MIC-3377/M

6U-size CompactPCI™ Master SBC with Pentium® III / Celeron™ processor

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CE Notification

The MIC-3377/M, developed by Advantech CO., LTD., has passed the CE test for environment specification when shielded cables are used for external wiring. We recommend the use of shielded cables.

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Product warranty

Advantech warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for one year from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by Advantech, or which have been subject to misuse, abuse, accident or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

Because of Advantech's high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If an Advantech product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time and freight. Please consult your dealer for more details.

If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any on-screen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain an RMA (return merchandize authorization) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
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-3377/M all-in-one single board computer
- 1 utility CD-ROM disc
- 1 heat sink
- 1 Y-type keyboard/mouse cable
- 1 warranty certificate
- This user's manual

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

Technical Support and Sales Assistance

If you have any technical questions about the MIC-3377/M 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:

- **http://www.advantech.com**

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CHAPTER 1

Hardware Configuration

1.1 Introduction

The MIC-3377/M is a 6U-size CompactPCI™ all-in-one single board Pentium® III/Celeron™ CPU card which complies with PICMG 2.0 R2.1 CompactPCI™ specifications. Targeting performance-demanding applications like computer telephony and communications, the MIC-3377/M accepts up to Pentium® III 850 MHz processors and higher for optimum computing capability. Based on Intel®'s 440BX chipset, the MIC-3377/M enhances its performance with 100 MHz front side bus.

High Performance Pentium® III Processor

The MIC-3377/M accepts an Intel® Pentium® III or Celeron™ processor with the 370-pin FC-PGA package. The Pentium® III processor has on-chip 256 KB and the Celeron™ processor has on-chip 128 KB second level cache memory providing high performance with low cost. With the support of a 100 or 66 MHz CPU bus clock, the MIC-3377/M can fulfill customer's expectations of high-performance computing capability.

Compact Mechanical Design

The MIC-3377/M has many functions on a single board with only one-slot width. Advantech provides a CPU heat sink specially designed for the Pentium® III processor, enabling the MIC-3377/M to operate without a cooling fan on the heat sink. It only needs external cooling air from the chassis fans for ventilation. This enables the MIC-3377/M to use a Pentium® III CPU within a mere 1-slot wide space.

Single and Dual P2P Bridge Options

The MIC-3377/M with single PCI-to-PCI bridge is applicable up to 8-slot enclosure (MIC-3032/MIC-3033) and drive up to seven bus master PCI slots, while the MIC-3377D/M with optional dual PCI-to-PCI bridges is applicable up to 14-slot enclosure (MIC-3031) and drives up to 14 bus master slots.

Complete I/O Functions

The MIC-3377/M offers all the I/O functions of an industrial computer with the rugged Eurocard form factor. All I/O connectors are available on the front panel, containing two Fast Ethernet interfaces, two serial ports, one USB port, one VGA connector, and one PS/2 keyboard/mouse connector. The front panel also has a reset button and LEDs for power status, HDD operation and Ethernet communication.

The built-in high speed IDE controller provides two separate IDE channels with Ultra DMA/33 mode. The user-defined J3 connector is designed to support up to four IDE devices and two FDDs. These drives can simply be connected to the backplane or to the rear transition board for easy service and maintenance.

Meets Industrial Applications Requirements

The MIC-3377/M is designed for use in mission critical applications. It accepts a CompactFlash™ memory card on the rear transition board, thus eliminating the need to use a fragile rotating hard drive. A watchdog timer can automatically reset the system if the system stops due to a program bug or EMI. The two-layer front panel design complies with IEEE 1101.10. Connectors are firmly screwed to the front panel, and the replaceable shielding gasket is attached to the panel edge. This reduces emissions and gives better protection against external interference.

1.2 Specifications

Standard SBC Functions

- **CPU**: Socket 370 Pentium® III Coppermine CPU up to 850 MHz
  Socket 370 Celeron™ CPU up to 566 MHz
- **BIOS**: Award 2 Mb flash memory
- **Chipset**: Intel® 440BX Chipset
- **Front Side Bus Clock**: 100 MHz for Intel® Pentium® III CPU
  66 MHz for Celeron™ CPU
- **Bus Interface**: 32-bit, 33 MHz, PICMG 2.0 compliant
- **2nd level cache**: CPU built-in 256 KB (Pentium® III) or 128 KB (Celeron™) on die
- **RAM**: Two 144-pin SO-DIMM sockets. Support PC-100 SDRAMs with memory capacity up to 512 MB. Support ECC.
- **Enhanced IDE interface**: Two channels handles up to 4 IDE HDDs or other IDE devices via J3 connector. Supports PIO mode 4 and Ultra DMA/33 mode.
- **Floppy disk drive interface**: Supports up to two floppy disk drives through the J3 connector
- **Serial ports**: Two RS-232 ports with 16C550 compatible UARTs
- **USB interface**: One USB connector with fuse protection. Complies with USB specification 1.0
- **Keyboard/mouse connectors**: One 6-pin mini-DIN connector on the front panel
- **Watchdog timer**: Can generate a system reset. Software enabled/ disabled. Time interval is from 1 to 63 seconds, jumperless with run-time setup.

PCI-to-PCI Bridge

- **Controller chip**: One (MIC-3377/M) or two (MIC-3377D/M) Intel® DEC 21150 controller chips, drives up to 7/14 PCI master peripherals
- Drives up to two bus segments, one through J1 and J2 connectors, the other one through J4 and J5 connectors
- Supports up to seven bus masters on each bus segment
- Provides seven pairs of GNT# and REQ# signals on each bus segment

10/100Base-TX Ethernet Interface

- **Controller chips**: Two Intel 82599 Fast Ethernet controller chips
- Dual LAN ports
- 10 Mbps or 100 Mbps auto-switching

AGP VGA Interface

- **Controller**: Intel C&T 69000
- AGP 1.0 compliant, 66 MHz
- **Display memory**: On-chip 2 MB SDRAM
- **Display Resolution**:

Resolution	Number of Colors
640 x 480, 800 x 600, 1024 x 768, 1280 x 1024	256 (8 bits)
640 x 480, 800 x 600, 1024 x 768	65, 536 (16 bits)
640 x 480, 800 x 600	16.8 million (24 bits)
640 x 480, 800 x 600	16.8 million (32 bits)

Optional Rear I/O Boards

- **For MIC-3377/M**: MIC-3301 or MIC-3302
- **For MIC-3377D/M**: MIC-3301

***Note**: Please refer to the MIC-3301 or MIC-3302's user's manual for more detailed information.*

Mechanical and Environmental Specifications

- **Operating temperature**: 0 ~ 55° C (32 ~ 131° F), depending on CPU installed
- **Storage Temperature**: -20 ~ 80° C (-4 ~ 176° F)
- **Humidity (operating and storage)**: 5 ~ 95% (non-condensing)
- **Power Consumption:** +5 V@ 2.1 A; +3.3 V @ 2.5 A; +12 V @ 640 mA
- **Board size**: 233.35 x 160 mm (6U size), 1-slot (4 TE) wide
- **Weight**: 0.8 kg (1.8 lb)
- **Shock**: 20 G (operating); 50 G (storage/transit)
- **Random vibration**: 1.5 Grms

1.3 Functional Block Diagram

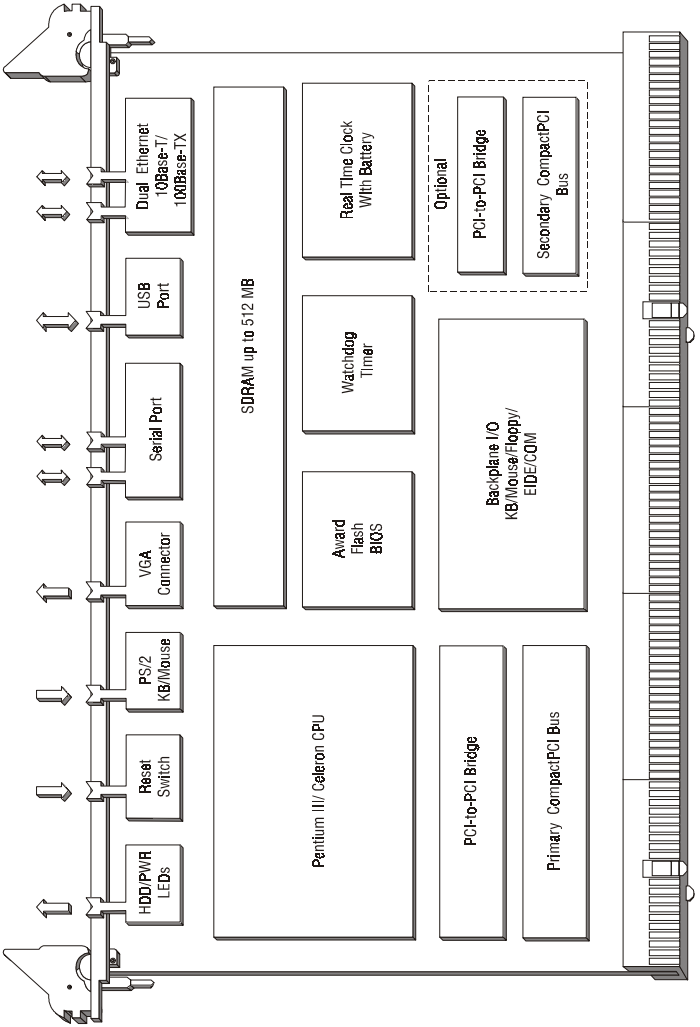


***Figure 1-1**: MIC-3377/M functional block diagram*

1.4 Jumpers

1.4.1 Jumper Locations

The MIC-3377/M provides a jumper (JP2) for configuring your board for specific applications other than the default settings.

