4 Servicing

This chapter describes the correct procedures for:

- Disassembling the MDT
- Repair of the field-serviceable units within the MDT
- Assembling the MDT.

4.1 Introduction to Servicing

The sub-sections that follow describe some general information that may be useful during servicing of the MDT.

4.1.1 Pozidriv Recess Head Screws

Pozidriv recess head screws are the preferred standard on all Tait manufactured equipment. The very real advantages of this type of screw will not be realised unless the correct screwdrivers are used by servicing personnel.

4.1.2 Screw Torques

Refer to Table 4.1.

Table 4.1 Screw Torques

Screw Type/Location	Quantity	Torque (Nm)	Torque (lbf.in)
M3 x 20 mm Plastite rear panel to front panel	4	0.6	5.3
N^{o} 4 x 3/8" Plastite LCD to front panel	2	0.6	5.3
N^{o} 4 x 3/8" Plastite Shield/PCB to rear panel	4	0.6	5.3
5 mm hexnut D-range to rear panel	2	0.45	4.0

4.1.3 Conventions

Throughout the following procedures:

- The terms *left-hand side* and *right-hand side* apply to the MDT when viewed from the front.
- The *top* side of the Main PCB is that which is fitted with most of the electronic components; the *bottom* side of the PCB is fitted with only one component.

4.1.4 Tools required

The following may be required when servicing the MDT:

- Access to MDT programming facilities (i.e. MDT programming cable and PC running PGM610 software)
- soldering iron
- conductive rubber bench mat
- 3 mm Allen key
- N^{o} 1 Pozidriv screwdriver
- 5 mm nut driver
- A small flat blade screwdriver.

4.1.5 Caution: CMOS Devices

This equipment contains CMOS Devices which are susceptible to damage from static charges. Care when handling these devices is essential. For correct handling procedures refer to the manufacturers' data books, e.g. Philips data books covering CMOS devices, or Motorola CMOS data books, Section 5 'Handling', etc.

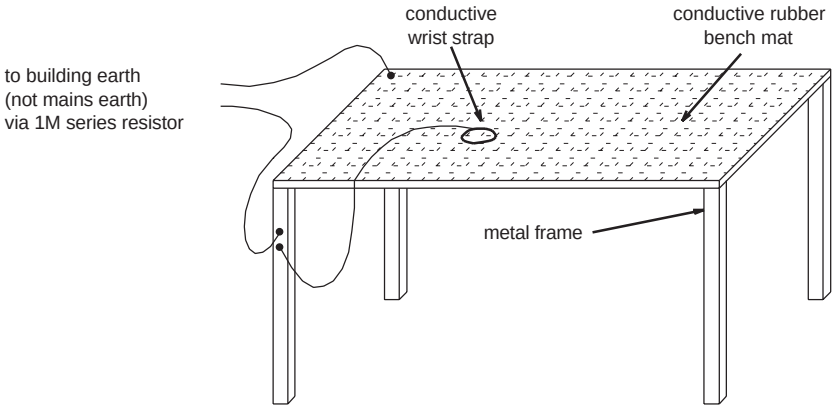

Figure 4.1 Typical Antistatic Bench Setup

An antistatic bench kit (refer to Figure 4.1) is available from Tait Electronics Ltd under the usual consumable goods ordering system. The kit is held in stock under IPN 937-00000-34 and contains:

1 conductive rubber bench mat
1 earth lead to connect the mat to ground (c/w 1M series resistor)
1 wrist strap
information leaflet.

4.2 Disassembly

This section provides detailed instructions for:

- removing the MDT from its working installation
- removing the sunshield (if fitted)
- disassembling the MDT to a level sufficient to allow access to field-serviceable modules.

Data Loss: **To provide protection from data loss during servicing, backup the MDT's operating parameters (using the PGM610 software) before commencing disassembly. Refer to the *inform* Text Despatch System Manual for detailed instructions.**

4.2.1 Removing the MDT from its Working Installation

The following instructions describe how to disconnect the data cable from the MDT and remove the MDT from the mounting bracket. Refer to Figure 4.2; note that the exact mounting arrangement may vary.

