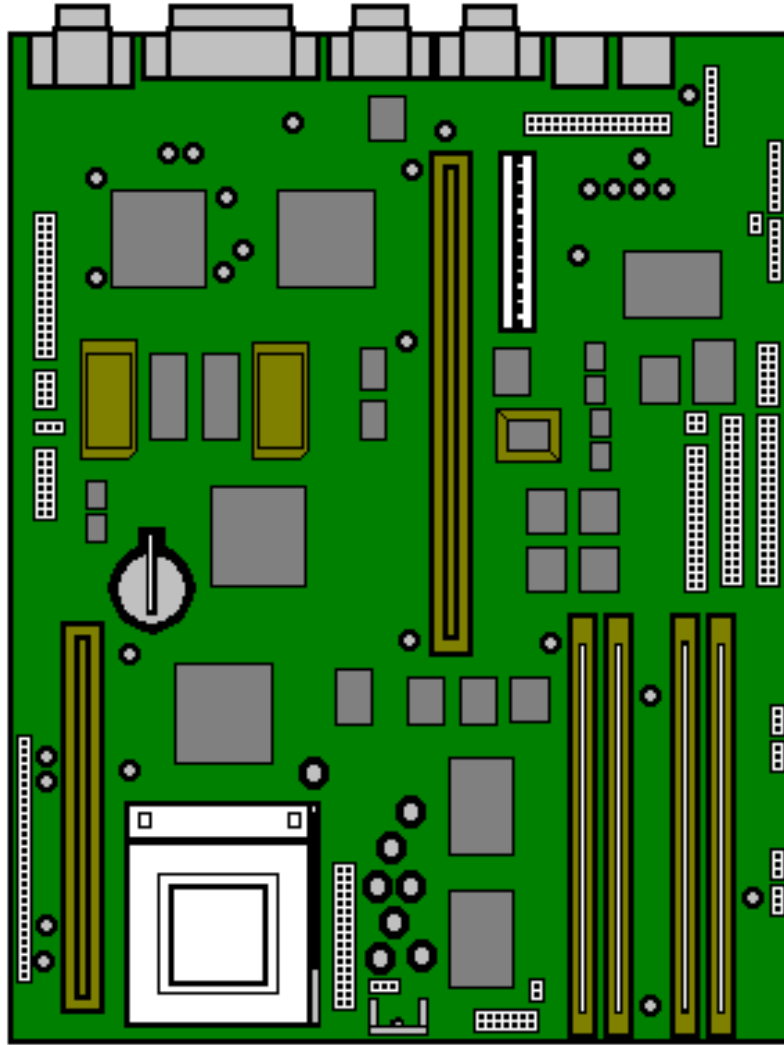# Diamond Motherboard

Cache SIMM Socket

If your computer came without any cache fitted you can install a 256Kb module of either of the following types:-

256KB ASYNC CACHE MODULE

256KB 55MHz PIPELINED SYNC

If you have a 75MHz motherboard it will not have a cache SIMM, due to the performance benefits of EDO RAM. If you upgrade the processor at a later date you may require a cache upgrade to improve performance further.

Video RAM

If your machine came with 1MB video RAM then it can be upgraded as follows (depending on your Video Card) -

GD5434 1MB to 2MB Video RAM Upgrade

GD5436 1MB to 2MB Video RAM Upgrade

If your machine came with 2MB already installed then it cannot be upgraded further.

RAM Configuration

The SIMM sockets are located at the front of the motherboard. Each pair of sockets can be fitted with SIMMs. SIMMs with capacities of 2, 4, 8, 16 or 32 Mbytes are supported, giving a maximum capacity of 128 Mbytes.