Table 1-1 lists the jumper function. Figure 1-2 illustrates the jumper location. Read this section carefully before changing the jump setting on your MIC-3377/M card.

Table 1-1: MIC-3377/M jumper descriptions

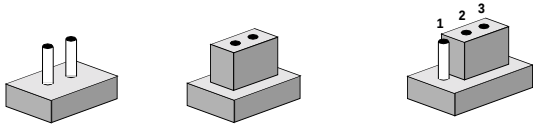
Number	Function
JP2	Clear CMOS

1.4.2 Jumper Settings

This section tells how to set the jumpers 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 6) 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, 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**

The jumper settings are schematically depicted in this manual as follows:

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.

1.4.3 Clear CMOS (JP2)

This jumper is used to erase CMOS data and reset system BIOS information. Follow the procedures below to clear the CMOS.

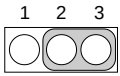
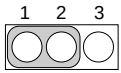
1. Turn off the system.

2. Close jumper JP2 (2-3) for about 3 seconds.

3. Close jumper JP2 (1-2).

4. Turn on the system. The BIOS is reset to its default setting.

Table 1-2: Clear CMOS

CMOS	JP2
Clear	
Normal (default)	

1.5 Connectors

On board connectors link to external devices such as hard disk drives, keyboards, or flooy drives, etc. Table 1-3 lists the function of each connector and Figure 1-2 and Figure 1-3 illustrate each connector location. Chapter 2 gives instructions for connecting external devices to your card.

Table 1-3 MIC-3377/M connector descriptions

Number	Function
CN1	COM1
CN2	COM2
CN3	VGA connector
CN4	USB connector
CN5	PS/2 Keyboard and mouse connector
CN6	Ethernet connector 2
CN7	Ethernet connector 1
CN8	CPU fan power connector
CN9	CompactFlash socket (optional)
CN10	IDE connector
CPU1	Socket 370 for CPU
DIM1	SODIMM socket 1
DIM2	SODIMM socket 2
J1/J2	Primary CompactPCI™ bus
J3	Rear I/O transition
J4 (MIC-3377/M)	Rear I/O transition
J4/J5 (MIC-3377D/M)	Secondary CompactPCI™ bus
LED1	HDD LED and Power LED
SW1	Reset switch

Please refer to Appendix B for pin assignments

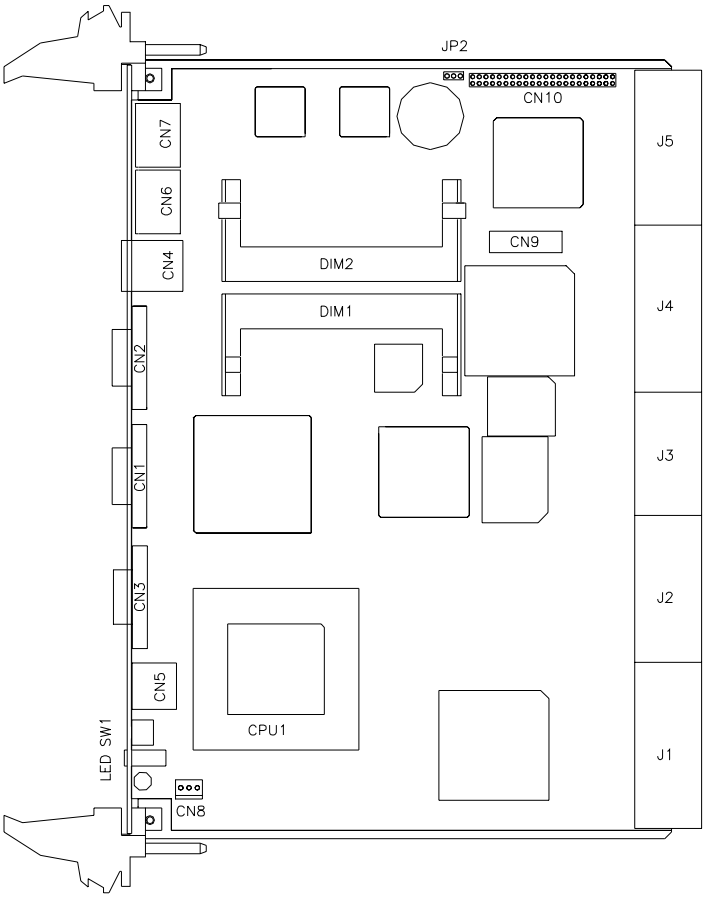


***Figure 1-2**: MIC-3377/M jumper and connector locations*

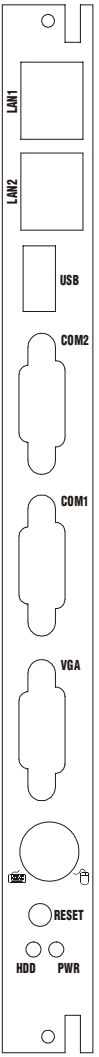


***Figure 1-3**: MIC-3377/M front panel connector and indicator locations*

1.6 Safety Precautions

Follow these simple precautions to protect yourself from harm and the products 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 dissipative mat when you are working with it. Wear a grounding wrist strap for continuous protection.

1.7 Installing SDRAM (SODIMMs)

The MIC-3377/M provides two 144-pin SODIMM sockets. Each socket accepts either 16, 32, 64, 128 or 256 MB SDRAM. The sockets can be filled in any combination with SODIMMs of any size, giving a total memory capacity between 16 and 512 MB. If only one SODIMM module is required, it can be installed in either SODIMM socket.

Since the MIC-3377/M can operate at 66 or 100 MHz, we recommend using PC100-compliant SODIMMs.

To enable the chipset's Error Checking and Correction (ECC) function, please use SODIMMs which support the ECC function.

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

1. Ensure that all power supplies to the system are switched Off.
2. Install the SODIMM module. Install the SODIMM so that its gold pins point down into the SODIMM socket.
3. Slip the SODIMM into the socket at a 45 degree angle and carefully fit the bottom of the card against the connectors.
4. Gently push the SODIMM into the socket until the clips on the ends of the SODIMM sockets snap into place.
5. Check to ensure that the SODIMM is correctly seated and all connector contacts touch. The SODIMM should not move around in its socket.

NOTE: The SODIMM modules can only fit into sockets one way, in accordance with the keyed notches along the bottom edge of the modules. Their gold pins must point down into the SODIMM socket.

1.8 Installing CPU and Heat Sink

The MIC-3377/M accepts Intel® socket 370 Pentium® III Cuppermine CPU or Intel® socket 370 Celeron™ CPU. In order to meet critical environmental conditions and the physical space of the MIC-3377/M at the same time, Advantech designed a heat sink to fulfill both needs.

Please refer to Figure 1-4 for an illustration of the heat sink used for the MIC-3377/M.

Because the thickness of the Pentium® III and Celeron™ CPU are different, Advantech provides a samll aluminum plate along with the heat sink when installed with a Pentium® III CPU. The small aluminum plate is default fastened on the heat sink in the factory. If users would like to use a Celeron™ CPU on the MIC-3377/M, please remove the small aluminum plate from the heat sink.

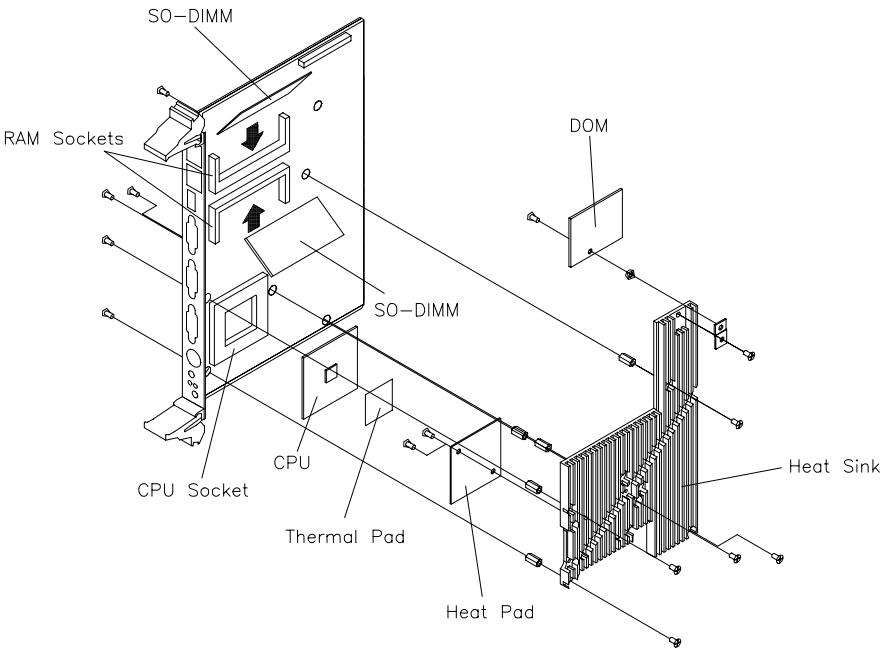


***Figure 1-4**: Heat sink installation*

1.9 Software support

The MIC-3377/M comes with a utility CD-ROM disc, which includes drivers and utility programs of Ethernet and SVGA interfaces.

