guard, lower the power supply into position and secure from the bottom half of the unit using two countersunk screws, previously removed, for each power supply.

(6) Connect the drive assembly cables at CN5 and CN8. Connect the antenna cable to the Combiner.

(7) Re-establish the ac and/or dc supplies.

(8) Switch power on at the amplifier using the rear mounted Supply switch.

(9) Ensure the front panel Ready indicator is lit and the Alarm indicator is unlit.

(10) Carry out a BIT interruptive test as detailed in the procedure To Initiate a BIT Test on page 102.

(11) Set the rear panel Supply switch to Standby. Isolate the amplifier from the ac and/or dc supplies.

(12) Refit the amplifier top and bottom covers. The amplifier can now be returned to service.

Removing and Refitting the Combiner BIT Module

The Combiner BIT module is located as shown in Fig 34. The removal diagram is shown in Fig 40.

WARNING  **Dangerous Voltage**

Dangerous voltage is present within the T6T VHF amplifier. Care must be taken by personnel to avoid accidental contact with exposed circuitry when the covers are removed and power is applied to the radio.

Removal

Before attempting to remove the Combiner BIT module, ensure that the amplifier is isolated from the ac and dc input supplies. Disconnect the drive assembly cables at CN5 and CN8. Disconnect the antenna cable to the Combiner. Then proceed as follows:

(1) Remove the amplifier top and bottom covers as described on page 106.

(2) Locate the Combiner BIT module and disconnect the following connectors:

- CN1 4-way connector
- CN2 3-way connector
- CN3 4-way connector
- CN4 3-way connector
- CN5 3-way connector
- CN6 3-way connector
- CN7 8-way connector
- CN10 3-way connector
- CN11 3-way connector
- CN12 6-way connector
- CN13 6-way connector

- CN14 6-way connector
- CN15 10-way connector
- CN16 SMB connector
- CN17 SMB connector
- CN18 SMB connector
- CN22 QMA connector
- CN23 QMA connector
- CN24 QMA connector
- CN25 SMB connector
- CN26 SMB connector
- CN27 SMB connector.

(3) The Combiner BIT module is secured from both sides of the chassis thus requiring removal of the Power Supply modules. Refer to page 109 and remove both Power Supply modules.

(4) Removal of the Power Supply modules will expose the six M3 x 6 mm countersunk screws that secure the Combiner BIT module heatsink to the chassis. Remove these six screws.

(5) Remove the six M3 nuts that secure the Combiner BIT module PCB to the stud spacers. Also remove the two M3 x 8 mm panhead screws that secure the Combiner BIT module heatsink to the lower PA heatsink. The Combiner BIT module can now be removed.

Refitting

To refit the Combinere BIT module, proceed as follows:

(1) Place the Combiner BIT module in place on the stud spacers and replace the six washers and nuts, previously removed, but do not tighten. Take care that cables are dressed properly and that none are trapped. Replace the two screws previously removed that secure the Combiner BIT module to the PA heatsink, but do not tighten.

(2) Turn the unit over and replace the six countersunk M3 x 6 mm screws previously removed. Tighten these and return to the other side to tighten the six nuts and two screws.

(3) All 22 connectors removed earlier can now be reconnected.

(4) Connect the drive assembly cables at CN5 and CN8. Connect the antenna cable to the Combiner.

(5) Re-establish the ac and/or dc supplies.

(6) Switch power on at the radio using the rear mounted Supply switch.

(7) Ensure the front panel Ready indicator is lit and the Alarm indicator is unlit.

(8) Carry out the Calibrate routine using the Virtual Front Panel (VFP), as detailed in the procedure To Calibrate the Transmitter on page 130.

(9) Carry out a BIT interruptive test as detailed in the procedure To Initiate a BIT Test on page 102.

(10) Set the rear panel Supply switch to Standby and remove the VFP connector. Isolate the transmitter from the ac and/or dc supplies.

(11) Refit the amplifier top and bottom covers. The amplifier can now be returned to service.

Removing and Refitting the PA Modules

Caution  **Repairs**

When carrying out repairs to the PA module, care must be taken not to damage the gasket. If the strips become damaged, they must be replaced. Failure to comply with this instruction may compromise the transmitter's Electromagnetic Compatibility (EMC) and breach European Commission regulations.

When screws are inserted into the PA casting care must be taken not to exceed a torque of 6 lbs/inch when tightening. This applies when replacing the top and bottom covers and during the refitting of the PA modules.

The PA modules are located one above the other on the right side of the amplifier as shown in Fig 34. The module removal diagram is shown in Fig 41. At the amplifier rear panel, each PA module is fastened to the chassis with two M3 x 8 mm panhead screws. At the front, the modules are fastened with one countersunk screw each, one at the top (PA-1) and one at the bottom (PA-2). They are also secured to the front panel with two M5 x 20 mm panhead screws that also fix the right-hand equipment handle.

WARNING  **Dangerous Voltage**

Dangerous voltage is present within the T6T VHF amplifier. Care must be taken by personnel to avoid accidental contact with exposed circuitry when the covers are removed and power is applied to the radio.

Removal

Before attempting to remove one or both PA modules, ensure that the amplifier is isolated from the ac and dc input supplies. Disconnect the drive assembly cables at CN5 and CN8. Disconnect the antenna cable to the Combiner. Then proceed as follows:

(1) Remove the amplifier top and bottom covers as described on page 106.

(2) Disconnect CN3, a flying 3-way connector from the Combiner BIT module, CN5 (PA-1) and/or CN6 (PA-2).

(3) At the Combiner BIT module disconnect the 6-way CN13 (PA-1) and/or CN14 (PA-2). Also remove the two M3 x 8 mm panhead screws that secure the Combiner BIT module heatsink to the lower PA module heatsink.

(4) Disconnect the SMB connectors CN8 from PA-1 (upper) and PA-2 (lower). Disconnect SMB connector CN10 from the lower PA using long nosed pliers; do not pull on the cable. On the lower PA remove the screw securing the p-clip that holds the coaxial cable coming from the N-type connector at the rear.

(5) Disconnect the N-type connectors at the rear of the PA modules.

(6) Remove the four countersunk M3 x 6 mm screws that hold the front panel to the chassis.

(7) Remove the equipment handle from the right-hand side of the amplifier by unscrewing and removing the two M5 x 20 mm panhead screws that secure it. Loosen (but do not remove) the two screws securing the left-hand equipment handle so that the front panel can be pulled slightly away from the PA heatsinks.

(8) Remove the two screws holding the upper heatsink to the rear panel and the countersunk screw securing it to the front of the chassis. Slowly withdraw the upper PA module from the mainframe taking care not to snag the wiring looms. Note that SMB connector CN10 is located within the bottom of the heatsink fins and should be disconnected using long nosed pliers. Do not attempt to remove the connector by pulling on the cable.

(9) Remove the two screws holding the lower heatsink to the rear panel and the countersunk screw, at the front, securing it to the bottom of the chassis. Slowly withdraw the lower PA module from the mainframe taking care not to snag the wiring looms.

Refitting

To refit the PA modules, proceed as follows:

(1) Place the lower PA module in position and secure it in place with the previously removede single countersunk screw at the front and the two panhead screws at the rear. Replace the two screws, previously removed, that secure the Combiner BIT module to the PA heatsink. Connect the SMB connector CN10.

(2) Route the coaxial cable with the N-type connector out the rear of the module and connect to CN1. Replace the p-clip that was removed earlier. Ensure no wires are trapped by the module.

(3) Next, while placing the upper PA module in position, first connect SMB connector CN10 before replacing the two rear screws and the front countersunk screw previously removed. Route the coaxial cable from Combiner BIT module out between the PAs via the heatsink groove. Connect the N-type to CN1.

(4) Fit the four countersunk screws, previously removed, that secure the front panel to the chassis, two at the top and two at the bottom. Replace the right-hand handle and tighten the screws securing the left-hand handle.

(5) Connect the SMB connectors CN8 on both modules and CN13 (PA-1) and CN14 (PA-2) at the Combiner BIT module.

(6) Connect the two flying 3-way connectors CN3 that come from CN5 (PA-1) and CN6 (PA-2) on the Combiner BIT module.

(7) Connect the drive assembly cables at CN5 and CN8. Connect the antenna cable to the Combiner.

(8) Re-establish the ac and/or dc supplies and switch power on at the radio using the rear mounted Supply switch.

(9) Ensure the front panel Ready indicator is lit and the Alarm indicator is unlit.

(10) Carry out the Calibrate routine using the Virtual Front Panel (VFP), as detailed in the procedure To Calibrate the Transmitter on page 130.

(11) Carry out a BIT interruptive test as detailed in the procedure To Initiate a BIT Test on page 102.

(12) Set the rear panel Supply switch to Standby and remove the VFP connector. Isolate the amplifier from the ac and/or dc supplies.

(13) Refit the amplifier top and bottom covers. The amplifier can now be returned to service.

Removing and Refitting the Front Panel PCB

The Front Panel PCB is located as shown in Fig 42. Removing this assembly necessitates the removal of both Power Supply modules and partial removal of the Combiner BIT module.

WARNING  **Dangerous Voltage**

Dangerous voltage is present within the T6T VHF amplifier. Care must be taken by personnel to avoid accidental contact with exposed circuitry when the covers are removed and power is applied to the radio.

Removal

Before attempting to remove the Front Panel PCB, ensure that the amplifier is isolated from the ac and dc input supplies. Disconnect the drive assembly cables at CN5 and CN8. Disconnect the antenna cable to the Combiner. Then proceed as follows:

(1) Remove the amplifier top and bottom covers as described on page 106.

(2) Disconnect CN7 (10-way ribbon cable) at the Interface module. Carefully push the cable through the aperture to the other side of the chassis.

(3) Refer to the instructions for removal of the Combiner BIT module, but **do not** remove any connectors. The Power Supply modules must be removed and the Combiner BIT module's securing screws must be removed so that it can be lifted slightly away from the chassis. This permits the ribbon cable to pass under the Combiner BIT module.

(4) Remove the two handles from the front panel by removing the four M5 x 20 mm panhead screws.

(5) Remove the four countersunk M3 x 6 mm screws that hold the front panel to the chassis. The front panel can now be moved away from the mainframe while guiding the ribbon cable from within.

(6) Remove the Front Panel PCB from the Front Panel assembly by removing the four M3 x 6 mm panhead screws and wavy washers.

Refitting

To refit the Front Panel PCB, proceed as follows:

(1) Place the PCB in position on the front panel. Secure the PCB to the Front Panel assembly using the four M3 x 6 mm panhead screws and wavy washers previously removed.

(2) Feed the ribbon cable through its respective hole at the front of the chassis.

(3) Secure the Front Panel assembly to the top and bottom of the chassis using the four M3 x 6 mm countersunk screws. Fit the two equipment handles using the four M5 x 20 mm panhead screws previously removed.

(4) Route the ribbon cable under the Combiner BIT module, through the aperture to the Interface module and connect it to CN7.

(5) Connect the drive assembly cables at CN5 and CN8. Connect the antenna cable to the Combiner.

(6) Re-establish the ac and/or dc supplies.

(7) Switch power on at the radio using the rear mounted Supply switch.

(8) Ensure the front panel Ready indicator is lit and the Alarm indicator is unlit.

(9) Carry out a BIT interruptive test as detailed in the procedure To Initiate a BIT Test on page 102.

(10) Set the rear panel Supply switch to Standby. Isolate the amplifier from the ac and/or dc supplies.

(11) Refit the amplifier top and bottom covers. The amplifier can now be returned to service.

Removing and Refitting the Cooling Fans

The cooling fans are mounted at the rear of the PA modules as shown in Fig 34. The removal diagram is shown in Fig 43.

Removal

Before attempting to remove the fan, ensure that the T6T VHF amplifier is isolated from the ac and dc input supplies. Disconnect the drive assembly cables at CN5 and CN8. Disconnect the antenna cable to the Combiner. Then proceed as follows:

(1) Disconnect the two-pin connector.

(2) Remove the fan finger guard.

(3) Using an Allen key inserted through the holes exposed when the finger guard is removed, remove the three M4 x 12 mm caphead Allen screws that secure the fan to the PA module heatsink.

(4) Remove the fan from the PA module.

Refitting

To refit a cooling fan, proceed as follows:

(1) Locate the fan in position and using a suitable Allen key inserted through the holes for the fan finger guard, secure using the three M4 x 12 mm caphead Allen screws previously removed.

(2) Secure the finger guard to the fan.

(3) Connect the two-pin fan connector to the fan. Ensure the + marked socket mates with the + marked plug on the fan.

(4) Connect the drive assembly cables at CN5 and CN8. Connect the antenna cable to the Combiner.

(5) Re-establish the ac and/or dc supplies.

(6) Switch power on at the radio using the rear mounted Supply switch.

(7) Ensure the front panel Ready indicator is lit and the Alarm indicator is unlit. The amplifier can now be returned to service.

T6T VHF Drive Assembly Procedures

Removing the Top Cover

WARNING  **Dangerous Voltage**

Dangerous voltage is present within the T6T VHF drive assembly. Care must be taken by personnel to avoid accidental contact with exposed circuitry when the covers are removed and power is applied to the radio.

To remove the top cover, ensure that the drive assembly is isolated from the ac and dc input supplies. Then locate and unscrew the 13 screws securing the top cover to the mainframe. Access can then be gained to the following modules:

- Processor module
- PSU Regulation module
- Drive module
- Power Supply (requires top and bottom covers to be removed)
- Front Panel assembly PCB (requires top and bottom covers to be removed).

Removing and Refitting the Processor Module

The Processor module is located as shown in Fig 44. A module removal diagram is shown in Fig 46.

WARNING  **Dangerous Voltage**

Dangerous voltage is present within the T6T VHF drive assembly. Care must be taken by personnel to avoid accidental contact with exposed circuitry when the covers are removed and power is applied to the radio.

Removal

Before attempting to remove the Processor module, and if possible, save the drive assembly settings. To achieve this connect a PC with the VFP software loaded to the radio using the PC to Radio Interconnection Lead (Park Air part number 17E12600001). With the VFP software active, upload the radio settings to a specified file.

Ensure that the drive assembly is isolated from the ac and dc input supplies. Disconnect the six Amplifier Out connectors, CN1 to CN6. Then proceed as follows:

(1) Unscrew the 13 countersunk screws and remove the drive assembly top cover.

(2) Locate the Processor module (Fig 44) and disconnect the following connectors:

- CN1 50-way connector (50-way ribbon cable from PA Control module)
- CN12 2-way connector (2 wire loom from Drive module CN11)
- CN3 14-way connector (14-way ribbon cable from PSU Regulation module)
- CN4 34-way connector (34-way ribbon cable from Front Panel module).

(3) Gain access to the rear of the drive assembly. Using a 5 mm nut spinner tool, remove the four screwloc 8 mm-4-40 UNC screws that secure the Processor module interface connectors CN5 and CN6 to the rear panel.

(4) Remove the seven M3 x 8 mm screws that secure the module to the drive assembly mainframe.

(5) Remove the module from the chassis.

Refitting

To refit the Processor module, proceed as follows:

(1) Place the module in position. Ensure no wires are trapped by the module. Ensure jumper J2 on the module is set to 'T' for drive assembly (see Fig 30).

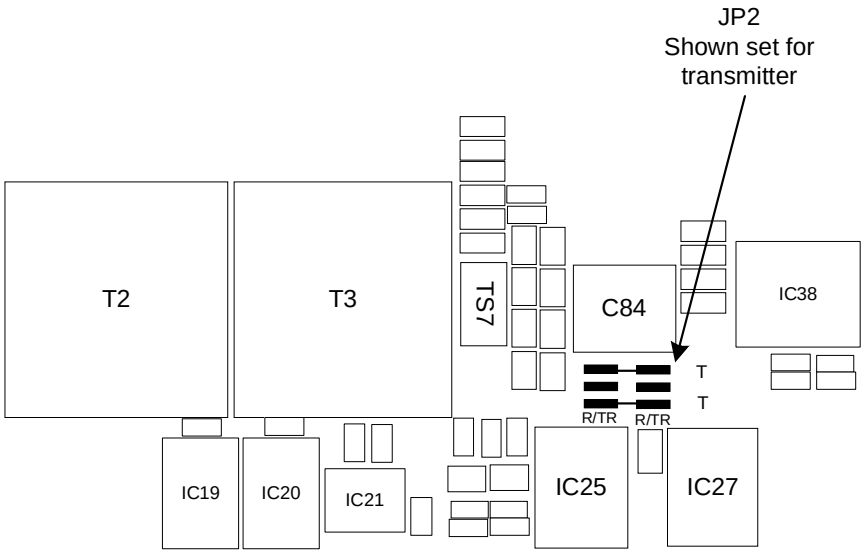


Fig 30 Processor Module JP2 location

(2) Ensure the module's interface connectors CN5 and CN6 are located correctly and are aligned with the screw holes in the rear panel. Fit the four screwloc 8 mm-4-40 UNC screws and wavy washers, previously removed, but leave them loose.

(3) Fit the seven M3 x 8 mm screws, previously removed, that secure the module to the drive assembly mainframe, but leave them loose.

(4) Using a 5 mm nut spinner, tighten the four screwloc 8 mm-4-40 UNC screws and wavy washers that secure the connectors; then tighten the seven M3 x 8 mm screws that secure the module to the drive assembly mainframe.

(5) Refit the following connectors to the module:

- CN1 50-way connector (50-way ribbon cable from PA Control module)
- CN12 2-way connector (2 wire loom from Drive module CN11)
- CN3 14-way connector (14-way ribbon cable from PSU Regulation module)
- CN4 34-way connector (34-way ribbon cable from Front Panel module).

(6) Re-connect the six Amplifier Out connectors, CN1 to CN6.