Socket Location

BANK 3 — | | └ BANK 1
BANK 2 BANK 0
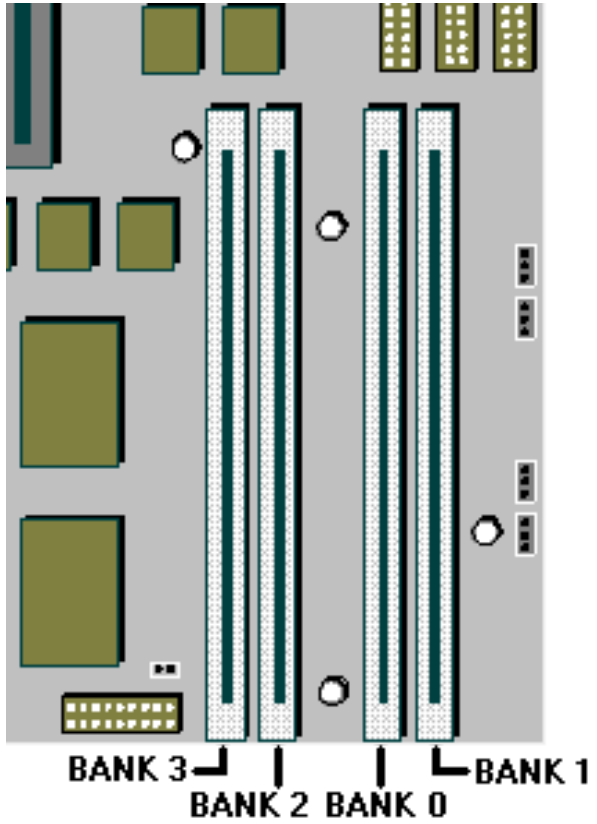
SIMMs must be fitted in pairs and the pair must be identical. The system does not require Parity checking (36-bit) SIMMs. Conventional 32-bit SIMMs with a refresh rate of 70ns is the specification. The newer Extended Data Output (EDO) type SIMMs are supported and will give enhanced performance.

Possible SIMM Memory Combinations

Total Memory	Bank 0	Bank 1	Bank 2	Bank 3

8 Mb	4 Mb	4 Mb	-	-
12 Mb	4 Mb	4 Mb	2 Mb	2 Mb
16 Mb	4 Mb	4 Mb	4 Mb	4 Mb
16 Mb	8 Mb	8 Mb	-	-
20 Mb	8 Mb	8 Mb	2 Mb	2 Mb
24 Mb	8 Mb	8 Mb	4 Mb	4 Mb
32 Mb	8 Mb	8 Mb	8 Mb	8 Mb
32 Mb	16 Mb	16 Mb	-	-
36 Mb	16 Mb	16 Mb	2 Mb	2 Mb
40 Mb	16 Mb	16 Mb	4 Mb	4 Mb
48 Mb	16 Mb	16 Mb	8 Mb	8 Mb
64 Mb	16 Mb	16 Mb	16 Mb	16 Mb
64 Mb	32 Mb	32 Mb	-	-
68 Mb	32 Mb	32 Mb	2 Mb	2 Mb
72 Mb	32 Mb	32 Mb	4 Mb	4 Mb
80 Mb	32 Mb	32 Mb	8 Mb	8 Mb
96 Mb	32 Mb	32 Mb	16 Mb	16 Mb
128 Mb	32 Mb	32 Mb	32 Mb	32 Mb

Note: MS530 has only Banks 0 & 1 available for memory expansion.

Processor Upgrade

These are is the processor upgrades for MS530's and MS540's with the model number prefixes MK or MT. To use the tables below, select the processor you wish to upgrade to and confirm that the upgrade is possible. Then check additional requirements such as BIOS upgrades & processor speed jumper settings.

Warning

DO NOT alter these links unless you are upgrading the processor as it could lead to the destruction of the processor and/or other vital components on the board

MS530 (MK) & MS540 (MT) Processor upgrades	
Processor type and speed	**Is it supported?**
Pentium 120	YES (set speed jumpers)
Pentium 133	YES (set speed jumpers)
Pentium 150	YES (set speed jumpers)
Pentium 166	YES (set speed jumpers and upgrade BIOS)

Pentium 200	YES (set speed jumpers and upgrade BIOS)
Pentium 166 MMX	NO (no motherboard support for full 2.8volt MMX processor)
Pentium 200 MMX	NO (no motherboard support for full 2.8volt MMX processor)
Pentium 233 MMX	NO (no motherboard support for full 2.8volt MMX processor)
Pentium Overdrive 166 MMX (BPODPMT66X166). Will run at 100mhz or 133Mhz.	YES (upgrade BIOS then set speed jumpers to 100mhz or 133mhz)
Pentium Overdrive 180 MMX (BPODPMT60X180). Will run at 75, 90, 120 & 150Mhz.	YES (upgrade BIOS then set speed jumpers to 75, 90, 120 or 133mhz)
Pentium Overdrive 200 MMX (BPODPMT66X200). Will run at 100, 133 & 166Mhz.	YES (upgrade BIOS then set speed jumpers to 100, 133 or 166mhz)

