MIC-3350

3u-sized Pentium® processor-based
CPU module for CompactPCI

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5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Packing List

Before installing your board, ensure that the following materials have been received:

- 1 MIC-3350 all-in-one single board computer
- 1CD-ROM disc including Ethernet utility programs, IDE utility programs and SVGA utility programs and drivers for Windows 3.1/95/NT and OS/2
- 1 26-pin FPC cable for floppy drive connection
- A 6-pin mini-DIN to PS/2 keyboard and PS/2 mouse adaptor
- 1 bracket for mounting floppy drive and hard drive
- 1 hard disk drive (IDE) interface cable (44-pin)
- 1 warranty certificate
- This user's manual

If any of these items are missing or damaged, contact your distributor or sales representative immediately.

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If you have any technical questions about the MIC-3350 or any other Advantech products, please visit our support website at:

- **http://support.advantech.com.tw**.

For more information about Advantech's products and sales information, please visit:

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Contents

Tables and Figures

Hardware Configuration

This chapter gives background information on the MIC-3350. It then shows you how to configure the card to match your application and prepare it for installation into your chassis.

Sections include:

- Card specifications
- Board layout: dimensions
- Board layout: jumper locations
- Board layout: connector locations
- Safety precautions
- Jumper settings
- Installing DRAM (SIMMs)

1.1   Introduction

The MIC-3350 is a 3U-sized CompactPCI™, all-in-one single board Pentium® processor-based CPU card which complies with PICMG 2.0 R2.1 CompactPCI specifications. The MIC-3350 offers all the functions of an industrial computer on a single board CPU card. This card supports an Intel Pentium, Pentium MMX, AMD K5, AMD K6, Cyrix M1 or Cyrix M2 processor. The card accepts up to 64 MB DRAM. It also supports on-board 512 KB PB-SRAM 2nd level cache.

The MIC-3350 uses a single-chip solution, allowing on-board DRAM to be shared with the built-in VGA controller. In this configuration, the chipset always acts as the arbiter between memory bus masters. This system ensures efficient memory allocation while substantially reducing the overall system cost.

On-board features include 512 KB 2nd level cache memory, one RS-232 port, one RS-232/422/485 port, one multi-mode parallel (ECP/EPP/SPP) port, a floppy drive controller and a keyboard and PS/2 mouse interface. The built-in high speed PCI IDE controller supports both PIO and bus master modes. One IDE channel is available through the on-board connector. A 1-slot wide mounting bracket can be attached to the MIC-3350 for mounting one 2.5" hard disk drive and one floppy disk drive. The MIC-3350 also supports two USB ports.

The MIC-3350 is designed for use in mission critical applications. It can accept a DOC-2000 single chip flashed disk for diskless operation. It also features power management to minimize power consumption. A watchdog timer can automatically reset the system or generate an interrupt should the system stop due to a program bug or EMI.

1.2 Specifications

1.2.1 Standard SBC Functions

- **CPU:** Intel Pentium®, Pentium MMX, AMD K5, AMD K6, Cyrix M1, Cyrix M2

- **BIOS:** Award 256 KB (2 Mbit) memory; supports plug and play

- **Chipset:** SiS5598

- **L2 cache:** On-board 512 KB synchronous (pipeline burst) SRAM

- **Green function:** Features power management option via BIOS, activated by keyboard or mouse activity. Supports doze, sleep and suspend modes. APM 1.1 compliant

- **RAM:** Two 72-pin SIMM sockets. Supports DRAM with memory capacity up to 64 MB

- **EIDE interface:** Supports 2 IDE devices through the on-board connector. Supports PIO mode 4 and Ultra DMA mode

- **FDD interface:** Supports up to two floppy disk drives through the on-board connector

- **Parallel port:** Configured to LPT1, LPT2, LPT3 or disabled. Supports multi-mode parallel port (SPP/ECP/EPP)

- **Serial ports:** Two 16C550 UARTs, one RS-232, one RS-232/422/485 interface

- **Watchdog timer:** Can generate a system reset in the event of a software failure. Software enabled/disabled. Time interval is from 1 to 62 seconds, jumperless with run-time setup

- **Keyboard/mouse connector:** 6-pin mini-DIN connector on the front panel

- **USB interface:** Two USB connectors with fuse protection. Complies with USB specification 1.0

1.2.2 PCI bus

The MIC-3350 supports up to four bus master cards. The MIC-3350
has only four REQ/GNT pairs, which are routed as below:
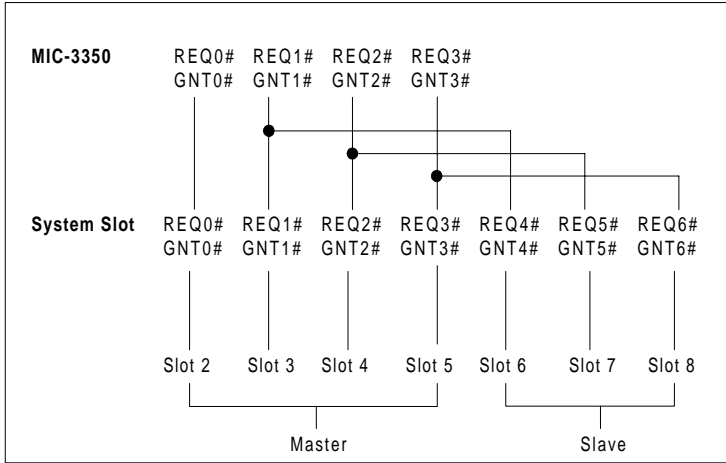
We recommend users to use bus master cards on logical slot 2, 3, 4
and 5. The slave cards can be used in any slots except system slot
(logical slot 1).

1.2.3 VGA Interface

- **Chipset:** SiS5598 built-in VGA function

- **Architecture:** Universal memory architecture

- **Display memory:** Shares system RAM 0.5 MB ~ 4 MB through BIOS setting (refer to section 4.1.4 for details)

- **Display Resolution**:
    - 640 x 480 with 256/32K/64K/16M color display, NI
    - 800 x 600 with 16/256/32K/64K/16M color display, NI
    - 1024 x 768 with 16/256/32K/64K/16M color display, NI
    - 1280 x 1024 with 16/256 color display, NI
    - 1280 x 1024 with 32K/64K color display, interlaced only
    - 1600 x 1200 with 256 color display, NI

1.2.4 Mechanical and Environmental Specifications

- **Board size:** 100 x 160 mm (3u size)

- **Max. power requirements**: +5 V (4.75 ~ 5.25 V) @ 5.5 A

- **Operating temperature**: 0 ~ 60° C (32 ~ 140° F)

- **Storage temperature**: -20° C ~ 70° C (4 ~ 158° F)

- **Humidity (operating and storage)**: 5 ~ 95% (non-condensing)

- **Board weight**: 0.5 kg (1.2 lb)

- **Operating altitude**: 0 to 10,000 feet (3048 meters)

- **Storage/transit altitude**: 0 to 40,000 feet (12,190 meters)

- **Shock**: 20 G (operating); 50 G (storage/transit)

- **Vibration**: 1.5 G at 5-39 Hz, 100 - 200 Hz; 0.5 G 40 - 99 Hz (Y-axis)
    1.5 G at 5-39 Hz, 0.5 G 40 - 200 Hz (X-axis)
    1.5 G at 5-49 Hz, 0.75 G 50 - 200 Hz (Z-axis)

1.3   Board Layout: Dimensions
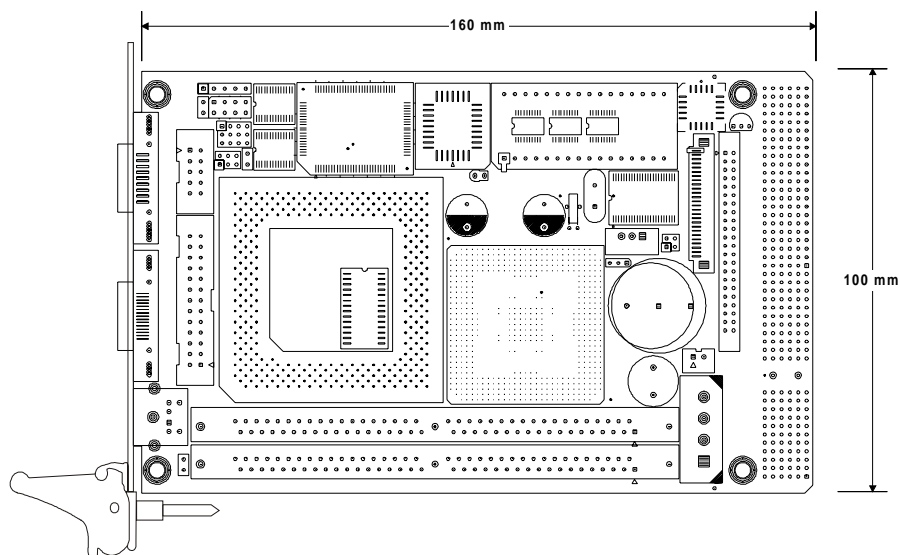
Figure 1-1: MIC-3350 board layout: Dimensions

1.4 Jumpers and Connectors

On-board connectors link the MIC-3350 to external devices such as hard disk drives, a keyboard, or floppy drives. In addition, the board has jumpers for configuring your board for specific applications.

The table below lists the function of each of the board's jumpers and connectors. Later sections in this chapter give instructions on setting jumpers and detailed information on each jumper setting. Chapter 2 gives instructions for connecting external devices to your card.