(7) Re-establish the ac and/or dc supplies.

(8) Switch power on at the drive assembly using the rear mounted Supply switch.

(9) Ensure the front panel Ready indicator is lit and the Alarm indicator is unlit.

(10) If a new module has been fitted, connect the VFP PC to the drive assembly using the PC to Radio Interconnection Lead, Park Air part number 17E12600001 (if not already connected). Note that any module sent from Park Air as a spare for a particular radio will be programmed with

compatible operating and Fill software. Park Air keeps records of module software in all radios supplied. Care must be taken when using a module removed from another radio as this module may not have compatible software.

(11) Download the saved radio settings from file using the VFP. Alternatively, the settings can be edited by hand as described in the Operation topic. Once entered, ensure the required settings appear in the VFP screen.

(12) Carry out the Calibrate routine using the VFP, as detailed in the procedure To Calibrate the Transmitter on page 130.

(13) Carry out a BIT interruptive test as detailed in the procedure To Initiate a BIT Test on page 102.

(14) Set the drive assembly internal reference frequency by carrying out the procedure detailed on page 100.

(15) Set the rear panel Supply switch to Standby and remove the VFP connector. Isolate the drive assembly from the ac and/or dc supplies.

(16) Refit the drive assembly top cover. The drive assembly can now be returned to service.

Removing and Refitting the PSU Regulation Module

The PSU Regulation module is located as shown in Fig 44. A module removal diagram is shown in Fig 47.

WARNING  **Dangerous Voltage**

Dangerous voltage is present within the drive assembly. Care must be taken by personnel to avoid accidental contact with exposed circuitry when the covers are removed and power is applied to the radio.

Removal

Before attempting to remove the PSU Regulation module, ensure that the drive assembly is isolated from the ac and dc input supplies. Disconnect the six Amplifier Out connectors, CN1 to CN6. Then proceed as follows:

(1) Remove the drive assembly top cover as described on page 116.

(2) Locate the PSU Regulation module and remove the three M3 x 8 mm captive washer screws that secure the module to the drive assembly mainframe.

(3) Carefully raise the module to gain access to the module connectors.

(4) Disconnect the following connectors:

- CN5 10-way connector (10-way ribbon cable to PA Control module)
- CN6 6-way connector (2-way loom to power supply)
- CN4 14-way connector (14-way ribbon cable to Processor module)
- CN7 3-way connector (3-wire loom to rear panel On/Off switch)
- CN2 2-way connector (2-wire loom from dc input connector on rear panel)
- CN1 4-way connector (4-wire cable from power supply)
- CN3 3-way connector (3-wire loom from Drive module)
- CN9 2-way connector (2-wire cable ac input to power supply)
- CN8 3-way connector (2-wire loom to rear panel ac input connector plus chassis connection).

(5) Remove the module from the chassis.

Refitting

To refit the PSU Regulation module, proceed as follows:

(1) While holding the module in position, connect the following connectors:

- CN8 3-way connector (2-wire loom to rear panel ac input connector plus chassis connection)
- CN9 2-way connector (2-wire cable ac input to power supply)
- CN3 3-way connector (3-wire loom from Drive module)
- CN1 4-way connector (4-wire cable from power supply)
- CN2 2-way connector (2-wire loom from dc input connector on rear panel)
- CN7 3-way connector (3-wire loom to rear panel On/Off switch)
- CN4 14-way connector (14-way ribbon cable to Processor module)
- CN6 6-way connector (2-way loom to power supply)
- CN5 10-way connector (10-way ribbon cable to PA Control module).

(2) Locate the module in position. Ensure no wires are trapped by the module.

(3) Secure the module to the drive assembly mainframe using the three M3 x 8 mm captive washer screws removed during the removal procedure.

(4) Re-connect the six Amplifier Out connectors, CN1 to CN6.

(5) Re-establish the ac and/or dc supplies.

(6) Switch power on at the rear mounted Supply switch.

(7) Ensure the front panel Ready indicator is lit and the Alarm indicator is unlit.

(8) Carry out a BIT interruptive test as detailed in the procedure To Initiate a BIT Test on page 102.

(9) Set the rear panel Supply switch to Standby. Isolate the drive assembly from the ac and/or dc supplies.

(10) Refit the drive assembly top cover. The drive assembly can now be returned to service.

Removing and Refitting the Drive Module

The Drive module is located as shown in Fig 44. A module removal diagram is shown in Fig 48.

WARNING  **Dangerous Voltage**

Dangerous voltage is present within the T6T VHF drive assembly. Care must be taken by personnel to avoid accidental contact with exposed circuitry when the covers are removed and power is applied to the radio.

Removal

Before attempting to remove the Drive module, ensure that the drive assembly is isolated from the ac and dc input supplies. Disconnect the six Amplifier Out connectors, CN1 to CN6. Then proceed as follows:

(1) Remove the drive assembly top cover as described on page 116.

(2) Locate the Drive module and disconnect the following connectors:

- CN7 SMB connector (RF drive from PA control module CN3)
- CN9 SMB connector (forward power sense from PA control module CN4)
- CN5 3-way connector (3-wire loom from PSU regulation module CN3)
- CN10 6-way connector (6-wire loom from PA control module)
- CN11 2-way connector (2-wire loom from Processor module).

(3) Gain access to the rear of the drive assembly. Using a 5 mm nut spinner tool, remove the six screwloc 8 mm-4-40 UNC screws that secure the Drive module ribbon cable connectors to the rear panel. Use the same procedure to remove the three coaxial connectors from the rear panel.

(4) Remove the five M3 x 8 mm captive washer panhead screws that secure the Drive module to the drive assembly mainframe.

(5) Remove the module from the chassis.

Refitting

To refit the Drive module, proceed as follows:

(1) Locate the module in position. Ensure no wires are trapped by the module.

(2) Secure the module to the drive assembly mainframe using the five M3 x 8 mm captive washer panhead screws removed during the removal procedure.

(3) Using a 5 mm nut spinner, fit the 12 screwloc 8 mm-4-40 UNC screws and wavy washers that secure the ribbon cable connectors and three coaxial connectors to the rear panel.

(4) Refit the following connectors to the module:

- CN11 2-way connector (2-wire loom from Processor module)
- CN10 6-way connector (6-wire loom from PA control module)
- CN5 3-way connector (3-wire loom from PSU regulation module CN3)
- CN9 SMB connector (forward power sense from PA control module CN4)
- CN7 SMB connector (RF drive from PA control module CN3).

(5) Re-connect the six Amplifier Out connectors, CN1 to CN6.

(6) Re-establish the ac and/or dc supplies.

(7) Switch power on at the radio using the rear mounted Supply switch.

(8) Ensure the front panel Ready indicator is lit and the Alarm indicator is unlit.

(9) Carry out a BIT interruptive test as detailed in the procedure To Initiate a BIT Test on page 102.

(10) Set the rear panel Supply switch to Standby. Isolate the drive assembly from the ac and/or dc supplies.

(11) Refit the drive assembly top cover. The drive assembly can now be returned to service.

Removing the Bottom Cover

WARNING  **Dangerous Voltage**

Dangerous voltage is present within the T6T VHF drive assembly. Care must be taken by personnel to avoid accidental contact with exposed circuitry when the covers are removed and power is applied to the radio.

To remove the bottom cover, ensure that the drive assembly is isolated from the ac and dc input supplies. Then locate and unscrew the 13 countersunk screws securing the bottom cover to the mainframe. Access can then be gained to the following modules:

- PA Control module
- Power Supply (requires top and bottom covers to be removed)
- Front Panel assembly (requires top and bottom covers to be removed).

Removing and Refitting the PA Control Module

The PA Control module is located as shown in Fig 44. A module removal diagram is shown in Fig 49.

WARNING  **Dangerous Voltage**

Dangerous voltage is present within the T6T VHF drive assembly. Care must be taken by personnel to avoid accidental contact with exposed circuitry when the covers are removed and power is applied to the radio.

Removal

Before attempting to remove the PA Control module, ensure that the drive assembly is isolated from the ac and dc input supplies. Disconnect the six Amplifier Out connectors, CN1 to CN6. Then proceed as follows:

(1) Unscrew the 13 countersunk screws and remove the drive assembly bottom cover.

(2) Locate the PA Control module and disconnect the following connectors:

- CN1 50-way connector (50-way ribbon cable to Processor module)
- CN6 10-way connector (10-way ribbon cable to PSU Regulation module)
- CN5 SMB connector (reference frequency at front panel)
- CN3 SMB connector (RF drive to Drive module CN7)
- CN4 SMB connector (forward power sense to Drive module CN9)
- CN2 6-way connector (6-wire loom to Drive module CN10).

(3) Remove the eight M3 x 8 mm captive washer screws that secure the module to the drive assembly mainframe.

(4) Remove the module from the chassis.

Refitting

To refit the PA Control module, proceed as follows:

(1) Place the module in position. Ensure no wires are trapped by the module.

(2) Fit the eight M3 x 8 mm captive washer screws, previously removed, that secure the module to the drive assembly mainframe.

(3) Refit the following connectors to the module:

- CN2 6-way connector (6-wire loom to Drive module CN10)
- CN4 SMB connector (forward power sense to Drive module CN9)
- CN3 SMB connector (RF drive to Drive module CN7)
- CN5 SMB connector (reference frequency at front panel)
- CN6 10-way connector (10-way ribbon cable to PSU Regulation module)
- CN1 50-way connector (50-way ribbon cable to Processor module).

(4) Re-connect the six Amplifier Out connectors, CN1 to CN6.

(5) Re-establish the ac and/or dc supplies.

(6) Switch power on at the radio using the rear mounted Supply switch.

(7) Ensure the front panel Ready indicator is lit and the Alarm indicator is unlit.

(8) Carry out the Calibrate routine using the Virtual Front Panel (VFP), as detailed in the procedure To Calibrate the Transmitter on page 130.

(9) Carry out a BIT interruptive test as detailed in the procedure To Initiate a BIT Test on page 102.

(10) Set the drive assembly internal reference frequency by carrying out the procedure detailed on page 100.

(11) Remove the VFP connector and switch power to Standby using the rear mounted Supply switch. Isolate the drive assembly from the ac and/or dc supplies.

(12) Refit the drive assembly bottom cover. The drive assembly can now be returned to service.

Removing and Refitting the Power Supply

The Power Supply is located as shown in Fig 44. A module removal diagram is shown in Fig 50.

WARNING  **Dangerous Voltage**

Dangerous voltage is present within the drive assembly. Care must be taken by personnel to avoid accidental contact with exposed circuitry when the covers are removed and power is applied to the radio.

Removal

Before attempting to remove the Power Supply, ensure that the drive assembly is isolated from the ac and dc input supplies. Disconnect the six Amplifier Out connectors, CN1 to CN6. Then proceed as follows:

(1) Remove the drive assembly top and bottom covers as described on page 116 and page 121.

(2) Support the drive assembly on its side.

(3) Locate the power supply. From the bottom half of the unit remove the four No. 6 x 32 UNC countersunk screws that secure the power supply to the drive assembly mainframe. During this operation support the power supply from the top half of the unit.

(4) Withdraw the power supply from the chassis sufficient to allow access to the power terminal blocks taking care not to damage the ac terminal plastic supply guard.

(5) Remove the connector CN4 (power supply to the PSU regulation module CN6).

(6) Disconnect the dc wires from the eight connector terminal block.

(7) Slide back the terminal block cover and disconnect the ac wires from the three connector terminal block (marked L N E).

(8) Carefully remove the power supply from the drive assembly.

Refitting

To refit the Power Supply:

(1) With the drive assembly on its side hold the power supply near to its securing position in the top half of the radio.

(2) Slide back the terminal block cover and connect the ac wires to the three connector terminal block (marked L N E); brown to terminal L, blue to terminal N and yellow/green to terminal E.

(3) Connect the dc wires to the eight connector terminal block; red to terminal 2 and terminal 3 and black to terminal 6 and terminal 7.

(4) Connect CN4.

(5) Taking care not to damage the plastic supply guard, lower the power supply into position and secure from the bottom half of the unit using the four countersunk screws previously removed.

(6) Re-connect the six Amplifier Out connectors, CN1 to CN6.

(7) Re-establish the ac and/or dc supplies.

(8) Switch power on using the rear mounted Supply switch.

(9) Ensure the front panel Ready indicator is lit and the Alarm indicator is unlit.

(10) Carry out a BIT interruptive test as detailed in the procedure To Initiate a BIT Test on page 102.

(11) Switch power to Standby using the rear mounted Supply switch. Isolate the drive assembly from the ac and/or dc supplies.

(12) Refit the drive assembly top and bottom covers. The drive assembly can now be returned to service.

Removing and Refitting the Front Panel PCB

The Front Panel assembly is located as shown in Fig 44. An assembly and PCB removal diagram is shown in Fig 51.

WARNING  **Dangerous Voltage**

Dangerous voltage is present within the T6T VHF drive assembly. Care must be taken by personnel to avoid accidental contact with exposed circuitry when the covers are removed and power is applied to the radio.

Removal

Before attempting to remove the Front Panel PCB, ensure that the drive assembly is isolated from the ac and dc input supplies. Disconnect the six Amplifier Out connectors, CN1 to CN6. Then proceed as follows:

(1) Remove the drive assembly top and bottom covers as described on page 116 and page 121.

(2) Disconnect CN4 at the Processor module. Carefully pull the cable through the aperture in the mainframe to free it.

(3) Disconnect SMB connector CN5 at the PA Control module.

(4) Remove the four M3 x 8 mm countersunk screws from the bottom and top of the mainframe box section (see Fig 51, Diagram A).

(5) Remove the two black equipment handles by unscrewing and removing the four M5 x 20 mm panhead screws and wavy washers that secure them to the drive assembly. The front panel can now be moved forward and away from the mainframe.

(6) At the front panel, release the control knob by unscrewing the Allen head grub screw using a 1.5 mm Allen key. Withdraw the control knob from the spindle.

(7) Remove the Front Panel PCB from the Front Panel assembly by removing the six M3 x 6 mm panhead screws and wavy washers (see Fig 51 Diagram B).

Refitting

To refit the Front Panel PCB, proceed as follows:

(1) Place the PCB in position at the Front Panel assembly. Ensure the spindle of the control knob and microphone/diagnostics connector are correctly located. Secure the PCB to the Front Panel assembly using the six M3 x 6 mm panhead screws and wavy washers previously removed (see Fig 51, Diagram B).

(2) At the front panel, place the control knob onto the spindle and using a 1.5 mm Allen key, secure the Allen head grub screw.

(3) Secure the Front Panel assembly to the top and bottom of the mainframe box section using the four M3 x 8 mm countersunk screws, previously removed. Fit the two black equipment handles using the four M5 x 20 mm panhead screws and wavy washers previously removed (see Fig 51, Diagram A).

(4) Route the ribbon cable to the Processor module connector CN4 and connect it.

(5) Route the SMB connector to CN5 on the PA Control module and connect it.

(6) Re-connect the six Amplifier Out connectors, CN1 to CN6.

(7) Re-establish the ac and/or dc supplies.

(8) Switch power on at the radio using the rear mounted Power switch.

(9) Ensure the front panel Ready indicator is lit and the Alarm indicator is unlit.

(10) Carry out a BIT interruptive test as detailed in the procedure To Initiate a BIT Test on page 102.

(11) Switch power to Standby using the rear mounted Power switch. Isolate the drive assembly from the ac and/or dc supplies.

(12) Refit the drive assembly top and bottom covers. The drive assembly can now be returned to service.

Virtual Front Panel (VFP)

Virtual Front Panel (VFP) software is supplied on CD and is compatible with any PC or laptop running Windows 2000™ or Windows XP™. The VFP allows changes to a radio's settings and channel information, it displays the current BIT state, displays BIT history, allows security locks to be set, and provides maintenance facilities.

A radio can be set up using the front panel Scroll/Select switch and LCD, or by using the VFP. Using the VFP has several advantages over setting the drive assembly from the front panel; these are:

- A profile of the drive assembly operation settings and channel information can be created, stored on disk, and then recalled to download into other drive assemblies
- A printout of the drive assembly profile can be made from the VFP
- Front Panel Lock is available only when using the VFP. As part of the drive assembly Settings (see Fig 31), Front Panel Lock can be set to ON. When selected to on, no settings or frequency information can be changed from the front panel
- If the drive assembly is part of a MARC system or operates in a digital mode, a MARC Lock, HDLC Lock and T1E1 Lock are available when using the VFP. When selected to on, no settings or frequency information can be changed from the MARC equipment screen, or the digital control equipment.