Processor and BUS clock			
Processor Speed	PL17	SW1, ‖ = Link, : = No link	ISA (MHz)
Pentium P 75	VRE	Pin 1 ‖ ‖ : : : : : :	8.33
P 90	VRE	Pin 1 : ‖ : : ‖ : : :	7.5
P 100	VRE	Pin 1 ‖ : : : ‖ : : :	8.33
P 120	VRE	Pin 1 : ‖ ‖ : ‖ : : :	7.5
P 133	VRE	Pin 1 ‖ : ‖ : ‖ : : :	8.33
P 150	VRE	Pin 1 : ‖ ‖ ‖ ‖ : : :	7.5
P 166	VRE	Pin 1 ‖ : ‖ ‖ ‖ : : :	8.33
P 200	VRE	Pin 1 ‖ : : ‖ ‖ : : :	8.33 (5-07 BIOS or greater)

BIOS Upgrade

For MK (MS530) and MT (MS540) model machines, the latest version of the BIOS is 5.09, which you can [Download Here](#).

BIOS Installation Instructions

Once the BIOS update file has been downloaded & saved in your C:\WINDOWS\TEMP folder:

Click on START

Click on RUN

Type in c:\windows\temp\D509COMB.EXE

Press RETURN, then click on UNZIP (this will create three files in your C:\WINDOWS\TEMP folder).

Place a blank formatted disk into the floppy drive A:

Click on START

Click on RUN

Type C:\WINDOWS\TEMP\IMAGE 509BIOS.IMG A: /M /B

When the boot disk has been created, restart the computer and boot from the diskette. From the menu press 1 to detect the type of video controller, and then press 2 or 3 to upgrade the BIOS for your type of video controller.

Jumper Settings

Internal speaker operation

Next to outer SIMM socket, default position link pins 4 and 5 gives audio output to the internal speaker in mono. Only to be removed in a system having internal stereo speakers.

PL2	Stereo: L Cable = 1, 2 R Cable = 5, 6.
	Mono: Cable = 2, 3. Jumper = 4, 5.

Internal 'audio' modem

Just along from the CD audio connection, default position if no internal modem is fitted, link pins 3 and 4. Remove only when fitting an internal modem supporting sound.

| PL4	Modem absent = 3, 4.
	Modem present = no jumper

BIOS reprogramme

These links are for special purposes. Only to be used for an official upgrade to the system BIOS. DO NOT move for any other reason.

PL5	Reserved. Do not change from 2, 3.
PL6	Flash Program.
	Enable = 1, 2. Disable = 2, 3.

Floppy disk control mode

Next to floppy disk ribbon connector, default position link pins 3 and 4.
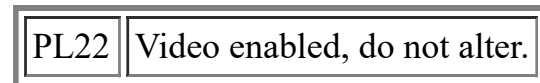
PL13	
	2 mode =
	3 mode =
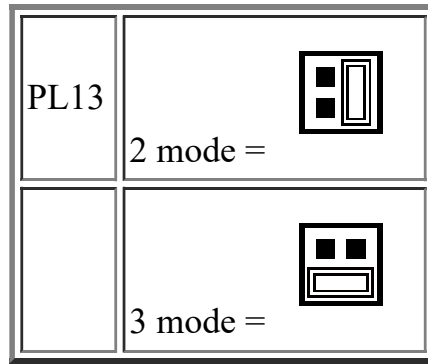
Clear BIOS settings

Next to outer video upgrade socket, default position linkpins 1 and 2. Moving the link to pins 2 and 3 disconnects the battery from the BIOS memory, and will cause all the user settings to be lost. To be used with caution and only in the event of an access password being lost.
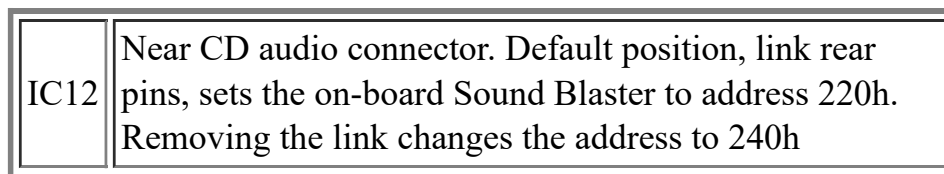
PL21	Normal = 1, 2. Clear = 2, 3.
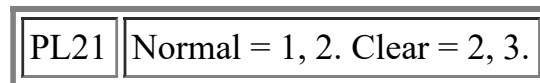
Video / VESA option

A single jumper may be the only one fitted, at the end nearest PL21. Only needs to be removed if fitting a new high feature 'plug-in' video card and serious problems are encountered. If taken out, it must be replaced if the extra video card is subsequently removed.

