PCL6000 Motherboard (Rev 1.13)
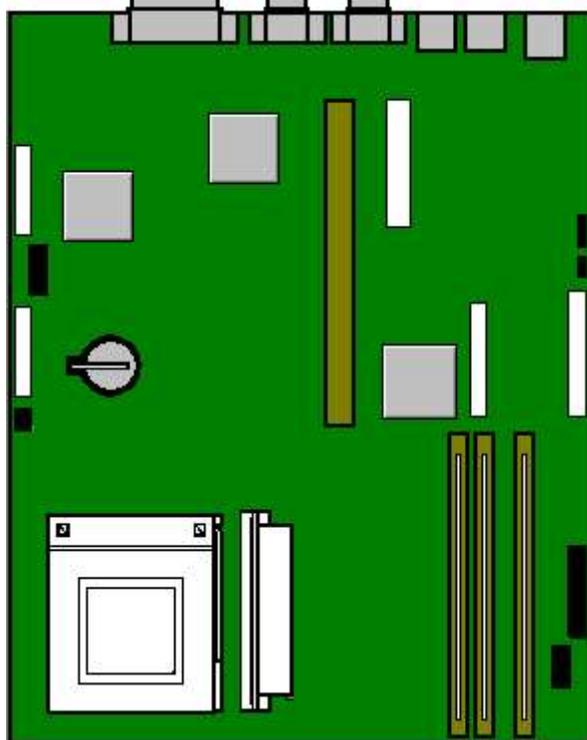
NOTE RAM Configuration
NOTE Disk Drives
NOTE Ethernet Options
NOTE Jumper Settings
NOTE Additional Options
NOTE Rear Panel
NOTE CMOS Battery
NOTE Setup Screens
NOTE IRQ,DMA,I/O & Memory
NOTE Beep Codes
NOTE Error Messages
NOTE PSU Wiring

RAM Configuration

DIMM specification

Memory can be fitted in three vertical DIMM sockets which must be populated with gold contact, 3.3V, 72-bit unbuffered EDO type DIMMs having 60 ns timing.

The three DIMM slots accept DIMMs of 16, 32 and 64 Mbytes in any combination, to the maximum of 192 Mbytes.

DIMMs are not the same as those used on 'Cosworth' motherboards.

Disk Drives

MB	Make	Model	Type	Part Number
2GB	IBM	DORS-32160	UltraSCSI	SU58303
4GB	IBM	DCAS-34330	UltraSCSI	XB61177
1280	Quantum	TM1280A	IDE	SU59082

2100	Quantum	TM2110A	IDE	SU59083
3200	Quantum	TM3200A	IDE	SU59084

Tape Drives

MB	Make	Model	Type	Part Number
12-24GB	HP	HP C1537A	DDS III	SU61220

Floppy Drives

MB	Make	Model	Type	Part Number
2 MB	Mitsubishi	355F-2450MP	3.5"	

CD-ROM

MB	Make	Model	Type	Part Number
	Sony	CDU511-10/10	IDE PCAV	XB61060
	Sony	CDU311-10/10	IDE	SU58747

