GE Healthcare

# Portascan

## Portable Bladder Scanner

## Service Manual

imagination at work

Portascan Service and Assembly Manual
MAN-004-049
Issue 1

- **Section 1**

  Service Information

- Chapter 1. Introduction
  - About this manual ..... 1

- Chapter 2. Warnings and Precautions
  - Warnings ..... 1
  - Precautions ..... 1

- Chapter 3. Technical Specifications of the Scanner
  - General Specifications ..... 2
  - Acoustic Output information ..... 2

- Chapter 4. Connector overview
  - Connections ..... 3
  - Main board ..... 3
  - ETX Board ..... 3

- Chapter 5. Planned Maintenance
  - Handling and Care ..... 4
  - Handling and Care probes ..... 4
  - Agents and procedures that may damage the probes. ..... 4

- Chapter 6. Unit Disassembly
  - Images ..... 5

- Chapter 7. Faults and Solutions
  - Screen Related ..... 7
  - Probe Related ..... 7
  - Keypad Related ..... 7
  - Software Related ..... 7

- Chapter 8. Parts list ..... 8

- Chapter 9. ESD
  - What is ESD ..... 9
  - Preventing ESD damage ..... 9
  - ESD safe workshop ..... 9
  - ESD safe field service ..... 9

- Circuit Diagrams
  - Diagram 1 ..... 10
  - Diagram 2 ..... 11
  - Diagram 3 .....

- Appendix 1
  - Testing of Final Assembly ..... 12


© Mediwatch UK Ltd
Cosford Lane, Rugby CV21 1QN
Phone +44 1788 547888 Fax +44 1788 536434

# Table of Figures


- Figure **1**
  Portascan Block Diagram ..... 3
- Figure **2**
  Mainboard Top View ..... 3
- Figure 3
  ETX Board Block Diagram ..... 3
- Figure **4**
  Portascan  Top View ..... 5
- Figure **5**
  Portascan complete. ..... 5
- Figure **6**
  Battery release & removal. ..... 5
- Figure **7**
  Unscrew 4 screws ... & remove cover. ..... 5
- Figure **8**
  Battery Pack & PCB Board. ..... 5
- Figure **9**
  Back Panel with release screws arrowed. ..... 5
- Figure **10**
  Note location of long screw. ..... 5
- Figure **11**
  Probe connector lock nut. ..... 5
- Figure **12**
  Use special Lemo wrench to loosen probe connector nut. ..... 5
- Figure **13**
  Cut or remove security sticker then hinge top away to separate case. ..... 5
- Figure **14**
  The bottom case and handle grip can be placed to one side. ..... 5
- Figure **15**
  Two screws hold  the main assembly in place. ..... 5
- Figure **16**
  Lift main board peeling away earth strap & disconnect plugs/skts. ..... 5
- Figure **17**
  Note location of sounder & fan ... and display inverter board. ..... 5
- Figure **18**
  Carefully turn over main panel. ..... 5
- Figure **19**
  Shielding removed. ..... 5

# Table of Figures


- Figure **20**
  Probe interface panel set. ... Remove screws to separate. . . . . 5
- Figure **21**
  Separate ribbon connector, or carefully hinge probe interface boards . . . . . 6
- Figure **22**
  ... to reveal ETX Heatsink  screws. Retain Heatsink from other side. . . . . 6
- Figure **23**
  The compact flash can now be removed, reprogrammed & replaced. . . . . 6
- Figure **24**
  RAM can also be accessed if necessary. (Observe E.S.D. precautions) . . . . . 6
- Figure **25**
  Thermal Printer PCB ... and location. . . . . 6
- Figure **26**
  Paper roll installed. . . . . 6
- Dual Frequency prove & connector. . . . . 6
- Rear panel connections. . . . . 6
- Bottom case label. . . . . 6
- Keypad membrane. . . . . 6

About this manual

## Chapter 1. Introduction

This service manual can be used to service the Portascan at board level. The manual explains the functioning of the boards by means of functional block diagrams and photographs while connections can be checked at the connector overview. Preventative and corrective maintenance is also included as are circuit diagrams.

**Warnings**

## Chapter 2. Warnings and Precautions

- A probe may only be connected to or disconnected from the scanner while the instrument is switched off. Ignoring this may cause severe damage to your scanner and/or probe.
- To avoid a risk of explosion the equipment must not be operated in the presence of flammable anaesthetics.
- To avoid a risk of electric shock do not open the equipment. Refer servicing to qualified personnel only.
- Be careful not to place the patient into contact with the ultrasound equipment or other devices. If the ultrasound equipment or other devices are defective, there is a risk of electrical shock.
- For continued protection against fire hazard, replace fuses only with the same type and rating.
- The use of non-Mediwatch Plc components with this scanner may result in damage to Mediwatch Plc components.
- To prevent hazards; refer to your local requirements for adequate electrical installation in case of class 1 type BF equipment.
- Do not subject the equipment to excessive shock, for example, when moving the equipment. If the equipment is repeatedly subjected to excessive shock, mechanical parts may be damaged.
- Assembly operations, extensions, re-adjustments, modifications or repairs must be carried out by authorized persons.
- The electrical installation of the relevant room must comply with the IEC requirements.
- The product must be used in accordance with the instructions for use.

