

TI6NLM
Pentium II ATX All-In-One Motherboard
User's Manual
Version 1.1

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Chapter 1 Introduction

This manual is designed to give you information on the TI6NLM motherboard. It is divided into the following sections:

- **Introduction**
- **Specifications**
- **Hardware Description**
- **Configuring the Motherboard**
- **Installation**
- **BIOS and System Setup**
- **VGA Installation Guide**
- **Audio Installation Guide**
- **LANdesk User's Guide**

Checklist

Please check that your package is complete and contains the items below. If you discover damaged or missing items, please contact your dealer.

- The TI6NLM Motherboard
- 1 IDE ribbon cable
- 1 floppy ribbon cable
- 1 serial ribbon cable
- 1 CD containing Intel IDE Bus Master drivers, flash memory utility, Creative Labs ViBRA 16CL audio drivers, S3 ViRGE/GX2 VGA drivers and LANdesk Client Manager 3.x

Chapter 2 Specifications

The TI6NLM is a high-performance ATX 440LX motherboard with a Slot 1 CPU socket for Pentium® II processors. It offers flexibility in terms of CPU frequency and main memory type and size. The main features of the motherboard consist of the following:

CPU Socket

Slot 1

Processor

Intel Pentium II 233/266/300MHz

L2 Cache

CPU integrated L2 cache

CPU Voltage

Switching voltage regulator on board supporting multiple voltage ranging 1.8V-3.5V

Main Memory

Three 168-pin DIMM sockets

Memory types: Extended Data Output (EDO) DRAM, SDRAM (Synchronous DRAM)

Chipset

Intel 82440LX with built-in PCI-IDE

BIOS

AMIBIOS with ISA Plug and Play (PnP) extension, DMI, bootable CD-ROM and power-management features

Power Connector

ATX power supply connector

PCI Bus Master IDE Controller (Ultra DMA/33)

Onboard PCI Bus Master IDE (Ultra DMA/33) controller with two connectors for up to four IDE devices in two channels, supporting faster data transfer rates, enhanced IDE devices such as Tape Backup and CD-ROM drives, PIO Mode 3/4 and Bus Mastering Ultra DMA/33

Super I/O

Onboard super I/O is an SMC 37C932 that provides:

- Two 16550 UART compatible serial ports
- One parallel port (ECP/EPP compatible)
- One floppy controller (2.88MB compatible)
- One IrDA port
- Keyboard Controller

Mouse Connector

PS/2 type

Keyboard Connector

PS/2 type

USB Connector

2 ports onboard

Win95-shut-off

Allows shut-off control from within Windows 95

Modem-ring-on

Supports modem-ring-on capability through an external modem.

DMI BIOS Support

Desktop Management Interface (DMI) allows users to download system hardware-level information such as CPU type, CPU speed, internal/external frequencies and memory size.

Onboard VGA (AGP)

Powered by S3 ViRGE/GX2, the multimedia VGA combines high-performance integrated SDRAM-based 2D/3D graphics accelerator and full motion video playback including MPEG-1, with AGP (Accelerated Graphics Port) support. (4MB memory onboard.) AGP is a platform bus specification that enables 3D graphics capabilities including support for z-buffering, alpha blending and faster texture mapping.

Onboard Audio (optional)

Creative Labs ViBRA 16CL, 3D

Expansion Slots

Three PCI 32-bit slots
Three ISA 16-bit slots

Form Factor

ATX, 12" x 9.5" (30.7cm x 24.1cm)

Chapter 3 Hardware Description

This chapter briefly describes each of the major features of the TI6NLM motherboard. The layout of the board in Figure 1 shows the location of the key components. The topics covered in this chapter are as follows:

- 3.1 Processor.....
- 3.2 L2 Cache.....
- 3.3 Main Memory.....
- 3.4 BIOS.....
- 3.5 I/O Port Address Map.....
- 3.6 DMA Channels.....
- 3.7 Interrupt Request (IRQ) Lines.....
- 3.8 Onboard PCI-IDE.....
- 3.9 Onboard Multi-I/O.....
- 3.10 Onboard VGA (AGP).....
- 3.11 Onboard Audio (optional).....

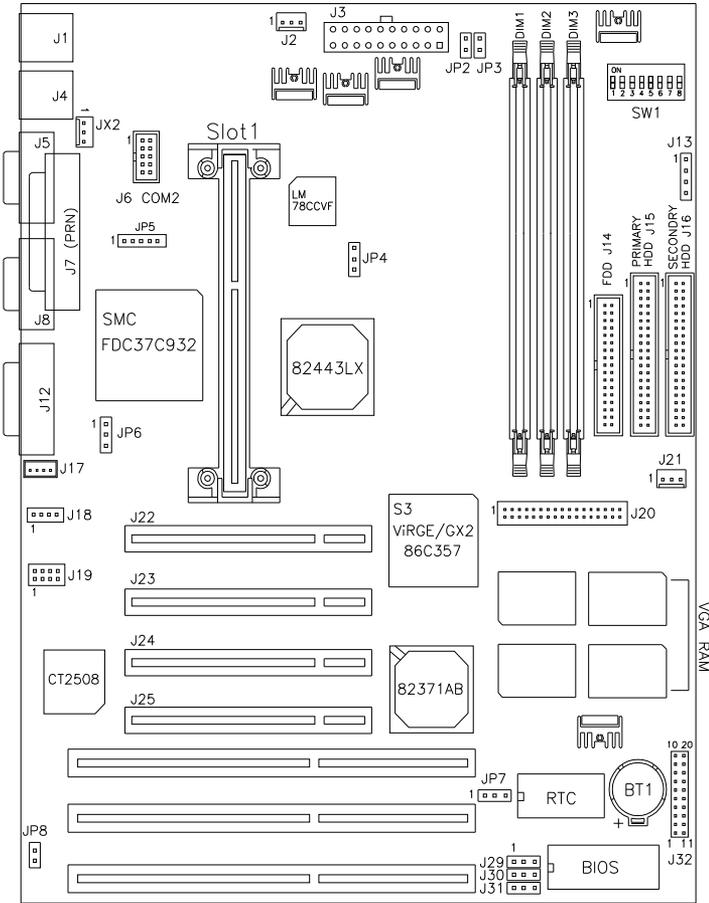


Figure 1: Layout of the TI6NLM Motherboard

3.1 Processor

The TI6NLM motherboard is designed to take a Pentium II processor running 233MHz/266MHz/300MHz with its SLOT 1 CPU connector.

3.2 L2 Cache

The L2 cache is integrated in the Pentium II processor. The private L2 cache bus is not connected to package pins, rather its signals are routed between the two cavities using standard package techniques. The high-performance bandwidth is used by the CPU to serve all L1 cache misses, the characteristic of a CPU-cache bus, and is utilized 90-95 percent of the time.

3.3 Main Memory

The TI6NLM motherboard supports three 168-pin DIMM (Dual In-line Memory Module) sockets to form a memory configuration from 8MB to 384MB. DIMM modules can be 8MB, 16MB, 32MB, 64MB and 128MB in SDRAM or EDO DRAM. In populating the DIMM sockets, DIMM1, DIMM2 and DIMM3 bank can be populated first. Refer to the following table on how to configure the memory.