Table 1-1: MIC-3350 jumpers

Number	Function
JP1	HDD activity LED
JP2	Reset switch
JP4	COM2 RS-232/422/485 setting
JP5	COM2 RS-232/422/485 setting
JP7	Clear CMOS
JP8	CPU clock setting
DS1	CPU core voltage setting
DS2	CPU clock ratio setting and Cyrix linear mode setting

Table 1-2: MIC-3350 connectors

Number	Function
CN1	COM1 connector
CN2	VGA connector
CN3	Keyboard and PS/2 mouse
CN5	COM2 connector
CN6	Parallel port
CN7	USB connector
CN8	CPU fan power connector
CN9	Floppy disk connector
CN10	Main power connector
CN11	IDE connector
LED1	Power LED

Please refer to Appendix B for pin assignments.

1.5 Board Layout: Jumper Locations
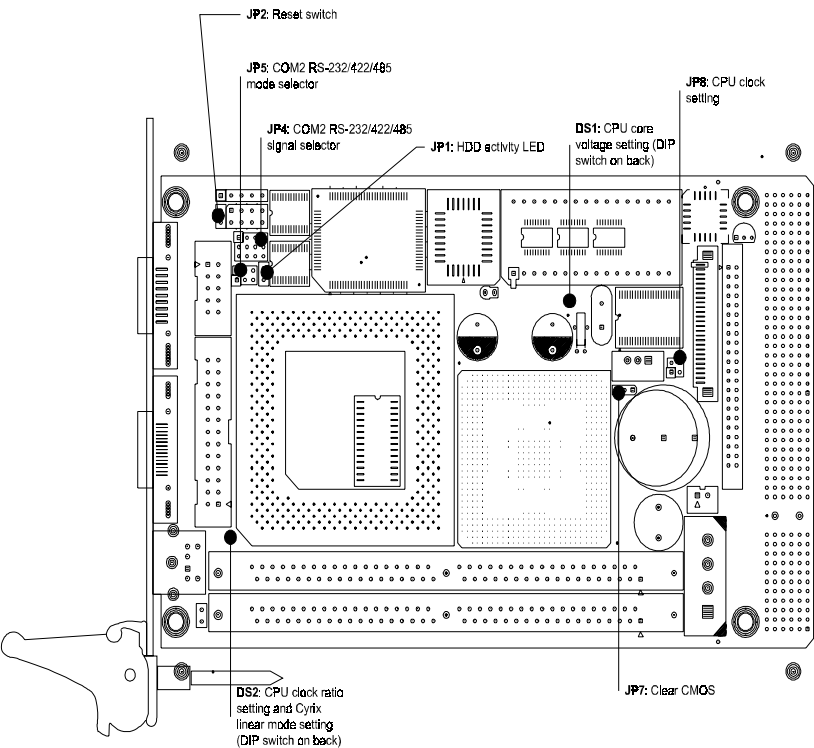
Figure 1-2: MIC-3350 board layout: Jumper locations

1.6 Board Layout: Connector Locations

CN1: COM1

CN5: COM2

CN7: USB2 (up)
USB1 (down)

DiskOnChip® 2000

J2

CN9: Floppy drive
connector

CN11: IDE
connector

CN8: Fan power
connector

J1

CN6: Parallel
port

SIMMs

CN10: Main
power connector

LED1: Power LED

CN3: Keyboard and PS/2
mouse

CN2: VGA connector
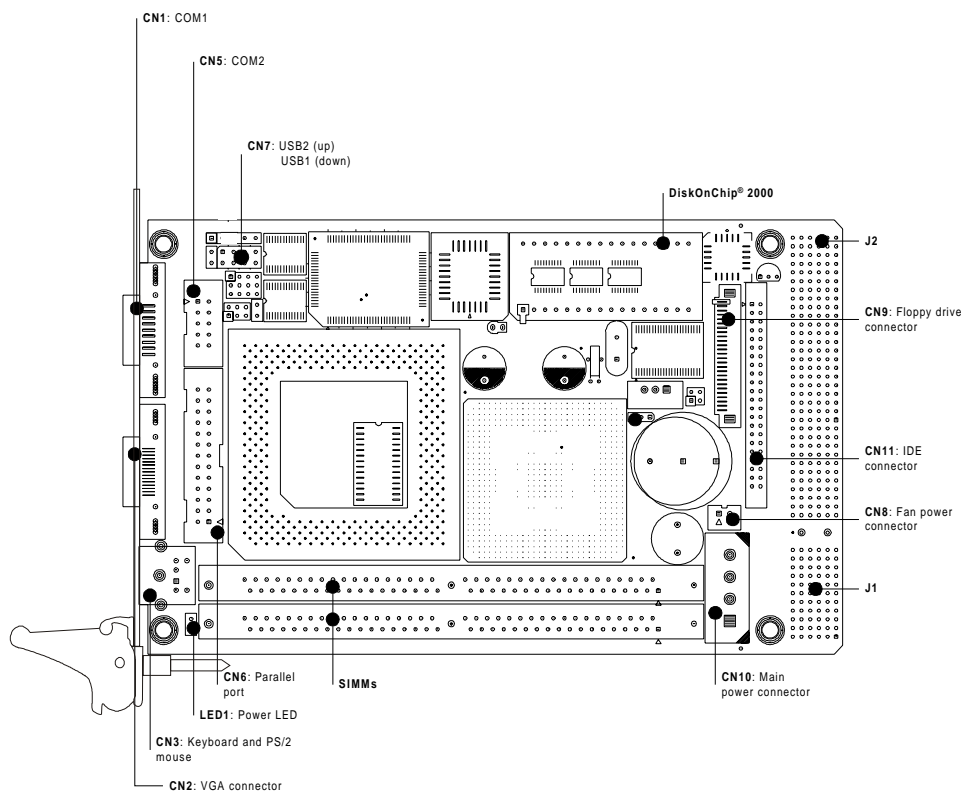
Figure 1-3: MIC-3350 board layout: Connector locations

1.7 Front Panel Connectors and Indicators
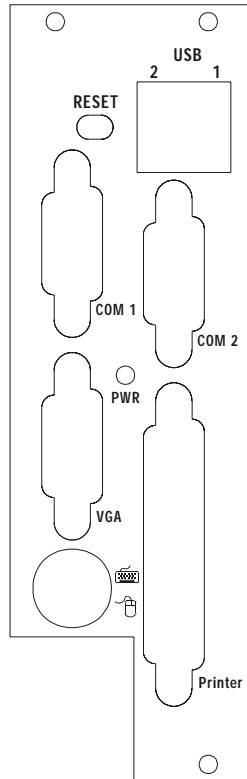
Figure 1-4: MIC-3350 front panel connectors and indicators

Note: *The power LED (PWR) turns off under "standby" or "suspend" mode.*

1.8 Safety Precautions

Follow these simple precautions to protect yourself from harm and
your PC from damage.

1. To avoid electric shock, always disconnect the power from your
    PC chassis before you work on it. Don't touch any components on
    the CPU card or other cards while the PC is on.

2. Disconnect power before making any configuration changes. The
    sudden rush of power as you connect a jumper or install a card
    may damage sensitive electronic components.

3. Always ground yourself to remove any static charge before you
    touch your CPU card. Be particularly careful not to touch the chip
    connectors. Modern integrated electronic devices, especially CPUs
    and memory chips, are extremely sensitive to static electric
    discharges and fields. Keep the card in its antistatic packaging
    when it is not installed in the PC, and place it on a static dissipa-
    tive mat when you are working with it. Wear a grounding wrist
    strap for continuous protection.

1.9 Jumper and DIP Switch Settings

This section tells how to set the jumpers and dip switches to configure your card. It gives the card default configuration and your options for each jumper. After you set the jumpers and install the card, you will also need to run the BIOS Setup program (discussed in Chapter 4) to configure the serial port addresses, floppy/hard disk drive types and system operating parameters. Connections, such as hard disk cables, appear in Chapter 2.

For the locations of each jumper and switch, see the board layout diagram depicted earlier in this chapter.

You configure your card to match the needs of your application by setting jumpers. A jumper is the simplest kind of electric switch. It consists of two metal pins and a small metal cap (often protected by a plastic cover) that slides over the pins to connect them. To "close" a jumper you connect the pins with the cap. To "open" a jumper you remove the cap. Sometimes a jumper will have three pins, labeled 1, 2 and 3. In this case you connect either pins 1 and 2 or 2 and 3.

Open   **Closed**   **Closed 2-3**
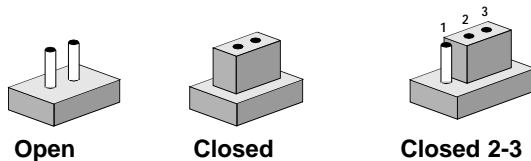
You may find a pair of needle-nose pliers useful for setting the jumpers.

If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes.

