Workabout MX

Service Manual

PSION

Note

The Psion Workabout contains CMOS devices that may be damaged by electrostatic discharge (ESD). The following steps to minimise ESD must be taken before the unit is dismantled. To prevent any damage that could result if the unit or its parts are not handled properly, observe the following precautions during any handling procedures:

■ Minimise all handling of static-sensitive components and assemblies.

■ Transport and store static-sensitive components and assemblies in their original containers or in anti-static bags.

■ Label accordingly any package that contains static-sensitive components or assemblies.

■ Discharge static electricity from the body by wearing a grounded anti-static wrist strap while handling these components. Servicing static-sensitive components or assemblies should be done only at a static-free work station by qualified service technicians. Increasing the humidity in the work area minimises static electricity problems.

■ Do not allow anything that can generate or hold a static charge on the work station surface.

■ Pick up components by their bodies, never by their leads.

■ Do not slide components over any surface.

■ Avoid handling components in areas with a floor or work-surface covering that can generate static charge.

FCC Information for the USA

Radio and Television Interference:
This equipment radiates radio frequency energy and if not used properly - that is, in strict accordance with the instructions in this manual - may cause interference to Radio and Television reception.
It has been tested and found to comply with the limits for a Class B computing device pursuant to part 15 of the FCC Rules. These are designed to provide reasonable protection against harmful interference in a residential installation. This equipment can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

■ Reorient or relocate the receiving antenna.

■ Increase the separation distance between the equipment and the receiver.

■ If you are using the Workabout computer with a mains adapter, plug it into an outlet which is on a different circuit from that to which the receiver is connected.

Consult an authorised Psion dealer or an experienced radio/TV technician for help.

This equipment was tested for FCC compliance under conditions that included the use of shielded cables and connectors between it and the peripherals. It is important that you use shielded cable and connectors to reduce the possibility of causing Radio and Television interference. Shielded cables, suitable for the Workabout, can be obtained from an authorised Psion dealer. If the user modifies the Workabout or the Multiple Docking Station, and these modifications are not approved by Psion, the FCC may withdraw the user's right to operate the equipment. For customers in the USA, the following booklet prepared by the Federal Communications Commission may be of help: "How to Identify and Resolve Radio-TV Interference Problems". This booklet is available from the US Government Printing Office, Washington, DC 20402 - Stock No: 004-000-00345-4.

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Table of Contents

Introduction

The purpose of this service manual is to give an overview of the service procedures that may need to be performed on the Workabout by either a third party user, or a registered Psion service centre. It has been designed to be used by the service and repair technicians who have the responsibility of maintaining the products.

The Workabout uses both conventional and high-density surface mount component technology, which requires specialist servicing techniques. We therefore recommend that repairs are carried out at *circuit board* level, rather than at *component* level. We also encourage service centres to carry a small buffer stock of replaceable parts, to allow immediate exchange, should they need to be replaced.

Although a Final Test Unit is not essential to service a Workabout, it is recommended and is described in the *Final Test* section on page 26. The Final Test Unit (Psion part no. 1828-0100-01) is used within Psion during the manufacturing process to run a final check on the assembly. When a Workabout is connected to the Test Unit via the LIF Connector, test code (the test program) is downloaded into the machine, which then automatically performs an exhaustive and modifiable series of tests on the Workabout.

This test program can be run to monitor the liquid crystal display (LCD), keyboard, drawer switch, solid state disks (SSDs), serial channel, and piezo status. Operating, idle, and standby current consumption can also be measured. This can be very valuable when investigating or diagnosing a reported problem. Also, once a repair has been completed, a full test can be run to ensure that the repair has been done correctly and that no other fault has been introduced.

☞ Note:- *The information in this document is confidential and should therefore only be released under a non-disclosure agreement.*

Part Number Information

The part numbers referred to throughout this manual typically do not show the revision suffix. Consequently, refer to your Psion distributor for information on the latest revision of a specific part.

The format of the part numbers issued by Psion Industrial is as follows:

NNNN-NNNN-NN

Part Category

Revision Suffix
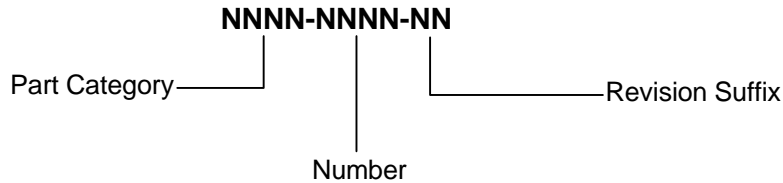
Number

Serial Number Information

Each Workabout has a unique serial number that includes codes for the year and week it was manufactured. The serial number can therefore be used to determine whether a Workabout is still within its warranty period.

The serial number is located on a label on the Drawer Assembly. It has the following format:

M L V T Y W W X X X X

The letter M - **generic code for the MX**.

1 letter - used for manufacturing purposes.

1 letter - **variant** (see table below).

1 letter - **product type**.
A = alphanumeric keypad
B = numeric keypad
C = future variant

1 number - **year of manufacture**.
1 = 1993
2 = 1994
…
9 = 2001

2 numbers - **week of manufacture**.
01 = first week in January
52 = last week in December

4 numbers - **unique identifier**.
0001 = first product of its type to be produced in a week
9999 = 9999th product of the same type to be produced in the same week

The table below lists the variant code for Workabout MX variants that are expected to be shipping within a few months of product launch.
Further codes will be released along with new variants.

Code	Option ports fitted	
	Top option ports	Bottom option port
A	-	-
B	TTL & RS232	-
C	BCR & RS232	-
D	TTL & IrDA	RS232
E	Wand	RS232
F	Scanner	RS232
G	IrDA	IrDA
H	TTL & RS232	IrDA
I-K	reserved	
L	Scanner	IrDA

Troubleshooting Guide

| Fault	Cause	Cure
Machine fails to boot up.	1 Discharged/faulty batteries. 2 Main PCB fault. 3 Fuse faulty. 4 Battery contact fault.	1 Replace alkalines/replace or recharge Nicad pack. 2 Remove internals from machine and check Main Power FFC ZIF Connector. 3 Remove fuse. Check and replace if necessary. 4 Check for continuity of battery contacts/Main FFC using multimeter. Replace if necessary.
Lines on LCD.	1 LCD damaged. 2 LCD ZIF open. 3 Main PCB problem.	1 Replace LCD. 2 Dismantle machine until Chassis Assembly is exposed, close ZIF, reassemble. 3 Follow *Dismantling the Workabout* to remove and replace Main PCB. Return faulty PCB to Psion.
Blue portions on LCD.	1 LCD damaged. 2 LCD ZIF open. 3 Main PCB problem.	1 Replace LCD. 2 Dismantle machine until Chassis Assembly is exposed, close ZIF, reassemble. 3 Follow *Dismantling the Workabout* to remove and replace Main PCB. Return faulty PCB to Psion.
Cracks on LCD.	LCD glass broken.	Replace LCD.
Workabout has problems with LIF communications.	Main PCB problem.	Follow *Dismantling the Workabout* to remove and replace Main PCB. Return faulty PCB to Psion.
Workabout has problems reading SSDs.	1 Warped Connector Block Arm. 2 Main FFC faulty. 3 Door switch on Main PCB damaged.	1 Dismantle machine, remove and replace Connector Block. 2 Replace Drawer Assembly. 3 Follow *Dismantling the Workabout* to remove and replace Main PCB. Return faulty PCB to Psion.
No top port communications possible.	1 Damaged expansion FFC. 2 Warped Connector Block Arm. 3 Loose ZIF connector. 4 Door switch on Main PCB damaged.	1 Replace Drawer Assembly. 2 Dismantle machine, remove and replace Connector Block. 3 Remove outer case of machine, relocate Expansion FFC and close ZIF. 4 Follow *Dismantling the Workabout* to remove and replace Main PCB. Return faulty PCB to Psion.
No infrared communications.	1 Top port damaged. 2 Bottom port damaged.	1 Replace Drawer Assembly. 2 Replace bottom infrared port flexi-connector.
No TTL communications possible.	1 Damaged expansion FFC. 2 Warped Connector Block Arm. 3 Loose ZIF connector. 4 Door switch on Main PCB damaged.	1 Replace Drawer Assembly. 2 Dismantle machine, remove and replace Connector Block. 3 Remove outer case of machine, relocate Expansion FFC and close ZIF. 4 Follow *Dismantling the Workabout* to remove and replace Main PCB. Return faulty PCB to Psion.