### Precautions

- Cleaning the probe is done by first removing the ultrasound coupling gel with a soft tissue and then gently wipe the probe dry using a new tissue or dry cloth.
- When more cleaning is required only a mild detergent or hand-soap may be used together with some water and a soft tissue cloth.
- To avoid possible damage, the probe cable must not be coiled to a diameter of less than 9 cm (3.5 inch).
- Although there is no danger to a patient with an implantable pulse generator (IPG); ultrasonic scanning equipment could cause mechanical damage to the IPG if used directly over the device's implant site.
- Do not use the equipment in locations subject to intense electric or magnetic fields (near transformers, for example). If the equipment is used in such locations, the monitor will be adversely affected.
- Do not use the equipment near devices generating high frequencies (such as medical telemeters and cordless telephones). If used near such devices, the equipment may malfunction or adversely affect such devices.
- To guarantee proper unit operation; do not operate the scanner in an environment with a temperature in excess of 35 °C. If the equipment is used in a small room, the room temperature may rise. Proper ventilation must be provided.
- Avoid installation near a heater or in direct sunlight.
- For correct image geometry, only monitors properly adjusted by the manufacturer may be used on the scanner.
- Inspect the probe carefully after a drop. A dangerous situation may arise due to damaged insulation of the probe surface.
- To prevent damage to mechanical probes due to excessive heat, a warning mechanism has been built into the system.

## Chapter 3. Technical Specifications of the Scanner

General Specifications:

| | |
|---|---|
| **Power Input** | 10 - 13.5 Vdc |
| **Power Consumption** | 12 VA |
| **Scanning Method** | Mechanical Sector |
| **Display Modes** | B - mode |
| **Probe Frequency** | 3.5/5.0 MHz |
| **Max Image Depth** | 20 cm |
| **Scan Converter** | Full Digital 512 x 512 x 8 |
| **Bladder Volume** | 0 -1500 ml |
| **Accuracy** | 0 - 699 ml ± 20%, ± 20ml<br>(whichever is700 ml - 1500ml ± 25% ± 25ml greater) |

Accuracy is based upon usage as per instructions and scanning a tissue equivalent phantom

| | |
|---|---|
| **Display Format** | 8 inch colour TFT LCD 640 x 480 pixels |
| **Battery** | 12 Volt rechargeable at least 1.5 Hrs continuous operation from full charge. |
| **Dimensions** | WxDxH = 16 x13 x 13 cm |
| **Weight** | 2540g without battery and probe3220g with battery and probe |
| **Enclosure Leakage and Earth Leakage Current** | Within specification for Class II type BF according to EN 60601 - 1 |
| **Environmental Operating Conditions** | Temperature 8 - 40°C Humidity up to 90% (20°C) |
| **General Storage Conditions** | Temperature 0 - 50°C |
| **Standards** | EN 60601 - 1 & Class II, Type BF handheld equipment |

Acoustic Output information for the 3.5/5.0 MHz Mechanical sector (410047):

| **Parameter:** | **Mode** | **B W o max.** |
|---|---|---|
| **P_** | (MPa) | 1.2 |
| **1spt** | (mW.cm2) | 2.8 |
| **System settings** | | 5.0HMz<br>Min. scan angle<br>Min. scan depth |
| **1p** | | 53.8 |
| **(mm)** | | |
| **Wpb6 (_1_)** | (mm) | 2.4 |
| **Prr** | (KHz) | 1708 |
| **Srr** | | |
| **(Hz)** | | 2.8 |
| **Output Beam Dimensions** | | 520.6 |
| **Area** | | |
| **(mm²)** | | |
| **Ø,<** | (mm), | 19.35 |
| **(°)** | | |
| **Fawf** | (MHz) | 3.2 |
| **Acoustic power up fraction** | | 0 |
| **(%)** | | |
| **Maximum Power** | | 2.6 |
| **(mW)** | | |
| **lob** | | 0.6 |
| **(mW/cm²)** | | |
| **Power up mode** | | B |
| **Initialisation mode** | | B |
| **Acoustic output freeze** | | YES |
| **L tt** | | 7.29 |
| **(mm)** | | |
| **Lts** | | CONTACT |
| **(mm)** | | |
| **Inclusive modes** | | B |

