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***COMPUTING  
SURFACE  
MAINTENANCE  
MANUAL***

***meiko***

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*This manual was written, designed and produced by Vardas, Bristol, UK.*

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<i>1</i>	<i>M60E ENCLOSURE MAINTENANCE MANUAL</i>
<i>2</i>	<i>M40 CHASSIS MAINTENANCE MANUAL</i>
<i>3</i>	<i>M10 CHASSIS MAINTENANCE MANUAL</i>
<i>4</i>	<i>DESK TOP UNIT MAINTENANCE MANUAL</i>

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*C o m p u t i n g*  
*S u r f a c e*

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***M60E ENCLOSURE  
MAINTENANCE  
MANUAL***

***meiko***



## ***GENERAL MAINTENANCE ON THE M60E***

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This chapter describes the unpacking of an M60E enclosure, and maintenance of objects in the enclosure (subject to technical modifications).

It covers:

- 1 Unpacking the M60E.
- 2 Getting access to the disk tray.
- 3 Changing devices in the disk tray.
- 4 Changing power supply devices in the disk tray.
- 5 Changing fuses.
- 6 Changing the tangential fan filter.
- 7 Changing the tangential fan.
- 8 Changing the overhead fans.
- 9 Electrical and mechanical specifications.

Information about unpacking M10E and M40E Modules can be found in the **Hardware Reference Manual**. Information about M10 and M40 chassis maintenance can be found in the appropriate maintenance manual.

## 1.1 ***WIRING CONVENTIONS***

The following wiring conventions are used throughout the M60E enclosure:

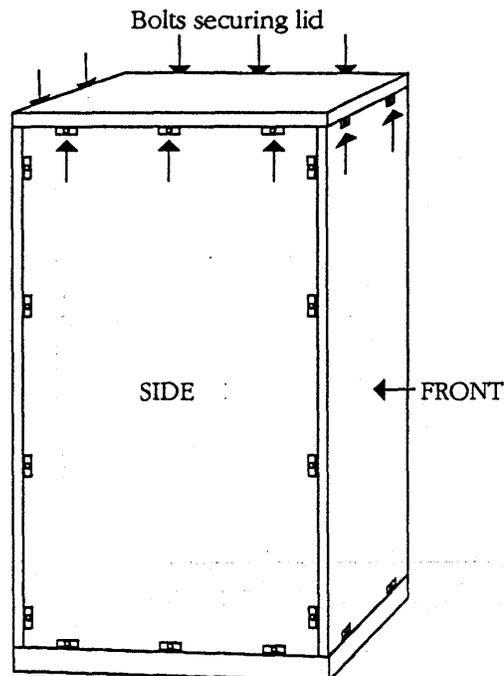
<b>Colour</b>	<b>Voltage</b>
Red	+5V
Black	0V (Gnd)
White	-5.2V
Grey	-12V
Violet	+12V

## 1.2 UNPACKING THE M60E ENCLOSURE

The M60E is packed in a wooden crate. The top of the M60E is shipped in the front door of the crate.

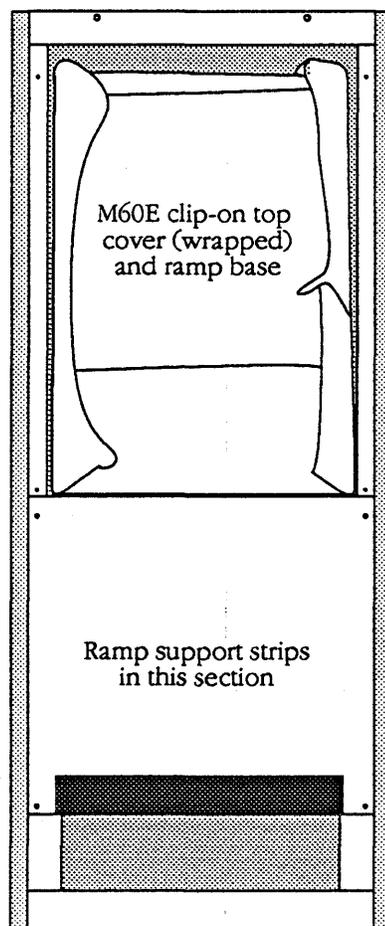
- ◆ Undo the 10 screws holding the lid on the crate and take off the lid.
- ◆ Remove the four bolts on each side, and the two bolts at the base of the front door and remove it. Keep the front door containing lid and ramp strips.
- ◆ Remove the four bolts at the side and the three bolts at the base of one of the crate sides. Remove the side.

FIG. 1.1 BOLTS SECURING LID

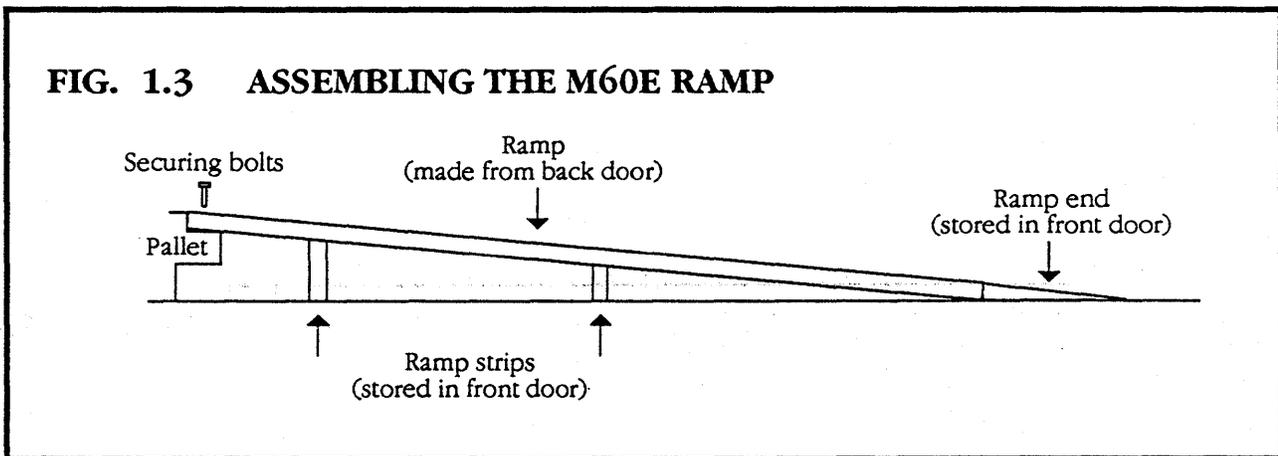


- ◆ Remove the remaining bolts on the base and lift off the remaining L-piece (made up of the back and side).
- ◆ Remove the upper inside cover of the case's front door and take out the top of the M60E.

**FIG. 1.2 CONTENTS OF CASE FRONT DOOR**



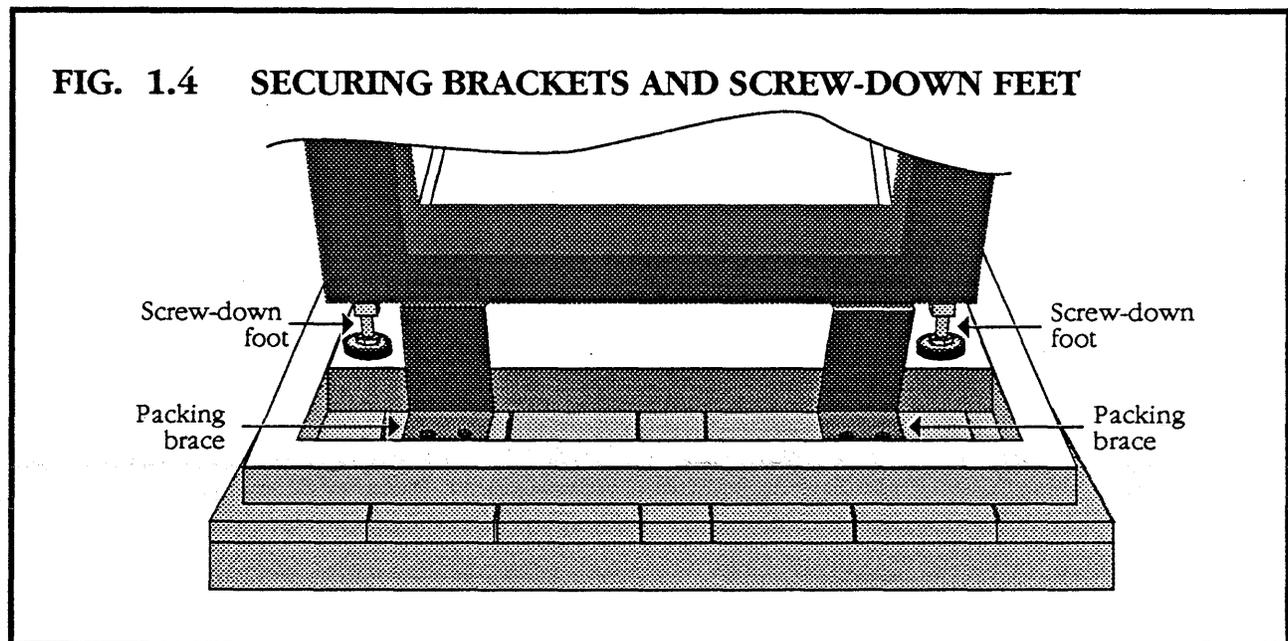
- ◆ Remove the lower inside cover of the front door and take out the two ramp braces, and the ramp end.
- ◆ Unbolt the back door from the L-piece to use as the ramp.
- ◆ Assemble the ramp. The bolts needed are in a small plastic bag by the back feet of the M60E.



- ◆ Use a 13mm spanner to take off the two brackets which hold the M60E to the back of the pallet.
- ◆ Attach the ramp to the front of the pallet that the M60E is on. (This is the opposite side to the side that the brackets were on).
- ◆ Screw the four feet at the bottom of the enclosure up as far as they will go, using a 12mm spanner.



**Make sure that you screw the feet up evenly, otherwise the M60E will become unstable. It is very heavy, and could be dangerous.**



- ◆ Two or more people can now slide the M60E gently down the ramp.
- ◆ Wheel the M60E into position, and screw down the four screw-down feet evenly.
- ◆ Clip the lid on top of the M60E.

### 1.3 **PERIPHERAL DEVICES**

Peripheral devices such as disks and tape drives are contained within a 19" disk tray on the M60E. They may be replaced by a qualified service engineer.

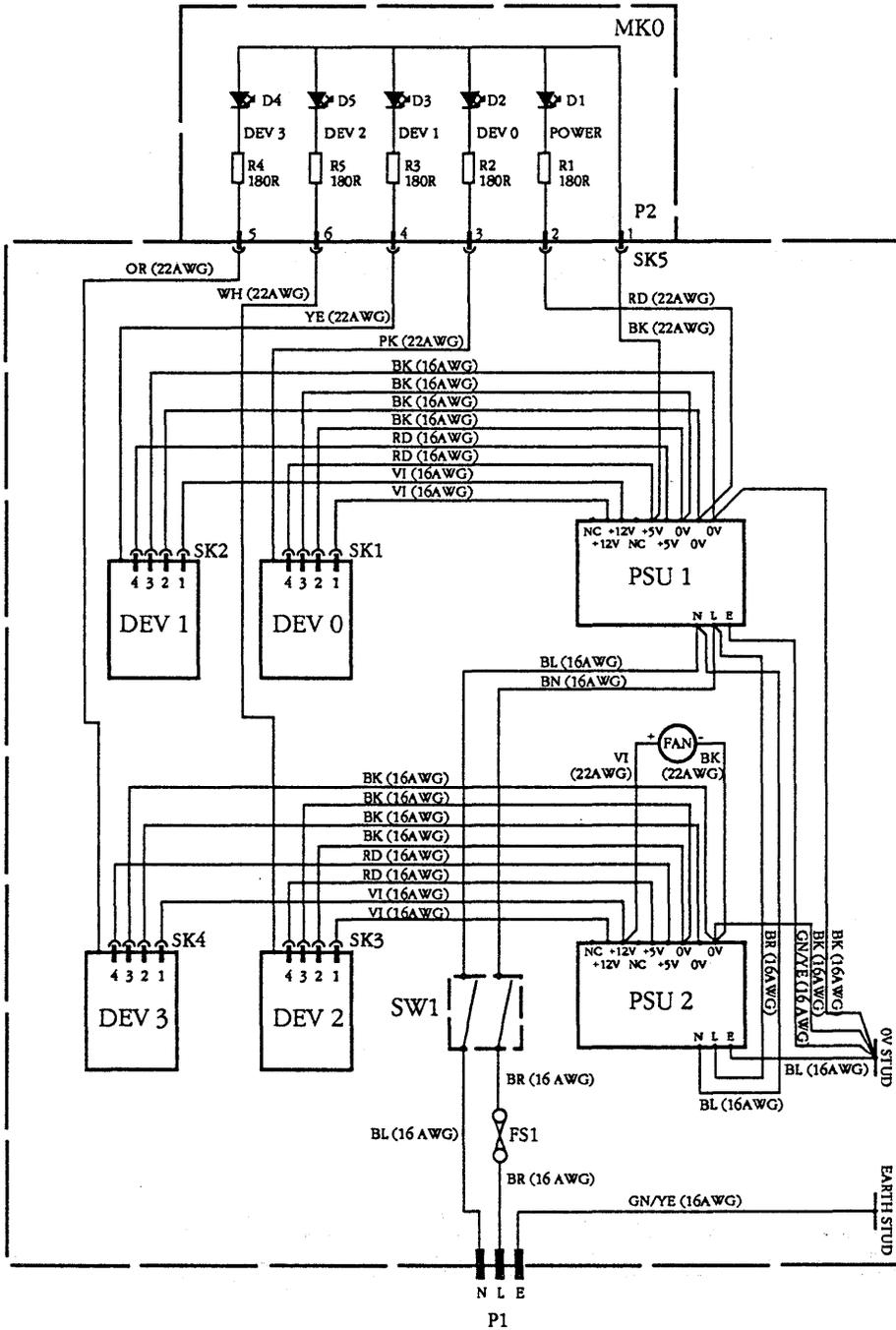


**For continued safety of operation, all parts used should be of the type and value recommended by Meiko.**



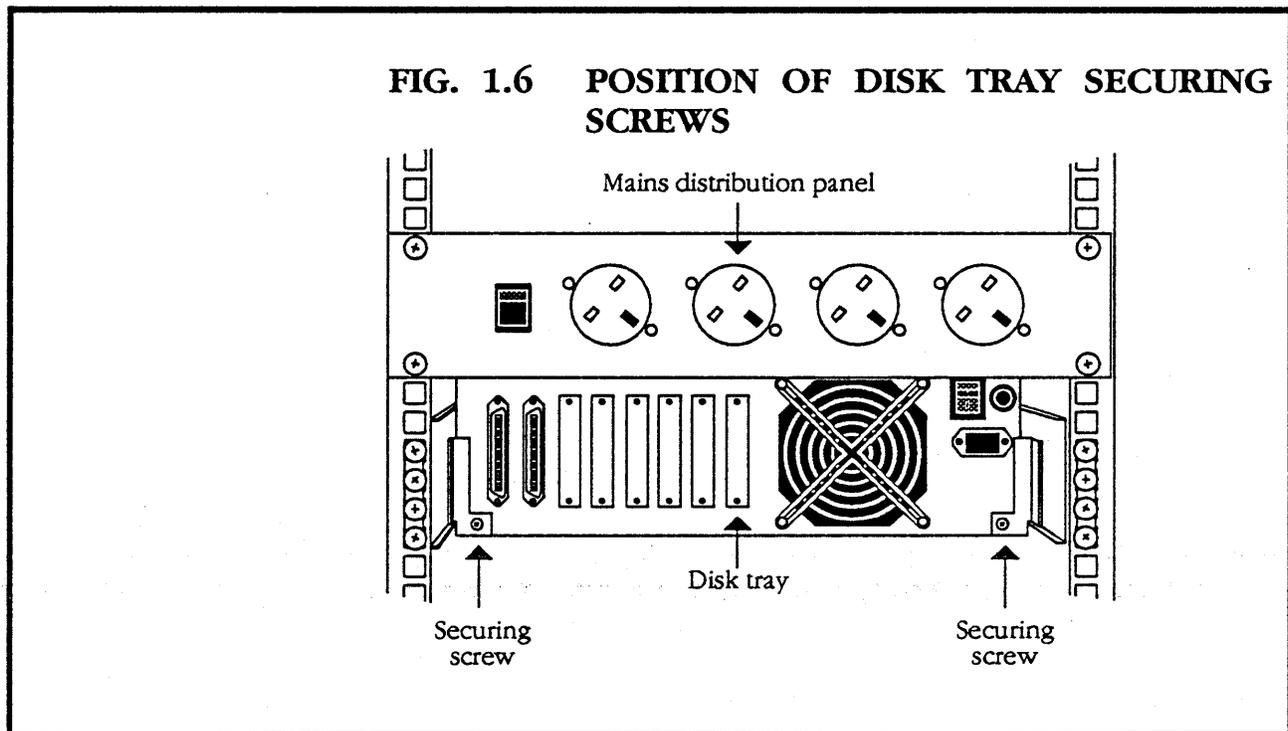
**Please observe static precautions when dealing with static sensitive objects.**

FIG. 1.5 Power supply tray – wiring diagram



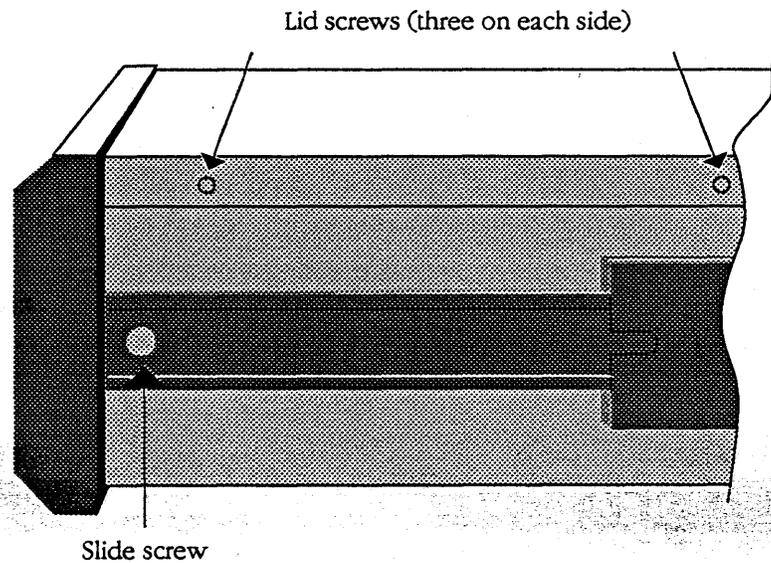
### 1.3.1 REMOVING THE DISK TRAY

- ◆ Isolate the M60E enclosure from the mains.
- ◆ Open the back door of the M60E.
- ◆ Unplug the mains plug from the rear of the disk tray.
- ◆ Remove the two screws securing the back of the disk tray to the back stop.



- ◆ Push the disk tray towards the front of the enclosure. Go round to the front of the machine and pull it forward.
- ◆ Undo and remove the screws securing the disk tray to the slides.
- ◆ Pull the disk tray out and place it on a level surface.
- ◆ Remove the six screws holding the lid on the disk tray, and take off the lid.

**FIG. 1.7 POSITION OF SLIDE SECURING SCREW**

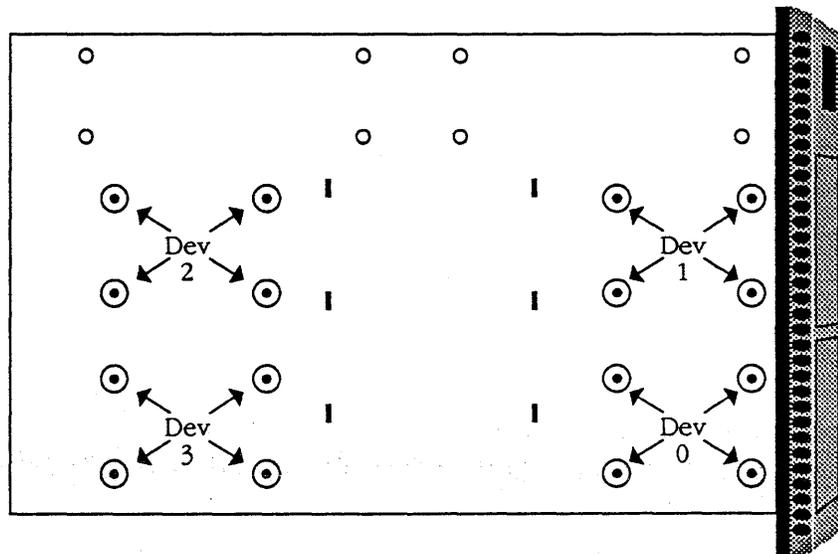


### 1.3.2 CHANGING DEVICES

The disk and tape devices are held in cradles within the disk tray.

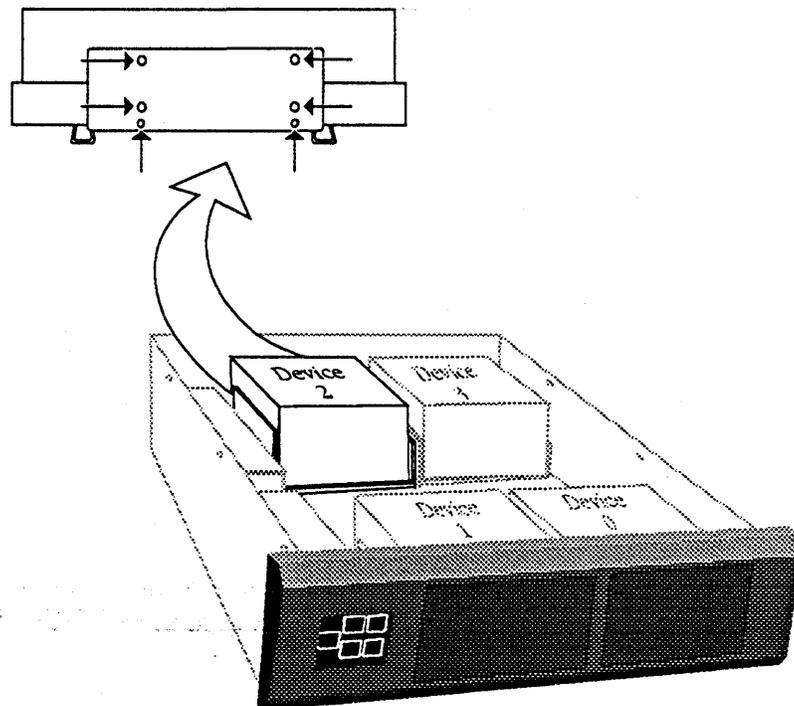
- ◆ Remove and open the disk tray as described in section 1.3.1.
- ◆ Unplug the 50-way SCSI cable and the power supply connector from the device to be changed.
- ◆ Put the disk tray on its side and undo the four screws holding the appropriate cradle in place, and lift out the cradle and device.

FIG. 1.8 THE CRADLE SECURING SCREWS



- ◆ Remove the four screws (two on each side) which hold the device in the cradle. These screws will be in different places, depending on the type of device.
- ◆ Put a new device in the cradle and secure it in place.
- ◆ Fix the cradle in the disk tray.
- ◆ Reconnect the SCSI and power supply to the device.

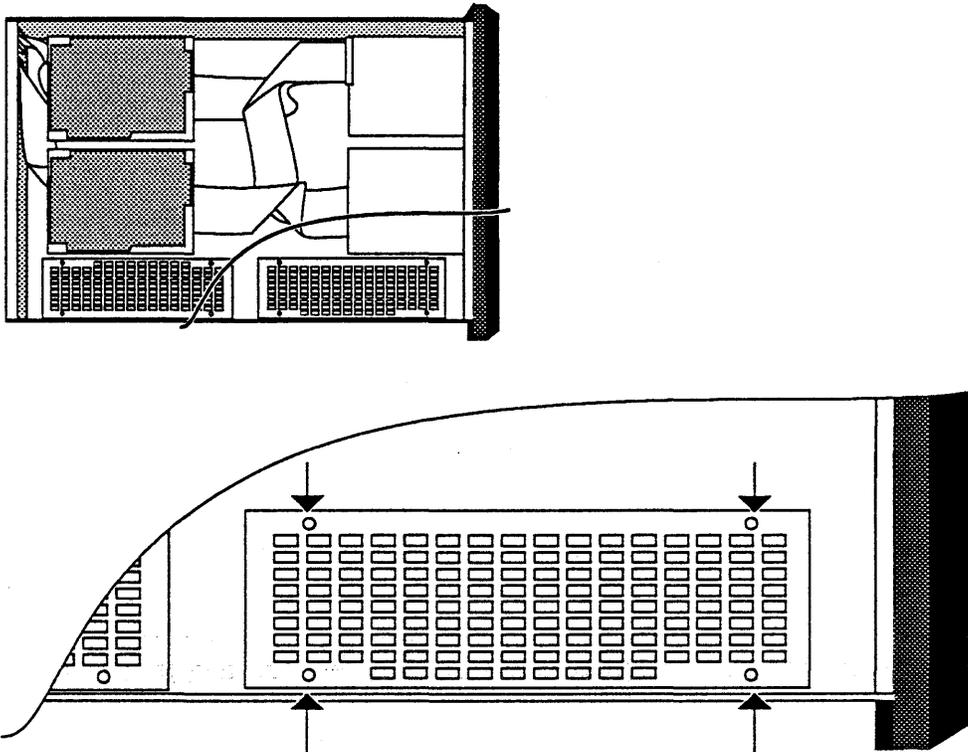
**FIG. 1.9 POSSIBLE POSITIONS FOR DEVICE SECURING SCREWS**



## 1.4 CHANGING ONE OF THE POWER SUPPLY ASSEMBLIES

- ◆ Take the disk tray out of the enclosure and open it (see section 1.3.1).
- ◆ Undo the four screws holding the lid on the power supply cage which you want to change.
- ◆ Undo the earth, live and neutral leads from the right hand end of the power supply cage, and the internal wiring leads from the left-hand end of the cage.

FIG. 1.10 TAKING THE LID OFF THE POWER SUPPLY CAGE

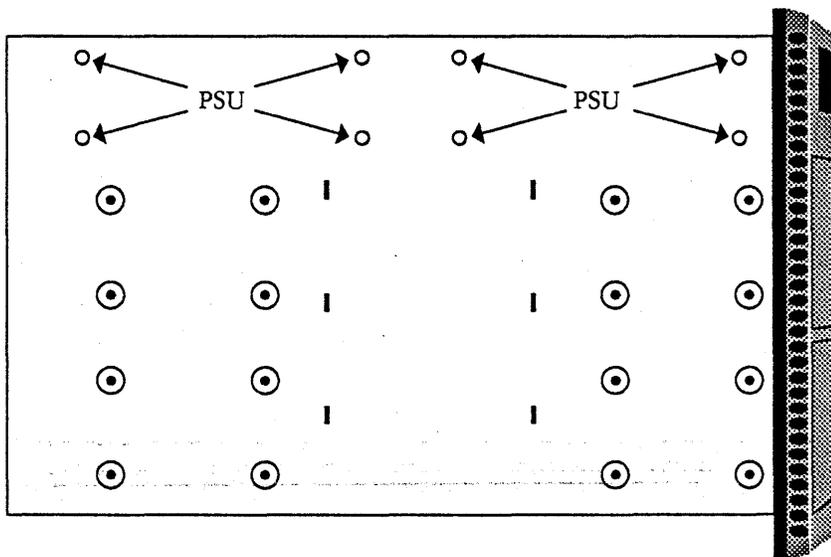


- ◆ Turn the disk tray on its side and undo the four securing screws which hold the power supply unit in place. Lift out the unit.
- ◆ Replace with a new power supply unit from Meiko.
- ◆ Put the disk tray the right way up, and take the lid off the power supply unit to give access to the terminals. Reconnect all leads to the power supply unit.



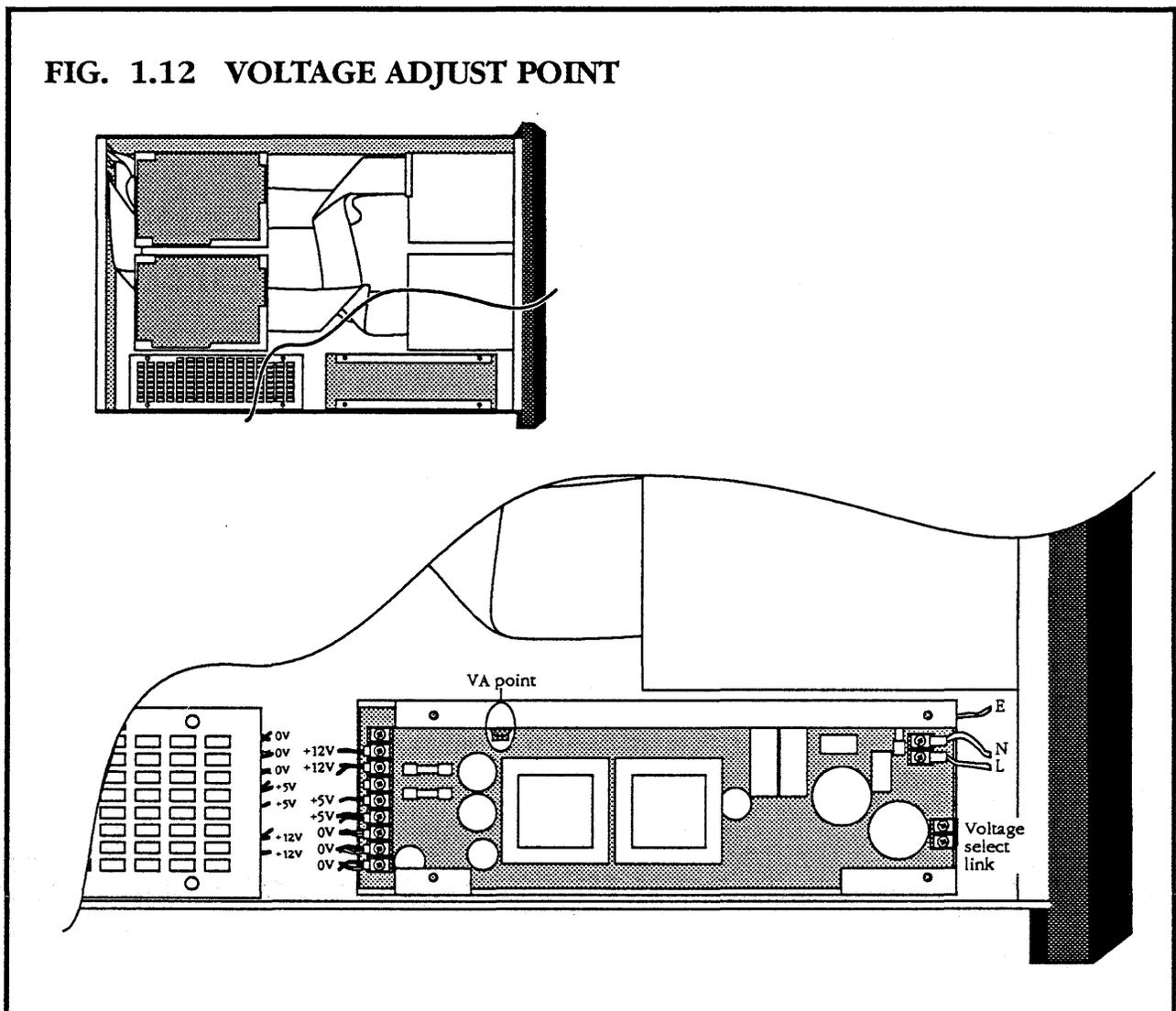
**Disconnect the disk/tape units from the power supply.**

**FIG. 1.11 POSITION OF POWER SUPPLY SECURING SCREWS**



- ◆ Power up the unit and place a voltmeter across the 0V and +5V terminals.
- ◆ Adjust the VA point until the voltmeter reads 5V.
- ◆ Power off the unit and reconnect the disk/tape units.

**FIG. 1.12 VOLTAGE ADJUST POINT**



- ◆ Recheck the +5V on the voltmeter.
- ◆ Place the voltmeter across the 0V and 12V terminals. and check it reads 12V (If not, the PSU may be faulty)
- ◆ Replace the lid.

## 1.5 **CHANGING FUSES**

When you change a fuse, make sure that you know the cause of the fuse blowing.