Fault	Cause	Cure
No Bar Code communications possible.	1 Damaged expansion FFC. 2 Warped Connector Block Arm. 3 Loose ZIF connector. 4 Door switch on Main PCB damaged.	1 Replace Drawer Assembly. 2 Dismantle machine, remove and replace Connector Block. 3 Remove outer case of machine, relocate Expansion FFC and close ZIF. 4 Follow *Dismantling the Workabout* to remove and replace Main PCB. Return faulty PCB to Psion.
Outer case/ keymat/window damaged.	User damage.	Remove the outer case assembly and replace. Make sure the labels on the new case match the labels on the old case.
Drawer cannot be closed.	1 Drawer derailed. 2 Mechanical interference. 3 Drawer lock damaged.	1 Refit Drawer. 2 Remove case from machine. Check for obstructions and interference caused by misplaced/ill-fitting batteries, battery contacts, SSDs, FFCs, PCBs, seals, etc. 3 Replace outer case.
Drawer not opening when release button is pressed.	1 Drawer derailed. 2 Release button damaged. 3 Mechanical interference. 4 Drawer Spring missing.	1 Refit Drawer. 2 Replace outer case or Drawer Assembly. 3 Remove case from machine. Check for obstructions and interference caused by misplaced/ill-fitting batteries, battery contacts, SSDs, FFCs, PCBs, seals, etc. 4 Replace Drawer Spring.
Drawer will not stay closed.	1 Mechanical interference. 2 Drawer lock damaged.	1 Remove case from machine. Check for obstructions and interference caused by misplaced/ill-fitting batteries, battery contacts, SSDs, FFCs, PCBs, seals, etc. 2 Replace outer case or Drawer Assembly.
Alphanumeric keys not working.	1 Damaged keymat. 2 Defective Main PCB.	1 Replace case. 2 Replace Main PCB.
Nicad pack fails to charge.	1 Central contact not connecting. 2 Battery contacts damaged. 3 Nicad pack damaged. 4 Charger problems.	1 Replace Drawer Assembly. 2 Replace Drawer Assembly. 3 Replace Nicad pack. 4 Consult *Docking Station Service Manual* Psion p/no: 6104-0004-01.
Machine switches off when operated.	Main Power FFC damaged.	Replace Drawer Assembly.
Backlight does not work.	1 Backlight damaged. 2 Main PCB problem.	1 Replace backlight. 2 Replace Main PCB.
Backlight is dim.	Backlight worn. Approximate time to 50% brightness is 500 hours.	Replace backlight.

Exploded View - General Assembly

The following illustration shows the general assembly, dismantled into replaceable subassemblies and components.

Note that the numbered circles in the illustration correspond to the items in the REF. column of Table 1.
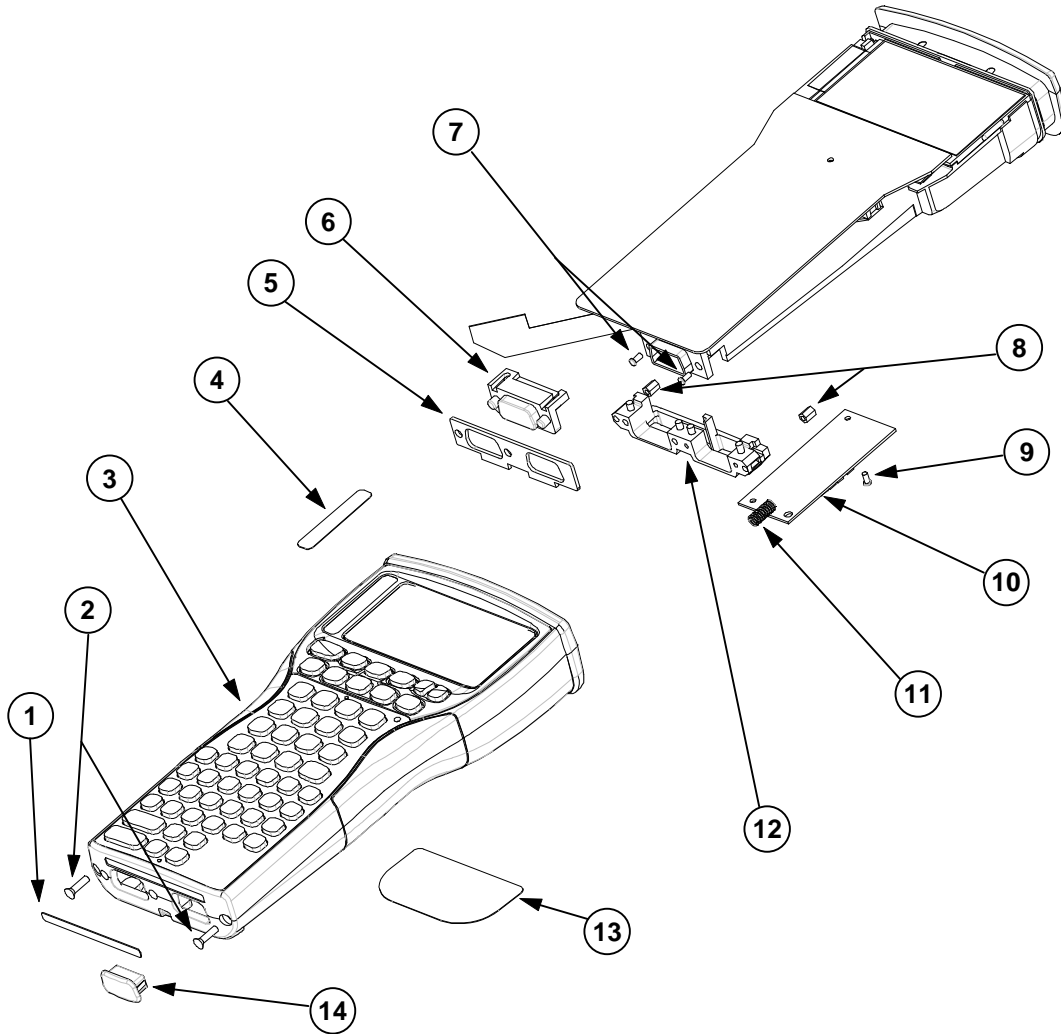
Table 1

REF.	PART NO.	DESCRIPTION	QTY
1	A6204000601	LBL BOTTOM	1
	A6204006301	LBL BTM RS232/LIF	1
	A6224000201	LBL BTM IRDA/LIF	1
2	A83020003	SCREW M2.5x10MM POZ.CS	2
3	2821005001	MX ALPHA CASE + LATCH	1
	TBS	MX NUMERIC CASE + LATCH	1
	2821004801	MX SCANNER CASE + LATCH	1
	TBS	MX SCANNER NUMERIC CASE + LATCH	1
4	A6224000301	LBL MX 2MB MEMORY	1
5	A8704001802	BOTTOM SEAL	1
6	A1804100801	MLDG D-TYPE BLANK	1
	A8124000601	MX BTM FLEXI IRDA	1
	2821004001	MX BTM FLEXI RS232	1
7	A8304003	SCREW M2x4MM PANHEAD BLACK	2
8	A8304000101	NUTSERTS	2
9	A83040003	SCREW M2x4MM PANHEAD BLACK	2
10	28210006001	EXPANSION PCB (Barcode/Wand)	1
	A2802005002	DECODER PCB (Scanner)	1
	A8104104801	DECODER PCB SUPPORT MOULDING (Scanner)	1
11	A8404000401	DRAWER SPRING	1
12	A8104100701	CONNECTOR BLOCK	1
13	A6224000401	LBL MX REAR CASE	1
	A6224001301	LBL MX SCANNER REAR	1
14	A8704000701	LIF DUST COVER	1

Exploded View - Chassis Assembly

The following illustration shows the chassis assembly, dismantled into replaceable subassemblies and components.