168Pin DIMM (3.3V)
SDRAM or EDO DRAM

Bank0 (DIMM3)	Bank1 (DIMM2)	Bank2 (DIMM1)	Total Memory
8MB	-----	-----	8MB
16MB	-----	-----	16MB
32MB	-----	-----	32MB
64MB	-----	-----	64MB
128MB	-----	-----	128MB
8MB	8MB	-----	16MB
16MB	8MB	-----	24MB
32MB	8MB	-----	40MB
64MB	8MB	-----	72MB
128MB	8MB	-----	136MB
8MB	8MB	8MB	24MB
16MB	8MB	8MB	32MB
32MB	8MB	8MB	48MB
64MB	8MB	8MB	80MB
128MB	8MB	8MB	144MB
16MB	16MB	-----	32MB
32MB	16MB	-----	48MB
64MB	16MB	-----	80MB
128MB	16MB	-----	144MB
16MB	16MB	8MB	40MB
32MB	16MB	8MB	56MB
64MB	16MB	8MB	88MB
128MB	16MB	8MB	152MB
16MB	16MB	16MB	48MB
32MB	16MB	16MB	64MB
64MB	16MB	16MB	96MB
128MB	16MB	16MB	160MB
32MB	32MB	-----	64MB
64MB	32MB	-----	96MB
64MB	32MB	-----	96MB
128MB	32MB	-----	160MB
32MB	32MB	8MB	72MB
64MB	32MB	8MB	104MB
128MB	32MB	8MB	168MB
32MB	32MB	16MB	80MB
64MB	32MB	16MB	112MB
128MB	32MB	16MB	176MB
32MB	32MB	32MB	96MB
64MB	32MB	32MB	128MB

168Pin DIMM (3.3V) (continued)
SDRAM or EDO DRAM

Bank0 (DIMM3)	Bank1 (DIMM2)	Bank2 (DIMM1)	Total Memory
128MB	32MB	32MB	192MB
64MB	64MB	-----	128MB
128MB	64MB	-----	192MB
64MB	64MB	8MB	136MB
128MB	64MB	8MB	200MB
64MB	64MB	16MB	144MB
128MB	64MB	16MB	208MB
64MB	64MB	32MB	160MB
128MB	64MB	32MB	224MB
64MB	64MB	64MB	192MB
128MB	64MB	64MB	256MB
128MB	128MB	128MB	384MB

3.4 BIOS

The BIOS on the TI6NLM motherboard provides the standard BIOS functions plus the following additional features:

1. ISA Plug and Play (PnP) Extension

Unlike PCI cards that are Plug and Play, ISA cards require setting jumpers to resolve hardware conflicts. To make a computer system PnP, an ISA PnP standard is established and supported by new operating systems, such as Windows 95. Under Windows 95, the motherboard BIOS must have an ISA PnP extension to support new ISA PnP cards.

2. Power Management

The power management feature provides power savings by slowing down the CPU clock, turning off the monitor screen and stopping the HDD spindle motor. The BIOS fully conforms to APM 1.2 specifications.

3.5 I/O Port Address Map

Each peripheral device in the system is assigned a set of I/O port addresses which also becomes the identity of the device. There is a total of 1K port address space available. The following table lists the I/O port addresses used on the motherboard.

Address	Device Description
000h - 01Fh	DMA Controller #1
020h - 03Fh	Interrupt Controller #1
040h - 05Fh	Timer
060h - 06Fh	Keyboard Controller
070h - 07Fh	Real Time Clock,, NMI
080h - 09Fh	DMA Page Register
0A0h - 0BFh	Interrupt Controller #2
0C0h - 0DFh	DMA Controller #2
0F0h	Clear Math Coprocessor Busy Signal
0F1h	Reset Math Coprocessor
1F0h - 1F7h	IDE Interface
2F8h - 2FFh	Serial Port #2(COM2)
378h - 3FFh	Parallel Port #1(LPT1)
3F0h - 3F7h	Floppy Disk Controller
3F8h - 3FFh	Serial Port #1(COM1)

3.6 DMA Channels

There are seven DMA channels available on the motherboard. Only DMA2 is used by the floppy controller. In the case that ECP mode on the parallel port is utilized, DMA1 or DMA3 will be used.

3.7 Interrupt Request (IRQ) Lines

There is a total of 15 IRQ lines available on the motherboard. Peripheral devices use an interrupt request to notify the CPU for the service required. The following table shows the IRQ lines used by the devices on the motherboard:

<u>Level</u>	<u>Function</u>
IRQ0	System Timer Output
IRQ1	Keyboard
IRQ2	Interrupt Cascade
IRQ8	Real Time Clock
IRQ9	Software Redirected to Int 0Ah
IRQ10	Reserved
IRQ11	Reserved
IRQ12	Reserved
IRQ13	Co-Processor
IRQ14	Primary IDE
IRQ15	Secondary IDE
IRQ3	INTERRUPT
IRQ4	Serial Port #1
IRQ5	INTERRUPT
IRQ6	Floppy Disk Controller
IRQ7	Parallel Port #1

3.8 Onboard PCI-IDE

The PCI-IDE controller is a part of the 82440LX PCIset. It supports PIO mode 3/4 and bus mastering Ultra DMA/33. The peak transfer rate of PIO mode 3/4 can be as high as 17MB/sec. Using HDDs that support Ultra DMA/33, the peak transfer rate can reach 33MB/sec. There are two IDE connectors - primary IDE and secondary IDE. With two devices per connector, up to four IDE devices can be supported.

3.9 Onboard Multi-I/O

The onboard multi-I/O chip, SMC37C932, provides a keyboard controller (AMI copyright), two serial ports, one parallel port, one floppy controller and one IrDA port. The serial ports are 16550 UART compatible. The parallel port supports high-speed EPP/ECP mode. The floppy controller supports up to 2.88 MB format.

3.10 Onboard VGA (AGP)

The onboard VGA is an S3 ViRGE/GX2 graphics accelerator with AGP support. The ViRGE graphics accelerator has the following functions:

- 2D/3D graphics
- Video scaler, color space converter and true color palette
- Local Peripheral Bus (LPB) connector
- AGP 1.0 compliant
- Power management

3.11 Onboard Audio (optional)

The onboard audio chip is a Creative Labs ViBRA 16CL codec. It provides all the digital audio and analog mixing functions needed for recording and playing sound on personal computers.

The ViBRA 16CL features the following:

- Analog mixing of six audio sources
 - Digital audio (stereo)
 - CD audio (stereo)
 - Synthesized music (stereo)
 - Line level audio (stereo)
 - Microphone level audio (mono)
 - PC speaker (mono)
 - Individual software programmable volume controls
- Mixer controlled record for recording and playing and playing sound on personal computers.

Chapter 4 Configuring the Motherboard

The following sections describe the necessary procedures and proper jumper settings to configure the TI6NLM motherboard. For the locations of the jumpers, refer to Figure 2.

- 4.1 CPU Frequency: SW1(1-8).....
- 4.2 Clear CMOS Selection: JP7.....
- 4.3 Audio Enable/Disable: JP8.....

The following examples show the conventions used in this chapter.

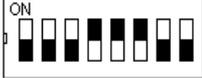
	Jumper Open
	Jumper Closed/Short

	DIP Switch 1 and switch 2 are set to OFF. Switch 3 and switch 4 are set to ON.
-----------------------------------------------------------------------------------	--------------------------------------------------------------------------------------

4.1 CPU Frequency: SW1(1-8)

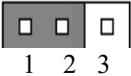
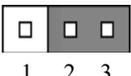
SW1(1-4) sets the clock generator frequency to 66MHz, which is the frequency of the CPU, to the bus clock. **SW1(5-8)** sets the ratio of the bus clock to the CPU internal clock.

Refer to the following table for the correct setting to match the CPU frequency.

Pentium II CPU FREQ.	SW1(1-8)	Switch Settings
Pentium II 233MHz		1 2 3 4 5 6 7 8 off off on off off on off off
Pentium II 266MHz		1 2 3 4 5 6 7 8 off off off on on on off off
Pentium II 300MHz		1 2 3 4 5 6 7 8 off off off on off on off off

4.2 Clear CMOS Selection: JP7

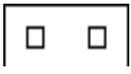
Use JP7, a 3-pin header, to clear the contents of the CMOS RAM. Do not clear the CMOS RAM unless it is absolutely necessary. You will lose your password, etc.