## Chapter 4. Connector overview

**Connections**:

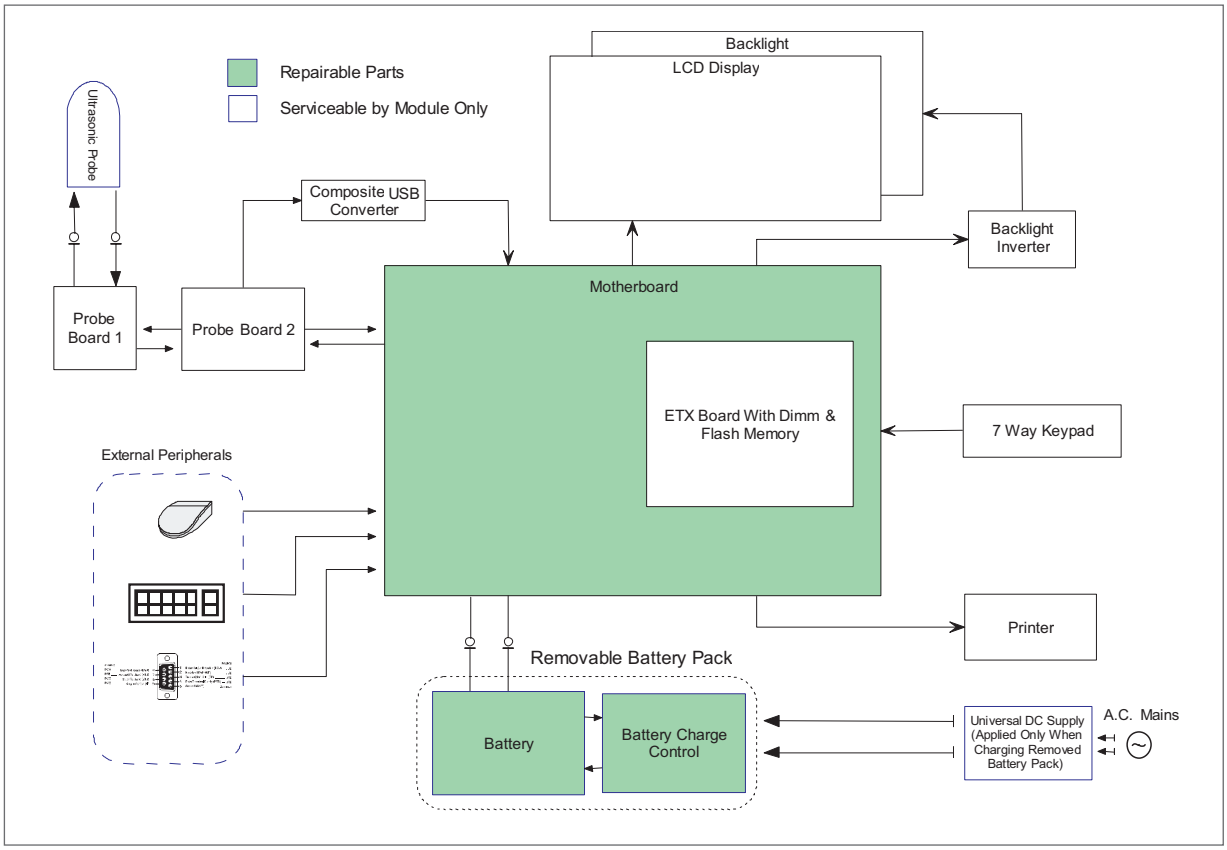



**Figure 1.** Portascan Block Diagram

**EXT Board:**

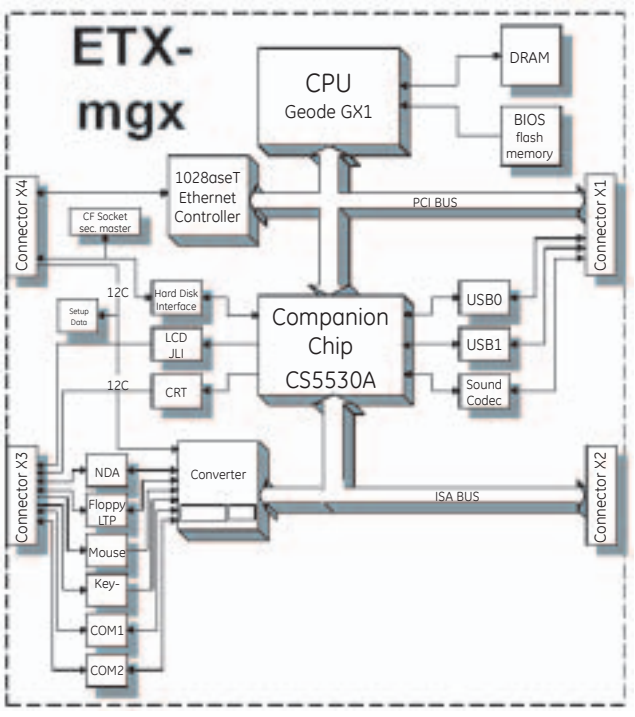



**Figure 3.** ETX Board Block Diagram

**Main Board:**

See **Main Board Schematic** for further details of connector Pin assignments.

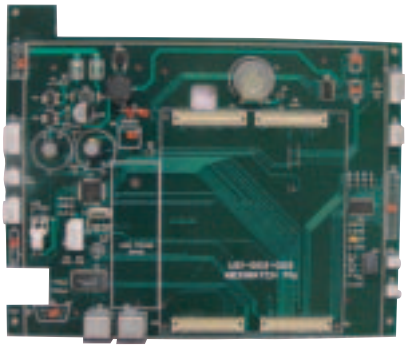


**Figure 2.** Mainboard Top View

## Chapter 5. Planned Maintenance

### Handling and Care

Although the scanner is produced with the utmost care and only the highest quality components are used, maintenance will be necessary from time to time to ensure trouble-free operation.

- Remove loose dust from the exterior with a soft cloth or a dry brush. A solution of water with a mild detergent may be used, but not freely applied. Avoid aggressive cleaners.
- Check the ventilation fans of the unit for proper operation.

### Handling and Care probes

#### Basic precautions probes

Always follow these basic precautions:

- Inspect the probe daily for cracks and other damage.
- DO NOT use a probe that has been cracked or damaged.
- DO NOT use a probe that has been dropped or struck against another object until it is inspected by a service engineer.
- Avoid pinching or kinking the probe cable. If the probe housing becomes cracked or broken or if there are cuts or openings in the probe cable the electrical safety of the probe could be compromised.
- Disconnect the probe from the scanner before cleaning and disinfection. Make sure to switch the system off before disconnecting or connecting the probe.
- To prevent hazards; refer to your local requirements for adequate electrical installation in case of class 1 type BF

#### Agents and procedures that may damage the probes.

Some agents and procedures damage probes. Use of any of the following procedures or products WILL VOID your probe warranty.

Agents that contain the following chemicals are known to damage the probe:

- Acetone
- Methanol
- Denatured ethyl alcohol
- Mineral oil
- Iodine
- Any lotions or gels containing perfume. Check with the ultrasound gel manufacturer regarding gel contents. If you have additional questions, please contact your representative.