External mains input fuse    1  $\frac{1}{4}$ " 5A at 240V

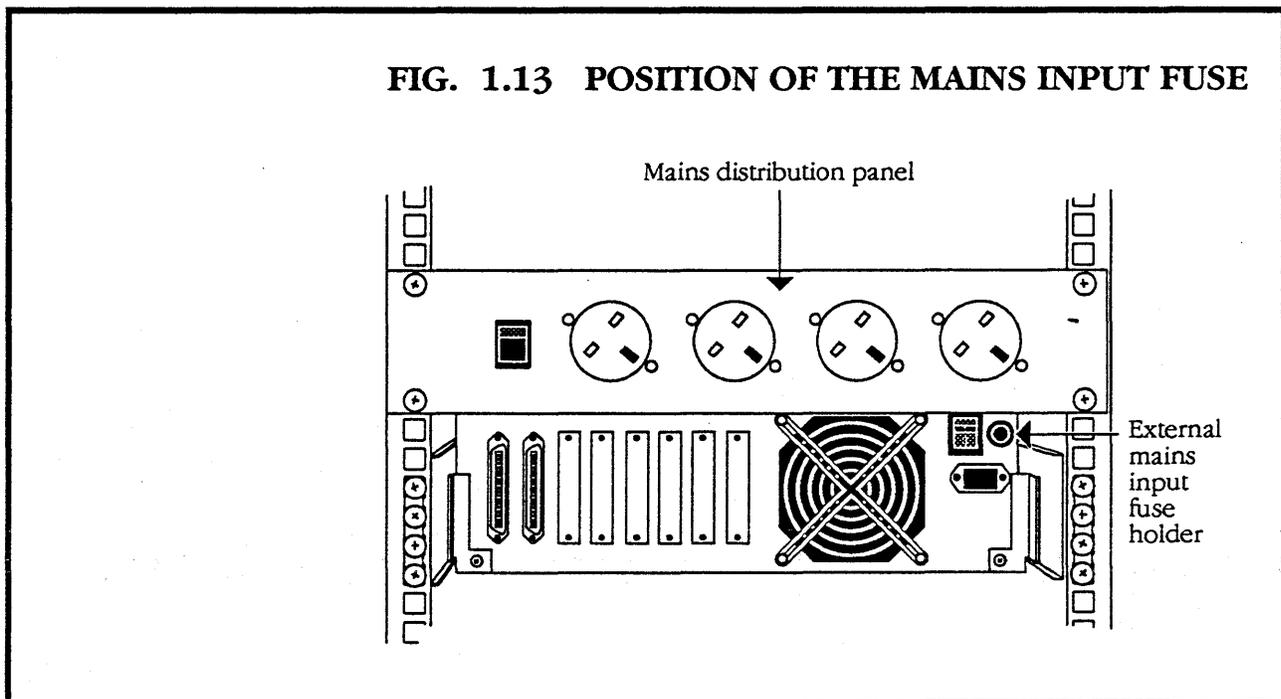
### **Power supply unit**

Internal mains input fuse    5A HRC    FS1

Internal 12V fuses            6.3A AT    FS3 and FS4

### 1.5.1 *CHANGING THE EXTERNAL MAINS INPUT FUSE*

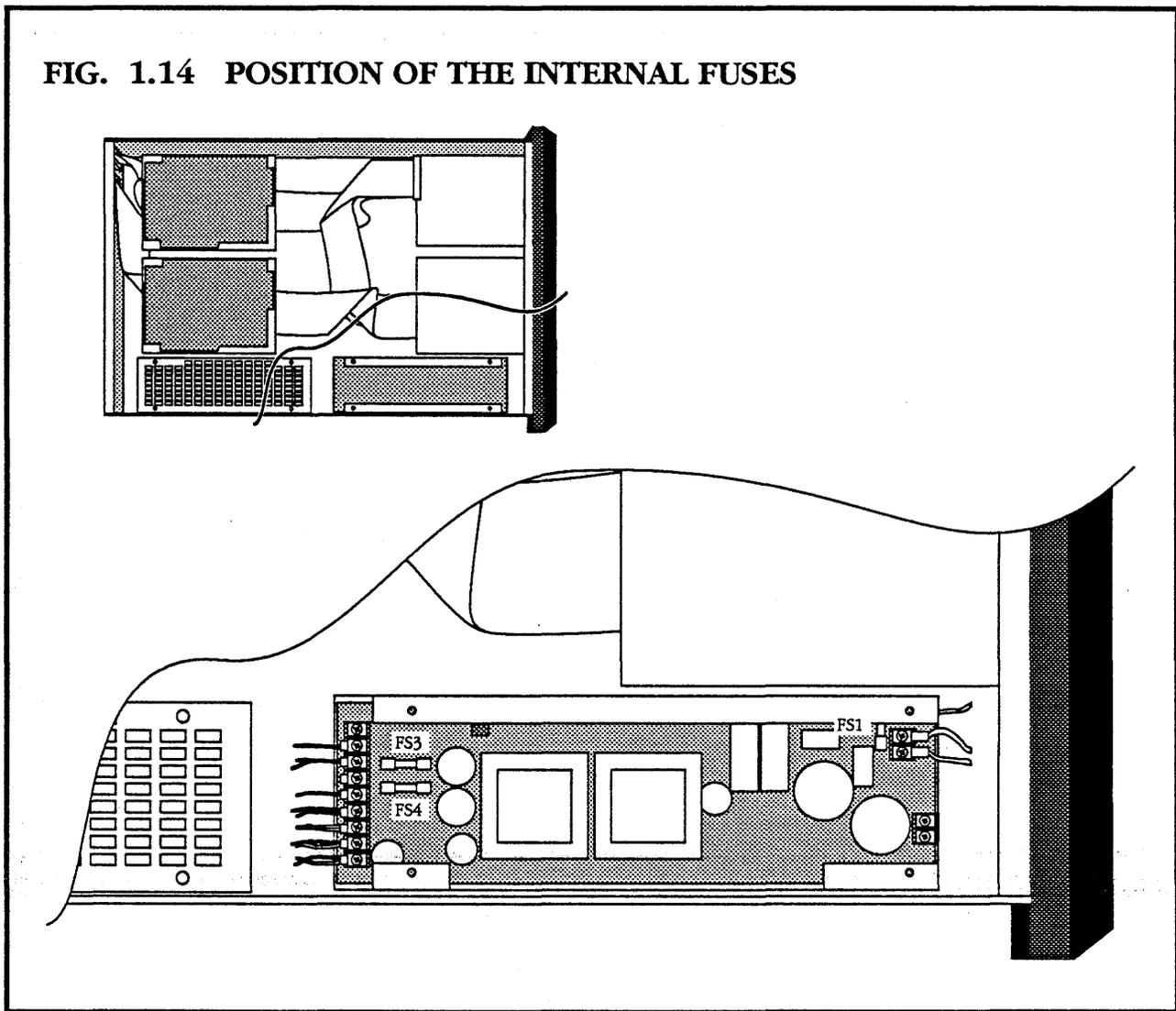
- ◆ Ensure that the disk tray is isolated from the mains.
- ◆ Pull out the mains input fuse holder.
- ◆ Replace the fuse with one of identical type and value.



### 1.5.2 *CHANGING THE INTERNAL FUSES*

- ◆ Take the disk tray out of the enclosure and open it as described in section 1.3.1.
- ◆ Undo the four securing screws holding the lid on the power supply cage (shown in fig. 1.10).
- ◆ Change the fuse for one of identical type and value.

FIG. 1.14 POSITION OF THE INTERNAL FUSES

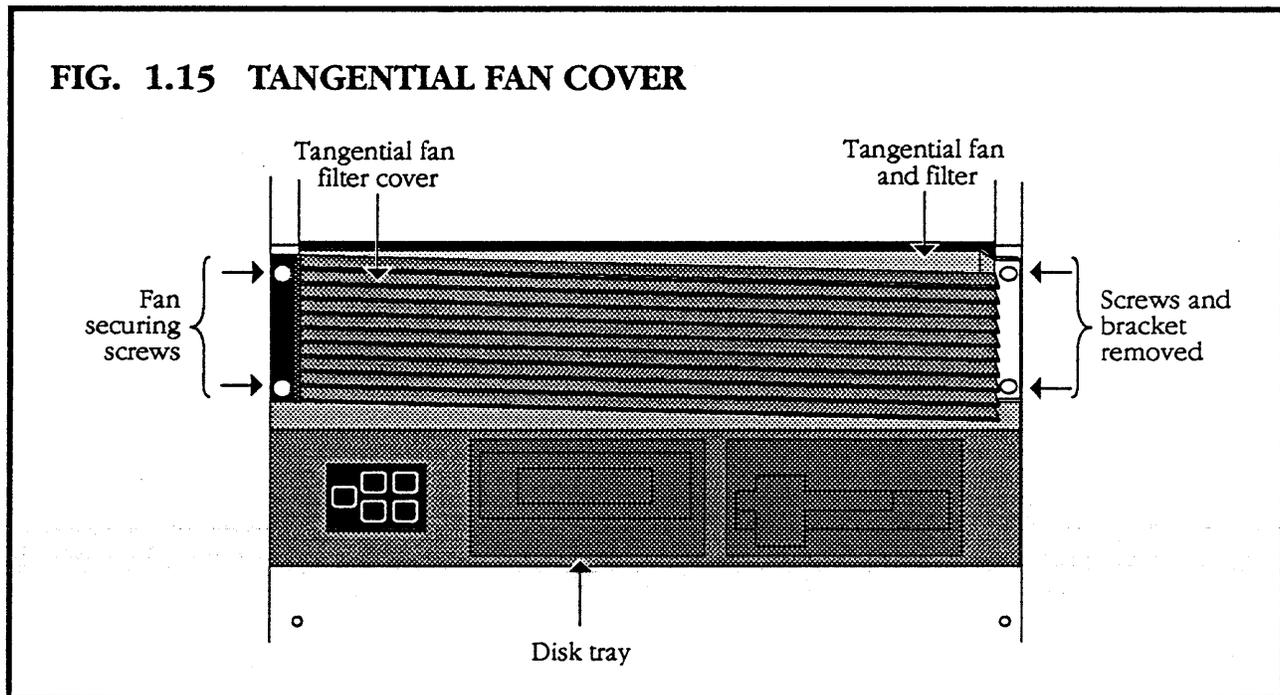


## 1.6 FANS AND FILTERS

### 1.6.1 CHANGING THE M60E TANGENTIAL FAN FILTER

There is a tangential fan in the M60E, which increases the air flow through the power supply. This fan must be operated with a filter fitted. The filter should be changed regularly.

- ◆ Isolate the mains. This fan is powered from the mains distribution panel on the front of the M60E.
- ◆ Remove the two right-hand corner screws on the tangential fan cover and lift off the bracket.
- ◆ Move the filter cover out of the left-hand bracket, and lift out the filter.

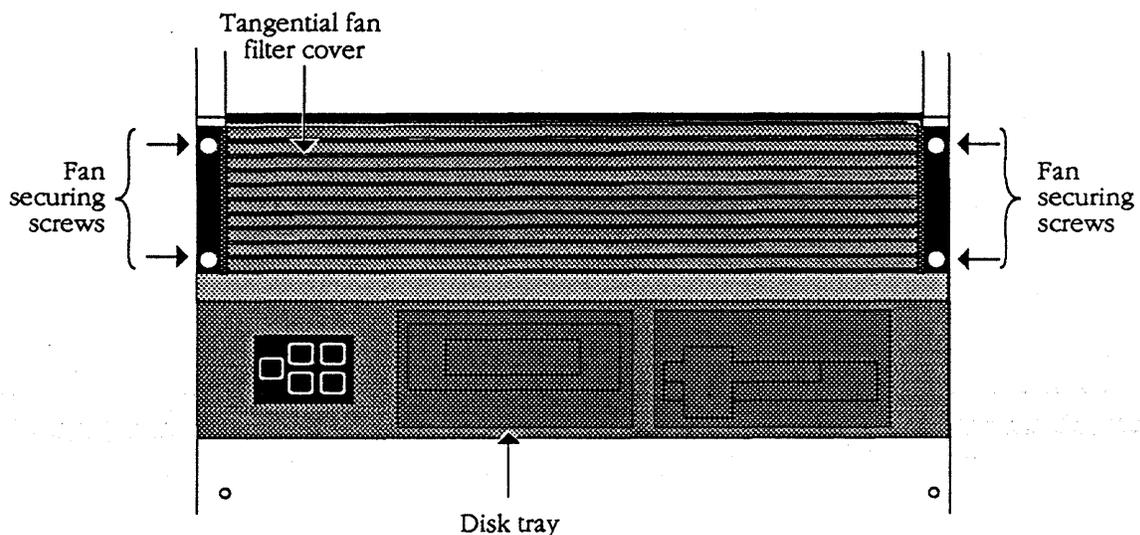


- ◆ Replace with a new filter from Meiko.

### 1.6.2 *CHANGING THE TANGENTIAL FAN*

- ◆ Remove the four screws holding the tangential fan and filter cover in place.
- ◆ Lift out the filter cover and tangential fan.
- ◆ Replace with a new fan from Meiko.

**FIG. 1.16 TANGENTIAL FAN SECURING SCREWS**

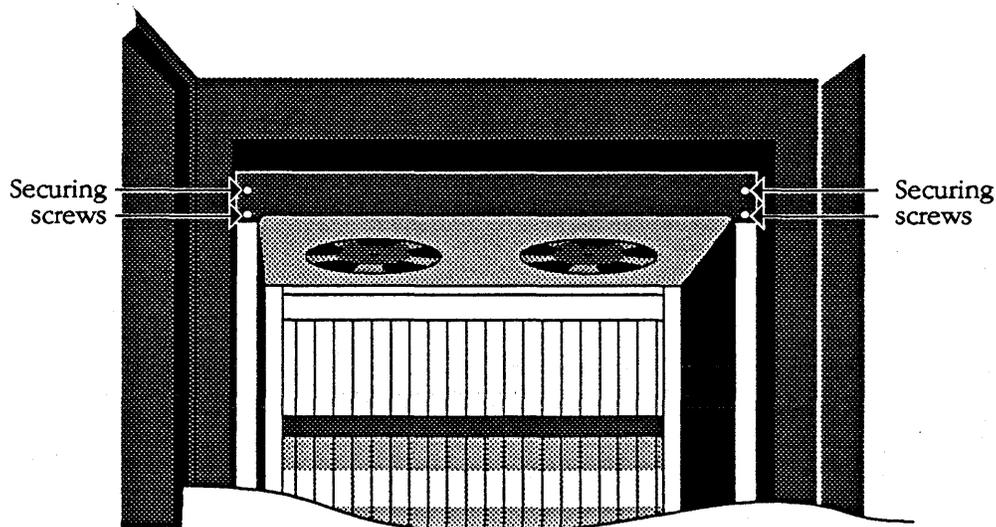


### 1.6.3 *CHANGING THE OVERHEAD FANS*

There are two overhead fans at the back of the M60E enclosure.

- ◆ Disconnect the fan power plug from the mains distribution panel.
- ◆ Undo the four screws holding the fan unit in place.
- ◆ Lift the fan unit off the lip at back of the enclosure, and pull it out.
- ◆ Remove the four corner screws securing the fan.
- ◆ Disconnect the wires from the fan power supply terminals.
- ◆ Lift the fan off the fixing studs.
- ◆ Replace with a new fan from Meiko.

**FIG. 1.17 SCREWS SECURING FAN UNIT**



## 1.7 ELECTRICAL AND MECHANICAL SPECIFICATIONS

### M60E

Input voltage	180 – 260V
Input frequency	47 – 63Hz
Maximum power in <sup>1</sup>	3500W (M40 only)
Maximum heat output <sup>1</sup>	11940 Btu/hour
Maximum input current r.m.s.	25A
Size of M60E enclosure	1880mm x 970mm x 700mm
Mass of M40 Module in M60E <sup>2</sup>	240Kg
Shipping weight M40/M60E <sup>2</sup>	330Kg
Maximum tip angle	12°(worst case)

### 19" Disk Tray

Input current at 240V	4A
Input frequency	47 – 63Hz
Maximum power in	560W
Maximum heat output	1365 Btu/Hour
Size	425mm x 132mm x 700mm
Mass	30Kg

### M60E and Disk Tray

Operating ambient	10-50°C
Operating altitude	0-2100m
Operating humidity	8% to 80% non-condensing

### PSU Details

2 off 200W 240V/110V  
2 O/P 5V at 15A each  
4 O/P 12V at 5A each

### NOTES:

- 1 This is an absolute worst case power consumption, assuming that the enclosure contains an M40 chassis configured to draw the maximum power supply currents at worst case input voltage, and no peripherals.

- 2 Mass including an empty M40 chassis. Add 1 Kg per board for given configuration and the mass of any installed peripherals.

The mains distribution unit requires a separate 13A supply. A 30A supply is recommended for the M40 chassis.



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***M40 CHASSIS  
MAINTENANCE  
MANUAL***

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# GENERAL MAINTENANCE ON THE M40 MK2

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This manual describes maintenance for the M40 MK2 chassis (subject to technical modifications).

It covers:

- 1 Changing fuses.
- 2 Changing fuse holders and inlet connectors.
- 3 Changing switch assemblies and meters.
- 4 Changing the power supply.
- 5 Calibrating the MK034 power supply board.
- 6 Changing fans, fan filters and sensors.
- 7 Removing the M40 chassis from an M40E or M60E enclosure.

The following topics (which are not covered here) are covered in the **Hardware Reference Manual**.

- 1 Unpacking of an M40 chassis shipped in an M40E enclosure.
- 2 The M40E enclosure.
- 3 The card cage.
- 4 Installing boards in the card cage.
- 5 Installing I/O assemblies.
- 6 Manually configuring links.
- 7 Cooling.

Unpacking an M40 chassis shipped in an M60E enclosure and information about the M60E enclosure is covered in the **M60E Enclosure Maintenance Manual**.

## 1.1 **WIRING CONVENTIONS**

The following wiring conventions are used throughout the M40 MK2 Computing Surface.

<b>Colour</b>	<b>Voltage</b>
Red	+5V
Black	0V (Gnd)
White	-5.2V
Grey	-12V
Violet	+12V

## 1.2 **CHANGING THE POWER SUPPLY AND ASSOCIATED ITEMS**

The power supply on the M40 is contained in a power supply tray below the card cage. The following items are contained in it, and may be replaced by a qualified service engineer.

- 1 1 x A1500 power supply.
- 2 1 x P1000 power supply.
- 3 4 x fuses.
- 4 1 x MK034 board.
- 5 1 x ON/OFF circuit breaker.
- 6 1 x mains inlet.
- 7 1 set of BCD switches.



After any removal or adjustment of the power supply, MK034 or the bus bars carrying the power supply inputs, the MK034 must be recalibrated.

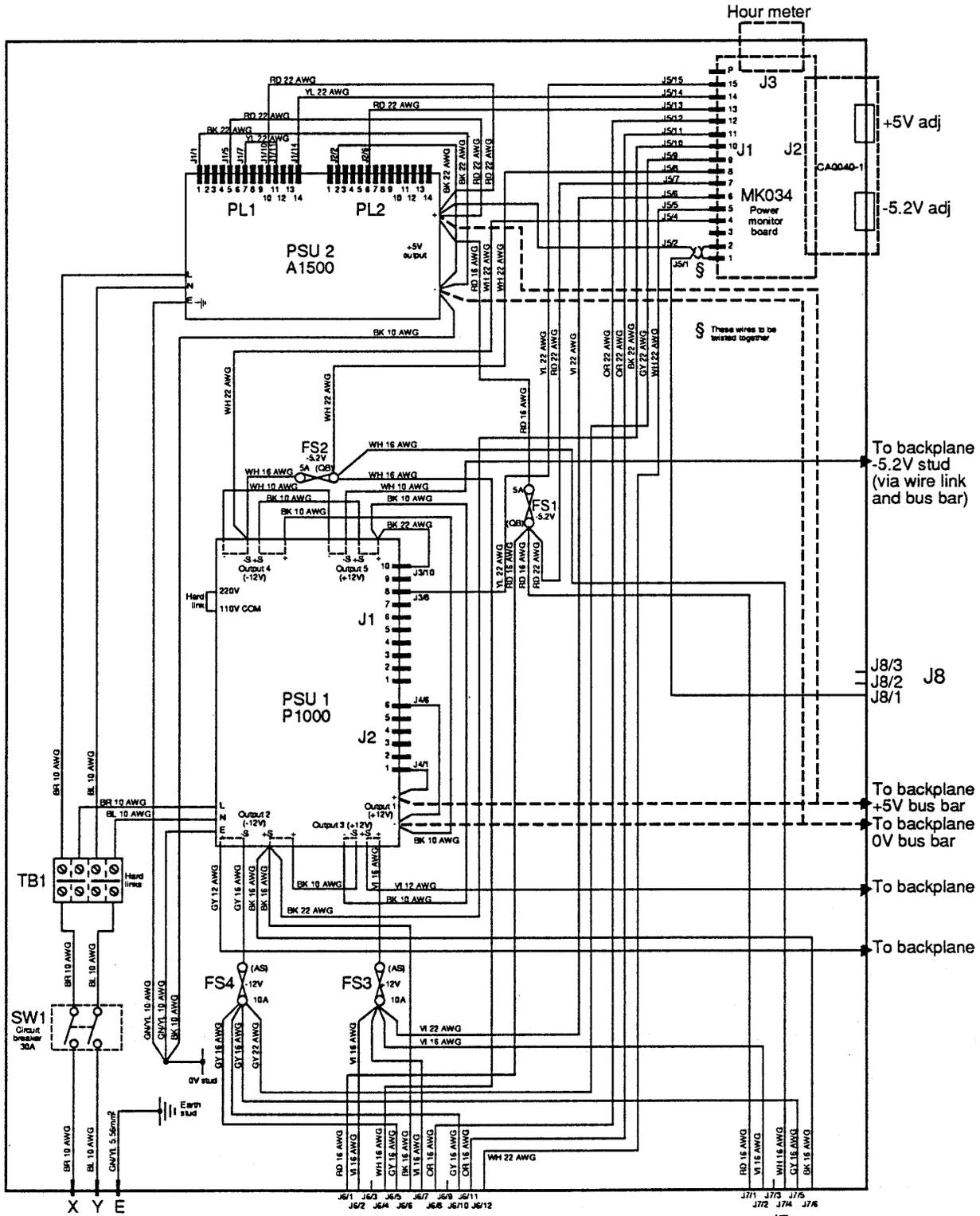


For continued safety of operation, all parts used should be of the type and value recommended by Meiko Ltd.



Please observe static precautions when dealing with static sensitive objects

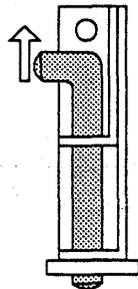
FIG. 1.1 Power supply tray wiring diagram



### 1.3 ***EXPOSING THE POWER SUPPLY TRAY***

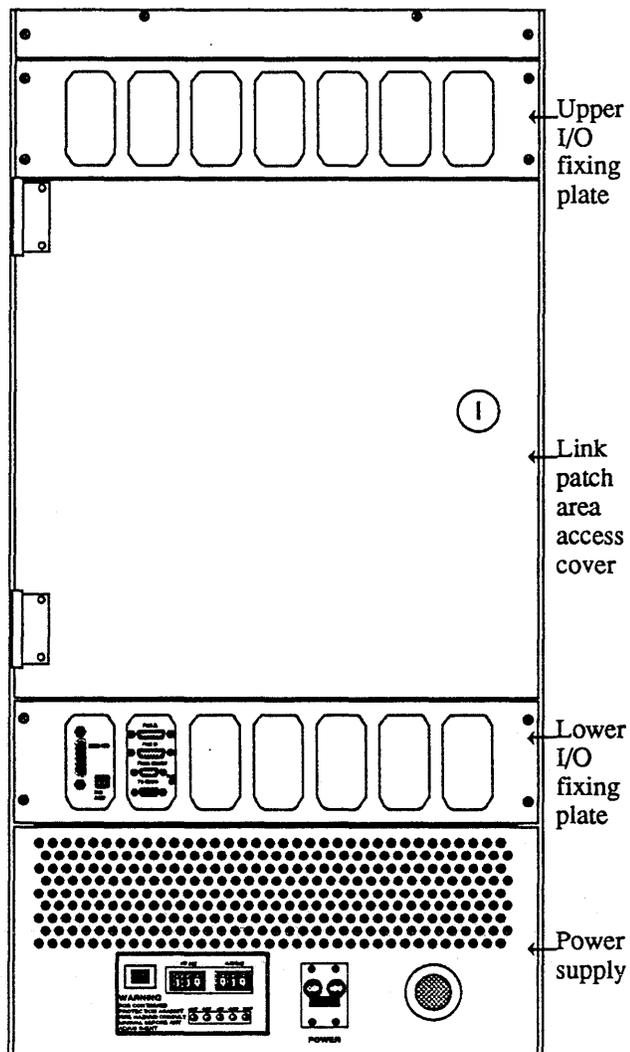
- ◆ Isolate from the mains.
- ◆ Disconnect all external peripherals attached to the M40.
- ◆ Lift two of the hinge-pins on the back door of the enclosure, move the door so the pins cannot spring back, and then lift the other hinge pin(s). Remove the freed door.

**FIG. 1.2 M40E/M60E ENCLOSURE HINGE**



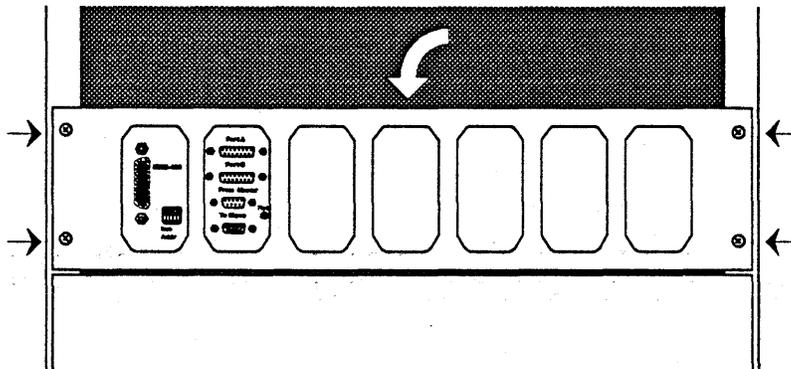
- ◆ Open the link patch area access cover.
- ◆ Remove the cover by lifting it out of its hinges.

FIG. 1.3 REAR VIEW OF AN M40



- ◆ Remove the four screws that hold the lower I/O fixing plate in position.

**FIG. 1.4 REMOVING THE M40 I/O FIXING PLATE**

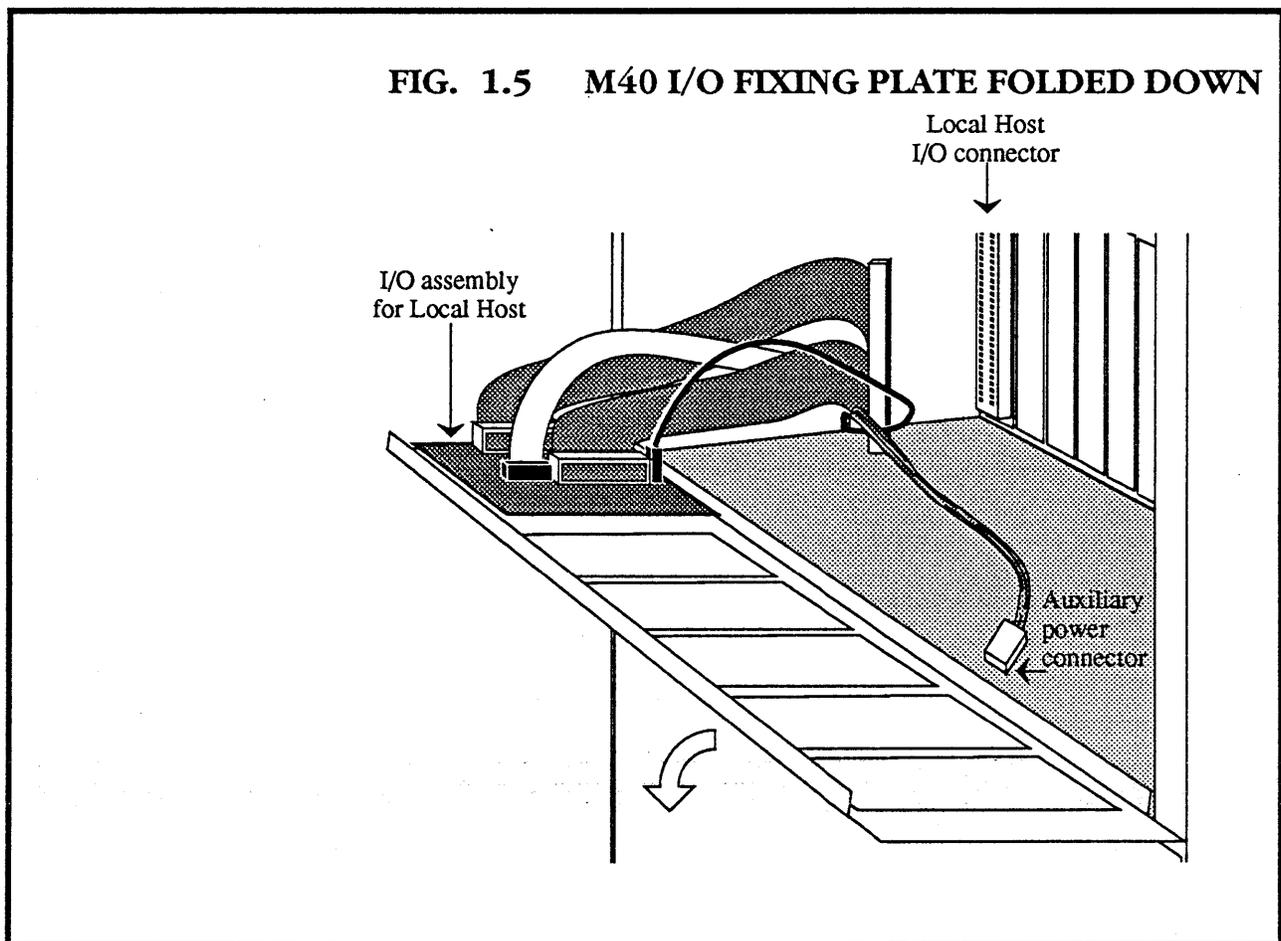


- ◆ Fold down the lower I/O fixing plate, and unplug any cables which connect between the fixing plate, and existing boards.



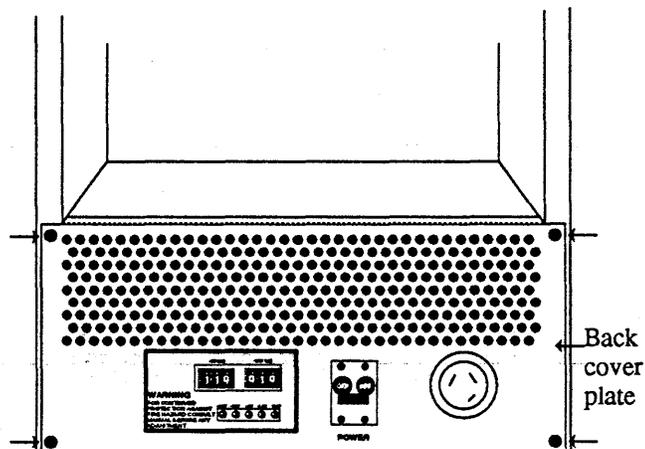
**Be careful to note which wires go where, so that you can reconnect them later.**

- ◆ Remove the lower I/O fixing plate by lifting it out of the hinge slots.

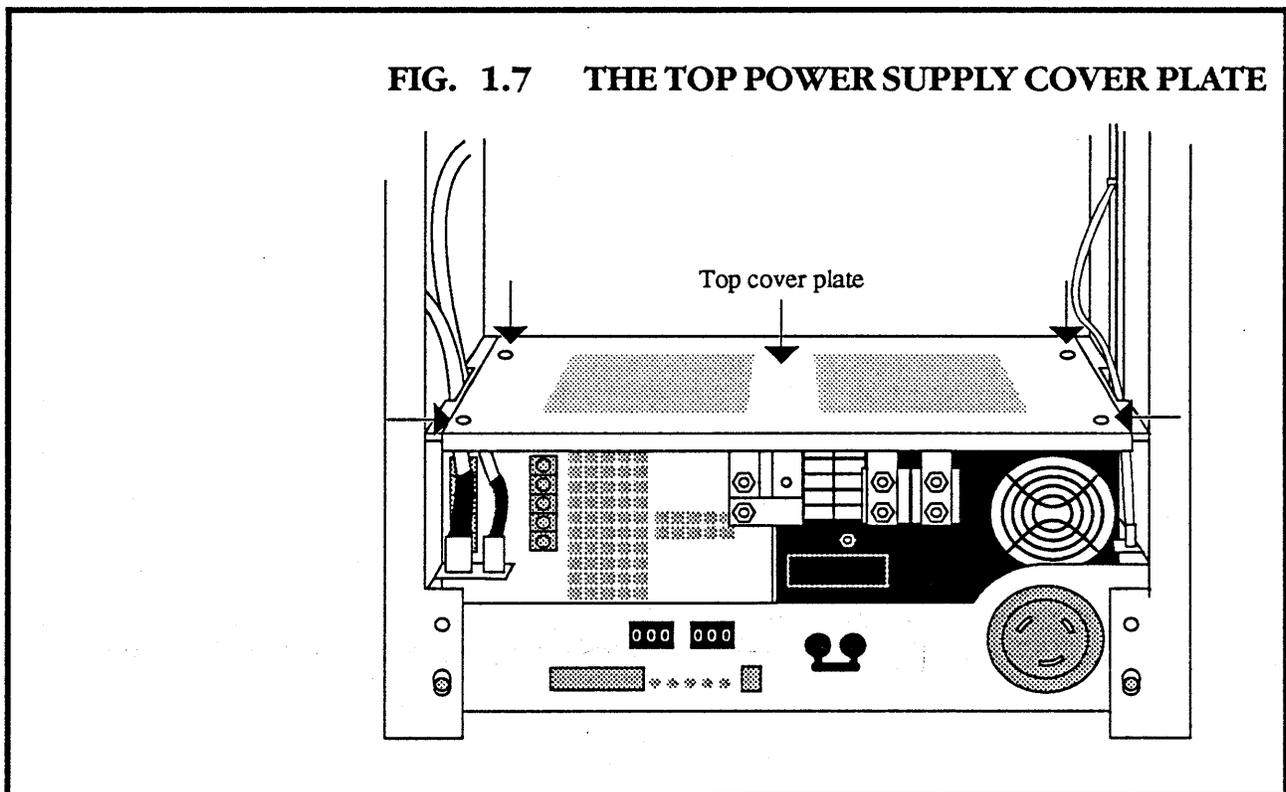


- ◆ Remove the four corner screws on the back cover plate and lift off the cover plate.

FIG. 1.6 THE BACK POWER SUPPLY COVER PLATE

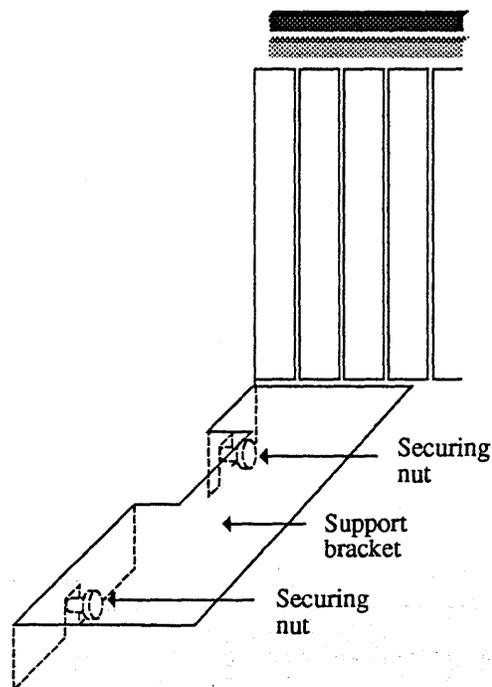


- ◆ Remove the four corner screws in the top cover plate, and lift the cover plate off the two supporting brackets.



- ◆ Slacken off the two M3.5 securing nuts below the left-hand support bracket.
- ◆ Slide the left hand support bracket forward and lift it off.