JP7	Setting	Function
 1 2 3	pin 1-2: short	Normal
 1 2 3	pin 2-3: short	Clear CMOS

NOTE: To clear CMOS, the ATX-power connector should be disconnected from the motherboard.

4.3 Audio Enable/Disable: JP8

Use JP8, a 2-pin header, enable or disable the onboard audio capability of the motherboard.

JP8	Setting	Function
	Open	Disable
	Short	Enable

Chapter 5 Installation

This chapter describes the interface that the TI6NLM provides for creating a working system. Refer to Figure 3 for the location of the connectors.

The following items are covered in this chapter:

5.1 I/O Connectors.....	
5.2 J1: PS/2 Keyboard and PS/2 Mouse Connectors.....	
5.3 J2: CPU Fan Power Connector.....	
5.4 J3: ATX Power Supply Connector.....	
5.5 J4: USB Connector.....	
5.6 J5, J6: Serial Ports.....	
5.7 J7: Parallel Port Connector.....	
5.8 J8: VGA Port Connector.....	
5.9 J9, J10, J11: Line Out, Line In, Mic-In Connectors (option).....	
5.10 J12: Game Port Connector (option).....	
5.11 J13: TV Out Connector.....	
5.12 J14: Floppy Drive Connector.....	
5.13 J15, J16: EIDE Connectors.....	
5.14 J17, J18: CD-ROM Audio In Connector (option).....	
5.15 J19: Wave Table Connector.....	
5.16 J20: VGA Feature Connector.....	
5.17 J21: Chassis Fan Power Connector.....	
5.18 J32: Front Bezel Connectors.....	
5.19 JP4: Chassis Intrusion Monitoring Connector.....	
5.20 JP5: IrDA Connector.....	
5.21 JX2: Wake on LAN Connector.....	
5.22 JX3: Ring-on Connector.....	27

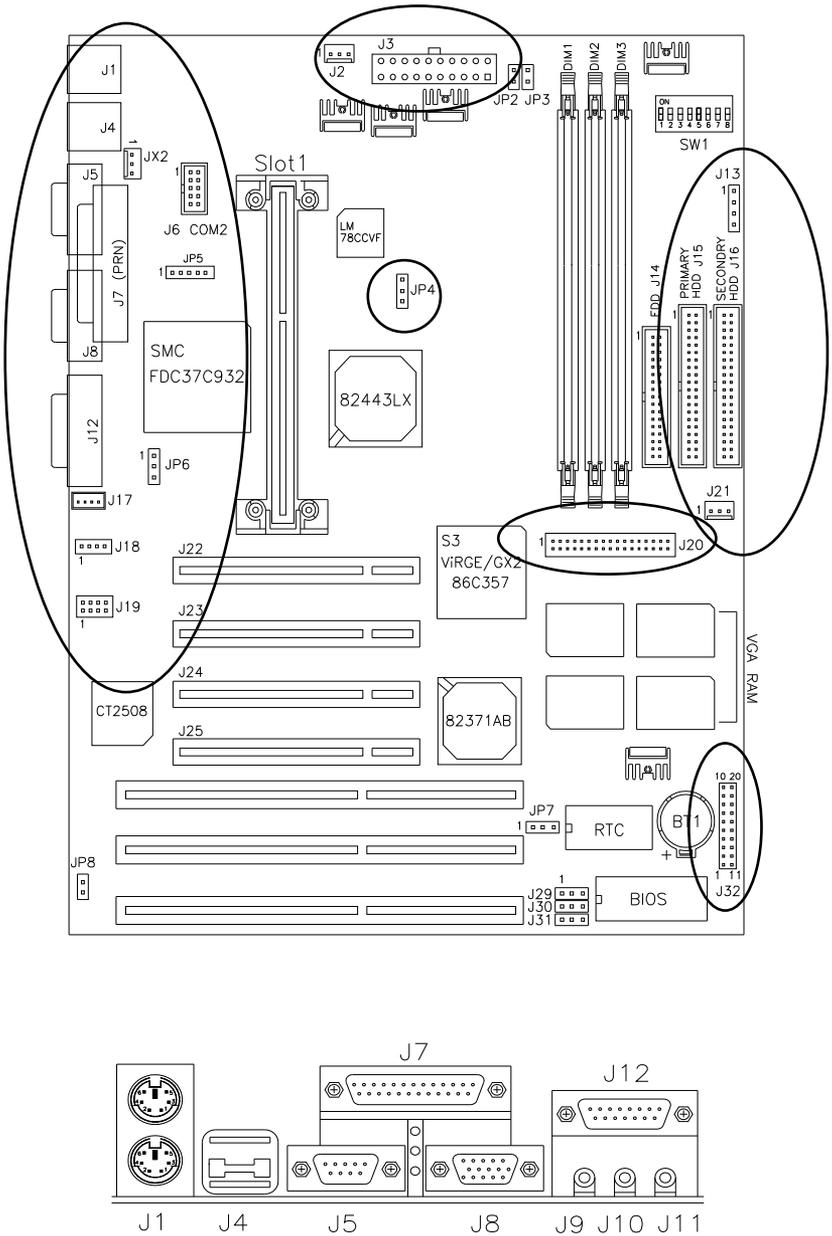


Figure 3: Connector Location on the TI6NLM

5.1 I/O Connectors

The I/O connectors connect the TI6NLM to the most common peripherals. To attach cables to these connectors, carefully align Pin 1 of the cables to that of the connectors. Refer to Figure 4 for the location and orientation of the connectors.

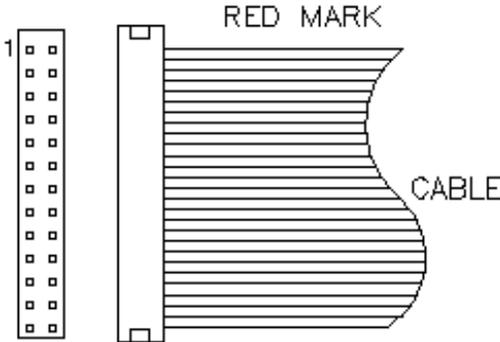
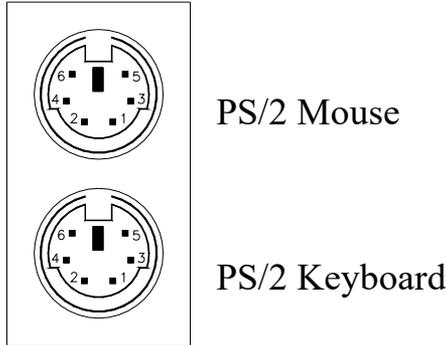


Figure 4: Orientation of the I/O Connector

5.2 J1: PS/2 Keyboard and PS/2 Mouse Connectors

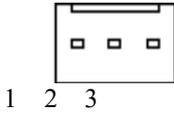


Below are the pin-out assignments of the connectors.

Keyboard	Signal Name	Mouse	Signal Name
1	Keyboard data	1	Mouse data
2	N.C.	2	N.C.
3	GND	3	N.C.
4	5V	4	5V
5	Keyboard clock	5	Mouse Clock
6	N.C.	6	N.C.

5.3 J2: CPU Fan Power Connector

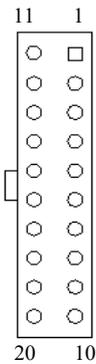
J2 is a 3-pin header for the CPU fan power connector. The fan must be a 12V fan.