The following procedures are known to damage probes:

- Autoclaving
- Soaking the probe in chlorine bleach

#### General probe cleaning

Cleaning the probe is done by first removing the ultrasound coupling gel with a soft tissue and then gently wiping the probe dry using a new tissue or dry cloth. When more cleaning is required only a mild detergent or hand-soap may be used together with some water and a soft tissue cloth.

## Chapter 6. Unit Disassembly

**Figure 4.** Portascan Top View

**Figure 5.** Portascan complete

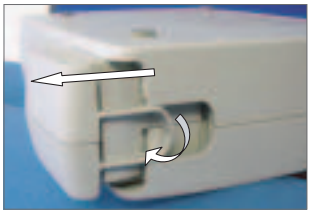


**Figure 6.** Battery release & removal

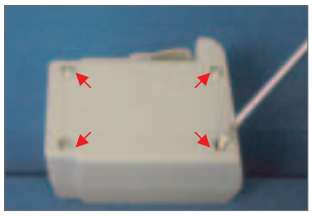
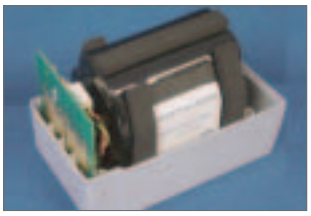


**Figure 7.** Unscrew 4 screws



& remove cover

**Figure 8.** Battery Pack & PCB Board

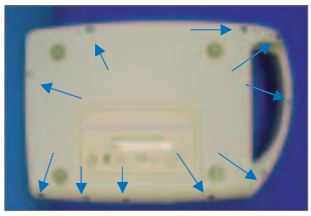


**Figure 9.** Back Panel with release screws arrowed

**Figure 10.** Note location of long screw

**Figure 11.** Probe connector lock nut

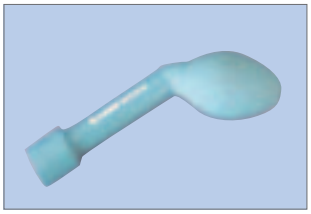


**Figure 12.** Use special Lemo wrench to loosen probe connector nut

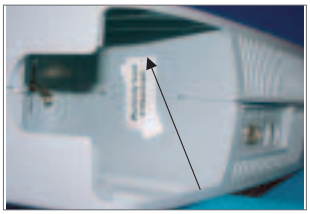


**Figure 13.** Cut or remove security sticker then hinge top away to separate case

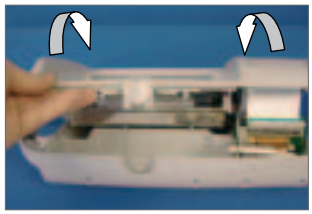


**Figure 14.** The bottom case and handle grip can be placed to one side

**Figure 15.** Two screws hold the main assembly in place

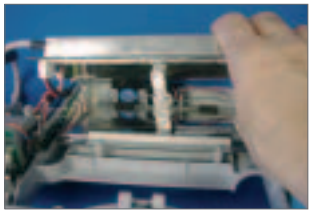


**Figure 16.** Lift main board peeling away earth strap & disconnect plugs/skts.

**Figure 17.** Note location of sounder & fan ... and display inverter board

**Figure 18.** Carefully turn over main panel.

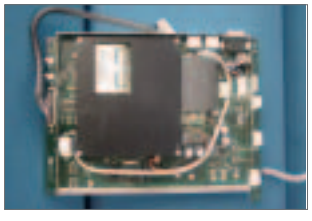
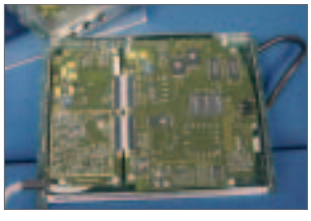


**Figure 19.** Shielding removed



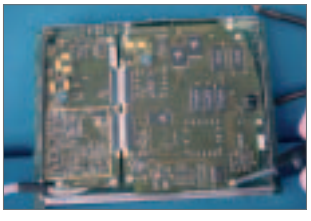


**Figure 20.** Probe interface panel set. Remove screws to separate

## Chapter 6. Unit Disassembly - continued

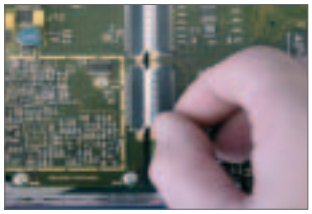
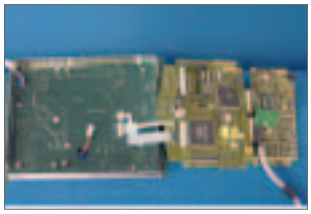


**Figure 21.** Separate ribbon connector, or carefully hinge probe interface boards



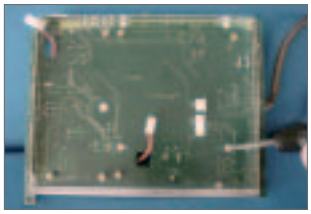
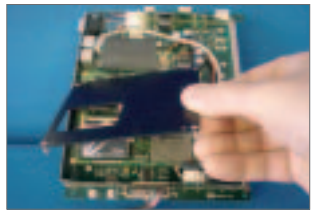


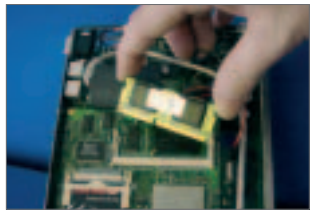
**Figure 22.** ... to reveal ETX Heatsink screws