DS1: CPU core voltage
x = OFF   o = ON

1	2	3	4	Vcore
x	x	x	x	2.1
o	x	x	x	2.2
x	o	x	x	2.3
o	o	x	x	2.4
x	x	o	x	2.5
o	x	o	x	2.6
x	o	o	x	2.7
o	o	o	x	2.8
x	x	x	o	2.9
o	x	x	o	3.0
x	o	x	o	3.1
o	o	x	o	3.2
x	x	o	o	3.3
o	x	o	o	3.4
x	o	o	o	3.5
o	o	o	o	3.6

JP4: COM2 Signal Selector

1. : RS-232

2. : RS-422/485

DS1 (On rear side)
ON 1 2 3 4

JP5: COM2 Mode

1. : RS-232
2. : RS-422
3. : RS-485

JP7: Clear CMOS
: Normal
: clear CMOS

JP8: CPU clock setting

1. : 55 MHz
2. : 75 MHz
3. : 60 MHz
4. : 66 MHz

DS2 (On rear side)
ON 1 2 3 4

DS2: (1) CPU clock ratio setting
x = OFF   o = ON

1. Intel CPU ratio

1	2	3	P54C	P55C
x	x	x	1.5	3.5
o	o	x	2.5	2.5
o	x	x	2	2
x	o	x	3	3

2. AMD K6

1	2	3	ratio
x	x	x	3.5
o	o	x	2.5
o	x	x	2
x	o	x	3
x	x	o	5.5
o	o	o	4.5
o	x	o	4
x	o	o	5

(2) Cyrix CPU
4: ON - linear mode
   OFF - normal

Figure 1-5: MIC-3350 board layout: Jumper settings

1.10 CPU Clock Ratio Setting

Table 1-3: CPU clock ratio setting

CPU model	CPU clock	Bus clock	Clock ratio	DS2 1	2	3
Pentium 233 MHz	233	66	3.5	x	x	x
Pentium 200 MHz	200	66	3.0	x	o	x
Pentium 166 MHz	166	66	2.5	o	o	x
Pentium 150 MHz	150	60	2.5	o	o	x
Pentium 133 MHz	133	66	2.0	o	x	x
Pentium 120 MHz	120	60	2.0	o	x	x
Pentium 100 MHz	100	66	1.5	x	x	x
Pentium 90 MHz	90	60	1.5	x	x	x
Pentium 75 MHz	75	50	1.5	x	x	x
AMD K6-300	300	66	4.5	o	o	o
AMD K6-266	266	66	4.0	o	x	o
AMD K6-233	233	66	3.5	x	x	x
AMD K6-200	200	66	3.0	x	o	x
AMD K6-166	166	66	2.5	o	o	x
Cyrix 6x86MX-PR166GP	133	66	2.0	o	x	x
Cyrix 6x86MX-PR166GP	150	60	2.5	o	o	x
Cyrix 6x86MX-PR200GP	166	66	2.5	o	o	x
*Cyrix 6x86MX-PR200GP	150	75	2.0	o	x	x
*Cyrix 6x86MX-PR233GP	187.5	75	2.5	o	o	x
*Cyrix MII-300GP	225	75	3.0	x	o	x
Cyrix MII-300GP	233	66	3.5	x	x	x

x: OFF

o: ON

* Using a bus clock frequency of 75 MHz is not recommended

1.11 Installing DRAM (SIMMs)

The MIC-3350 provides two 72-pin SIMM sockets. Each socket
accepts 16 or 32 MB DRAM with access time ≤ 60 ns. The MIC-
3350 supports a single DRAM module. However, we recommend the
use of two DRAM modules to avoid possible conflict with the shared
VGA memory.

1.11.1 Installing SIMMs

NOTE: *The modules can only fit into a socket one way.
Their gold pins must point down into the SIMM
socket.*

The procedure for installing SIMMs appears below. Please follow
these steps carefully.

1. Ensure that all power supplies to the system are switched Off.

2. Install the SIMM module. Install the SIMM so that its gold pins
   point down into the SIMM socket.

3. Slip the SIMM into the socket and carefully fit the bottom of the
   card against the connectors.

4. Gently push the SIMM into a perpendicular position until the clips
   on the ends of the SIMM sockets snap into place.

5. Check to ensure that the SIMM is correctly seated and all connec-
   tor contacts touch. The SIMM should not move around in its
   socket.

Connecting Peripherals

This chapter tells how to connect peripherals to the MIC-3350. You can access most of the connectors from the front panel.

The following table lists the connectors on the MIC-3350.

Table 2-1: Connectors

Number	Function
J1	Compact PCI bus (32-bit)
J2	Compact PCI bus (64-bit)
CN1	COM1
CN2	VGA connector
CN3	Keyboard and PS/2 mouse
CN5	COM2
CN6	Parallel port
CN7	USB connector
CN8	CPU fan connector
CN9	Floppy disk connector
CN10	Main power connector
CN11	IDE connector (primary)

The following sections tell how to make each connection. In most cases, you will simply need to connect a standard cable. All of the connector pin assignments are shown in Appendix C.

Warning! *Always completely disconnect the power cord from your chassis whenever you are working on it. Do not make connections while the power is on. Sensitive electronic components can be damaged by a sudden rush of power.*

Caution! *Always ground yourself to remove any static charge before touching the CPU card. Modern electronic devices are very sensitive to static electric charges. Use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the chassis.*

2.1 IDE Device Connector (CN11) and Floppy Drive Connector (CN9)

The MIC-3350 provides one IDE (Integrated Device Electronics) channel and one floppy drive interface through the on-board connectors (CN11 and CN9). One 2.5" IDE hard drive and one 3.5" slim floppy drive can be attached by using the bracket and cables shipped with the MIC-3350.

CN11 is a 44-pin connector for the primary IDE channel, and CN9 is for the floppy drive. Figure 2-1 illustrates the installation of hard disk and floppy disk.
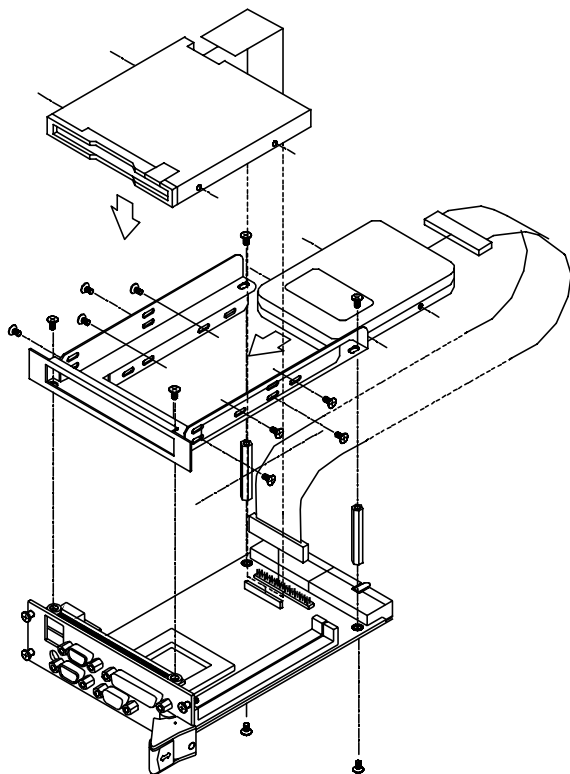
Figure 2-1: Installing hard disk and floppy disk drives

Warning: Plug the other end of the cable into the drive with pin 1 on the cable corresponding to pin 1 on the drive. Improper connection will damage the drive.

Note: The FPC cable is designed for connecting to the floppy drive. Its signal lines are twisted internally thus it has opposite pin assignments at both ends. You do not need to twist it to connect to a floppy disk drive.

2.2 VGA Display Connector (CN2)

The MIC-3350 provides a VGA controller for a high resolution VGA interface. The MIC-3350's CN2 is a DB-15 connector for VGA monitor input. Pin assignments for the CRT display are detailed in Appendix B. Shared memory architecture supports 0.5 MB, 1 MB, 1.5 MB, 2 MB, 2.5 MB, 3 MB, 3.5 MB and 4 MB system memory. The memory is configured in the system BIOS setup.

2.3 Parallel Port Connector (CN6)

The parallel port is normally used to connect the CPU card to a printer. The MIC-3350 includes an on-board parallel port, accessed through a DB 25-pin connector, CN6 on the front panel.

The parallel port is designated as LPT1 and can be disabled or changed to LPT2 or LPT3 in the system BIOS setup.

2.4 Keyboard and PS/2 Mouse Connector (CN3)

The MIC-3350 provides a 6-pin mini-DIN connector (CN3) on the front panel for connection of PS/2 keyboard and PS/2 mouse. The MIC-3350 comes with an adapter to convert from the 6-pin mini-DIN connector to a PS/2 keyboard connector and a PS/2 mouse connector. Since these two connectors are identical, please be careful to plug in keyboard or mouse into the correct connector.

2.5 Serial Ports (CN1,CN5: COM1 and COM2)

The MIC-3350 offers two serial ports: COM1 in RS-232, COM2 in RS-232/422/485. These ports let you connect to serial devices (a mouse, printers, etc.) or a communication network.

You can select the address for each port (For example, 3F8H [COM1], 2F8H [COM2]) or disable it, using the BIOS Advanced Setup program, covered in Chapter 4.

2.5.1 RS-232 connection (CN1: COM1)

Different devices implement the RS-232 standard in different ways. If you are having problems with a serial device, be sure to check the pin assignments for the connector.

2.5.2 RS-232/422/485 connection (CN5: COM2)

COM2 is an RS-232/422/485 serial port. The specific port type is determined by jumper settings, as detailed in Chapter 1.

The IRQ and address range for both ports are fixed. However, if you wish to disable the port or change these parameters later, you can do this in the system BIOS setup. The table below shows the settings for the MIC-3350 board's ports:

Table 2-2: MIC-3350 serial port default settings

Port	Address	Interrupt	Default
COM1	3F8, 3E8	IRQ4	3F8
COM2	2F8, 2E8	IRQ3	2F8

2.6 Power Connectors (CN10 & CN8)

2.6.1 Main Power Connector +5 V, +12 V (CN10)

The on-board power connector allows users to operate the MIC-3350 with an external power supply without plugging into a chassis. The CN10 connector provides power input connection to +5 V and +12 V.

2.6.2 CPU Fan Power Supply Connector (CN8)

This connector provides power supply to the optional CPU cooling fan. This connector is only available when +12 V power is supplied to the board.