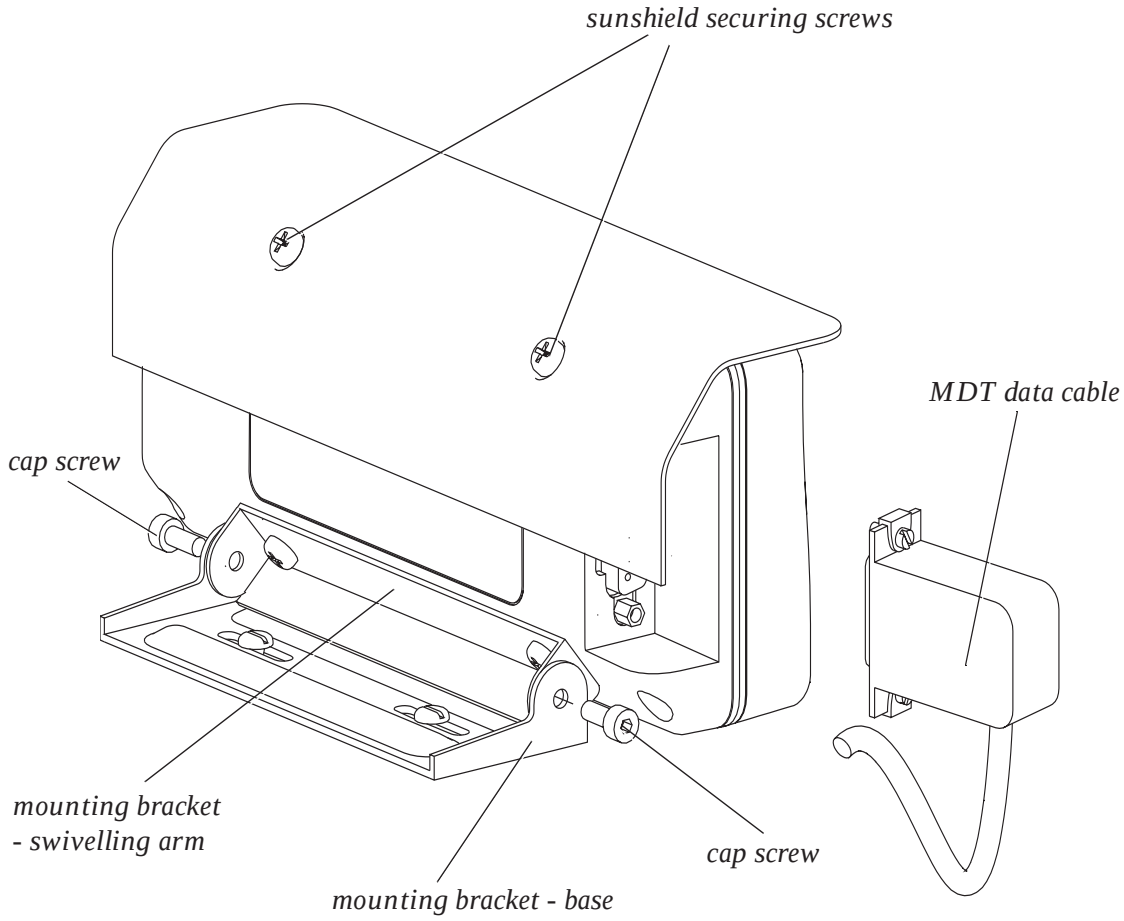

Figure 4.2 Removing the MDT from its Working Installation

4.2.1.1 Disconnecting the Data Cable

1 Release the lockscrew on each side of the D-range connector.

2 Disconnect the data cable from the MDT.

4.2.1.2 Removing the MDT from the Mounting Bracket

1 Release the two cap screws that secure the swivelling arm of the mounting bracket to the base of the bracket.

2 Remove the MDT from the base of the mounting bracket.

4.2.2 Removing the Sunshield

If the sunshield is fitted to the MDT, this can be removed in preparation for servicing. Refer to Figure 4.2; note that the exact mounting arrangement may vary.

1 Using a Pozidriv screwdriver, remove the two screws securing the sunshield to the MDT.

2 Remove the sunshield from the MDT.

4.2.3 Disassembling the MDT

Data Loss: **Operating parameters stored in the MDT are lost when the battery backup is disconnected from the Main PCB. If exchange of the MDT's battery is intended, ensure that the MDT's parameters have been read and stored to disk before commencing disassembly.**

The MDT can be disassembled to three primary units and five further sub-units, namely:

Table 4.2 MDT Disassembly - Primary Units and Sub-units

Primary Unit	Sub-unit
Front panel assembly	Front panel
	LCD
Gasket	None
Rear panel assembly	Main PCB
	PCB shield
	Rear panel

4.2.3.1 Separating the Front Panel and Rear Panel Assemblies

Refer to Figure 4.3.