Retain Heatsink from other side

**Figure 23.** The compact flash can now be removed, reprogrammed & replaced

**Figure 24.** 24 RAM can also be accessed if necessary (Observe E.S.D. precautions)



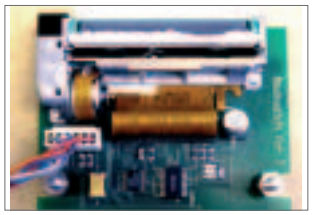


**Figure 25.** The compact flash can now be removed, reprogrammed & replaced

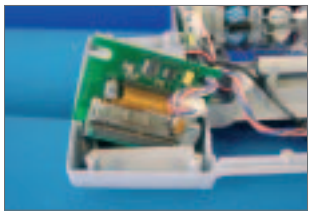
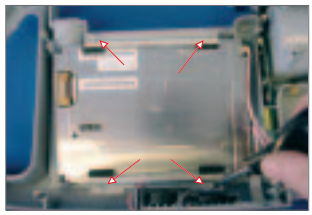
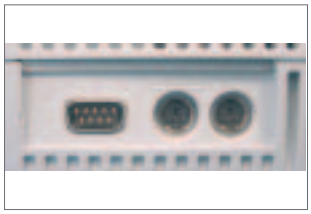


**Figure 26.** 24 RAM can also be accessed if necessary (Observe E.S.D. precautions)

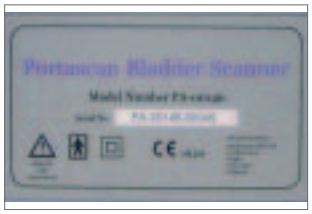


LCD mounting brackets & screws

Dual frequency probe & connector



Rear panel connections




Bottom case label

Keypad membrane

## Chapter 7. Faults and Solutions

**Screen Related**

LCD blank, can be caused by loose connector at rear of display panel or faulty display.

LCD poor contrast or dark due to failure of inverter board P/N C-00049.

**Probe Related**

Probe knocking: generally caused by one or more broken wires at the back of probe socket.

Probe not scanning, error message probe too hot: Probe or probe interface board

**Keypad Related**

Led failure, internal led becomes detached possibly due to operator, replace keypad.

No response from keypad. Due either to connector failure or to short caused by poor etching of the keypad ribbon cable. Reconnect or replace keypad

**Software Related**

On the rare occasion that Windows 98SE crashes, the display will freeze and keypad will be inactive. In this situation the system will automatically shut down after 15 seconds. DO NOT remove the battery pack until this has happened. Removing the battery pack before complete shutdown could cause the following problems:

Unit boots into windows safe mode, connect external keyboard and follow screen prompts, if problem is not resolved after two or three reboot attempts then unit requires the compact flash to be reprogrammed.

Fatal exception error, run scandisk to establish integrity of compact flash using the ETX test assembly. If flash disk fails then replace and reprogram with latest version.

Boot error message writing to drive c, treat as per fatal exception error.

## Chapter 8. Parts List

| Parts Description | Mediwatch Code |
|---|---|
| Battery Cells | PSA00020 |
| Battery Gold Contacts | PSA00021 |
| Battery Pack | PA00141B |
| Battery Pack Case (Lower) | C00052A |
| Battery Pack Case (Upper) | C00051A |
| Battery PCB | PSA00052 |
| Fan | C00068 |
| Flash Memory 256Mb | C00169 |
| Flexi-Links (Interface PCB-pair) | PSA00065 |
| Frame Grabber PCB | C00165 |
| Motherboard PCB | PSA 00042 |
| ETX PCB | C00148 |
| SDRAM 256Mb | C00168B |
| Interface PCB | PA00143A |
| Inverter Cable | C00049 |
| Screening Cans | PSA00062 |
| Keyboard Membrane | PSA00182 |
| LCD Backlight Inverter | C00048 |
| LCD Bracket(Bottom) | PSA00015 |
| LCD Bracket(Top) | PSA00014 |
| LCD Data Cable | PSA00017 |
| LCD Screen | C00047 |
| Lid | PSA00006A |
| Magnet Contact | PSA00061 |
| Magnet Support Plates | PSA00060 |
| Handle Soft Grip | PSA00011 |
| Magnet(Print Lid) | C00216 |
| Main Case(Lower) | C00037A |
| Main Case(Upper) | C00036A |
| Main Printer Lid | C00040A |
| Printer Bowl | C00041A |
| Printer Pcb Assy. | PSA00045 |
| Probe 3.5/5.0Mhz | PA00143 |
| Probe Connector Location Washer | PSA00072 |
| Probe Connector Mounting Ring | PSA00064A |
| Battery Charger | PA00142B |
| Speaker | C00067 |
| Thermal Print Unit | C00057 |

## Chapter 9. ESD

### What is ESD

Electro Static Discharge (ESD) is the transmission of electro static charges between two bodies with a potential difference. This transmission can be achieved by direct contact or by an inducted electrostatic field. Electro static discharges are not always noticed by operators, because ESD is:

- sensed at 3,500 Volt
- audible at 4,500 Volt
- visible at 5,000 Volt

Components and integrated circuits are more sensitive than operators and might be damaged by lower voltage discharges.

| Component Type | ESD sensitivity in Volts |
|---|---|
| V-MOS | 30-1800 |
| mosFET | 100-200 |
| EPROM | 100 |
| JFET | 140-7000 |
| OP-AMP | 190-2500 |
| C-MOS | 250-3000 |
| Schottky Diodes | 300-2000 |
| Bipolar Transistors | 380-7000 |
| ECL | 500-1500 |
| SCR | 680-1000 |
| Schottky | TTL 1000-2500 |

### Preventing ESD damage

Use electro static sensitive parts only in an ESD safe workshop.