The 440BX chipset may not be recognized by some old-versioned Windows 95. Please visit Intel's website to download the required files:

http://developer.intel.com/design/chipsets/drivers/inf_update.htm

CHAPTER 2

Connecting Peripherals

2.1 IDE Device (CN10)

The MIC-3377/M provides two IDE (Integrated Device Electronics) channels via the J3 connector to the rear transition board (MIC-3302 or MIC-3301 for MIC-3377/M; MIC-3301 for MIC-3377D/M). Four IDE drives can be connected to the MIC-3377/M through the rear transition board.

Users can connect two IDE drives to each IDE channel. If two drives are installed on one channel, remember to set one as the master and the other one as the slave. You may do this by setting the jumpers on the drives. Refer to the documentation that came with your drive for more information. A jumper diagram usually appears on the top side of a hard disk drive.

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: *We don't recommend connection to the following Seagate brand IDE HDD models: ST 31276A, ST 31720A, ST 32531A, ST 33240A or ST 34340A*

2.2 VGA Display Connector (CN3)

The MIC-3377/M provides an VGA chipset built-in display for high performance application. The MIC-3377/M's CN3 is a DB-15 connector for VGA monitor input. Pin assignments for the VGA display are detailed in Appendix B.

2.3 PS/2 Keyboard and Mouse Connector (CN5)

The MIC-3377/M provides a 6-pin mini-DIN connector (CN5) on the front panel for connection of PS/2 keyboard and PS/2 mouse. The MIC-3377/M comes with a cable to convert from the single 6-pin mini-DIN connector to a double PS/2 keyboard connector and PS/2 mouse connector. Since these two connectors are identical, please

follow the icons on the cable to plug the keyboard and the mouse into their correct connectors.

2.4 Serial Ports (CN1 and CN2)

The MIC-3377/M offers two serial ports: COM1 and COM2, both in RS-232. These ports allow users to 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 5.

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.

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-3377/M board's ports:

Table 2-1: MIC-3377/M serial port default settings

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

2.5 Ethernet Configuration (CN6 and CN7)

The MIC-3377/M is equipped with dual high performance 32-bit PCI-bus Fast Ethernet interfaces which are fully compliant with IEEE 802.3u 10/100Base-TX specifications. It is supported by all major network operating systems and is 100% Novell NE-2000 compatible. Two on-board RJ-45 jacks provide convenient connection to the network.

The medium type can be configured via the software program included on the utility CD-ROM disc. (See Chapter 3 for detailed information.)

2.6 USB Connector (CN4)

The MIC-3377/M provides one USB (Universal Serial Bus) interface on the front panel. The USB interface gives complete plug and play, hot attach/detach for up to 127 external devices. The MIC-3377/M USB interface complies with USB specification rev. 1.0 and is fuse protected.

The USB interface can be disabled in the system BIOS setup. The USB controller default is "Enabled" but the USB keyboard support default is "Disabled".

2.7 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 inject/eject handles of MIC-3377/M help you install and remove the card easily and safely. Follow the procedure below to install the MIC-3377/M into a chassis:

To install a card:

1. Hold the card 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. Pull out both handles 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 guides.
4. Push the card into the slot gently by sliding the card along the card guide until the handles meet 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 handle 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. Pull the upper handle down and lift the lower handle up to push the card into place.
6. Secure the card by pushing in the red handle to lock it into place.

To remove a card:

1. Unscrew the screws on the front panel.
2. Lift the upper handle up and press the lower handle down to release the card from the backplane.
3. Slide the card out.

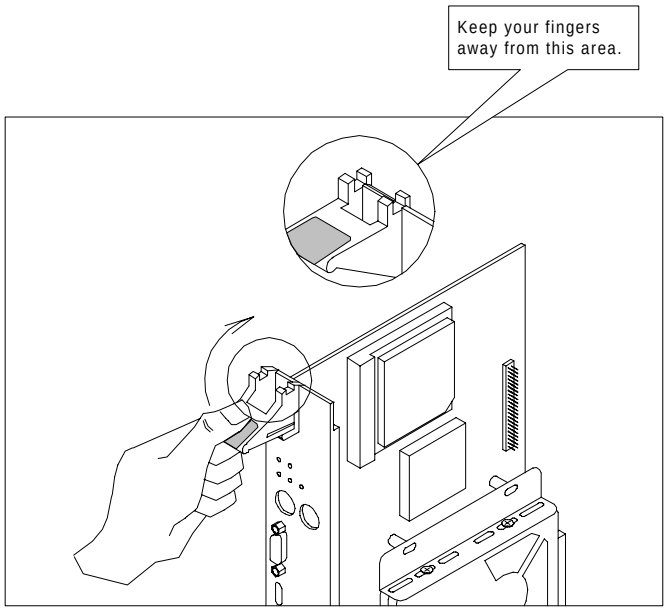


Figure 2-1*: Installing the card into the chassis*

CHAPTER 3

Ethernet Software Configuration

3.1 Introduction

The MIC-3377/M has two on-board high-performance fast Ethernet interfaces which comply with IEEE 802.3/802.3u for 10Base-T and 100 Base-TX data rates.

The module uses two Intel® 82559 fast Ethernet controllers with integrated PHY and is compatible with the Intel® PRO/100+ Server and Client Adapter. The dual Ethernet channel design provides several options for increasing throughput and fault tolerance when running Windows NT 4.0 or NetWare 4.1x and newer versions of these, includes:

- Adapter Fault Tolerance (AFT) - provides automatic redundancy for your Ethernet channel. If the primary channel fails, the secondary takes over.
- Adaptive Load Balancing (ALB) - creates a team of 2 channels to increase transmission throughput. Also includes AFT and ALB. This function works with any 100BASE-TX switch.
- Fast EtherChannel (FEC) - creates a team of 2 to 4 channels to increase transmission and reception throughput. Also includes AFT. This function requires a Cisco switch with FEC capability.

The MIC-3377/M comes with drivers for a wide variety of networks and operating systems. The MIC-3377/M is an excellent choice for operation in standalone and harsh industrial environments.

3.2 Utility and Drivers

The MIC-3377/M's on-board Ethernet interface supports all major network operating systems. The installation instructions and drivers for different operating systems are located in the following directories of the utility CD-ROM disc:

General Information:

- **\MIC3377\LAN\README.TXT:** General information about the drivers

For Microsoft Windows:

- **\MIC3377\LAN\INFO\MS\MS.TXT:** Installation instructions for Microsoft Windows
- **\MIC3377\LAN\E100BNT.SYS (NDIS 4.0), \MIC3377\LAN\ OEMSETUP.INF:** Drivers for Windows NT 4.0
- **\MIC3377/M\LAN\E100B.SYS (NDIS 3), \MIC3377\LAN\ OEMSETUP.INF:** Drivers for Windows NT 3.51
- **\MIC3377\LAN\NET82557.INF:** Drivers for Windows 98
- **\MIC3377\LAN\E100BNT.SYS (NDIS 4.0), \MIC3377\LAN\ NET82557.INF:** Drivers for Windows 95
- **MIC3377\LAN\WFW\E100B.38_, \MIC3377\LAN\WFW\ OEMSETUP.INF:** Drivers for Windows 3.1

For Novell NetWare

- **\MIC3377\LAN\INFO\NETWARE\NETWARE.TXT:** Installation instructions for Novell NetWare
- **\MIC3377\LAN\NWSERVER\3X4X.OLD\E100B.LAN:** Drivers for NetWare 3.12 and 4.10
- **\MIC3377\LAN\NWSERVER\311LAN\E100B.LAN:** Drivers for NetWare 3.11
- **\MIC3377\LAN\OS2\E100BODI.SYS:** Drivers for NetWare OS/2 ODI Client
- **\MIC3377\LAN\DOS\E100BODI.COM:** Drivers for DOS ODI Client

For UNIX

- **\MIC3377\LAN\INFO\UNIX\UNIX.TXT:** Installation instructions for UNIX

For Other Operating Systems

- **\MIC3377\LAN\INFO\OTHER\OTHER.TXT:** Installation instructions for other operating systems
- **\MIC3377\LAN\DOS\E100B.DOS:** Drivers for IBM LAN support for AS/400 and NetWare (for LANSUP)

- **\MIC3377\LAN\DOS\E100BODI.COM:** Drivers for IBM LAN support for AS/400 and NetWare (for ODINSUP)
- **\MIC3377\LAN\OS2\E100B.OS2:** Drivers for LAN server (OS/2 driver)
- **\MIC3377\LAN\DOS\E100B.DOS:** Drivers for LAN server (DOS driver)
- **\MIC3377\LAN\DOS\E100B.DOS:** Drivers for BANYAN NDIS workstation
- **\MIC3377\LAN\DOS\E100B.DOS:** Drivers for LANTASTIC 6.0
- **\MIC3377\LAN\DOS\E100B.DOS:** Drivers for general NDIS 2.X (DOS driver)
- **\MIC3377\LAN\OS2\E100B.OS2:** Drivers for general NDIS 2.X (OS/2 driver)

Before installing drivers, please refer to the installation instructions of each operating system.