PL22	Video enabled, do not alter.

Sound Blaster Address

IC12	Near CD audio connector. Default position, link rear pins, sets the on-board Sound Blaster to address 220h. Removing the link changes the address to 240h
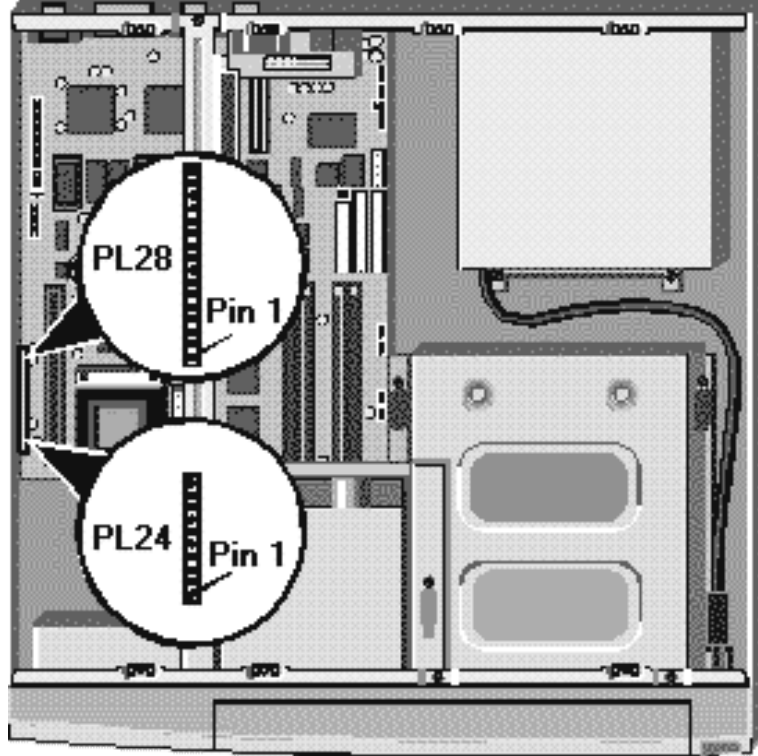
PL24, PL28

This range of pins is not exactly for jumpers, but is used to connect various features around the system case to the motherboard.

PL24, PL28 Pinouts

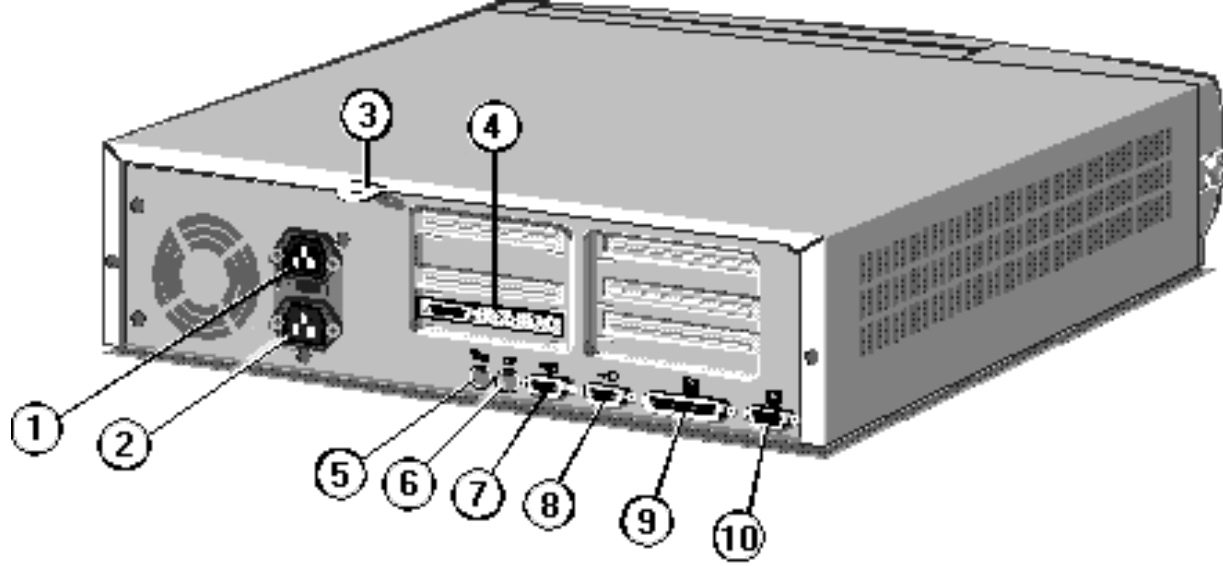| PL24	Pins	1 to 4	HDD active light
		5 to 9	Keylock (not fitted)
		10 & 11	System in 'power standby' light
		12 & 13	System hardware reset (not fitted)
PL28	Pins	1 & 2	System standby restore switch
		3 to 7	Infrared controller
		8,9,10	Fan, slow mode
		11,12,13	Fan, full speed mode
		14 to 17	Internal speaker (only when no audio fitted to motherboard)