- Use ESD safe packing material.
- Remove all static chargeable materials (plastics) from the workshop.
- Wear ESD safe clothing.
- Always check wrist strap and other ESD equipment before use.
- Be grounded.
- BE AWARE.

### ESD safe workshop

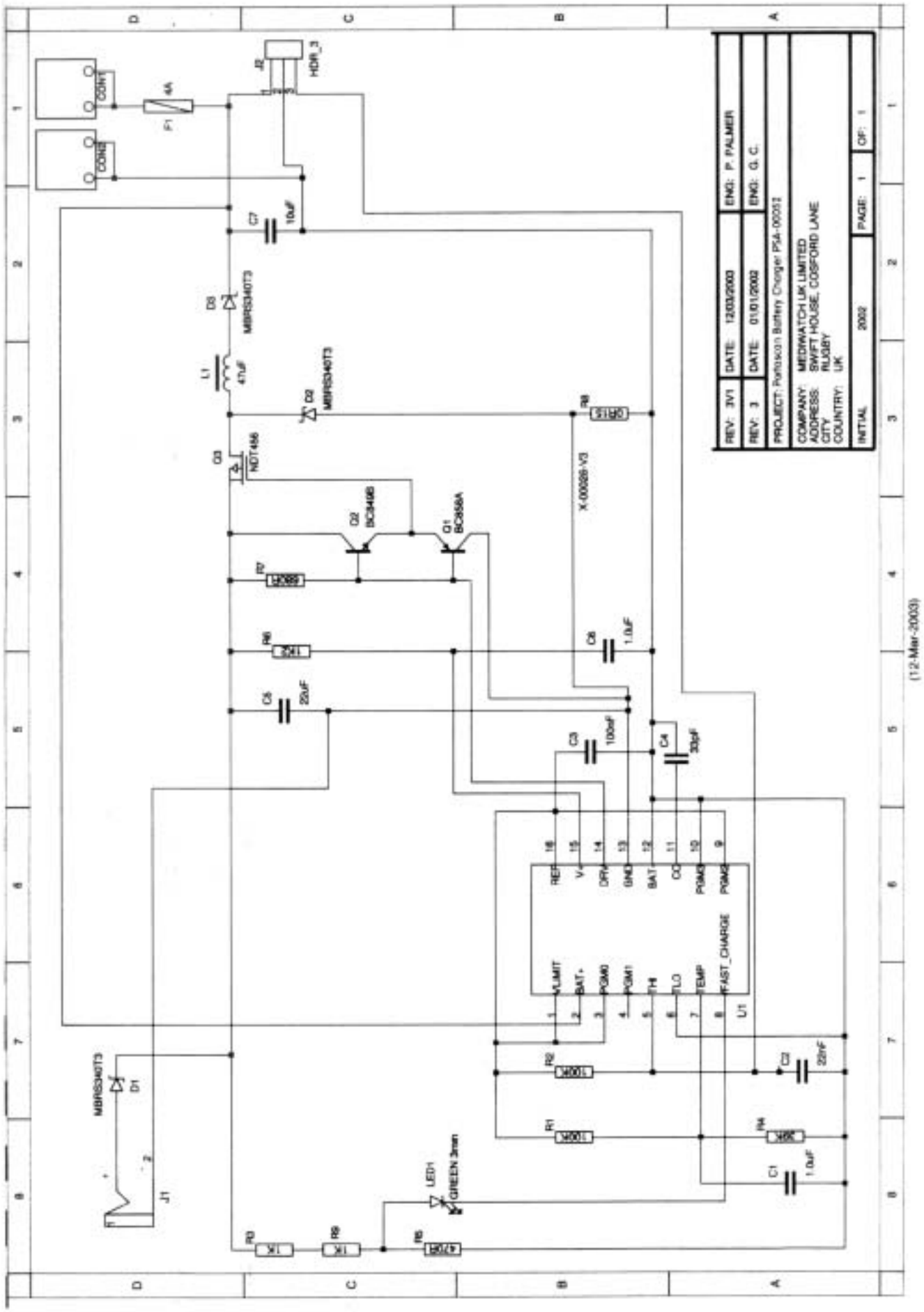
To be sure that there is no potential difference between body, boards and work surface, the work surface should be made of electrostatic dissipative rubber. The work surface should be connected to a central ground point. The engineer, handling the boards should also be connected to the central ground point, either through wrist strap or heal strap (and conductive floor).