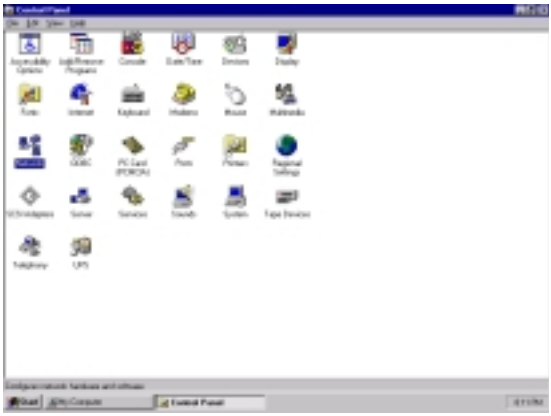
Note: Do not use the driver recommended by the Windows 95/98/NT Add New Hardware wizard. Choose the driver from the utility CD-ROM disc.

Note: Operating system vendors may post driver updates on their web sites. Please visit the web sites of OS vendors to download updated drivers.

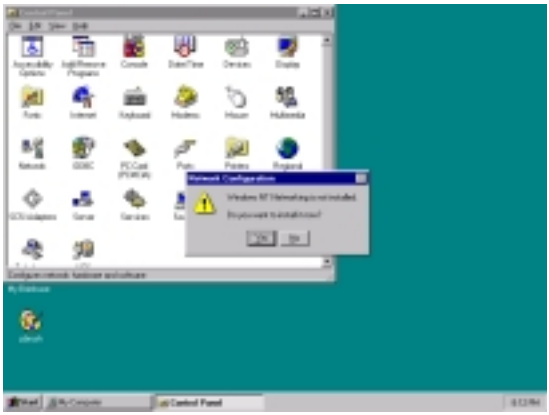
3.3 Installation for Windows NT 4.0

Before installing; create a new folder [🗀], \MIC3377\LAN\, in your disk drive, and download all files from the directory, \MIC3377\LAN\, on the utility CD-ROM to it.

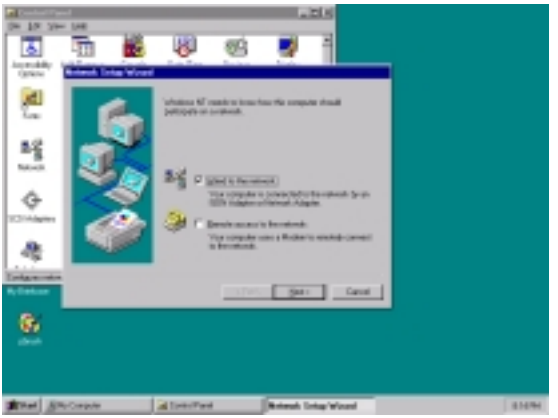
1. In the Windows NT screen, select "Start", click "Settings". Click the "Control Panel" item and choose "Network".



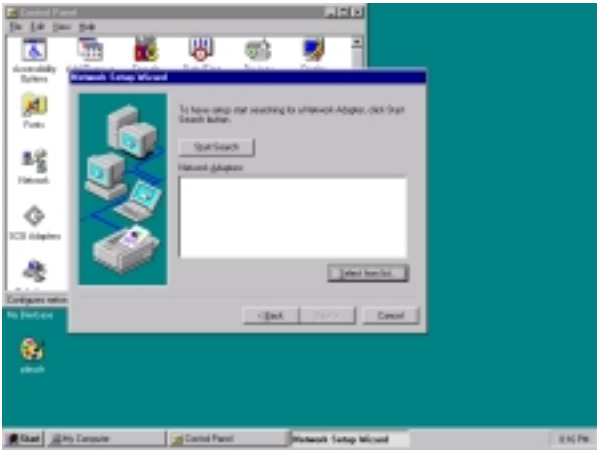
2. Click "Yes".



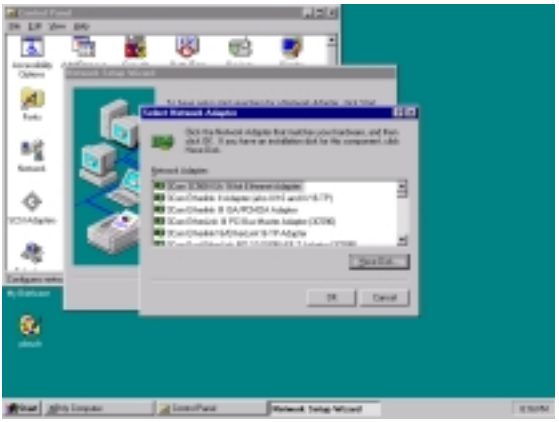
3. Click "Wired to the Network", or users may choose "Remote access to the network" if applicable.



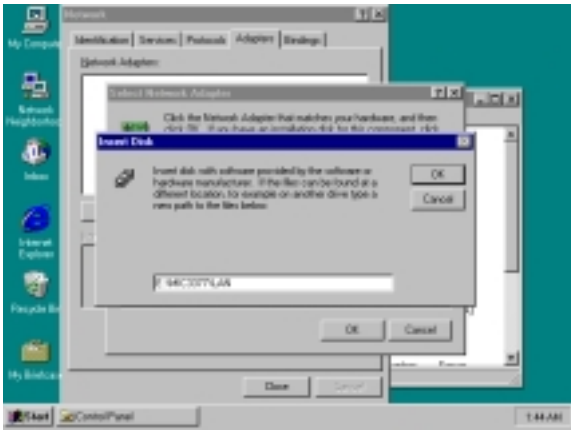
4. Click "Select from list".



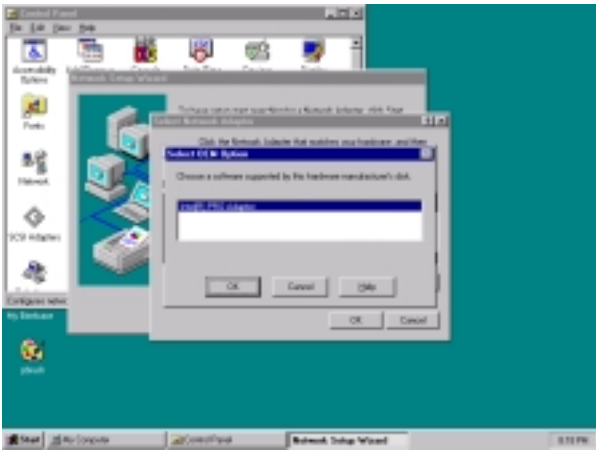
5. Click "Have Disk".



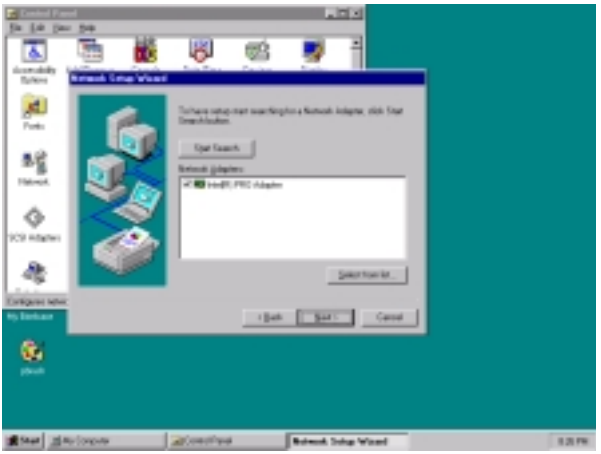
6. Type in "E:\MIC3377\LAN" in the blank column and click "OK". (E: your hard disk drive)



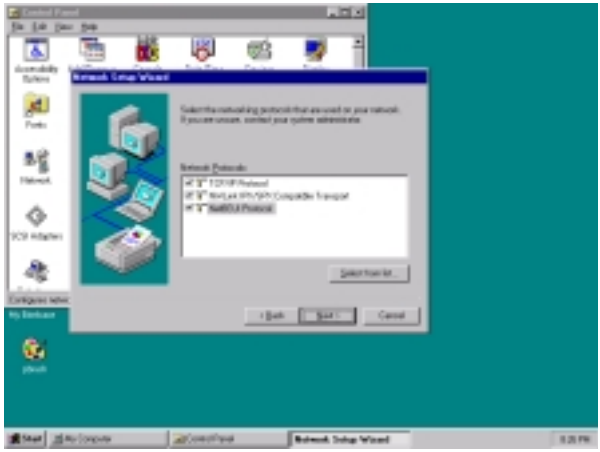
7. Click "OK".