▲ ▲

Ethernet Options

3Com PCI 3C900 triple combo card
3Com PCI 10/100TX 3C905

▲ ▲

Jumper Settings
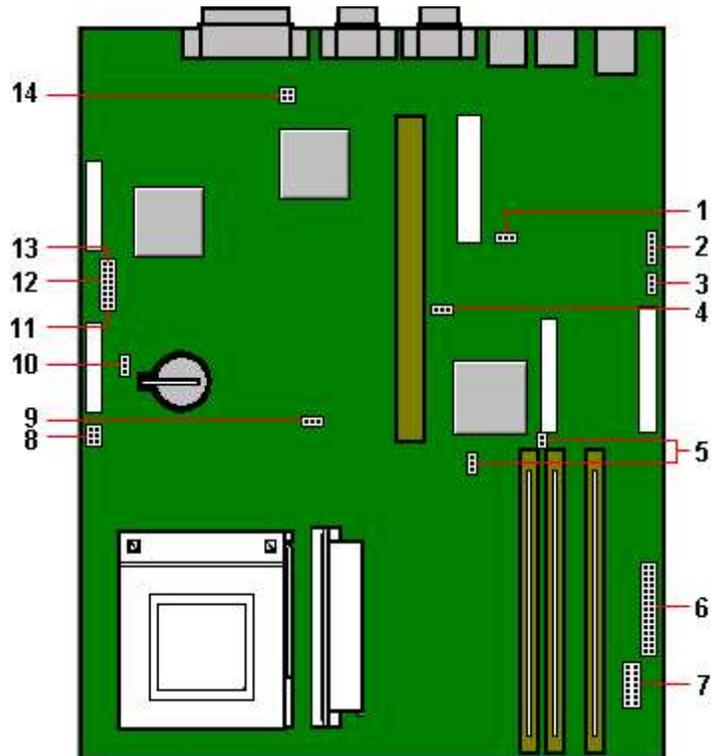
| 1 | J80 - audio enable/disable | 8 | PL74 and PL75 - fan connectors |

2	PL86 - speaker links	9	J70 - Reserved. Do not move.
3	J40 - hard disk LED select	10	J72 - battery disconnect
4	J71 - Reserved. Do not move	11	J1 to 4 - CPU clock divisor
5	J90 and J91 - SCSI setting links	12	J32 - board bus frequency
6	PL70 and PL71 - case connections	13	J30 and J31 - BIOS links
7	PL20 - front bezel daughterboard	14	J60 - floppy drive setting

Processor clock multiplier, J1 to 4

J1	J2	J3	J4	Ratio
I	I	I	I	2:1 (2x)
I	I	O	I	3:1 (3x) 200MHz (J32 - No fit)
I	I	I	O	4:1 (4x)
I	I	O	O	5:1 (5x)
I	O	I	I	5/2 (2.5x) 166MHz (J32 - No fit)
I	O	O	I	7/2 (3.5x)
I	O	I	O	9/2 (4.5x)
I	O	O	O	11/2)5.5x)
O	X	X	I	Strictly reserved
O	O	O	O	2:1 (2x)

I=jumper fitted	O=No jumper	X=Don't care

Bus speed select, J32

Frequency	Jumper J32
60 MHz	No jumper
66 MHz	Jumper fitted *

Flash BIOS, J30 & J31

Recovery J30	Program enable J31
2-3, Normal *	1-2, Enable *
1-2, Recover	2-3, Disable

Battery backup, J72

Erase CMOS settings
1-2, Normal *
2-3, >1 sec. to discharge

Audio disable, J80

Audio J80
1-2, Enable Audio
2-3, Disable Audio *

On-board SCSI Interface, J90 & J91

Link	SCSI Enable - J90	SCSI Type - J91	Link
1 - 2	Enable SCSI *	Non Ultra SCSI	ON
2 - 3	Disable SCSI	Ultra wide SCSI *	OFF

Hard drive LED, J40

J90 setting (see above)	Set J40 as follows:
SCSI Disabled (IDE drives fitted)	1 - 2
SCSI Enabled (SCSI drives fitted)	2 - 3 *

Floppy Disk mode, J60

Pins	Floppy options J60
1-3 & 2-4	3-mode operation
3-4	Standard 2-mode drives *
	Software control for 1.2Mb mode operation in Japan

Speakers, PL86 (if fitted)

This is only for special system cases with internal stereo speakers, the normal casing is only fitted with a single 'beep' type speaker, connected to PL71.		
Pins	Function	Connection PL86
1	Stereo - Left	Left speaker = pins 1 and 2
2	Audio ground	
3	Mono	Mono = pins 3 and 2
4	Link	Link 4 and 5 for mono
5	Stereo - Right	Right speaker = pins 5 and 6
6	Audio ground	

Fan Connectors, PL73 & PL74

Pins	CPU Fansink PL73	Pins	Main fan PL74
1	Ground	1	Ground
2	Fan Fail	2	Controlled supply
3	+ 12 volts	3	Ground