Note that the numbered circles in the illustration correspond to the items in the REF. column of Table 2.
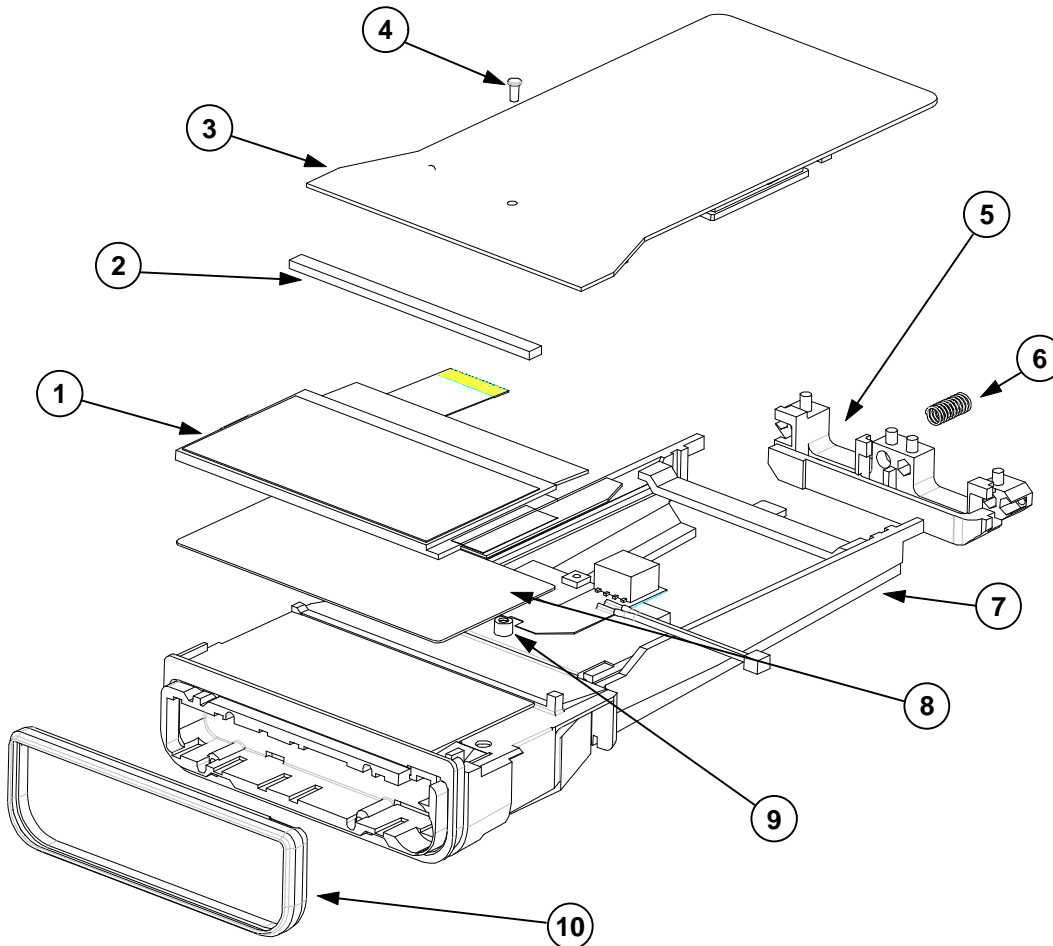
Table 2

REF.	PART NO.	DESCRIPTION	QTY
1	A2802000301	LCD MODULE (240x100)	1
2	A8704000401	FOAM LCD SUPPORT	1
3	2821004601	MX PCB 2MB	1
4	A83040003	SCREW M2x4MM PANHEAD BLACK	1
5	A8104100702	CONNECTOR BLOCK	1
6	A8421000301	DRAWER SPRING	1
7	A8104100605	CPU FRAME	1
8	A2802000402	LCD BACKLIGHT	1
9	A8704000901	LCD SLEEVE	1
10	A8704003801	CHASSIS SEAL	1

Exploded View - Drawer Assembly

The following illustration shows the Drawer Assembly, dismantled into subassemblies and components.

☞ Note:- *The Drawer Assembly is normally replaced as a complete kit (see Spares Kits on page 10). It is therefore not necessary to dismantle the Drawer Assembly. This illustration is included for information purposes only.*

Note that the numbered circles in the illustration correspond to the items in the REF. column of Table 3.
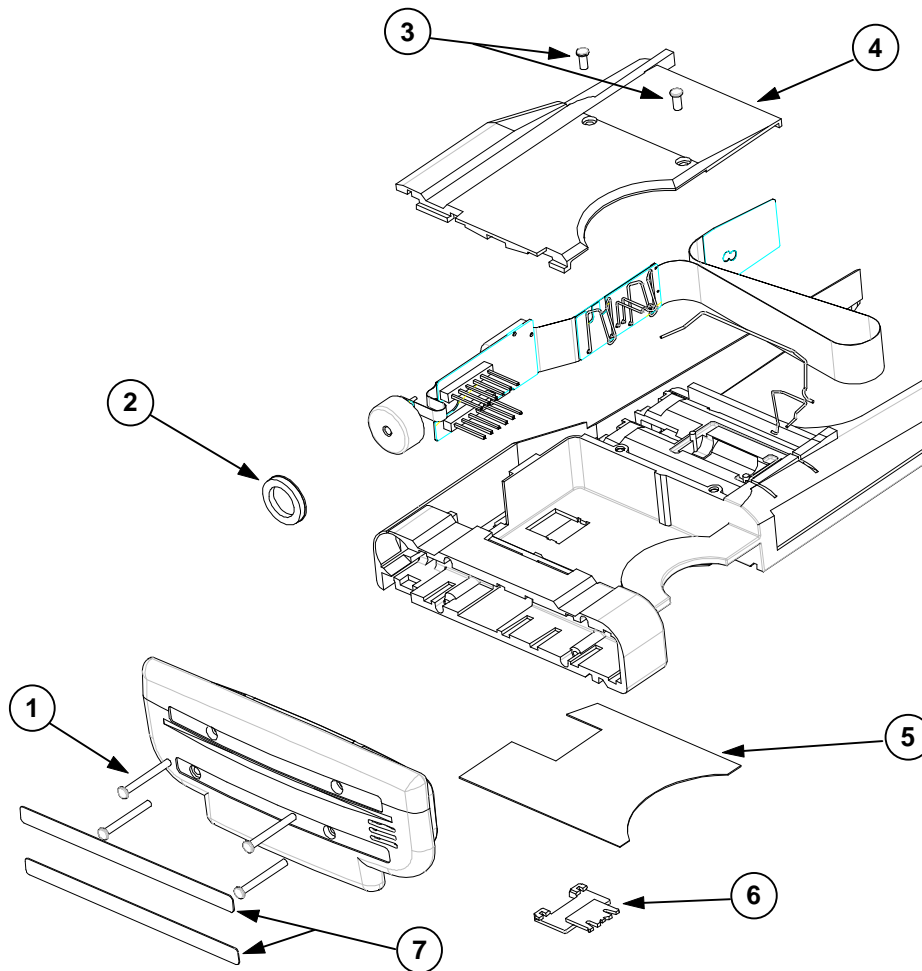
Table 3

REF.	PART NO.	DESCRIPTION	QTY
1	A83040028	SCREW M2x16MM TOP CAP	4
2	A8724000201	FOAM PIEZO SEAL	1
3	A83040003	SCREW M2x4MM PANHEAD BLACK	2
4	A8104100301	SSD BACK	1
5	A6204001101	BATTERY CONFIGURATION LABEL	1
6	A8104100501	LITHIUM BATTERY DOOR	1
7	A6204000401	TOP CAP LABEL - BLANK	2

Spares Kits

The following tables show the listed spares kits that are offered to service centres enabling thorough and complete service and repair work. These tables are correct at the time of printing this manual. Please refer to the latest Psion Industrial spares list for current information.

General Kits

PART NUMBER	DESCRIPTION	QTY
1828000101	**MX GENERIC KIT**	
	LBL BATTERY CONFIGURATION	10
	BATTERY TAG 100 X 9 MM	30
	MLDG SSD/BATT DRAWER NO CATCH	10
	MLDG SSD BACK	5
	MLDG LITHIUM DOOR	5
	MLDG CPU FRAME	5
	S3C MLDG CONN SUPPORT	5
	MLDG D-TYPE BLANK	5
	NUTSERTS	20
	SCREW M2x4MM PANHEAD BLACK	40
	THIN HEAD B TYPE DIA 2x4 LNG	20
	DRAWER SPRING	20
	FOAM LCD SUPPORT	10
	LIF DUST COVER	10
	LCD SLEEVE	10
	PIEZO SEAL	10
	CHASSIS SEAL	10
	TOP CAP SEAL	10
	SCREW M2x16MM TOP CAP	10
	BOTTOM SEAL	20
1828000201	**MX LABEL KIT**	
	LBL MX 2MB MEMORY	25
	LBL MX REAR CASE	25
	LBL KBD 57AN - EURO	25
	LBL TOP CAP BLANK	10
	LBL TOP CAP FCC ID	10
	LBL BTM RS232/LIF	5
	LBL BTM IRDA/LIF	5
1828000301	**MX LATCH KIT**	
	MX CATCH ASSY	10

Bottom Port Kits

PART NUMBER	DESCRIPTION	QTY
1828001001	**MX BTM PORT IRDA**	
	MX BTM FLEXI IRDA	10
	LBL BTM IRDA/LIF	10
	BTM SEAL	10
1828001101	**MX BTM PORT RS232**	
	MX BTM FLEXI RS232	10
	LBL BTM RS232	10
	BTM SEAL	10