J2 Pin #	Signal Name
1	Rotation
2	+12V
3	Ground

5.4 J3: ATX Power Supply Connector

J3 is a 20-pin ATX power supply connector. Refer to the following table for the pin out assignments.



Signal Name	Pin #	Pin #	Signal Name
3.3V	11	1	3.3V
-12V	12	2	3.3V
Ground	13	3	Ground
PS-ON	14	4	+5V
Ground	15	5	Ground
Ground	16	6	+5V
Ground	17	7	Ground
-5V	18	8	Power good
+5V	19	9	5VSB
+5V	20	10	+12V

5.5 J4: USB Connector

Chapter 5 Installation

J4 is the standard USB external connector consisting of two ports. USB support allows connections of up to 64 plug and play external peripherals per channel. The following table shows the pin outs of these ports.

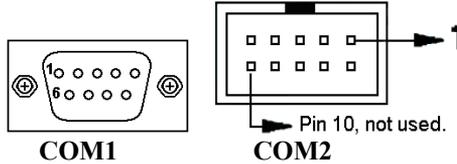


J4 Pin #	Signal Name
1	Vcc
2	USB-
3	USB+
4	Ground

PORT1

5.6 J5, J6: Serial Ports

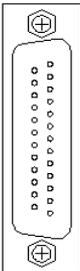
The onboard serial ports of the TI6NLM 10 are J5, a DB-9 connector which is COM1 and J6, a 10-pin header connector which is COM2. The following table shows the pin-out assignments of the these connectors.



Pin #	Signal Name	Pin #	Signal Name
1	DCD, Data carrier detect	6	DSR, Data set ready
2	RXD, Receive data	7	RTS, Request to send
3	TXD, Transmit data	8	CTS, Clear to send
4	DTR, Data terminal ready	9	RI, Ring indicator
5	GND, ground	10	Not Used

5.7 J7: Parallel Port Connector

J7 is a DB-25 external connector. The following table describes the pin-out assignments of this connector.



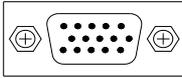
Signal Name	Pin #	Pin #	Signal Name
Line printer strobe	1	14	AutoFeed
PD0, parallel data 0	2	15	Error
PD1, parallel data 1	3	16	Initialize
PD2, parallel data 2	4	17	Select
PD3, parallel data 3	5	18	Ground
PD4, parallel data 4	6	19	Ground

Chapter 5 Installation

PD5, parallel data 5	7	20	Ground
PD6, parallel data 6	8	21	Ground
PD7, parallel data 7	9	22	Ground
ACK, acknowledge	10	23	Ground
Busy	11	24	Ground
Paper empty	12	25	Ground
Select	13	N/A	N/A

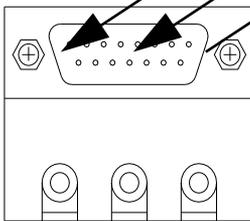
5.8 J8: VGA Port Connector

J8 is a DB-15 VGA connector. The following table shows the pin-out assignments of this connector.



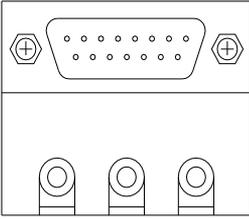
Signal Name	Pin #	Pin #	Signal Name
Red	1	2	Green
Blue	3	4	N.C.
GND	5	6	GND
GND	7	8	GND
N.C.	9	10	GND
N.C.	11	12	N.C.
HSYNC	13	14	VSYNC
NC	15		

5.9 J9, J10, J11: Line In (option) Mic-In Connectors



J9, J10 and J11 are the **optional** input jacks for Line Out, Line In and Microphone respectively. J9 is for audio out to amplifiers; J10 is for audio input from external sources; J11 is for audio input from external microphones.

5.10 J12: Game Port Connector (option)



J12 is the **optional** game port connector that is primarily used for joysticks.

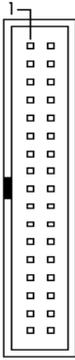
← J12 Game Port Connector

5.11 J13: TV Out Connector

J13 is a 4-pin header TV Out connector for the optional external jack that supports video output to a television screen.

5.12 J14: Floppy Drive Connector

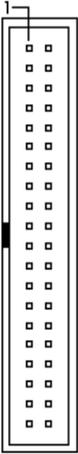
J14 of the TI6NLM is a 34-pin header and will support up to 2.88MB floppy drives. The following table shows its pin-out assignments.



Signal Name	Pin #	Pin #	Signal Name
Ground	1	2	RM/LC
Ground	3	4	No connect
Ground	5	6	No connect
Ground	7	8	Index
Ground	9	10	Motor enable 0
Ground	11	12	Drive select 1
Ground	13	14	Drive select 0
Ground	15	16	Motor enable 1
Ground	17	18	Direction
Ground	19	20	Step
Ground	21	22	Write data
Ground	23	24	Write gate
Ground	25	26	Track 00
Ground	27	28	Write protect
Ground	29	30	Read data
Ground	31	32	Side 1 select
Ground	33	34	Diskette change

5.13 J15, J16: EIDE Connectors

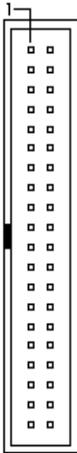
J15: Primary IDE Connector



Signal Name	Pin #	Pin #	Signal Name
Reset IDE	1	2	Ground
Host data 7	3	4	Host data 8
Host data 6	5	6	Host data 9
Host data 5	7	8	Host data 10
Host data 4	9	10	Host data 11
Host data 3	11	12	Host data 12
Host data 2	13	14	Host data 13
Host data 1	15	16	Host data 14
Host data 0	17	18	Host data 15
Ground	19	20	Key
DRQ0	21	22	Ground
Host IOW	23	24	Ground
Host IOR	25	26	Ground
IOCHRDY	27	28	Host ALE
DACK0	29	30	Ground
IRQ14	31	32	No connect
Address 1	33	34	No connect
Address 0	35	36	Address 2
Chip select 0	37	38	Chip select 1
Activity	39	40	Ground

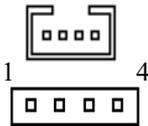
J16: Secondary IDE Connector

Signal Name	Pin #	Pin #	Signal Name
-------------	-------	-------	-------------



Reset IDE	1	2	Ground
Host data 7	3	4	Host data 8
Host data 6	5	6	Host data 9
Host data 5	7	8	Host data 10
Host data 4	9	10	Host data 11
Host data 3	11	12	Host data 12
Host data 2	13	14	Host data 13
Host data 1	15	16	Host data 14
Host data 0	17	18	Host data 15
Ground	19	20	Key
DRQ0	21	22	Ground
Host IOW	23	24	Ground
Host IOR	25	26	Ground
IOCHRDY	27	28	Host ALE
DACK1	29	30	Ground
MIRQ0	31	32	No connect
Address 1	33	34	No connect
Address 0	35	36	Address 2
Chip select 0	37	38	Chip select 1
Activity	39	40	Ground

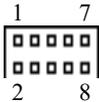
5.14 J17, J18: CD-ROM Audio In Connector (option)



J17, J18 Pin #	Signal Name
1	Ground
2	CD left
3	Ground
4	CD right

5.15 J19: Wave Table Connector

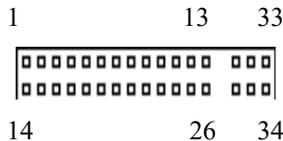
This 8-pin header can be used to interface to an optional wave table module.