Front and panel connectors, PL70 & PL71

Row A - PL70	Pins	Row B - PL71
Power (PSU control)	1	Standby switch
Power return	2	Standby switch return

(Connected to pin 6)	3	Vcc
Keyed	4	Keyed
Hard disk LED signal	5	IRDA input
Hard disk LED pullup	6	Ground
Ground	7	IRDA output
Keylock switch	8	Ground
Keylock switch return	9	Not used
Power on LED signal	10	Not used
Power on LED return	11	Speaker out (BEEP)
Standby LED signal	12	Message LED signal
Standby LED return	13	Message LED pullup
Reset switch return	14	Not used
Reset switch	15	Not used

Front panel connector, PL20

Analogue ground	1	2	KEYED
No connection	3	4	No connection
No connection	5	6	No connection
Message LED (control 2)	7	8	No connection
Message LED (control 1)	9	10	5 V supply (fused)
IR transmit	11	12	RTS
IR receive	13	14	Digital ground

 * - Default

Additional Options

Server Products

Memory

1 x 16MB 72-bit DIMM module   XB59883
1 x 32MB 72-bit DIMM module   XB59884
1 x 64MB 72-bit DIMM module   XB59885

Raid

DPT 2144uw single channel raid   XB59886

UPS

APC 420v/s Smart-UPS   XB59898

Desktop Products

Modems

V32 data/fax/voice modem.   XB55987
V34 data/fax/voice modem.   XB57689

Video Memory

1MB to 2MB EDO DRAM Upgrade   XB57374

Graphics Cards

Matrox MGA Millenium PCI, 4MB WRAM, (See Note below)	XB57212

SCSI Cards

SCSI card add-in (No HD Support)	SA50160
Adaptec 2940 PCI SCSI card	UD55556

Specialix Serial Cards

32-port ISA SI/XIO serial card	XB54693
4 port terminal adaptor	XB43319
8 port terminal adaptor	XB43320
8 port modular terminal adaptor	XB54611
8 port modular terminal adaptor (7 RS232, 1 PARALLEL)	XB54612

Audio Options

Apricot Deepsound Subwoofer	XB58090
20W Powered external speakers	XB55607
Wave Table Card	XB57690

Rear Panel
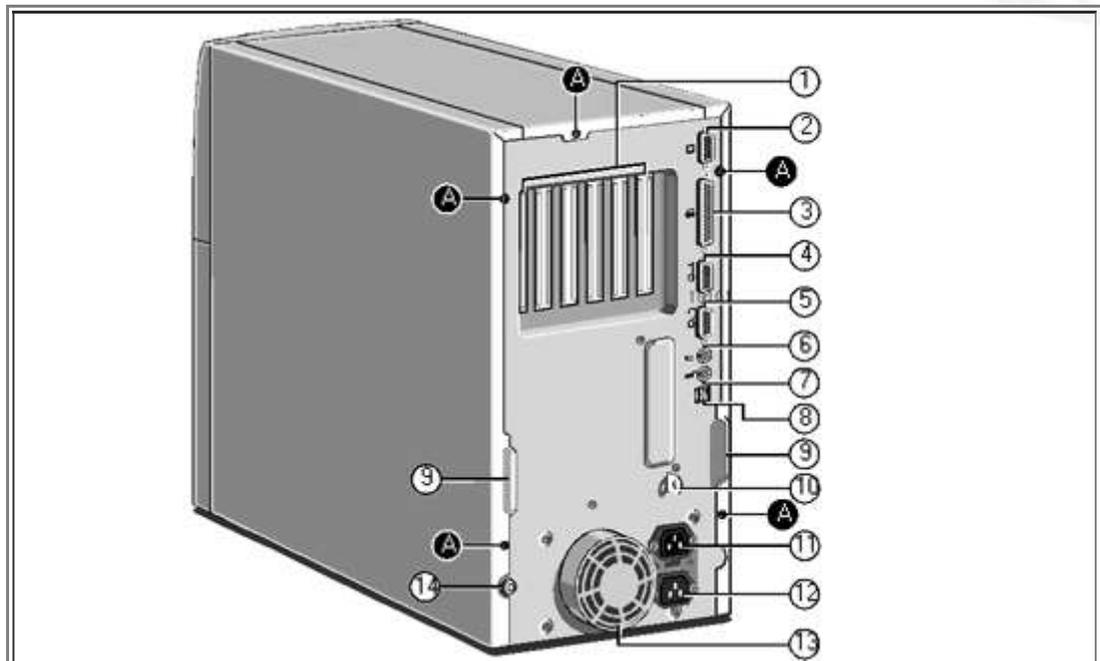
1 Rear of expansion bay	9 Handles to assist side panel removal
2 Not fitted on this model *1	10 Security loop for cable or padlock
3 Parallel or printer port	11 AC power output for monitor
4 Serial port 2	12 AC power input from supply
5 Serial port 1	13 Protection cover for PSU fan *2
6 PS/2 port for mouse	14 Main side panel locking
7 PS/2 port for keyboard	
8 USB port for future use	A - Panel fixing screws