Warning!   Before making the connection, make sure the voltage is absolutely correct and matched with the correct connector.

2.7 USB Connector (CN7)

The MIC-3350 board provides two USB (Universal Serial Bus) interfaces, which give complete plug and play, hot attach/detach for up to 127 external devices. The USB interfaces comply with USB specification rev. 1.0 and are fuse protected.

The USB interfaces can be disabled in the system BIOS setup.

2.8 Card Installation

The CompactPCI connectors are firm and rigid, and require careful handling while plugging and unplugging. Improper installation of a card can easily damage the backplane of the chassis.

The insert/eject handles of MIC-3350 help you to install and remove the card easily and safely. Follow the procedure below to install the MIC-3350 into a chassis:

To install a card:

1. Hold the MIC-3350 vertically. Be sure that the card is pointing in the correct direction. The components of the card should be pointing to the right-hand side.

2. Holding both handles, pull out the red portion in the middle of the handle to unlock it.

Caution: *Keep your fingers away from the hinge to prevent your fingers from getting pinched.*

3. Insert the card into the chassis by sliding the upper and lower edges of the card into the card guide.

4. Push the card into the slot gently by sliding the card along the card guide until the handle meets the rectangular holes of the cross rails.

Note: *If the card is correctly positioned and has been slid all the way into the chassis, the handles should match the rectangular holes. If not, remove the card from the card guide and repeat step 3 again. Do not try to install a card by forcing it into the chassis.*

5. Lift the handle up to push the card into place.

6. Secure the card by pushing in the red portion to lock the handle and tightening the four screws on the front panel.

To remove a card:

1. Unscrew the four screws on the front panel. Pull out the red part to unlock the handles.

2. Press the handle down to release the card from the backplane.

3. Slide the card out.

VGA Display Configuration

This chapter details the software configuration information. It shows you how to configure the board to match your application requirements. The AWARD System BIOS is covered in Chapter 4.

3.1   Introduction

The MIC-3350 uses the SiS5598 chipset. This chipset includes a high-performance VGA display controller, which uses system SDRAM as display memory. The shared memory size can easily be adjusted from 0.5 MB to 4 MB by setting BIOS, which is covered in Chapter 4. The larger memory size allows high display resolution and more display color.

3.2 Utility and Drivers

The MIC-3350 is supplied with a software utility CD-ROM that holds the necessary files for setting up the VGA display under the directory \MIC3000\SiS5598.

The following lists the contents and pathnames of this CD-ROM:

- **MIC3000\SiS5598\README.TXT**: ASCII text file.

- **MIC3000\SiS5598\RELEASE.TXT**: Text file of driver release note

- **MIC3000\SiS5598\IDE <DIR>**: SiS IDE drivers and Readme files for SiS chipset 5513, 5571, 5581, 5582, 5597, 5598, 559 and 5592

- **MIC3000\SiS5598\MM <DIR>**: SISTAG (disk tag file for Windows NT 3.5x)

- **MIC3000\SiS5598\MM <DIR>**: RELEASE.TXT (Text file of driver release note)

- **MIC3000\SiS5598\MM\BIOS <DIR>**: contains SiS SVGA BIOS binary file. It is not a driver file but for your reference only.

- **MIC3000\SiS5598\MM\DOS <DIR>**: Including the following files and sub-directories:

- •**INSTDRV.EXE**: Unpack & copy program of ADI 4.2

- •**SVGAUTIL.EXE**: SiS5598 SVGA Utility Program

- • **MIC3000\SiS5598\MM\DOS\ADI42 <DIR>**: Contains AutoCAD, AutoShade, 3D Studio driver files

- • **MIC3000\SiS5598\ MM\DOS\ET   <DIR>**: Contains ETen Chinese system display driver (ETDSPDRV.COM) v. 119B01 to support SiS SVGA. You may update this driver to your ETen Chinese system if you have the old version or you may ignore it if you have the newer version.

- **MIC3000\SiS5598\MM\OS2 <DIR>**: Contains IBM OS/2 Ver. 2.1, IBM OS/2 Warp 3.0 (double-byte) and IBM OS/2 Warp 3.0 (single byte) driver files. Including the following sub-directories:

  - **MIC3000\SiS5598\OS2\SBCS.21 <DIR>**: SISINST.CMD: SiS 5597/5598 VGA OS/2 2.1 setup program

  - **MIC3000\SiS5598\OS2\DBCS.30 <DIR>**: SETUP.CMD: SiS 5597/5598 SVGA OS/2 3.0 setup program, contains IBM OS/2 WARP 3.0 (double-byte: Chinese, Japanese, Korean, etc.) driver files.

  - **MIC3000\SiS5598\OS2\SBCS.30 <DIR>**: SISINST.CMD: SiS 5597/5598 VGA OS/2 3.0 Setup Program, contains IBM OS/2 WARP 3.0 (single-byte) driver files.

- **MIC3000\SiS5598\MM\WIN31 <DIR>**: Contains Windows 3.x driver, setup program, SiS MMPlayer and utilities.

- **MIC3000\SiS5598\MM\WIN95 <DIR>**: Contains Windows 95 driver, setup program, SiS MMPlayer, Direct Draw driver and utilities.

- **MIC3000\SiS5598\MM\WINNT <DIR>**: Contains Windows 3.5x, 4.0 driver files and contains the following sub-directories:

    - **MIC3000\SiS5598\WINNT\WINNT35 <DIR>**: Contains Windows NT 3.5x driver files OEMSETUP.INF: SiS SVGA setup information file (NT 3.5x)

    - **MIC3000\SiS5598\WINNT\WINNT40 <DIR>**: Contains Windows NT 4.0 driver files SISV5597.INF: SiS SVGA setup information file (NT 4.0)

3.3 VGA Display Setup and Configuration

3.3.1 VGA Display Setup and Configuration for DOS

3.3.1.1. General Description

SVGAUTL.EXE is one of the utilities for VGA controller SiS5598. It supports three functions:

1. Video mode setting

2. Frame rate setting

3. Power saving setting

Since SiS5598 supports many enhanced text mode and graphic modes, you can use SVGAUTL.EXE to select the desired video mode.

For 640 x 480, 800 x 600, 1024 x 768 and 1280 x 1024 resolutions, SiS5598 SVGA supports multiple frame rates.

If your monitor could synchronize with these frame rates, you can use SVGAUTL.EXE to take advantage of your monitor's features.

SiS 5597/5598 also supports VESA DPMS power saving modes. SVGAUTL.EXE can help you make the settings.

3.3.1.2. How to Use SVGAUTL.EXE

1. Type "SVGAUTL" in the directory where it resides. For example:

D:\MIC3000\SiS5598\DOS\SVGAUTL <Enter>

(assume the CD-ROM drive letter is "D:\")

2. The Main Menu appears and directs you to configure SiS5598.

3. When you complete configuration, you may save your preferences to the AUTOEXEC.BAT file and use it as your power-on (or hardware reset) default environment.

3.3.1.3. Parameters Explanation

The meaning of parameters used by SVGAUTL.EXE are explained below:

Syntax:

>SVGAUTL [/D:mode_no] [/F0:n0] [/F1:n1]
[/F2:n2] [/F3:n3] [/PA:ta] [/PB:tb]

where

/D: Set the video mode to be mode_no (hex)

For example: Set 1024 x 768, 256-color graphic mode:

>SVGAUTL /D:38 <Enter>

/F0: For 640 x 480, set frame rate to be n0 Hz.

Three available frame rates are 60, 72 and 75 Hz.

For example: Set 640 x 480 graphic mode with 60 Hz frame rate

>SVGAUTL /F0:60 <Enter>

/F1: For 800 x 600, set frame rate to be n1 Hz.

Four available frame rates are 56, 60, 72 and 75 Hz.

For example: Set 800 x 600 graphic mode with 72 Hz frame rate:

>SVGAUTL /F1:72 <Enter>

/F2: For 1024 x 768, set frame rate to be n2 Hz.

Four available frame rates are 87 (interlaced), 60, 70, and 75 Hz.

For example: Set 1024 x 768 graphic mode with 60 Hz frame rate:

>SVGAUTL /F2:60 <Enter>

/F3: For 1280 x 1024, set frame rate to be n3 Hz.

Two available frame rates are 87 (interlaced) and 60 Hz.

For example: Set 1280 x 1024 graphic mode with 60 Hz frame rate:

>SVGAUTL /F3:60 <Enter>

/PA: Set standby timer to be t_a minutes. ($0 < t_a < 15$ min.)

For example: Set Standby Timer to be 5 minutes:

>SVGAUTL /PA:5 <Enter>

/PB: Set suspend timer to be t_b minutes. ($0 < t_b < 15$ min.)

For example: Set suspend timer to be 5 minutes:

>SVGAUTL /PB:5 <Enter>

Note:

1. Suspend time would be "$t_a + t_b$". (i.e., standby time + suspend time)

2. The timers will not be very accurate and approximate the time that you set

3.3.2 VGA Driver Setup for Autodesk ADI 4.2 (Protected Mode)

Concerning how to setup VGA for AutoCAD R11, AutoCAD R12, AutoShade R2.0 and 3D Studio Version 3.0., please refer to MIC3000\SiS5598\README.TXT on the accompanying CD-ROM disc.