Rear Panel

1 - AC Power Inlet	5 - Keyboard Port	9 - Parallel Port
2 - AC Power Outlet	6 - Mouse Port	10 - Video Port
3 - System Security Loop	7 - Serial Port 1	
4 - Audio Ports	8 - Serial Port 2	

Expansion Slots
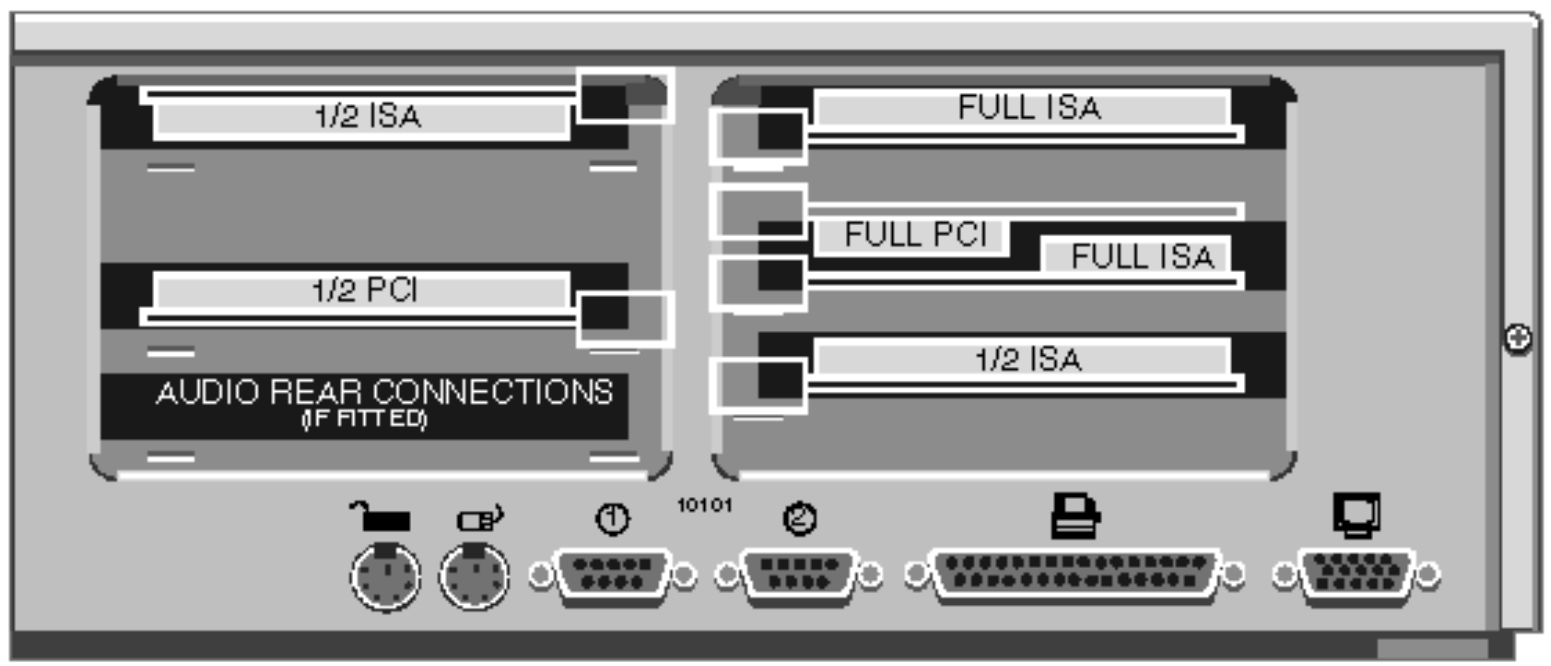
Clear BIOS Settings / CMOS Discharge

To clear the BIOS. you need to move jumper PL21, which is situated next to outer video upgrade socket. By default the jumper should be set to 1-2.