J19 Pin #	Signal Name
1	Wave Right
2	Ground
3	Wave Left
4	Ground
5	Key
6	Ground
7	MIDI-WR
8	MIDI-out

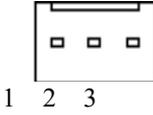
5.16 J20: VGA Feature Connector

J20 is a 34-pin VGA feature connector. The first 26 pins provide the necessary signals to an interface for VESA feature connector. The additional pins provide an interface for S3 LPB interface connector.



5.17 J21: Chassis Fan Power Connector

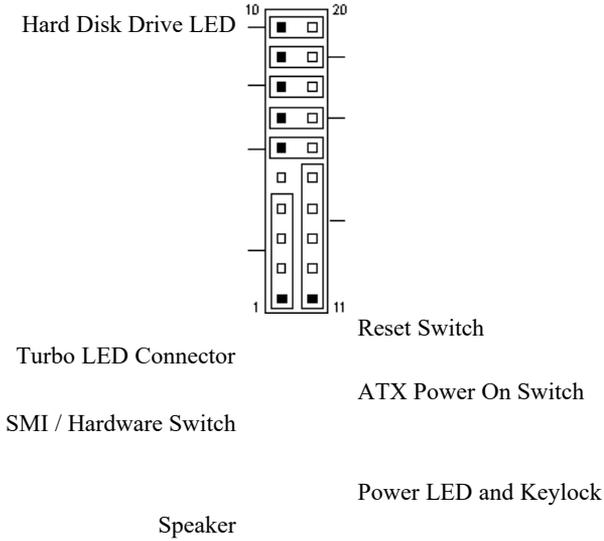
J21 is a 3-pin header for the CPU fan power connector. The fan must be a 12V fan.



J21 Pin #	Signal Name
1	Rotation
2	+12V
3	Ground

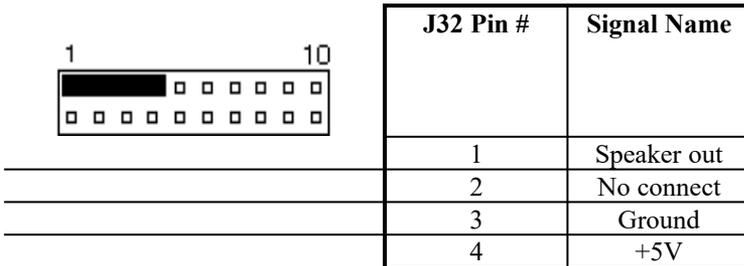
5.18 J32: Front Bezel Connectors

The front bezel of the case has a control panel which provides light indication of the computer activities and switches to change the computer status. J32 is a 20-pin header that provides interfaces for the following functions.



Speaker: Pins 1 - 4

This connector provides an interface to a speaker for audio tone generation. An 8-ohm speaker is recommended.



Power LED and Keylock: Pins 11 - 15

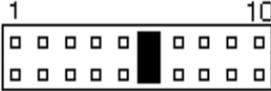
The power LED indicates the status of the main power switch. The keylock switch, when closed, will disable the keyboard function.



J32 Pin #	Signal Name
11	Power LED
12	No connect
13	Ground
14	Keylock
15	Ground

SMI/Hardware Switch: Pins 6 and 16

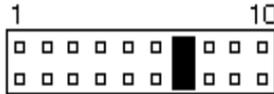
This connector supports the "Green Switch" on the control panel, which, when pressed, will force the system board into the power-saving mode immediately.



J32 Pin #	Signal Name
6	Sleep
16	Ground

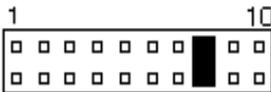
ATX Power ON Switch: Pins 7 and 17

This 2-pin connector is an "ATX Power Supply On/Off Switch" on the motherboard that connects to the power switch on the case. When pressed, the power switch will force the motherboard to power on. When pressed again, it will force the motherboard to power off.



Turbo LED Connector: Pins 8 and 18

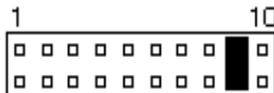
There is no turbo/deturbo function on the motherboard. The Turbo LED on the control panel will always be on when attached to this connector.



J32 Pin #	Signal Name
8	5V
18	Ground

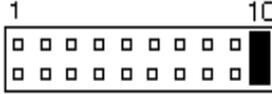
Reset Switch: Pins 9 and 19

The reset switch allows the user to reset the system without turning the main power switch Off and then On. Orientation is not required when making a connection to this header.



Hard Disk Drive LED Connector: Pins 10 and 20

This connector connects to the hard drive activity LED on control panel. This LED will flash when the HDD is being accessed.



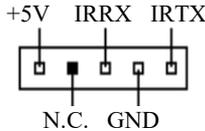
J32 Pin #	Signal Name
10	Ground
20	5V

5.19 JP4: Chassis Intrusion Monitoring Connector

JP4 is a 3-pin header for chassis intrusion monitoring, a feature of the optional LM78 Hardware Monitoring ASIC.

5.20 JP5: IrDA Connector

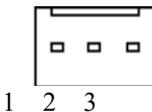
This connector is used for an IrDA connector that supports infrared wireless communication.



JP5 Pin #	Signal Name
1	+5V
2	No connect
3	Ir RX
4	Ground
5	Ir TX

5.21 JX2: Wake on LAN Connector

JX2 is a 3-pin header for the Wake on LAN function on the motherboard.



JX2 Pin #	Signal Name

1	+5 VSB
2	Ground
3	WOL

5.21 JX3: Ring-on Connector

JX3 is a 2-pin header that is connected to internal modems that support the Ring-on function.

Chapter 6 BIOS and System Setup

This chapter describes the different settings available in the BIOS. The TI6NLM motherboard comes with AMIBIOS in HIFLEX version. The topics covered in this chapter are as follows:

- 6.1 Invoking the System Setup Program.....
- 6.2 Running the Setup.....
 - Using the Keyboard with Setup
- 6.3 Setup Main Menu.....
 - Default Values
 - Optimal
 - Fail safe
 - Save Changes and Exit
 - Exit Without Saving
 - Setup Menu Categories
- 6.4 Standard CMOS Setup.....
 - Date/Time
 - Floppy Drive A, B
 - Configuring IDE Drives
 - Configuring an MFM Drive
 - User-Defined Drive
 - Configuring a CD-ROM Drive
 - Boot Sector Virus Protection
- 6.5 Advanced CMOS Setup.....
 - Quick Boot
 - BootUp Sequence
 - Floppy / HDD Access Control
 - S.M.A.R.T. for Hard Disks
 - BootUp Num-Lock
 - Floppy Drive Swap
 - Floppy Drive Seek
 - PS/2 Mouse Support
 - Primary Display
 - Password Check
 - Boot to OS/2 > 64MB
 - Internal Cache
 - System BIOS Shadow cacheable
 - C000-DC000, 16k Shadow

- 6.6 Advanced Chipset Setup.....
 - Auto Configure DRAM Timing
 - EDO DRAM Speed
 - EDO Read Burst Timing
 - EDO Write Burst Timing
 - MA Wait State
 - SDRAM RAS to CAS Delay
 - SDRAM CAS Latency
 - SDRAM RAS Precharge Time
 - DRAM Integrity Mode
 - Fixed Memory Hole
 - CPU To PCI IDE Posting
 - USWC Write I/O Post
 - AGP Aperture Size
 - PIIX4 Delayed Transaction
 - USB Function

 - 6.7 Power Management Setup.....
 - Power Management/ APM
 - Green PC Monitor Power State
 - Video Power Down Mode
 - Hard Disk Power Down Mode
 - Standby Timeout
 - Suspend Timeout
 - Throttle Slow Clock Ratio
 - Modem Use I/O Port
 - Modem Use IRQ
 - Display Activity
 - Device 0/1/23/5/6/7/8
 - Power Button Function
 - Ring Resume From Soft Off
 - RTC Alarm Resume From Soft Off