*1 A high grade video board is fitted into one of the PCI expansion slots	*2 DO NOT use this to lift the system

Replacing CMOS Battery

The battery is a 3 volt lithium type (CR2032 or equivalent) typically used in calculators, watches and other small, battery-powered electronic items. The average battery life is between 3 and 5 years.

Read carefully the following instructions before commencing work.

1. Turn off the computer and unplug all power cords. Take suitable anti-static precautions and remove the system unit cover.

2. Identify the battery holder.

3. Carefully disconnect and remove any expansion cards that may obstruct easy access to the battery. Take note of any cable positions before removal.

Warning

Do not use a metal or other conductive implement to remove the battery. If a short-circuit is accidentally made between its positive and negative terminals, it may cause the battery to explode.

4. Lift the edge of the battery far enough to clear the base of the holder, then slide the battery from under the contact spring.

5. Taking care not to touch the top or bottom surface of the battery, pick up the replacement with the positive (+) terminal upwards and slide the battery into the holder from the same side the old battery was removed.

6. Replace any expansion cards you had to remove in step 4 and replace the system unit cover.

7. Dispose of the old battery according to the makers instructions.

When you next turn on the computer you will have to run the BIOS Set-up utility to enter the hardware configuration. See 'System BIOS and set-up' for guidance.

Setup Screens

Configuration / Setup Utility

Select Option

▶ System Summary
▶ Device and I/O Ports
▶ Date and time
System Security
Start Options
Advanced Setup
▶ Plug and Play
Error Log
Power Management

Save Settings
Restore Settings
Load Default Settings

Exit

(F1) Help   (↑)(↓) Move
(Esc) Exit   (Enter) Select

System Summary

Processor	Pentium Pro
Processor Speed	200 MHz
System Memory	640 KB
Extended Memory	31 MB
Processor Cache Size	256 KB
Shadow RAM:	384 KB
System ROM	E000h - FFFFh
Diskette Drive A	1.44 MB 3.5"
Diskette Drive B	Not Installed
Hard Disk Drive 0	1281 MB
Hard Disk Drive 1	Not Installed
CD-ROM Drive 2	Installed
Hard Disk Drive 3	Not Installed
Mouse	Not Installed
BU Version	000000C5
BU Date	25/01/1995

Devices and I/O Ports

Serial Port A	[Auto-configure]
Serial Port B	[Auto-configure]
Parallel Port	[Auto-configure]
Parallel Port Mode	Auto
Parallel Port IRQ	Auto
Parallel Port DMA	Auto
Mouse	Not Installed
Diskette Controller	Enabled
Diskette Drive A	[1.44 MB 3.5"]
Diskette Drive B	Not Installed
Video Setup...	
IDE Controller	Enabled
IDE Drives Setup...	

Video Setup ...

Video Controller	ATI MACH64
Video Memory	1024 KB

IDE Drive Setup ...