3.3.3 VGA Display Setup and Configuration for Microsoft Windows NT 3.5x

3.3.3.1 Driver Installation

a. Select Control Panel from Main group.

b. Select Display icon.

c. Select Change Display Type from Display Settings.

d. Select Change from Display Type.

e. Select Other from Select Device.

f. Place the CD-ROM into CD-ROM Drive.

g. When the "Install from Disk" dialog box appears, type "D:\MIC3000\SiS5598\MM\WINNT\WINNT35" and click "OK".

h. Select Install and click "Yes" when the "Installing Driver" dialog box appears.

i. Select New when the "Windows NT Setup" dialog box appears. Click "Continue".

A message will appear stating that the drivers were successfully installed. Click "OK". You must now restart Windows NT 3.51.

3.3.3.2 Selecting Resolution and Color Depth

a. Select Control Panel from the Main group.

b. Select Display icon.

c. Select Color Palette to change between 16 colors, 256 colors, 32768 colors, 65536 colors and 16777216 colors.

d. To select desktop resolution size, go to the Desktop area and use the slide bar to change resolution from 640 x 480, 800 x 600, 1024 x 768, and 1280 x 1024.

e. Select Test to test the resolution.

f. If the display test screen was good then select "Yes" when the "Testing Mode" dialog box appears. If the display test screen was bad then select "No". Windows NT will give you an error message.

g. If the display test screen was good and you select "Yes", Windows NT 3.5x will prompt you to restart Windows NT 3.5x.

3.3.4 VGA Display Setup and Configuration for Microsoft Windows NT 4.0

3.3.4.1 Driver Installation

a. Click the "Start" menu and select Control Panel from the Settings group.

b. Select the Display icon.

c. Select Settings of Display Properties.

d. Select Display Type.

e. Select Change from the Adapter Type area.

f. Select Have Disk in the Change Display screen.

g. Place the CD-ROM disc into the CD-ROM drive.

h. When the "Install from Disk" dialog box appears, type "D:\MIC3000\SiS5598\ MM\WINNT\WINNT40" and click "OK".

i. When the "Change Display" dialog box appears, click "OK".

j. When the "Third-party Drivers" dialog box appears, click "Yes".

A message will appear stating that the drivers were successfully installed. Click "OK". You must now restart Windows NT 4.0.

3.3.4.2 Selecting Resolution and Color Depth

a. Click the "Start" menu and select Control Panel from the Settings group.

b. Select Display icon.

c. Select Settings.

d. Select Color Palette to change between 16 colors, 256 colors, 32768 colors, 65536 colors and 16777216 colors.

e. To select desktop resolution size, go to the Desktop area and use the slide bar to change resolution from 640 x 480, 800 x 600, 1024 x 768 to 1280 x 1024.

f. Select Test to test the resolution. If the display test screen was good then select "Yes" when the "Testing Mode" dialog box appears. If the display test screen was bad then select "No". Windows NT will give you an error message.

g. Click "OK". If the display test screen was good and you select "Yes", Windows NT 4.0 will change the mode without restarting Windows NT 4.0.

3.3.5 VGA Display Setup and Configuration for Microsoft Windows 95

3.3.5.1 Driver Installation

a. Click "Start" menu and select Control Panel from Settings group.

b. Select "Display" icon.

c. Select "Settings" index in the display properties sheet.

d. Select "Change Display Type" button.

e. Select "Change..." button in "Adapter Type" group.

f. Select "Have Disk" button.

g. Place the CD-ROM disc into CD-ROM drive.

h. When the "Install from Disk" dialog box appears, type "D:\MIC3000\SiS5598\ MM\WINNT\WIN95" and click "OK".

i. When the "Change Display" dialog box appears, click "Close".

j. Select the "Close" or "Apply" button from the display properties sheet.

k. A message will appear stating that you must restart Windows 95. Select "yes" to restart.

l. After restarting, Windows 95 will run on 640 x 480 at 256 colors, 75Hz NI.

3.3.5.2 Selecting Resolution, Color Depth, and Refresh Rate

a. Click "Start" menu and select Control Panel from Settings group.

b. Select Display icon.

c. Select Settings.

d. Select Color Palette to change between 16-color, 256-color, Hi-color, and True-color.

e. To select desktop resolution size, go to the Desktop area and use the slide bar to change resolution from 640 x 480, 800 x 600, 1024 x 768 and 1280 x 1024.

f. Select Refresh rate list box to change the screen refresh rate.

g. Click "OK" or "Apply".

3.3.5.2 Install the Utility for Windows 95

a. Place the CD-ROM disc into the CD-ROM drive.

b. Click "Start" menu and select "Run..." menu item.

c. In "Run" dialog, type:

"D:\MIC3000\SiS5598\MM\WIN95\SETUP.EXE"

d. The Setup procedure will create a "SiS Multimedia Vx.xx" program group, including 3 items:

• Multimedia Manager

• SiS MMPlayer

• Center Screen

e. A Setup Successful dialog will appear when setup completes. You are given the option of restarting your computer and finalizing the changes.

3.3.6 VGA Display Setup and Configuration for Microsoft Windows 3.x

3.3.6.1 Display Driver and Utility Installation

a. Click "File" menu and select "Run..." menu item.

b. In "Run" dialog, type:

D:\MIC3000\SiS5598\MM\WIN31\SETUP.EXE

c. Follow the setup program's on-screen instructions.

d. Setup procedure will create a "SiS Multimedia Vx.xx" program
    group, including 5 items:

• Multimedia Manager

• SiS MMPlayer

• SVGA Setup

• Center Screen

• Uninstall

e. A Setup Successful dialog will appear when setup completes.
    You are given the option of restarting your computer and
    finalizing the changes.

3.3.6.2. Graphics Setup

a. In the "SiS Multimedia Vx.xx" program group, choose "SVGA
    Setup" icon to enter "SiS VGA Configuration System" screen.

b. In "SiS VGA Configuration System" screen, choose which
    options you would like to use.

c. After completing your selections, choose "OK" to make all your
    selections effective.

d. Choose "Restart Windows" to re-boot Windows using the new
    settings. Or, choose "Continue" to finalize the changes later.

3.3.6.3. Power Saving Setup in Windows

a. In the "SiS VGA Configuration System" screen, choose "power
    saver" item to enter "Power Saver" screen.

b. In the "Power Saver" Screen, choose which options you would
    like to use.

c. After completing the selections, choose "OK" to make all your
    selections effective.

d. After completing setup, the power_saver should take effect after
    the time interval has elapsed.

3.3.6.4. Zoom_Key Setup

In the "SiS VGA Configuration System" screen, choose "zooming" item to define "hot keys" for enlarging or making the screen smaller without entering the setup program.

The operation principles of zoom-in and zoom-out are as follows:

1. The resolution change sequence for zoom-in is:

1024 x 768 ——→ 800 x 600 ——→ 640 x 480

2. The resolution change sequence for zoom-out is:

640 x 480 ——→ 800 x 600 ——→ 1024 x 768

Note: You cannot zoom-out to a resolution larger than you have previously configured.

To use this feature, follow this procedure:

a. In the "SiS VGA Configuration System" screen, choose "zooming" item to enter the "Zooming Hotkey" screen.

b. In the "Zooming Hotkey" Screen, choose which "hot-key" you would like to use and enable it.

c. After completing the selections, choose "OK" to make all your selections effective.

d. After completing the setup, you may use your own defined hot key to zoom-in or zoom-out.

Note: The power saver's timer settings would be effective even after exiting Windows back to DOS.

3.3.6.5 MPEG1 Video Operations

SiS 5597/5598 supports DCI drivers for software MPEG playback and other media player programs which can take advantage of DCI.

The SiS 5597/5598 DCI driver is automatically loaded during the "Windows Driver Unpack & Copy" process. Therefore it should be transparent to the end-user and any media players can take advantage of it.

To make software MPEG playback better than what your original software MPEG player supplier provided, SiS provide an MMPlayer application program to provide a VCP-like (Video Cassette Player) interface.

To take advantage of the SiS MMPlayer, you must first install "SW MPEG Player". SiS provides an interface but not a software MPEG player. If the software MPEG player (Xing or Mediamatics) does not exist, the SiS MMPlayer will not work.

To use the SiS MMPlayer, choose the "SiS MMPlayer" icon in the "SiS Multimedia Vx.xx" program group and the SiS MMPlayer VCP-like icon will appear. You can then enjoy the software MPEG playback.

3.3.7 VGA Display Setup and Configuration for IBM OS/2 Ver. 2.1

3.3.7.1 OS2 V2.1 Display Driver Installation

a. Before installing SiS OS/2 V2.1 display driver, start up OS/2 system in standard VGA mode.

b. Select "Command Prompt" folder.

c. Select "OS/2 window" or "OS/2 full screen" icon.

d. Place the CD-ROM disc into the CD-ROM drive.

e. Change the directory to D:\MIC3000\SiS5598\MM\OS2\SBCS.21.

f. Type SISINST then press "Enter".

g. When the "Select Screen Parameters for SiS SVGA" dialog appears, select the resolution, color depth and frame rate you would like, then click "OK"

h. The installation program will create a "SiS Setup" icon on the desktop.

i. Shut down and re-boot OS/2 V2.1.

3.3.8 VGA Display Setup and Configuration for IBM OS/2 Warp 3.0 (Double Byte Character)

3.3.8.1 OS/2 Warp Display Driver Installation (For DBCS version)

a. Before installing SiS OS/2 Warp display driver, start up OS/2 system in standard VGA mode.

b. Select "Command Prompt" folder.

c. Select "OS/2 window" or "OS/2 full screen" icon.

d. Place the CD-ROM disc into the CD-ROM drive.

e. Change the directory to D:\MIC3000\SiS5598\MM\OS2\DBCS.30.

f. Type SETUP and then press "Enter".

g. Setup procedure will create a "SiS Install" icon on the desktop.

h. Shutdown and reboot the OS/2 Warp system.

i. When the system reboots, double-click the "SiS Install" icon. It will perform more installation procedures.

j. When the "Select Screen Parameters for SiS SVGA" dialog appears, select the resolution, color depth and frame rate you would like, then click "OK"

k. The installation program will create a "SiS Setup" icon on the desktop.

l. Shutdown and re-boot OS/2 Warp.