**FIG. 1.8 LEFT HAND SUPPORT BRACKET**



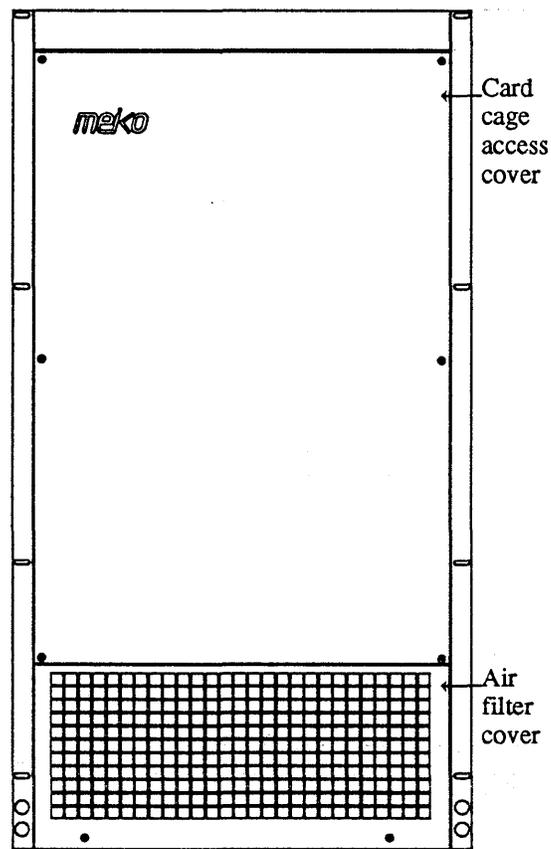
## **1.4    *REMOVING THE POWER SUPPLY TRAY***

Expose the power supply tray as described in section **1.3**.

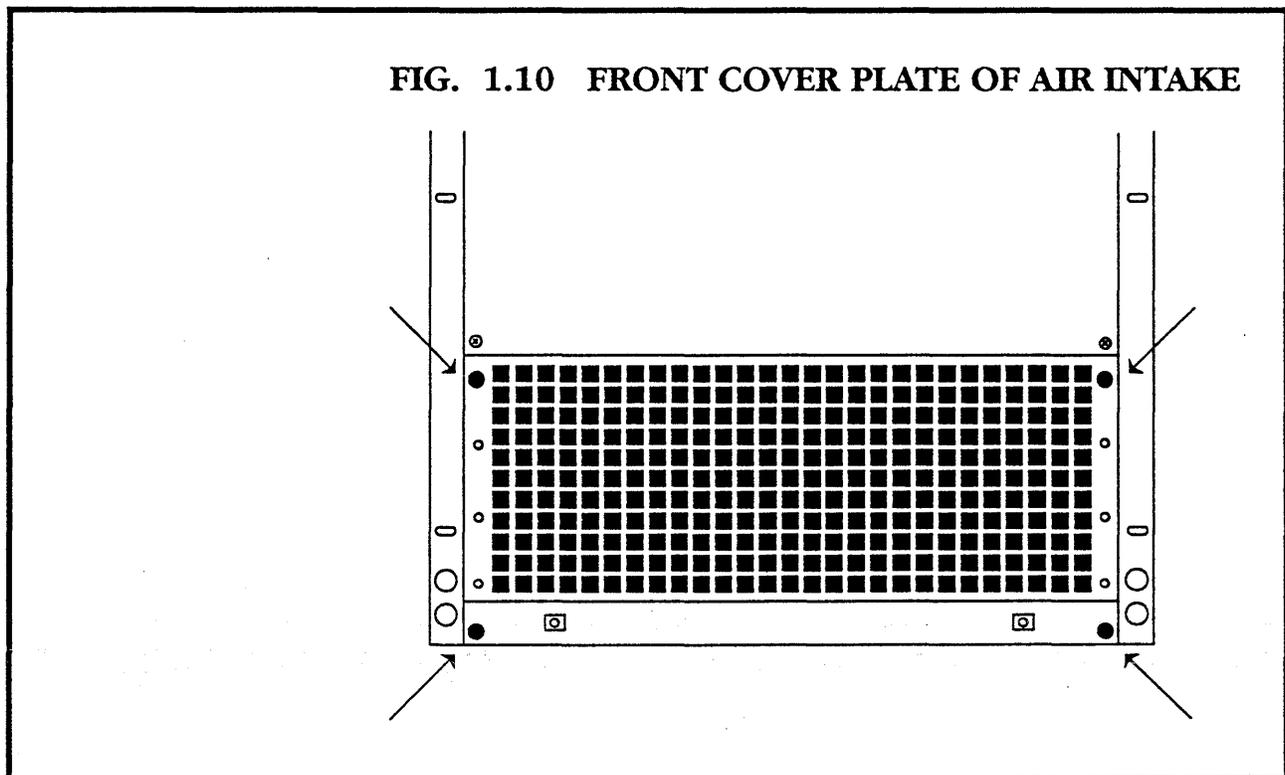
- ◆ Go round to the front of the machine.
- ◆ Lift the hinge pins simultaneously on the front door of the enclosure, and remove the door.

- ◆ Undo the six retaining screws on the card cage access cover.
- ◆ Remove the card cage access cover.
- ◆ Remove the air filter cover by releasing the 1/4 turn fasteners.
- ◆ Remove the air filter material.

**FIG. 1.9 FRONT VIEW OF M40 SHOWING AIR FILTER**

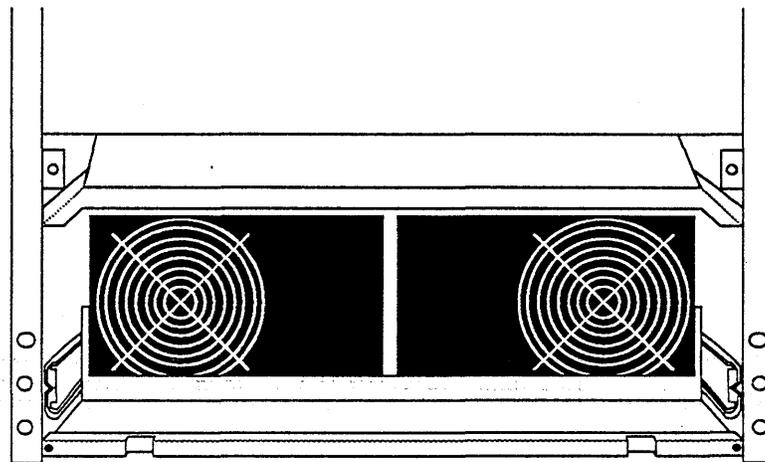


- ◆ Remove the front cover plate of the air intake by undoing the four corner screws and pulling the plate forwards off the supporting rails.

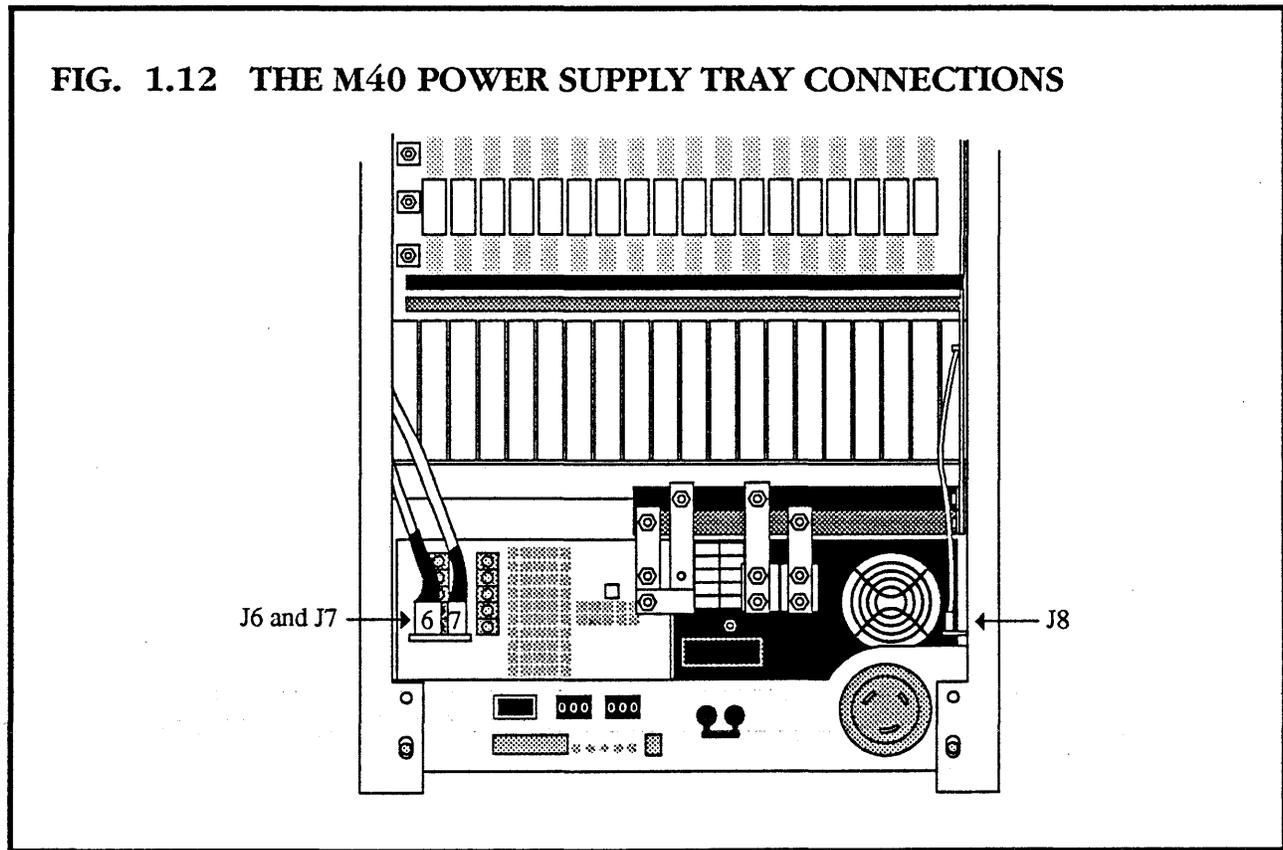


- ◆ The power supply tray should now be visible.

**FIG. 1.11 FRONT VIEW OF POWER SUPPLY TRAY, SHOWING SUPPORTING SLIDES**

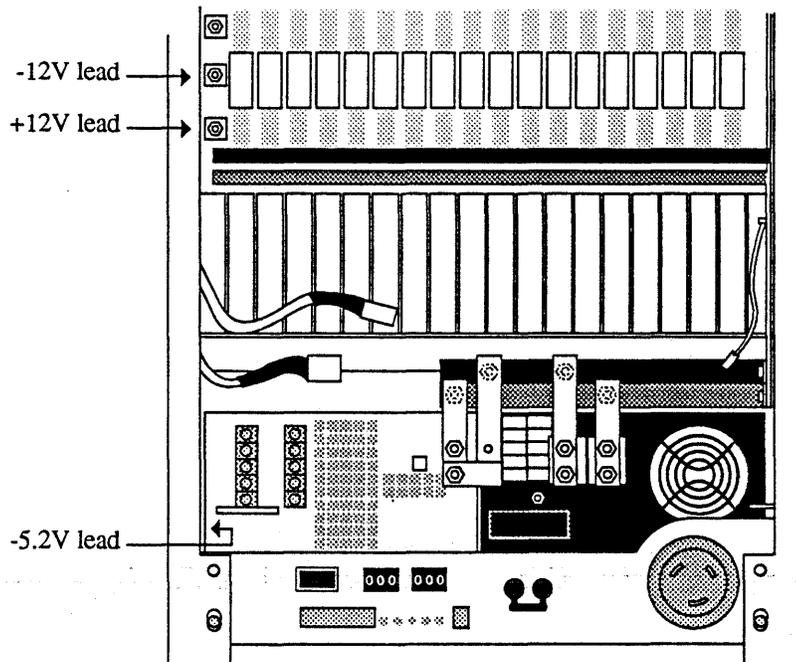


- ◆ Go to the back of the machine.
- ◆ Unplug the three connectors into the power supply tray. **J6** (twelve-way) and **J7** (six-way) are at the left. **J8** (three-way) is at the right.
- ◆ Disconnect the earth strap from the right hand side of the chassis. (The other end of the strap connects to an M4 stud at the right hand base of the power supply tray.)

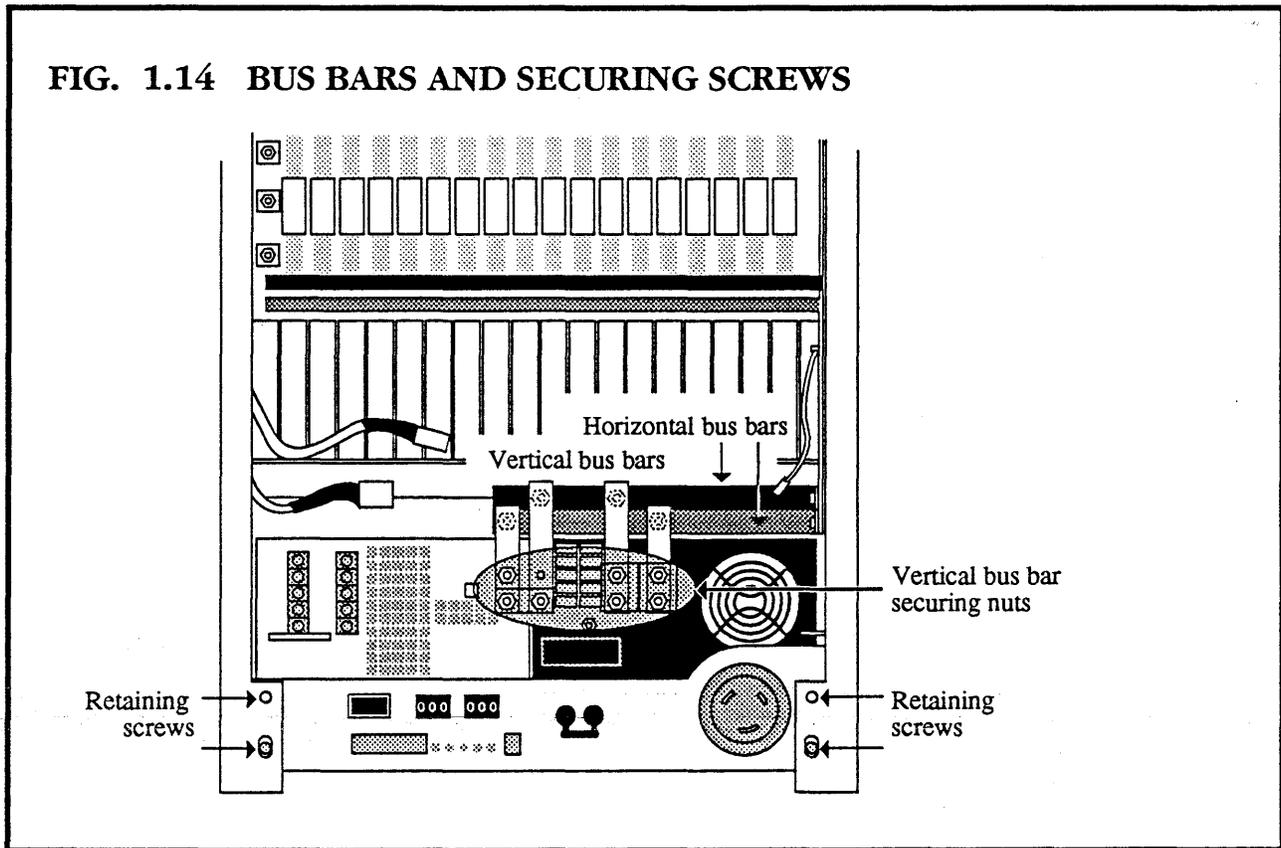


- ◆ Undo the M4 nuts connecting the +12V and -12V power supply leads to the backplane. Remove the leads and replace the nuts and washers.
- ◆ Cut the cable clips which secure the +12V and -12V power supply leads to the white bus bar, and remove the cable clips.
- ◆ Remove the -5.2V lead from the white -5.2V bus bar.

**FIG. 1.13 THE M40 POWER LEAD CONNECTIONS**



- ◆ Remove the six M8 nuts and wires connecting the power supplies to the vertical bus bars.
- ◆ Undo and remove the four retaining screws that hold the back of the power supply tray in position.

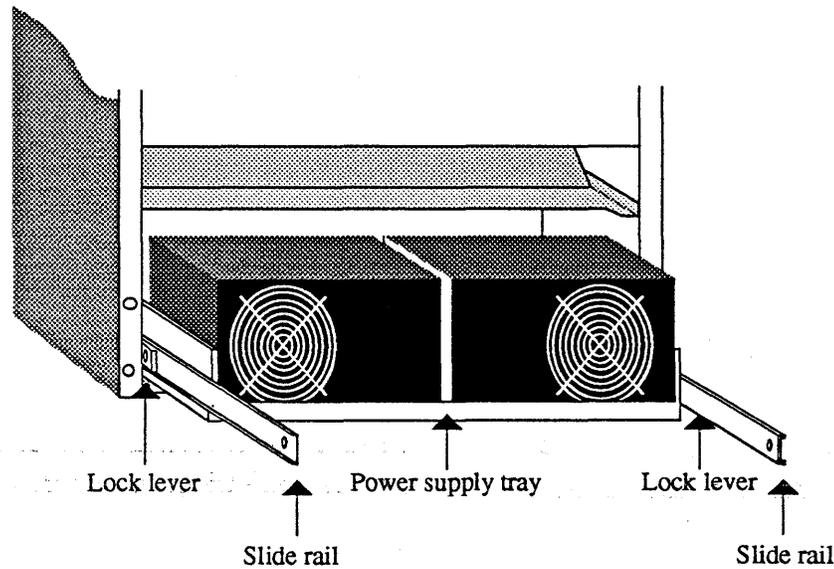


- ◆ Push forward the power supply tray.
- ◆ Go round to the front of the machine and pull the power supply tray forward until it locks.
- ◆ Push both the lock levers simultaneously into the slide rails and pull the power supply tray out.



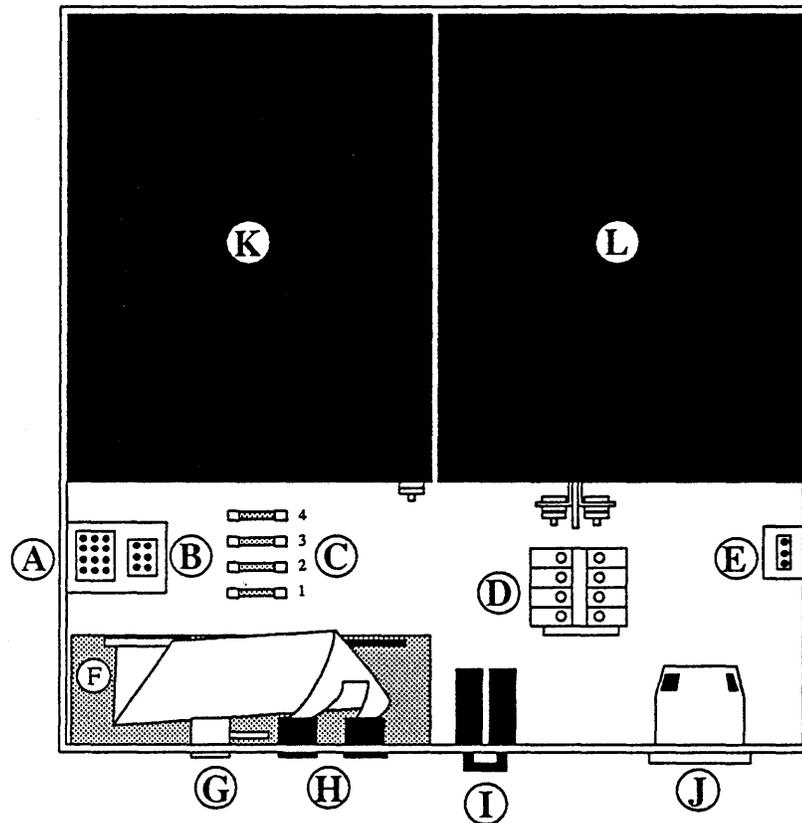
**The power supply tray is heavy. Be careful.**

**FIG. 1.15 POSITION OF LOCK LEVERS ON POWER SUPPLY TRAY**



## 1.5 THE POWER SUPPLY TRAY

FIG. 1.16 Items in the power supply tray



**A** Plug **J6** supplying:

Power for I/O connectors on top  
half of card cage.  
Power for fans.  
Thermal sensor wires.

**B** Plug **J7** supplying power for I/O connectors on  
lower half of card cage.

**C** Four power supply fuses.

- D** Power distribution connector.
- E** Plug **J8** connecting to 5V sense point.
- F** MK034 power supply monitor board.
- G** Hour meter, connected by a pair of wires.
- H** BCD switches, connected by a cable assembly.
- I** On/off circuit breaker.
- J** Mains inlet.
- K** P1000 power supply.
- L** A1500 power supply.

### **1.5.1 CHANGING THE FUSES**

---

The fuses marked **C** in fig. 1.28 are for the I/O power and the fans. They have the following values:

<b>FS1</b>	5A	+5V
<b>FS2</b>	5A	-5.2V
<b>FS3</b>	10A	+12V
<b>FS4</b>	10A	-12V

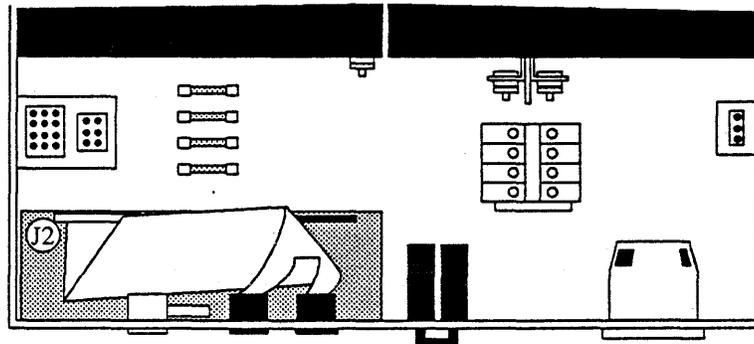


**When replacing a fuse, ensure that you know the cause of the fuse blowing. Ensure fuse is of the correct type and value specified.**

### 1.5.2 *CHANGING THE BCD SWITCH ASSEMBLY*

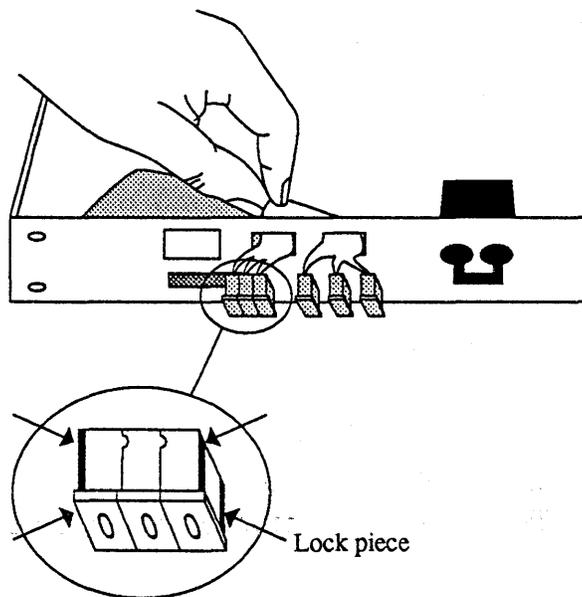
- ◆ Open back door.
- ◆ Remove the four corner screws on the back cover plate and remove plate (shown in fig. 1.6).
- ◆ Unplug the ribbon cable from **J2** on the MK034.

**FIG. 1.17 RIBBON CABLE CONNECTION**



- ◆ The BCD switches are secured in place by a lock piece on each corner. Squeeze in all four lock pieces simultaneously and push the BCD switch forward out of the power supply.
- ◆ Pull the individual switches apart.
- ◆ Feed the three switches back through the hole.
- ◆ Repeat for the other set of BCD switches.
- ◆ Replace with a new BCD switch cable assembly, ensuring that pin 1 of J2 connects to the +5V BCD switches on the left.

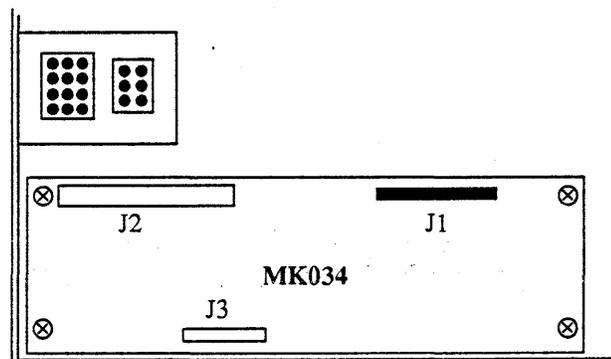
**FIG. 1.18 REMOVING THE BCD SWITCHES**



### 1.5.3 CHANGING THE HOUR METER

- ◆ Open back door.
- ◆ Remove the four corner screws on the back cover plate and remove plate (shown in fig. 1.6).
- ◆ Unplug the connection from **J3** on on the MK034.
- ◆ The hour meter is secured in place by a lock piece on each corner. Squeeze in all four lock pieces simultaneously and push the hour meter forward out of the power supply.
- ◆ Replace with a new hour meter,ensuring that the red wire connects to pin 5 of **J3** and the black wire connects to pin 1 of **J3**.

FIG. 1.19 POSITION OF J3

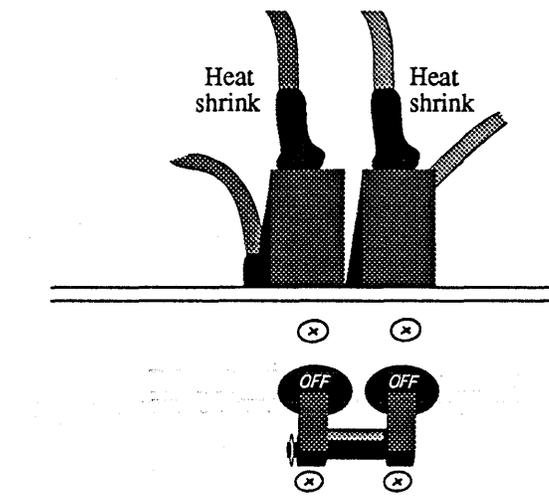


### 1.5.4 **CHANGING THE CIRCUIT BREAKER**

If the circuit breaker on/off switch requires replacement, it may be changed as follows:

- ◆ Expose the power supply tray as described in section 1.3.
- ◆ Cut the heat shrink off the four wires connected to the circuit breaker.
- ◆ Undo the screws holding the wires and remove the wires.
- ◆ Remove the four screws securing the circuit breaker in place.

**FIG. 1.20 POWER SUPPLY CIRCUIT BREAKER**

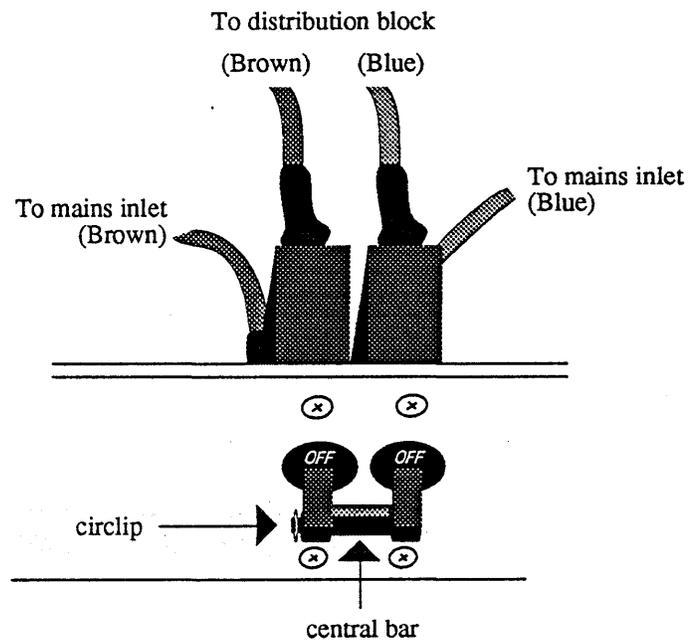


- ◆ Remove circlip from the pin running through the central bar.
- ◆ Take out the pin and the central bar.
- ◆ Pull out the circuit breaker.
- ◆ Fit new sleeving to wires.
- ◆ Replace with a new circuit breaker.



**For continued safety of operation, replace the circuit breaker with one of identical type and value.**

**FIG. 1.21 CONNECTIONS AND CIRCLIP ON CIRCUIT BREAKER**



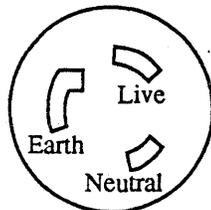
### 1.5.5 *CHANGING THE MAINS INLET CONNECTOR*

---

- ◆ Expose the power supply tray as described in section 1.3.
- ◆ Undo and remove the three retaining screws securing the mains connector.
- ◆ Undo the screws securing the wires in place, rotating the connector as necessary.
- ◆ Pull out the connector.
- ◆ Replace with a new twist-lock inlet socket, using the L6-30 wiring convention.

<b>X</b>	Live	Brown
<b>Y</b>	Neutral	Blue
<b>E</b>	Earth	Green and yellow

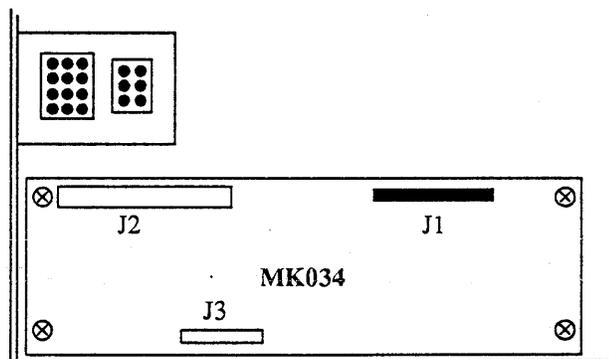
**FIG. 1.22 L6-30 CONNECTOR**



### 1.5.6 **CHANGING THE MK034 POWER SUPPLY MONITOR BOARD**

- ◆ Expose the rear of the power supply tray by removing the back cover.
- ◆ Unplug the polarised connectors **J1**, **J2** and **J3**.
- ◆ Undo and remove the four M3 securing screws in the corners of the MK034 board.
- ◆ Lift out the board.
- ◆ Replace with a new MK034 power supply monitor board from Meiko.
- ◆ Reconnect **J1**, **J2** and **J3**.
- ◆ Calibrate the MK034 board as described in section 1.6.5 below.

**FIG. 1.23 MK034 SECURING SCREWS**



## 1.6 *CHANGING THE POWER SUPPLIES*

The P1000 is the power supply on the left of the power supply tray. It supplies the following currents.

<b>Power</b>	<b>Current</b>
+5V	150A
-5.2V	30A
+12A	30A
-12V	30A

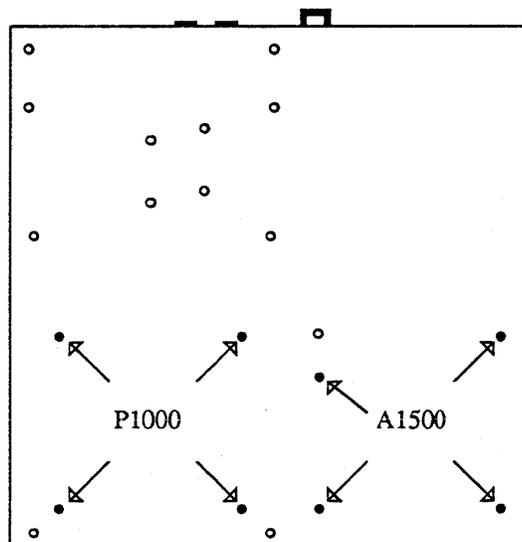
The A1500 power supply is to the right of the power supply tray. It supplies the following currents:

<b>Power</b>	<b>Current</b>
5V	300A

### 1.6.1 *CHANGING THE P1000*

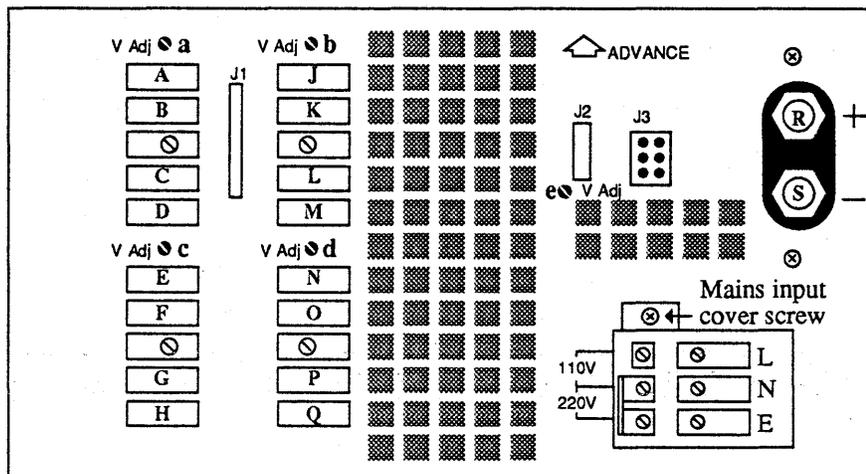
- ◆ Remove the power supply tray as described in section 1.4.
- ◆ The P1000 power supply is secured with four screws to the base of the power supply tray. Remove the screws, without dislodging the power supply.