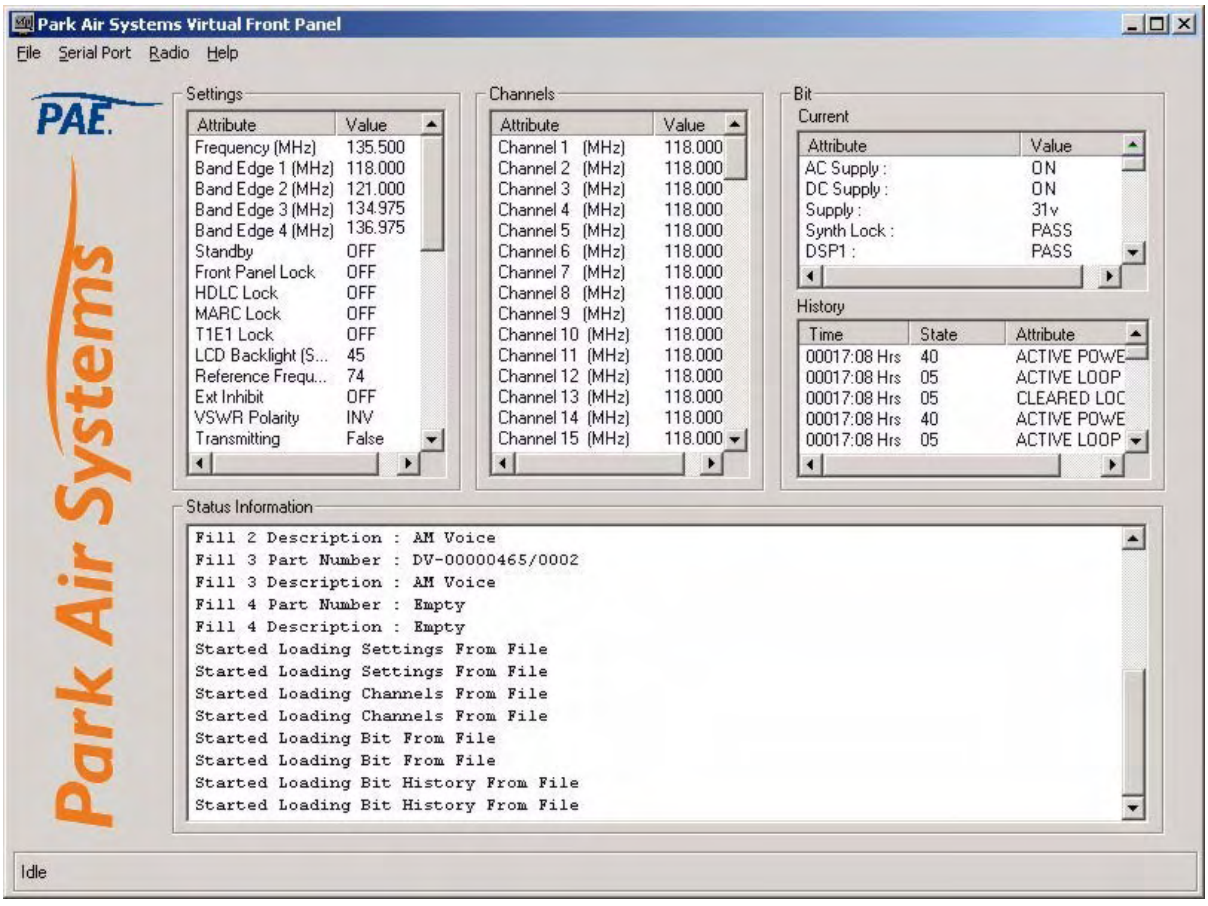


Fig 31 Typical VFP Screen - AM-Voice Profile Shown

Installing the VFP Software

The VFP software is supplied by Park Air on CD. The software can be run from the Main page or installed on your PC via Explorer.

To install the software onto your PC:

(1) Using explorer, display the contents of the CD supplied by Park Air. Identify the file named S0473Vxx.EXE (where xx is the version number).

(2) Using the mouse, right click on the file and then select *Copy*.

(3) Display the Windows desktop. Right click anywhere on the desktop and select *Paste*.

(4) Check that the VFP icon is shown on the desktop. Reposition the icon as required. The VFP application is now installed on the PC's desktop.

VFP Icon

VFP Features

The VFP screen is divided into four main windows: Settings, Channels, BIT and Status Information. Four colours are used to display text. The colours have the following meanings:

- Black indicates a valid parameter that has been accepted by the radio
- Red indicates an invalid parameter that has been rejected by the radio, or a BIT failure
- Green indicates text that has not yet been downloaded to the radio. Text loaded into the VFP from a previously stored file, or any text that is manually amended is green until it is downloaded into the radio; after being downloaded into the radio the text changes to black, or if it is invalid, to red
- Blue indicates Help text and is shown in the Status Information window.

The Menu Bar

The menu bar has four categories: File, Serial Port, Radio and Help.

File	Has the sub-categories: Open, Save and Print. These sub-categories allow the user to open previously saved profiles, save a new profile, or print a profile. A special sub-category: File > Save > Diagnostics should only be used when advised by Park Air.
Serial Port	Has the sub-categories: Com 1 and Com 2. Before the VFP can be used, the appropriate Com 1 or Com 2 must be selected to correspond with the PC's Com Port used for the radio connection.
Radio	Has the sub-categories: Retrieve, Send, Calibrate and Test. These sub-categories allow a radio's profile to be loaded into the VFP, allow a profile to be downloaded from the VFP to a radio, calibrates a radio and initiates a BIT test.
Help	Provides detail about the VFP software.

Settings Window
This window lists all attributes that can be adjusted by the user. If any individual attribute is clicked on using the mouse, help information is displayed in the Status Information window showing the range of adjustment for that attribute. Click on the value and use the keyboard to amend it; press Enter to confirm the new value noting that the amended text is green until it is downloaded into the radio. Any invalid parameters are not indicated until the Settings are downloaded to the radio. It is the radio that rejects invalid parameters, not the VFP.

The drive assembly reference frequency setting is displayed in the window. Adjusting the reference frequency is a maintenance operation that requires external test equipment to be connected. The value shown in the Settings window should not be changed; instead, adjustment of the reference frequency should be performed using the radio front panel controls as detailed on page 100.

Channels Window
Up to 100 preset channels can be stored in the radio. These are listed in the Channels window. Any channel frequency can be amended by clicking on the value to amend it and pressing Enter to confirm the new value. Note that the amended channel is green until it is downloaded into the radio. Any invalid frequencies are not indicated until the Channels are downloaded to the radio. It is the radio that rejects invalid frequencies, not the VFP.

BIT Window
Two lists of information are presented: The current BIT status and the BIT history. The BIT history shows the last 100 entries.

Status Information Window
The Status Information window gives information regarding the type of radio, the software fills, recent VFP actions and Help information.

To Change the Drive Assembly Profile or Save a Profile

(1) Using a PC to Radio Interconnection Lead, Park Air part number 17E12600001, connect the drive assembly's front panel Microphone/Diagnostics connector to the PC's Com Port 1 or Com Port 2 (note which Com Port is used).

(2) Run up the VFP software and check that a blank VFP screen (see Fig 32) is displayed.

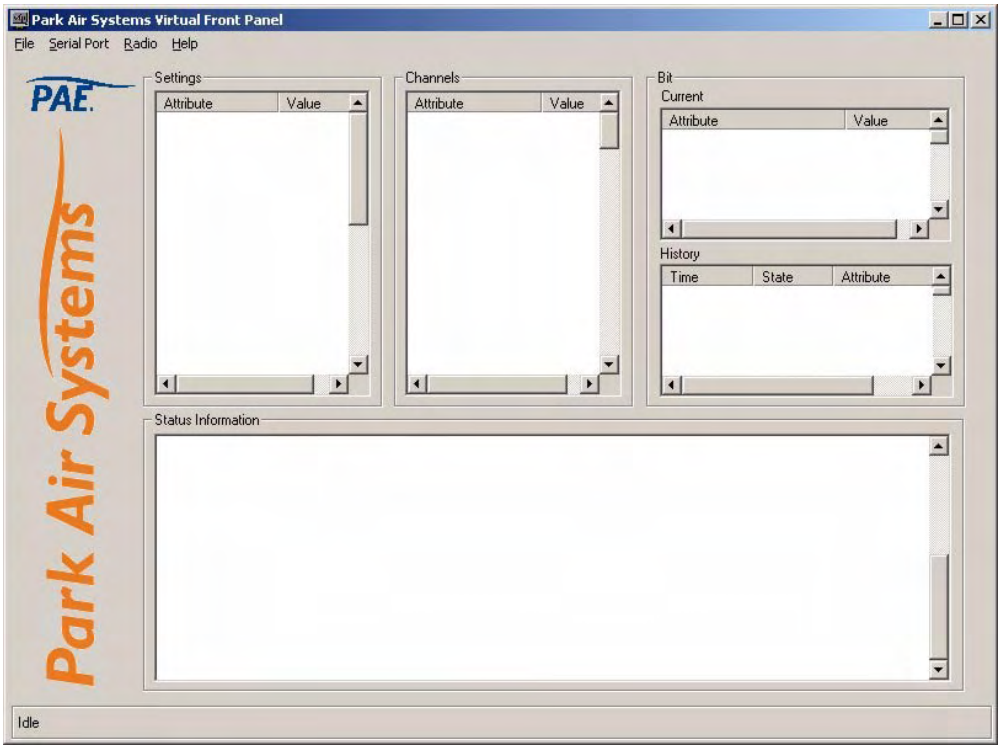


Fig 32 Blank VFP Screen

(3) At the Menu Bar, click on *Serial Port* and select either *Com 1* or *Com 2*. The selection must correspond to the port used to connect to the radio.

(4) Load the required information from the radio, or from a stored file. The required information can be radio settings, frequency channels, BIT information, or all of these.

To load a previously stored file, select *File > Open > All*
or, *File > Open >Settings*
or, *File > Open > Channel*
or, *File > Open > BIT*

To load information from the radio, select *Radio > Retrieve > All*
or, *Radio > Retrieve > Settings*
or, *Radio > Retrieve > Channel*
or, *Radio > Retrieve > BIT*

(5) If required, amend any radio Settings or Channel information.

(6) Download the radio's profile as shown on the VFP screen to either the radio, or to a file.

To download into the radio, select *Radio* > *Send* > *All*
or, *Radio* > *Send* > *Settings*
or, *Radio* > *Send* > *Channel*

To download to a file, select *File* > *Send* > *All*
or, *File* > *Send* > *Settings*
or, *File* > *Send* > *Channel*
or, *File* > *Send* > *BIT*

(7) Check that after downloading to a radio, no invalid parameters are returned (such parameters are displayed as red text). If there are invalid parameters, amend them and then repeat the download.

(8) When there is no further requirement for using the VFP, exit the VFP software and disconnect the radio from the PC.

To Initiate a BIT Test

During an interruptive BIT test, the transmitter radiates modulated carrier waves at the set power. Users should therefore obtain the necessary authority before initiating a test.

If the test is to be carried out with the antenna disconnected, ensure a load is fitted to the transmitter's Antenna connector.

In order to test the line input stages, an internally generated 1 kHz tone is injected into the line input circuit. Any other audio present on the line input will cause the test to be inaccurate. Therefore the transmitter MUST NOT be keyed during the test.

(1) Using a PC to Radio Interconnection Lead, Park Air part number 17E12600001, connect the radio's front panel Microphone/Diagnostics connector to the PC's Com Port 1 or Com Port 2 (note which Com Port is used).

(2) Run up the VFP software and check that a blank VFP screen is displayed.

(3) At the Menu Bar, click on *Serial Port* and select either *Com 1* or *Com 2*. The selection must correspond to the port used to connect to the radio.

(4) At the Menu Bar select *Radio* > *Test*.

(5) An interruptive BIT test now takes place. The results are displayed in the BIT window.

(6) If there is no further requirement for using the VFP, exit the VFP software and disconnect the radio from the PC.

To Calibrate the Transmitter

(1) Connect a suitable dummy load via a power meter to the combiner's Antenna connector.

(2) Remove the drive assembly's bottom cover.

(3) Using a PC to Radio Interconnection Lead, Park Air part number 17E12600001, connect the front panel Microphone/Diagnostics connector to the PC's Com Port 1 or Com Port 2 (note which Com Port is used).

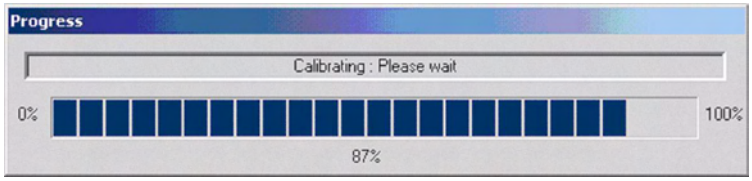
(4) Run up the VFP software and check that a blank VFP screen is displayed.

(5) At the Menu Bar, click on *Serial Port* and select either *Com 1* or *Com 2*. The selection must correspond to the port used to connect to the radio.

(6) At the Menu Bar select *Radio* > *Retrieve* > *All*.

(7) At the Menu Bar select *Radio* > *Calibrate*. The Confirm screen will then be displayed to remind you that a dummy load must be connected before proceeding.

(8) With the Confirm screen displayed and dummy load connected, select Yes to continue with the calibrate routine. The Progress screen will then be displayed.



(9) When the PA Control/PA loop has been calibrated the Progress screen disappears and the VFP screen reappears showing a calibration complete message in the Status Information window.

(10) Gain access to the PA Control module and identify RV8 (see Fig 33). From the drive assembly's front panel AM-Voice or AM-MSK Settings screen, select PTT On.

(11) From the Settings window of the VFP screen, note the RF power setting. Adjust RV8 until the power meter reads this value.

(12) From the drive assembly's front panel AM-Voice or AM-MSK Settings screen select PTT Off, then remove the power meter and dummy load. This completes the calibration routine.

(13) When there is no further requirement for using the VFP, exit the VFP software and disconnect the radio from the PC and refit the bottom cover.

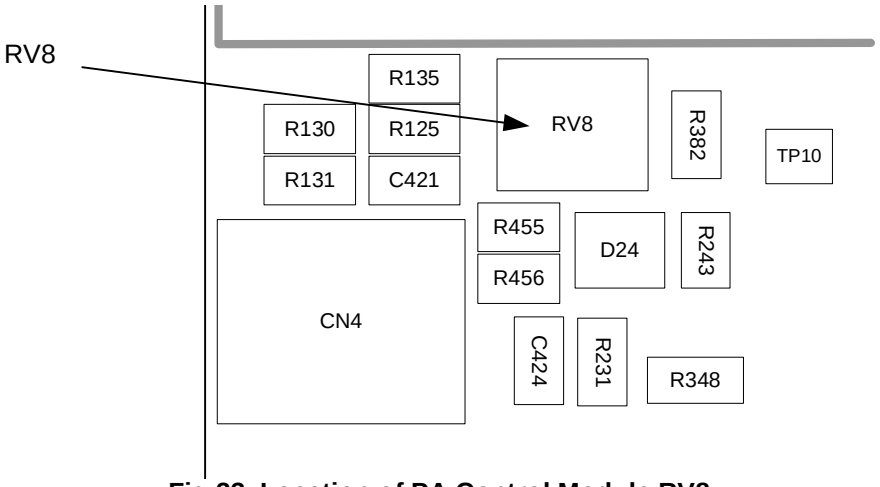


Fig 33 Location of PA Control Module RV8

Intentionally Blank

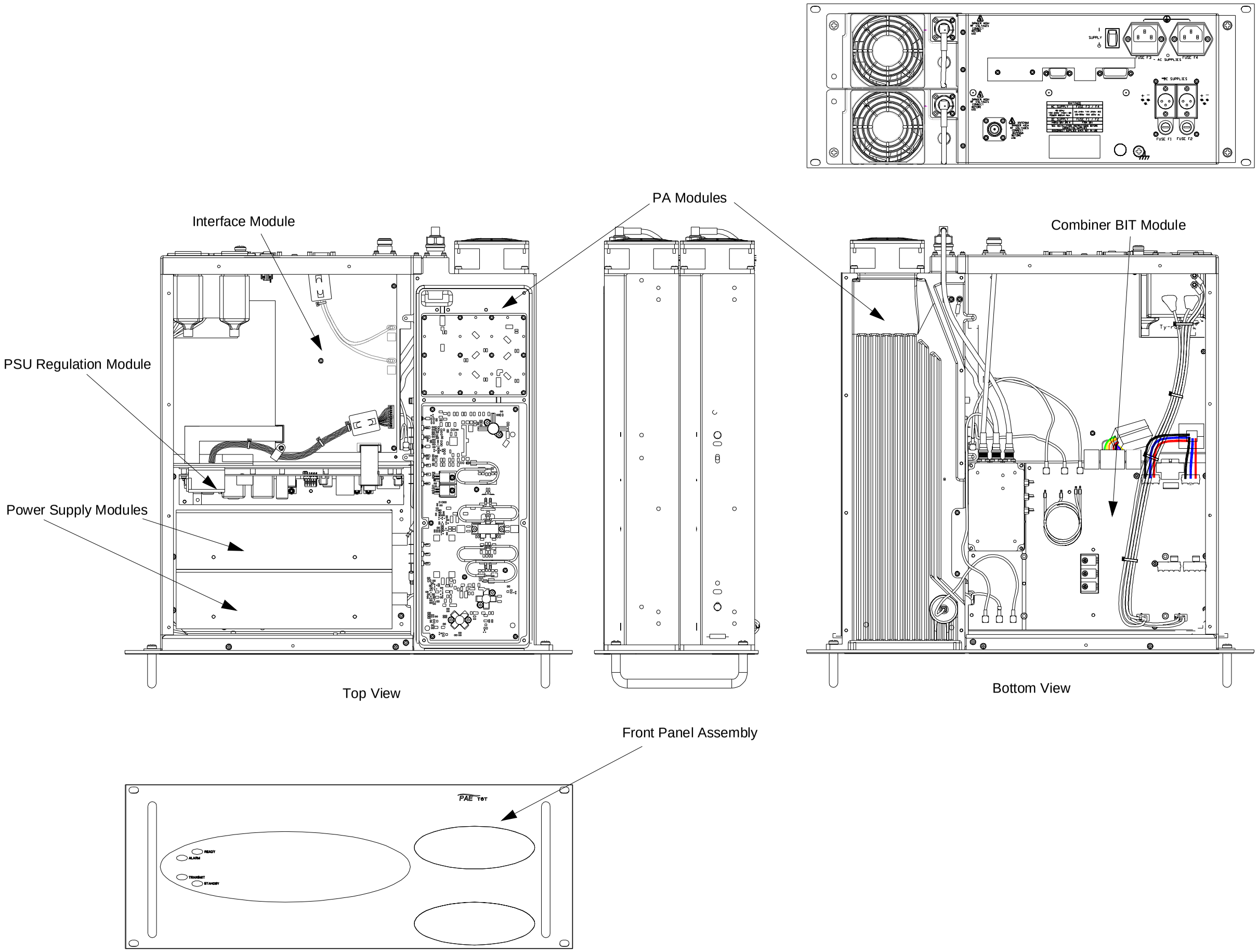


Fig 34 T6T VHF Amplifier Module Location Diagram

Connections	1	Name	Characteristic
Interface	MARC Port		
CN8-1	1	RF Drive	1 dBm carrier
CN8-2	2	Forward Power Sense	17 dBm