Drawer Kits

PART NUMBER	DESCRIPTION	QTY
1828002001	**MX DRAWER KIT - RS232/TTL**	
	MX RS232/TTL DRAWER	10
	BTM SEAL	10
1828002101	**MX DRAWER KIT - RS232/BCR**	
	MX RS232/BCR DRAWER	10
	BTM SEAL	10
1828002201	**MX DRAWER KIT - INT WAND**	
	MX WAND DRAWER	10
	BTM SEAL	10
1828002301	**MX DRAWER KIT - SCANNER**	
	MX SCANNER DRAWER	10
	BTM SEAL	10
1828002401	**MX DRAWER KIT - IRDA**	
	MX IRDA DRAWER	10
	BTM SEAL	10
1828002501	**MX DRAWER KIT - IRDA/TTL**	
	MX TTL/IRDA DRAWER	10
	BTM SEAL	10
1828002601	**MX DRAWER KIT - BASE**	
	MX BASE DRAWER	10
	BTM SEAL	10

Case Kits

PART NUMBER	DESCRIPTION	QTY
1828003001	**MX CASE KIT ALPHA GREY**	
	MX ALPHA CASE + LATCH	10
	LBL MX 2MB MEMORY	10
	LBL MX REAR CASE	10
	SCREW M2.5x10MM POZ.CS	20
	LBL BOTTOM	10
	BOTTOM SEAL	10
	LBL BTM RS232/LIF	5
	LBL BTM IRDA/LIF	5
1828003101	**MX CASE KIT NUMERIC GREY**	
	MX NUMERIC CASE + LATCH	10
	LBL MX 2MB MEMORY	10
	LBL MX REAR CASE	10
	SCREW M2.5x10MM POZ.CS	20
	LBL BOTTOM	10
	BOTTOM SEAL	10
	LBL BTM RS232/LIF	5
	LBL BTM IRDA/LIF	5
1828003201	**MX CASE KIT SCANNER**	
	MX SCANNER CASE + LATCH	10
	LBL MX 2MB MEMORY	10
	LBL MX REAR CASE	10
	SCREW M2.5x10MM POZ.CS	20
	LBL BOTTOM	10
	BOTTOM SEAL	10
	LBL BTM RS232/LIF	5
	LBL BTM IRDA/LIF	5

PART NUMBER	DESCRIPTION	QTY
1828003301	**MX CASE KIT SCANNER NUMERIC**	
	MX SCANNER NUMERIC CASE + LATCH	10
	LBL MX 2MB MEMORY	10
	LBL MX REAR CASE	10
	SCREW M2.5x10MM POZ.CS	20
	LBL BOTTOM	10
	BOTTOM SEAL	10
	LBL BTM RS232/LIF	5
	LBL BTM IRDA/LIF	5

LCD Kits

PART NUMBER	DESCRIPTION	QTY
1808001401	**W/A SPARES KIT BACKLIGHT KIT**	
	ASSY EL/BACKLIGHT 3V	
1808001520	**W/A SPARES KIT-LCD**	
	LCD MODULE (240X100)	

PCB Kits

PART NUMBER	DESCRIPTION	QTY
1828004001	**MX PCB 2MB**	
	MX PCB 2MB	1
1828004101	**MX SCANNER EXPANSION KIT**	
	DECODER PCB	1
	SUPPORT MOULDING	1
	SCREW M2x4MM	2
1828004201	**MX BARCODE/WAND EXPANSION KIT**	
	EXPANSION PCB	1
	SCREW M2x4MM	2

Dismantling the Workabout

The modular design of the Workabout is such that the internal workings of the product can be removed from the case by removing two screws. This means that if the outer case assembly becomes damaged, it can be replaced quickly and easily without the need to change any other component. If there is a fault in the Outer Case Moulding, LCD Window, Keyboard Frame, or Rubber Keymat, the entire case should be replaced.

☞ Note:- *In some cases the machine may be fitted with security screws that require a suitable screwdriver to remove them.*

When you remove internal components from the case, take care not to damage the LCD Module. Do not bend the Module, as it is prone to fracturing. Do not touch the LCD Glass as it will show finger marks and smudges.

If the LCD glass is broken, be careful not to get any liquid in your mouth or eyes. In the event of any liquid crystal getting on skin or clothes, wash it off immediately with soap and plenty of water and seek a doctor's advice.

Tools Required

Tool	Description	Type
Crosshead Screwdriver	Pozi	Size - 0
Crosshead Screwdriver	Phillips	Size - 00
Screwdriver	Flat	Size - 2.5mm
Nut Spinner	n/a	4mm AF
Knife/Scalpel	n/a	n/a
Pliers	Snipenose	n/a

Dismantling Procedure

1 Press the drawer release button (or use a security key if necessary) and open the Workabout.

2 Remove any batteries (including the Lithium Dry Cell) and SSDs that are inside the Workabout.

3 Remove the fuse from its location beneath the main batteries. If the fuse is damaged, replace it with a 1.25 AMP 'Fast Blow' glass fuse, 5mm ∅, 20mm long, Psion part number A4900-0041.

4 Remove the 2 screws from the base of the Workabout.

5 Pull the Chassis Assembly from the case (this may require a sharp tug).

6 If fitted, unclip the Expansion FFC from its ZIF Connector on the Main PCB and also from the ZIF Connector(s) on the Expansion or Monitor PCB.

☞ Note:- *Take care not to crease or tear the FFC.*
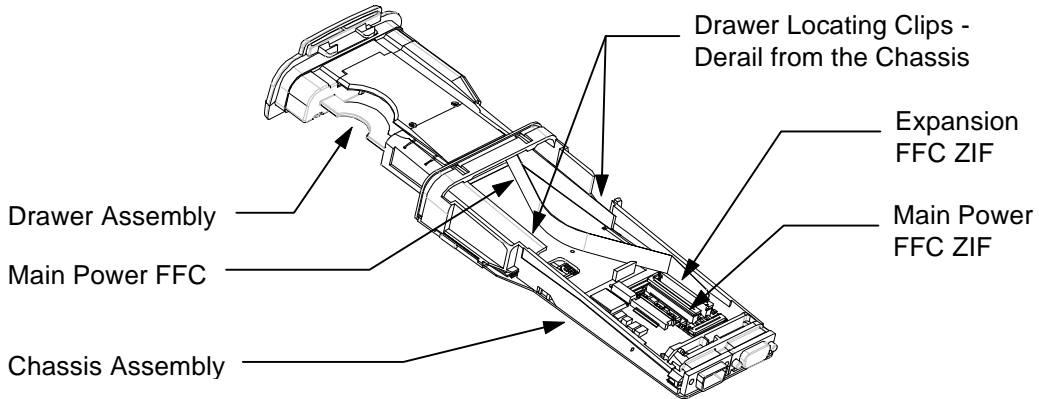
7 Unclip the Main Power FFC from its ZIF Connector.

8 Unclip the Drawer Assembly by derailing the Drawer from its tracks.

9 Slide the Drawer Assembly out of the Chassis Assembly.

☞ Note:- *Dismantling the Latch Assembly is not necessary as replacement cases are supplied complete with latches. The following step is for information only.*

10 To remove the Latch Assembly, remove the 3 screws from the latch case. Be careful to catch the internal springs and other components when you remove the case.

Dismantling the Chassis Assembly

1 Remove the Drawer Spring from the Connector Block.

☞ Note:- *The Drawer Spring should always be removed when you either remove or refit the Connector Block.*

2 Remove the Bottom Connector Seal.

☞ Note:- *As a general rule, replace the Bottom Connector Seal whenever it is removed for servicing.*

3 Remove the 2 screws from the LIF Connector.
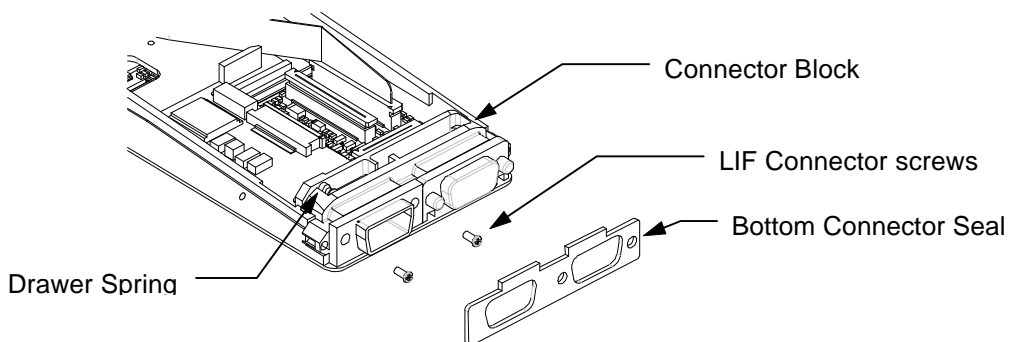
4 Remove the screw-locks for the Expansion Board D-Type Connector, if fitted.

5 Lift out the Connector Block by squeezing its arm in as near as possible to the base of the Workabout, to allow the actuator to clear the retaining tab on the CPU frame.