**FIG. 1.24 POSITION OF SECURING SCREWS IN BASE OF POWER SUPPLY TRAY**

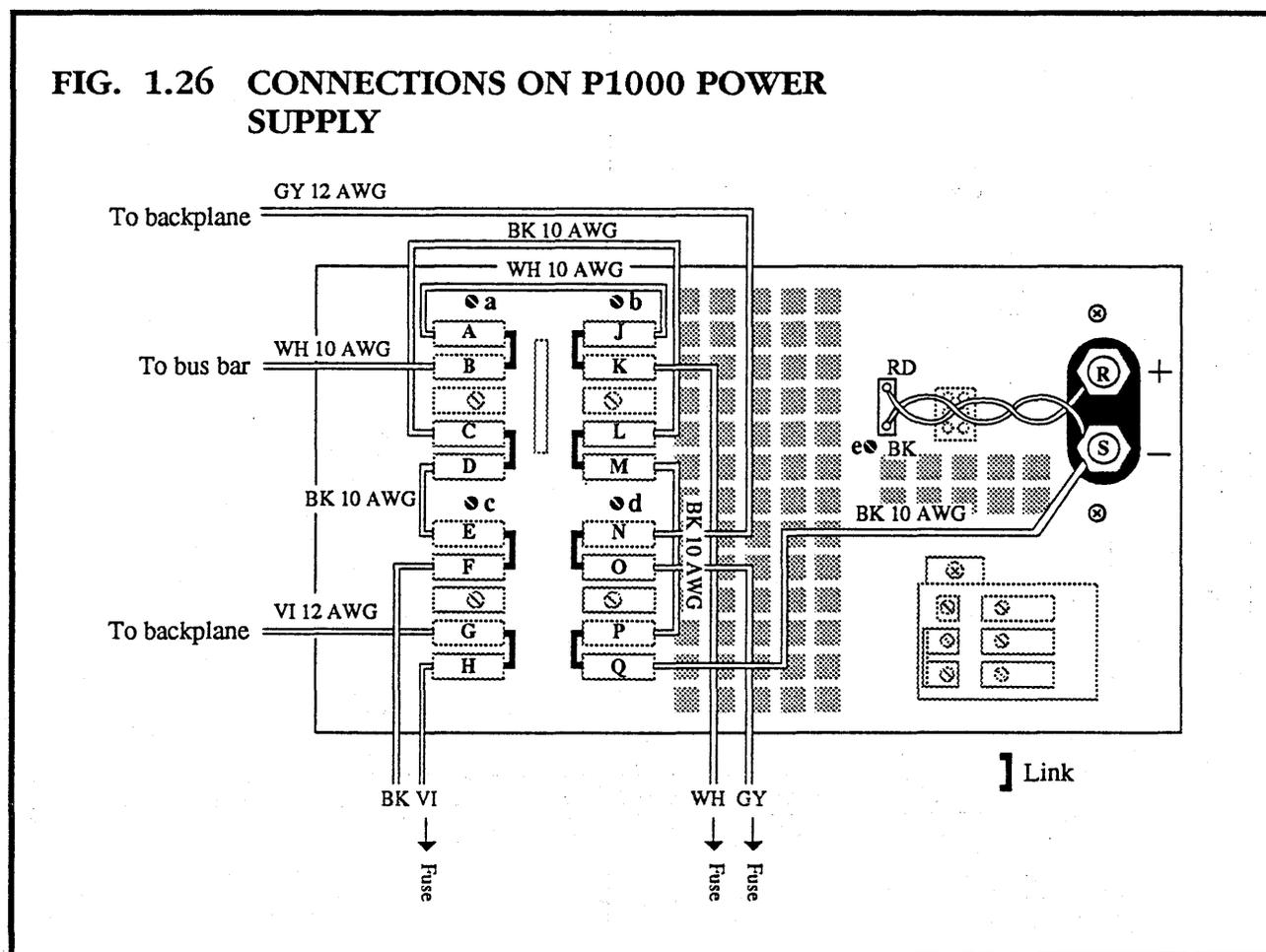


- ◆ Remove the single screw securing the mains input cover and take off the cover.
- ◆ Remove the screws retaining the three mains input leads and disconnect them.
- ◆ Remove all the cable connections on the power supply.
- ◆ Remove the connectors **J1** and **J2**.

**FIG. 1.25 FRONT VIEW OF P1000 POWER SUPPLY**

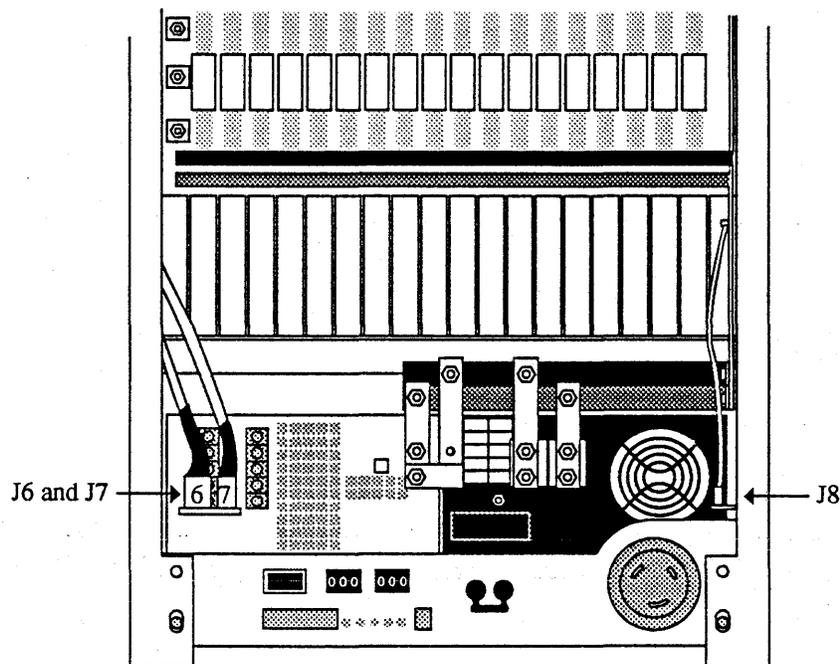


- ◆ Lift out the old power supply and put in the new power supply.
- ◆ Replace **J1**, **J2** and the connections according to the wiring diagram.
- ◆ Ensure that the links on the new power supply are in the positions shown in the diagram below.
- ◆ Replace the mains leads and the mains input cover.
- ◆ Secure with the four screws in the base.

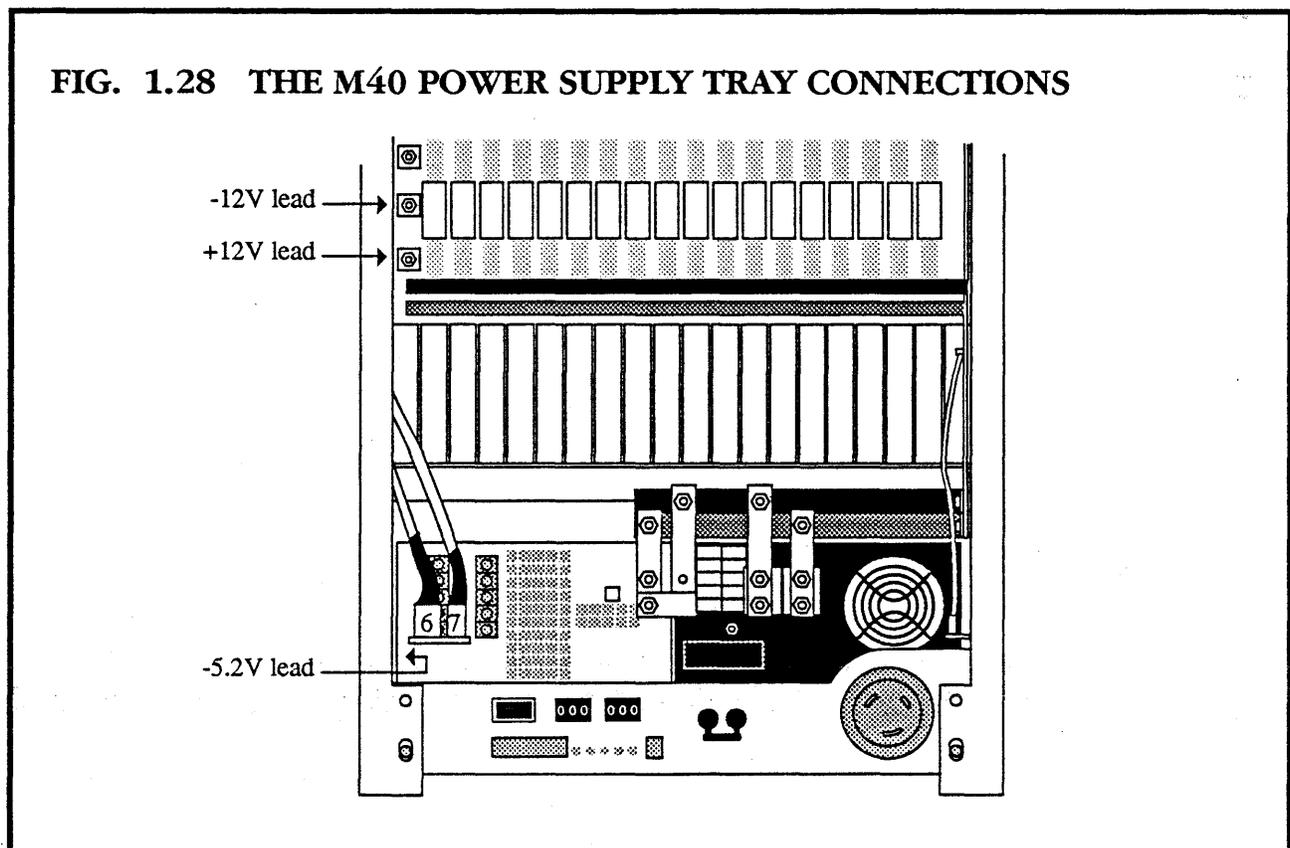


- ◆ Replace the power supply tray in the chassis by inserting it in the slides at the front and pushing it until it locks.
- ◆ Push both the lock levers simultaneously into the slide rails and push the power supply tray into place. (The lock levers are shown in fig. 1.15.)
- ◆ Replace the four securing screws at the back of the power supply tray.
- ◆ Replace the leads to **J6**, **J7** and **J8**.

**FIG. 1.27 THE M40 POWER SUPPLY TRAY CONNECTIONS**

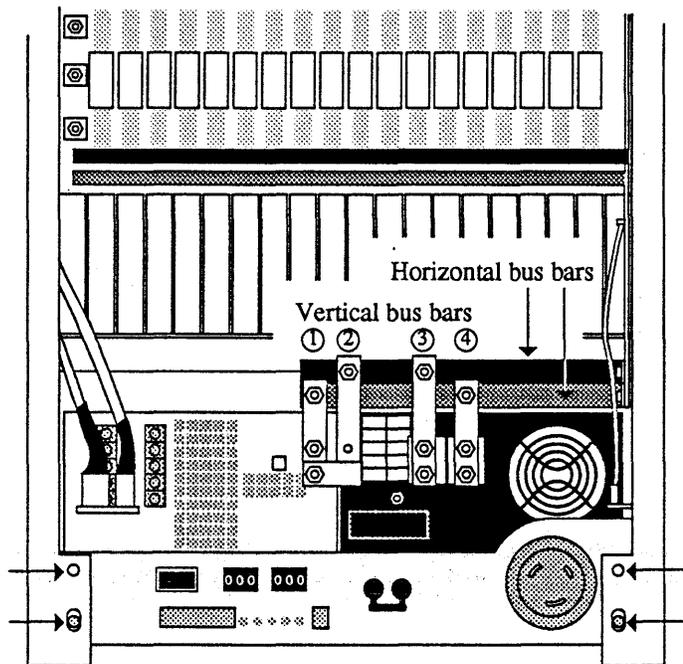


- ◆ Connect the +12V and -12V leads to the backplane.
- ◆ Put on new cable clips to secure the +12V and -12V leads to the white bus bar.
- ◆ Connect the -5.2V lead to the white bus bar.



- ◆ Reconnect the four vertical bus bars to the power supply units.
- ◆ Connect the earth strap from the stud in the power supply tray to the stud on the right hand side of the chassis.
- ◆ Calibrate the P1000 power supply as described in section 1.6.2.
- ◆ Calibrate the MK034 board as described in section 1.6.5.

FIG. 1.29 POSITION OF BUS BARS AND SECURING SCREWS



### 1.6.2 CALIBRATING THE P1000 POWER SUPPLY

The power supply should be in the machine and fully connected. You require a voltmeter with an accuracy of 0.1%.

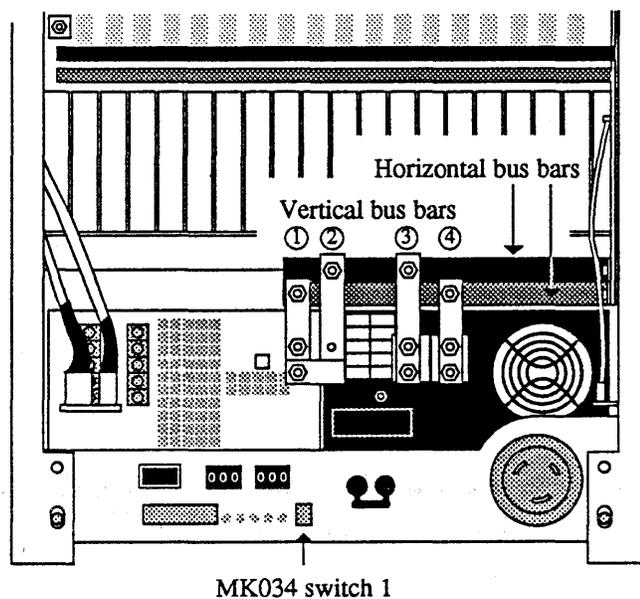
- ◆ Make sure the machine is isolated from the mains.
- ◆ Ensure that there is no load in the machine by moving the boards out until they are disconnected.



**Observe static precautions**

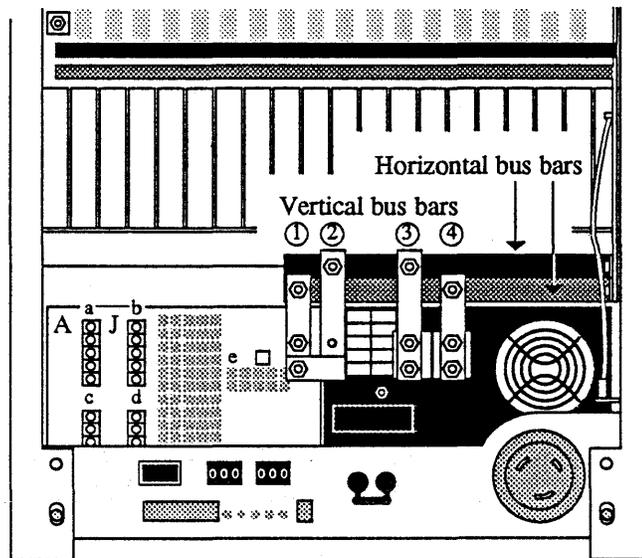
- ◆ Put **SW1** on the MK034 UP (OFF).

**FIG. 1.30 POSITION OF SWITCH**



- ◆ Re-connect the mains power supply.
- ◆ Connect a voltmeter between 0V on the bottom screw on vertical bus bar **3**, and the +12V stud on the backplane (shown in fig. 1.27).
- ◆ Adjust VA point **c** to give 12V on the voltmeter (shown in fig. 1.31).
- ◆ Connect a voltmeter between 0V on the bottom screw on vertical bus bar **3**, and the -12V stud on the backplane (shown in fig. 1.27).
- ◆ Adjust VA point **d** to give 12V on the voltmeter (shown in fig. 1.31).
- ◆ Turn off mains power to the machine.

**FIG. 1.31 THE M40 POWER SUPPLY TRAY CONNECTIONS**



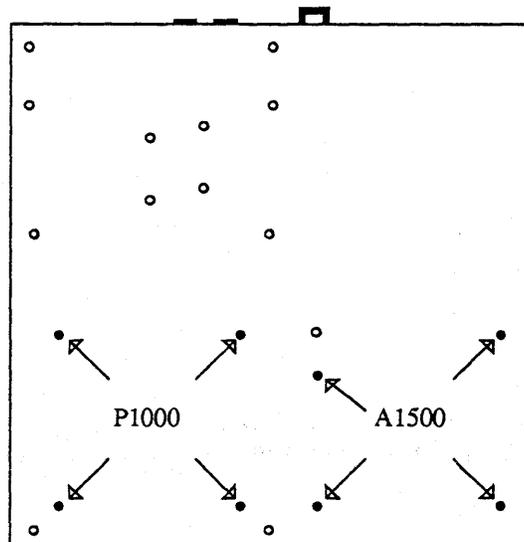


- ◆ Connect a voltmeter between 0V on the bottom screw on vertical bus bar **3**, and the top right hand connector **J** on the power supply.
- ◆ Adjust VA point **b** to give  $-5.2V$  on the voltmeter.
- ◆ Switch off the machine.
- ◆ Reconnect the white lead to the top right hand connector **J**.
- ◆ Disconnect the P1000 from the red horizontal bus bar piece by undoing the the two M8 securing nuts on vertical bus bar **1** and removing vertical bus bar **1**.
- ◆ Reconnect the sense leads from **J2** on the P1000 to the +5V screw **R** and the 0V screw **S**.
- ◆ Turn on the machine.
- ◆ Connect a voltmeter between the bottom screw on vertical bus bar **1**, and +5V on the middle screw of vertical bus bar **2**.
- ◆ Adjust VA point **e** to give 5V on the voltmeter.
- ◆ Switch off the machine.
- ◆ Calibrate the A1500 power supply as described in **1.6.4**.
- ◆ Reconnect vertical bus bar **1**.

### 1.6.3 *CHANGING THE A1500 POWER SUPPLY*

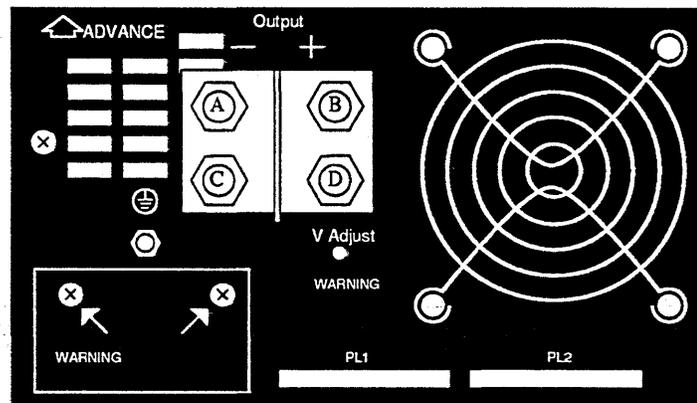
- ◆ Remove the power supply tray as described in section 1.4.
- ◆ The A1500 power supply is secured with four screws to the base of the power supply tray. Remove the screws, without dislodging the power supply.

**FIG. 1.33 POSITION OF SECURING SCREWS IN BASE OF POWER SUPPLY TRAY**



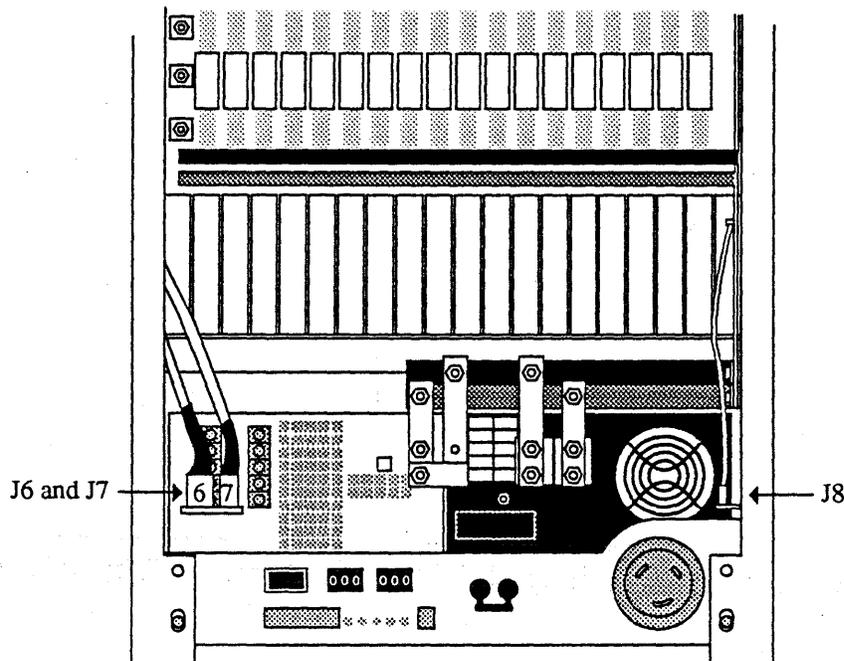
- ◆ Unplug the connectors **PL1** and **PL2**.
- ◆ Remove the two screws securing the mains input cover (marked by arrows in fig. 1.33) and lift off the cover.
- ◆ Remove the three M4 nuts on the mains input leads, and disconnect the leads.
- ◆ Lift out the old power supply.
- ◆ Put in the new power supply.
- ◆ Replace **PL1** and **PL2** .
- ◆ Replace the mains leads and the input cover.
- ◆ Secure with the four screws in the base.

**FIG. 1.34 FRONT VIEW OF A1500 POWER SUPPLY**



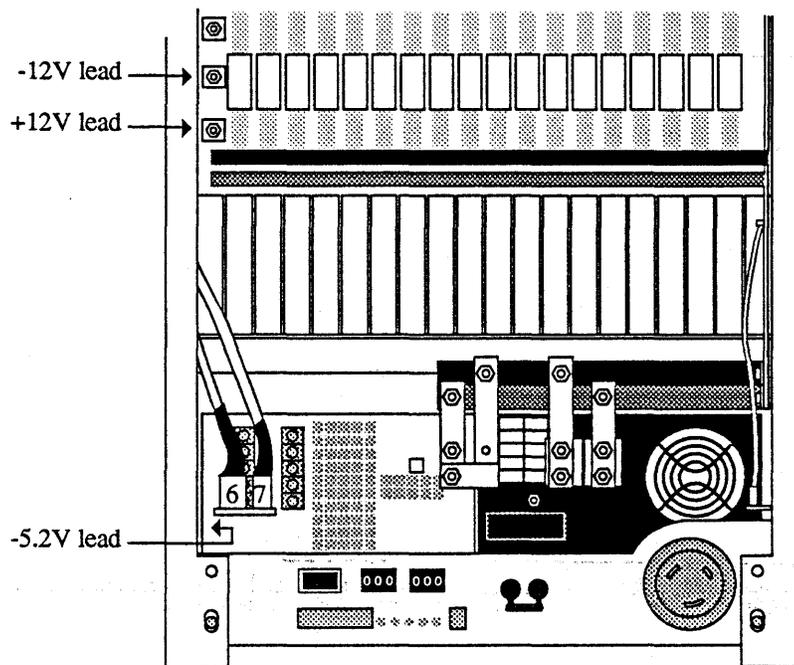
- ◆ Replace the power supply tray in the chassis by inserting it in the slides at the front and pushing it until it locks.
- ◆ Push both the lock levers simultaneously into the slide rails and push the power supply tray into place.
- ◆ Replace the four securing screws at the back of the power supply tray.
- ◆ Replace the leads to J6, J7 and J8.

FIG. 1.35 THE M40 POWER SUPPLY TRAY CONNECTIONS



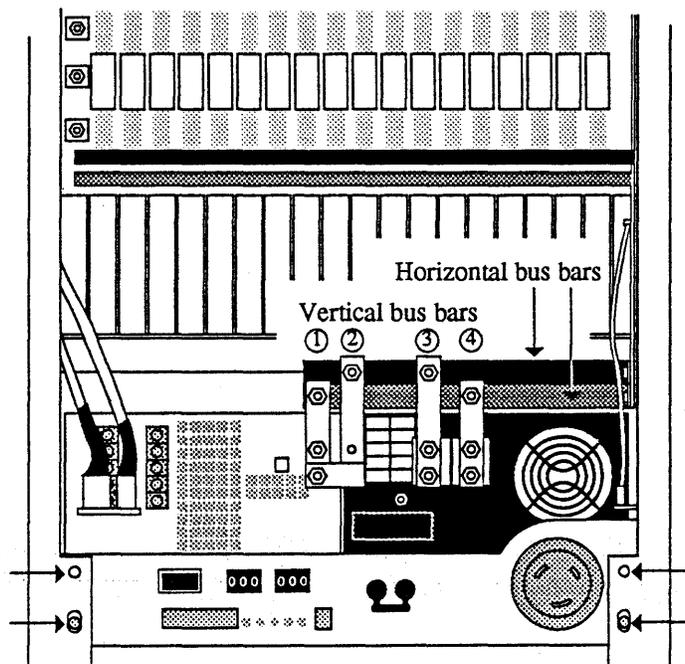
- ◆ Connect the +12V and -12V leads to the backplane.
- ◆ Put on new cable clips to secure the +12V and -12V leads to the white bus bar.
- ◆ Connect the -5.2V lead to the white bus bar.

**FIG. 1.36 THE M40 POWER LEAD CONNECTIONS**



- ◆ Replace the four vertical bus bars.
- ◆ Connect the earth strap from the stud in the power supply tray to the stud on the right hand side of the chassis.
- ◆ Calibrate the A1500 power supply as described in section 1.6.4.
- ◆ Calibrate the MK034 board as described in section 1.6.5.

**FIG. 1.37 POSITION OF BUS BARS AND SECURING SCREWS**



### 1.6.4 *CALIBRATING THE A1500 POWER SUPPLY*

---

The power supply should be in the machine and fully connected. You require a voltmeter with an accuracy of 0.1%.

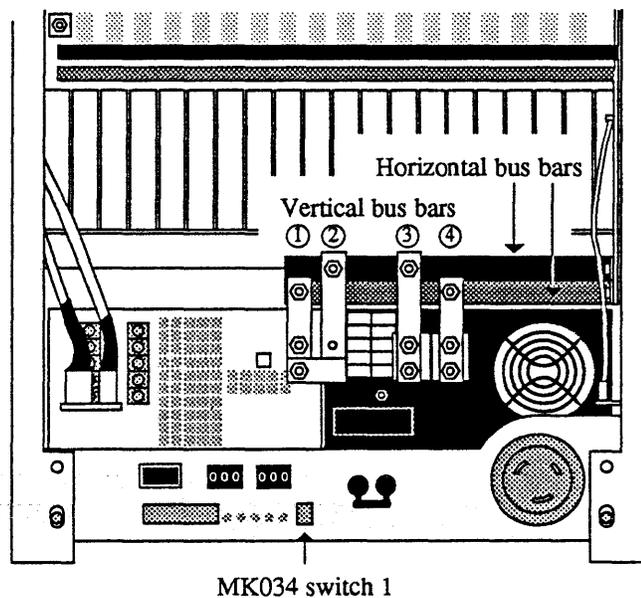
- ◆ Make sure the machine is isolated from the mains.
- ◆ Ensure that there is no load in the machine, by moving the boards out until they are disconnected.



**Observe static precautions**

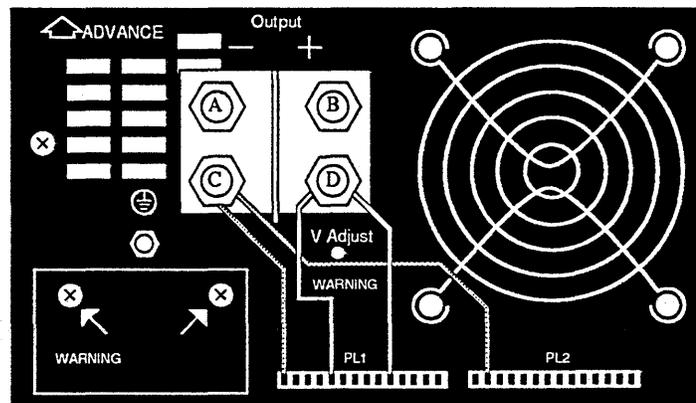
- ◆ Disconnect the A1500 from the red horizontal bus bar by undoing the three M8 securing nuts on the vertical bus bar **1** and removing vertical bus bar **1**.
- ◆ Check that the sense leads from **PL1** and **PL2** are connected to the power input screws **C** and **D**, as shown on fig. **1.38**.
- ◆ Ensure that **SW1** on the MK034 is UP (OFF). This can be reached through the right hand cut-out in the power supply tray.

FIG. 1.38 POSITION OF SWITCH



- ◆ Connect the mains power to the machine.
- ◆ Connect a voltmeter between points **A** and **B** shown on fig. 1.38.
- ◆ Adjust the voltage adjuster to give 5.02V on the voltmeter.
- ◆ Switch off the machine.
- ◆ Reconnect vertical bus bar **1**, replacing any leads which you removed.

**FIG. 1.39 FRONT VIEW OF A1500 POWER SUPPLY**



### 1.6.5 *CALIBRATING THE MK034*

---

The power supply tray should be in the machine and fully connected. You require Meiko load boards and a voltmeter with an accuracy of 0.1%.

- ◆ Ensure the machine is isolated from the mains.
- ◆ Insert resistive load boards in the card cage, giving a total load of:

400A at +5V  
30A at -5.2V

This is the factory procedure. If you do not have this total of load boards, you may use decreased values. Accuracy will be impaired at very low currents. A single load board providing 20A at +5V and 5A at -5.2V is adequate for field configuration.

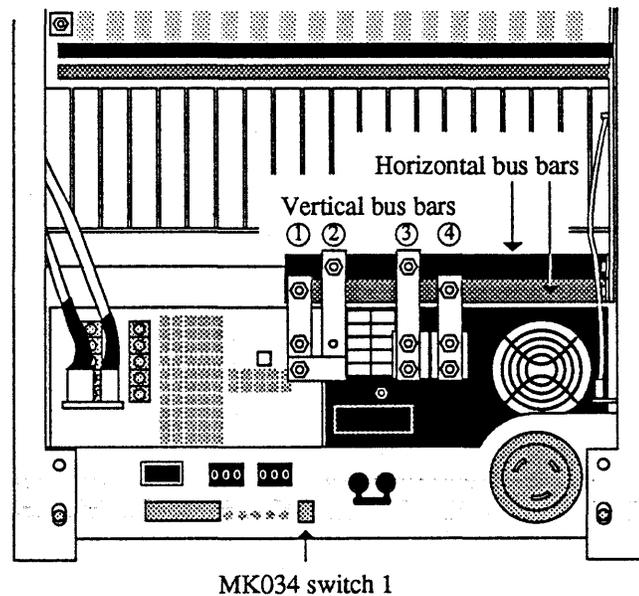
- ◆ Run the machine for at least 1 hour before commencing calibration.



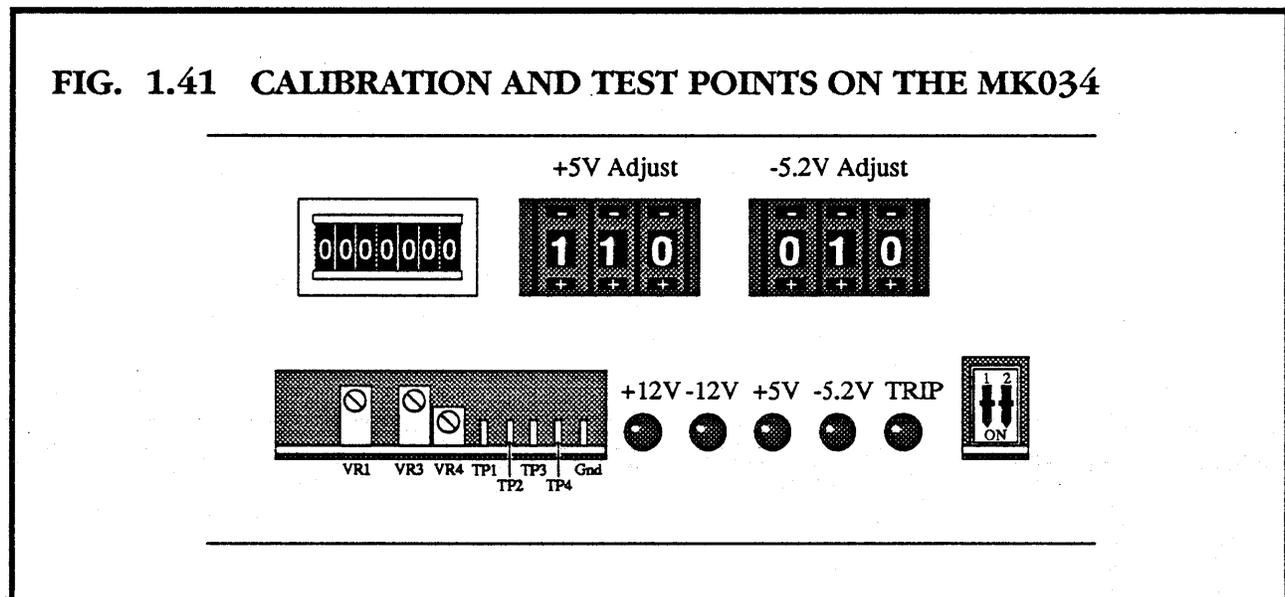
**Observe static precautions.**

- ◆ Ensure that **SW1** on the MK034 is up (OFF).
- ◆ Dial up 400 on the +5 volt BCD switches and 30 on the -5.2V BCD switches (see fig. 1.40).
- ◆ Power up the machine.

**FIG. 1.40 POSITION OF SWITCH**



- ◆ Put the +ve lead of the voltmeter on test point 2 (**TP2**) of the MK034, and the –ve end on the Ground pin shown in fig 1.40.
- ◆ Adjust **VR4** to give –2V on the voltmeter.
- ◆ Put the +ve lead of the voltmeter on test point 1 (**TP1**) of the MK034, and the –ve end on the Ground pin on the board.
- ◆ Adjust **VR1** to give  $\frac{+5V \text{ Load(Amps)}}{200}$  on the voltmeter (-2.0V for a full 400A load. 0.1V for single 20A load board.)
- ◆ Put the +ve lead of the voltmeter on **TP3** of the MK034, and the –ve end on the Ground pin on the board.
- ◆ Adjust **VR3** to give  $\frac{-5.2V \text{ Load(Amps)}}{100}$  on the voltmeter (-0.3V for the full 30A load, 0.05V for a single load board drawing 5A.)



- ◆ Put **SW1** on the MK034 down (ON).
- ◆ Switch the machine off and remove the load boards, replace the functional boards, and reassemble the machine.



**Observe static precautions**

- ◆ Set up the BCD switches for the load on the machine.



**Illegal values on the BCD switches will cause the machine to trip (e.g., 0A, 450A etc.).**

### **1.6.6 THE POWER SUPPLY MONITOR (MK034)**

---

The M40 power supply monitors the +5V and -5.2V card cage current consumption. If these go above the limits set on the BCD switches, the power supply unit is tripped, and disabled until the power supply is cycled (turned off and on).

The power monitor's BCD switches are factory set, prior to shipping, to the maximum supply current required for the initial board configuration. If you change the configuration by adding or removing boards you must alter the settings. Each board has a specified power consumption (see the chapter for the board) which must be added to the setting if you add the board to the card cage, or subtracted from the setting if you remove it.

If the power monitor settings are too low, nuisance tripping may occur; either when the power supply is turned on or during heavy computational loads.

If the power monitor settings are too high a catastrophic hardware failure (such as an electrical short) may cause overheating. As an additional precaution, thermal sensors are located near the exhaust of the cooling fans. These shut down the machine in the event of the card cage getting overheated.