Moving the link to pins 2 and 3 disconnects the battery from the BIOS memory, and will cause all the user settings to be lost. To be used with caution and only in the event of an access password being lost.

PL21 Normal = 1, 2. Clear = 2, 3.
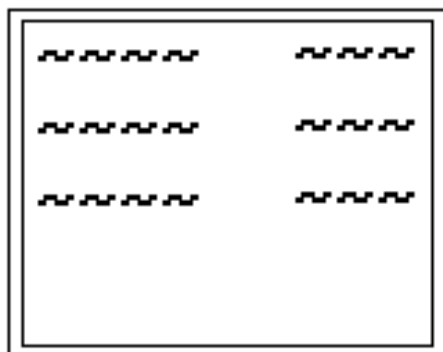
When this appears in the top right of the screen press the F1 on the keyboard and in a few seconds you will be presented with the BIOS setup screen see below)

Configuration / Setup Utility
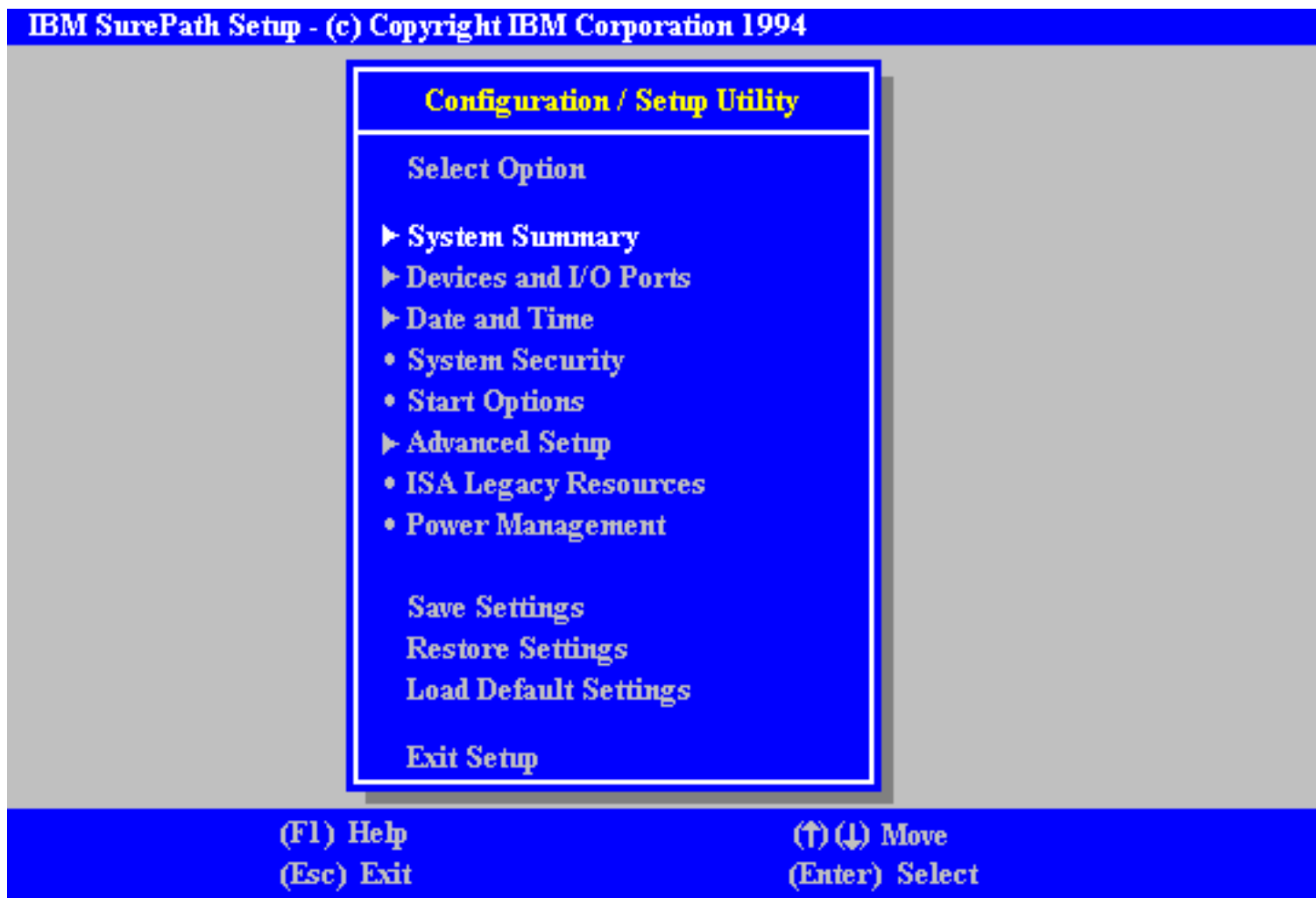
System Summary