6 If fitted, remove the Decoder or Expansion PCB:

    a) On a Scanner Workabout, remove the FFCs from the ZIFs and then remove the 2 retaining screws on the Support Moulding.

    b) On a Barcode/Wand Workabout, remove the FFC from the ZIF and then remove the 2 retaining screws.

Barcode/Wand   **Scanner**
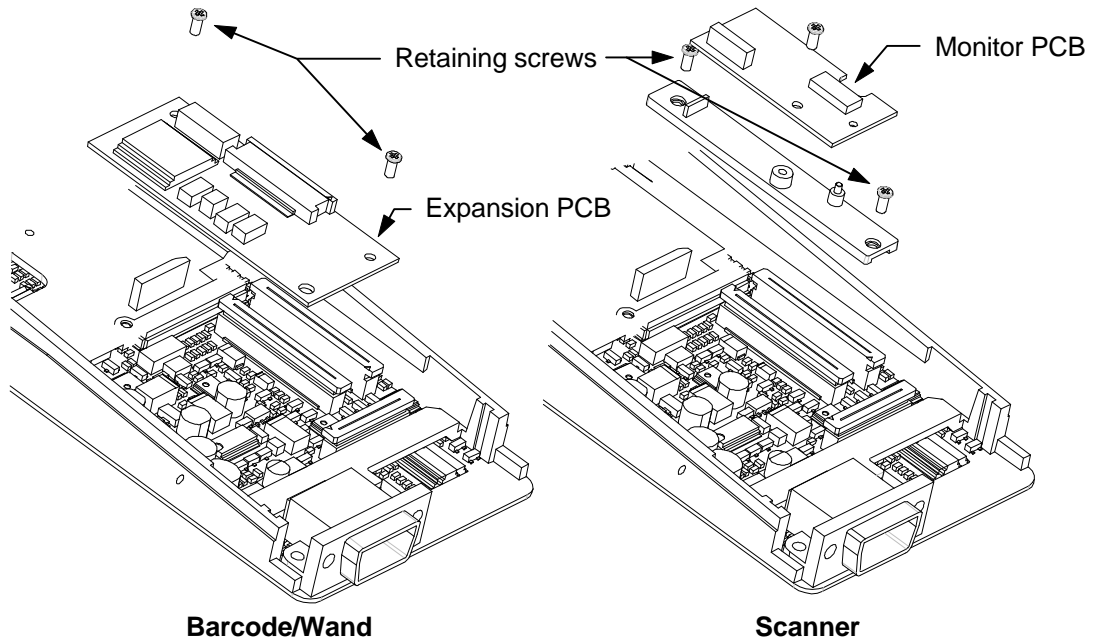
7 Remove the Option Port FFC, if fitted, and remove the Option Port.

8 Remove the LCD Backlight Power Connector, if fitted.
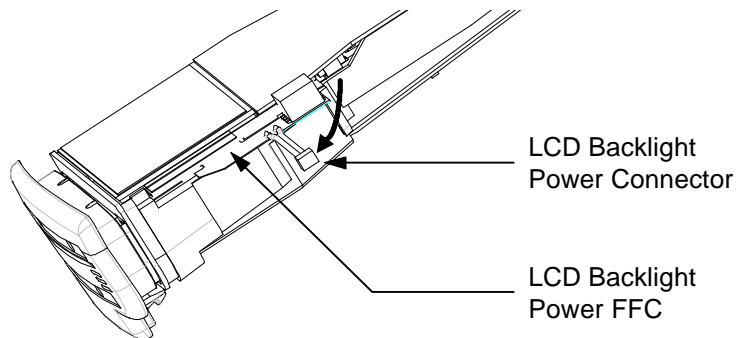
9 Unclip the LCD ZIF from the Main PCB. There is a hole in the CPU frame moulding to allow you to do this.

CPU Frame
Moulding

LCD ZIF
Connector

LCD FFC
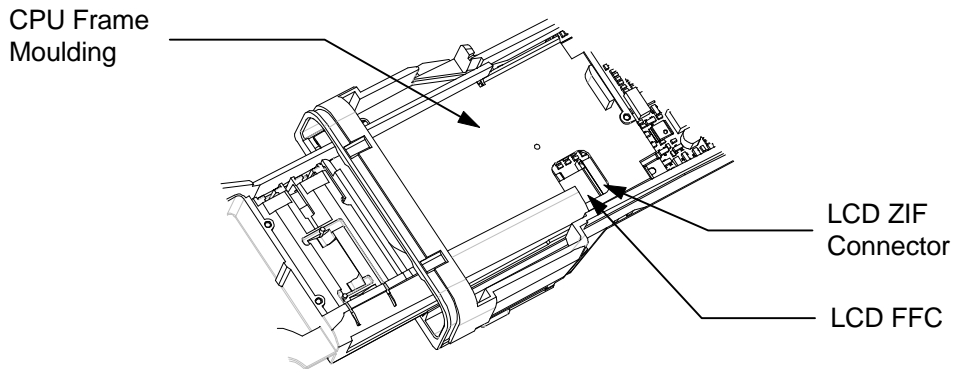
10 Remove the Main PCB Screw.

11 Remove the Main PCB.

12 Remove the Chassis Seal.

13 Remove the LCD. The LCD Module is located on a pin on the CPU Frame moulding. This pin is covered by the rubber LCD Sleeve. Handle the LCD Module by the glass so that you do not damage the circuit boards. Manoeuvre the module off the pin by wiggling the module while holding the glass.

14 Remove the Backlight, if fitted.

The Chassis Assembly is now dismantled.

Dismantling the Drawer Assembly

☞ Note:- *It is not necessary to dismantle the Drawer Assembly. This procedure is included for information purposes only.*

1 Remove the Top Cap:

a) On base machines, the four screws that secure the Top Cap are covered by labels. Remove the labels and then remove the screws.

b) On Option Machines, the screws are not covered.

4 screws

Top Cap

Labels on Base
machines
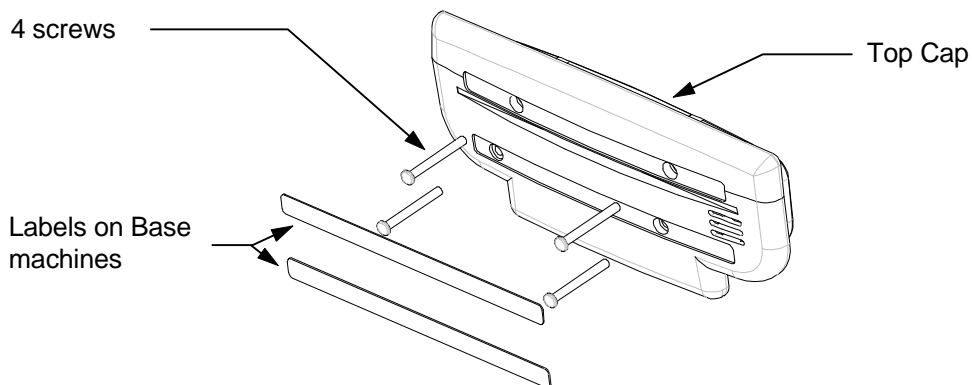
2 Remove the foam Top Cap Seal and the Piezo Seal.

☞ Note:- *As a general rule, replace the Top Cap Seal and Piezo Seal whenever they are removed for servicing.*

3 Remove the Expansion FFC if fitted. Ease the FFC out of the case by sliding it backwards and forwards length-ways and pulling it gently up out of the insertion slot in the SSD Drawer moulding.

4 Remove the SSD Back. This is clipped onto the SSD Drawer at the top end. To remove it:

a) Remove the two securing screws.

b) Remove the SSD Back by lifting its free end out by about 10mm and then prying the top left-hand corner away from the SSD Drawer moulding until it becomes unclipped. Take care not to damage the Lithium Battery Contacts on the FFC.

5 Release the Piezo. The tail that connects the Piezo to the Main Power FFC is quite thin and can be damaged if not handled correctly. Take care to release the strip of the FFC attached to the Piezo at the same time that the rest of the Main Power FFC assembly is eased out of the SSD Drawer.

6 Remove the Fuse Contacts.

The Drawer Assembly is now fully dismantled.

Selecting the PCB Type

The Workabout Main PCB can be programmed for use in the Scanner, Integral Wand, or Numeric versions by using a special Configuration SSD.

The Main PCB is supplied unprogrammed and the SSD allows you to select the PCB type using the product type/variant code as listed in the section *Serial Number Information* on page 2.

Re-assembly Instructions

The Workabout can be re-assembled by following the flow diagrams below.

The flow diagrams show the correct sequence for re-assembling the subassemblies. Also refer to the diagrams in the *Dismantling Procedure* steps on page 13, in reverse order, as you perform each re-assembly step.