IDE Translation Mode	[Extended CHS]
Hard Disk Drive 0	
Hard Disk Drive 1	
CD-ROM Drive 2	
Hard Disk Drive 3	

Hard Disk Drive 0

Size	1281 MB
Transfer mode determination	[Automatic]
Transfer Mode	PIO Mode 4
LBA mode	Supported

Date and Time

Time	14:03:59
Date	30/12/1996

System Security

Power-on Password
Administrator Password

Power-on Password

Enter your new power-on password twice.

Enter Power-on Password   [   ]
Enter Power-on Password Again   [   ]

Change Power-on Password
Delete Power-on Password

Password Prompt   [On]

Administrator Password

Enter your new administrator password twice
Enter Administrator Password   [   ]
Enter Administrator Password Again   [   ]

Change Administrator Password
Delete Administrator Password

User password changeable by user   [No]

Start Options

Keyboard Numlock State   [On]
Keyboard Speed   [Fast]
Disketteless Operation   [Disabled]
Displayless Operation   [Disabled]
Keyboardless Operation Mode   [Disabled]

First Startup Device   [Diskette Drive 0]
Second Startup Device   [Hard Disk 0   ]
Third Startup Device   [Disabled   ]
Fourth Startup Device   [Disabled   ]

Power On Self Test   [Enhanced]
Virus Detection   [Enabled]

Advanced Setup

Warning:

Items on the following menus control advanced hardware features.
If they are configured incorrectly, the system might
malfunction.

Cache Control
ROM Shadowing
PCI Options
Universal Serial Bus
Memory Settings
Pentium Pro Features

Cache Control

Cache State **Enabled**

▶ Cache Size 256 KB

ROM Shadowing

E0000h - FFFFFh (System BIOS)	[Enabled]
D8000h - DFFFFh	[Disabled]
D0000h - D7FFFh	[Disabled]
C8000h - CFFFFh	[Disabled]
C0000h - C7FFF (ISA Adapter Video BIOS)	[Enabled]

PCI Options

Palette Snooping   [Disabled]

Universal Serial Bus

Universal Serial Bus   [Enable]
Universal Serial Bus Clock   [24 MHz]

Memory Settings

Error Checking / Correction   [Correction Only]

Pentium Pro Features

BU Enable   { Enabled]

Plug and Play

Plug and Play adapter configuration   [Enabled]

Information: ISA legacy resources (DMA, Interrupts,
Memory and I/O ports) are resources that are used by
ISA adapters that do not support Plug and Play.

Before you may install Plug and Play adapters you must
enter the resources that are used by legacy adapters (if
any). These menus do not show resources that are used
by the system nor by Plug and Play.

Memory Resources
I/O Port Resouces
DMA Resources
Interrupt Resources

Memory Resources

A0000h - A3FFFh	[Plug and Play]
A4000h - A7FFFh	[Plug and Play]
A8000h - ABFFFh	[Plug and Play]
AC000h - AFFFFh	[Plug and Play]
B0000h - B3000h	[Plug and Play]
B4000h - B7FFFh	[Plug and Play]
B8000h - BBFFFh	[Plug and Play]
- - -	
- - -	
C8000h - C9FFFh	[Plug and Play]
CA000h - CBFFFh	[Plug and Play]
CC000h - CDFFFh	[Plug and Play]
- - -	
DE000h - DFFFFh	[Plug and Play]
E0000h - FFFFFh	Allocated by the system.
100000h - 1FFFFFh	[Plug and Play]
- - -	
F00000h - FFFFFFh	[Plug and Play]

I/O Port Resources

100h - 103h	Not Applicable
104h - 107h	Not Applicable
108h - 10Bh	[Plug and Play]
- - -	-
3FCh - 3FFh	[Plug and Play]