 - 6.8 PCI / Plug and Play Setup.....
 - Plug and Play Aware OS
 - Clear NVRAM on Every Boot
 - PCI Latency Timer (in PCI Clocks)
 - Allocate IRQ to PCI VGA
 - PCI IDE BusMaster
 - Offboard PCI IDE Card
 - Offboard PCI IDE Primary IRQ
-

Offboard PCI IDE Secondary IRQ
DMA Channel 0 / 1 / 3 / 5 / 6 / 7
Reserved Memory Size
Reserved Memory Address

- 6.9 Peripheral Setup.....
 - Onboard FDC
 - Onboard Serial Port1
 - Onboard Serial Port2
 - Onboard Parallel Port
 - Parallel Port Mode
 - Parallel Port DMA Channel
 - Onboard IDE
- 6.10 Hardware Monitor Setup.....
- 6.11 Auto-Detect Hard Disks.....
- 6.12 Password.....
 - If You Do Not Want to Use a Password
 - Setting a Password

6.1 Invoking the System Setup Program

Power on the system and the screen will display:

Hit to enter Setup

Hit the key and screen will display the main Setup screen.

```
AMIBIOS HIFLEX SETUP UTILITY - VERSION 1.12
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Standard CMOS Setup
Advanced CMOS Setup
Advanced Chipset Setup
Power Management Setup
PCI / Plug and Play Setup
Peripheral Setup
Hardware Monitor Setup
Auto-Detect Hard Disks
Change User Password
Change Supervisor Password
Auto Configuration with Optimal Settings
Auto Configuration with Fail Safe Settings
Save Settings and Exit
Exit Without Saving

Standard CMOS setup for changing time, date, hard disk type, etc.
ESC:Exit  ↑ ↓:Sec  F2/F3:Color  F10:Save & Exit
```

6.2 Running the Setup

Using the Keyboard with Setup

Use the following keys to modify and move around in the Setup:

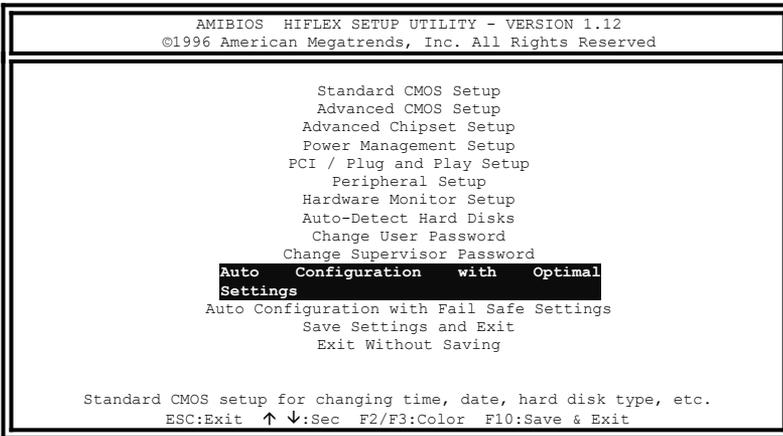
Keystroke	Function
<Tab>	Move to the next field.
→, ←, ↑, ↓	Move to the next field to the above, or below.
<Enter>	Select in the current field.
+ / -	Modify Selection
<Esc>	Close the current operation and return to the previous level.
<PgUp> / <PgDn>	Modify Selection
F2, F3	Change Screen Color
F10	Save and Exit

6.3 Setup Main Menu

Default Values

The icons in this section permit you to select a group of settings for all the Setup options. Not only can you use these icons to quickly set system configuration parameters, you can choose a group of settings that have a better chance of working when the system is having configuration-related problems.

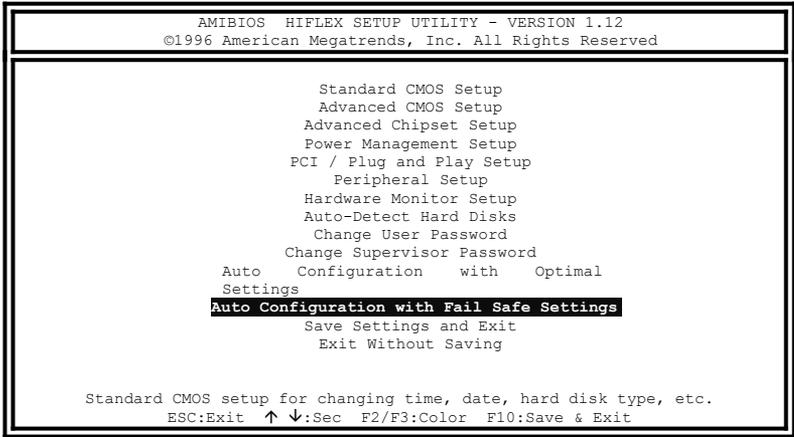
Optimal



You can load the optimal default settings for the BIOS by selecting the Optimal icon. The Optimal default settings are best-case values that should optimize system performance. If CMOS RAM is corrupted, the Optimal settings are loaded automatically.

NOTE: The optimal values are for regular use.

Fail safe



You can load the Fail-Safe BIOS Setup option setting by selecting the Fail-Safe icon from the Default section of the Setup main menu.

The Fail-Safe settings provide far-from-optimal system performance, but are the most stable settings. Use this option as a diagnostic aid if the system is behaving erratically.

Save Changes and Exit

```
AMIBIOS HIFLEX SETUP UTILITY - VERSION 1.12
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Standard CMOS Setup
Advanced CMOS Setup
Advanced Chipset Setup
Power Management Setup
PCI / Plug and Play Setup
Peripheral Setup
Hardware Monitor Setup
Auto-Detect Hard Disks
Change User Password
Change Supervisor Password
Auto Configuration with Optimal
Settings
Auto Configuration with Fail Safe Settings
Save Settings and
Exit
Exit Without Saving

Standard CMOS setup for changing time, date, hard disk type, etc.
ESC:Exit ↑ ↓:Sec F2/F3:Color F10:Save & Exit
```

Select this option to save into the CMOS RAM all the modifications you have specified during the current session.

Exit Without Saving

```
AMIBIOS HIFLEX SETUP UTILITY - VERSION 1.12
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Standard CMOS Setup
Advanced CMOS Setup
Advanced Chipset Setup
Power Management Setup
PCI / Plug and Play Setup
Peripheral Setup
Hardware Monitor Setup
Auto-Detect Hard Disks
Change User Password
Change Supervisor Password
Auto Configuration with Optimal
Settings
Auto Configuration with Fail Safe Settings
Save Settings and
Exit
Exit Without Saving

Standard CMOS setup for changing time, date, hard disk type, etc.
ESC:Exit ↑ ↓:Sec F2/F3:Color F10:Save & Exit
```

Select this option to exit the current session while disregarding the modifications that you have made.

Setup Menu Categories

Your Setup program can have up to five separate screens. Different types of system configuration parameters are set on each screen.

Type	Description
Standard CMOS Setup	Set the time and date. Configure disk drives.
Advanced CMOS Setup	Configure basic system performance parameters.
Advanced Chipset Setup	Configure features specific to the chipset used in the computer.
Power Management Setup	Configure power conservation features.
PCI / Plug and Play Setup	Configure PCI and Plug-and-Play features.
Peripheral Setup	Configure I/O support.

6.4 Standard CMOS Setup

Standard Setup options are displayed by choosing the Standard icon from the Setup menu. All Standard Setup options are described below.