Connections	3	Name	Characteristic
Interface	Facilities		
CN5-1	1	PA Temperature	10 mV / °C +0.5 V
CN5-2	2	Drive Detect	0.5 V for +10 dBm
CN5-3	3	PTT	TTL - High for bias on
CN5-4	4	Fan Enable	TTL - High for fan on
CN5-5	5	Reflected Power	50 W = 670 mV
CN5-6	6	TX Key	TTL - High for PA Keyed
CN5-7	7	Present	+5 V
CN5-8	8	n/c	n/c
CN5-9	9	Fail 3	TTL Low to indicate failure
CN5-10	10	n/c	n/c
CN5-11	11	DC Detect	Open collector
CN5-12	12	AC Detect	15 Von,0 Voff
CN5-13	13	Remote on/off	0V=off,opencollector=on
CN5-14	14	n/c	n/c
CN5-15	15	Ground	0 V

Connections	6	Name	Characteristic
Combiner BIT module	Interface		
CN15-1	CN2-1	PA Temperature	10 mV / °C +0.5 V
CN15-2	CN2-2	Drive Detect	0.5 V for +10 dBm
CN15-3	CN2-3	PA Bias Enable	TTL - High for bias on
CN15-4	CN2-4	Fan Enable	TTL - High for fan on
CN15-5	CN2-5	Reflected Power	50 W = 670 mV
CN15-6	CN2-6	PA Count	TTL, Pulse width = 10 ms/50 W PA
CN15-7	CN2-7	Ground	0 V
CN15-8	CN2-8	Combiner Supply	Unreg current limited at 250mA
CN15-9	CN2-9	PA-1 Fail Indication	TTL, 0 V = fail
CN15-10	CN2-10	PA-2 Fail Indication	TTL, 0 V = fail

Connections	7	Name	Characteristic
Combiner BIT module	Interface		
CN27-1	CN4-1	Forward Power Sense	17 dBm

Connections	8	Name	Characteristic
Combiner BIT module	Interface		
CN16-1	CN3-1	RF Drive	1 dBm carrier

Connections	9	Name	Characteristic
PA			
CN24-1	Antenna Port	RF Output	10 to 100 W

Connections	10	Name	Characteristic
PA-1 PA-2			
CN6	Fan	Fan Control	10 V approx or 26.5 V
PA Heatsink	Fan	Ground	0 V

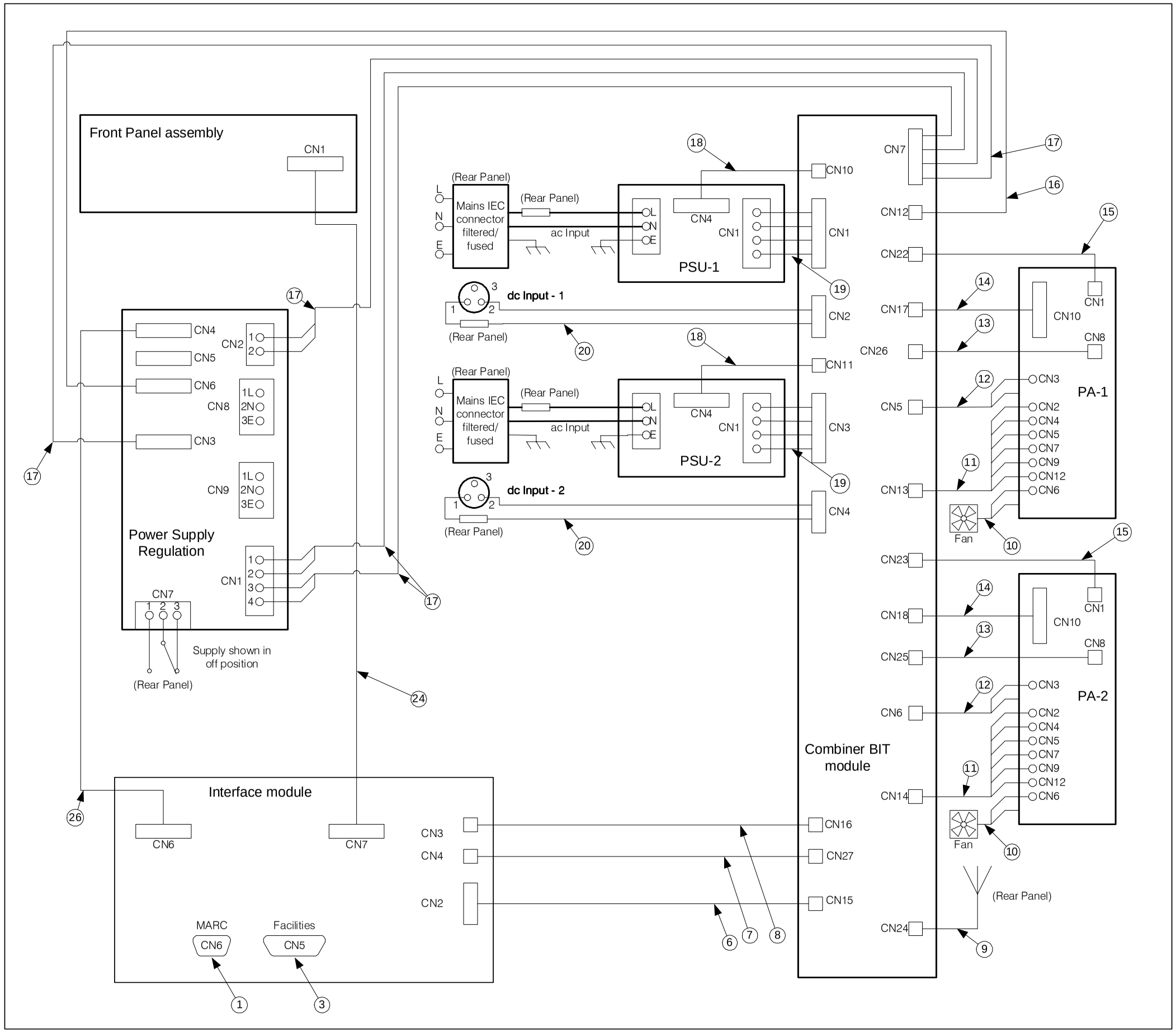


Fig 35 T6T VHF Amplifier Wiring and Interconnection Diagram

Connections		11	Name	Characteristic
Combiner BIT module		PA-1 PA-2		
CN13-1	CN14-1	CN4	PA Temperature	10 mV / °C +0.5 V
CN13-2	CN14-2	CN2	Drive Detect	0.5 V for +10 dBm
CN13-3	CN14-3	CN7	PA Bias Enable	TTL - High for bias on
CN13-4	CN14-4	CN5	Fan Enable	TTL - High for fan on
CN13-5	CN14-5	CN9	Reflected Power	50 W = 670 mV
CN13-6	CN14-6	CN12	PA Count	TTL, PW = 10 ms/50 W PA

Connections		12	Name	Characteristic
Combiner BIT module		PA-1 PA-2		
CN5-1	CN6-1	CN3-1	V Unreg	21.6 V to 32 V
CN5-2	CN6-2	CN3-2	-33 V	-30 V to -35 V
CN5-3	CN6-3	CN3-3	Ground Supply	0 V

Connections		13	Name	Characteristic
Combiner BIT module		PA-1 PA-2		
CN25-1	CN26-1	CN8	Forward Power Sense	17 dBm ±1 dB (-30.5 dBc ± 0.9 dB)

Connections		14	Name	Characteristic
Combiner BIT module		PA-1 PA-2		
CN17-1	CN18-1	CN10	RF Drive	1 dBm carrier

Connections		15	Name	Characteristic
Combiner BIT module		PA-1 PA-2		
CN22-1	CN23-1	CN1-1	RF Output	5 to 50 W

Connections		16	Name	Characteristic
Combiner BIT module		Regulation		
CN12-1		CN6-1	0 V	0 V
CN12-3		CN6-2	PSU ok	0 V ok
CN12-3		CN6-3	PSU ok	o/c ok
CN12-4		CN6-4	PSU off	0 V=on
CN12-5		CN6-5	0 V	0 V
CN12-6		CN6-6	PSU off	0 V=off

Connections		17	Name	Characteristic
Combiner BIT module		Regulation		
CN7-1		CN1-1 & 2	Ground	0 V
CN7-2		CN1-3 & 4	AC Derived Supply	29 V
CN7-3		CN2-1	Ground	0 V
CN7-4		CN2-2	DC Derived Supply	21.6 V to 32 V
CN7-5		CN3-3	Ground	0 V
CN7-6		CN3-2	Pin Diode - ve	-30 V to -35 V
CN7-7		CN3-1	V Unregulated	21.6 V to 32 V
CN7-8		n/c	n/c	n/c

Connections		18	Name	Characteristic
Combiner BIT module		PSU-1 PSU-2		
CN10-1	CN11-1	CN4-1	PSU off	0 V = off
CN10-2	CN11-2	CN4-2	dc OK	TTL, high = PSU on
CN10-3	CN11-3	CN4-3	Ground	0 V

Connections		19	Name	Characteristic
Combiner BIT module		PSU-1 PSU-2		
CN1-1	CN3-1	CN1-5	Ground Supply	0 V
CN1-2	CN3-2	CN1-6	Ground Supply	0 V
CN1-3	CN3-3	CN1-1	V Unreg	29 V
CN1-4	CN3-4	CN1-2	V Unreg	29 V

Connections		20	Name	Characteristic
DC Input-1, DC Input-2		Regulation		
Input-1		CN2-2	Dc Input	Fused 21.6 V to 32 V
Input-2		CN2-1	Ground Supply	0 V
Input-3			n/c	n/c

Connections		24	Name	Characteristic
Interface		Front Panel		
CN7-1		CN1-1	0 V	0 V
CN7-2		CN1-2	Alarm LED	Open Collector, 21 mA maximum
CN7-3		CN1-3	Ready LED	Open Collector, 21 mA maximum
CN7-4		CN1-4	TX LED	Open Collector, 21 mA maximum
CN7-5		CN1-5	0 V	0 V
CN7-6		CN1-6	+15 V	+15 V
CN7-7		CN1-7	n/c	n/c
CN7-8		CN1-8	n/c	n/c
CN7-9		CN1-9	n/c	n/c
CN7-10		CN1-10	n/c	n/c

Connections		26	Name	Characteristic
Regulation		Processor		
CN4-1		CN3-1	+15 V Supply	+15 V
CN4-2		CN3-2	+15 V Supply	+15 V
CN4-3		CN3-3	+5 V Supply	+5 V
CN4-4		CN3-4	+5 V Supply	+5 V
CN4-5		CN3-5	Ground	0 V
CN4-6		CN3-6	Ground	0 V
CN4-7		CN3-7	-15 V Supply	-15 V
CN4-8		CN3-8	-15 V Supply	-15 V
CN4-9		CN3-9	AC Detect	15 V on, 0 V off
CN4-10		CN3-10	DC Detect	Open collector
CN4-11		CN3-11	V Unreg	21.6 to 32 V
CN4-12		CN3-12	V Unreg	21.6 to 32 V
CN4-13		CN3-13	Remote on/off	0 V=off, open collector=on
CN4-14		CN3-14	n/c	n/c