DMA Resources

Channel 0	[Plug and Play]
Channel 1	[Plug and Play]
Channel 2	[Plug and Play]
Channel 3	[Plug and Play]
Channel 4	[Plug and Play]
Channel 5	[Plug and Play]
Channel 6	[Plug and Play]
Channel 7	[Plug and Play]

```
            Interrupt Resources

    0:              Not Applicable
    1:              Not Applicable
    2:              Not Applicable
    3:              [ Plug and Play ]
    4:              [ Plug and Play ]
    5:              [ Plug and Play ]
    6:              [ Plug and Play ]
    7:              [ Plug and Play ]
    8:              Not Applicable
    9:              [ Plug and Play ]
    10:             [ Plug and Play ]
    11:             [ Plug and Play ]
    12:             [ Plug and Play ]
    13:             Not Applicable
    14:             [ Plug and Play ]
    15:             [ Plug and Play ]
```

```
        Error Log

Entry 1:    none
Entry 2:    none
Entry 3:    none

Clear error logs
```

```
                Power Management

Power Management Feature            [ On ]

Time Till (Automatic) Power Saving  [ Disabled ]
Hard Disk Power Saving              [ Enabled ]
Standby Switch Monitor Control      Disabled

Warning:
If your Monitor does not have
Power Management Support, enabling
of "Monitor Power Management" may
damage your Monitor.
```

Interrupts (IRQ)

IRQ	Default assignment	Available?
IRQ0	System timer	No
IRQ1	Keyboard controller	No
IRQ2	System	No
IRQ3	Serial port 2	Optionally
IRQ4	Serial port 1	Optionally
IRQ5	Audio (if fitted)	Yes
IRQ6	Diskette controller	No

IRQ7	Parallel port	Optionally
IRQ8	Real time clock	No
IRQ9		Yes
IRQ10		Yes
IRQ11		Yes
IRQ12	Mouse	No
IRQ13	Coprocessor	No
IRQ14	Primary ATA/IDE interface	Optionally
IRQ15	Secondary ATA/IDE interface	Optionally
IRQ3 is available if you disable serial port 2 with the BIOS Setup utility.		
IRQ4 is available if you disable serial port 1.		

Direct memory access (DMA) channel

DMA	Default assignment	Available?
DMA0		Yes
DMA1	Default (8 bit) Audio	Optionally
DMA2	Diskette/floppy disk controller	No
DMA3	Enhanced Capabilities Port (default)	Optionally
DMA4	System	No
DMA5	Default (16 bit) Audio	Optionally
DMA6		Yes
DMA7		Yes

I/O Ports

I/O ports	Default assignment
000h-01Fh	DMA controller 1
020h-021h	Interrupt controller 1
034h, 038h, 03Ch	Alternate Local bus ATA/IDE
040h-05Fh	System timer
060h-06Fh	Keyboard controller
070h-07Fh	Real-time clock, NMI mask
080h-09Fh	DMA page register
0A0h-0A1h	Interrupt controller 2
0B4h, 0B8h, 0BCh	Local bus ATA/IDE
0C0h-0DFh	DMA controller 2
0F0h, 0F1h	Math coprocessor busy (clear/reset)

0F8h-0FFh	Math coprocessor
1F0h-1F7h	Hard disk drive controller
200h-207h	Game I/O (disable)
220h-22Fh, 230h-233Fh	Sound blaster system
240h-24Fh, 250h-253Fh	Alternate Sound blaster system
278h-27Fh	Parallel port 2
2B0h-2DFh	Alternate VGA
2F8h-2FFh	Serial port 2
300h-301Fh	Alternate MIDI (disable)
330h-331Fh	MIDI
378h-37Fh	Parallel port 1
388h-38Fh	FM synthesiser
3B0h-3BFh	Monochrome display and printer adapter
3B4h, 3B5h, 3BAh	Video subsystem
3C0h-3C5h	VGA
3C6h-3C9h	Video DAC
3CAh-3DFh	VGA
3F0h-3F7h	Diskette drive controller
3F8h-3FFh	Serial port 1

Base memory address

Some expansion cards are fitted with memory of their own, usually read-only memory (ROM) containing functional extensions to the computer's BIOS (basic input/output system) ROM. Some cards also have random-access memory (RAM).