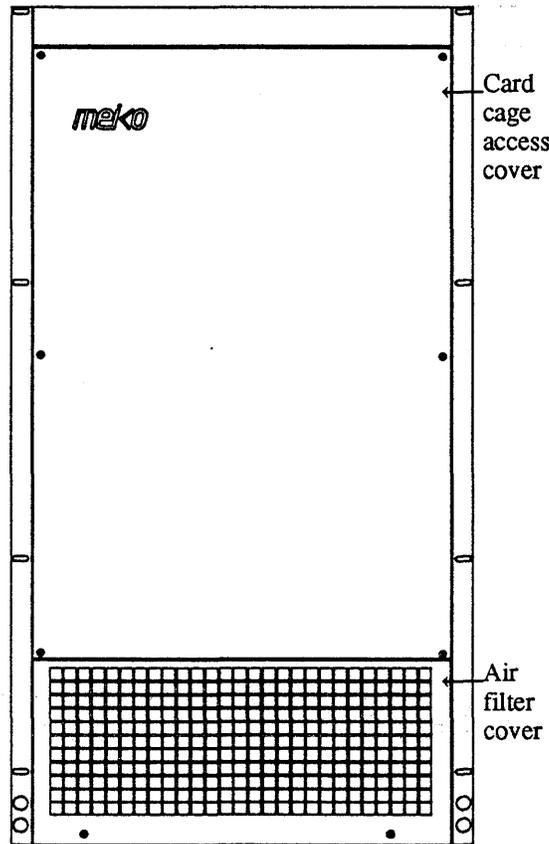
## **1.7 CHANGING FILTERS**

The only regular M40 maintenance required is changing the air filter every six months.

### 1.7.1 CHANGING THE AIR FILTER

- ◆ Make sure the M40 is powered off.
- ◆ Open the front door of the enclosure.
- ◆ Remove the filter cover by releasing the 1/4 turn fasteners.
- ◆ Replace the filter with a new one. New filters can be obtained from Meiko.

FIG. 1.42 FRONT VIEW OF M40 SHOWING AIR FILTER



## 1.8 ***CHANGING FANS AND SENSORS***

The M40 MK2 is cooled by:

Four fans in the fan tray above the card cage

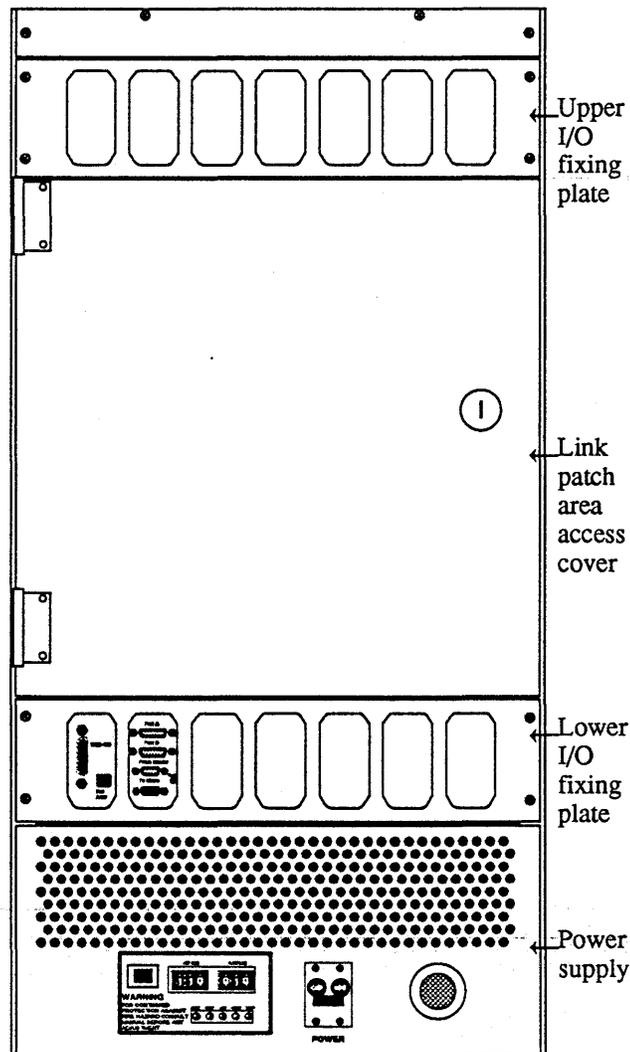
A single fan above the I/O space.

There are three heat sensors stored in the fan tray. These monitor the card cage temperature of the M40. The fan tray is immediately above the card cage.

### 1.8.1 REMOVING THE FAN TRAY

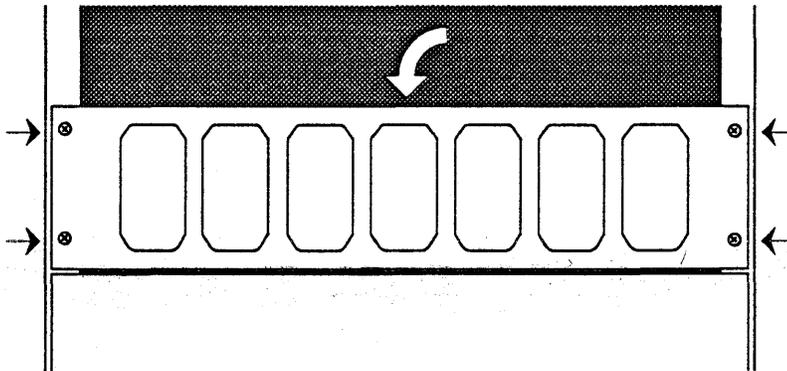
- ◆ Isolate the mains.
- ◆ Open the link patch area access cover.

FIG. 1.43 REAR VIEW OF AN M40



- ◆ Remove the four screws that hold the upper I/O fixing plate in position.

**FIG. 1.44 REMOVING THE M40 I/O FIXING PLATE**



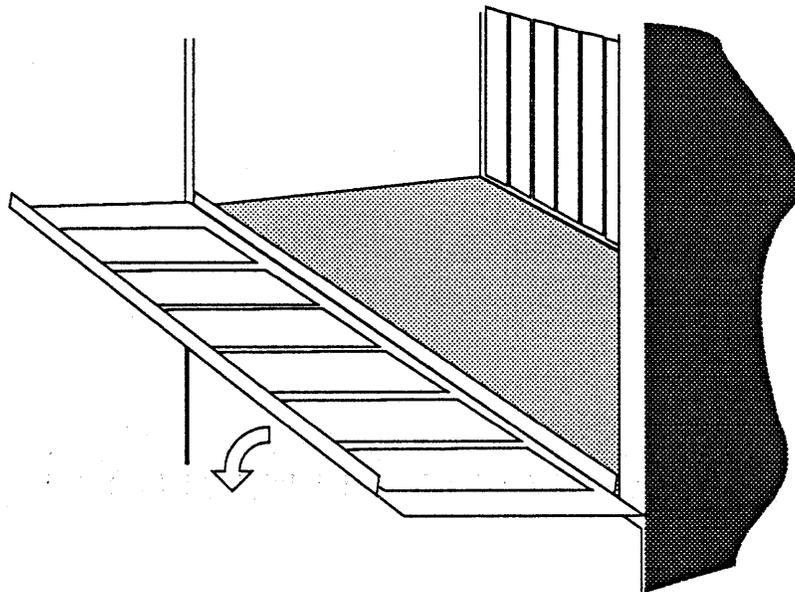
- ◆ Fold down the upper I/O fixing plate, and unplug any cables which connect between the fixing plate, and existing boards.



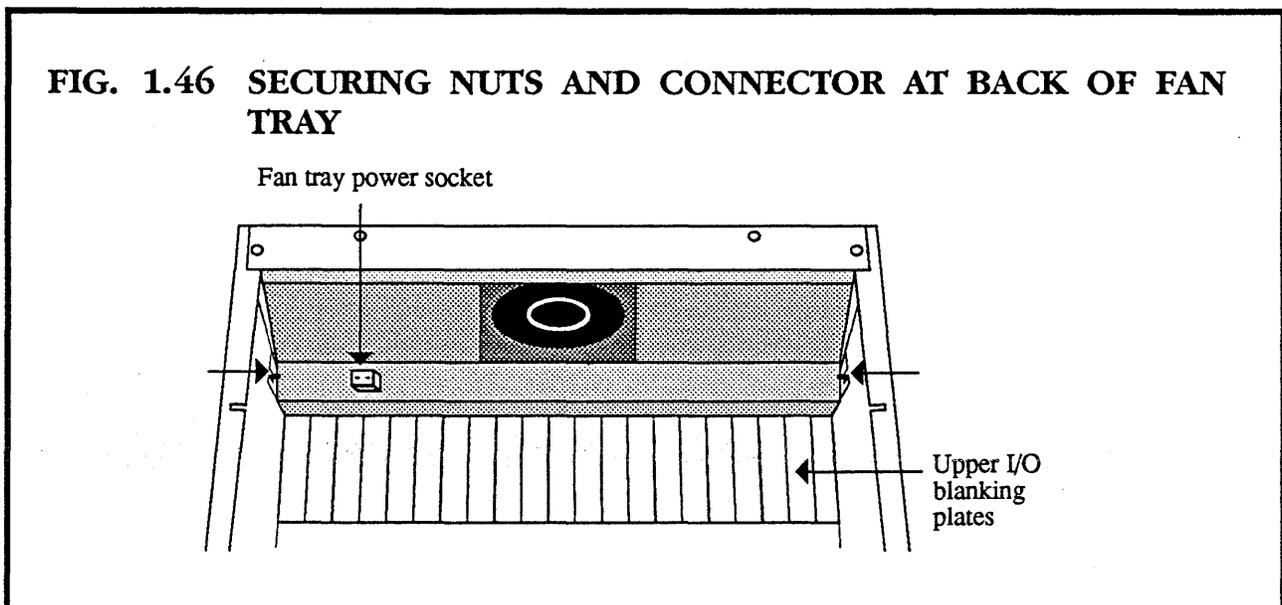
**Be careful to note which wires go where, so that you can reconnect them later.**

- ◆ Remove the upper I/O fixing plate by lifting it out of the hinge slots.

**FIG. 1.45 M40 I/O FIXING PLATE FOLDED DOWN**

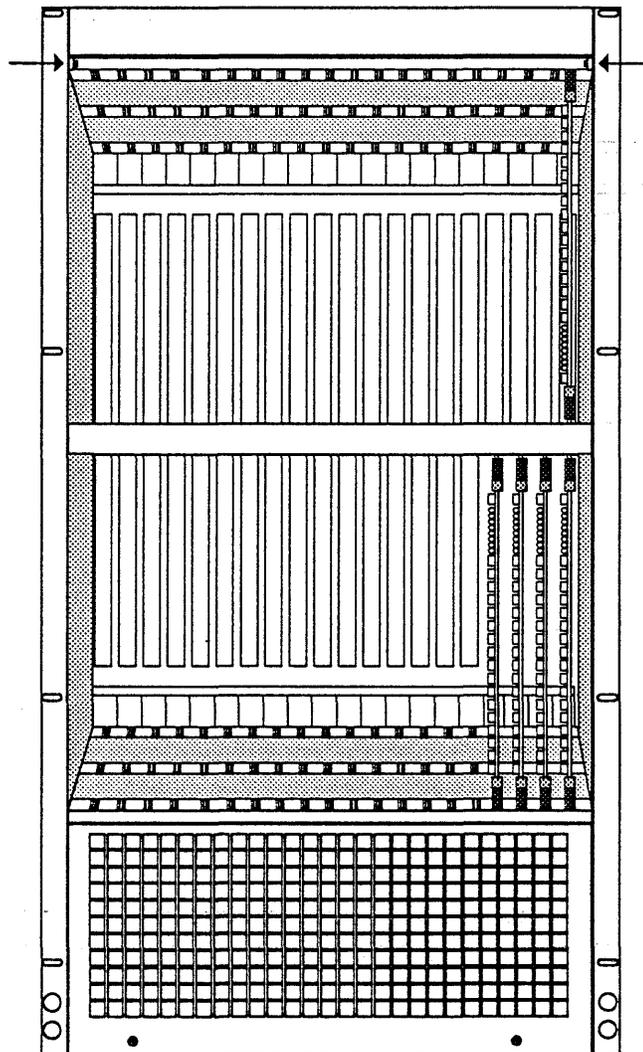


- ◆ Disconnect the plug into the back of the fan tray.
- ◆ Loosen the two securing nuts at the back.



- ◆ Remove the front door of the enclosure.
- ◆ Loosen the two securing nuts at the front of the fan tray.
- ◆ Slide out the fan tray to the front.

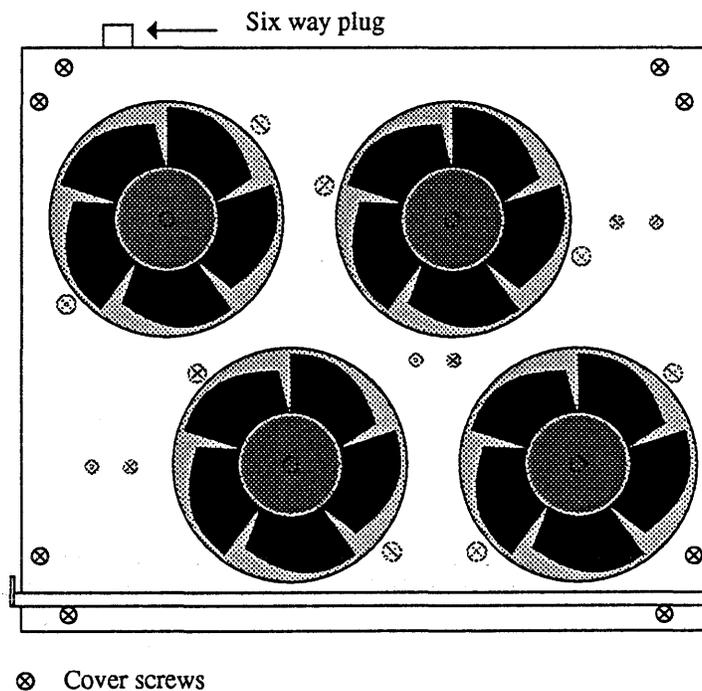
**FIG. 1.47 NUTS AT FRONT OF FAN TRAY**



## 1.8.2 REMOVING A FAN FROM THE FAN TRAY

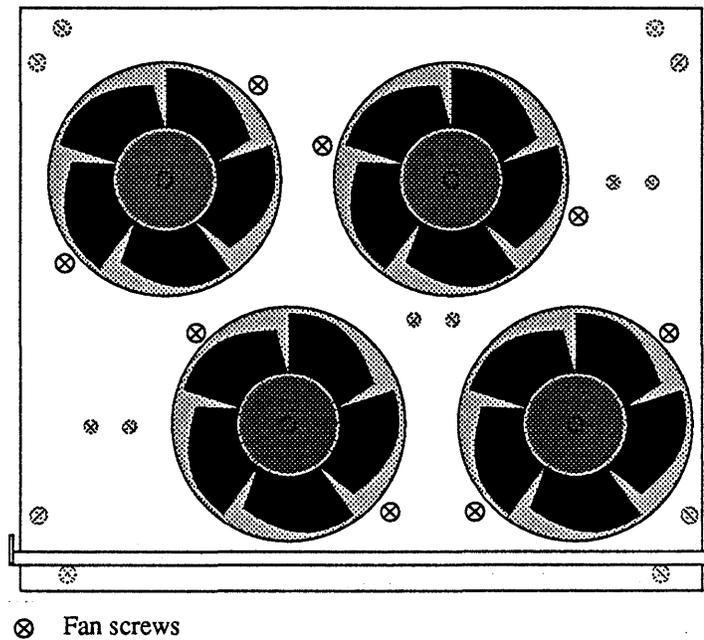
- ◆ Remove the fan tray as described in section 1.8.1.
- ◆ Place the unit face down.
- ◆ Remove the 8 corner screws securing the cover.
- ◆ Push the six-way plug into the fan tray by pressing the edge catch down with a screwdriver.
- ◆ Lift the base and fans off the top cover .

FIG. 1.48 BASE OF FAN TRAY



- ◆ Remove the two screws securing the fan to the base.
- ◆ Turn the base over and desolder the two wires on the fan.
- ◆ Replace with a new fan, connecting the violet wire to the +ve and the grey wire to the -ve.

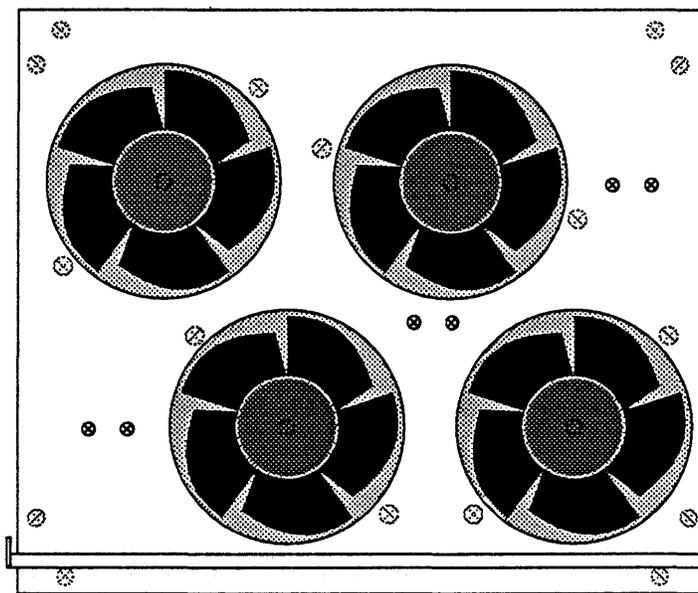
**FIG. 1.49 FAN SECURING SCREWS ON TRAY BASE**



### 1.8.3 *REPLACING A SENSOR IN THE FAN TRAY*

- ◆ Remove the fan tray and take off the fan tray cover (described in sections 1.8.1 and 1.8.2).
- ◆ Pull the connector wires off the faulty sensor in the fan tray.
- ◆ Remove the two securing screws in the fan tray base.
- ◆ Replace the sensor with a new one.

**FIG. 1.50 SENSOR SECURING SCREWS ON TRAY BASE**

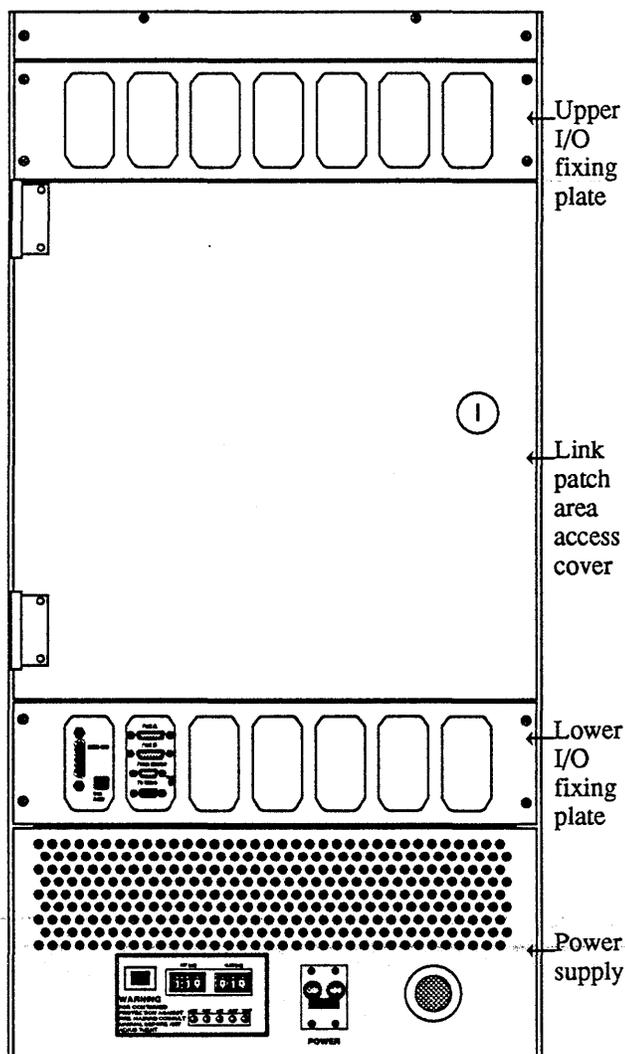


⊗ Sensor screws

### 1.8.4 REMOVING THE REAR FAN

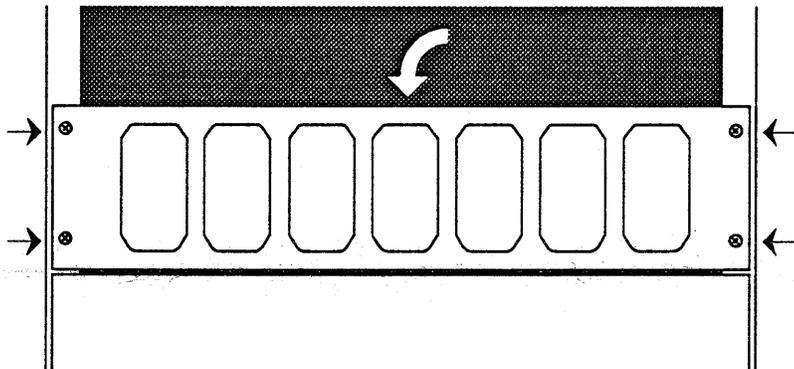
- ◆ Isolate the machine from the mains.
- ◆ Open the link patch area access cover.

FIG. 1.51 REAR VIEW OF AN M40



- ◆ Remove the four screws that hold the upper I/O fixing plate in position.

**FIG. 1.52 REMOVING THE M40 I/O FIXING PLATE**



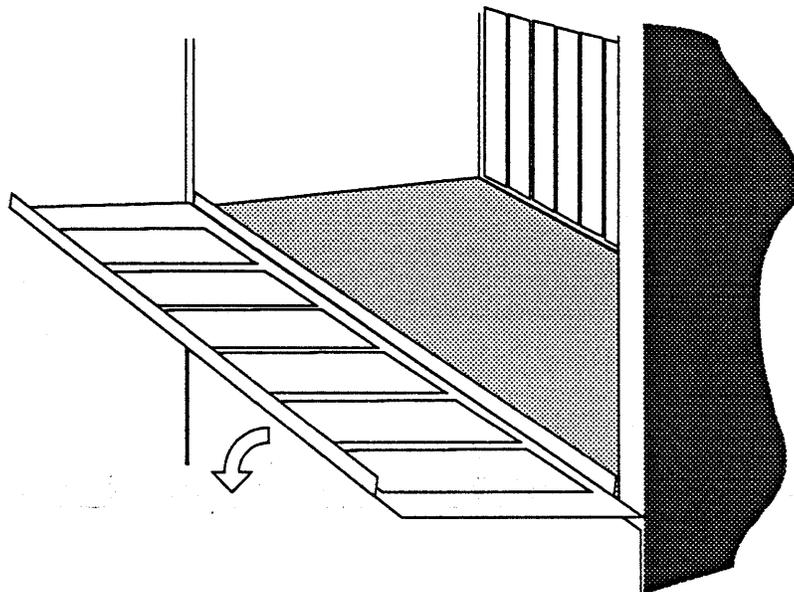
- ◆ Fold down the upper I/O fixing plate, and unplug any cables which connect between the fixing plate, and existing boards.



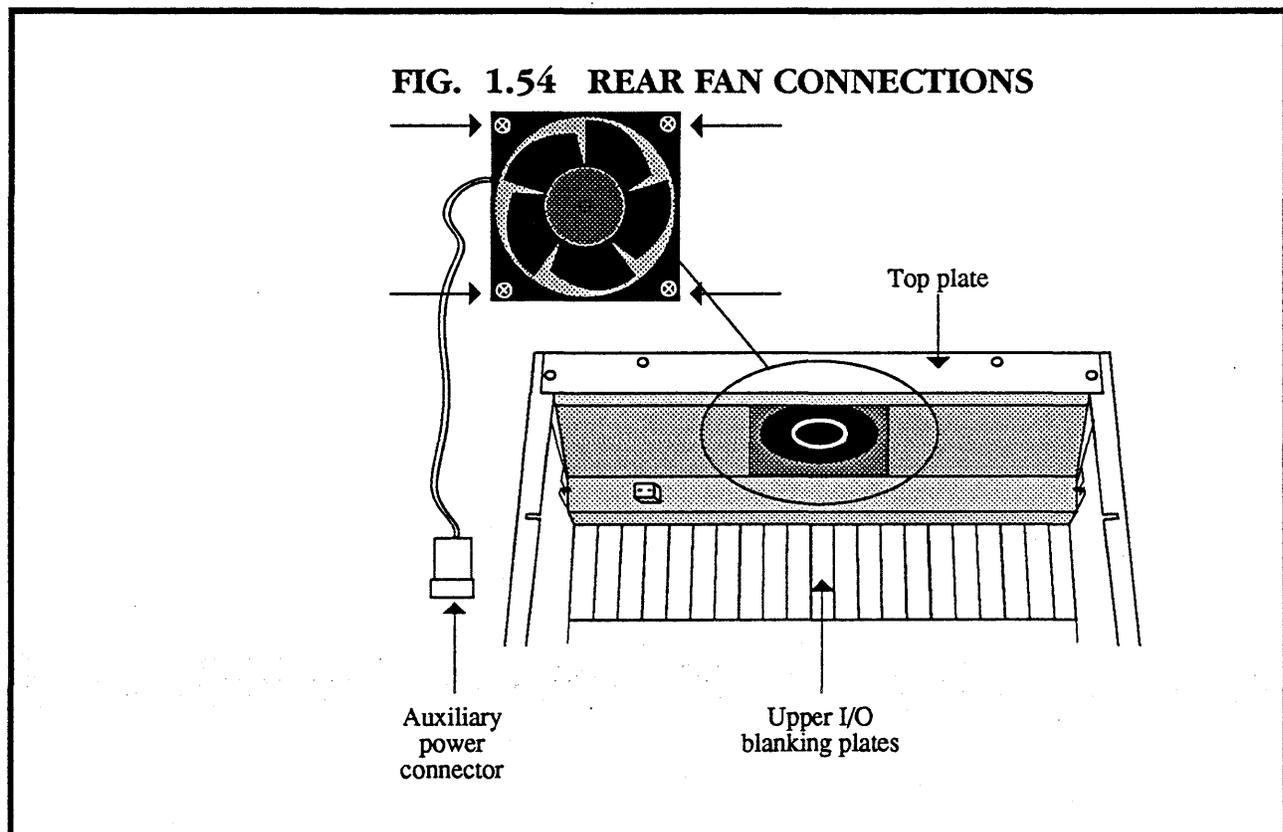
**Be careful to note which wires go where, so that you can reconnect them later.**

- ◆ Remove the upper I/O fixing plate by lifting it out of the hinge slots.

**FIG. 1.53 M40 I/O FIXING PLATE FOLDED DOWN**



- ◆ Remove the four screws in the top plate
- ◆ Disconnect the auxiliary power connector to the fan.
- ◆ Remove the four corner studs on the fan, using an M3.5 spanner.
- ◆ Replace the fan with a new one.



### 1.9 **REMOVING THE M40 CHASSIS FROM AN M40E OR M60E ENCLOSURE**

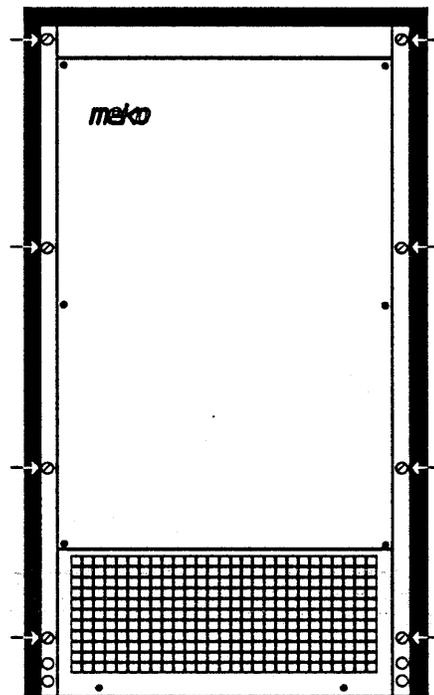
- ◆ Isolate from mains.
- ◆ Disconnect all peripherals connected to the chassis.
- ◆ Remove all boards from the card cage.



**Observe static precautions.**

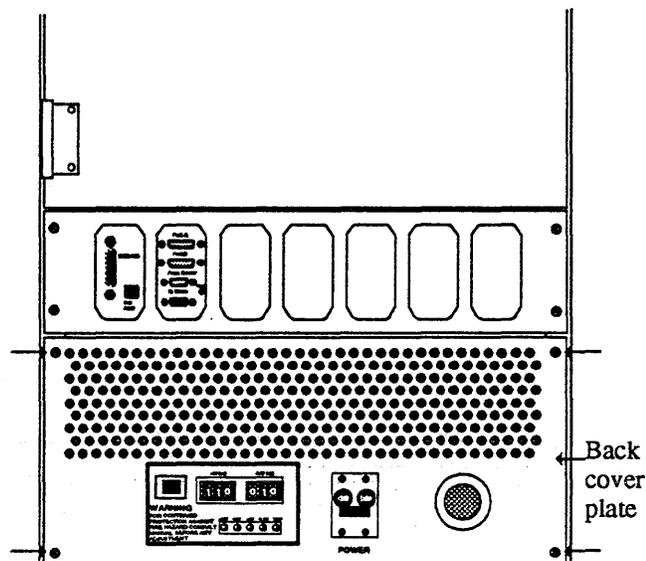
- ◆ Take out the 8 securing screws at the sides of the chassis.

**FIG. 1.55 SCREWS HOLDING CHASSIS**



- ◆ Go round to the back of the machine.
- ◆ Remove the rear door
- ◆ Undo the four screws securing the back cover plate of the power supply, and remove the cover plate.

**FIG. 1.56 BACK COVER PLATE SECURING SCREWS**

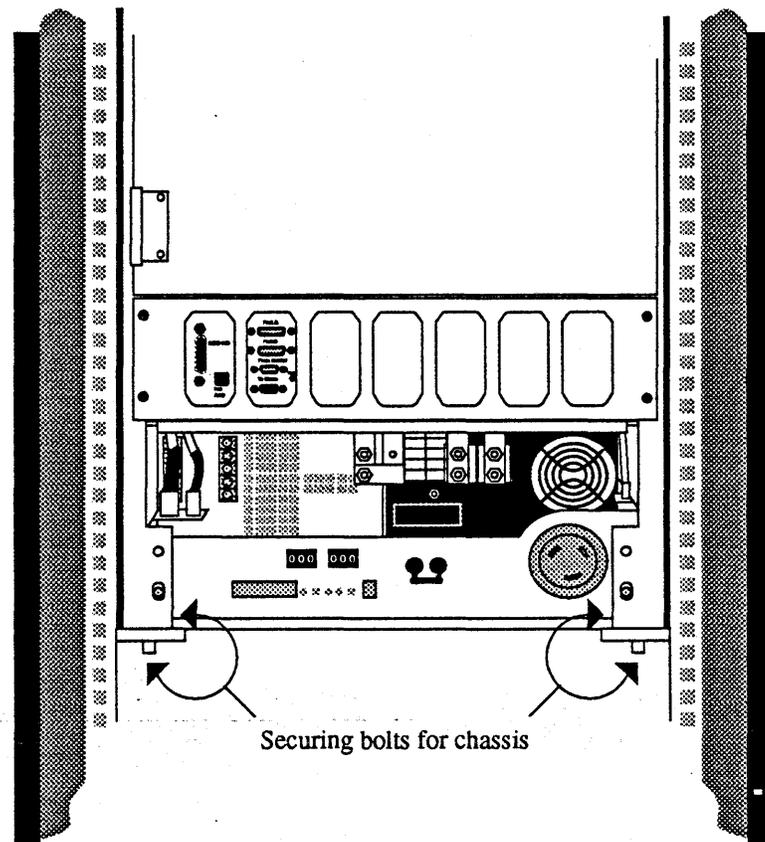


- ◆ Remove the two base bolts securing the chassis.
- ◆ Slide the M40 chassis out of the front of the machine.



**It is extremely heavy, and requires two people to carry it.**

**FIG. 1.57 POSITION OF BASE BOLTS FOR CHASSIS**



## 1.10 ELECTRICAL AND MECHANICAL SPECIFICATIONS

### M40

Number of slots	40
+5 volt supply current <sup>1</sup>	400A
-5.2 volt supply current <sup>1</sup>	30A
+12 volt supply current	12A
-12 volt supply current	12A
Input voltage	180 - 260V
Input frequency	47 - 63Hz
Maximum power in <sup>2</sup>	3500W
Maximum heat output <sup>2</sup>	11940 Btu/hour
Maximum input current r.m.s.	25A
Size in M40E enclosure	1100mm x 760mm x 610mm
Size in M60E enclosure	1880mm x 970mm x 700mm
Size as rack mountable	930mm x 550mm x 483mm
Mass of M40 Module <sup>3</sup>	58Kg
Mass of M40 Module in M40E <sup>3</sup>	120Kg
Mass of M40 Module in M60E <sup>3,4</sup>	240Kg
Shipping weight M40/M40E <sup>3</sup>	160Kg
Shipping weight M40/M60E <sup>3,4</sup>	330Kg
Maximum tip angle	
Operating ambient	5-30°C
Operating altitude	0-2100m
Operating humidity	20% to 80% non-condensing

### NOTES:

- 1 Power supply capacities should be checked against the total load of the specific configuration of boards used.
- 2 This is an absolute worst case power consumption, assuming that the machine is configured to draw the maximum power supply currents at worst case input voltage.
- 3 Mass when empty. Add 1 Kg per board for given configuration.

- 4 Add the mass of any installed peripherals.

*Computing*  
*Surface*

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***M10A CHASSIS  
MAINTENANCE  
MANUAL***

***meiko***



# ***GENERAL MAINTENANCE ON THE M10A***

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<b>1.3</b>	Removing the Chassis from the Enclosure . . . . .	1♦5
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1.4.1	Power Supply Calibration . . . . .	1♦18
<b>1.5</b>	Changing the Power Supply Voltage . . . . .	1♦21
<b>1.6</b>	Changing the Fans and Switches . . . . .	1♦22
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<b>1.8</b>	Electrical and Mechanical Specifications . . . . .	1♦29

This chapter describes advanced maintenance for the M10A chassis (subject to technical modifications).

It covers:

- 1 Changing the power supply.
- 2 Changing fuses.
- 3 Changing fans.
- 4 Changing fuse holders and inlet connectors.

The following topics (which are not covered here) are covered in the **Hardware Reference Manual**.

- 1 Unpacking of an M10A Module shipped in an M10E enclosure.
- 2 The M10E enclosure.
- 3 The card cage.
- 4 Installing boards in the card cage.
- 5 Installing I/O assemblies.
- 6 Manually configuring links.
- 7 Cooling.

## 1.1 **WIRING CONVENTIONS**

The following wiring conventions are used throughout the M10A Module:

<b>Colour</b>	<b>Voltage</b>
Red	+5V
Black	0V (Gnd)
White	-5.2V
Grey	-12V
Violet	+12V

## 1.2 **CHANGING THE POWER SUPPLY AND ASSOCIATED ITEMS**

The power supply on the M10A is contained in a box on the back of the card cage access door. The power supply may be replaced by a qualified service engineer.