Fig 36 T6T VHF Amplifier Wiring List

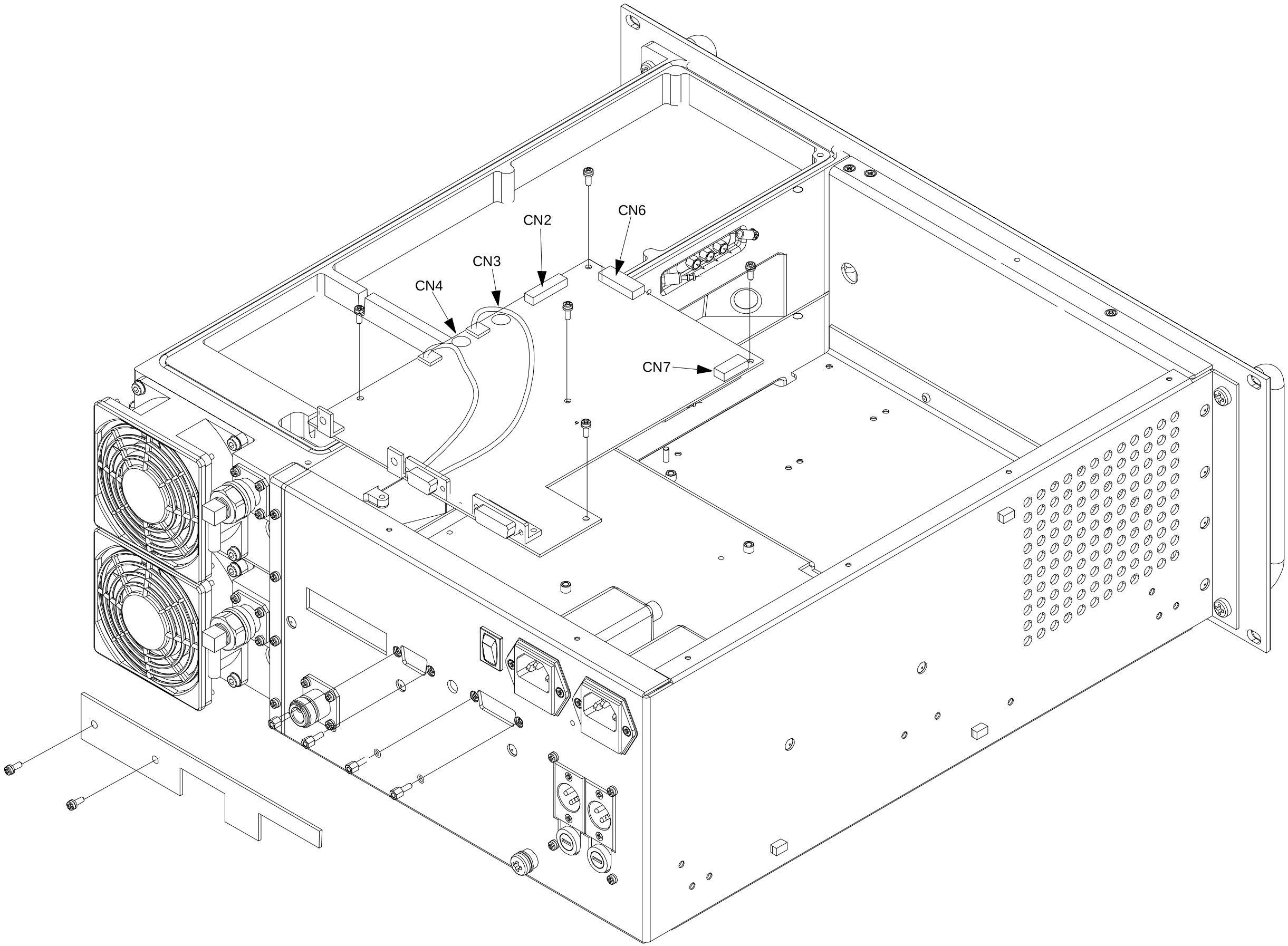


Fig 37 T6T VHF Amplifier Interface Module - Removal and Refitting Detail

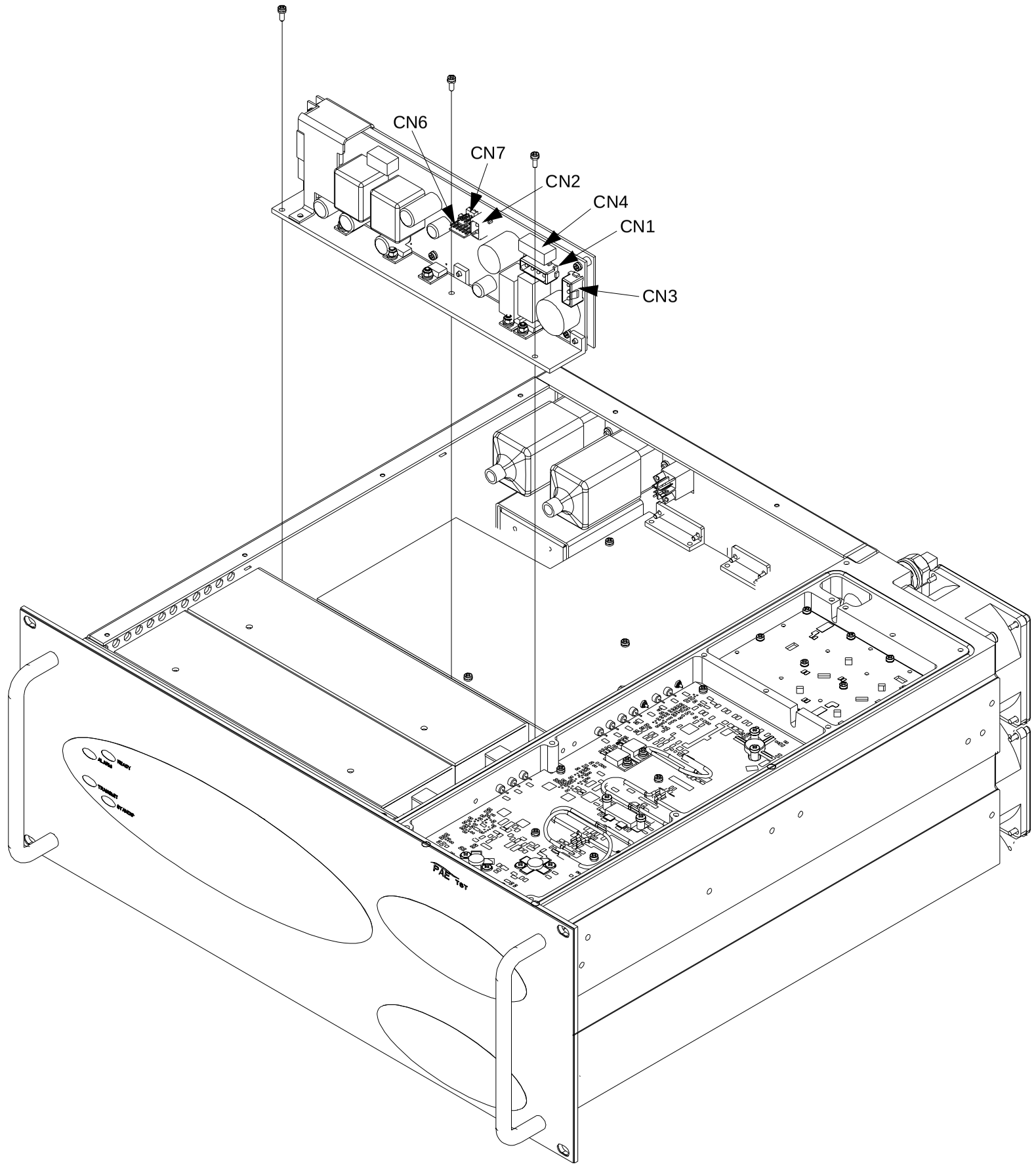


Fig 38 T6T VHF Amplifier PSU Regulation Module - Removal and Refitting Detail

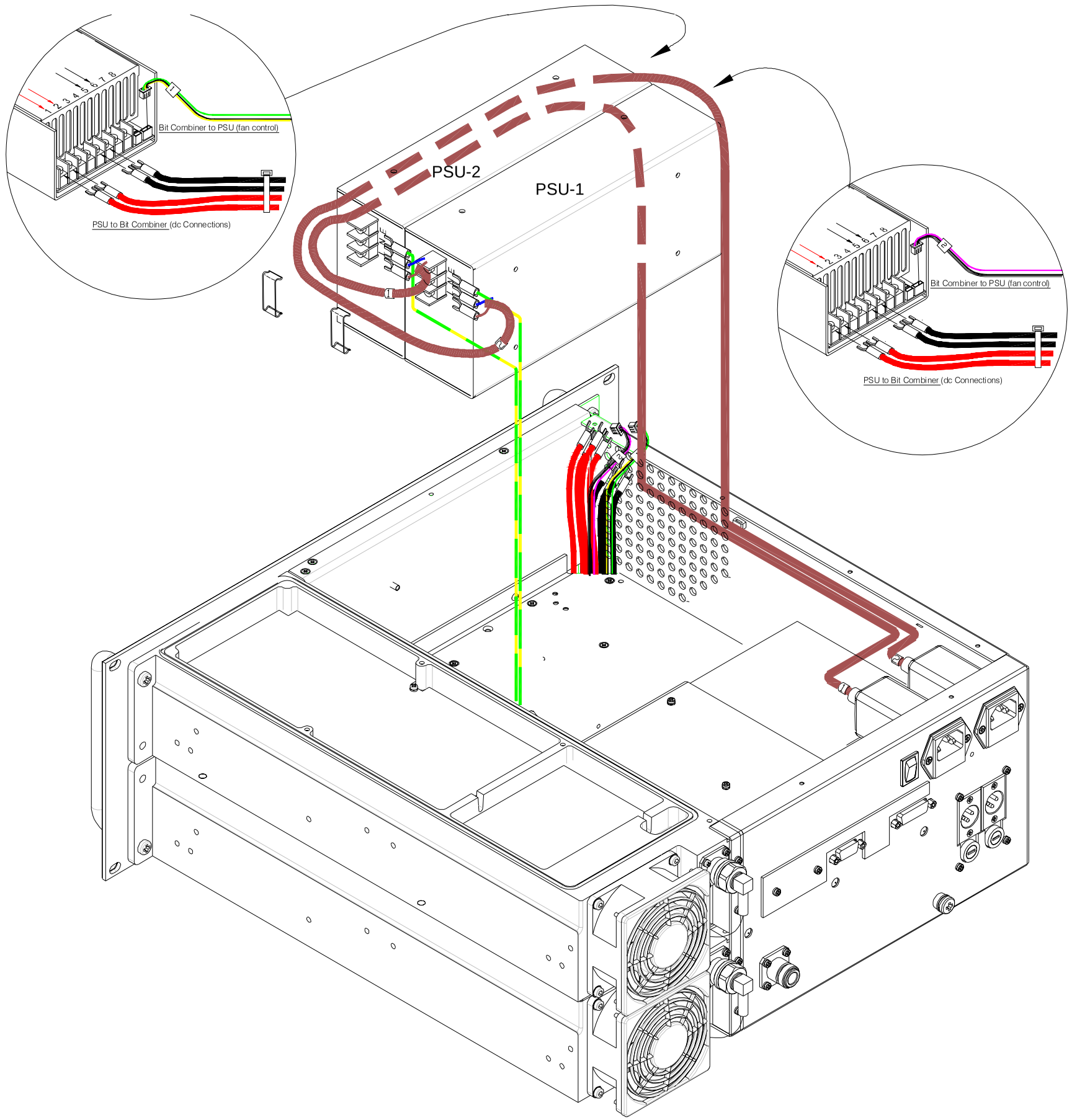


Fig 39 T6T VHF Amplifier Power Supplies - Removal and Refitting Detail

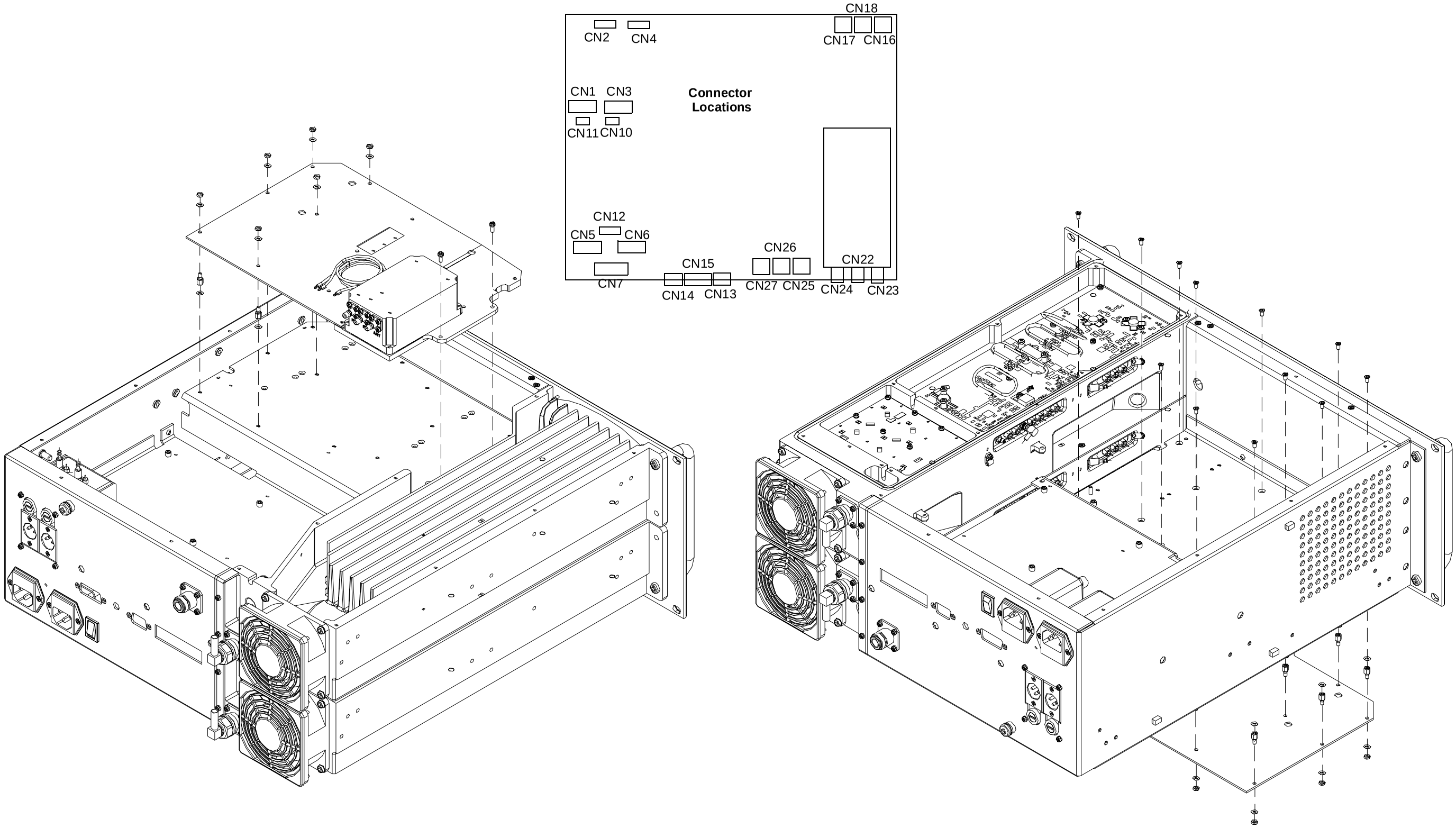


Fig 40 T6T VHF Amplifier Combiner BIT Module - Removal and Refitting Detail

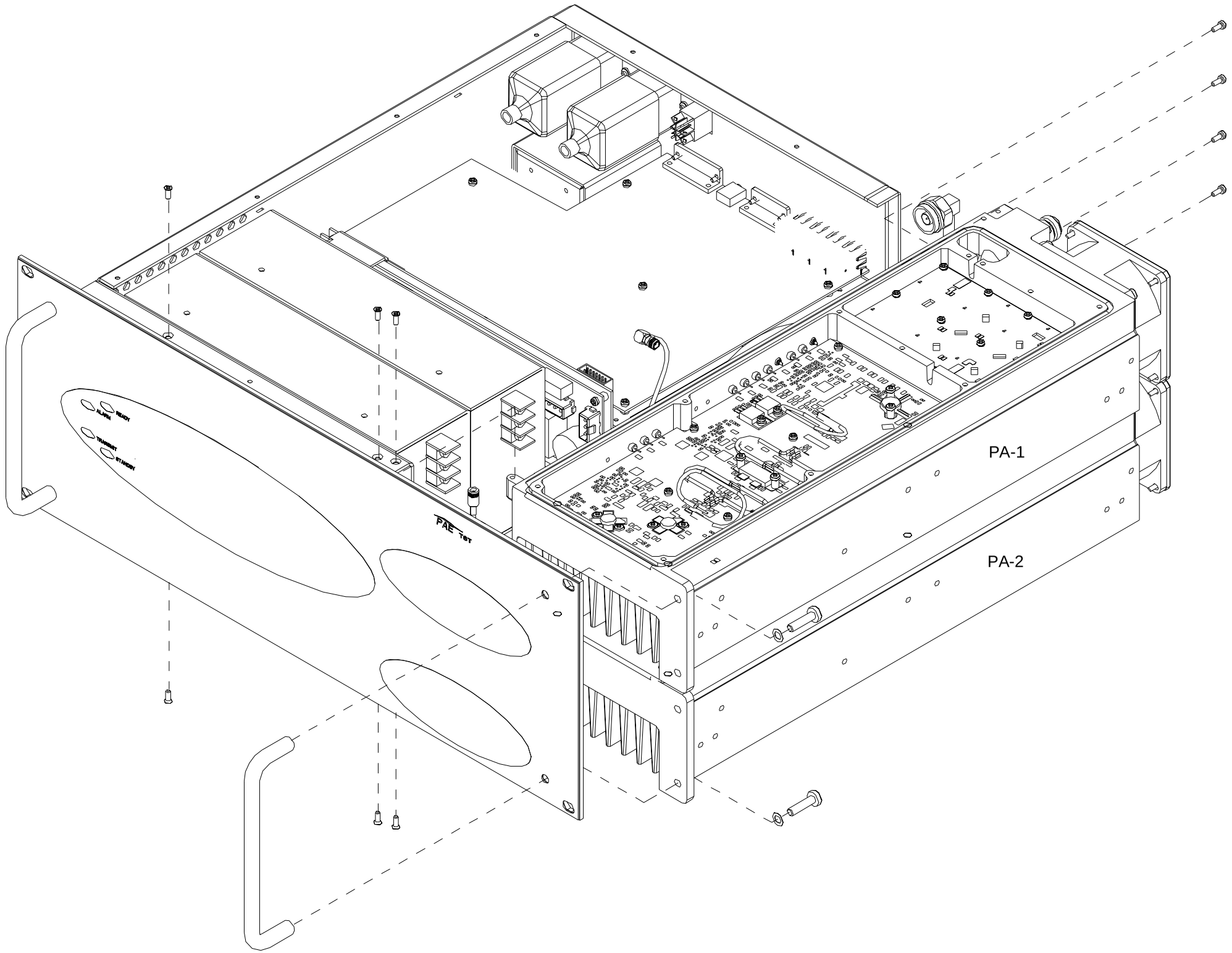


Fig 41 T6T VHF Amplifier PA Modules - Removal and Refitting Detail

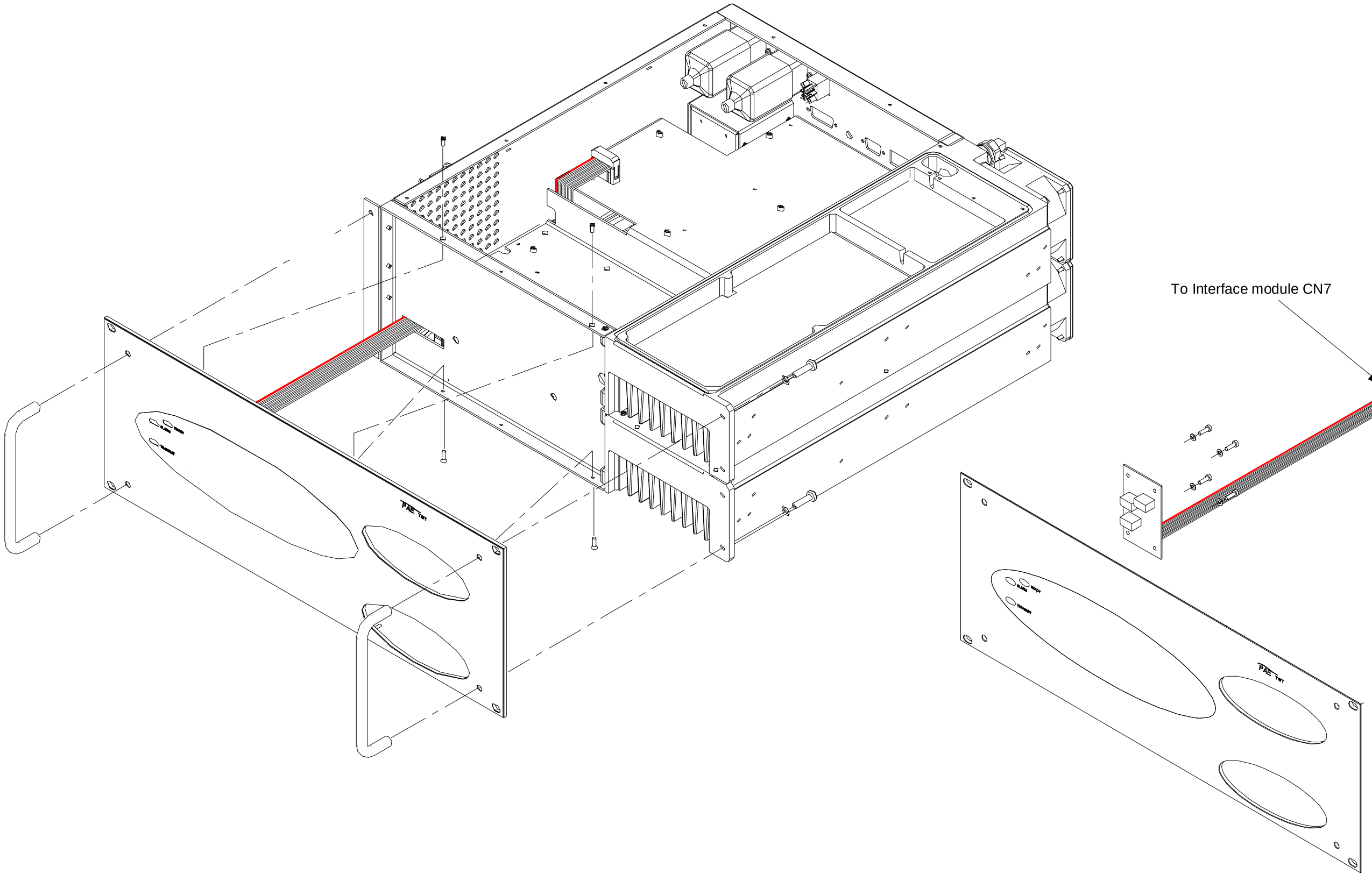


Fig 42 T6T VHF Amplifier Front Panel PCB - Removal and Refitting Detail

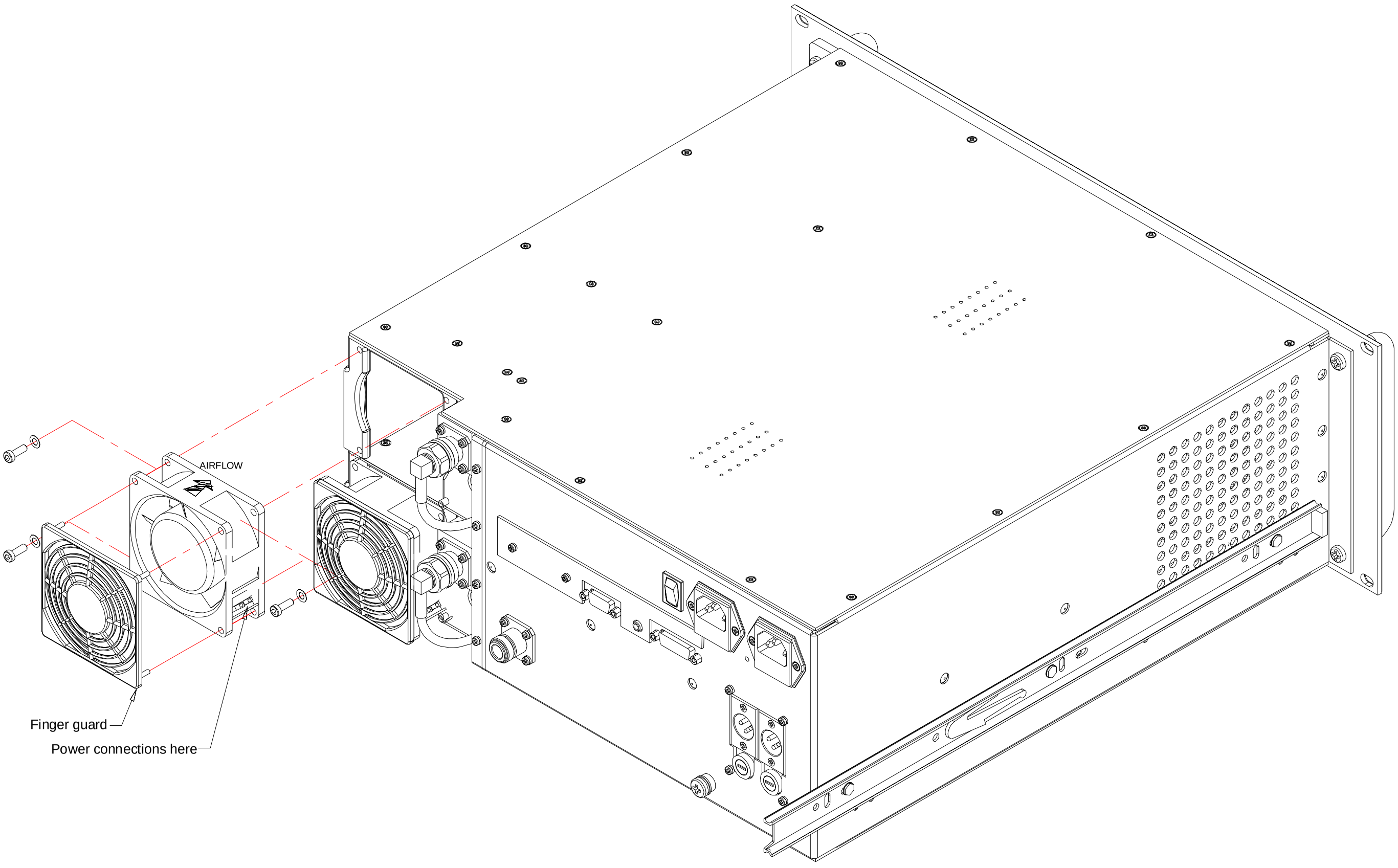
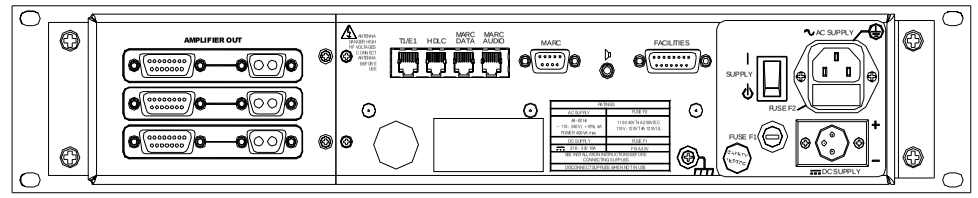


Fig 43 T6T VHF Amplifier Cooling Fans - Removal and Refitting Detail



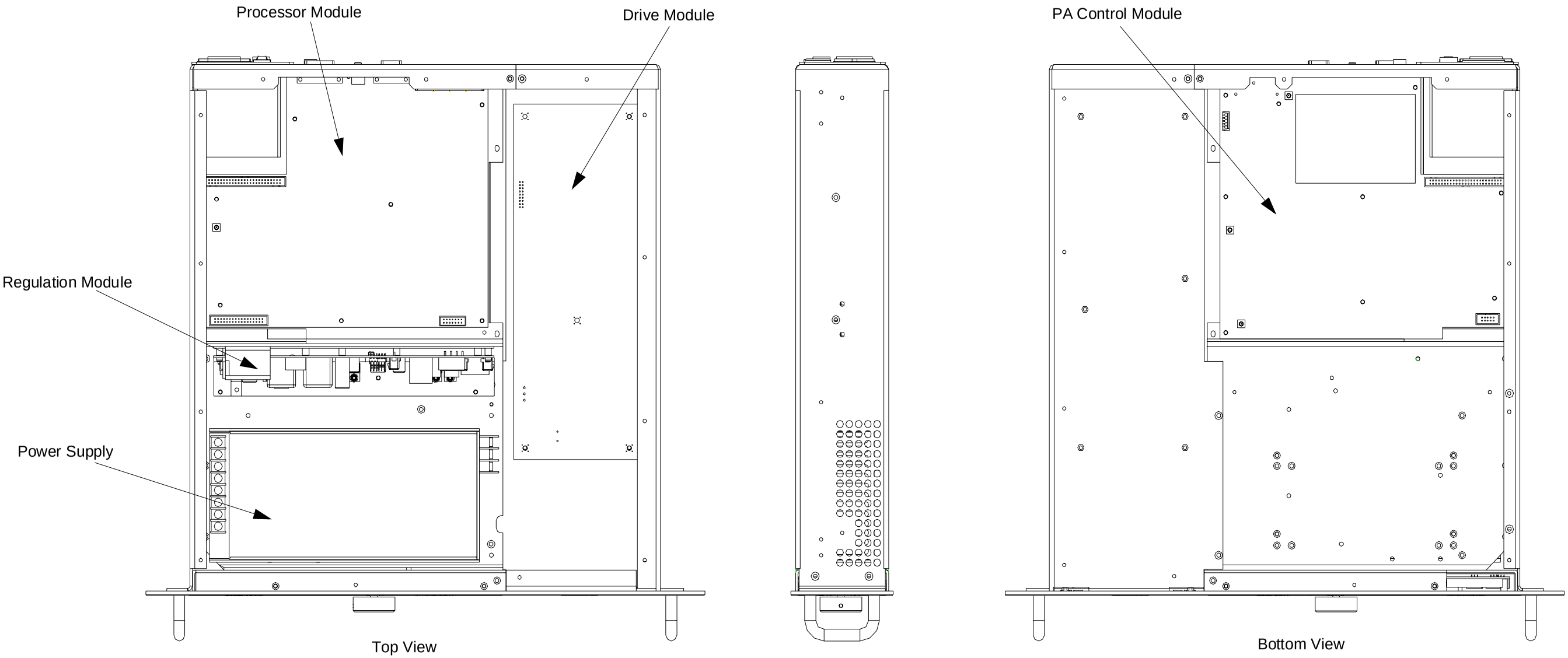


Fig 44 T6T VHF Drive Assembly Module Location Diagram

Connections		Name	Characteristic
Processor	Front Panel		
CN4-1	CN1-1	LED Alarm	Open collector (5 mA)
CN4-2	CN1-2	LED Ready	Open collector (5 mA)
CN4-3	CN1-3	LED Standby	Open collector (5 mA)
CN4-4	CN1-4	LED Tx	Open collector (5 mA)
CN4-5	CN1-5	LCD RS	TTL
CN4-6	CN1-6	LCD R/W	TTL
CN4-7	CN1-7	LCD Enable	TTL
CN4-8	CN1-8	Data 0	TTL
CN4-9	CN1-9	Data 1	TTL
CN4-10	CN1-10	Data 2	TTL
CN4-11	CN1-11	Data 3	TTL
CN4-12	CN1-12	Data 4	TTL
CN4-13	CN1-13	Data 5	TTL
CN4-14	CN1-14	Data 6	TTL
CN4-15	CN1-15	Data 7	TTL
CN4-16	CN1-16	LCD Backlight	Open collector (200 mA)
CN4-17	CN1-17	Transmit Data	RS232
CN4-18	CN1-18	+5 V Supply	+5 V
CN4-19	CN1-19	Receive Data	RS232
CN4-20	CN1-20	-5 V Supply	-5 V
CN4-21	CN1-21	Ground	0 V
CN4-22	CN1-22	+15 V Supply	+15 V
CN4-23	CN1-23	Ground	0 V
CN4-24	CN1-24	LED RX (not used)	Open collector (5 mA)
CN4-25	CN1-25	Turn +	5 V pull-up
CN4-26	CN1-26	Turn -	5 V pull-up
CN4-27	CN1-27	Push	5 V pull-up
CN4-28	CN1-28	Mic PTT	0 V=PTT, 5 V pull-up=PTT
CN4-29	CN1-29	Ground	0 V
CN4-30	CN1-30	Sidetone (Headset Drive)	3 Vac pk-pk
CN4-31	CN1-31	Loudspeaker Amp Drive	2 V pk-pk maximum
CN4-32	CN1-32	Ground	0 V
CN4-33	CN1-33	Mic Input	1.6 V pk-pk maximum
CN4-34	CN1-34	Ground	0 V

Connections		Name	Characteristic
Front Panel	Microphone/ Diagnostics		
CN2-1	1	Ground - Microphone	0 V
CN2-2	2	Transmit Data	RS232
CN2-3	3	MIC PTT	0 V = PTT, 5 V pull-up = not PTT
CN2-4	4	Receive Data	RS232
CN2-5	5	Sidetone (Headset Drive)	3 Vac pk-pk, 200R
CN2-6	6	Microphone Input	6k8 input impedance, 5 mV sensitivity
CN2-7	7	Ground	0 V

Connections		Name	Characteristic
Front Panel			
CN3-1		Loudspeaker Output	7.5 V pk-pk maximum
CN3-2		Ground	0 V
CN3-3		n/c	n/c

Connections		Name	Characteristic
DC Input	Regulation		
Input-1	CN2-2	dc Input	Fused 21.6 to 32 V
Input-2	CN2-1	Ground Supply	0 V
Input-3		n/c	n/c

**

Connections		Name	Characteristic
Processor	MARC Port		
CN6-1	1	Ground	0 V
CN6-2	2	Line In +	+20 dBm to -20 dBm 600R
CN6-3	3	Line In -	+20 dBm to -20 dBm 600R
CN6-4	4	PTT Input	0 V or +10 V to +60 V or -10 V to -60 V at 6 mA
CN6-5	5	Unregulated Supply	Fused 500mA, 21.6 to 32 V
CN6-6	6	Data RX B - Data In +	RS422
CN6-7	7	Data RX A - Data In -	RS422
CN6-8	8	Data TX B - Data Out +	RS422
CN6-9	9	Data TX A - Data Out -	RS422

Connections		Name	Characteristic
Regulation	PSU		
CN6-1		0 V	0 V
CN6-2		PSU OK	0 V OK
CN6-3		PSU OK	Open circuit OK
CN6-4		PSU off	0 V = on
CN6-5	CN4-3	0 V	0 V
CN6-6	CN4-1	PSU off	PSU off 0V = 0ff

* CN7A

Pin Number	Name	Characteristic