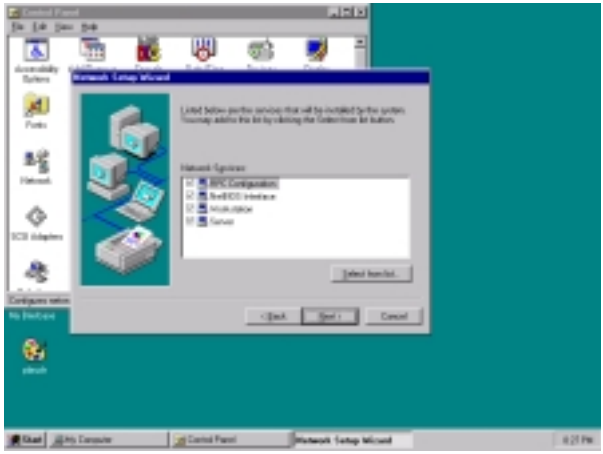
8. Click "Next".



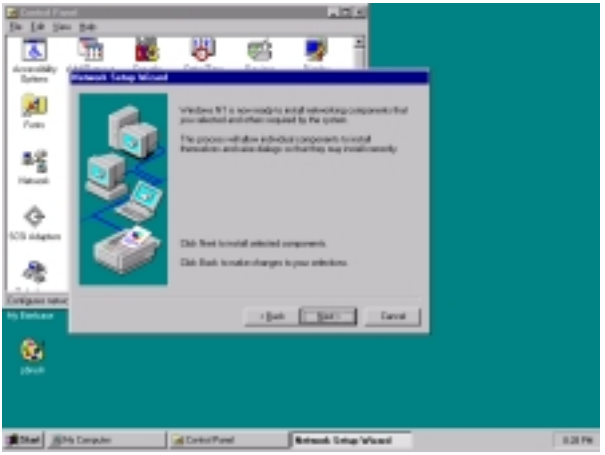
9. Click "Next".



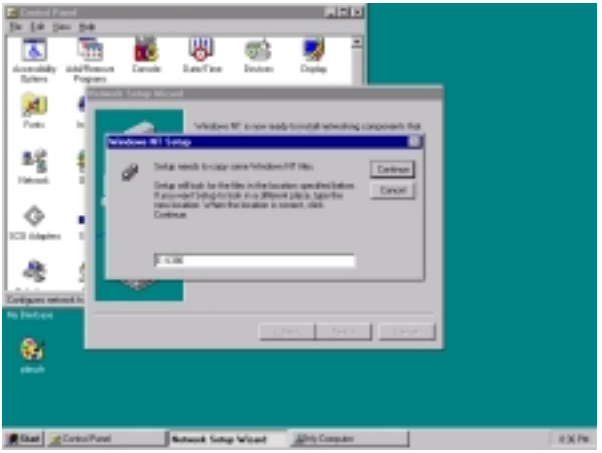
10. Click "Next".



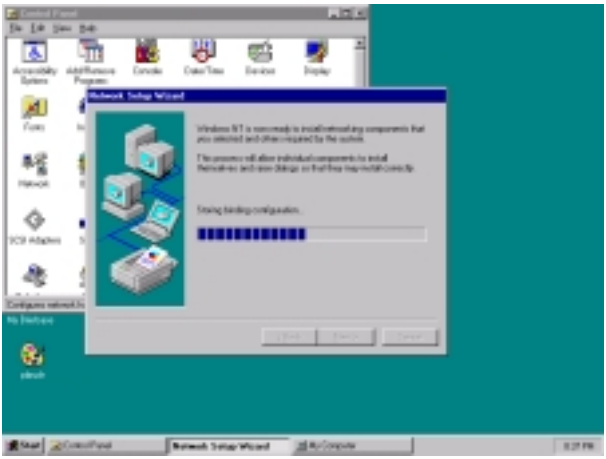
11. Click "Next".



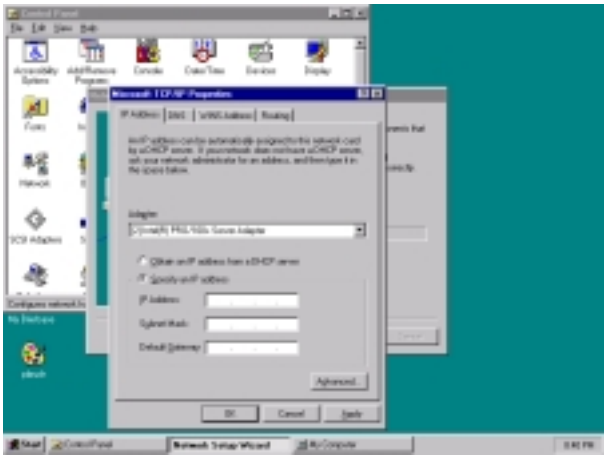
12. Insert Windows NT source disc in drive E. Type "E:\I386" in the blank column or any other directory that contains the Windows NT files. Click "Continue".



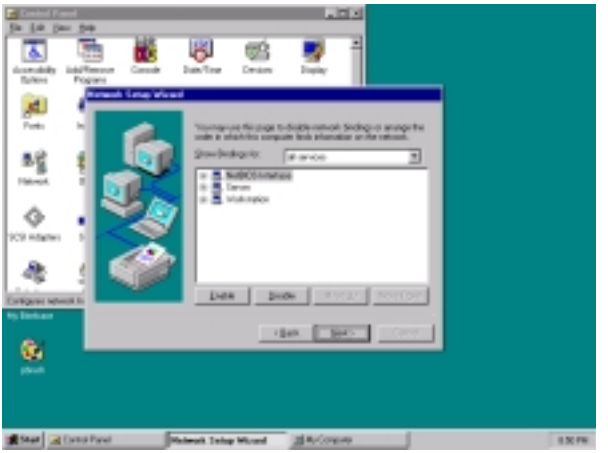
13. Wait for the installation to finish.



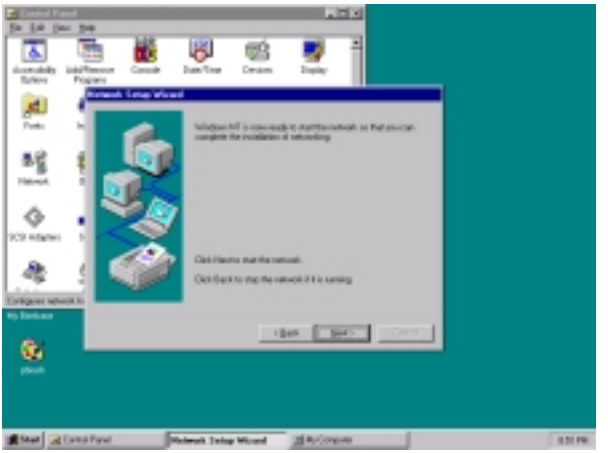
14. Complete the settings with users' network settings. Click "OK".



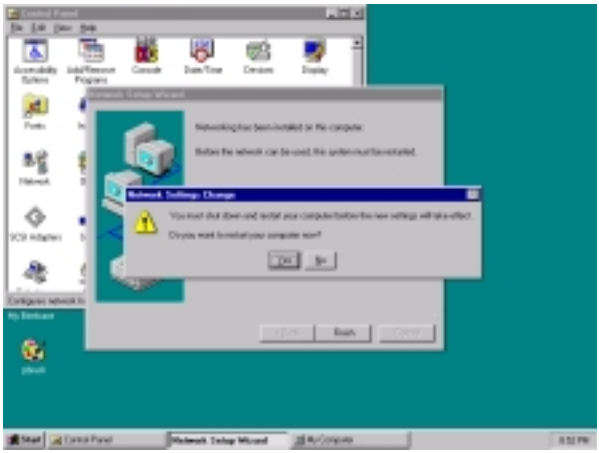
15. Click "Next".



16. Click "Next".



17. Click "Yes" to restart the computer and enable the changes to take effect.



CHAPTER 4

AGP SVGA Setup

4.1 Introduction

The MIC-3377/M uses an Intel C&T 69000 chipset as its AGP VGA controller. The VGA controller has an integrated 2 MB SDRAM operating at 83 MHz, and can drive CRT displays with resolutions up to 1024 x 768 at 64 K colors. It supports interlaced and non-interlaced analog monitors (color and monochrome VGA) in high-resolution modes while maintaining complete IBM VGA compatibility. Digital monitors (i.e. MDA, CGA, and EGA) are NOT supported. Multiple frequency (multisync) monitors are handled as if they were analog monitors.