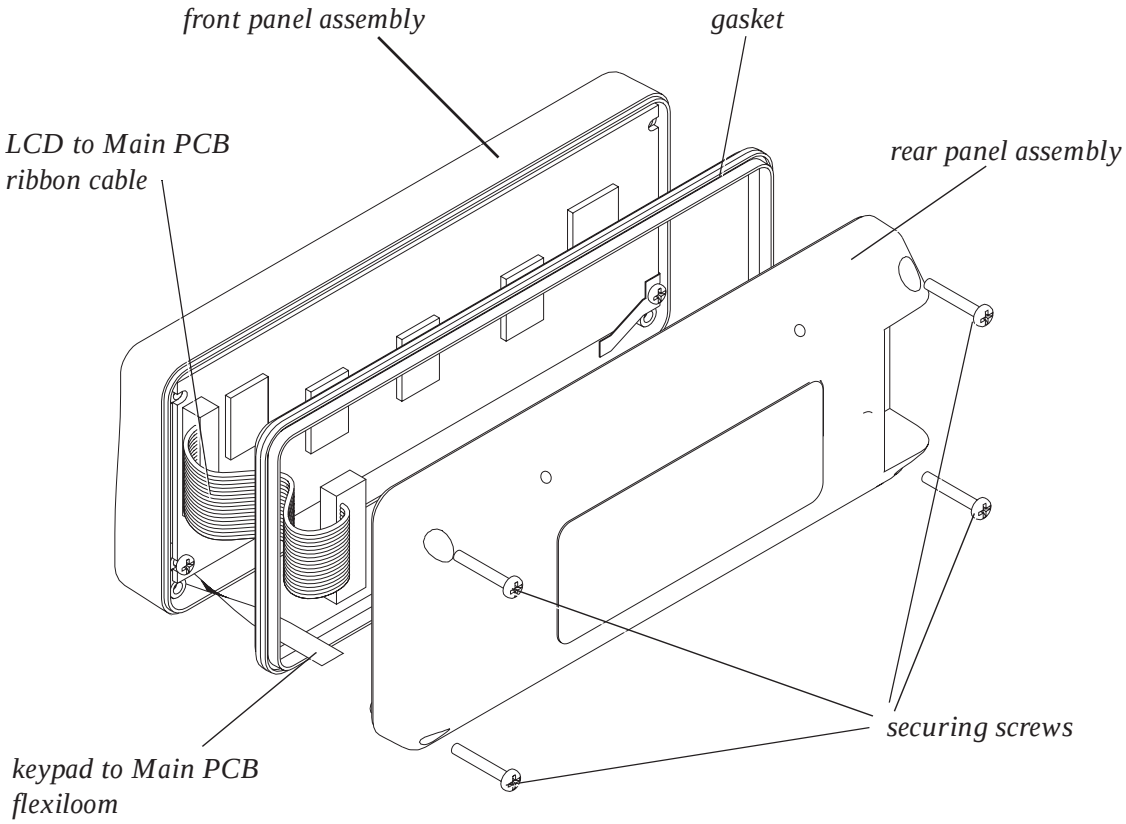

Figure 4.3 Disassembling the MDT - Rear View

1 At the rear panel of the MDT, remove the screw from each corner of the panel and set the screws aside.

2 Separate the rear panel and front panel assemblies by carefully pulling the two panels apart.

The two assemblies remain physically joined by two cables. However the interior of the assemblies can be exposed by opening the cover panels, like the covers of a book, about the edges opposite the D-range connector.

The gasket usually remains attached to one of the panels.

3 Disconnect the keypad flexiloom from the connector on the Main PCB.

Note: The remaining ribbon cable (LCD to Main PCB) cannot be disconnected until the Main PCB has been removed from the rear panel assembly.

4 Remove the panel gasket from the appropriate panel assembly.

4.2.3.2 Separating the Main PCB from the Rear Panel

Refer to Figure 4.4 and Figure 4.5.