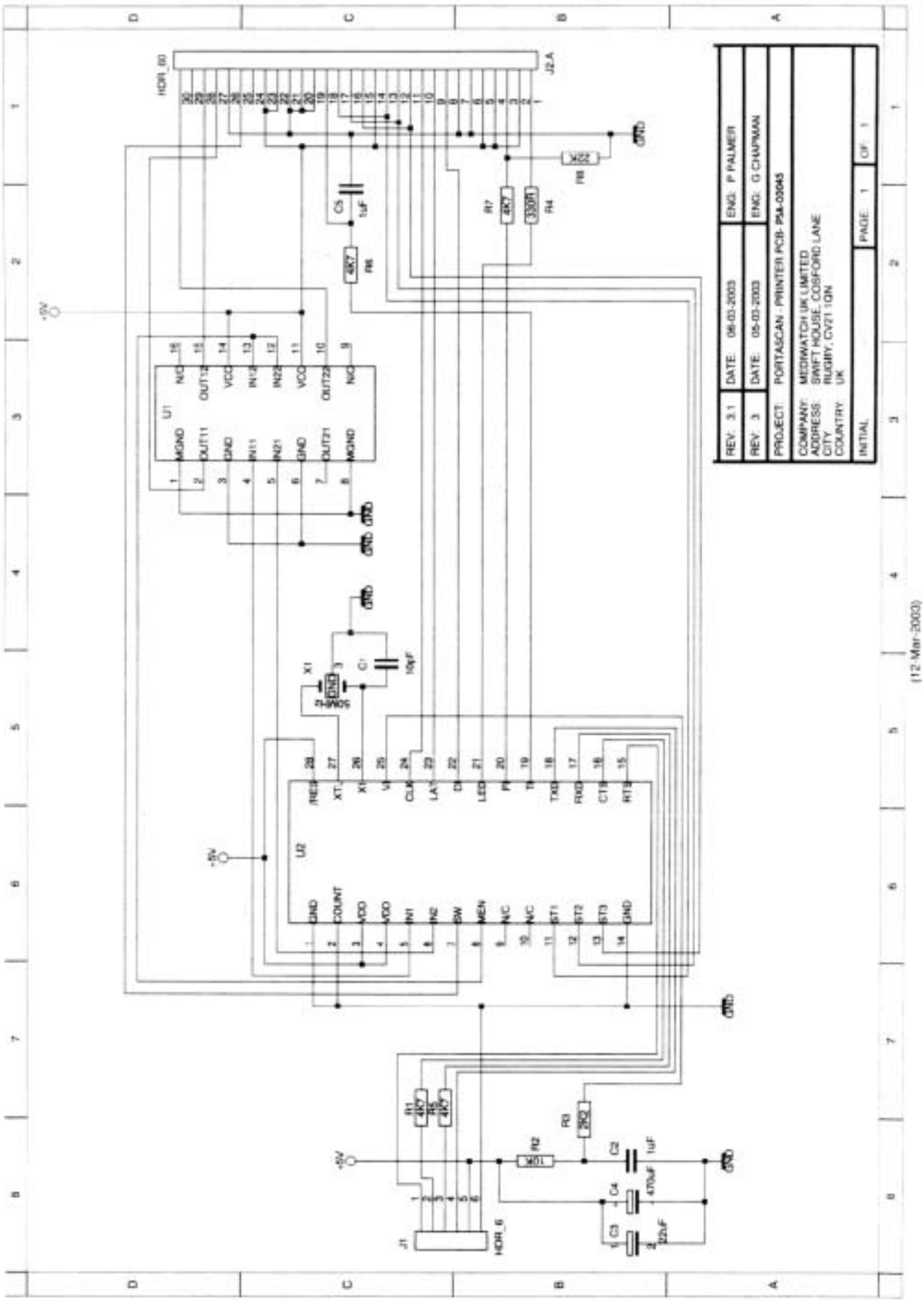
### ESD safe field service

To enable ESD field safe service an ESD field service kit has to be used whenhandling boards.
This ESD field service kit should be connected to a central ground point and the service engineer should be connected to the ESD field service kit through a wrist strap.
Handle boards only on this ESD field service kit and pack in ESD safe packing material.

### More information about ESD precautions

All precautions against ESD damage are described in the CECC 00015/I regulations, composed by the CECC - Cenelec electronic Components Committee.


REV: 3V1
DATE: 12/03/2003
ENG: P. PALMER
REV: 3
DATE: 01/01/2002
ENG: G. C.
PROJECT: Portascan Battery Charger PSA-00052
COMPANY: MEDIWATCH UK LIMITED
ADDRESS: SWIFT HOUSE, COSFORD LANE
CITY: RUGBY
COUNTRY: UK
INITIAL 2002
PAGE: 1
OF: 1
(12-Mar-2003)
CON1
CON2
F1
4A
J2
HDR_3
C7
10uF
D3
MBRS340T3
L1
47uF
D2
MBRS340T3
R8
0R15
Q3
NDT456
Q2
BC849B
Q1
BC858A
X-00026-V3
R7
680R
R6
1K2
C6
1.0uF
C5
22uF
C3
100nF
C4
33pF
U1
REF
V+
DRV
GND
BAT
CO
PGM3
PGM2
VLIMIT
BAT+
PGM0
PGM1
THI
TLO
TEMP
FAST_CHARGE
R2
100K
C2
22nF
R1
100K
R4
39K
C1
1.0uF
D1
MBRS340T3
J1
LED1
GREEN 3mm
R3
1K
R9
1K
R5
470R


REV: 3.1
DATE: 06-03-2003
ENG: P PALMER
REV: 3
DATE: 05-03-2003
ENG: G CHAPMAN
PROJECT: PORTASCAN : PRINTER PCB- P34-0045
COMPANY: MEDIWATCH UK LIMITED
ADDRESS: SWIFT HOUSE, COSFORD LANE
CITY: RUGBY, CV21 1QN
COUNTRY: UK
INITIAL
PAGE: 1
OF: 1
(12-Mar-2003)