Processor	Pentium
Processor Speed	120 MHz
Math Coprocessor	Internal
System Memory	640 KB
Extended Memory	7168 KB
Cache Size	256 KB
Shadow RAM:	384 KB
System ROM	F000h - FFFFh
Diskette Drive A:	[1.44 MB 3.5"]
Diskette Drive B:	Not Installed
Hard Disk Drive 0	730 MB
Hard Disk Drive 1	Not Installed
Hard Disk Drive 2	Not Installed
Hard Disk Drive 3	Not Installed
Mouse	[Not Installed]

Devices and I/O Ports

Serial Port A Address	[3F8h - IRQ 4]
Serial Port B Address	[2F8h - IRQ 3]
Parallel Port Mode	[Standard]
Parallel Port	[3BCh - IRQ 7]
Diskette Drive A:	[1.44 MB 3.5"]
Diskette Drive B:	[Not Installed]
▶ Mouse	[Not Installed]
▶ IDE Drives Setup...	

IDE Drives Setup...

- **Hard Disk Drive 0**
- Hard Disk Drive 1
- Hard Disk Drive 2
- Hard Disk Drive 3

Hard Disk Drive 0

Size	1089 MB
IDE Performance	[High Performance]
IDE Translation Mode	[Extended CHS]

Date and Time

Time	[03:48:31]
Date	[00/00/1900]

System Security

- **Secure Hard Disk Drives and Diskette Drives**
- Power-on Password
- Administrator Password

Secure Hard Disk Drives and Diskette Drives

Hard Disk Access	[Enable]
Diskette Drive Access	[Enable]

```
                    Power-on Password

        Enter your new power-on password twice.


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


        Set or 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      [        ]


        Set or 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                [Disabled]
```

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

Cache Control

Cache State [Enabled]
▶ Cache Size   256 KB

ROM Shadowing

F0000h - FFFFFh (System BIOS)	Enabled
E8000h - EFFFFh:	Enabled
E0000h - E7FFFh	Enabled
D8000h - DFFFFh:	[Disabled]
D0000h - D7FFFh:	[Disabled]
C8000h - CFFFFh:	[Disabled]
C0000h - C7FFFh (Adapter Video BIOS):	[Enabled]

ISA Legacy Resources

Information: ISA Legacy resources (DMA, Interrupts, Memory, and I/O ports) are resources that are used by ISA adapters. These are not the resources that are used by the system or Plug-and-Play adapters.

- Memory Resources
- I/O Port Resources
- DMA Resources
- Interrupt Resources

Memory Resources

A0000h - A3FFFh	[Not available]
A4000h - A7FFFh	[Not available]
A8000h - ABFFFh	[Not available]
AC000h - AFFFFh	[Not available]
B0000h - B3000h	[Not available]
B4000h - B7FFFh	[Not available]
B8000h - BBFFFh	[Not available]
- - -	
- - -	
C8000h - C9FFFh	[Available]
CA000h - CBFFFh	[Available]
CC000h - CDFFFh	[Available]
- - -	
DE000h - DFFFFh	[Available]
E0000h - FFFFFh	Allocated by the system.
100000h - 1FFFFFh	[Available]
- - -	
F00000h - FFFFFFh	[Available]

```
            I/O Port Resources

    100h  -  103h       Allocated by the system.
    104h  -  107h       Allocated by the system.
    108h  -  10Bh       [ Available    ]
        -    -    -              -
    3FCh  -  3FFh        [ Available    ]
```

```
            DMA Resources

    Channel 0    [ Available    ]
    Channel 1    [ Available    ]
    Channel 2    [ Available    ]
    Channel 3    [ Available    ]
    Channel 4    [ Available    ]
    Channel 5    [ Available    ]
    Channel 6    [ Available    ]
    Channel 7    [ Available    ]
```

Interrupt Resources

0:	Allocated by the system.
1:	Allocated by the system.
2:	Allocated by the system.
3:	[Available]
4:	[Available]
5:	[Available]
6:	[Available]
7:	[Available]
8:	Allocated by the system.
9:	[Available]
10:	[Available]
11:	[Available]
12:	[Available]
13:	Allocated by the system.
14:	[Available]
15:	[Available]

Power Management

Standby Time-out	[Disabled]
Monitor Power Management:	[Disabled]
Wake Up on Alarm	[Disabled]
Alarm Date	[01/01/00]
Alarm Time	[00:00]
Hard Disk Standby:	[Disabled]

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

Save Settings

Current settings will be saved.