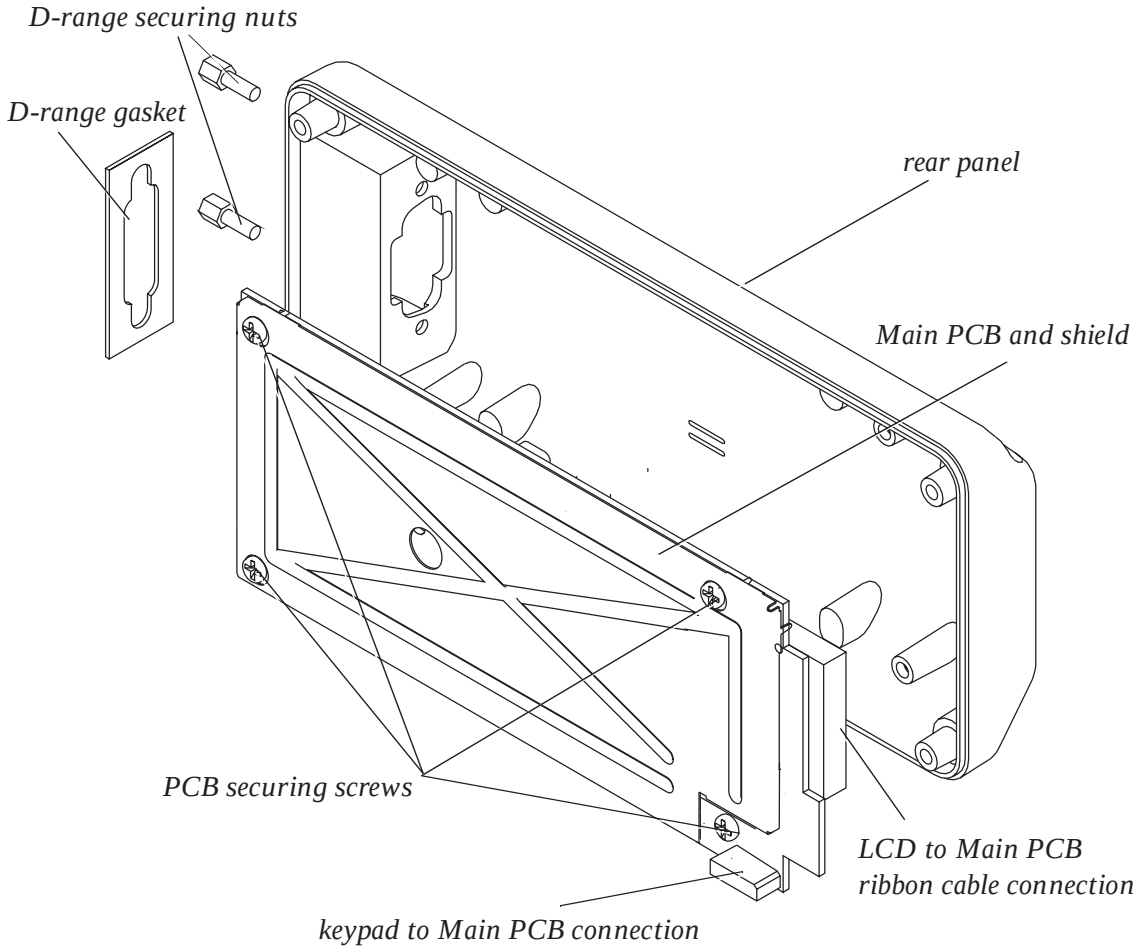

Figure 4.4 Separating the Main PCB from the Rear Panel - Internal View

1 With the inside of the rear panel assembly exposed, remove the screw from each corner of the PCB and set the screws aside.

2 At the left-hand side of the rear panel assembly, remove the D-range securing nut from each side of the D-range connector and set the nuts aside.

3 At the inside of the rear panel assembly, lift the Main PCB out of the rear panel, withdrawing the D-range connector from the slot in the panel.

4 Disconnect the LCD to Main PCB ribbon cable from the connector on the top side of the Main PCB.

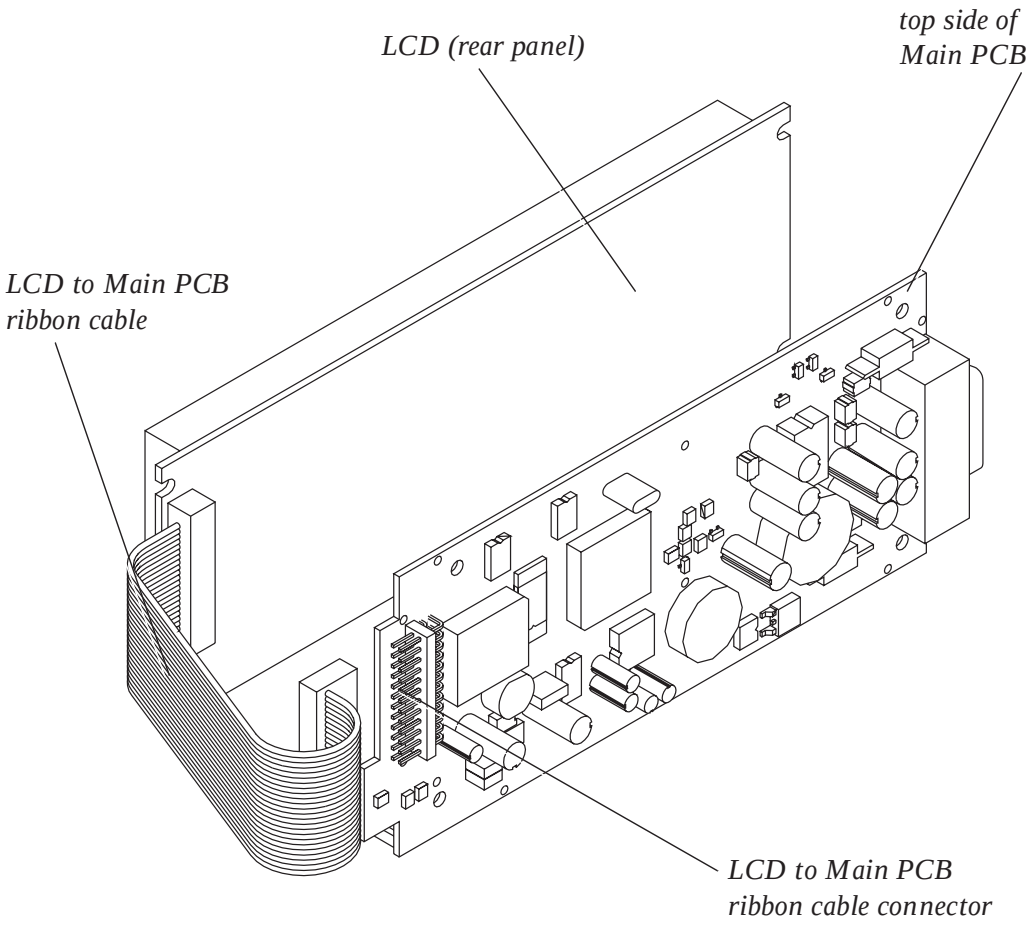

Figure 4.5 Disconnecting the LCD to Main PCB Ribbon Cable

4.2.3.3 Removing the PCB Shield

The PCB shield must be removed only in preparation for servicing of leaded components. Proceed as follows:

1 The shield is secured to the Main PCB by nine claws around the edge of the shield which are soldered to the PCB. Desolder each of the claws.