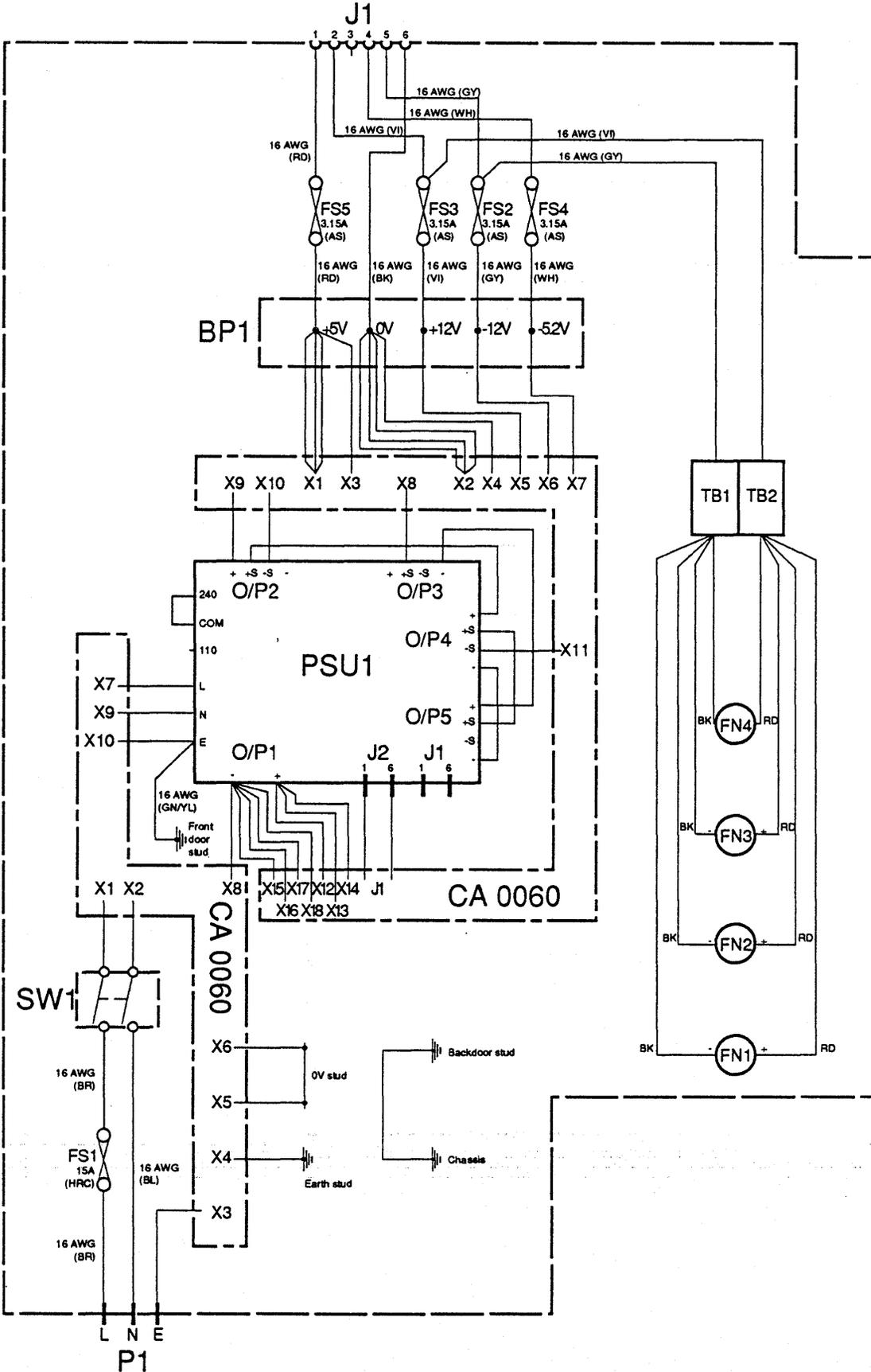


**For continued safety of operation, all parts used should be of the type and value recommended by Meiko.**



**Please observe static precautions when dealing with static sensitive objects.**

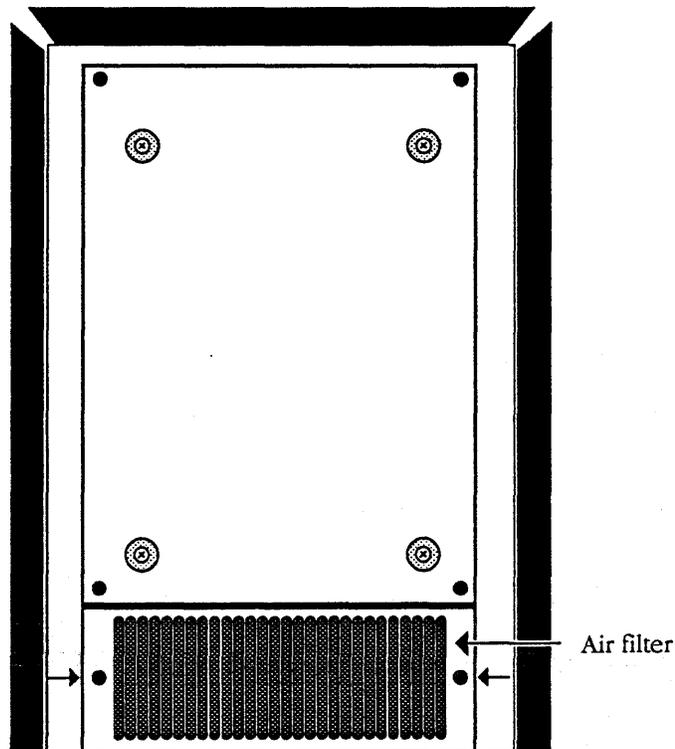
FIG. 1.1 Power supply tray – wiring diagram



### 1.3 **REMOVING THE CHASSIS FROM THE ENCLOSURE**

- ◆ Isolate the M10A chassis from the mains.
- ◆ Disconnect all external peripherals attached to the M10A.
- ◆ Remove the front and back doors of the M10E enclosure.
- ◆ Remove the air filter by unscrewing the two retaining Allen screws with the 4mm A/F Allen key supplied.

**FIG. 1.2 AIR FILTER SECURING SCREWS**





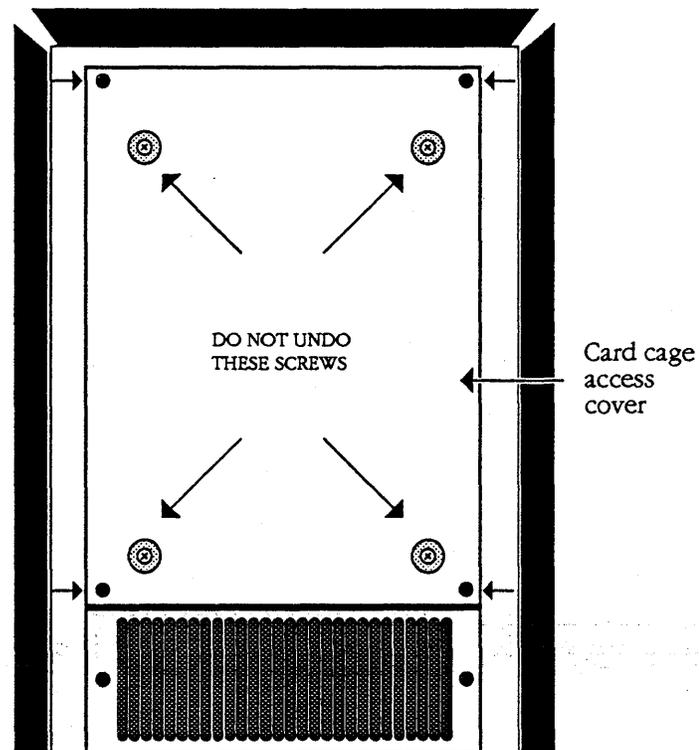
The air filter **MUST** be removed before the access door is lowered.

- ◆ Undo the 4 retaining Allen screws and lower the access door carefully. Support it while you are lowering it, as it is heavy.



Do not undo the recessed crosshead screws as they retain the power supply.

FIG. 1.3 SCREWS SECURING ACCESS DOOR



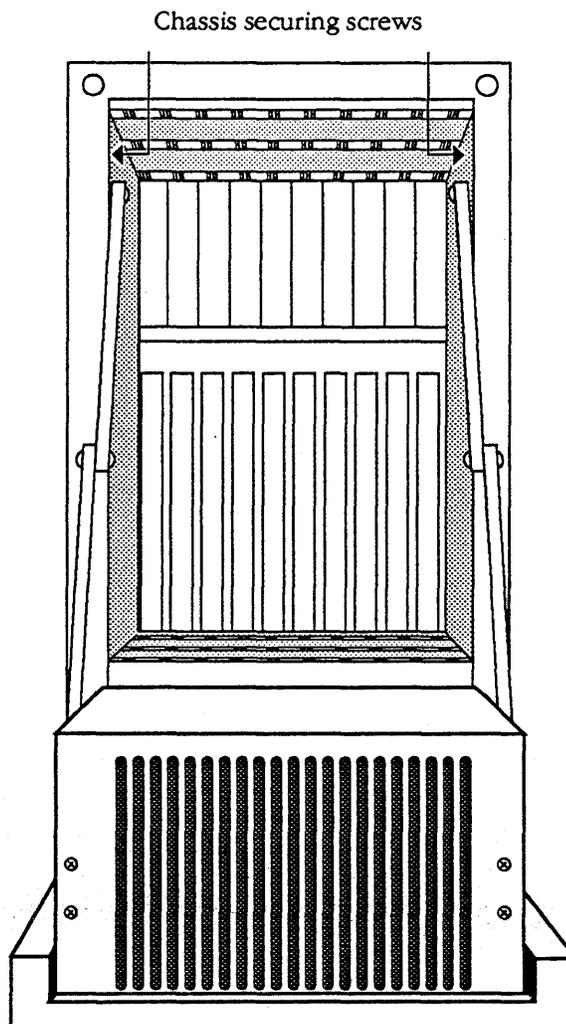
- ◆ Remove all cards from the card cage.



**Observe static precautions.**

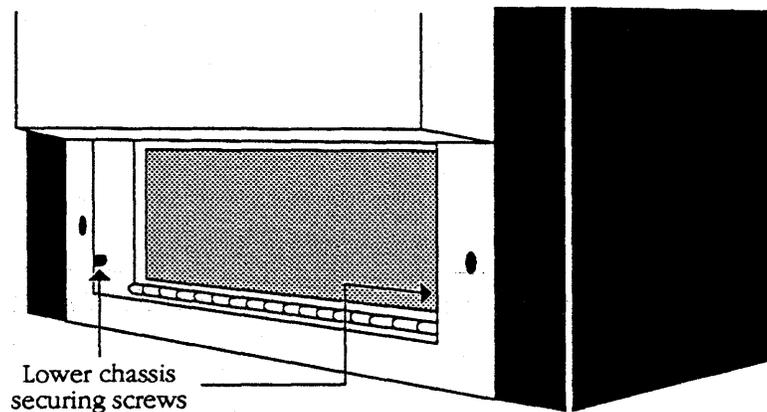
- ◆ Remove the two upper M5 fixing screws securing the front of the chassis to the enclosure.

**FIG. 1.4 FRONT CHASSIS SECURING SCREWS**



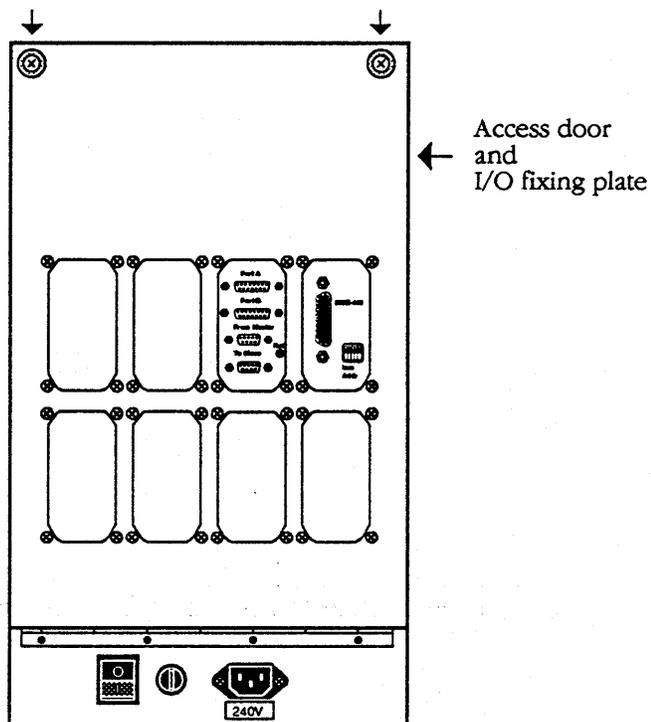
- ◆ Close the access door.
- ◆ Remove the two lower M5 fixing screws which secure the front of the chassis to the enclosure. These are in the space behind the air filter.

**FIG. 1.5 POSITION OF LOWER CHASSIS SECURING SCREWS**



- ◆ Go to the back of the machine.
- ◆ Using a Supadriv No. 2 screwdriver, lower the access cover by undoing the 2 quarter-turn retaining screws.
- ◆ Lower the access cover.

**FIG. 1.6 ACCESS COVER RETAINING SCREWS**

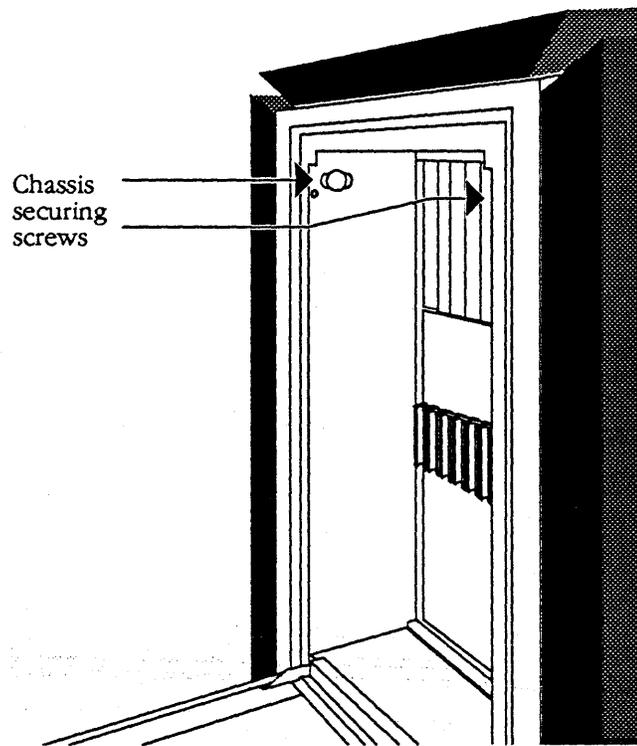


- ◆ Remove the two screws which secure the back of the chassis to the enclosure.
- ◆ Close the I/O access cover.
- ◆ Slide the chassis out of the enclosure. It is heavy, and needs two people to lift it safely.



**The chassis is heavier at the front than the back. Be careful when moving it.**

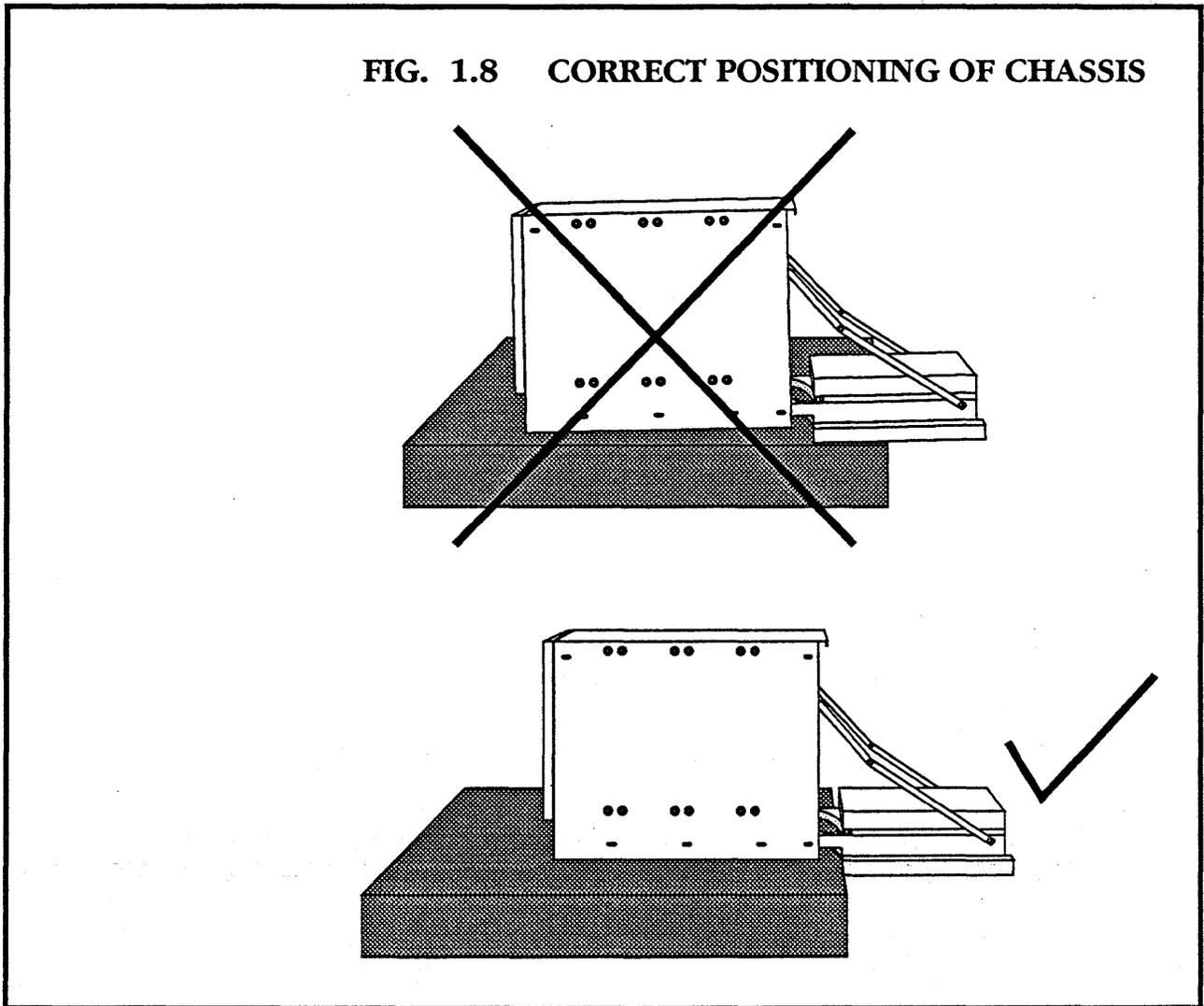
**FIG. 1.7 POSITION OF SCREWS SECURING BACK OF CHASSIS**



## 1.4 **CHANGING THE POWER SUPPLY**

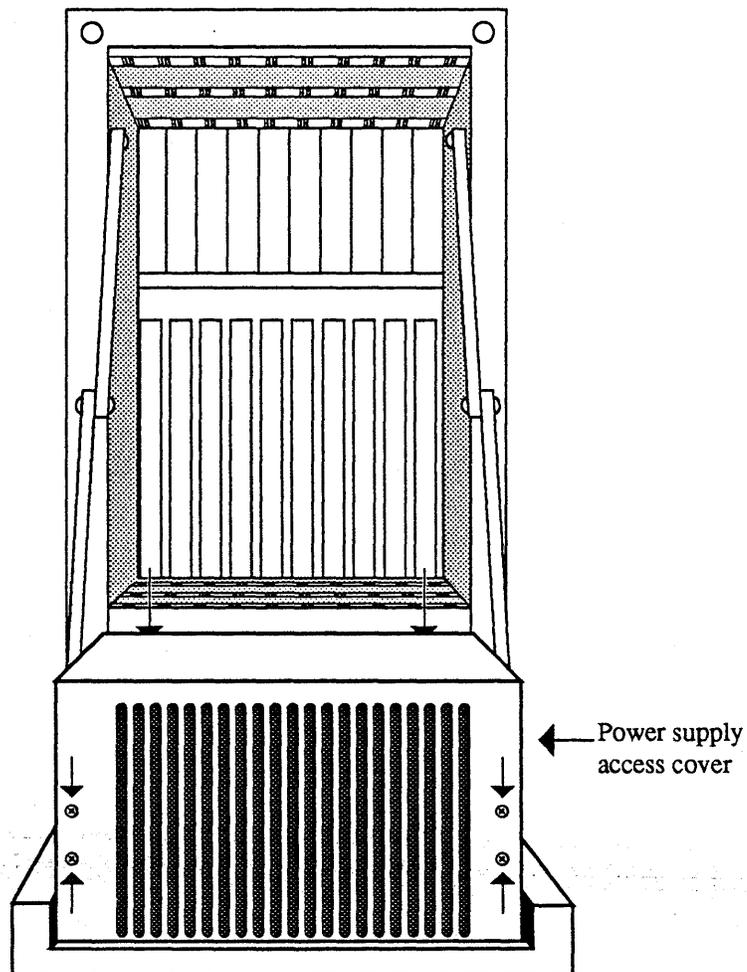
- ◆ This can be done without removing the chassis from the enclosure. The pictures illustrating this section show the chassis only.
- ◆ Open the card cage access cover, ensuring that the weight of the machine does not rest on the power supply.

**FIG. 1.8 CORRECT POSITIONING OF CHASSIS**



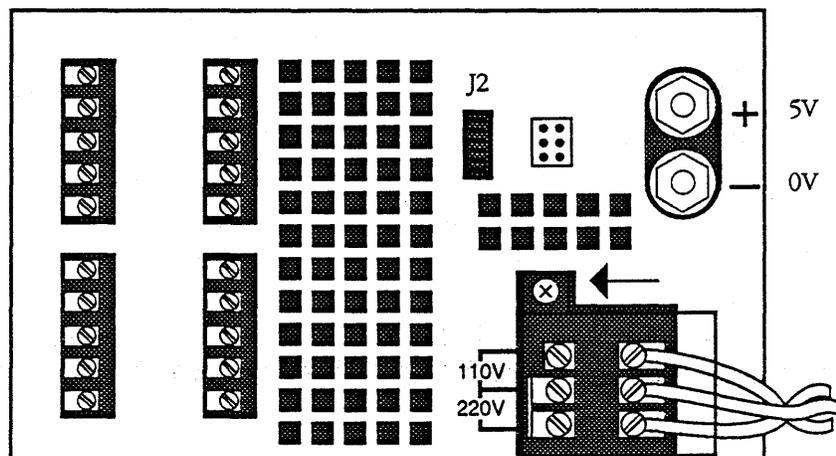
- ◆ Use a Supadriv No. 2 screwdriver to undo the six retaining screws. (Four at the front of the power supply access cover and two at the back.)
- ◆ Remove the cover.

**FIG. 1.9 FRONT VIEW OF THE POWER SUPPLY SHOWING ACCESS COVER**



- ◆ Remove the voltage selector plastic cover by undoing the single retaining screw.
- ◆ Unscrew and remove the live, earth and neutral leads.
- ◆ Remove all the red and black wires from the 0V and 5V studs.
- ◆ Unplug J2.

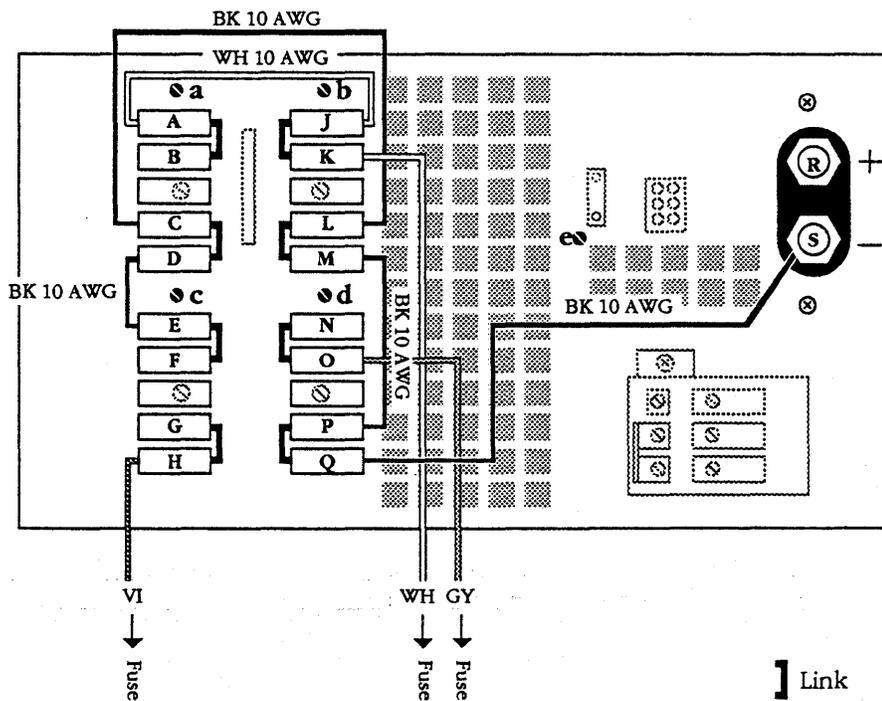
**FIG. 1.10 SCREW SECURING PLASTIC COVER**



- ◆ Undo and remove the wires connecting the wiring loom to the power supply. These connections are as follows:

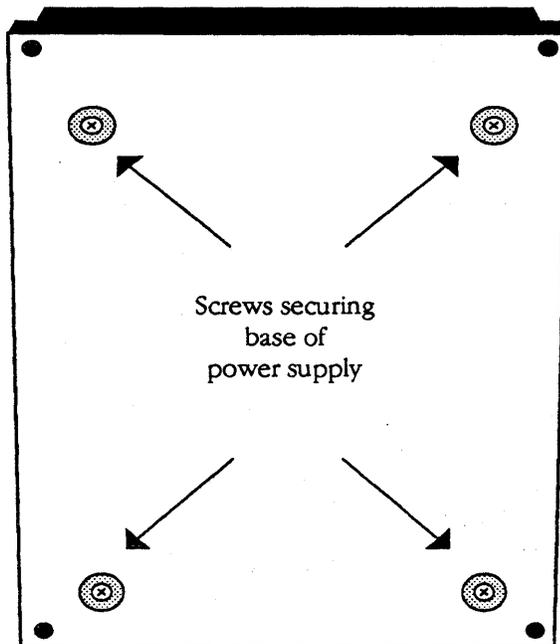
Violet wire to H  
White wire to K  
Grey wire to O  
Black wire to Q

FIG. 1.11 WIRING ON THE POWER SUPPLY



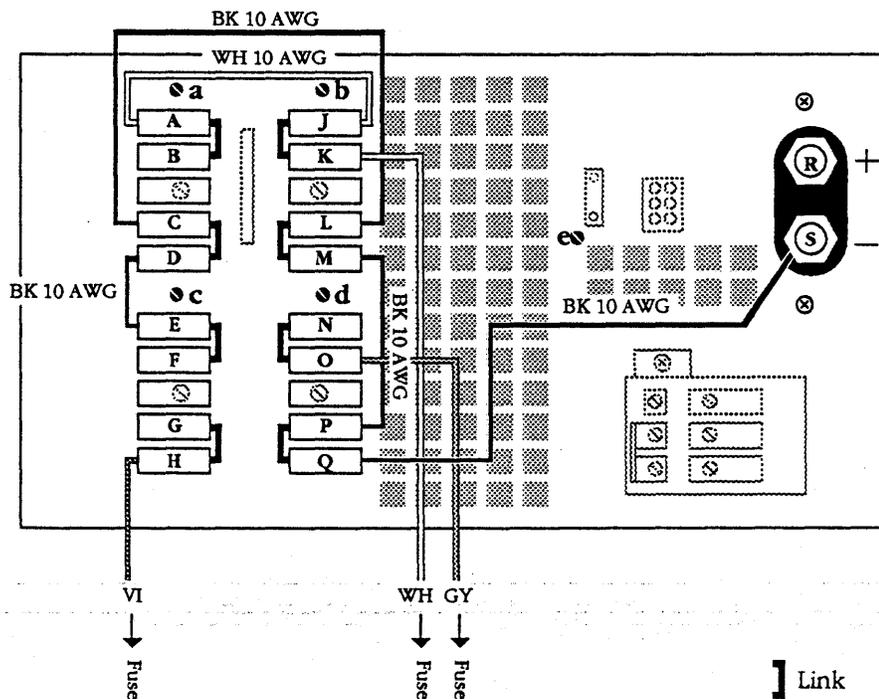
- ◆ Remove the four recessed fixing screws securing the power supply to the access cover. Keep hold of the power supply, so that it does not slip out of place when the screws are removed.
- ◆ Remove the old power supply and replace with a new M10A power supply.
- ◆ Secure with the four screws in the base.

**FIG. 1.12 POSITION OF SECURING SCREWS IN BASE OF POWER SUPPLY**



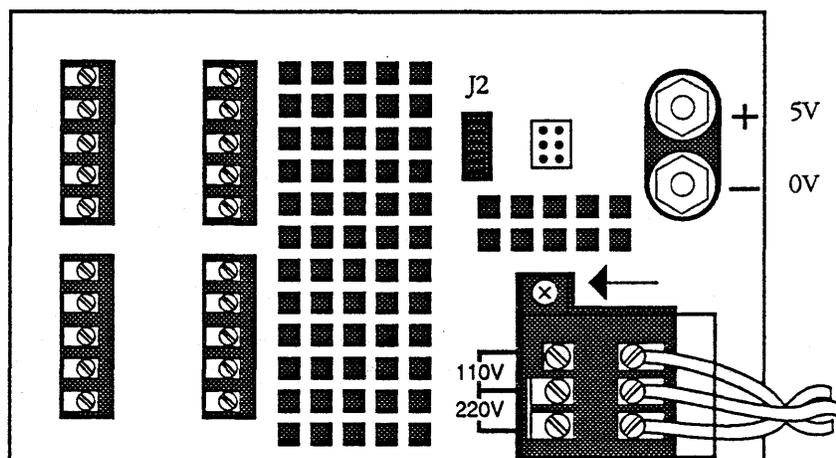
- ◆ Ensure that the links on the new power supply are in the same places as the links on the old power supply.
- ◆ Move the wires from the old power supply to the new power supply, connecting them as shown below. Leave one end of the white wire connecting points A and J disconnected for calibration purposes.
- ◆ Reconnect the earth, live and neutral wires and the wires in the loom.

FIG. 1.13 POSITION OF WIRES AND LINKS ON POWER SUPPLY



- ◆ Replace the voltage selector cover.
- ◆ Replace J2.
- ◆ Calibrate the power supply as described in section 1.4.1.

**FIG. 1.14 POSITION OF J2 AND VOLTAGE SELECTOR COVER**

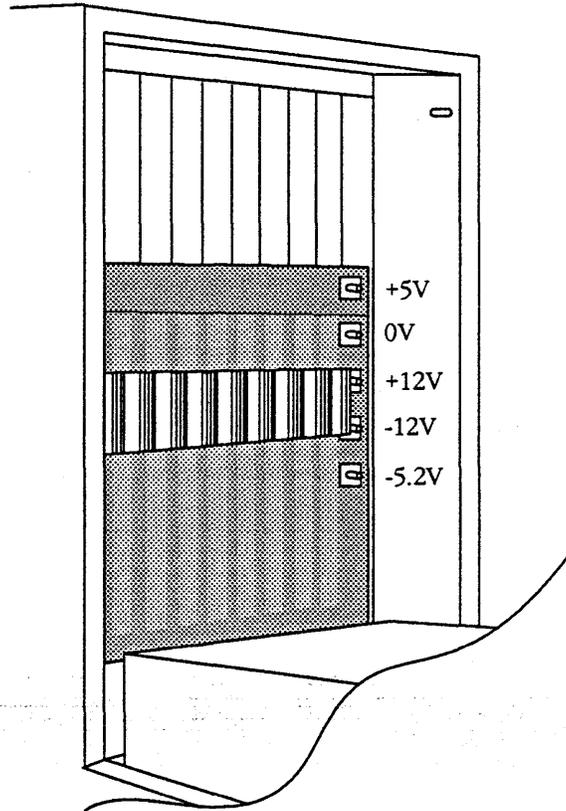


### 1.4.1 **POWER SUPPLY CALIBRATION**

You require a voltmeter with an accuracy of 0.1%.

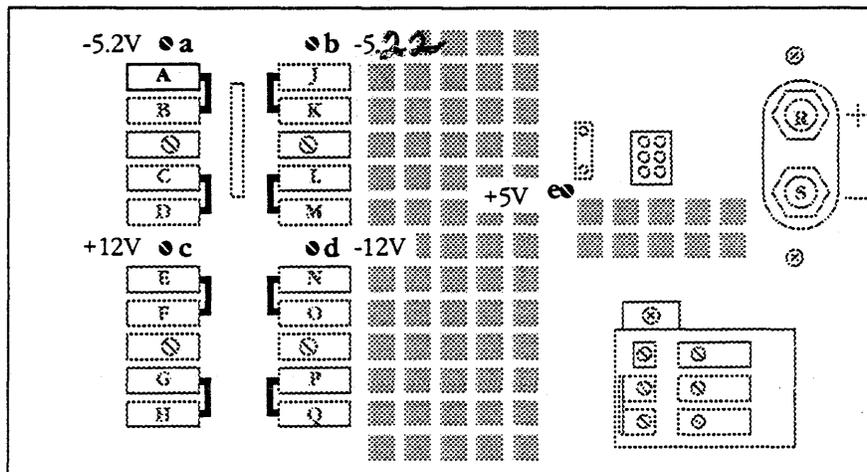
- ◆ Open the I/O area access cover (shown in fig. 1.6) to reveal the power supply studs on the backplane.
- ◆ Re-connect the mains power supply.
- ◆ Connect a voltmeter between the 0V and +5V studs on the backplane.

**FIG. 1.15 BACKPLANE POWER SUPPLY STUDS**



- ◆ Adjust VA point **e** to give 5V on the voltmeter.
- ◆ Connect the voltmeter between the 0V and +12V studs on the backplane.
- ◆ Adjust VA point **c** to give 12V on the voltmeter.
- ◆ Connect the voltmeter between the 0V and -12V studs on the backplane.
- ◆ Adjust VA point **d** to give 12V on the voltmeter.
- ◆ Connect the voltmeter between the 0V and -5.2V studs on the backplane.
- ◆ Adjust VA point **b** to give 5.22V on the voltmeter.
- ◆ Connect the voltmeter between the 0V stud on the backplane and point **A** (the top left-hand connector on the power supply).