4.2 Installation of SVGA Driver

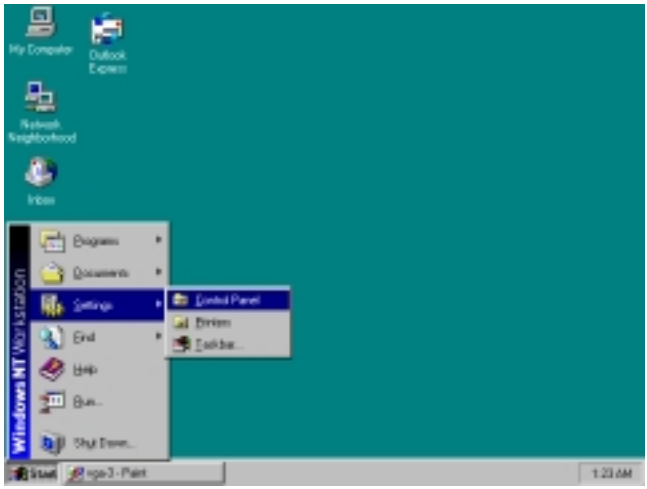
The MIC-3377/M is supplied with a utility CD-ROM disc that holds the necessary file for setting up the VGA display under the directory \MIC-3377\VGA. The contents and pathnames of this directory are listed below:

- **MIC3377\VGA\Win31:** VGA utility for Windows 3.1
- **MIC3377\VGA\Win95\w95500:** VGA utility for Windows 95
- **MIC3377\VGA\Win98\w98600:** VGA utility for Windows 98
- **MIC3377\VGA\WINNT:** Utility for Windows NT 4.0
- **MIC3377\VGA\OS2:** VGA utility for OS/2

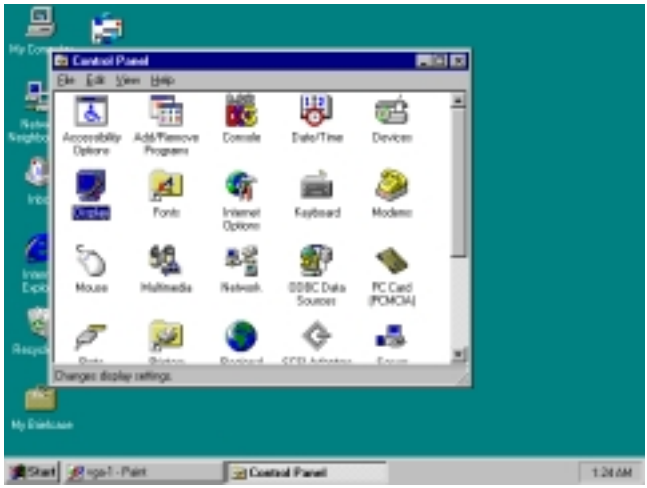
Complete the following steps to install the VGA driver. Follow the procedures in the flow chart that apply to the operating system you are using with your MIC-3377/M.

4.3 Installation for Windows NT 4.0

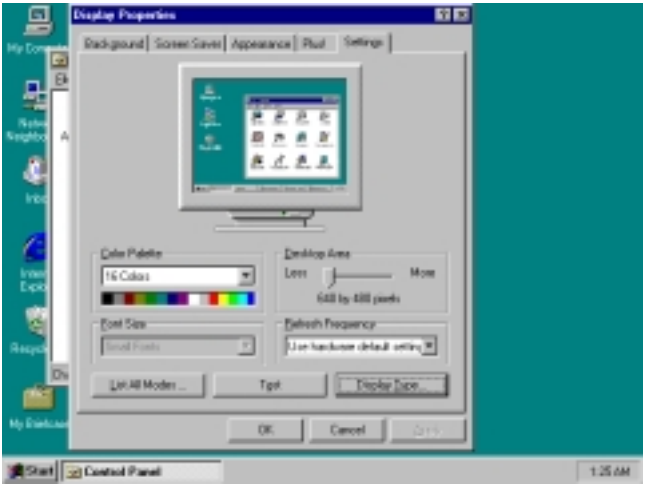
1. Select "Settings" "Control Panel" from the "Start" menu.



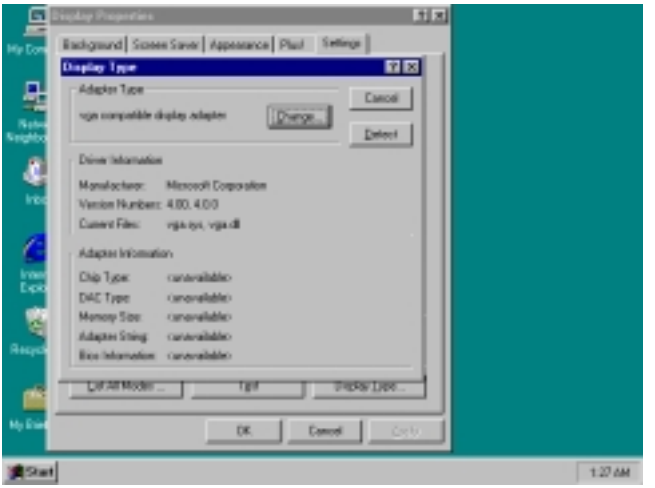
2.Click "Display".



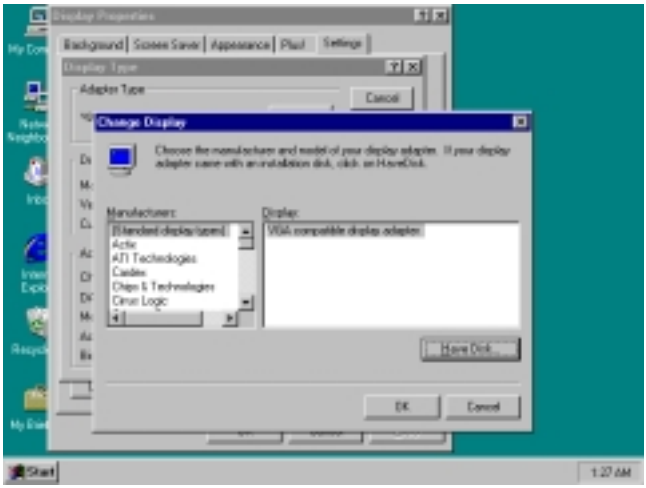
3. Select the "Settings" tab and click the "Display Type" button.



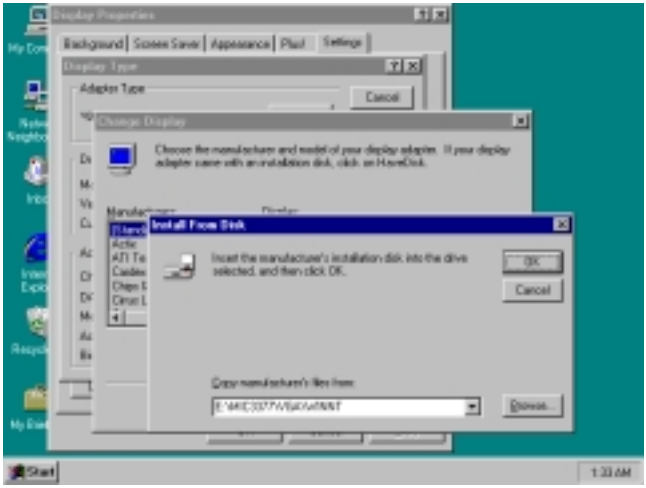
4. Click "Change" button in the "Adapter Type" block.



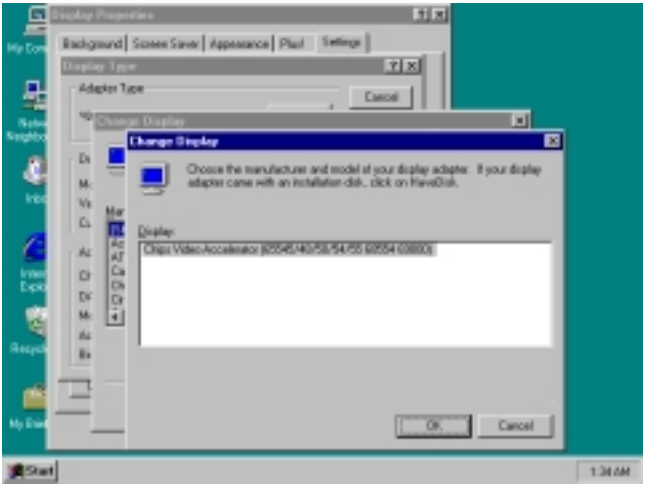
5. Click "Have Disk" button in the "Change Display" Windows.



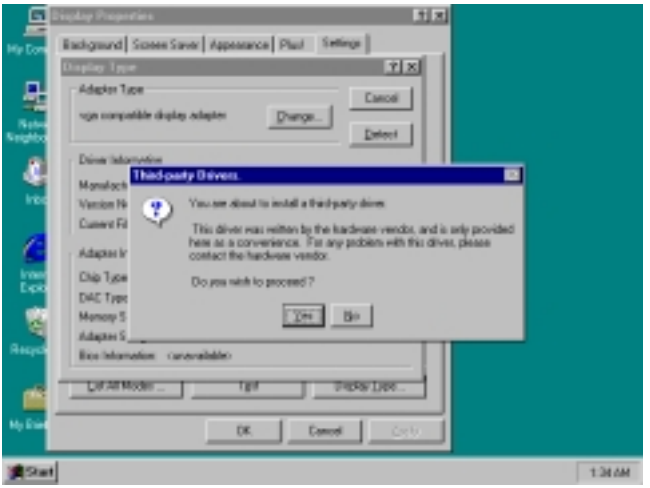
6. Insert the utility CD-ROM disc in drive E. Type "E:\MIC3377\VGA\WINNT in the blank column. Click "OK".