In order that this memory can be recognised by the system processor, it must be mapped somewhere within the computer's own address space. By setting the base memory address you specify where the card's memory begins within the address space. Typically, an expansion card's memory must be mapped onto the addresses between C8000h and DFFFF in upper memory. With most modern expansion cards this is fully automatic.

The card's documentation should list its possible base memory addresses. You will also need to know how much memory the card has, so that you can leave the right gap between this card's base address and the next.

Cards often come with pre-configured or default settings. It is best to rely on these settings as much as possible, and change them only if they conflict with other devices.

Beep codes

No beeps. If no beeps are heard at all the speaker may be disconnected or there may be a speaker circuitry fault.

One short beep. Marks the completion of POST and no functional errors found. You will also get a single beep if you press an invalid key for a power-on password.

Two short beeps. Indicates and draws your attention to an error during POST. This should be accompanied by an error message.

Three short beeps. System memory error, normally accompanied by code 201. Beeps are used when the video cannot display the code.

Continuous beep. Could indicate a serious failure of the system motherboard, or a failure of the speaker circuitry.

Repeating short beeps. Usually indicative of a keyboard key stuck down, but may be due to the keyboard interface failing.

One long and one short beep. POST has detected an error on the video adapter in the system. There may be no display on the screen.

One long and two short beeps. This means that either the video system is faulty, or that a video I/O adapter ROM is not readable.

Two long and two short beeps. The video subsystem cannot be supported by the main system POST. This can occur when the video subsystem is replaced or changed on site.

Many of these following codes indicate a serious fault and the system may halt. Switch off for 20 to 30 seconds and try again. If the fault persists, make a note of it and call your maintenance provider.

| Number of beeps	Meaning
1-1-3	CMOS write/read test failure
1-1-4	BIOS ROM checksum failure
1-2-1	Programmable Interval Timer test failure
1-2-2	DMA initialisation failure
1-2-3	DMA page register read/write test failure
1-2-4	RAM refresh verification failure
1-3-1	First 64K RAM test failure
1-3-2	First 64K RAM parity test failure
1-3-3	Slave DMA register test failure
1-3-4	Master DMA register test failure
1-4-1	Master interrupt mask register test failure
1-4-2	Slave interrupt mask register test failure
1-4-4	Keyboard controller test failure
2-2-2	Search for video ROM test failure
2-2-3	Screen believed inoperable
2-2-4	Timer tick interrupt test failure
2-3-1	Interval timer channel 2 test failure
2-3-3	Time-of -day clock test failure
2-4-3	CMOS memory size against actual compare failure
2-4-4	Memory size mismatch occurred

Error Messages

If you get an error which is not listed or the problem persists, call your maintenance provider.

Code	Cause	Code	Cause
0	Keyboard locked	301	Keyboard clock line failure

Code	Description	Code	Description
062	Boot failure. Default values loaded	301	Keyboard data line failure
101	Timer tick interrupt failure	301	Keyboard stuck key failure
102	Timer 2 test failure	303	Keyboard controller failure
106	Diskette controller failure	604	Diskette drive 0 failure
110	System board memory parity interrupt	604	Diskette drive 1 failure
114	Option ROM checksum failure	605	Diskette unlocked problem
151	Real time clock failure	662	Diskette drive configuration
161	Real time clock battery failure	762	Coprocessor configuration
162	CMOS RAM checksum failure	962	Parallel configuration
162	Invalid configuration information	1162	Serial configuration
163	Time of day not set -preboot	1762	Hard disk configuration
164	Memory size does not match CMOS	1780	Fixed disk 0 failure
165	Add/remove MC card	1781	Fixed disk 1 failure
166	Memory configuration change	1782	Fixed disk 2 failure
175	Bad EEPROM CRC #1	1783	Fixed disk 3 failure
176	System tampered	1800	No more IRQ available
177	Bad PAP checksum	1801	No more room for option ROM
178	EEPROM is not functional	1802	No more I/O space available
183	PAP update required	1803	No more memory <1Mb available
184	Bad POP checksum	1804	No more memory >1MB available
185	Corrupted Boot sequence	1805	Checksum error or 0 size option ROM
186	Hardware problem	1806	PCI-PCI bridge error
187	VPD S/N not set	1962	No bootable device
188	Bad EEPROM CRC #2	2400	Display adapter failed ; using alternate
189	Excessive password attempts	2462	Video configuration
201	Base memory error	5962	IDE CD-ROM configuration
229	External cache failure	8601	Pointer device failure
301	Keyboard failure	8603	Pointer device has been removed