1	RRING	ANSI T1.403-1995 (T1) ITU-T: G.703 (E1)
2	RTIP	
3	n/c	
4	TRING	ANSI T1.403-1995 (T1) ITU-T: G.703 (E1)
5	TTIP	
6	n/c	
7	n/c	
8	n/c	

* CN7B

Pin Number	Name	Characteristic
1	HDLC Rx A	RS 422
2	HDLC Rx B	RS 422
3	HDLC CL A	RS 422
4	HDLC Tx B	RS 422
5	HDLC Tx A	RS 422
6	HDLC CL B	RS 422
7	Ground	0 V
8	Unregulated Supply	21.6 V to 32 V

* CN7C

Pin Number	Name	Characteristic
1	Data Rx A (Data In -)	RS 422
2	Data Rx B (Data In +)	RS 422
3	n/c	
4	Data Tx B (Data Out +)	RS 422
5	Data Tx A (Data Out -)	RS 422
6	Remote Supply On/Off	
7	Ground	0 V
8	Unregulated Supply	21.6 V to 32 V

*CN7D

Pin Number	Name	Characteristic
1	Line In -	+20 dBm to -20 dBm 600R
2	Line In +	+20 dBm to -20 dBm 600R
3	Fast antenna change-over/PTT	NPN open collector grounding transistor
4	Not used	+20 dBm to -20 dBm 600R
5	Not used	+20 dBm to -20 dBm 600R
6	PTT Input	0 V or +10 V to +60 V or -10 V to -60 V at 6 mA
7	Ground	0 V
8	Not used	0 V or +10 V to +60 V or -10 V to -60 V at 6 mA

***

Connections		Name	Characteristic
Processor	PA Control		
CN1-1	CN1-1	Ground	0 V
CN1-2	CN1-2	IF AGC (Not used)	0 to 2.5 V
CN1-3	CN1-3	Ground	0 V
CN1-4	CN1-4	RF AGC (Not used)	0 to 2.5 V
CN1-5	CN1-5	Ground	0 V
CN1-6	CN1-6	I	0 to 2.5 V
CN1-7	CN1-7	Ground	0 V
CN1-8	CN1-8	BIT I Monitor	±2.5 V
CN1-9	CN1-9	Ground	0 V
CN1-10	CN1-10	BIT Q Monitor	±2.5 V
CN1-11	CN1-11	Ground	0 V
CN1-12	CN1-12	Q	0 to 2.5 V
CN1-13	CN1-13	Ground	0 V
CN1-14	CN1-14	Frequency Trim	0 to 4 V / 0 to 6 V
CN1-15	CN1-15	Tx/Rx Detect	TTL
CN1-16	CN1-16	Power Down	TTL pull up active low
CN1-17	CN1-17	Ground	0 V
CN1-18	CN1-18	Filter 0	TTL
CN1-19	CN1-19	Filter 1	TTL
CN1-20	CN1-20	Filter 2	TTL
CN1-21	CN1-21	Filter 3	TTL
CN1-22	CN1-22	Filter 4	TTL
CN1-23	CN1-23	Ground	0 V
CN1-24	CN1-24	Synth Load	TTL
CN1-25	CN1-25	Data	TTL
CN1-26	CN1-26	Clock	TTL
CN1-27	CN1-27	Phase Load	TTL
CN1-28	CN1-28	Reserved	TTL
CN1-29	CN1-29	Tx Key	TTL
CN1-30	CN1-30	Auto Level Control	0 to 5 V (5 V, 3 dB back off)
CN1-31	CN1-31	PA Temperature	10 mV / °C
CN1-32	CN1-32	Reflected Power	0 to 2.5 V
CN1-33	CN1-33	PAC Temperature	10 mV / °C
CN1-34	CN1-34	External VSWR	TTL
CN1-35	CN1-35	NB/WB (not used)	TTL
CN1-36	CN1-36	BIT Control 0	TTL
CN1-37	CN1-37	BIT Control 1	TTL
CN1-38	CN1-38	BIT Open Loop	TTL
CN1-39	CN1-39	BIT Synth Lock	TTL
CN1-40	CN1-40	BIT Loop Correct	TTL
CN1-41	CN1-41	BIT VSWR OK	TTL
CN1-42	CN1-42	RF PA Bias Disable	TTL
CN1-43	CN1-43	Fan Enable	TTL - High fan on
CN1-44	CN1-44	OCXO Fitted	TTL - Low OCXO fitted
CN1-45	CN1-45	Reserved	TTL
CN1-46	CN1-46	Step Size (not used)	TTL
CN1-47	CN1-47	TR Detect	TTL
CN1-48	CN1-48	V/U Detect	TTL
CN1-49	CN1-49	BITControl2(not used)	TTL
CN1-50	CN1-50	BITControl3(not used)	TTL

Connections		Name	Characteristic
PSU	Regulation		
CN1-5	CN1-1	Ground Supply	0 V
CN1-6	CN1-2	Ground Supply	0 V
CN1-1	CN1-3	V Unreg	29 V
CN1-2	CN1-4	V Unreg	29 V

Connections		Name	Characteristic
Drive	Amplifier 1/2/3		
CN1/2/3 - 1	-1	Forward Power Sense	17 dBm ± 1 dB (-30.5 dBc ± 0.9 dB)
CN1/2/3 - 2	-2	RF Drive	1 dBm carrier

Connections		Name	Characteristic
Regulation	Processor		
CN4-1	CN3-1	+15 V Supply	+15 V
CN4-2	CN3-2	+15 V Supply	+15 V
CN4-3	CN3-3	+5 V Supply	+5 V
CN4-4	CN3-4	+5 V Supply	+5 V
CN4-5	CN3-5	Ground	0 V
CN4-6	CN3-6	Ground	0 V
CN4-7	CN3-7	-15 V Supply	-15 V
CN4-8	CN3-8	-15 V Supply	-15 V
CN4-9	CN3-9	ac Detect	15 V on, 0 V off
CN4-10	CN3-10	dc Detect	Open collector
CN4-11	CN3-11	V Unreg	21.6 to 32 V
CN4-12	CN3-12	V Unreg	21.6 to 32 V
CN4-13	CN3-13	Remote on/off	0V=off, open collector=on
CN4-14	CN3-14	n/c	n/c