2 Separate the shield from the PCB.

4.2.3.4 Separating the LCD from the Front Panel

Refer to Figure 4.6.

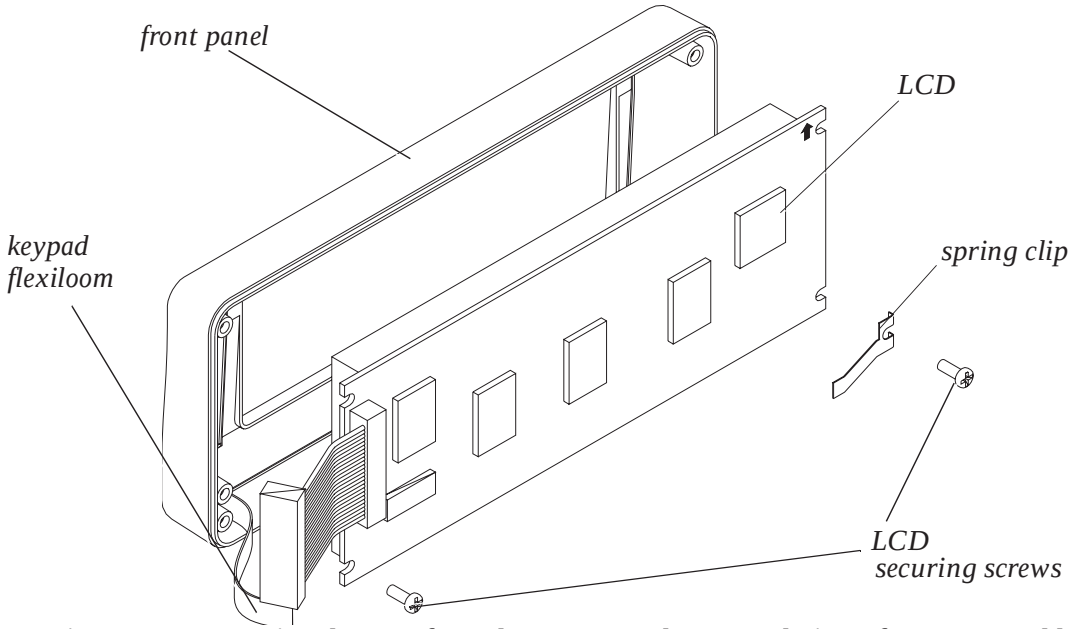

Figure 4.6 Separating the LCD from the Front Panel - Internal View of Front Assembly

1 With the inside of the front panel exposed, remove the screw from each of the bottom corners of the LCD and set the screws aside.

2 Remove the spring clip and set aside.

3 Remove the LCD from the front panel.

Note: The front panel comprising carcase, keypad, keypad loom and lens is not field serviceable and, therefore, cannot be further disassembled.

4.3 Servicing

4.3.1 Component Replacement

4.3.1.1 Leaded Components

Whenever components are removed from or fitted to the PCB, care must be taken to avoid damage to the track. The two correct methods of removing components from PTH PCBs are detailed below.

Note: The first method requires the use of a desoldering station, e.g. Philips SBC 314 or Pace MBT-100E.

- **Desoldering Iron Method**

  1 Place the tip over the lead and, as the solder starts to melt, move the tip in a circular motion.

  2 Start the suction and continue the movement until 3 or 4 circles have been completed.

  3 Remove the tip while continuing suction to ensure that all solder is removed from the joint, then stop the suction.

  Before pulling the lead out, ensure it is not stuck to the plating.

  4 If the lead is still not free, resolder the joint and try again.

Note: The desoldering iron does not usually generate enough heat to desolder leads from the ground plane. Additional heat can be applied by holding a soldering iron on the tip of the desoldering iron (assistance may be required to achieve this).

- **Component Cutting Method**

  1 Cut the leads on the component side of the PCB.

  2 Heat the solder joint ***sufficient*** to allow ***easy*** removal of the lead by drawing it out from the component side: do ***not*** use undue force.

  3 Fill the hole with solder and then clear with solderwick.

4.3.2 Surface Mount Devices

Caution: **Surface mount devices (SMDs) require special storage, handling, removal and replacement techniques. This equipment should be serviced only by an approved Tait Dealer or Service Centre equipped with the necessary facilities. Repairs attempted with incorrect equipment or by untrained personnel may result in permanent damage. If in doubt, contact Tait Electronics Ltd or your nearest Tait Branch or Subsidiary.**

4.3.3 Fitting a New Battery to the Main PCB

It is usually necessary to renew the MDT's battery backup after approximately three to five years. Return the MDT to your nearest Tait representative when a new battery is required.