Take care when you reinsert FFCs into ZIF Connectors. If you insert FFCs into the connectors at an angle, it can cause open or short-circuits.

Make sure that the bends in the FFCs allow the drawer to open and close correctly.

Re-assembling the Drawer Assembly

1	Insert the Fuse Contacts.
2 ← *See Notes Step 2 below*	Insert the Piezo and Main Power FFC assembly.
3 ← *See Notes Step 3 below*	Fit the SSD Back.
4	Fit the 2 securing screws.
5 ← *See Notes Step 5 below*	Insert the Expansion FFC (if fitted).
6	Fit a **new** Top Cap Seal.
7	Fit a **new** Piezo Seal.
8	Screw the Top Cap to the Drawer Assembly.

Base machine?

No

Yes

9	Apply End Cap labels.

The Drawer Assembly has now been re-assembled.

Notes on Drawer Re-assembly

Step 2

Take care when sliding the Piezo tail into the SSD Drawer via the insertion slot.

Step 3

Take care not to damage the Main Battery and Lithium Battery contacts.

Step 5

Ease the FFC into the case by sliding it backwards and forwards while pushing it gently down through the insertion slot in the SSD Drawer moulding.

Re-assembling the Chassis Assembly

See Notes Step 1 below ◄— **1** Place the Backlight, if fitted, in position.

2 Fit the LCD on top of the Backlight.

3 Fit the Chassis Seal.

See Notes Step 4 below ◄— **4** Fit the Main PCB.

5 Connect the Backlight Power Connector.

6 Fit the Option Port FFC or Blank.

7 Add the Expansion or Monitor PCB, if fitted.

8 Fit the Connector Block.

9 Fit the 2 LIF Connector Screws.

10 Fit a **new** Bottom Connector Seal.

11 Fit the Drawer Spring.

The Chassis Assembly has now been re-assembled.

Notes on Chassis Re-assembly

Step 1

Stick the LCD Backlight FFC to the side of the Chassis Assembly.

Step 4

Hold the Main PCB and Chassis Assembly parallel to each other and insert the LCD FFC into the LCD ZIF Connector. Lock the ZIF Connector. Now fit the Main PCB Screw.

Final Re-assembly

| 1 | Slide the Drawer Assembly into the Chassis Assembly. |

2 — Locate the Drawer rails in their tracks.

3 — Connect the Main Power FFC to its ZIF Connector.

Expansion ZIF Connector

Main Power ZIF Connector

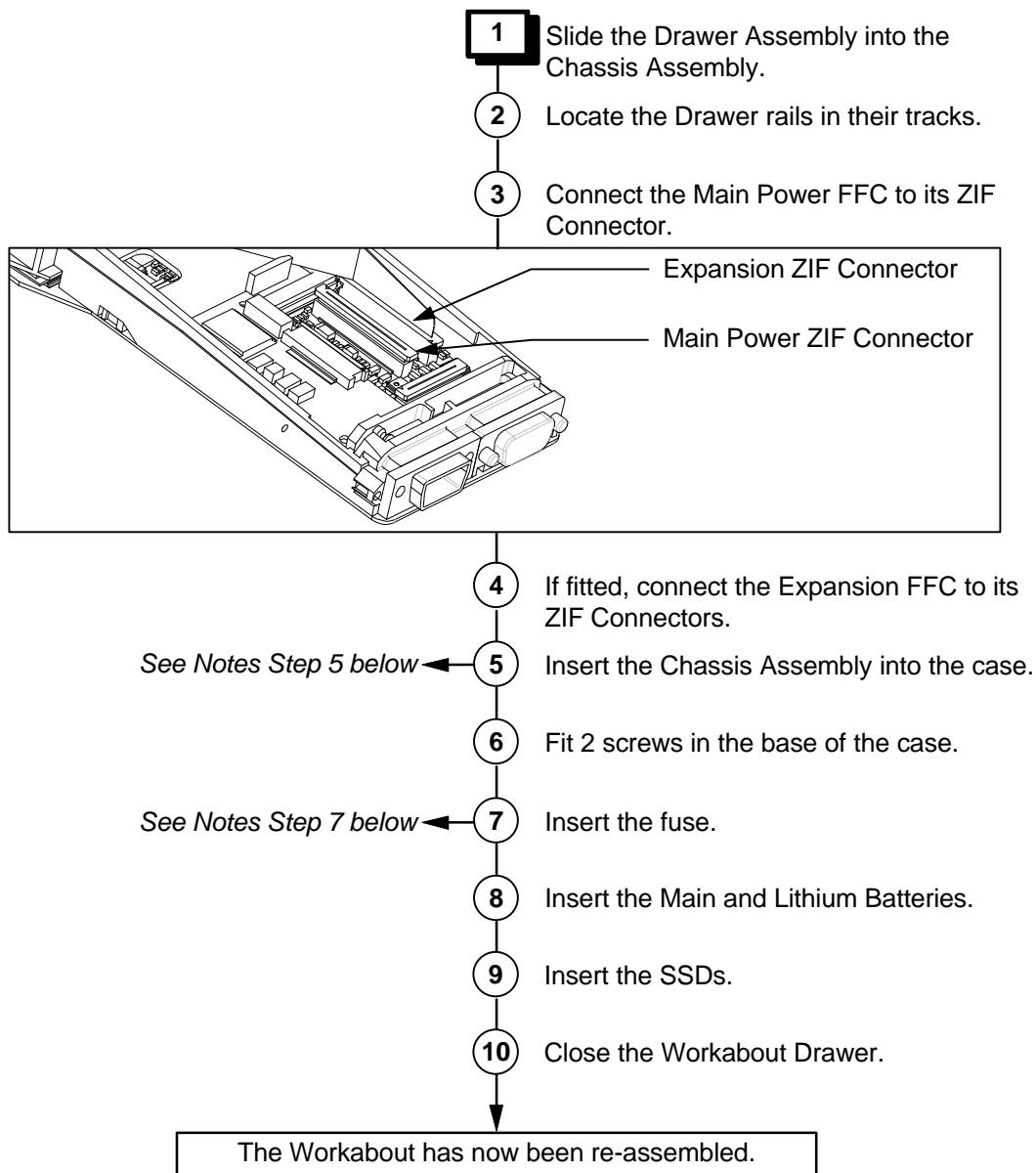4 — If fitted, connect the Expansion FFC to its ZIF Connectors.

See Notes Step 5 below ◄— 5 — Insert the Chassis Assembly into the case.

6 — Fit 2 screws in the base of the case.

See Notes Step 7 below ◄— 7 — Insert the fuse.

8 — Insert the Main and Lithium Batteries.

9 — Insert the SSDs.

10 — Close the Workabout Drawer.

The Workabout has now been re-assembled.

Notes on Final Re-assembly

Step 5

Take care to ensure that the Chassis Seal fits correctly.

Step 7

The fuse must be a 1.25 AMP 'Fast Blow' glass fuse, 5mm $\varnothing$, 20mm long, Psion part number A4900-0041.

Checking the Operation of the Options

To accurately check the operation of fitted options, you need the following items:

■ A bar code reader or a scanner that gives a TTL output.

■ An RS232 interface.

■ A bar code wand or scanner with a 9-way male connector with the following pin arrangement:

Pin No.	Signal Name	Remarks
1	DCD	Handshake - input
2	RX	Bar Code Data Receive - input
3	GND	0V
4	GND	0V
5	DSR	Handshake - input
6	DTR	Handshake (Trigger or Enable) - output
7	GND	0V
8	GND	0V
9	VCCEXT	5V 200mA max

■ An IBM-compatible PC able to run VT in MS-DOS or Terminal in Windows 3.1x. Any other program that can be run to provide Glass Terminal Emulation can also be used.

Checking the RS232 Interface

You can use the **Comms** application on the Workabout to turn on the RS232 interface on the option board and check the RS232 interface. To check the RS232 interface:

1 Switch on the Workabout.

Switching the machine on after replacing a backup battery, or for the first time, causes the Workabout to reboot. When you press the On button, the Workabout beeps and after a pause of up to 5 seconds, the shell screen appears.

2 Press the **Menu** key.

3 Use the cursor keys to select the **System screen** option and press **Enter**.
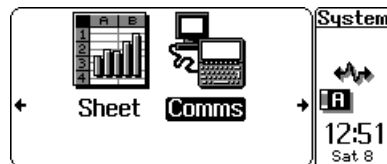
4 On the System screen, use the cursor keys to position the highlight bar over the **Comms** application and press **Enter**.

5 Plug a 9-way female to 9-way female null modem cable between the serial port on the PC and the RS232 port on the Workabout.

6 On the PC, run VT in MS-DOS, or Terminal in Windows 3.1x. The default baud rate for the RS232 port in the Workabout is 9600. Adjust the settings on the PC program to match.