## Appendix 1

**Testing of Final Assembly**

Scanner Serial No:
Interface Board Serial No:
Probe Serial No:

| Instructions: | Pass / fail: |
|---|---|
| Insert a charged 'test' battery pack and check that it fits securely. | |
| Ensure that the printer door opens and closes smoothly and that the magnetic latch holds the door securely when the door is closed. | |
| Restrain paper and shake unit and ensure that there are no loose parts inside. | |
| Unplug the probe from the unit by pulling on the release ring on the plug and ensure that there is no damage to the connector on the unit or the probe plug. Plug the probe in and check that it clicks securely in place. | |
| Plug a standard PC keyboard into the appropriate socket on the back of the unit. Switch the unit on by pressing the red power button & wait for the unit to start up.<br>Hold down 'Alt'& 'Shift'& 'Control' then press 'W' very briefly to disable the Interface board watchdog timer. Switch off by pressing the red button and wait for the unit to power down. | |
| Remove the keyboard and switch the unit back on by pressing the red button. Wait for the unit to start up. | |
| Press the display brightness button several times and ensure that the display brightness toggles between its high and low setting. | |
| Press the menu button and check that the menu options are displayed. | |
| Using the "UP", "DOWN" menu buttons select the "Date/Time" option and then press the "SELECT" button. Press the "SELECT" button again to select the "Set Date" option. Check that the correct date is displayed. If the incorrect date is displayed then set the correct date by using the "UP", "DOWN" and "TAB" menu buttons and lock the setting by pressing the "SELECT" button. | |
| Press the menu button. Using the "UP", "DOWN" menu buttons select the "Date/Time" option and then press the "SELECT" button. Press the "DOWN" button and then the "SELECT" button to select the "Set Time" option. Check that the correct time is displayed. If the incorrect time is displayed then set the correct time by using the "UP", "DOWN" and "TAB" menu buttons and lock the setting by pressing the "SELECT" button. | |
| Press the menu button. Using the "UP", "DOWN" menu buttons select the "Set Probe Frequency" option and then press the "SELECT" button. Press the "DOWN" button and then the "SELECT" button to select the "5Mhz" option. The unit will switch to 5Mhz operation and "5Mhz" will be displayed at the top of the display. | |
| Press the green button to start scanning.<br>Align the probe on a phantom bladder so the largest section of the phantom can be seen on the display. Press the magnification button repeatedly so that the unit cycles through all levels of magnification then set the magnification so that the phantom fills the display but does not overlap the edges of the scan sector. | |
| Press the green scan button to record the reading. Check that the reading is within tolerance (+ or - 10% of indicated phantom volume). | |
| Press the print button to obtain a hard copy of the result. | |
| Press the sagittal scan button and rotate the probe 90 degrees from the position of the first scan and obtain the largest section and press the sagittal scan button again to obtain the reading. | |

## Appendix 1

**Testing of Final Assembly** - continued

| Instructions: | Pass / fail: |
|---|---|
| Press the print button to obtain a hard copy of the result. | |
| Press the menu button. Using the "UP", "DOWN" menu buttons select the "Set Probe Frequency" option and then press the "SELECT" button. Press the "DOWN" button and then the "SELECT" button to select the "3.5Mhz" option. The unit will switch to 3.5Mhz operation and "3.5Mhz" will be displayed at the top of the display. | |
| Press the green button to start scanning.<br>Align the probe on a phantom bladder so the largest section of the phantom can be seen on the display. Press the magnification button repeatedly so that the unit cycles through all levels of magnification then set the magnification so that the phantom fills the display but dose not overlap the edges of the scan sector. | |
| Press the print button to obtain a hard copy of the result. | |
| Press the sagittal scan button and rotate the probe 90 degrees from the position of the first scan and obtain the largest section and press the sagittal scan button again to obtain the reading. | |
| Press the print button to obtain a hard copy of the result. | |
| On the printed results record in the field "Patient Name" the serial number of the unit that is being inspected. | |
| Open the printer door and raise the print head and remove the paper. Feed the paper back into the printer until the end appears from the front paper slot and re-engage the print head. | |
| Press the print button. The last recorded image should be printed. | |
| Leave the unit sitting for 5 minutes in which time the display should have shut down. (If the unit is left for longer than 7 minutes the unit will switch off and the test will need to be repeated in order to proceed to the next step). | |
| Press any function button to reactivate the display. | |
| Press the red power button. The unit will now shutdown and switch off. Remove the battery pack. Fit the top cover with protective polythene. | |
| Ensure that the top cover opens and closes smoothly and that the latch holds the cover securely in place when closed. Ensure that the friction latch holds it from falling forward when fully opened. | |
| Check that the Power drawn by the Battery when the unit is powered down is less than 10mA. | |

This Bladder scanner has PASSED/FAILED the above Test Procedure.

(Delete as appropriate)

Signed: _____. Date: ____/____/_____

Visit us online at:
www.gehealthcare.com

©2005 General Electric
Company
All Rights Reserved

GE and GE Monogram are
trademarksof General Electric
Company.

GE Medical Systems, a General
Electric company, going to
market as GE Healthcare.

Windows CE™ is either a
registered Trade Mark or a Trade
Mark of Microsoft Corporation in
the United States and/or other
countries.

General Electric Company
reserves the right to make
changes in specifications and
features shown herein, or
discontinue the product
described at any time without
notice or obligation.

Portascan manufactured by:

Mediwatch (UK) Ltd.
Swift House
Cosford Lane
Rugby
Warwickshire
CV21 1QN

For more than 100 years, scientists and industry leaders have relied on General Electric for technology, services and productivity solutions. So no matter what challenges your healthcare system faces – you can always count on GE to help deliver the highest quality services and support.

For details, please contact your GE Service Sales Team.

GE Healthcare
Building 4B, 21 South Street
Rydalmere, NSW 2116
Australia

Phone: 1800 223 615

www.gehealthcare.com

imagination at work