3.3.9 VGA Display Setup and Configuration for IBM OS/2 Warp 3.0 (Single Byte Character)

3.3.9.1 OS2 Warp Display Driver Installation (For SBCS version)

a. Before installing the SiS OS/2 Warp display driver, start up OS/2 system in standard VGA mode.

b. Select "Command Prompts" folder.

c. Select "OS/2 window" or "OS/2 full screen" icon.

d. Place the CD-ROM disc into the CD-ROM drive.

e. Change directory to D:\MIC3000\SiS5598\MM\OS2\SBCS.30

f. Type SISINST and then press "Enter".

g. When the "Select Screen Parameters for SiS SVGA" dialog appears, select the resolution, color depth and frame rate you would like and then click "OK".

h. The installation program will create a "SiS Setup" icon on the desktop.

i. Shutdown and re-boot OS/2 Warp.

Award BIOS Setup

This chapter describes how to set the card's BIOS configuration data.

4.1 AWARD BIOS Setup

```
ROM PCI/ISA BIOS (2A5IIAKC)
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.
────────────────────────────────────────────────────────

STANDARD CMOS SETTING            INTEGRATED PERIPHERALS

BIOS FEATURES SETUP              PASSWORD SETTING

CHIPSET FEATURES SETUP           IDE HDD AUTO DETECTION

POWER MANAGEMENT SETUP           SAVE & EXIT SETUP

PNP/PCI CONFIGURATION            EXIT WITHOUT SAVING

LOAD BIOS DEFAULTS

LOAD SETUP DEFAULTS
────────────────────────────────────────────────────────
Esc: Quit                        ↑↓→← : Select Item
F10: Save & Exit Setup           (Shift)F2: Change Color
```

Figure 4-1: Setup program initial screen

Award's BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backed RAM so that it retains the Setup information when the power is turned off.

4.1.1 Entering Setup

Turning on the computer and pressing <DEL> immediately will allow you to enter Setup.

4.1.2 Standard CMOS Setup

Choose the "STANDARD CMOS SETUP" option from the INITIAL SETUP SCREEN Menu, and the screen below is displayed. This standard Setup Menu allows users to configure system components such as date, time, hard disk drive, floppy drive, display, and memory.

```
                    ROM PCI/ISA BIOS (2A5IIAKC)
                       STANDARD CMOS SETUP
                       AWARD SOFTWARE, INC.
```

```
┌─────────────────────────────────────────────────────────────────┐
│  Date <mm:dd:yy>  : Mon. Oct 20 1998                              │
│  Time <hh:mm:ss>  : 22 : 29 : 38                                  │
│                                                                   │
│  HARD DISKS      TYPE  SIZE  CYLS   HEAD  PRECOMP  LANDZ  SECTOR  MODE │
│  Primary Master  :Auto  0    0      0     0        0      0      Auto │
│  Primary Slave   :Auto  0    0      0     0        0      0      Auto │
│                                                                   │
│                                                                   │
│  Drive A: 1.44M.  3.5 in.                                         │
│  Drive B: None               ┌─────────────────────────────────┐ │
│                              │  Base Memory:        640K        │ │
│                              │  Extended Memory: 15360K         │ │
│                              │  Other Memory:       384K        │ │
│  Video:  EGA/VGA             │  ───────────────────────────    │ │
│  Halt  On : All But Keyboard │  Total Memory:     16384K        │ │
│                              └─────────────────────────────────┘ │
│  ESC:  Quit             ↑↓→←: Select Item      PU/PD/+/-:  Modify │
│  F1:   Help             <Shift> F2: Change Color                  │
└─────────────────────────────────────────────────────────────────┘
```

Figure 4-2: CMOS setup screen

4.1.3 BIOS Features Setup

The "BIOS FEATURES SETUP" screen appears when choosing the BIOS FEATURES SETUP item from the CMOS SETUP UTILITY Menu. It allows the user to configure the MIC-3350 according to his particular requirements.

Below are some major items that are provided in the BIOS FEATURES SETUP screen:

```
                    ROM PCI/ISA BIOS (2A5IIAKC)
                       BIOS FEATURES SETUP
                      AWARD SOFTWARE, INC.
```

```
┌──────────────────────────────────────────────────────────────────────┐
│ Virus Warning           : Disabled   Video Bios Shadow    : Enabled    │
│ CPU Internal Cache      : Enabled    C8000-CBFFF Shadow : Disabled      │
│ External Cache          : Enabled    CC000-CFFFF Shadow : Disabled      │
│ Quick Power On Self Test : Enabled   D0000-D3FFF Shadow : Disabled      │
│ Boot Sequence           : C, A, SCSI D4000-D7FFF Shadow : Disabled      │
│ Swap Floppy Drive       : Disabled   D8000-DBFFF Shadow : Disabled      │
│ Boot Up Floppy Seek     : Enabled    DC000-DFFFF Shadow : Disabled      │
│ Boot Up NumLock Status  : On                                           │
│ Boot Up System Speed    : High                                         │
│ Gate A20 Option         : Fast                                         │
│ Memory Parity Check     : Disabled                                     │
│ Typematic Rate Setting  : Disabled                                     │
│ Typematic Rate (Char/sec): 6                                           │
│ Typematic Delay (Msec)  : 250                                          │
│ Security Option         : Setup      ───────────────────────────────── │
│ PCI/VGA Palette Snoop   : Disabled   Esc :  Quit      ↑↓→←: Select Item │
│ OS Select for DRAM >64M : Non-OS2    F1  : Help      PU/PD/+/- : Modify │
│                                      F5  : Old Values <Shift>F2 : Color │
│                                      F6  : Load BIOS Defaults           │
│                                      F7  : Load Setup Defaults          │
└──────────────────────────────────────────────────────────────────────┘
```

Figure 4-3: BIOS features setup screen

Virus Warning

During and after the system boots up, any attempt to write to the boot sector or partition table of the hard disk drive will halt the system. In this case, a warning message will be displayed. You can run the anti-virus program to locate the problem.

If Virus Warning is Disabled, no warning message will appear if anything attempts to access the boot sector or hard disk partition.

CPU Internal Cache/External Cache

Depending on the CPU/chipset design, these options can speed up memory access when enabled.

Quick Power On Self Test

This option speeds up the Power-On Self Test (POST) conducted as soon as the computer is turned on. When enabled, BIOS shortens or skips some of the items during the test. When disabled, normal POST procedures resume.

Boot Sequence

This function determines the sequence in which the computer will search the drives for the disk operating system (i.e. DOS). The default value is "C, A, SCSI". The following options are available:

A: Computer will boot from the A (floppy) disk drive
C: Computer will boot from the C (hard) disk drive
CDROM: Computer will boot from the CD-ROM disc drive
SCSI: Computer will boot from the SCSI drive
D: Computer will boot from the D drive
E: Computer will boot from the E drive
F: Computer will boot from the F drive
LS120:   Computer will boot from the LS-120 drive

Boot Up Floppy Seek

During POST, BIOS will determine if the floppy disk drive installed is 40 or 80 tracks. 360 KB type is 40 tracks while 720 KB, 1.2 MB, and 1.44 MB are all 80 tracks.

Enabled	BIOS searches the floppy drive to determine if it is 40 or 80 tracks. Note that BIOS cannot differentiate 720 KB, 1.2 MB, and 1.44 MB type drives as they are all 80 tracks.
Disabled	BIOS will not search for the floppy drive type by track number. Note that there will not be any warning message if the drive installed is 360 KB.

Boot Up NumLock Status
The default is "On".

On	Keypad boots up to number keys.
Off	Keypad boots up to arrow keys.

Boot Up System Speed

High	Sets the speed to high
Low	Sets the speed to low

IDE HDD Block Mode

Enabled	Enable IDE HDD Block Mode. BIOS will detect the block size of the HDD and send a block command automatically.
Disabled	Disable IDE HDD Block Mode

Gate A20 Option

Normal	The A20 signal is controlled by the keyboard controller or chipset hardware
Fast	Default: Fast. The A20 signal is controlled by Port 92 or chipset specific method.

Typematic Rate Setting
The typematic rate determines the characters per second accepted by the computer. Typematic Rate setting enables or disables the typematic rate.

Typematic Rate (Char/Sec)
BIOS accepts the following input values (character/second) for Typematic Rate: 6, 8, 10, 12, 15, 20, 24, 30.

Typematic Delay (msec)
When holding down a key, the Typematic Delay is the time interval between the appearance of the first and second characters. The input values (msec) for this category are: 250, 500, 750, 1000.

Security Option
This setting determines whether the system will boot if the password is denied, while limiting access to Setup.

System	The system will not boot, and access to Setup will be denied if the correct password is not entered at the prompt.
Setup	The system will boot, but access to Setup will be denied if the correct password is not entered at the prompt.

Note: To disable security, select PASSWORD SETTING in the main menu. At this point, you will be asked to enter a password. Simply hit the <ENTER> key to disable security. When security is disabled, the system will boot, and you can enter Setup freely.

OS Select for DRAM>64 MB
This setting is under OS/2 system.

Video BIOS Shadow
This determines whether video BIOS will be copied to RAM, which is optional according to the chipset design. When enabled, Video Shadow increases the video speed.