4.4 Assembly

4.4.1 Fitting the LCD to the Front Panel

Refer to Figure 4.7.

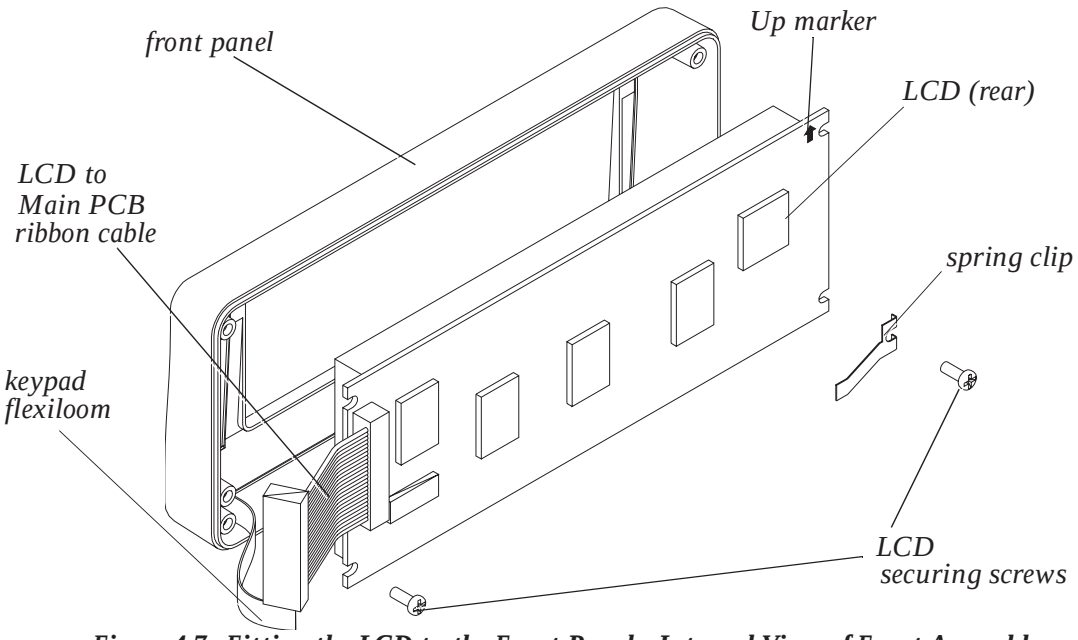

Figure 4.7 Fitting the LCD to the Front Panel - Internal View of Front Assembly

1 Arrange the front panel so that the inside of the panel is exposed and the keypad ribbon cable is at the bottom, left-hand side.

2 Arrange the LCD so that the PCB on the rear of the LCD is exposed and the **UP** ↑ marking is on the top, right-hand side.

3 Fit the gasket around the edge of the front panel.

4 Maintaining the above alignments, fit the LCD into the front panel so that the slots at the top of the module are aligned with the top-most pillars on the inside of the front panel, and the bottom slots of the LCD are aligned with the centre pillars of the front panel.

5 Position the spring clip over the slot at the bottom, right-hand corner of the LCD, so that the arm of the clip is innermost and the claws of the clip grip the edge of the LCD.

6 Fix the spring clip and right-hand side of the LCD to the front panel by using one of the securing screws.

7 Secure the left-hand side of the LCD to the front panel by using the remaining screw in the bottom, left-hand slot of the LCD.

4.4.2 Fitting the Main PCB and Shield to the Rear Panel

4.4.2.1 Fitting the Shield to the Main PCB

Refer to Figure 4.8.