PSU Wiring
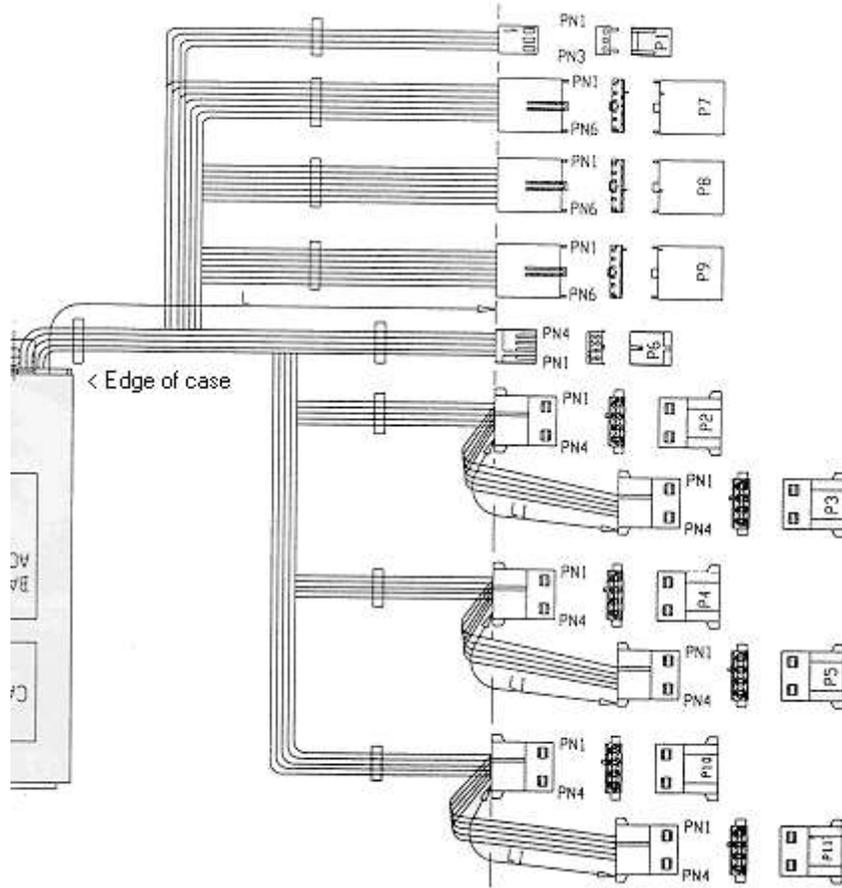
The psu should be tested to conform to the design specification parameters set out in the Design Specification :-

Regulation

Parameter	Current Range	Range	Minimum	Nominal	Maximum
+12v DC	0.0A to 10.0A	+12v ą5%	+11.40v	+12.00v	+12.60v
+5v DC	1.5A to 22.0A	+5v ą5%	+4.75v	+5.00v	+5.25v
+3v3 DC	0.3A to 14.0A	+3v3 ą5%	+3.15v	+3.30v	+3.45v
-5v DC	0.0A to 0.5A	-5v ą10%	-4.50v	-5.00v	-5.50v
-12v DC	0.0A to 0.8A	-12v ą10%	-10.80v	-12.00v	-13.20v

Power Good Signal

At Power Up:

Power good should go valid within 100mS and 500mS of the +5V signal reaching 4.75V

At Power Down:

Power good should go fails at least 1mS before the +5V signal goes below the regulation limits