C8000 - CFFFF Shadow/DC000-DFFFF Shadow
These determine whether optional ROM will be copied to RAM in blocks of 16 KB.

Enabled	Optional shadow is enabled
Disabled	Optional shadow is disabled

4.1.4 CHIPSET Features Setup

By choosing the "CHIPSET FEATURES SETUP" option from the
INITIAL SETUP SCREEN Menu, the screen below is displayed. This
sample screen contains the manufacturer's default values for the MIC-
3350.

```
              ROM PCI/ISA BIOS (2A5IIAKC)
                CHIPSET FEATURES SETUP
                 AWARD SOFTWARE, INC.

 Auto Configuration      : Enabled      Memory Hole at 15M-16M   : Disabled
 L2 (WB) Tag Bit Length  : 8 bits       VGA Shared Memory Size   : 2 MB
 SRAM Back to Back       : Enabled      VGA Mem Clock (MHz)      : 55
 NA # Enable             : Disabled     Linear Mode SRAM Support: Disabled
 Starting Point of Paging : 1T
 Refresh Cycle Time (US)  : 15.6
 RAS Pulse Width Refresh : 6T
 RAS Precharge Time      : 4T
 RAS to CAS Delay        : 4T
 CAS# Pulse Width (FP)    : 2T
 CAS# Pulse Width (EDO) : 1T
 RAMW# Assertion Timing: 3T
 CAS Precharge Time (FP) : 1T/2T
 CAS Precharge Time (EDO): 1T/2T

 Enhanced Memory Write : Disabled     Esc : Quit          ↑↓→←       : Select Item
 Read Prefetch Memory RD: Enabled     F1  : Help          PU/PD/+/-  : Modify
 CPU to PCI Post Write   : Disabled    F5  : Old Values    <Shift>F2  : Color
 CPU-PCI Burst Mem.WR   : Disabled     F6  : Load BIOS Defaults
 ISA Bus Clock Frequency : PCI CLK/4   F7  : Load Setup Defaults
 System BIOS Cacheable   : Enabled
 Video BIOS Cacheable    : Enabled
```

Figure 4-4: CHIPSET features setup screen

VGA Shared Memory Size
Share memory architecture can support 0.5 MB, 1MB, 1.5 MB, 2 MB,
3 MB, 3.5 MB and 4 MB of system memory.

4.1.5 Power Management Setup

The power management setup controls the CPU cards' "green" features. The following screen shows the manufacturer's default.

ROM PCI/ISA BIOS (2A5IIAKC)
POWER MANAGEMENT SETUP
AWARD SOFTWARE, INC.

```
┌─────────────────────────────────────────────────────────────────────────┐
│ Power Management      : Disabled      VGA Activity         : Disabled     │
│ PM Control by APM     : Yes           IRQ3 (COM2)          : Enabled      │
│ Video Off Option      : Susp,Stby → Off  IRQ4 (COM1)       : Enabled      │
│ Video Off Method      : DPMS Supported   IRQ5 (LPT2)       : Enabled      │
│ Switch Function       : Break/Wake    IRQ6 (Floppy Disk)  : Enabled      │
│ Doze Speed (div by)   : 2             IRQ7 (LPT1)          : Enabled      │
│ Stdby Speed (div by)  : 3             IRQ8 (RTC Alarm)     : Disabled     │
│ Modem Use IRQ         : 3             IRQ9 (IRQ2 Redir)    : Enabled      │
│ Hot Key Power Off     : Disabled      IRQ10 (Reserved)     : Enabled      │
│         **PM Timers**                 IRQ11 (Reserved)     : Enabled      │
│ HDD Off After         : Disabled      IRQ12 (PS/2 Mouse)   : Enabled      │
│ Doze Mode             : Disabled      IRQ13 (Coprocessor)  : Enabled      │
│ Standby Mode          : Disabled      IRQ14 (Hard Disk)    : Enabled      │
│ Suspend Mode          : Disabled      IRQ15 (Reserved)     : Enabled      │
│         **PM Events**                                                     │
│ COM Ports Activity    : Enabled       ┌──────────────────────────────────│
│ LPT Ports Activity    : Enabled       │ Esc : Quit       ↑↓→←: Select Item│
│ HDD Ports Activity    : Enabled       │ F1  : Help       PU/PD/+/- : Modify│
│                                       │ F5  : Old Values <Shift>F2 : Color │
│                                       │ F6  : Load BIOS Defaults           │
│                                       │ F7  : Load Setup Defaults          │
└─────────────────────────────────────────────────────────────────────────┘
```

Figure 4-5: Power management setup screen

Power Management
This option allows you to determine if the values in power management are disabled, user-defined, or predefined.

HDD Power Management
You can choose to turn the HDD off after one of the time intervals listed, or when the system is in Suspend mode. If in a power saving mode, any access to the HDD will wake it up.

*Note: HDD will not power down if the Power Management
              option is disabled.*

IRQ Activity
IRQ can be set independently. Activity on any enabled IRQ will wake up the system.

4.1.6 PCI Configuration Setup

ROM PCI/ISA BIOS (2A5IIAKC)
PNP/PCI CONFIGURATION
AWARD SOFTWARE, INC.

```
┌─────────────────────────────────────────────────────────────────────┐
│  Resources Controlled By  : Manual      PCI IRQ Activated By  : Level │
│  Reset Config. Data        : Disabled    PCI IDE 2nd Channel  : Enabled│
│                                          PCI IDE IRQ Map To   : PCI-AUTO│
│  IRQ-3 assigned to         : Legacy ISA  Primary IDE INT#     : A      │
│  IRQ-4 assigned to         : Legacy ISA  Secondary IDE INT#   : B      │
│  IRQ-5 assigned to         : PCI/ISA PnP                               │
│  IRQ-7 assigned to         : Legacy ISA                                │
│  IRQ-9 assigned to         : PCI/ISA PnP                               │
│  IRQ-10 assigned to        : PCI/ISA PnP                               │
│  IRQ-11 assigned to        : PCI/ISA PnP                               │
│  IRQ-12 assigned to        : PCI/ISA PnP                               │
│  IRQ-14 assigned to        : Legacy ISA                                │
│  IRQ-15 assigned to        : Legacy ISA                                │
│  DMA-0 assigned to         : PCI/ISA PnP                               │
│  DMA-1 assigned to         : PCI/ISA PnP ─────────────────────────────│
│  DMA-3 assigned to         : PCI/ISA PnP                               │
│  DMA-5 assigned to         : PCI/ISA PnP  Esc : Quit    ↑↓→←: Select Item│
│  DMA-6 assigned to         : PCI/ISA PnP  F1  : Help    PU/PD/+/- : Modify│
│  DMA-7 assigned to         : PCI/ISA PnP  F5  : Old Values <Shift>F2 : Color│
│                                           F6  : Load BIOS Defaults     │
│                                           F7  : Load Setup Default     │
└─────────────────────────────────────────────────────────────────────┘
```

Figure 4-6: PCI configuration screen

4.1.7 Load BIOS Defaults

"LOAD BIOS DEFAULTS" indicates the most appropriate values for the system parameters for minimum performance. These default values are loaded automatically if the stored record created by the Setup program becomes corrupted (and therefore unusable).

4.1.8 Load Setup Defaults

"LOAD SETUP DEFAULTS" loads the values required by the system for maximum performance.

4.1.9 Integrated Peripherals

ROM PCI/ISA BIOS (2A5IIAKC)
INTEGRATED PERIPHERALS
AWARD SOFTWARE, INC.

```
Internal PC/IDE              : Enabled
IDE Primary Master PIO       : Auto
IDE Primary Slave PIO        : Auto
Primary Master Ultra DMA     : Auto
Primary Slave Ultra DMA      : Auto
IDE Burst Mode               : Enabled
IDE Data Port Post Write     : Enabled
IDE HDD Block Mode           : Enabled

Onboard FDC Controller       : Enabled
Onboard Serial Port 1        : 3F8/IRQ4
Onboard Serial Port 2        : 2F8/IRQ3     Esc : Quit              ↑↓→←: Select Item
Onboard Parallel Port        : 378/IRQ7     F1  : Help              PU/PD/+/-  : Modify
Onboard Parallel Mode        : ECP+EPP      F5  : Old Values        <Shift>F2  : Color
ECP Mode Use DMA             : 3            F6  : Load BIOS Defaults
PS/2 Mouse function          : Enabled      F7  : Load Setup Default
USB Controller               : Enabled
USB Keyboard Support         : Disabled
WDT Active when power on      : 62 Sec
```

Figure 4-7: Integrated peripherals

Note: *If you enable the IDE HDD block mode, the en-*
          hanced IDE driver will be enabled.

4.1.10 Password Setting

To change, confirm, or disable the password, choose the "PASS-
WORD SETTING" option form the Setup main menu and press
[Enter]. The password can be at most 8 characters long.

Remember to enable this feature. You must first select the Security
Option in the BIOS FEATURES SETUP to be either "Setup" or
"System." Pressing [Enter] again without typing any characters can
disable the password setting function.

4.1.11 IDE HDD Auto Detection

"IDE HDD AUTO DETECTION" automatically self-detects the
correct hard disk type.

4.1.12 Save & Exit Setup

If you select this and press the [Enter] key, the values entered in the setup utilities will be recorded in the CMOS memory of the chipset. The microprocessor will check this every time you turn your system on and compare this to what it finds as it checks the system. This record is required for the system to operate.

4.1.13 Exit Without Saving

Selecting this option and pressing the [Enter] key lets you exit the Setup program without recording any new values or changing old ones.