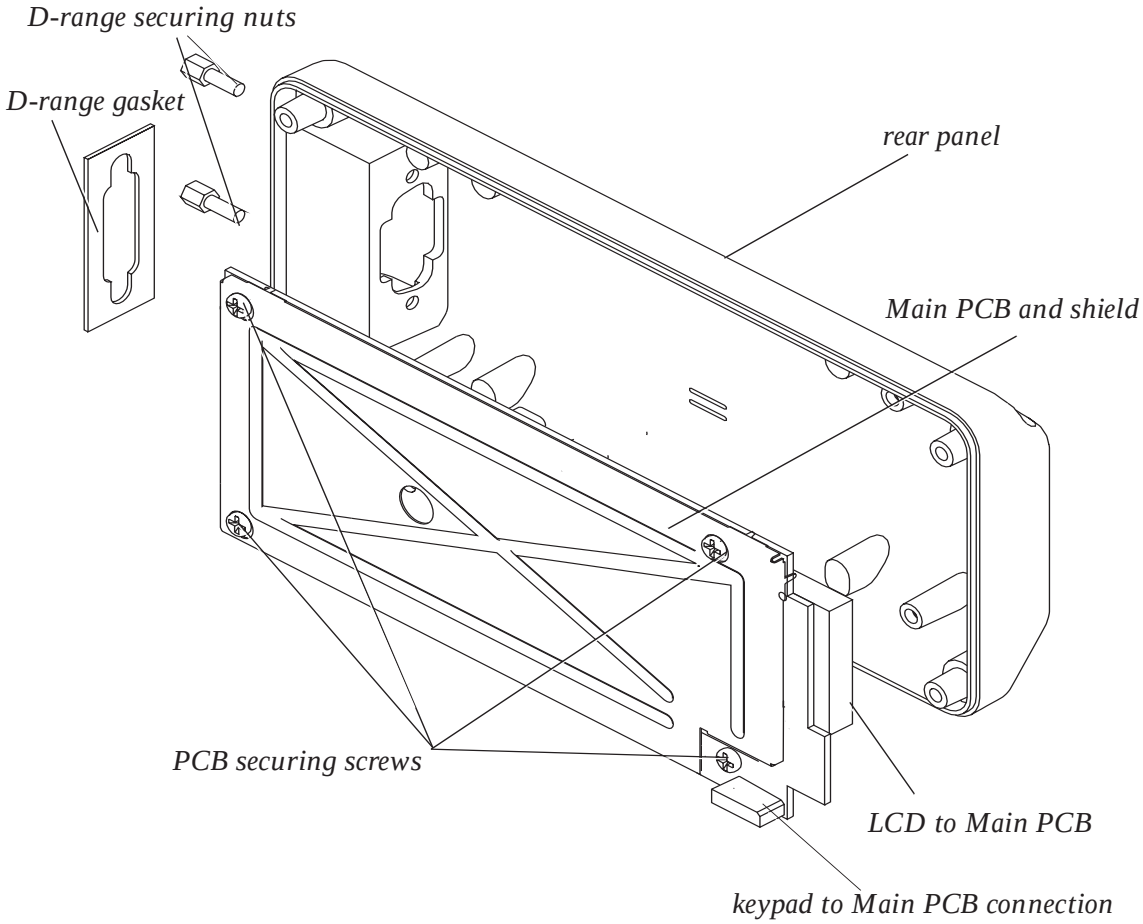

Figure 4.8 Fitting the Main PCB and Shield to the Rear Panel - Internal View

If the shield has been removed from the PCB, refit the shield as follows:

1 Position the shield over the bottom-side of the Main PCB so that the cut-out corner fits around the keypad ribbon cable connector, the slots at the corners of the shield are aligned with the slots in the PCB and the claws around the edges of the shield extend around the edges of the PCB.

2 From the top side of the PCB, solder the claws of the shield to the PCB.

4.4.2.2 Completing the Rear Panel Assembly

Refer to Figure 4.9 and Figure 4.8.