AMIBIOS SETUP - STANDARD CMOS SETUP	
©1996 American Megatrends, Inc. All Rights Reserved	
Date (mm/dd/yyyy) : Fri July 04, 1997	Base Memory : 640 KB
Time (hh/mm/ss) : 14:44:03	Extd Memory : 383 MB
Floppy Drive A: 1.44MB 3½	
Floppy Drive B: Not Installed	
LBA Blk PIO 32Bit	
Type	Size Cyln Head Wpcom Sec Mode Mode Mode Mode
Primary Master : Auto	On
Pri Slave : Auto	On
Sec Master : Auto	On
Sec Slave : Auto	On
Boot Sector Virus Protection: Disabled	
Month: Jan - Dec	ESC: Exit ↑↓:Sel
Day : 01 - 31	PgUp/PgDn:Modify
Year : 1901 - 2099	F2/F3:Color

Date/Time

Select the Date/Time option to change the date or time. The current date and time are displayed. Enter new values through the displayed window.

Floppy Drive A, B

Choose the Floppy Drive A or B icon to specify the floppy drive type. The settings are *360KB 5 1/4"*, *1.2MB 5 1/4"*, *720KB 3 1/2"*, *1.44MB 3 1/2"*, and *2.88MB 3 1/2"*

Configuring IDE Drives

If the hard disk drive to be configured is an IDE drive, select the appropriate drive icon (Pri Master, Pri Slave, Sec Master, or Sec Slave). Choose the *Type* parameter and select *Auto*. The BIOS automatically detects the IDE drive parameters and displays them. Click the OK button to accept these parameters.

Configuring an MFM Drive

In configuring an old MFM hard disk drive, you must know the drive parameters (number of heads, number of cylinders, number of sectors, the starting write precompensation cylinder, and drive capacity). Choose *Type* and choose the appropriate hard disk drive type (1-46).

User-Defined Drive

If you are configuring a SCSI drive or an MFM, RLL, ARLL, or ESDI drive with drive parameters that do not match drive types 1-46, you must select *User* in the *Type* field and enter the drive parameters on the screen that appears. The drive parameters include:

- Cylinder (number of cylinders),
- Hd (number of heads),
- WP (starting write precompensation cylinder),
- Sec (number of sectors), and
- Size (drive capacity).

Configuring a CD-ROM Drive

Select the appropriate drive icon (Pri Master, Pri Slave, Sec Master, or Sec Slave). Choose the *Type* parameter and select CDR0M. You can boot the computer from a CD-ROM drive.

Boot Sector Virus Protection

This item protects the boot sector and partition table of your hard disk against accidental modifications. If an attempt is made, the BIOS will halt the system and display a warning message. If this occurs, you can either allow the operation to continue or run an anti-virus program to locate and remove the problem.

NOTE: Many disk diagnostic programs which attempt to access the boot sector table can cause the virus warning. If you will run such a program, disable the Virus Warning feature.

6.5 Advanced CMOS Setup

AMIBIOS SETUP - ADVANCED CMOS SETUP		
©1996 American Megatrends, Inc. All Rights Reserved		
Quick Boot	Disabled	Available Options: Disabled Enabled
1 st Boot Device	FLOPPY	
2 nd Boot Device	IDE-0	
3 rd Boot Device	Disabled	
Try Other Boot Devices	Yes	
Floppy Access Control	Read-Write	
HDD Access Control	Read-Write	
S.M.A.R.T. for Hard Disks	Disabled	
BootUp Num-Lock	On	
Floppy Drive Swap	Disabled	
Floppy Drive Seek	Enabled	
PS/2 Mouse Support	Enabled	
Primary Display	VGA/EGA	
Password Check	Setup	
Boot To OS/2 > 64MB	No	
Internal Cache	WriteBack	
System BIOS Cacheable	Enabled	ESC:Exit ↑↓:Sel
C000, 16k Shadow	Cached	PgUp/PgDn:Modify
C400, 16k Shadow	Cached	F2/F3:Color

Quick Boot

Set this option to *Enabled* to instruct AMIBIOS to boot quickly when the computer is powered on. This option replaces the old **Above 1 MB Memory Test Advanced Setup** option.

BootUp Sequence

This option sets the sequence of boot drives. Four boot devices can be set according to the user's preference (Floppy, IDE-0 / IDE-1, CD-ROM, SCSI, FLOPTICAL[LS-120]).

Floppy / HDD Access Control

Set this option to Normal to allow the floppy and hard disk drive to perform read and write operations. The settings are *Normal* and *read only*. The Optimal and Fail-Safe default setting is *Normal*.

S.M.A.R.T. for Hard Disks

Enabling this option allows the system to support hard disks with the S.M.A.R.T. feature. The default setting is *Disabled*.

BootUp Num-Lock

Set this option to *Off* to turn the Num Lock key off when the computer is booted so you can use the arrow keys on both the numeric keypad and the keyboard. The settings are *On* and *Off*. The default setting is *On*.

Floppy Drive Swap

Set this option to *Enabled* to permit drives A: and B: to be swapped. The settings are *Enabled* and *Disabled*. The default setting is ***Disabled***.

Floppy Drive Seek

Set this option to *Enabled* to specify that floppy drive A: will perform a Seek operation at system boot. The settings are *Disabled* and *Enabled*. The Optimal default setting is ***Enabled***.

PS/2 Mouse Support

When this option is set to *Enabled*, AMIBIOS supports a PS/2-type mouse. The settings are *Enabled* and *Disabled*. The default setting is ***Enabled***.

Primary Display

This option specifies the type of display monitor and adapter in the computer. The settings are *Mono*, *CGA40*, *CGA80*, *VGA/EGA*, and *Absent*. The Optimal and Fail-Safe default setting is ***VGA/EGA***.

Password Check

This option enables password checking every time the computer is powered on or every time BIOS Setup is executed. If *Always* is chosen, a user password prompt appears every time the computer is turned on. If *Setup* is chosen, the password prompt appears if BIOS is executed. The Optimal and Power On defaults are ***Setup***.

Boot to OS/2 > 64MB

This option allows the system to access greater than 64MB of DRAM memory when used with OS/2 that depends on certain BIOS calls to access memory. The settings are *Yes* and *No*. For non-OS/2 systems, set this option to *No*. The default setting is ***No***.

Internal Cache

This option specifies the caching algorithm used for the internal cache memory. The settings are:

Setting	Description
<i>Disabled</i>	Neither L1 internal cache memory on the CPU or L2 secondary cache memory is enabled.
<i>Write Back (default)</i>	Use the write-back caching algorithm.
<i>Write Thru</i>	Use the write-through caching algorithm.

System BIOS Shadow cacheable

When this option is set to *Enabled*, the contents of the F0000h system memory segment can be read from or written to L2 secondary cache memory. The contents of the F0000h memory segment are always copied from the BIOS ROM to the system RAM for faster execution.

The settings are *Enabled* and *Disabled*. The Optimal default setting is *Enabled*. The Fail-Safe default setting is *Disabled*.

C000-DC000, 16k Shadow

Shadowing a ROM reduces the memory available between 640KB to 1024KB. These fields determine whether optional ROM will be copied to RAM or not.

6.6 Advanced Chipset Setup

AMIBIOS SETUP - ADVANCED CMOS SETUP		
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Auto Configure EDO DRAM Timing	Enabled	Available Options: Disabled Enabled
EDO DRAM Speed (ns)	60	
EDO Read Burst Timing	x222	
EDO Write Burst Timing	x222	
MA Wait State	Fast	
*****SDRAM Timing*****		
SDRAM RAS to CAS Delay	2 Clks	
SDRAM CAS Latency	3 Clks	
SDRAM RAS Precharge Time	2 Clks	
DRAM Integrity Mode	Non ECC	
Fixed Memory Hole	Disabled	
CPU To PCI IDE Posting	Enabled	
USWC Write I/O Post	Disabled	
AGP Aperture Size	64MB	
PIIX4 Delayed Transaction	Disabled	
USB Function	Disabled	
USB Keyboard legacy Support	Disabled	
		ESC:Exit ↑↓:Sel PgUp/PgDn:Modify F2/F3:Color

Auto Configure DRAM Timing

Use this option to specify the timing on the memory bus. The default setting is **Enabled**.