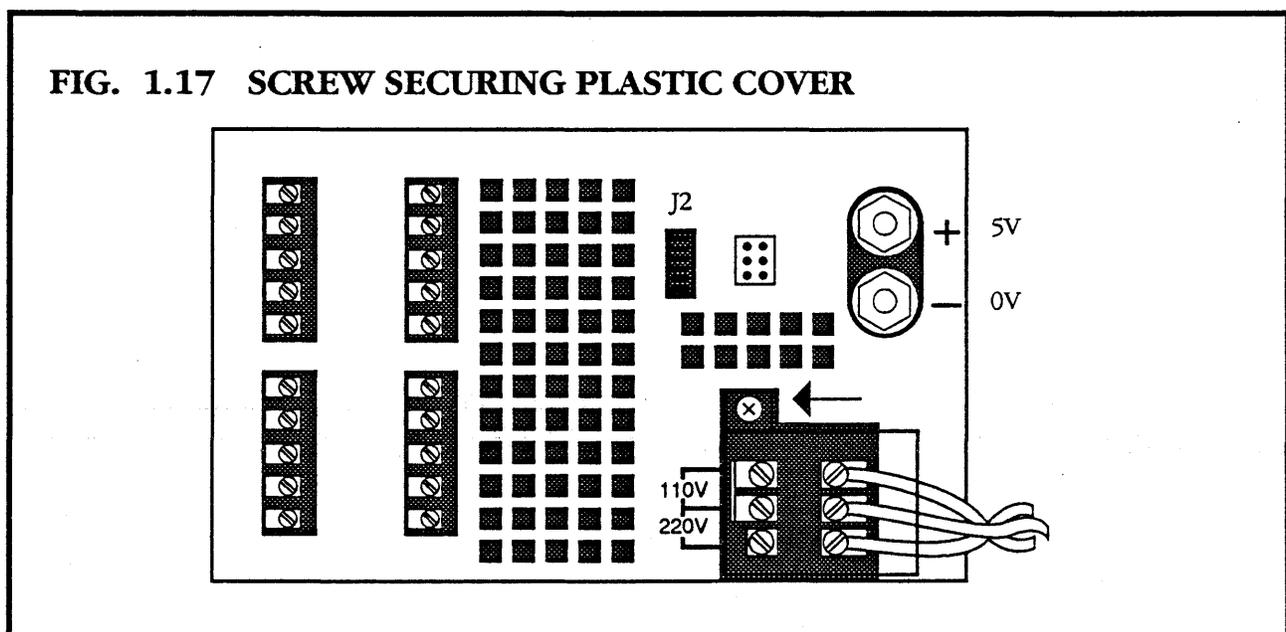
**FIG. 1.16 VOLTAGE ADJUST POINTS ON THE P1000**



- ◆ Adjust VA point **a** to give 5.2V on the voltmeter.
- ◆ Switch off the machine.
- ◆ Reconnect the white lead between points **A** and **J**.
- ◆ Replace the power supply cover.
- ◆ Close the access cover.
- ◆ Replace the air filter and air filter cover.
- ◆ Close and secure the I/O area access cover.
- ◆ Replace the chassis in the enclosure, as described in section **1.6**.

## 1.5 CHANGING THE POWER SUPPLY VOLTAGE

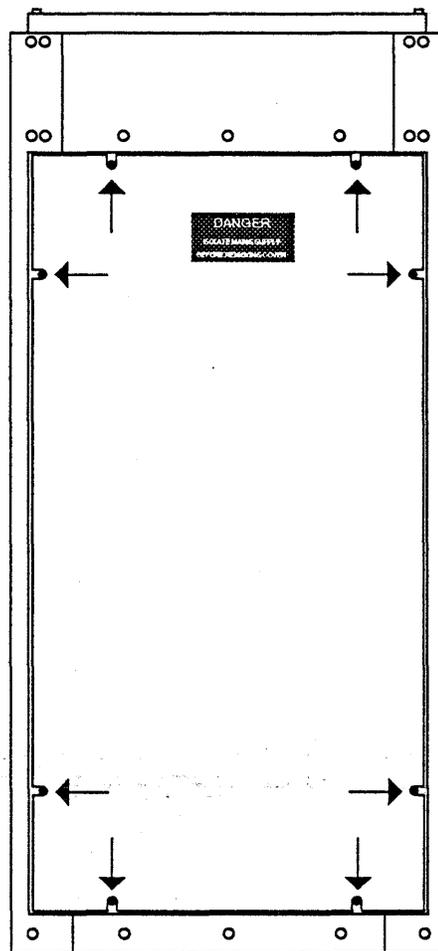
- ◆ Open the card cage access cover.
- ◆ Use a Supadriv No. 2 screwdriver to undo the six retaining screws. (Four at the front of the power supply access cover and two at the back.)
- ◆ Remove the cover.
- ◆ Remove the voltage selector plastic cover by undoing the single retaining screw.
- ◆ Undo the two retaining screws and move the jumper to the high position for 110V (shown in fig. 1.17) or to the low position for 220V.
- ◆ Replace the plastic cover.
- ◆ Replace the power supply access cover.
- ◆ Close the card cage access cover.



## 1.6 *CHANGING THE FANS AND SWITCHES*

- ◆ Remove the chassis from the enclosure as described in section 1.3.
- ◆ Place the machine upside-down, giving access to the base.
- ◆ Remove the 8 screws securing the base plate, and take off the base plate.

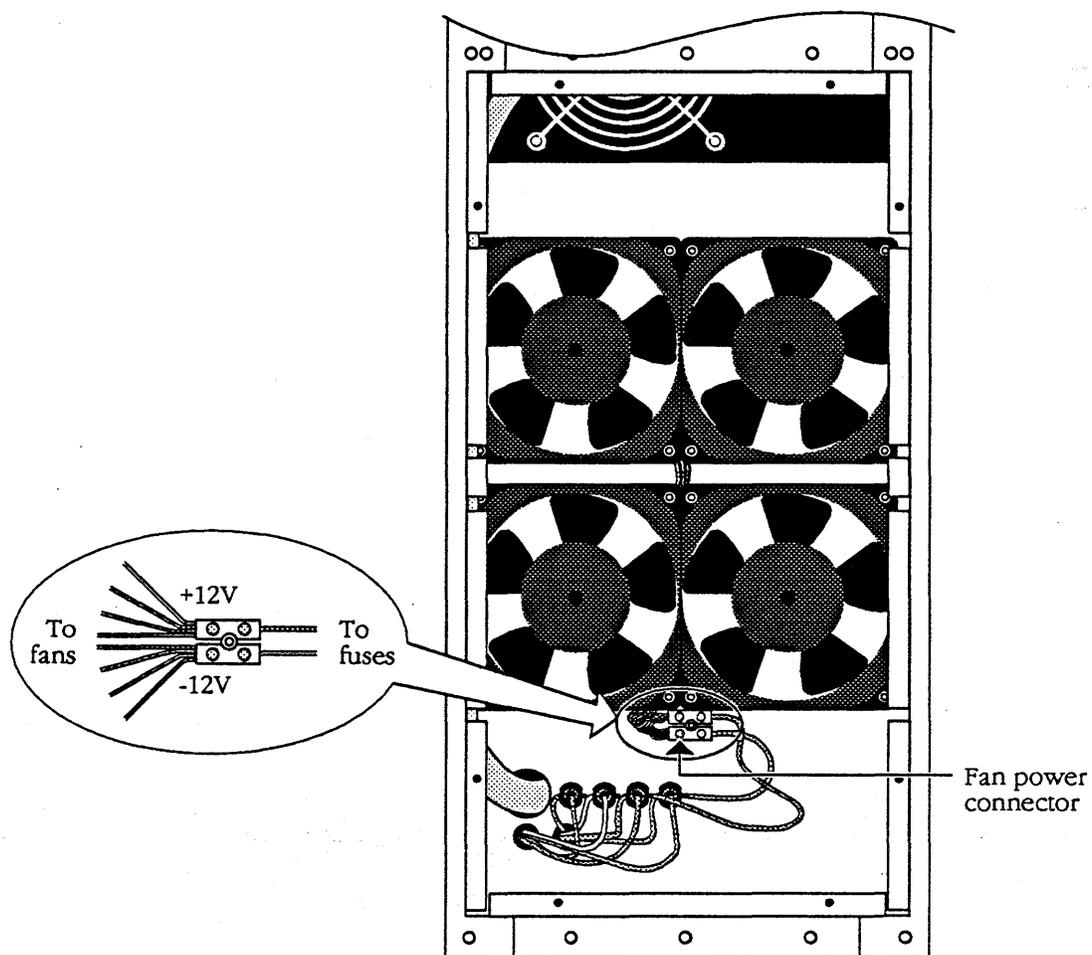
**FIG. 1.18 BASE PLATE SECURING SCREWS**



### 1.6.1 CHANGING A FAN

- ◆ Remove the four corner screws securing the fan.
- ◆ Disconnect the +12V and -12V wires from the connector.
- ◆ Lift the fan off the fixing studs.
- ◆ Replace with a new fan from Meiko.

FIG. 1.19 FANS AND FAN CONNECTIONS



### 1.6.2 *CHANGING THE MAINS SWITCH*

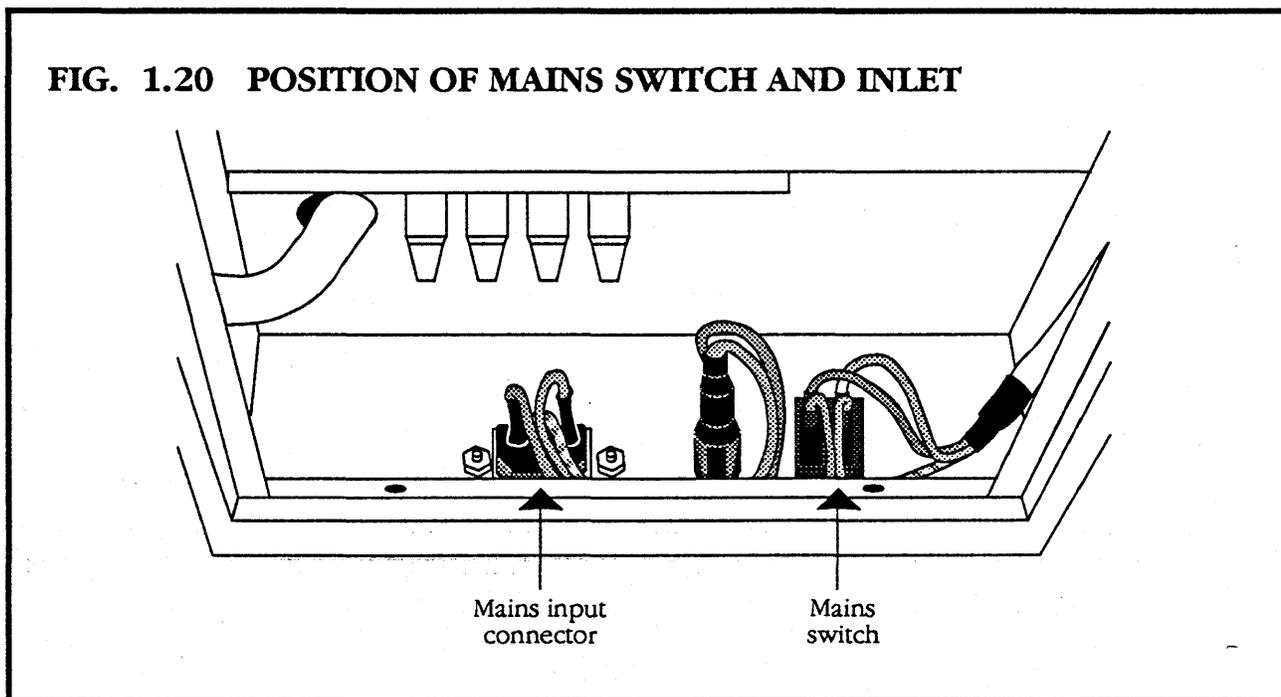
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- ◆ Pull off the wires connected to the mains switch.
- ◆ Squeeze in the four corners of the switch.
- ◆ Push the switch out through the back of the chassis.
- ◆ Replace with a new switch, ensuring that the wires are securely fastened.

### 1.6.3 *CHANGING THE MAINS INPUT CONNECTOR*

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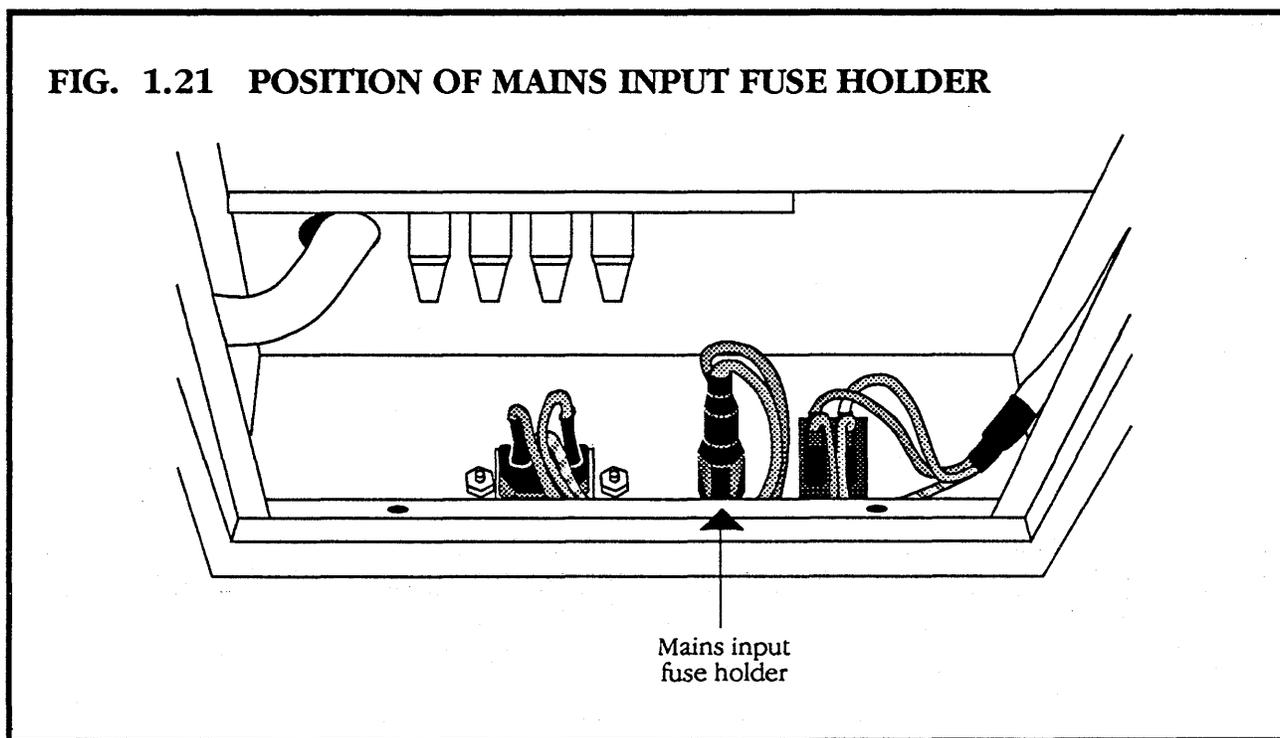
- ◆ Desolder the earth wire on the mains input connector.
- ◆ Pull off the live and neutral wires.
- ◆ Remove the two screws securing the connector.



- ◆ Push the mains input connector out through the back of the chassis.
- ◆ Replace with a new connector, ensuring that the wires are securely fastened.

#### 1.6.4 ***CHANGING THE MAINS INPUT FUSE HOLDER***

- ◆ Pull off the wires connected to the mains input fuse holder.
- ◆ Squeeze in the sides of the fuse holder.
- ◆ Push the fuse holder out through the back of the chassis.
- ◆ Replace with a new holder, ensuring that the wires are securely fastened.

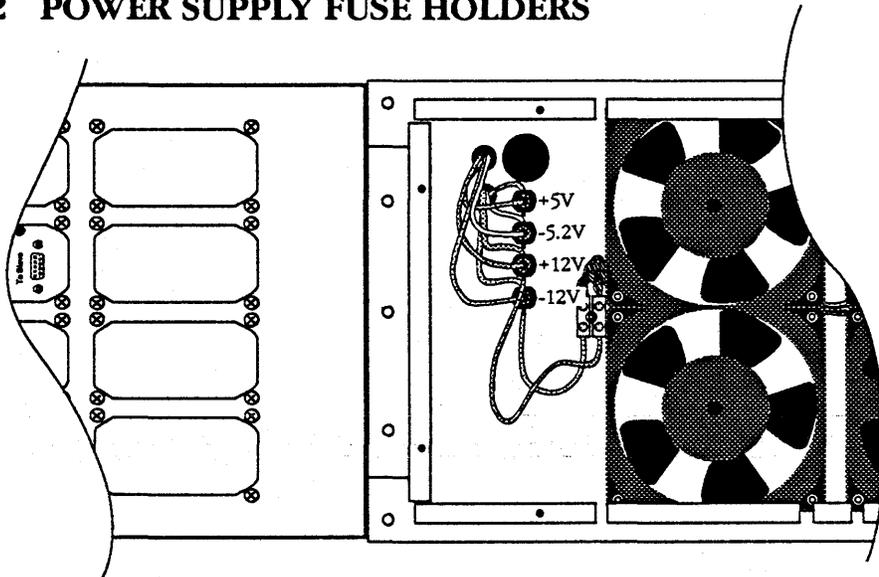


### 1.6.5 *CHANGING THE AUXILIARY DC SUPPLY FUSE HOLDERS*

There are fuse holders for the +5V, -5V, +12V and -12V power supplies. They are all removed in the same way.

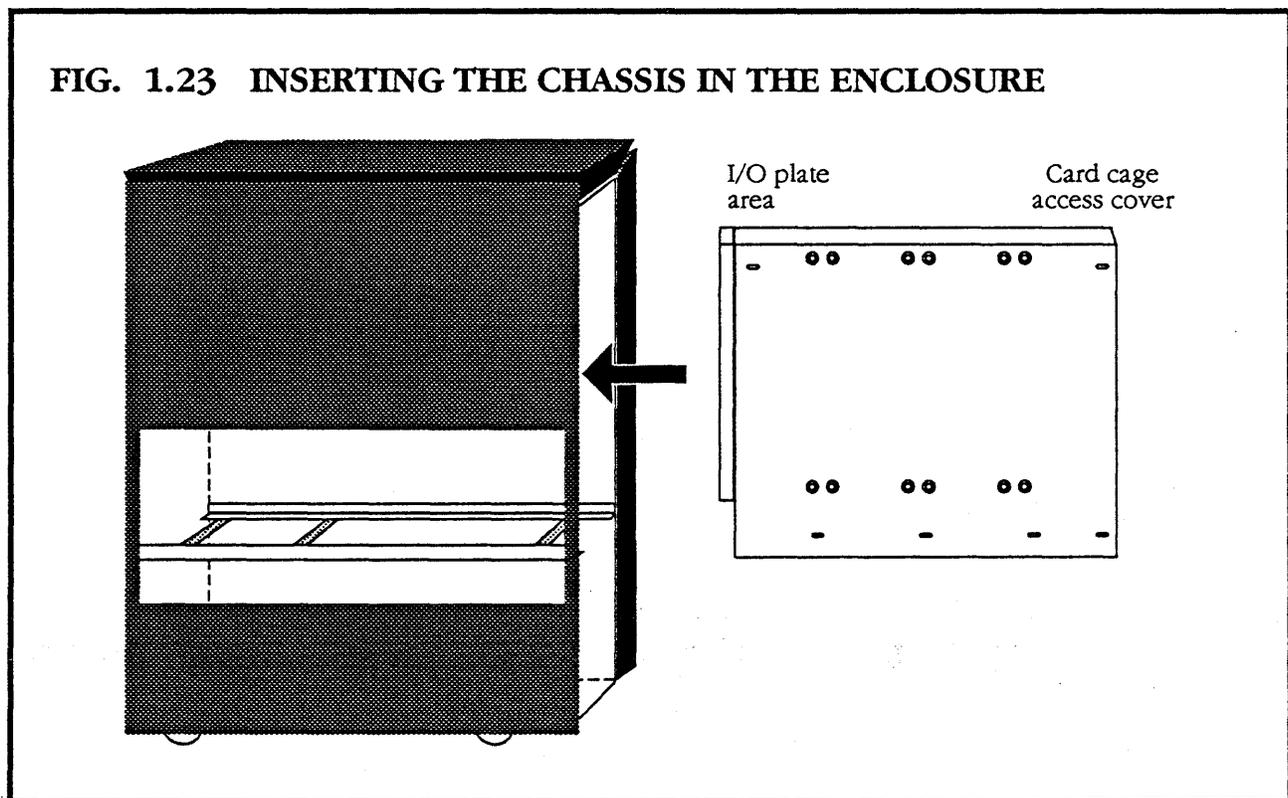
- ◆ Place the chassis on its side, with the open base facing you.
- ◆ Open the card cage access cover, exposing the front of the fuse holders.
- ◆ Desolder the wires securing the selected fuse holder.
- ◆ Squeeze in the sides of the fuse holder.
- ◆ Push the fuse holder out through the side of the chassis.
- ◆ Replace with a new holder, ensuring that the wires are securely fastened.

**FIG. 1.22 POWER SUPPLY FUSE HOLDERS**



## 1.7 **REPLACING THE CHASSIS IN THE ENCLOSURE**

- ◆ Fasten all chassis doors, and make sure that the chassis base plate is securely fixed.
- ◆ Remove the doors from the enclosure.
- ◆ Ensure that the chassis is inserted into the enclosure the right way round. This can be checked by noting whether the securing bolt holes in the enclosure are correctly aligned with the holes in the chassis.
- ◆ Slide the chassis into the enclosure



Loosely fit the six screws securing the chassis (two behind air filter at front pictured in fig. 1.5, two at top of front behind card cage access cover pictured in fig. 1.4, two at top of back behind I/O access cover pictured in fig. 1.7).

- ◆ Close the access covers and replace the doors on the enclosure.
- ◆ Shut the front and back doors of the enclosure to ensure that the chassis is centred between them.
- ◆ Remove the enclosure doors.
- ◆ Tighten the securing screws.
- ◆ Replace the enclosure doors.

## 1.8 ELECTRICAL AND MECHANICAL SPECIFICATIONS

### M10A

Number of slots	10
+5 volt supply current <sup>1</sup>	100A
-5.2 volt supply current <sup>1</sup>	30A
+12 volt supply current	15A
-12 volt supply current	15A
Input voltage	
on 240V	180 – 260V
on 110V	90 – 130V
Input frequency	47 – 63Hz
Maximum input current r.m.s.	
on 240V	7A
on 110V	12A
Maximum power in <sup>2</sup>	1.2KW
Maximum heat output <sup>2</sup>	4100 Btu/hour
Power supply fuse	15A 1 $\frac{1}{4}$ " x $\frac{1}{4}$ " Quick acting ceramic cartridge
Other fuses	
12V	3.15A 20mm x 5mm (antisurge)
5V	3.15A 20mm x 5mm (quick blow)
Size in enclosure	675mm x 625mm x 370mm
Size as rack mountable	450mm x 480mm x 250mm
Mass of M10A Module <sup>3</sup>	25kg
Mass of M10A Module in M10E <sup>3,4</sup>	50kg
Shipping weight of M10A/M10E <sup>3,4</sup>	40kg/65kg
Operating ambient	5-30°C
Operating altitude	0-2100m
Operating humidity	20% to 80% non-condensing

### NOTES:

- 1 Power supply capacities should be checked against the total load of the specific configuration of boards used.

- 2 This is an absolute worst case power consumption, assuming that the machine is configured to draw the maximum power supply currents at worst case input voltage.
- 3 Mass when empty. Add 1 Kg per board for given configuration.
- 4 Add the mass of any installed peripherals.

*C o m p u t i n g*  
*S u r f a c e*

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***DESK TOP UNIT  
MAINTENANCE  
MANUAL***

***meiko***



# ***GENERAL MAINTENANCE ON THE DESK TOP UNIT***

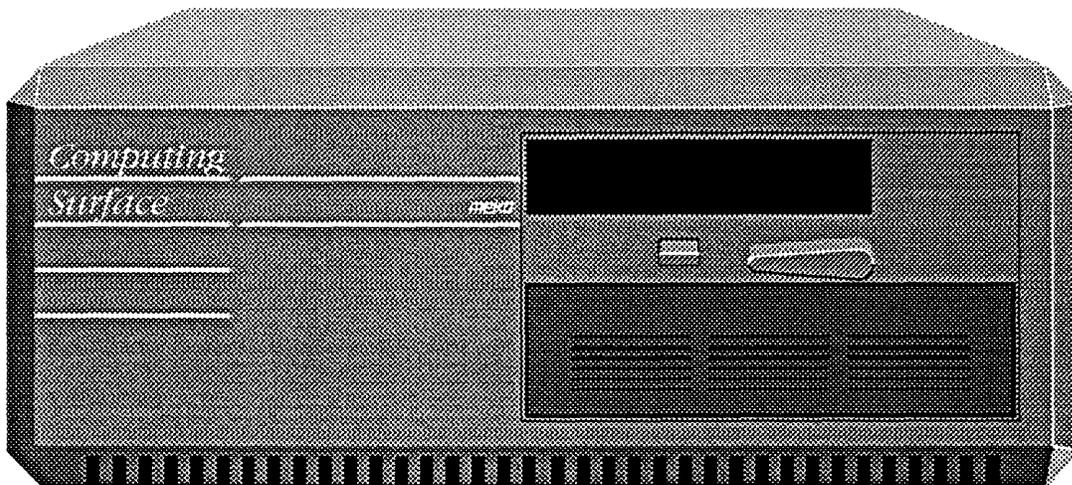
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This chapter describes advanced maintenance for the Meiko desk top unit (subject to technical modifications).

It covers:

- 1 Selecting the input voltage to be 240V or 110V.
- 2 Changing fuses.
- 3 Changing a disk or tape drive.
- 4 Changing the power supply unit.
- 5 Changing the fan.



## 1.1 WIRING CONVENTIONS

The following wiring conventions are used throughout the desk top unit:

Colour	Voltage
Red	+5V
Black	0V (Gnd)
White	-5.2V
Grey	-12V
Violet	+12V

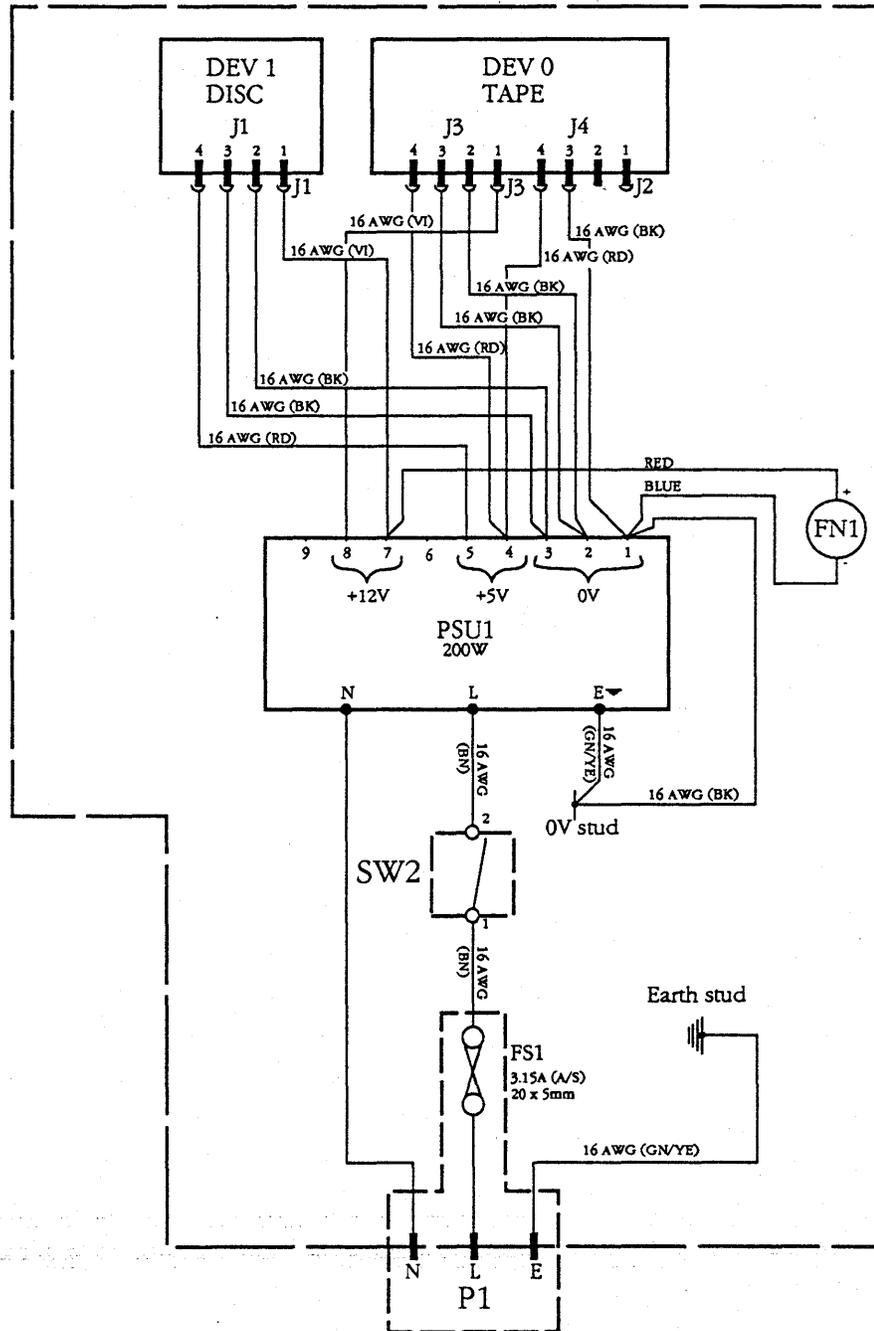


**For continued safety of operation, all parts used should be of the type and value recommended by Meiko.**



**Please observe static precautions when dealing with static sensitive objects.**

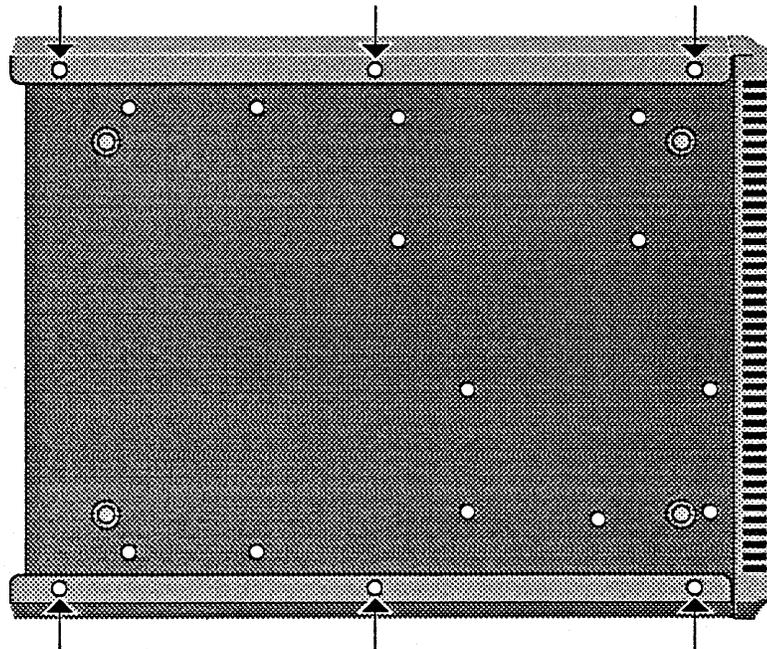
FIG. 1.1 Desk top unit wiring diagram



## 1.2 OPENING THE DESK TOP UNIT

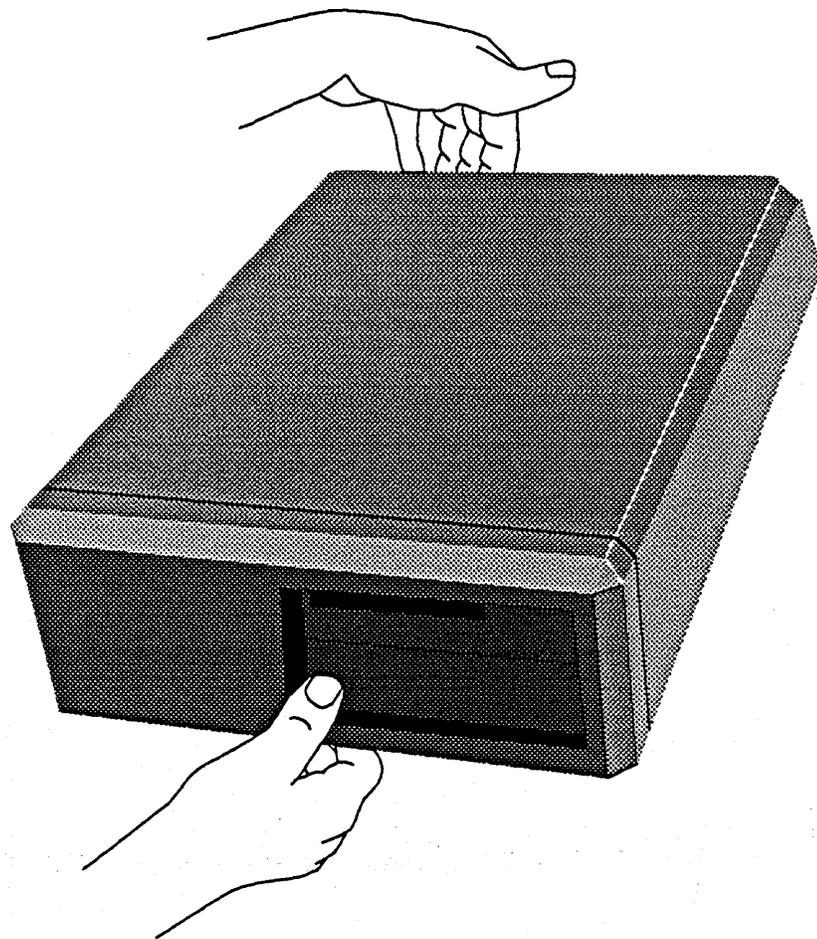
- ◆ Isolate the desk top unit from the mains.
- ◆ Disconnect the SCSI cables to the unit, noting which one is which.
- ◆ Turn the unit on its side, showing the base.
- ◆ Remove the six screws securing the cover of the unit.