Connections		Name	Characteristic
Drive	PA Control		
CN9	CN4-1	Forward Power Sense	17 dBm ± 1 dB (-30.5 dBc ± 0.9 dB)

Connections		Name	Characteristic
PA Control	Drive		
CN3-1	CN7	RF Drive	1 dBm carrier

Connections		Name	Characteristic
PA Control	Front Panel		
CN5-1	CN4-1	Reference Frequency	-20 dBm to 0 dBm

Connections		Name	Characteristic
Regulation	PA Contrd		
CN5-1	CN6-1	+15 V Supply	+15 V
CN5-2	CN6-2	+15 V Supply	+15 V
CN5-3	CN6-3	+5 V Supply	+5 V
CN5-4	CN6-4	+5 V Supply	+5 V
CN5-5	CN6-5	Ground	0 V
CN5-6	CN6-6	Ground	0 V
CN5-7	CN6-7	-15 V Supply	-15 V
CN5-8	CN6-8	-15 V Supply	-15 V
CN5-9	CN6-9	ac Detect	n/c
CN5-10	CN6-10	dc Detect	n/c

Connections		Name	Characteristic
Regulator	Drive		
CN3-1	CN8	V Unreg	21.6 to 32 V
CN3-2		-33 V	n/c
CN3-3	Heatsink	Ground Supply	0 V

Connections		Name	Characteristic
Drive	Processor		
CN11-1	CN12-1	Remote on/off	0 V=off, open collector=on
CN11-2	CN12-2	Ground	0 V

Connections		Name	Characteristic
Processor	External Speaker		
CN8 Tip	1	External Speaker Drive	3 Vac pk-pk maximum
CN8 Ring	2	External Speaker Drive	3 Vac pk-pk maximum
CN8 Sleeve	3	Ground	0 V

Connections		Name	Characteristic
Processor	Facilities		
CN5-1	1	Ground	0 V
CN5-2	2	E Bit	TTL pull-up active low
CN5-3	3	PTT	Grounding output +/- 60 V, 100 mA maximum
CN5-4	4	External VSWR	TTL pull-up active low
CN5-5	5	Antenna Change-over	Grounding output +/- 60V, 100 mA maximum
CN5-6	6	Antenna Change-over	Grounding output +/- 60V, 100 mA maximum
CN5-7	7	Squelch Defeat (not used)	TTL pull-up active low
CN5-8	8	Ground	0 V

Connections		Name	Characteristic
Processor	Facilities		
CN5-9	9	Unregulated Supply	Fused 300 mA 21.6 to 32 V
CN5-10	10	Inhibit	TTL pull-up active low
CN5-11	11	BIT Interruptive Test	TTL pull-up active low
CN5-12	12	RSSI (not used)	Potential range 0 V to 10 V
CN5-13	13	Ready Output	Open collector, 0 V=Ready
CN5-14	14	Tape Output	-10 dBm, 100R
CN5-15	15	Reserved	n/c

Connections		Name	Characteristic
PA Control	Drive		
CN2-1	CN10-1	PA Temperature	10 mV/°C + 0.5 V
CN2-2	CN10-2	Drive Detect	0.5 V for +10 dBm
CN2-3	CN10-3	PA Bias Enable	TTL - High for bias on
CN2-4	CN10-4	Fan Enable	TTL - High for fan on
CN2-5	CN10-5	Reflected Power	50 W = 670 mV
CN2-6	CN10-6	PA Count	25 Hz 1 Amplifier 12.5 Hz 2 Amplifiers 6.25 Hz 3 Amplifiers

Connections		Name	Characteristic
Drive CN4/5/6	Amplifier 1/2/3		
1	1	PA Temperature	10 mV/°C + 0.5 V
2	2	Drive Detect	0.5 V for + 10 dBm
3	3	PTT	TTL - High for PTT
4	4	Fan Enable	TTL - High for fan on
5	5	Reflected Power	50 W = 670 mV
6	6	Amplifier keyed	TTL - High for keyed
7	7	Present	TTL - High for present
8	8	Not used	N/A

Connections		Name	Characteristic
Processor	Facilities		
9	9	Fail 3	TTL pull-up active low
10	10	Not used	N/A
11	11	dc Detect	Open collector
12	12	ac Detect	15 V on, 0 V off
13	13	Remote on/off	0 V=off, open collector=on
14	14	Not used	N/A
15	15	Ground	0 V

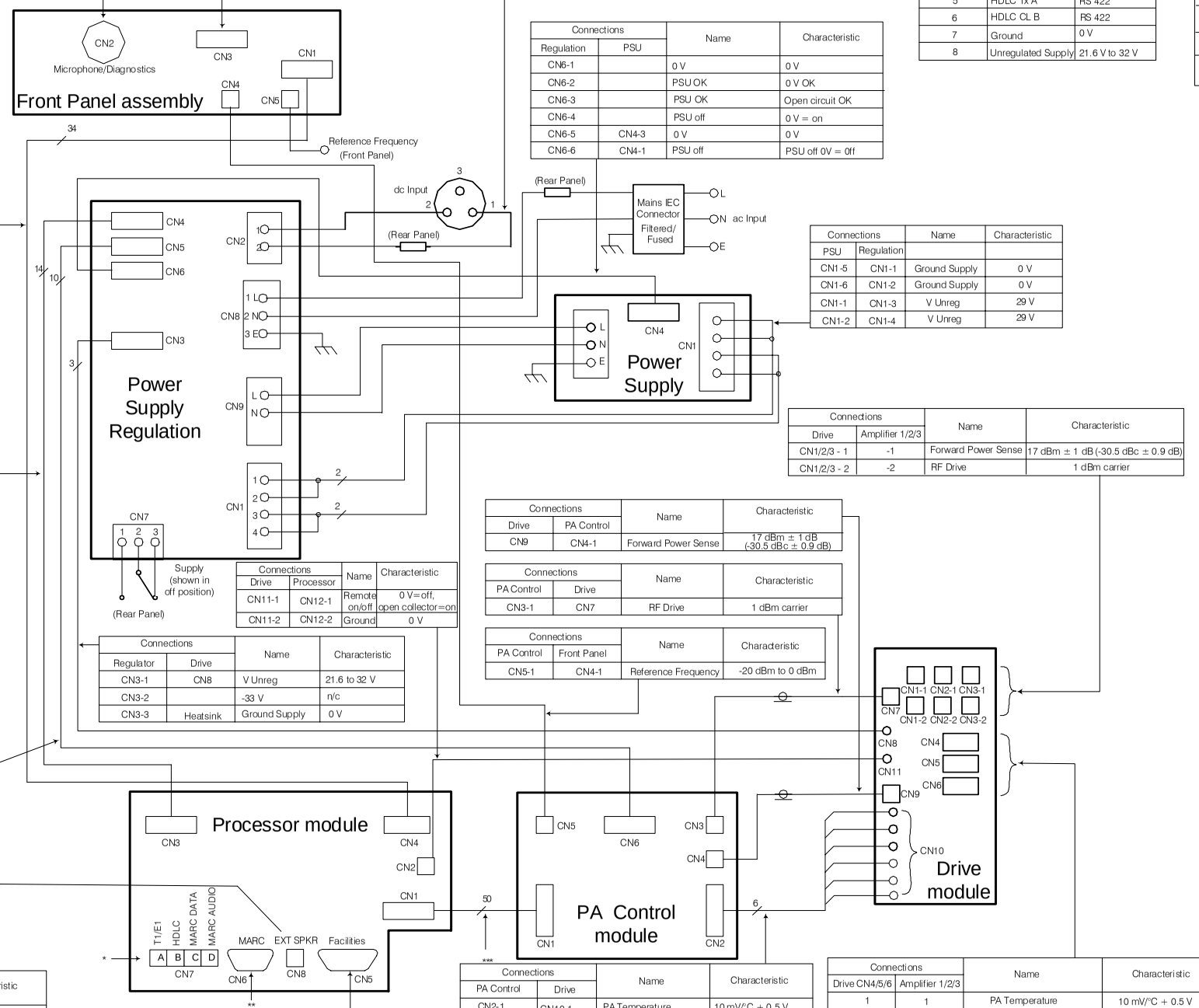


Fig 45 T6T VHF Drive Assembly Wiring and Interconnection Diagram

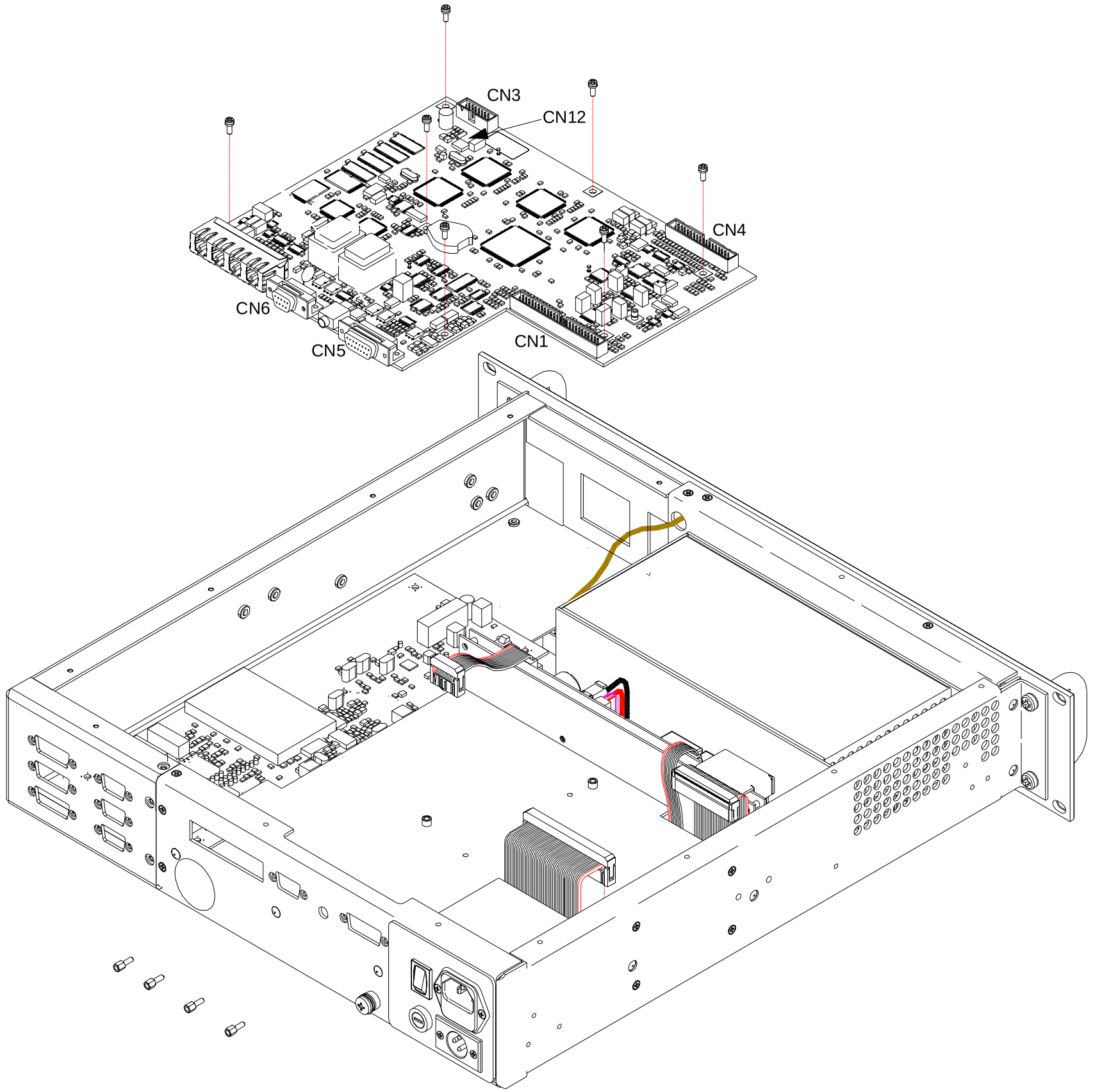


Fig 46 T6T VHF Drive Assembly Processor Module - Removal and Refitting Detail

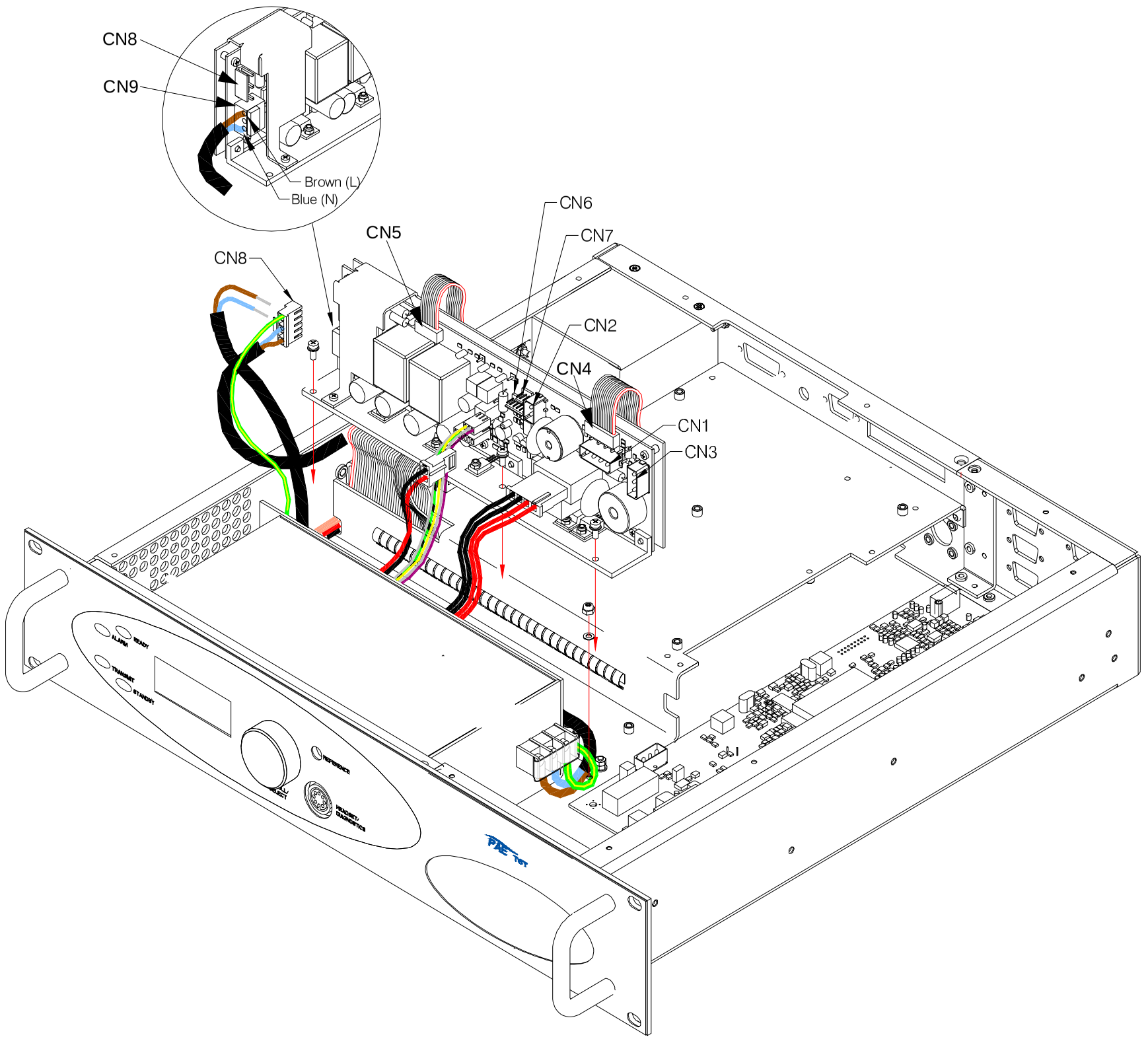


Fig 47 T6T VHF Drive Assembly PSU Regulation Module - Removal and Refitting Detail