Press <Enter> to continue.

Restore Settings

Current settings will be restored

Press <Enter> to continue.

Load Default Settings

Current settings will be changed to their default values.

Press <Enter> to continue.

Interrupts, Memory & I/O Ports

Interrupts (IRQ)

Interrupts	Default Function	Available ?
IRQ 0	System timer	No
IRQ 1	Keyboard	No
IRQ 2	Cascade	No
IRQ 3	Serial port 2	Optionally
IRQ 4	Serial port 1	Optionally
IRQ 5	Audio (if fitted)	Yes
IRQ 6	Diskette controller	No
IRQ 7	Parallel port	Optionally

IRQ 8	Real time clock	No
IRQ 9	Not used	Yes
IRQ 10	Not used	Yes
IRQ 11	Not used	Yes
IRQ 12	Mouse	No
IRQ 13	Co processor	No
IRQ 14	Primary ATA/IDE interface	No
IRQ 15	Secondary ATA/IDE interface	No

I/O Ports

I/O ports (Hex)	Used by
000 - 01F	DMA controller 1
020 - 021	Interrupt controller 1
022 - 023	ALI configuration port
034, 038, 03C	Local bus ATA/IDE (alternate)
040 - 05F	System timer
060 - 06F	Keyboard controller
070 - 07F	Real time clock,NMI mask
080 - 09F	DMA page register
0A0 - 0A1	Interrupt controller 2
0B4, 0B8, 0BC	Local bus ATA/IDE (default)
0C0 - 0DF	DMA controller 2
0F0, 0F1	Math coprocessor busy (clear/reset)
0F8 - 0FF	Math coprocessor
1F0 - 1F7	Hard disk drive controller
200 - 207	Game I/O
278 - 27F	Parallel port 2
2B0 - 2DF	Alternate VGA
2F8 - 2FF	Serial port 2
378 - 37F	Parallel port 1
3B0 - 3BF	Monochrome display and printer adapter
3B4, 3B5, 3BA	Video subsystem

3C0 - 3C5	VGA
3C6 - 3C9	Video DAC
3CA - 3DF	VGA
3F0 - 3F7	Diskette drive controller
3F8 - 3FF	Serial port 1

Direct memory access (DMA) channel

DMA	Default Function	Available ?
DMA 0		Yes
DMA 1	8-bit Audio	Optionally
DMA 2	Diskette Controller	No
DMA 3	Enhanced Capabilities Port	Optionally
DMA 4	System	No
DMA 5	16-bit Audio	Optionally
DMA 6		Yes
DMA 7		Yes

Error Codes

Code	Causes
101	Timer tick interrupt failure
102	Timer 2 test failure
106	Diskette controller failure
110	System Board Memory Parity interrupt
114	Option ROM checksum failure
151	Real time clock failure
161	Real time clock battery failure
162	CMOS RAM checksum failue
162	Invalid configuration information
163	Time of day not set -preboot
164	Memory size does not match CMOS
175	Bad EEPROM CRC #1
176	System tampered
177	Bad PAP checksum
178	EEPROM is not functional

183	PAP Update Required
184	Bad POP checksum
185	Corrupted Boot Sequence
186	Hardware problem
189	Excessive password attempts
201	Base memory error
229	External cache failure
303	Keyboard controller failure
301	Keyboard failure
301	Keyboard clock line failure
301	Keyboard data line failure
301	Keyboard stuck key failure
604	Diskette drive 0 failure
604	Diskette drive 1 failure
605	Diskette unlocked problem
662	Diskette drive configuration
762	Coprocessor configuration
1762	Hard disk configuration
1780	Fixed disk 0 failure
1781	Fixed disk 1 failure
1782	Fixed disk 2 failure
1783	Fixed disk 3 failure
1800	No more IRQ available
1801	No more room for option ROM
1802	No more I/O space available
1803	No more memory (< 1MB) available
1804	No more memory (> 1MB) available
1805	Checksum error or 0 size option ROM
1962	No bootable device
2400	Display adapter failed; using alternate
2462	Video configuration
5962	IDE CD-ROM configuration
8603	Pointer device has been removed