FIG. 1.2 COVER SECURING SCREWS



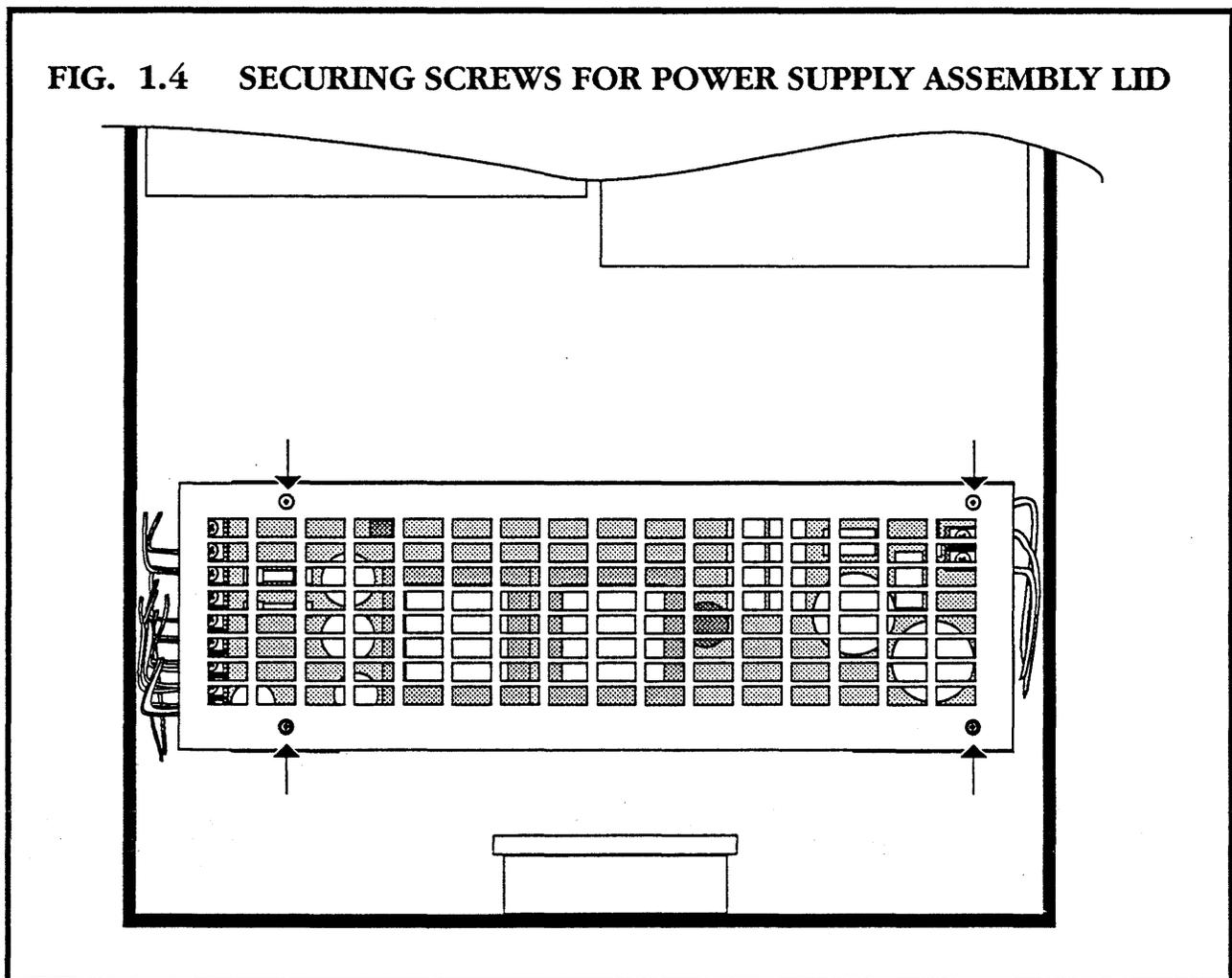
- ◆ Place the unit right way up.
- ◆ Slide the lid forward off the unit, being careful to manoeuvre it over the flanges at the rear.

**FIG. 1.3 TAKING THE LID OFF**



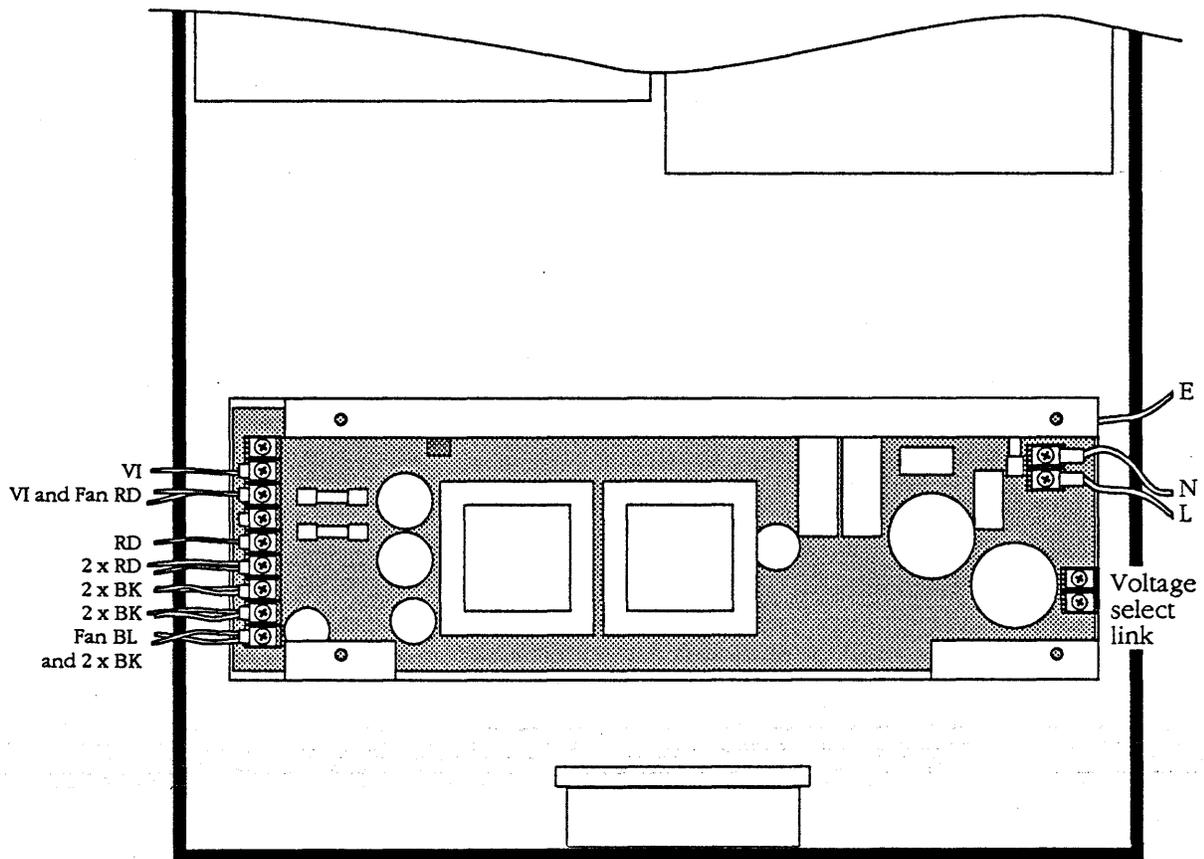
### 1.3 *SELECTING THE INPUT VOLTAGE*

- ◆ Open the desk top unit as described in section 1.2.
- ◆ Remove the lid of the power supply.



- ◆ Place a link across the two voltage select points to select 110V or remove it for 240V.
- ◆ Ensure that the external mains input fuse is 3A for 240V or 5A for 110V.

**FIG. 1.5 POSITION OF THE VOLTAGE SELECTOR LINK**



## 1.4 *CHANGING FUSES*

When you change a fuse, make sure that you know the cause of the fuse blowing. There are three fuses on the desk top unit.

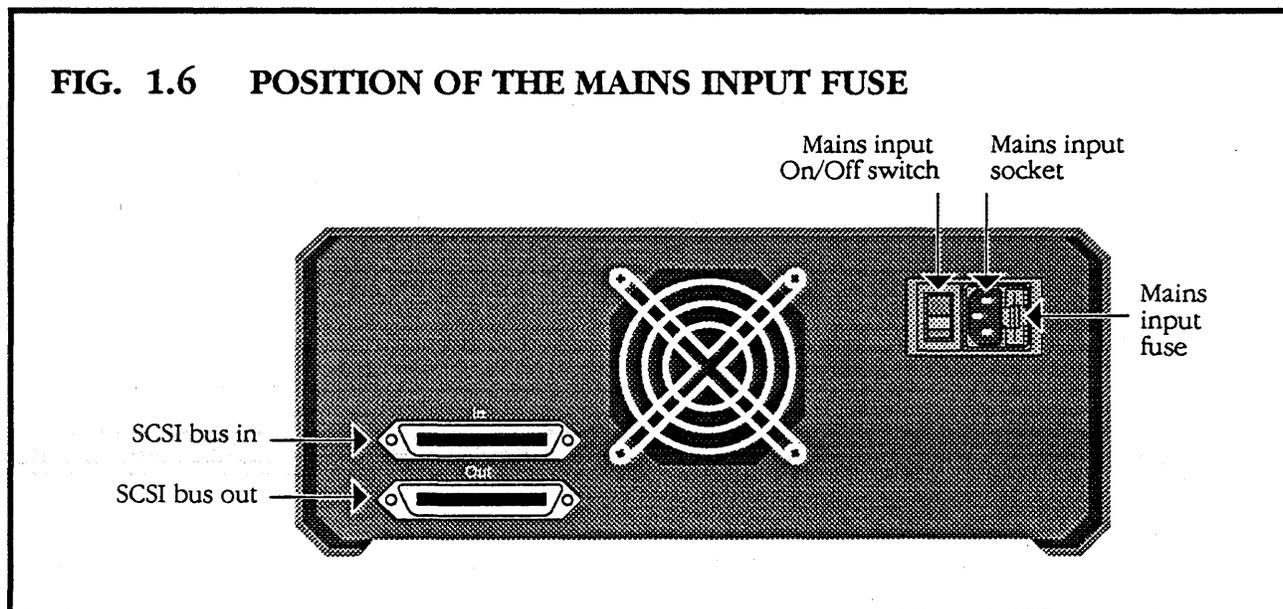
External mains input fuse    3A at 240V  
5A at 110V

Internal mains input fuse    5A HRC        FS1

Internal 12V fuses            6.3A AT        FS3 and FS4

### 1.4.1 *CHANGING THE EXTERNAL MAINS INPUT FUSE*

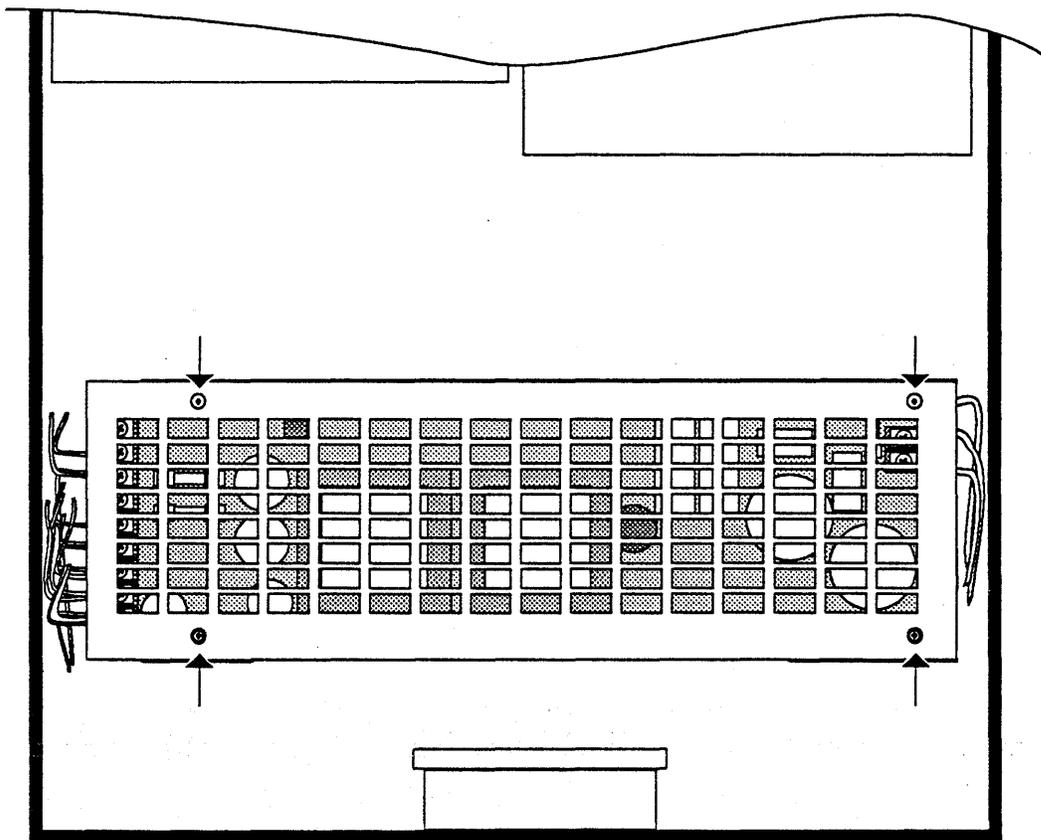
- ◆ Ensure that the unit is isolated from the mains.
- ◆ Pull out the mains input fuse holder.
- ◆ Replace the fuse with one of identical type and value.



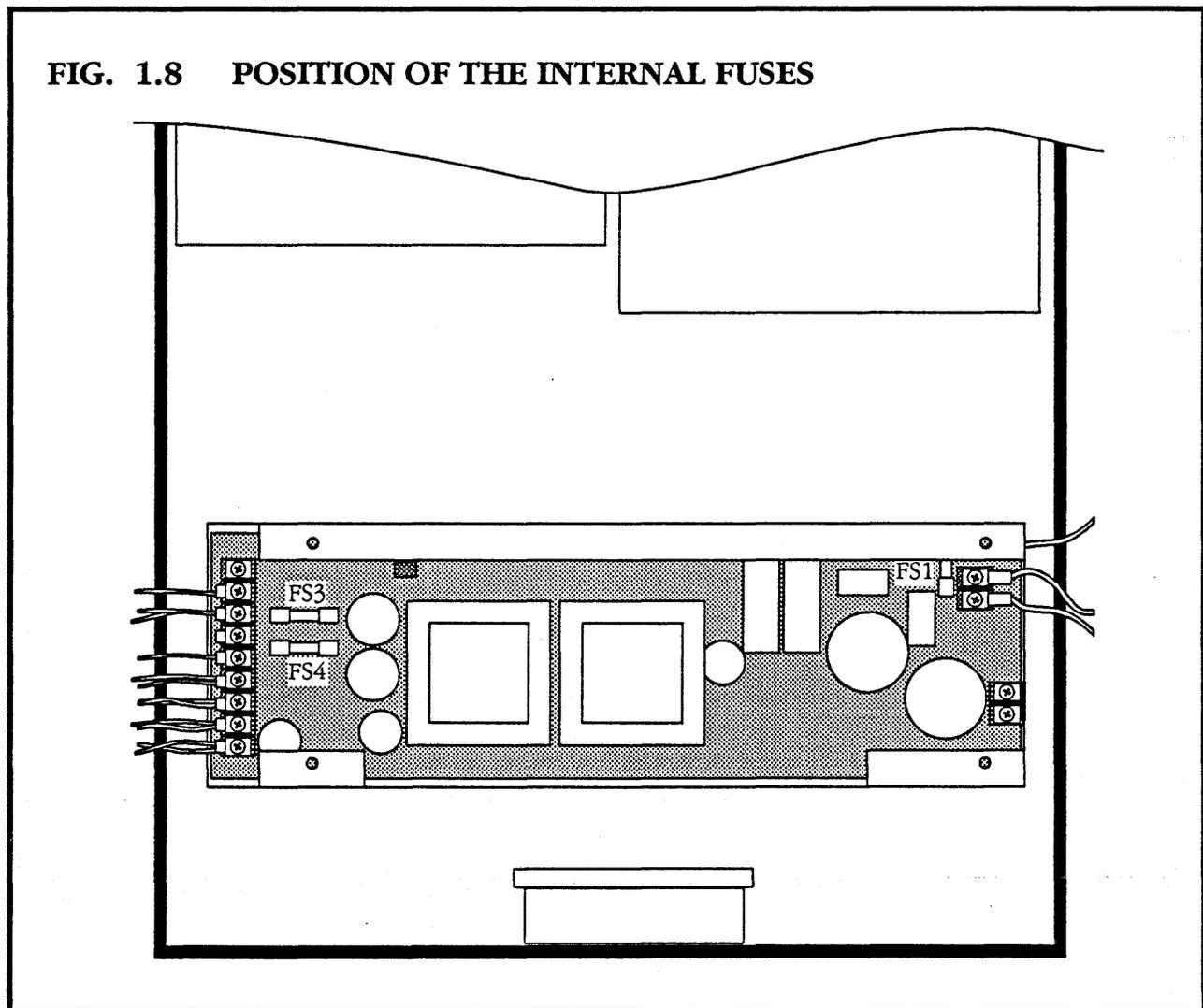
### 1.4.2 *CHANGING THE INTERNAL FUSES*

- ◆ Make sure you know the cause of the fuse blowing.
- ◆ Ensure that the unit is isolated from the mains.
- ◆ Open the desk top unit as described in section 1.2.
- ◆ Undo the four securing screws holding the lid on the power supply cage.

**FIG. 1.7 TAKING THE LID OFF THE POWER SUPPLY CAGE**



- ◆ Change the fuse for one of identical type and value.

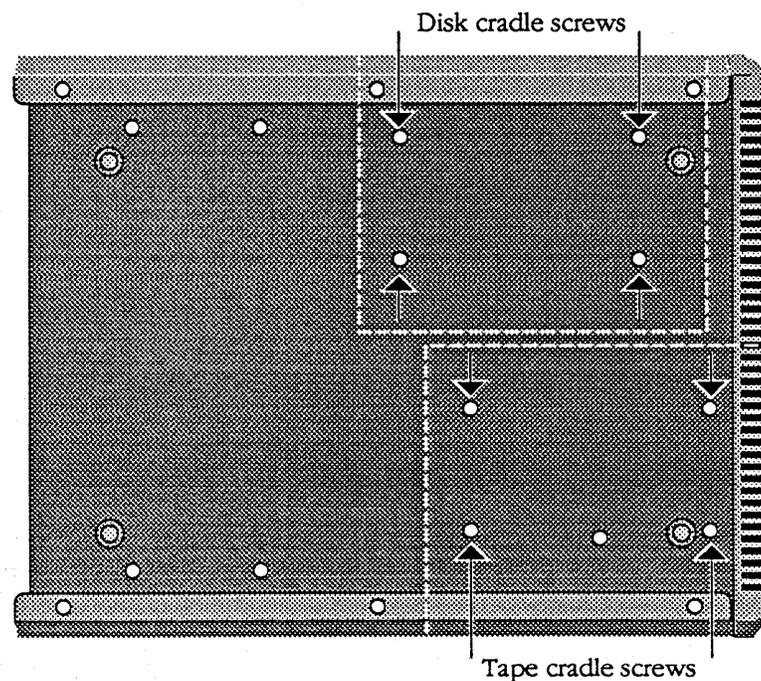


## 1.5 *CHANGING A DISK OR TAPE DEVICE*

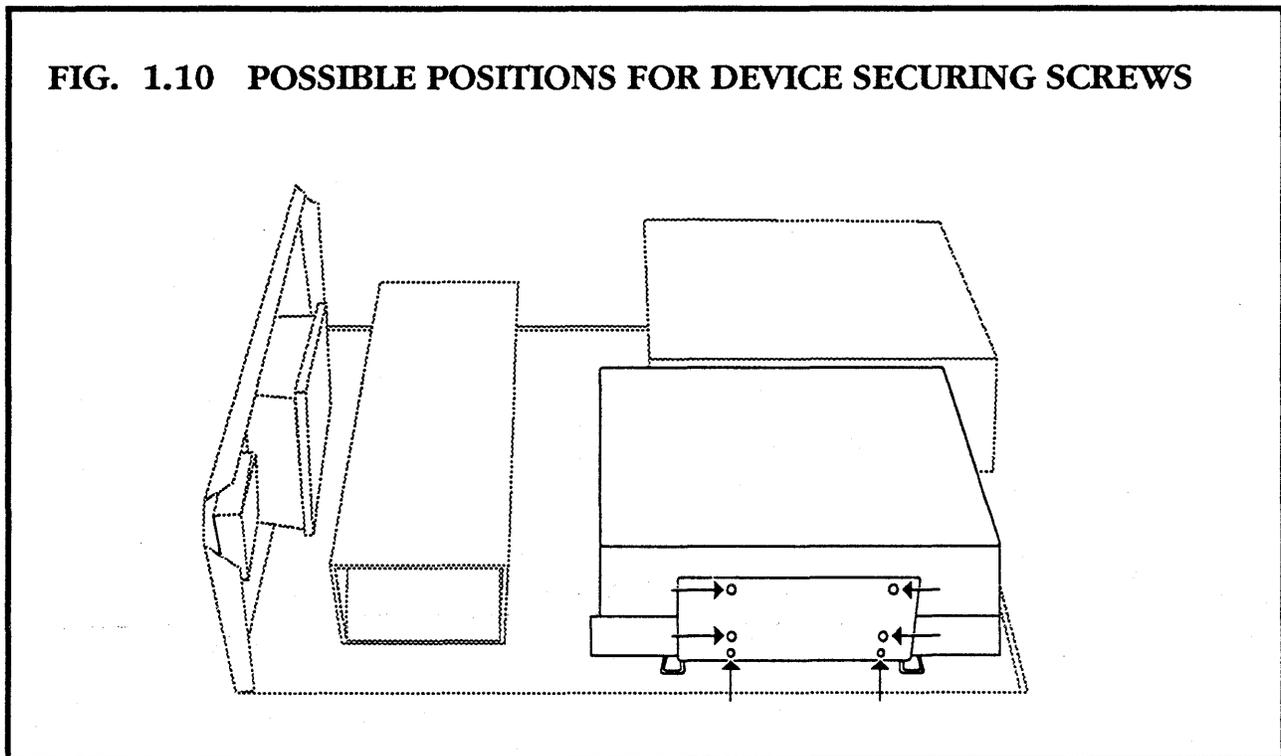
The disk and tape devices are held in cradles within the desk top unit.

- ◆ Isolate the desk top unit from the mains.
- ◆ Open the desk top unit as described in section 1.2.
- ◆ Unplug the 50-way SCSI cable and the power supply connector from the device to be changed.
- ◆ Put the desk top unit on its side and undo the four screws holding the appropriate cradle in place, and lift out the cradle and device.

**FIG. 1.9 THE CRADLE SECURING SCREWS**



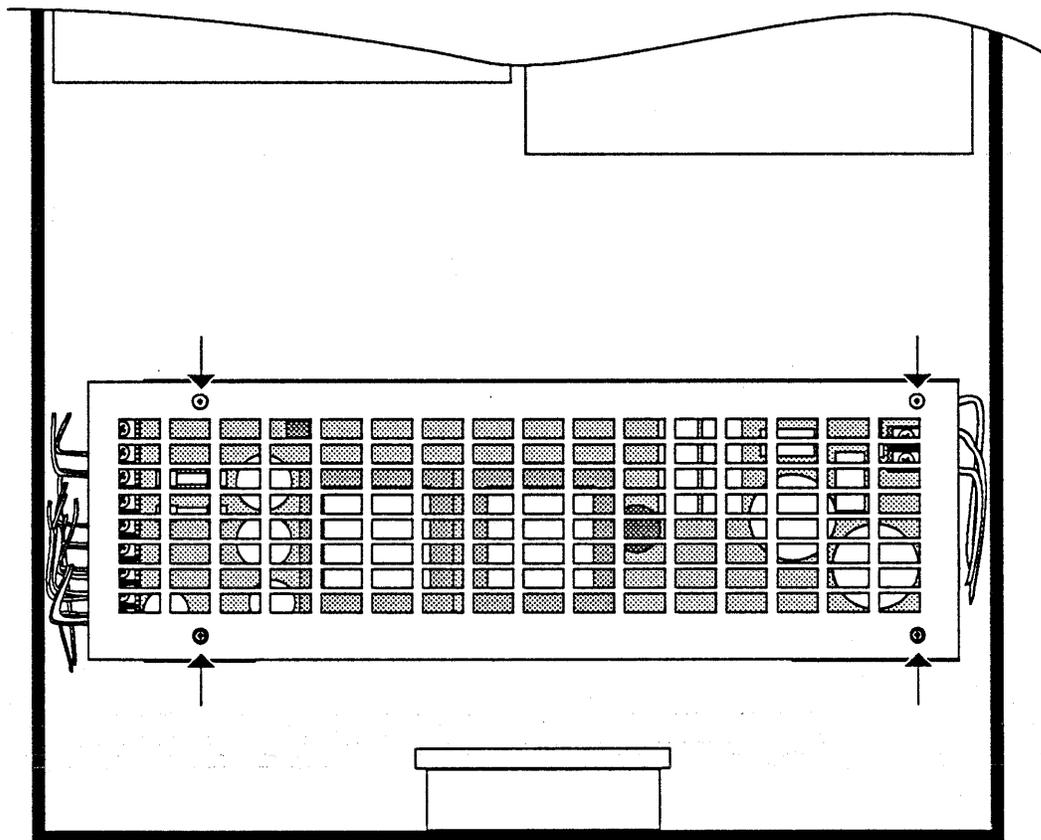
- ◆ Remove the four screws (two on each side) which hold the unit in the cradle. These screws will be in different places, depending on the type of unit.
- ◆ Put a new unit in the cradle and secure it in place.
- ◆ Replace the cradle in the desk top unit, and secure it with the four screws in the base.
- ◆ Reconnect the SCSI and power supply.



## 1.6 **CHANGING THE POWER SUPPLY ASSEMBLY**

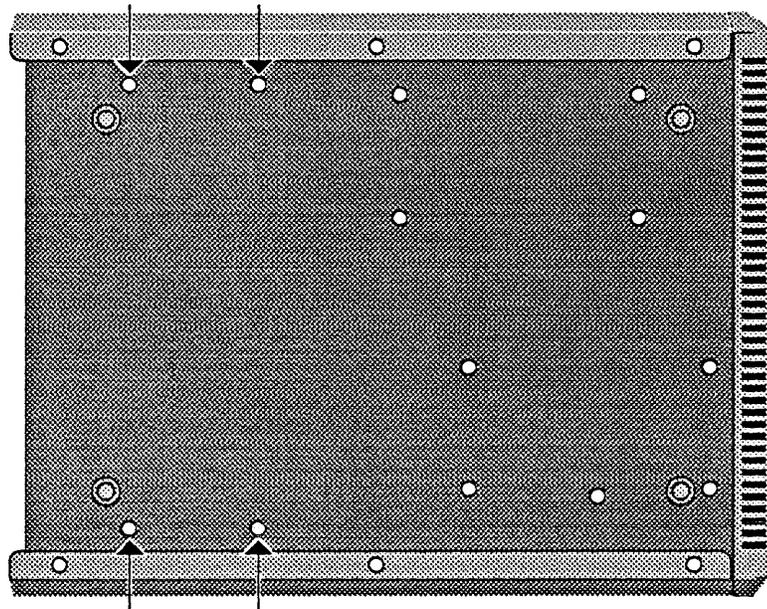
- ◆ Ensure that the desk top unit is isolated from the mains.
- ◆ Open the desk top unit as described in section 1.2.
- ◆ Undo the four securing screws holding the lid on the power supply cage.

**FIG. 1.11 TAKING THE LID OFF THE POWER SUPPLY CAGE**

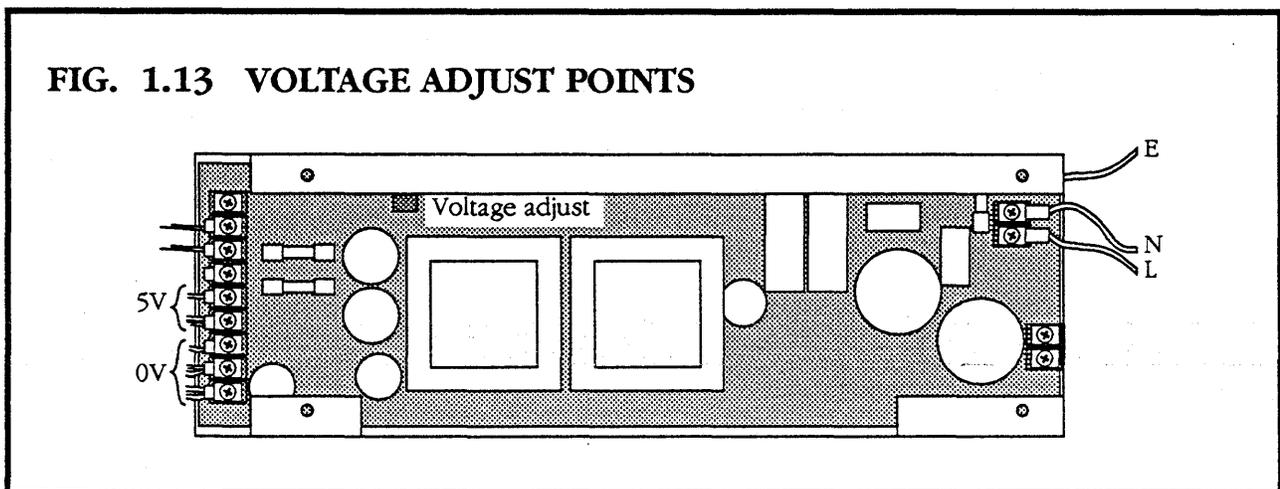


- ◆ Undo the earth, live and neutral leads from the right hand end of the power supply cage, and the thirteen internal wiring leads from the left-hand end of the cage (shown in fig. 1.13).
- ◆ Turn the desk top unit on its side and undo the four securing screws which hold the power supply unit in place. Lift out the unit.
- ◆ Replace with a new power supply unit from Meiko.

**FIG. 1.12 POSITION OF POWER SUPPLY SECURING SCREWS**

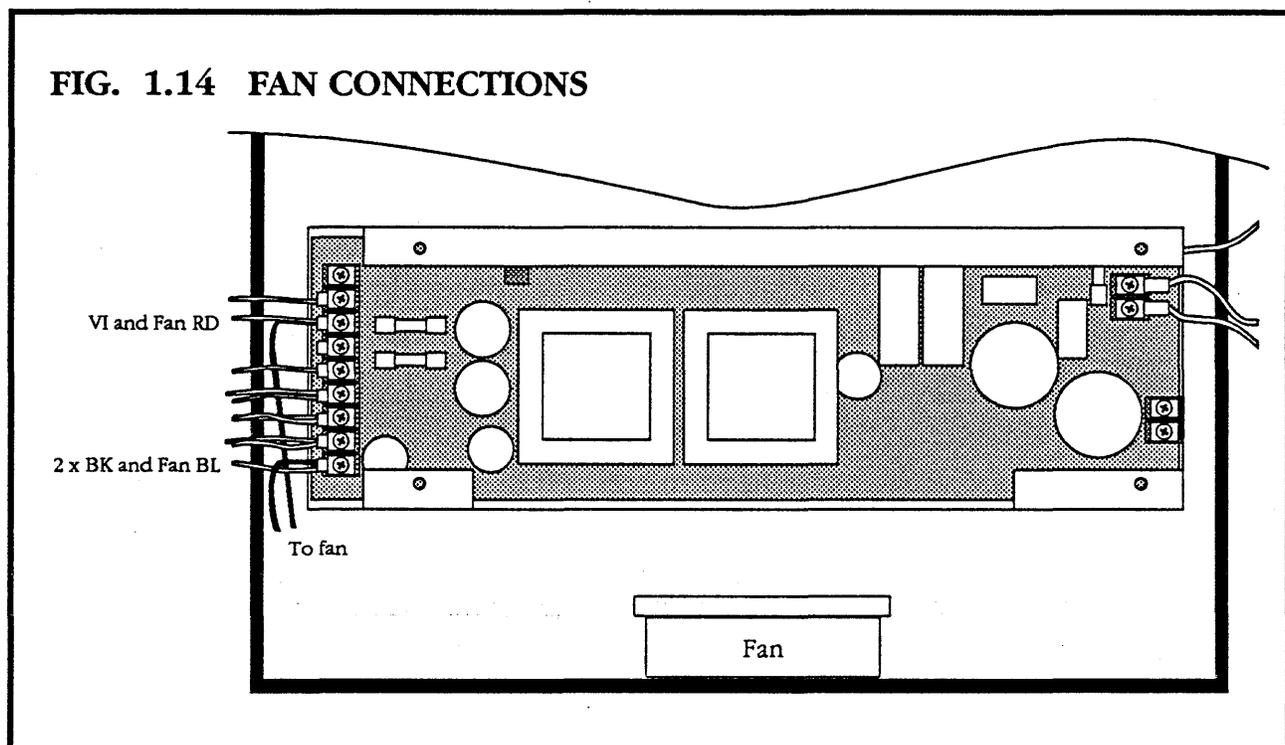


- ◆ Put the desk top unit the right way up, and take the lid off to give access to the terminals. Reconnect all leads to the power supply unit.
- ◆ Disconnect the disk/tape units from the power supply.
- ◆ Power up the unit and place a voltmeter across the 0V and 5V terminals.
- ◆ Adjust the VA point until the voltmeter reads 5V.
- ◆ Power off the unit and reconnect the disk/tape units.
- ◆ Replace the lid.



## 1.7 CHANGING THE FAN

- ◆ Take the top off the desk top unit as described in section 1.2.
- ◆ Take the lid off the power supply unit, giving access to the terminals (see fig. 1.11).
- ◆ Remove the four corner screws securing the fan.
- ◆ Disconnect the +12V and -12V wires from the power supply terminals.
- ◆ Lift the fan off the fixing studs.
- ◆ Replace with a new fan from Meiko.



## 1.8 *ELECTRICAL AND MECHANICAL SPECIFICATIONS*

### **Desk Top Unit**

Input current at 240V	2A
Input frequency	47 – 63Hz
Maximum power in	280W
Maximum heat output	683 Btu/Hour
Size	337mm x 147mm x 445mm
Mass	15Kg

### **PSU Details**

1 off 200W 240V/110V  
1 O/P 5V at 15A  
2 O/P 12V at 5A each

Operating ambient	10-50°C
Operating altitude	0-2100m
Operating humidity	8% to 80% non-condensing