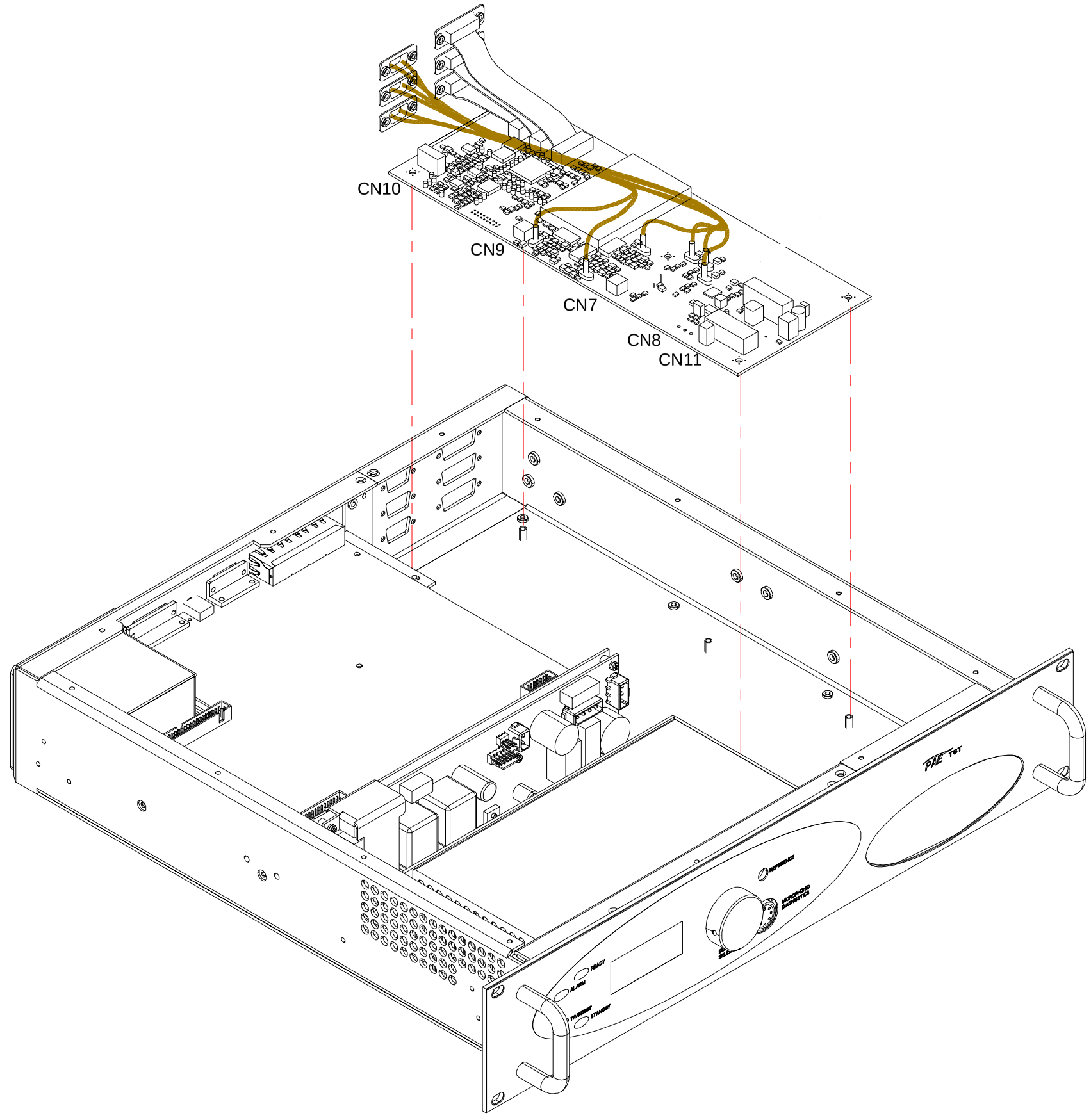


Fig 48 T6T VHF Drive Assembly Drive Module - Removal and Refitting Detail

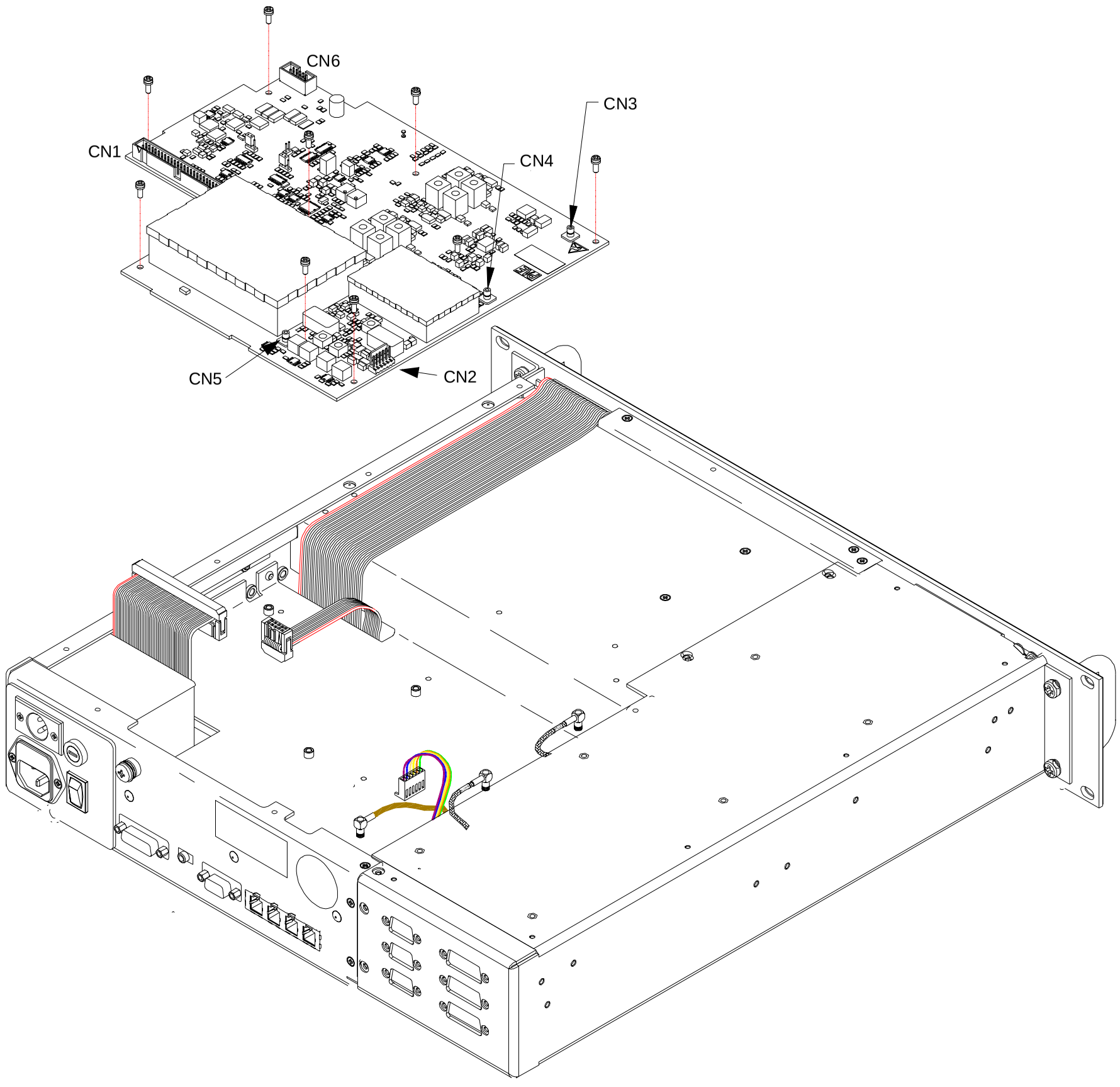


Fig 49 T6T VHF Drive Assembly PA Control Module - Removal and Refitting Detail

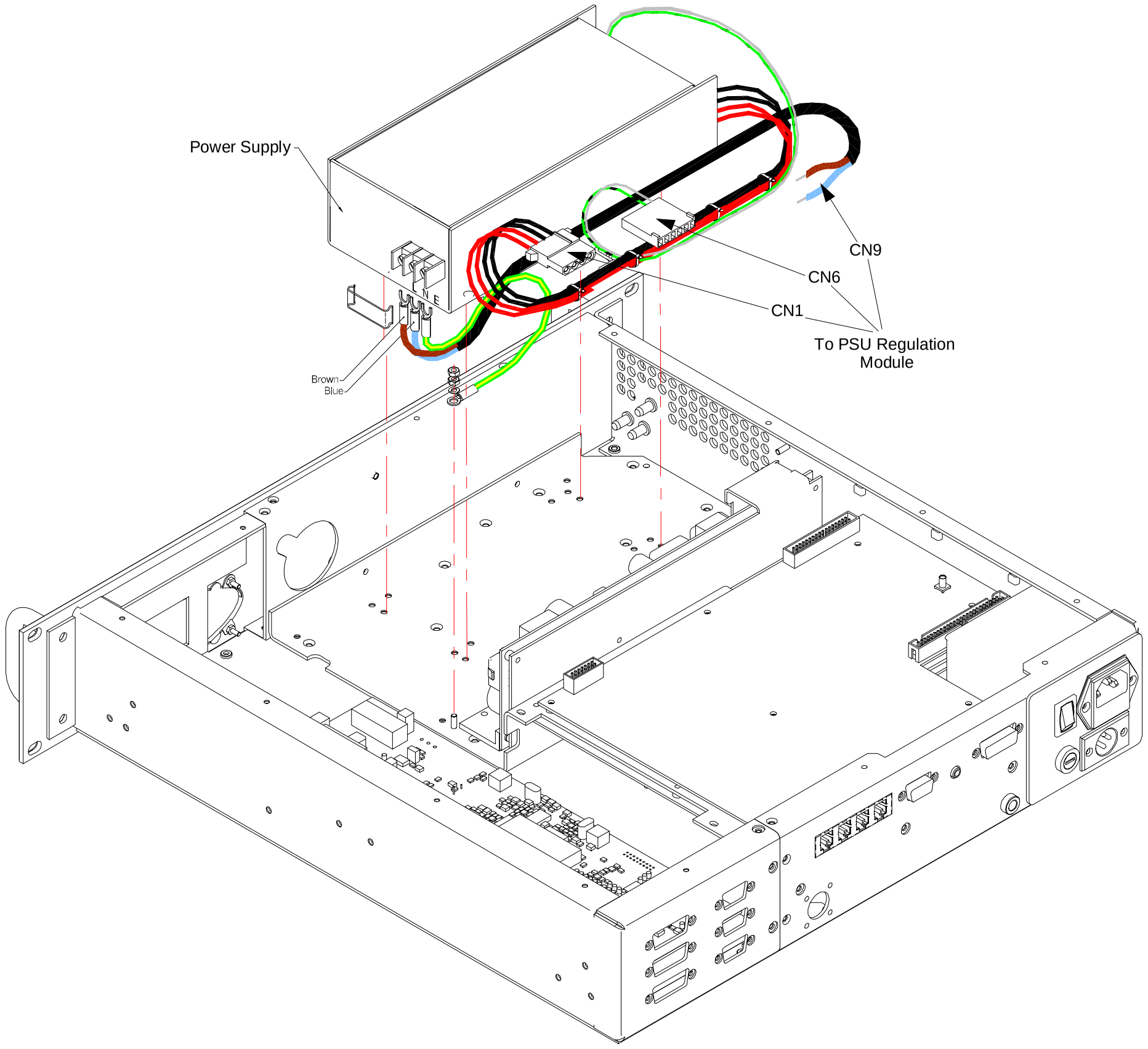


Fig 50 T6T VHF Drive Assembly Power Supply - Removal and Refitting Detail

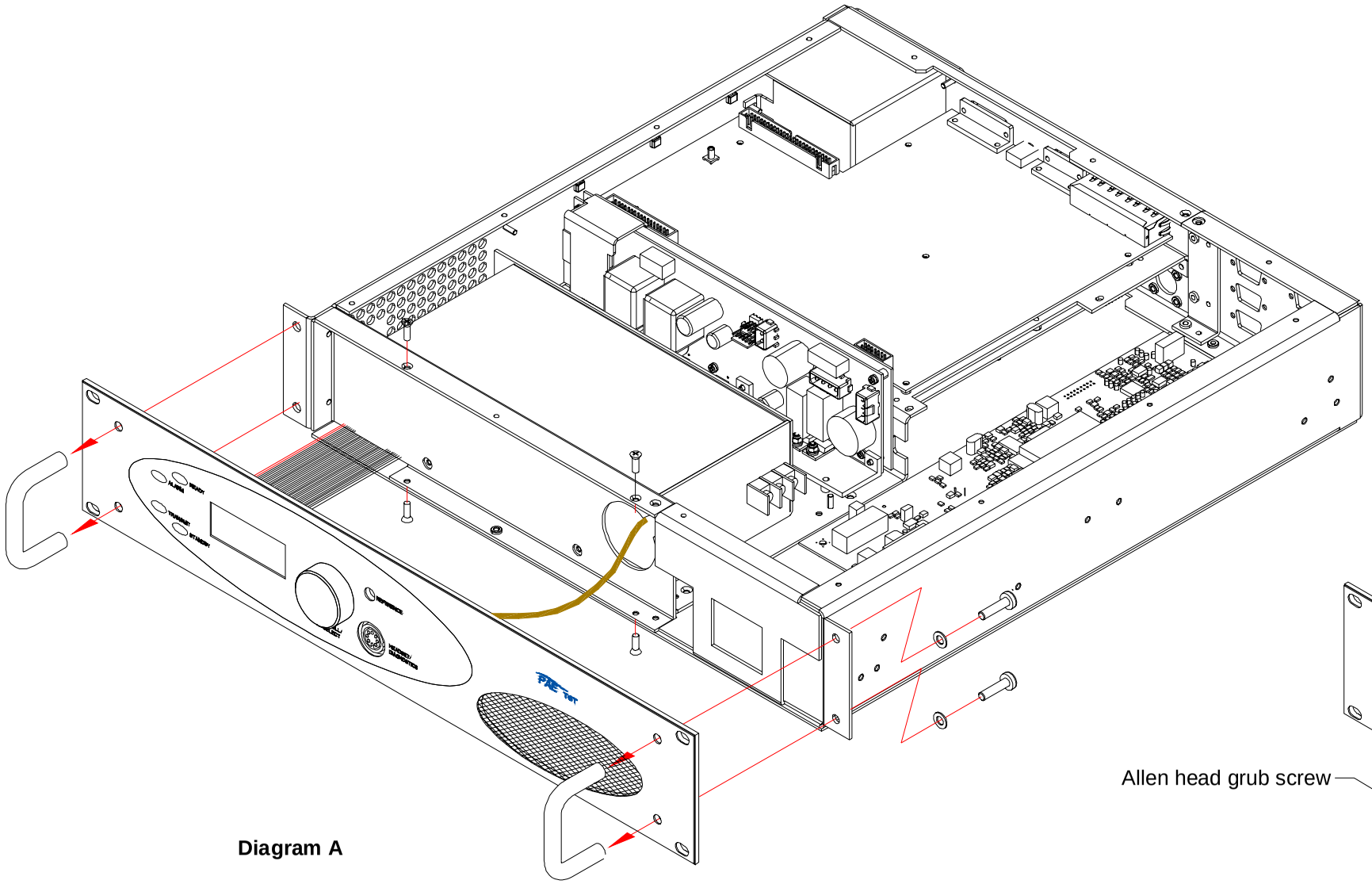


Diagram A

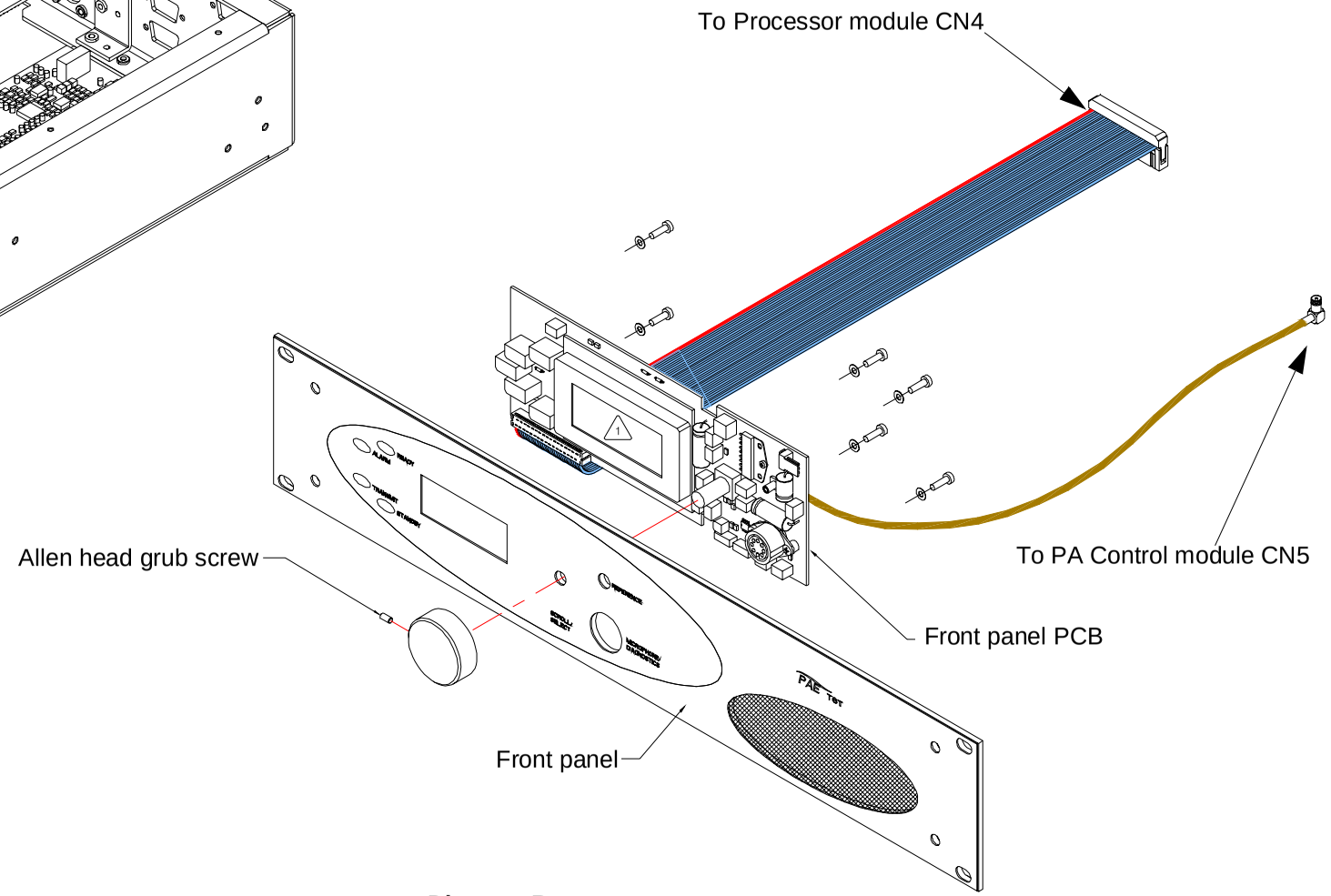


Diagram B

Fig 51 T6T VHF Drive Assembly Front Panel PCB - Removal and Refitting Detail