Programming the Watchdog Timer

The MIC-3350 is equipped with a watchdog timer that resets the CPU or generates an interrupt if processing comes to a standstill for any reason. This feature ensures system reliability in standalone or unmanned environments.

A.1 Programming the Watchdog Timer

To program the watchdog timer, you must write a program which writes I/O port address 443 (hex). The output data is a value of time interval. The value range is from 01 (hex) to 3E (hex), and the related time interval is 1 sec. to 62 sec.

Data	Time Interval
01	1 sec.
02	2 sec.
03	3 sec.
04	4 sec.
•	•
•	•
•	•
3E	62 sec.

After data entry, your program must refresh the watchdog timer by rewriting the I/O port 443 (hex) while simultaneously setting it. When you want to disable the watchdog timer, your program should read I/O port 443 (hex).

The following example shows how you might program the watchdog timer in BASIC:

```
10        REM  Watchdog timer example program
20        OUT &H443, data REM  Start and restart the watchdog
30        GOSUB 1000 REM  Your application task #1,
40        OUT &H443, data REM  Reset the timer
50        GOSUB 2000 REM  Your application task #2,
60        OUT &H443, data REM  Reset the timer
70        X=INP (&H443) REM, Disable the watchdog timer
80        END

1000      REM  Subroutine #1, your application task
•         •
•         •
•         •
1070      RETURN
2000      REM  Subroutine #2, your application task
•         •
•         •
•         •
2090      RETURN
```

Pin Assignments

This appendix contains information of a detailed or specialized nature. It includes:

- CRT display connector
- RS-232/422/485 serial port connector
- Keyboard and mouse connector
- External keyboard connector
- Main power connector
- IDE connector
- RS-232 serial port connector
- Floppy connector
- Parallel connector

B.1 CRT Display Connector (CN2)

Table B-1: MIC-3350 CRT display connector

Pin	Signal	Pin	Signal
1	RED	9	N/C
2	GREEN	10	GND
3	BLUE	11	N/C
4	N/C	12	DDAT
5	GND	13	H-SYNC
6	GND	14	V-SYNC
7	GND	15	DDCK
8	GND		

B.2 COM1 RS-232 Serial Port (CN1)

```
5  ○   ○  9
4  ○   ○  8
3  ○   ○  7
2  ○   ○  6
1  ○
```
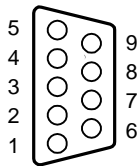
Table B-2: MIC-3350 COM1 RS-232 serial port

Pin	Signal
1	DCD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

B.3 COM2 RS-232/422/485 Serial Port (CN5)

1 ○ ○ 6

5 ○ ○ 10 (On board connector)
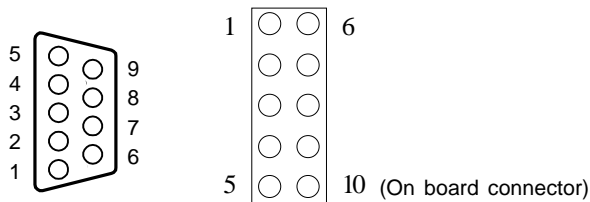
Table B-3: MIC-3350 COM2 RS-232/422/485 series port

Pin	RS-232 port	RS-422 port	RS-485 port
1	DCD	TXD-	DATA-
2	RXD	TXD+	DATA+
3	TXD	RX+	N/C
4	DTR	RX-	N/C
5	GND	N/C	N/C
6	DSR	N/C	N/C
7	RTS	N/C	N/C
8	CTS	N/C	N/C
9	RI	N/C	N/C
10	N/C	N/C	N/C

B.4 Keyboard and Mouse Connnector (CN3)

1. Table B-4: MIC-3350 keyboard connector

Pin	Signal
1	KB DATA
2	MDAT
3	GND
4	V_{CC}
5	KB CLOCK
6	MCLOCK

B.5 Main Power Connector (CN10)

Table B-5: MIC-3350 main power connector

Pin	Signal
1	+12 V
2	GND
3	GND
4	V_{CC}

B.6 IDE Hard Drive Connector (CN11)

```
43 41  ....   3   1
 ○  ○        ○  ○
         ...
 ○  ○        ○  ○
44 42  ....   4   2
```
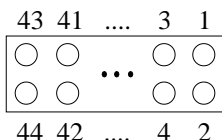
Table B-6: MIC-3350 IDE hard drive connector

Pin	Signal	Pin	Signal
1	IDE RESET*	2	GND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	SIGNAL GND	20	N/C
21	N/C	22	GND
23	IO WRITE	24	GND
25	IO READ	26	GND
27	IO CHANNEL READY	28	N/C
29	HDACKO*	30	GND
31	IRQ14	32	IOCS16
33	ADDR 1	34	N/C
35	ADDR 0	36	ADDR 2
37	HARD DISK SELECT 0*	38	HARD DISK SELECT 1*
39	IDE ACTIVE*	40	GND
41	V_{CC}	42	V_{CC}
43	GND	44	N/C

* Low active

B.7 USB Connector (CN7)
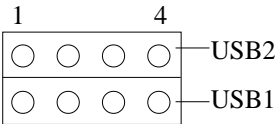
Table B-7: USB1/USB2 connector

Pin	USB1 Signal	Pin	USB2 Signal
1	+5 V	1	+5 V
2	DATA1-	2	DATA2-
3	DATA1+	3	DATA2+
4	GND	4	GND

B.8 CPU Fan Power Connector (CN8)

Table B-8: MIC-3350 CPU fan power connector

Pin	Signal
1	+12 V
2	GND

B.9   Floppy Drive Connector (CN9)

26 25   2   1
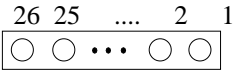
Table B-9: MIC-3350 floppy drive connector

Pin	Signal	Pin	Signal
1	V_{CC}	2	INDEX*
3	V_{CC}	4	DRVA*
5	V_{CC}	6	DSKCG*
7	N/C	8	N/C
9	N/C	10	MOTEA*
11	N/C	12	FDIR*
13	DVSL*	14	STEP*
15	GND	16	WDATA*
17	GND	18	WGATE*
19	GND	20	TK00*
21	GND	22	WPT*
23	GND	24	RDATA*
25	GND	26	SIDE1*

* Low active

B.10 Parallel Port Connector (CN6)
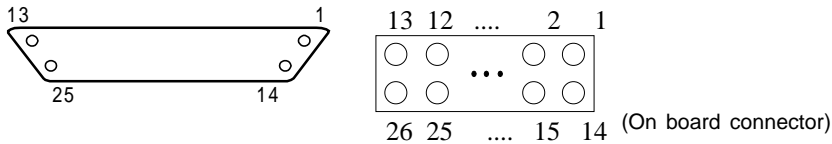
Table B-10: MIC-3350 parallel port connector

Pin	Signal
1	STB*
2	D0
3	D1
4	D2
5	D3
6	D4
7	D5
8	D6
9	D7
10	ACK*
11	BUSY
12	PE
13	SLCT
14	AFD*
15	ERR*
16	INIT*
17	SLIN*
18	GND
19	GND
20	GND
21	GND
22	GND
23	GND
24	GND
25	GND

B.11 System I/O Ports

Table B-11: System I/O ports

Addr. range (Hex)	Device
000-01F	DMA controller
020-021	Interrupt controller 1, master
022-023	Chipset address
040-05F	8254 timer
060-06F	8042 (keyboard controller)
070-07F	Real-time clock, non-maskable interrupt (NMI) mask
080-09F	DMA page register,
0A0-0BF	Interrupt controller 2
0C0-0DF	DMA controller
0F0	Clear math co-processor
0F1	Reset math co-processor
0F8-0FF	Math co-processor
1F0-1F8	Fixed disk
200-207	Game I/O
278-27F	Parallel printer port 2 (LPT 3)
2F8-2FF	Serial port 2
300-31F	Prototype card
360-36F	Reserved
378-37F	Parallel printer port 1 (LPT 2)
380-38F	SDLC, bisynchronous 2
3A0-3AF	Bisynchronous 1
3B0-3BF	Monochrome display and printer adapter(LPT1)
3C0-3CF	Reserved
3D0-3DF	Color/graphics monitor adapter
3F0-3F7	Diskette controller
3F8-3FF	Serial port 1

B.12 DMA Channel Assignments

Table B-12: DMA channel assignments

Channel	Function
0	Available
1	Available
2	Floppy disk (8-bit transfer)
3	Available
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available

* Audio DMA select 0, 1 or 3

B.13 Interrupt Assignments

Table B-13: Interrupt assignments

Interrupt#	Interrupt source
IRQ 0	Interval timer
IRQ 1	Keyboard
IRQ 2	Interrupt from controller 2 (cascade)
IRQ 8	Real-time clock
IRQ 9	Cascaded to INT 0A (IRQ 2)
IRQ 10	Available
IRQ 11	Available
IRQ 12	PS/2 mouse
IRQ 13	INT from co-processor
IRQ 14	Fixed disk controller
IRQ 15	Available
IRQ 3	Serial communication port 2
IRQ 4	Serial communication port 1
IRQ 5	Parallel port 2
IRQ 6	Diskette controller (FDC)
IRQ 7	Parallel port 1 (print port)

B.14 1st MB Memory Map

Table B-14:1st MB memory map

Addr. range (Hex)	Device
F000h - FFFFh	System ROM
C800h - EFFFh	Unused
C000h - C7FFh	Expansion ROM
B800h - BFFFh	CGA/EGA/VGA text
B000h - B7FFh	Unused
A000h - AFFFh	EGA/VGA graphics
0000h - 9FFFh	Base memory