7 When a serial link has been established between the PC and the Workabout, any characters you type on the Workabout appear on the PC screen and vice-versa. This indicates that the RS232 serial channel is working correctly.

8 To exist from the **Comms** program, press [⌄] + [X] on the Workabout.

Testing the TTL Interface

You can test the TTL interface by using a compatible barcode device. To do this, follow steps 1 to 4 of the RS232 Interface check procedure and then follow the steps below:

1 Plug a compatible barcode device into the TTL port.

2 If the barcode device is giving true data, set the expansion board port to D. If it is giving inverted data, set the port to G:

a) In the **Comms** application, press **Menu** and select **Spec**. (Use the ↑ and ↓ keys to select an item and the ← and → keys to select a value.)

b) Set the baud rate to 9600 and the port to D or G as appropriate.
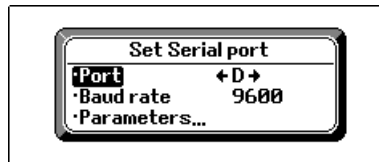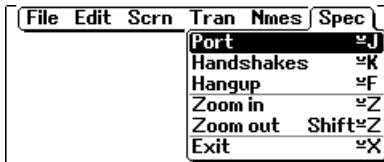
```
 File  Edit  Scrn  Tran  Nmes │Spec │
                   Port            ⌄J
                   Handshakes      ⌄K
                   Hangup          ⌄F
                   Zoom in         ⌄Z
                   Zoom out    Shift⌄Z
                   Exit            ⌄X
```

```
        Set Serial port
    ·Port         ←D→
    ·Baud rate     9600
    ·Parameters...
```

3 Scan some sample bar codes. The numerical equivalent of the barcode should appear in the top left corner of the screen.

☞ Note:- *Always scan at least two different barcodes to ensure that a chance operation has not occurred.*

4 To exist from the **Comms** program, press [⌄] + [X] on the Workabout.

Testing the Barcode Interface

The Barcode interface can be tested using a compatible barcode wand or scanner. To do this, follow steps 1 to 4 of the RS232 Interface check procedure and then follow the steps below:

1 Plug a compatible barcode device into the Barcode port.

2 Set the expansion board port to E and set the baud rate to 9600 (refer to the *Testing the TTL Interface* instructions).

3 Scan some sample bar codes. The numerical equivalent of the barcode should appear in the top left corner of the screen.

4 To exist from the **Comms** program, press [⌄] + [X] on the Workabout.

Expansion Interface

The interfaces built into the Workabout are accessible by plugging in appropriate connectors or adapters at the top or bottom of the unit.

The top connectors provide RS232 AT and either a TTL-level serial interface or a bar code wand interface. The TTL-level serial interface can operate CCD barcode scanners or low power laser scanners.

The bottom connector provides access to the LIF connector for the docking interface, external power and SIBO serial interfaces.

The serial and barcode interfaces are provided by optional internal peripheral modules. These are fitted inside the Workabout and plug into an internal expansion connector.

RS232 AT/TTL Serial Interfaces

These are provided by the RS232 AT/TTL peripheral module which provides:

■ an IBM-compatible RS232 AT serial interface at standard RS232 voltage levels

■ an RS232 TTL serial interface at 5V TTL levels

■ a 5V nominal (4.7V min.) software switched power supply (VCCEXT) which provides up to 200 mA, with a current limit at approximately 250mA

The serial format and the polarity of the TTL-level interface can be programmed using suitable software programs. The interfaces can be operated at a baud rate of 19,200.

☞ Note:- *Although both interfaces are present in the module, only one can be configured as operational at any one time.*

The 9-way D-type male RS232 AT interface connector pin allocation is shown below:

Pin No.	Signal Name	Remarks
1	DCD	Handshake - input
2	RX	Serial Receive - input
3	TX	Serial Transmit - output
4	DTR	Handshake - output
5	GND	0V
6	DSR	Handshake - input and EXON [1]
7	RTS	Handshake - output
8	CTS	Handshake - input
9	GND	0V

(1) The EXON signal is the external wake-up control for the Workabout. If the RS232 AT/TTL peripheral expansion module is configured correctly, the EXON signal switches on the Workabout when an RS232 or TTL-level rising edge is applied to this signal. The RS232 AT interface is enabled by opening port A (see *Testing the TTL Interface* on page 22 for instructions on how to do this).

The 9-way D-type female RS232 AT interface connector pin allocation is shown below:

Pin No.	Signal Name	Remarks
1	GND	0V
2	RX	Serial Receive - input
3	TX	Serial Transmit - output
4	VCCEXT	5V 200mA max [1]
5	GND	0V
6	DSR	Handshake - input
7	RTS	Handshake - output
8	CTS	Handshake - input
9	GND	0V

(1) The VCCEXT supply is switched on and off at the same time as the TTL serial port is opened and closed. The RS232 TTL interface is enabled by opening port D for true data and port G for inverted data (see *Testing the TTL Interface* on page 22 for instructions on how to do this).

RS232 AT Serial/Barcode Interfaces

These are provided by the RS232 AT/Barcode peripheral module which provides:

■ an IBM-compatible RS232 AT serial interface at standard RS232 voltage levels at up to 19,200 baud

■ an RS232 TTL serial interface at 5V TTL levels

■ a 5V nominal (4.7V min.) software switched power supply (VCCEXT) which provides up to 200 mA, with a current limit at approximately 250mA

■ a barcode wand interface with a 5V nominal (4.7V min.) software switched power supply (VCCEXT) which provides up to 200 mA

The RS232 AT interface serial format can be programmed using suitable software programs and the barcode interface is provided by a Hewlett Packard HBCR-1612 barcode decoder device. This allows wands which generate digital signals to be connected directly to the barcode interface. The barcode interface format can be programmed using software, although this feature is not used if a Hewlett Packard barcode wand is being used, as the decoder requires a set format.

☞ Note:- *Although both interfaces are present in the module, only one can be configured as operational at any one time.*

The 9-way D-type male RS232 AT interface connector pin allocation is shown below:

Pin No.	Signal Name	Remarks
1	DCD	Handshake - input
2	RX	Serial Receive - input
3	TX	Serial Transmit - output
4	DTR	Handshake - output
5	GND	0V
6	DSR	Handshake - input and EXON [1]
7	RTS	Handshake - output
8	CTS	Handshake - input
9	GND	0V

(1) The EXON signal is the external wake-up control for the Workabout. If the RS232 AT/TTL peripheral expansion module is configured correctly, the EXON signal switches on the Workabout when an RS232 or TTL-level rising edge is applied to this signal. The RS232 AT interface is enabled by opening port B (see *Testing the TTL Interface* on page 22 for instructions on how to do this).

The 9-way D-type female RS232 AT interface connector pin allocation is shown below:

Pin No.	Signal Name	Remarks
1	DCD	Handshake - input
2	RX	Bar Code Data Receive - input
3	GND	0V
4	GND	0V
5	DSR	Handshake - input
6	DTR	Handshake (Trigger or Enable) - output
7	GND	0V
8	GND	0V
9	VCCEXT	5V 200mA max [1]

(1) The VCCEXT supply is switched on and off at the same time as the barcode port is opened and closed. The barcode interface is enabled by opening port E (see *Testing the TTL Interface* on page 22 for instructions on how to do this).

☞ Note:- *The Hewlett Packard barcode decoder uses 9600 baud, true data port settings.*

Circuit Description

LIF Converter

The LIF Converter provides the interface between the mains adaptor, serial link and the Workabout. It also includes a charging circuit in the form of a linear regulator operating in constant current mode.

<u>Final Test</u>

The section describes how to set up the Final Test and perform the test sequence on a Workabout.

☞ Note:- *These instructions do not describe how to perform tests on the Workabout Peripheral product range.*

Equipment

You need the following equipment to perform the Final Test:

Qty	Description	Psion p/no.
1	Workabout Final Test Unit	1810-0001
1	Mains Lead	4801-0005
2	Test SSDs	2301-0115
1	Workabout Test Battery Cartridge	2800-0030
1	LIF Cable	2800-0005
1	Lithium Battery	4900-0018

☞ Note:- *The Final Test Unit is suitable for working with mains supplies in the range 90-130/180-260VAC @ 47-63Hz, without adjustment.*

Test Setup

WARNING - There are hazardous voltages within the Final Test Unit. Please follow this procedure carefully.