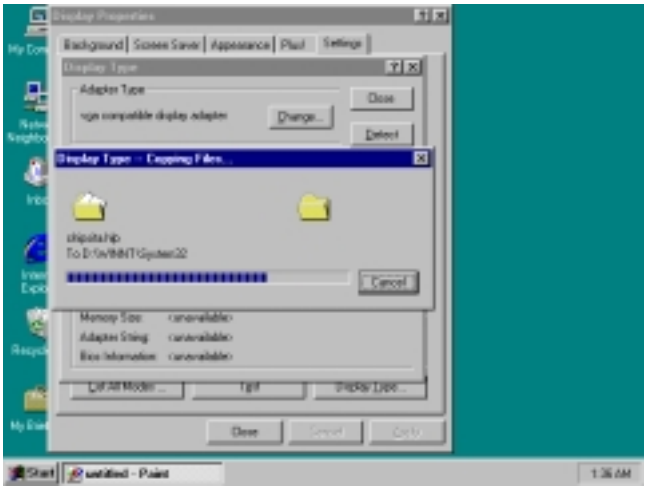
7. Click "OK".



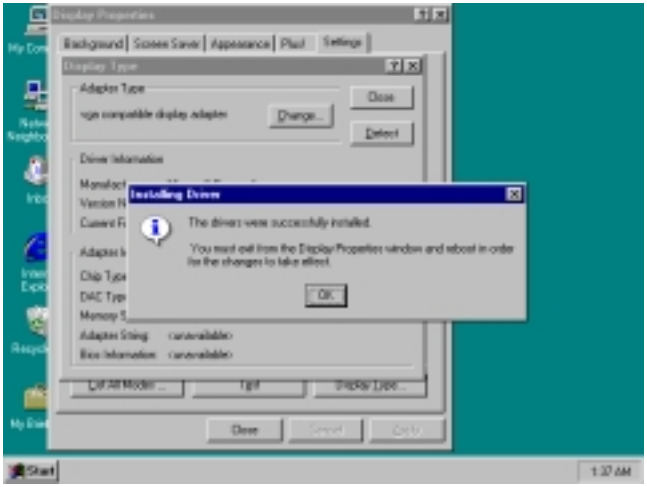
8. Click "OK" to install the VGA driver.



9. Wait for installation to finish.



10. Click "OK" and restart the computer to enable the change to take effect.



CHAPTER 5

Award BIOS Setup

5.1 AWARD BIOS Setup

***Figure 5-1**: 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 CMOS so that it retains the Setup information when the power is turned off.

5.1.1 Entering Setup

Turn on the computer and check for the "patch code". If there is a number assigned to the patch code, it means that the BIOS supports your CPU.

If there is no number assigned to the patch code, please contact Advantech's application engineer to obtain an up-to-date patch code file. This will ensure that your CPU's system status is valid.

After ensuring that you have a number assigned to the patch code, press <DEL> and you will immediately be allowed to enter Setup.

5.1.2 Standard CMOS Setup

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

***Figure 5-2**: CMOS setup screen*

5.1.3 BIOS Features Setup

The "BIOS FEATURES SETUP" screen will appear after the BIOS FEATURES SETUP item from the CMOS SETUP UTILITY Menu was chosen. This screen allows the user to configure the MIC-3377/M according to his particular requirements.

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

***Figure 5-3**: 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. If this happens, 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, the 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, the BIOS will determine if the floppy disk drive installed has 40 or 80 tracks. The 360 KB type has 40 tracks while the 720 KB, 1.2 MB, and 1.44 MB all have 80 tracks.

Enabled	BIOS searches the floppy drive to determine if it has 40 or 80 tracks. Note that BIOS cannot differentiate 720 KB, 1.2 MB, and 1.44 MB type drives as they all have 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 by a 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 for use under the OS/2 operating system.

Video BIOS Shadow

This setting determines whether the 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 settings determine whether optional ROM will be copied to RAM in blocks of 16 KB.

Enabled	Optional shadow is enabled
Disabled	Optional shadow is disabled

5.1.4 CHIPSET Features Setup

Choosing the "CHIPSET FEATURES SETUP" option from the INITIAL SETUP SCREEN Menu causes the screen below to be displayed. This sample screen contains the manufacturer's default values for the MIC-3377/M.

***Figure 5-4**: CHIPSET features setup screen*

VGA Shared Memory Size

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

5.1.5 Power Management Setup

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

***Figure 5-5**: 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**: The 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.

5.1.6 PNP/PCI Configuration Setup

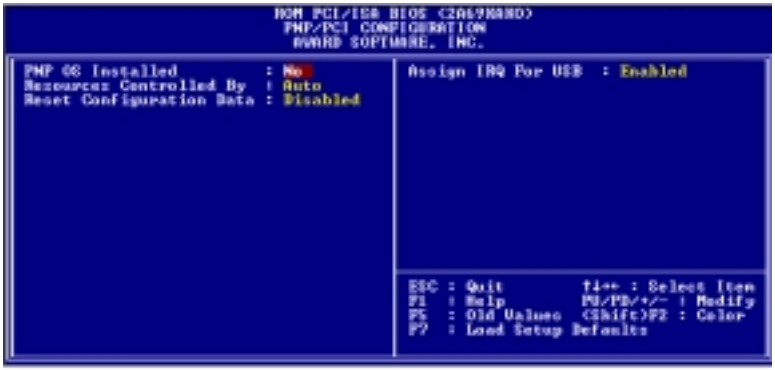


***Figure 5-6**: PNP/PCI configuration screen*

5.1.7 Integrated Peripherals

***Figure 5-7**: Integrated peripherals*

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

5.1.8 Load Setup Defaults

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

5.1.9 Password Setting

To change, confirm, or disable the password, choose the "PASSWORD 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.

5.1.10 IDE HDD Auto Detection

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

5.1.11 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.

5.1.12 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.

APPENDIX A

Programming the Watchdog Timer

A.1 Programming the Watchdog Timer

To program the watchdog timer, you must write a program which writes a value to I/O port address 443 (hex). This output value represents time interval. The value range is from 01 (hex) to 3F (hex), and the related time interval is 1 sec. to 63 sec.