1 Connect the LCD to Main PCB ribbon cable to the connector on the top side of the Main PCB.

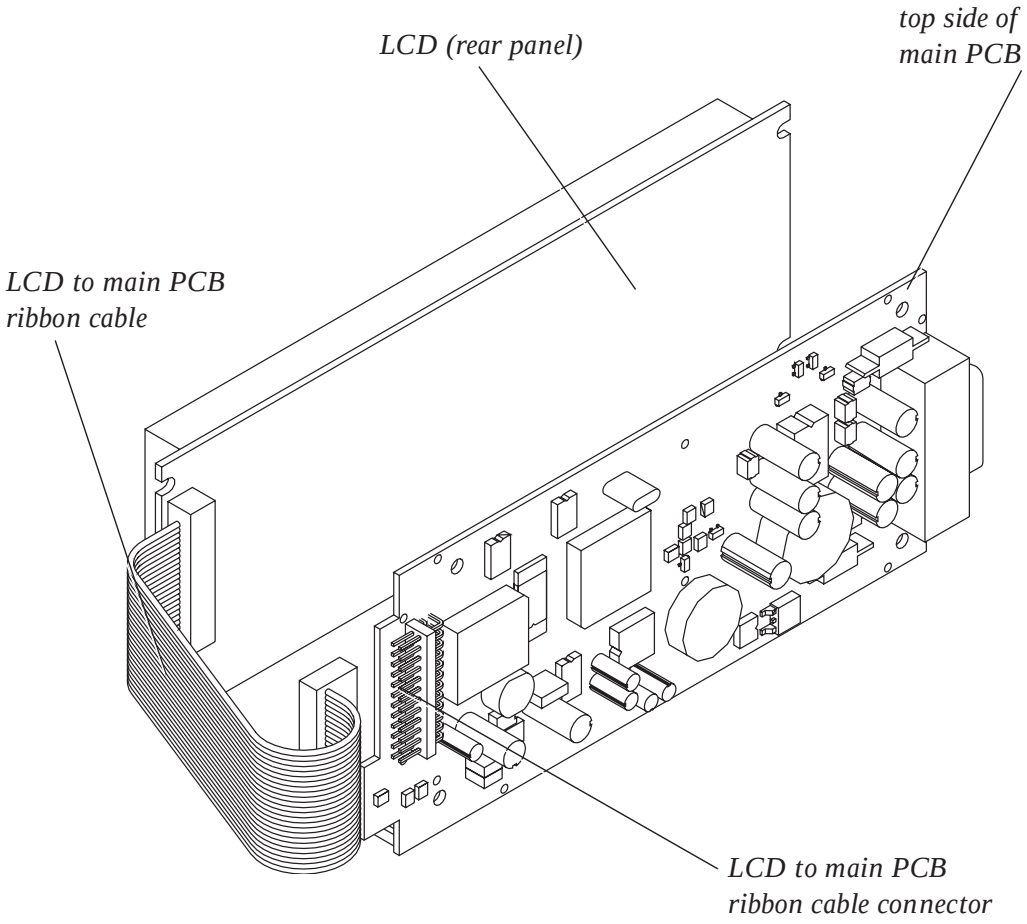

Figure 4.9 Connecting the LCD to Main PCB Ribbon Cable

2 Arrange the rear panel so that the inside of the panel is exposed and the slot for the D-range is at the left-hand side.

3 Arrange the Main PCB so that the bottom side is exposed and the D-range connector is on the left-hand side.

4 Check that the D-range gasket is in place around the D-range connector on the Main PCB.

5 Maintaining the above alignments, insert the D-range connector through the slot in the rear panel and position the Main PCB so that the holes at each corner are aligned with the pillars in the rear panel.

6 Secure the shield and Main PCB to the rear panel using a screw at each corner.

7 At the left-hand side of the rear panel assembly, fit the D-range securing nuts to the D-range connector.

4.4.3 Completing the Assembly

Refer to Figure 4.8 and Figure 4.10.

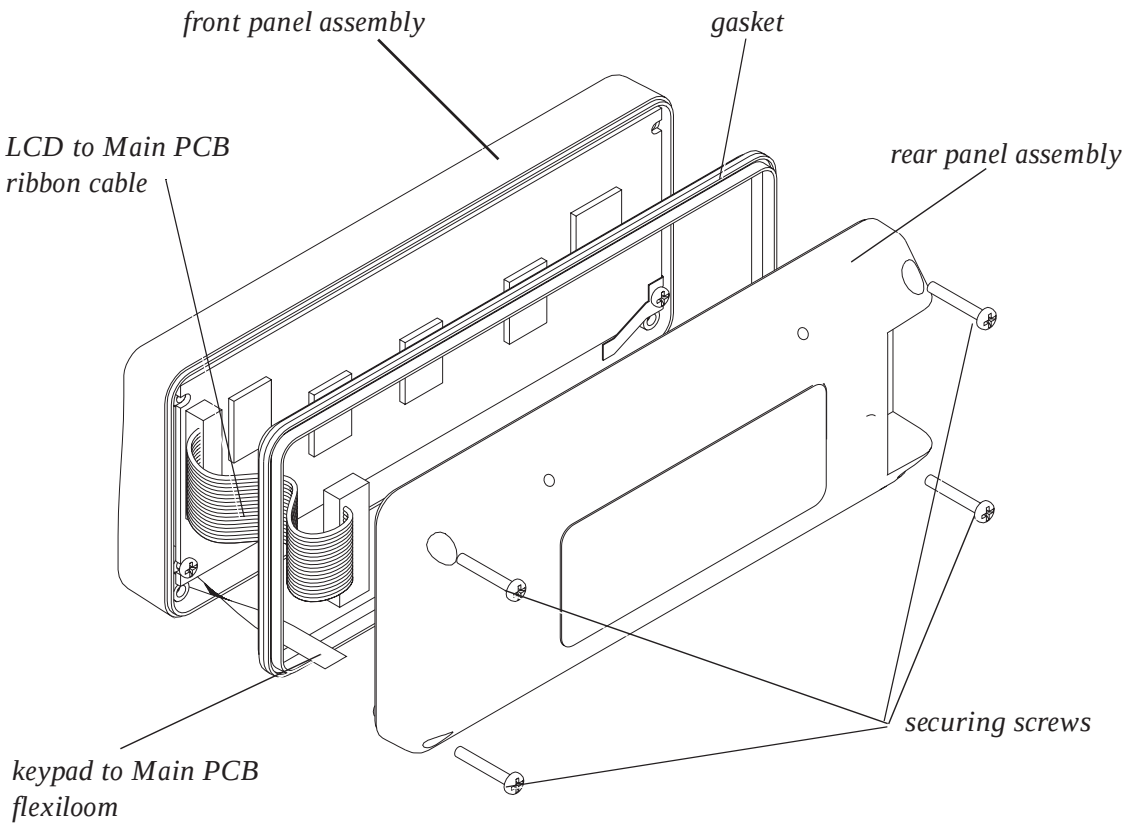

Figure 4.10 Assembling the MDT - Rear View

1 Connect the keypad flexiloom to the connector on the Main PCB.

2 Position the edge of the rear panel against the gasket and press the front and rear panels firmly into place on each side of the gasket.

3 Fasten the front panel and rear panel assemblies together using the M3 x 20 mm screws.

END OF CHAPTER 4