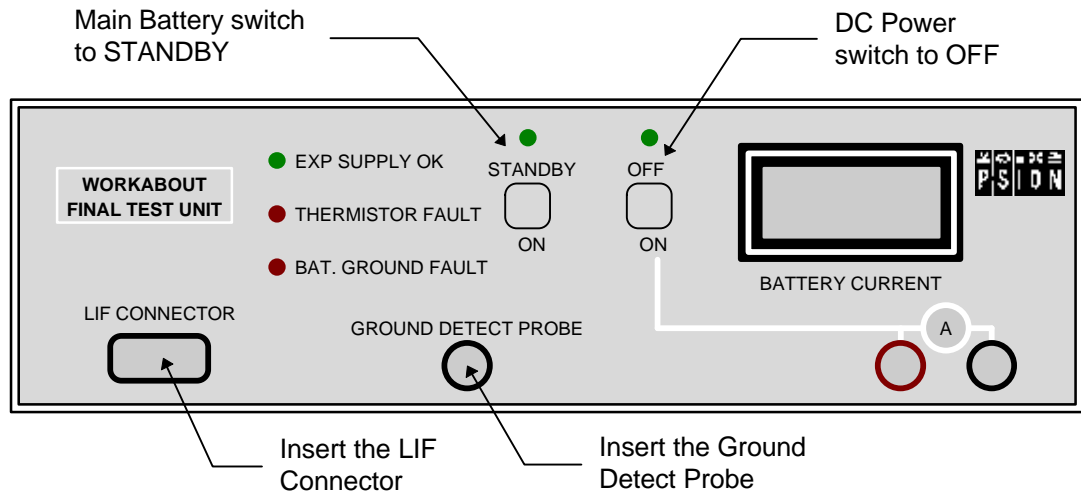Follow the steps below to set up a Workabout for testing.

1 Insert the following items in the Workabout:

❑ 2 x test SSDs

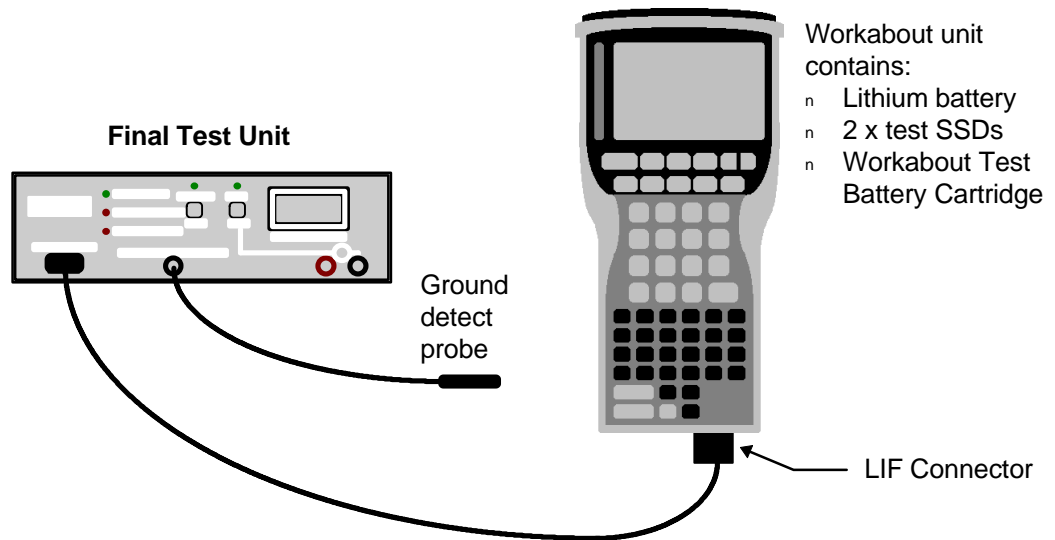❑ 1 x lithium battery

❑ 1 x Workabout Test Battery Cartridge

2 On the Final Test Unit:

a) Connect the LIF Cable and Ground Detect Probe to the Final Test Unit.

b) Set the main battery switch to STANDBY.

c) Set the DC Power switch to OFF.

3 Connect the LIF Connector to the Workabout. The LIF connector provides power to the Workabout:
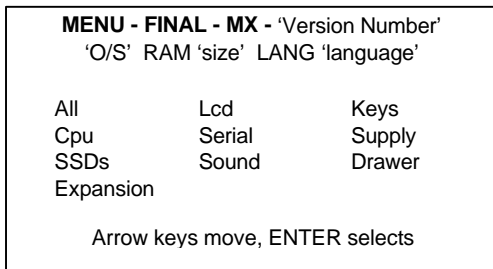

The Workabout is now ready for testing.

Test Sequence

1 Check the battery standby current reading on the Final Testing Unit ammeter.

Fail the 2M SR-DRAM unit if the reading is **higher** than **750μA**.

2 Check that the THERMISTOR FAULT lamp is **not lit**.

3 Move the Main Battery switch from STANDBY to ON.

The Final Test Program is downloaded via the LIF cable, and the following menu is displayed on the Workabout:

```
┌─────────────────────────────────────────────┐
│     MENU - FINAL - MX - 'Version Number'     │
│       'O/S'  RAM 'size'  LANG 'language'      │
│                                              │
│   All            Lcd            Keys         │
│   Cpu            Serial         Supply       │
│   SSDs           Sound          Drawer       │
│   Expansion                                  │
│                                              │
│        Arrow keys move, ENTER selects        │
└─────────────────────────────────────────────┘
```

Check the following:

a) The Final Test Program Version Number corresponds to the latest release.

b) Check that the Operating System version number, RAM size and Language settings are correct.

c) Check the ammeter reading on the Final Test Unit. **Fail** the unit if the reading is **higher** than **25mA**.

☞ Note:- *You can perform each check individually by selecting each option in turn from the test menu. This procedure uses the **All** option to run through all the checks in one go.*

**4** Select the **All** option from the test menu on the Workabout and press **Enter**.

A bold centre cross and a corner marker are displayed. The cross should be bold and even throughout and all corner should be complete, as shown in the example below:
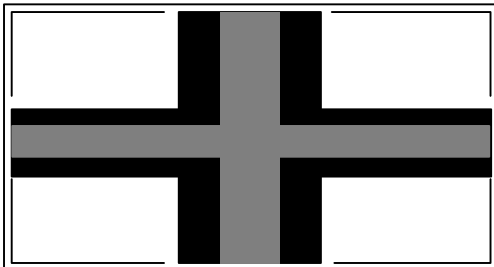
5 Press any key to continue.

6 If the pattern is correct press **Space**. If the pattern is faulty press **Esc**.

7 Check that the LCD backlight is now ON.

8 Check the contrast range:

a) Press any key - the screen should be black.

b) Press any key - the screen should be clear.

c) Press any key a third time - the screen should return to normal.

If the maximum and minimum contrast were correct, press **Space**. If they were not correct, press **Esc**.

9 Check all the Workabout keys:

a) Press any key to begin. A full keyboard map is displayed.

b) Press each key in turn and note that the selected key image changes from dark grey to light grey.

10 When you are prompted to "Switch on the DC Supply", move the DC Power switch on the Final Test Unit to ON.

11 Check the battery ammeter reading. It should be zero. Check also that the DC Supply indicator (the green LED on the Final Test Unit) is lit.

12 Check that the buzzer sounds. If the buzzers sounds press **Space**. If the buzzer does not sound press **Esc**.

☞ N.e:- *Check on the Final Test Unit, that the EXP SUPPLY OK indicator is lit.*

13 When you are prompted to "Open Drawer", open the Workabout and check the Battery Ground contact by touching the ground connection on the test battery cartridge with the ground detect probe:

Workabout Test Battery Cartridge
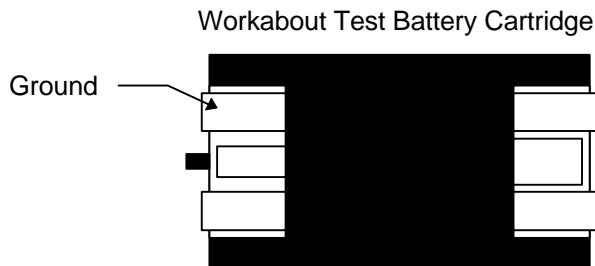
Ground

The BATTERY GROUND FAULT indicator should go off when the probe touches the metal.

14 Remove the solid state disks, battery pack and lithium battery.

15 Close the drawer and press any key.

If all the test have been passed, press **Space** to continue.

16 The EEPROM setting will be displayed and the serial number is required to be entered. The serial number information is detailed on page 2 of this manual.

Each field should be correctly filled by using the arrow keys to select the field, and entering the existing serial number displayed on the Workabout drawer. The variant settings can be verified against the information given on page 3 of this manual.

Once compete, press **Space** to continue.

N.te the EEPROM setting screen will only be displayed if the Workabout passes all tests.

17 Remove the LIF Connector from the Workabout.

The final test is now complete.

☞ N.te:- *If the test failed, remove the LIF Connector and set up the Workabout again, but when the test menu is displayed, select each test in turn from the test menu until you find the test that fails.*