Data	Time Interval
01	1 sec.
02	2 sec.
03	3 sec.
04	4 sec.
•	•
•	•
•	•
3F	63 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
```

APPENDIX B

Pin Assignments

B.1 VGA Display Connector (CN3)

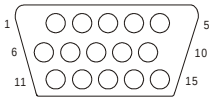


Table B-1: MIC-3377/M CRT display connector

Pin	Signal	Pin	Signal
1	RED	9	VCC
2	GREEN	10	GND
3	BLUE	11	N/C
4	N/C	12	SDA
5	GND	13	HSYNC
6	GND	14	VSYNC
7	GND	15	SCL
8	GND		

B.2 COM1 and COM2 Serial Ports (CN1 and CN2)

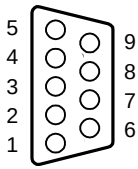


Table B-2: MIC-3377/M COM1 and com2 serial ports

Pin	COM1 Signal	COM2 Pin	Signal
1	NRLSD1	1	NRLSD2
2	NRX1	2	NRX2
3	NTX1	3	NTX2
4	NDTR1	4	NDTR2
5	GND	5	GND
6	NDSR1	6	NDSR2
7	NRTS1	7	NRTS2
8	NCTS1	8	NCTS2
9	NRI1	9	NRI2

B.3 Keyboard and Mouse Connnector (CN5)

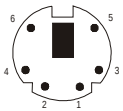


Table B-3: MIC-3377/M keyboard connector

Pin	Signal
1	KDAT
2	MDAT
3	GND
4	VCC
5	KCLK
6	MCLK

B.4 USB Connector (CN4)

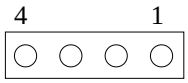


Table B-4: USB connector

Pin	USB Signal
1	VCC
2	USBD0-
3	USBD0+
4	GND

B.5 CPU Fan Power Connector (CN8)

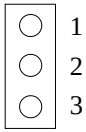


Table B-5: MIC-3377/M CPU fan power connector

Pin	Signal
1	GND
2	+12V
3	N/C

B.6 Ethernet RJ-45 Connectors (CN6 and CN7)

Table B-6: MIC-3377/M Ethernet RJ-45 connectors

Pin	Signal
1	TX+
2	TX-
3	RX+
4	N/C
5	N/C
6	RX-
7	N/C
8	N/C

B.7 CompactFlash Socket (CN9)

Table B-7: MIC-3377/M CompactFlash socket

Pin	Signal	Pin	Signal
1	GND	26	N/C
2	ID3	27	ID11
3	ID4	28	ID12
4	ID5	29	ID13
5	ID6	30	ID14
6	ID7	31	ID15
7	HCS1-	32	HCS3-
8	GND	33	N/C
9	GND	34	HIOR-
10	GND	35	HIOW-
11	GND	36	N/C
12	GND	37	HIRQ
13	VCC	38	VCC
14	GND	39	SANDISK
15	GND	40	N/C
16	GND	41	-HRST1
17	GND	42	HRDY
18	GDA2	43	N/C
19	HDA1	44	N/C
20	HDA0	45	SANLED
21	ID0	46	N/C
22	ID1	47	ID8
23	ID2	48	ID9
24	N/C	49	ID10
25	N/C	50	GND

B.8 System I/O Ports

Table B-8: 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
0F0-0F8	Math co-processor
1F0-1F7	Fixed disk
2F8-2FF	Serial port 2
3B0-3BB	VGA adapter
3C0-3DF	VGA adapter
3F0-3F5	Diskette controller
3F8-3FF	Serial port 1

B.9 Interrupt Assignments

Table B-9: 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	VGA
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	Available
IRQ 6	Diskette controller (FDC)
IRQ 7	Available

B.10 1st MB Memory Map

Table B-10:1st MB memory map

Addr. range (Hex)	Device
F000h - FFFFh	System ROM
CC00h - EFFFh	Unused
CA00h - CBFFh	Used
C000h - C9FFh	Expansion ROM
B800h - BFFFh	CGA/EGA/VGA text
B000h - B7FFh	Unused
A000h - AFFFh	EGA/VGA graphics
0000h - 9FFFh	Base memory

B.11 J1 connector pin assignments

Table B-11: J1 connector pin assignments

Pin	Row A	Row B	Row C	Row D	Row E
25	+5V	REQ64#	N/C	+3V	+5V
24	AD1	+5V	N/C	AD0	ACK64#
23	+3V	AD4	AD3	+5V	AD2
22	AD7	GND	+3V	AD6	AD5
21	+3V	AD9	AD8	GND	C/BE0#
20	AD12	GND	N/C	AD11	AD10
19	N/C	AD15	AD14	GND	AD13
18	SERR#	GND	+3V	PAR	C/BE1#
17	+3V	SDONE	SBO#	GND	PERR#
16	DEVSEL#	GND	N/C	STOP#	LOCK#
15	+3V	FRAME#	IRDY#	GND	TRDY#
12-14		KEY	AREA		
11	AD18	AD17	AD16	GND	C/BE2#
10	AD21	GND	+3V	AD20	AD19
9	C/BE3#	N/C	AD23	GND	AD22
8	AD26	GND	N/C	AD25	AD24
7	AD30	AD29	AD28	GND	AD27
6	REQ#	GND	+3V	CLK	AD31
5	N/C	N/C	RST#	GND	GNT#
4	N/C	GND	N/C	INTP	INTS
3	INTA#	INTB#	INTC#	+5V	INTD#
2	TCK	+5V	TMS	N/C	TDI
1	+5V	N/C	TRST#	+12V	+5V

#: low active

B.12 J2 connector pin assignments

Table B-12: J2 connector pin assignments

Pin	Row A	Row B	Row C	Row D	Row E
47	N/C	N/C	N/C	N/C	N/C
46	N/C	GND	N/C	N/C	N/C
45	N/C	N/C	N/C	GND	N/C
44	N/C	GND	N/C	N/C	N/C
43	N/C	N/C	N/C	GND	N/C
42	N/C	GND	PRST#	REQ6#	GNT6
41	N/C	N/C	DEG#	GND	N/C
40	N/C	GND	FAL#	REQ5#	GNT5
39	N/C	N/C	N/C	GND	N/C
38	N/C	GND	N/C	N/C	N/C
37	N/C	N/C	N/C	GND	N/C
36	N/C	GND	N/C	N/C	N/C
35	N/C	N/C	N/C	GND	N/C
34	N/C	GND	N/C	N/C	N/C
33	N/C	N/C	N/C	GND	N/C
32	N/C	GND	N/C	N/C	N/C
31	N/C	N/C	N/C	GND	N/C
30	N/C	GND	N/C	N/C	N/C
29	N/C	N/C	N/C	GND	N/C
28	CLK4	GND	GNT3	REQ4#	GNT4
27	CKL2	CLK3	N/C	GNT2	REQ3#
26	CLK1	GND	REQ1#	GNT1	REQ2#

#: low active

B.13 J3 connector pin assignments

Table B-13: J3 connector pin assignments

Pin	Row A	Row B	Row C	Row D	Row E
19	HDBD3	HDBD6	HDBD10	HDBD2	HD8D14
18	HDBD8	HDBD5	HDBD1	HDBD11	HDBD15
17	HDBD9	HDBD4	HDBD0	HDBD12	HDBD13
16	HDBDRQ	ICSOB#	IIORB#	ICS1B#	HDRDYB
15	HDBDRQ	IDACKB#	HDBSA2	HDBIRQ	IIOWB#
14	NRTS1	NDSR1	HDBSA1	GND	HDBSA0
13	NRI1	NCTS1	NTX1	NRX1	NRLSD1
12	ID0	ID2	ID4	ID7	NDTR1
11	ID1	ID3	ID8	ID6	ID12
10	ID5	ID9	ID10	ID11	ID13
9	ID15	ID14	HDRQ#	HCS3#	HIOR#
8	HIRQ	HACK#	+5V	HDA2	HIOW#
7	HLED	GND	HRST1#	HRDY	HCS1#
6	+12V	+5V	GND	HDA0	HDA1
5	+5V	GPIO5	IOCHK#	SMBCLK	SMBDATA
4	KDAT#	KCLK	MDTA	MCLK	GND
3	DSKCHG#	MOA#	STEP#	HEAD#	TRAK0#
2	DSA#	MOB#	RWC#	RDATA#	WP#
1	INDEX#	DSB#	DIR#	WE#	WD#

B.14 J4 connector pin assignments for MIC-3377/M

Table B-14: J4 connector pin assignments for MIC-3377/M

Pin	Row A	Row B	Row C	Row D	Row E
25	LAN2TX-	CONTX-	USB-VCC1	USB-VCC0	USBD1+
24	LANTX+	LANTX+	N/A	USBD1-	USBD0-
23	N/C	N/C	N/C	N/C	USBD0+
22	USBRX-	LANRX-	N/C	N/C	COMDTR2
21	USB2RX+	LANRX+	N/C	GND	COMRTS2
20	N/C	N/C	N/C	N/C	COMCTS2
19	N/C	N/C	N/C	N/C	COMTX2
18	N/C	N/C	N/C	N/C	COMLSD2
17	N/C	N/C	N/C	N/C	COMDSR2
16	N/C	N/C	N/C	N/C	COMRI2
15	N/C	N/C	N/C	N/C	COMRX2
12-14			KEY AREA		
11	N/C	N/C	N/C	N/C	N/C
10	N/C	N/C	N/C	N/C	N/C
9	N/C	N/C	N/C	N/C	N/C
8	N/C	N/C	N/C	N/C	N/C
7	N/C	N/C	N/C	N/C	N/C
6	N/C	N/C	N/C	N/C	N/C
5	N/C	N/C	N/C	CRT-SCL	N/C
4	N/C	N/C	N/C	YNC	N/C
3	N/C	N/C	N/C	CRT-SDA	N/C
2	BLUE	GREEN	RED	N/C	N/C
1	N/C	N/C	N/C	N/C	N/C

B.15 J4 connector pin assignments for MIC-3377D/M

Table B-15: J4 connector pin assignments for MIC-3377D/M

Pin	Row A	Row B	Row C	Row D	Row E
25	N/C	REQ64#	N/C	N/C	N/C
24	AD1	N/C	N/C	AD0	ACK64#
23	N/C	AD4	AD3	N/C	AD2
22	AD7	GND	N/C	AD6	AD5
21	N/C	AD9	AD8	GND	C/BE0#
20	AD12	GND	N/C	AD11	AD10
19	N/C	AD15	AD14	GND	AD13
18	SERR#	GND	N/C	PAR	C/BE1#
17	N/C	SDONE	SBO#	GND	PERR#
16	DEVSEL#	GND	N/C	STOP#	LOCK#
15	N/C	FRAME#	IRDY#	GND	TRDY#
12-14			KEY AREA		
11	AD18	AD17	AD16	GND	C/BE2#
10	AD21	GND	N/C	AD20	AD19
9	C/BE3#	N/C	AD23	GND	AD22
8	AD26	GND	N/C	AD25	AD24
7	AD30	AD29	AD28	GND	AD27
6	REQ#	GND	N/C	CLK	AD31
5	N/C	N/C	RST#	GND	GNT#
4	N/C	GND	N/C	INTP	INTS
3	INTA#	INTB#	INTC#	N/C	INTD#
2	TCK	N/C	TMS	N/C	TDI
1	N/C	N/C	TRST#	+12V	N/C

#: low active

B.16 J5 connector pin assignments (MIC-3377D/M only)

Table B-16: J5 connector pin assignments

Pin	Row A	Row B	Row C	Row D	Row E
47	N/C	N/C	N/C	N/C	N/C
46	N/C	GND	N/C	N/C	N/C
45	N/C	N/C	N/C	GND	N/C
44	N/C	GND	N/C	N/C	N/C
43	N/C	N/C	N/C	GND	N/C
42	N/C	GND	PRST#	REQ6#	GNT6
41	N/C	N/C	DEG#	GND	N/C
40	N/C	GND	FAL#	REQ5#	GNT5
39	N/C	N/C	N/C	GND	N/C
38	N/C	GND	N/C	N/C	N/C
37	N/C	N/C	N/C	GND	N/C
36	N/C	GND	N/C	N/C	N/C
35	N/C	N/C	N/C	GND	N/C
34	N/C	GND	N/C	N/C	N/C
33	N/C	N/C	N/C	GND	N/C
32	N/C	GND	N/C	N/C	N/C
31	N/C	N/C	N/C	GND	N/C
30	N/C	GND	N/C	N/C	N/C
29	N/C	N/C	N/C	GND	N/C
28	CLK4	GND	GNT3	REQ4#	GNT4
27	CKL2	CLK3	N/C	GNT2	REQ3#
26	CLK1	GND	REQ1#	GNT1	REQ2#