EDO DRAM Speed

This specifies the RAS access speed of the SIMMs installed on the motherboard as system memory. The settings are *60ns* and *70ns*. The default setting is **60ns**.

EDO Read Burst Timing

This sets the timing for burst mode reads from different DRAMs (BEDO/EDO/FP). Burst read and write requests are generated by the CPU in four separate parts. The first part provides the location within the DRAM where the read or write is to take place while the remaining three parts provide the actual data. The lower the timing numbers, the faster the system will address memory.

EDO Write Burst Timing

This sets the timing for burst mode writes from DRAM. Burst read and write requests are generated by the CPU in four separate parts. The first part provides the location within the DRAM where the read or write is to take place while the remaining three parts provide the actual data. The lower the timing numbers, the faster the system will address memory.

MA Wait State

This option sets the wait state of the memory address. The settings are *Fast* and *Slow*. By default, it is set to *Fast*.

SDRAM RAS to CAS Delay

When DRAM is refreshed, both rows and columns are addressed separately. This field allows you to determine the timing of the transition from Row Address Strobe (RAS) to Column Address Strobe (CAS). By default, it is set to *2 clocks*.

SDRAM CAS Latency

This option sets the CAS latency of the SDRAM. The higher the speed, the better quality the performance of the SDRAM. The default setting is *3 clocks*.

SDRAM RAS Precharge Time

DRAM must continuously be refreshed or it will lose its data. This option allows you to determine the number of CPU clocks allocated for Row Address Strobe to accumulate its charge before DRAM is refreshed. If the refreshed time is not enough, refresh may be incomplete and data will be lost.

DRAM Integrity Mode

This option allows software configurability of selecting between ECC (error checking and correction) mode, EC only or Non-ECC. The default setting is *Non-ECC*.

Fixed Memory Hole

Enabling this feature reserves (15MB to 16MB or 512KB to 640KB) memory address space to ISA expansion cards that specifically require this setting. This makes the memory from 15MB or 512MB and up unavailable to the system. Expansion cards can only access memory up to 16MB. The default setting is *Disabled*.

CPU To PCI IDE Posting

When enabled, the CPU to PCI IDE posting cycles are treated as normal I/O write transactions. The default setting is *Enabled*.

USWC Write I/O Post

The setting of *Enabled* allows USWC write posting during I/O bridge access. The default setting is *Disabled*.

AGP Aperture Size

The settings for this options are *4MB*, *8MB*, *16MB*, *32MB*, *64MB*, *128MB* and *2566MB*. The default setting is *64MB*.

PIIX4 Delayed Transaction

When enabled, the PIIX4 transaction is delayed. By default the optimal settings are *Disabled*.

USB Function

When enabled, the option allows legacy support for a USB keyboard. By default, the optimal settings are *Disabled*.

6.7 Power Management Setup

AMIBIOS SETUP - POWER MANAGEMENT SETUP		
©1996 American Megatrends, Inc. All Rights Reserved		
Power Management/APM	Enabled	Available Options: Disabled Enabled
Green PC Monitor Power State	Off	
Video Power Down Mode	Suspend	
Hard Disk Time Out (Minute)	Disabled	
Standby Time Out (Minute)	Disabled	
Suspend Time Out (Minute)	Disabled	
Throttle Slow Clock Ratio	50-62.5%	
Modem Use IO Port	N/A	
Modem Use IRQ	N/A	
Display Activity	Ignore	
Device 6 (Serial port 1)	Monitor	
Device 7 (Serial port 2)	Monitor	
Device 8 (Parallel port)	Ignore	
Device 5 (Floppy disk)	Monitor	
Device 0 (Primary master IDE)	Monitor	
Device 1 (Primary slave IDE)	Ignore	
Device 2 (Secondary master IDE)	Monitor	
Device 3 (Secondary slave IDE)	Ignore	ESC:Exit ↑↓:Sel
Power Button Function	On/Off	PgUp/PgDn:Modify
Ring Resume From Soft Off	Disabled	F2/F3:Color

Power Management/ APM

Set this option to *Enabled* to enable the power-management and APM (Advanced Power Management) features. The settings are *Enabled* and *Disabled*. The default setting is *Enabled*.

Green PC Monitor Power State

This option specifies the power-management state that the Green PC-compliant video monitor enters after the specified period of display inactivity has expired. The settings are *Disabled*, *off*, *Standby*, and *Suspend*. The default setting is *Off*.

Video Power Down Mode

This option specifies the power-management state that the video subsystem enters after the specified period of display inactivity has expired. The settings are *Disabled*, *Standby*, and *Suspend*. The default is *Suspend*.

Hard Disk Power Down Mode

This option specifies the power-management state that the hard disk drive enters after the specified period of display inactivity has expired. The settings are *Disabled*, *Standby*, and *Suspend*. The default setting is *Disabled*.

Standby Timeout

This option specifies the length of the period of system inactivity when the computer is in Full On mode before the computer is placed in Standby mode. In Standby mode, some power use is curtailed. The settings are *Disabled*, *1 Min*, *2 Min*, and *all one minute intervals up to and including 15 Min*. The default setting is ***Disabled***.

Suspend Timeout

This option specifies the length of the period of system inactivity when the computer is already in Standby mode before the computer is placed in Suspend mode. In Suspend mode, nearly all power use is curtailed. The settings are *Disabled*, *1 Min*, *2 Min*, and *all one minute intervals up to and including 15 Min*. The default setting is ***Disabled***.

Throttle Slow Clock Ratio

This option specifies the speed at which the system clock runs in power- saving modes. The settings are expressed as a ratio between the normal clock speed and the power down clock speed. The settings are - *0-12.5%*, *12.5-25%*, *25-37.5%*, *27.5-50%*, *50-62.5%*, *62.5-75%*, *75-87.5%*. The Optimal and Fail-Safe default settings are ***50-62.5%***.

Modem Use I/O Port

This option specifies the COM port that is being used by the system's modem. The settings are *N/A*, *COM1*, *COM2*, *COM3* and *COM4*. The default setting is *N/A*.

Modem Use IRQ

This option specifies the IRQ being used by the external modem for the Modem wake-up feature of the motherboard.

Display Activity

This option specifies if the BIOS is to monitor activity on the display monitor for power conservation purposes.

Device 0/1/23/5/6/7/8(Serial port 1/2, Parallel port, Floppy disk, Primary master/slave IDE, Secondary master/slave IDE)

These options enable event monitoring. When the computer is in a power-saving mode, activity on the named interrupt request line is monitored by AMIBIOS. When any activity occurs, the computer enters the Full On mode.

Power Button Function

This option allows the power button to function as a simple on/off button or with the suspend function. The options are *On/Off* and *Suspend*. In the Suspend mode, the system powers off after pressing the power button for more than four seconds or enters the suspend mode when pressed for less than four seconds. By default, this option is set to *On/Off*.

Ring Resume From Soft Off

This option allows the system to be turned on remotely through a modem from its soft-off state. By default, this option is set to *Disabled*.

RTC Alarm Resume From Soft Off

This allows the system to be turned on automatically through the timer set in the BIOS to make the system more scheduleable. By default, this option is set to *Disabled*.

6.8 PCI / Plug and Play Setup

AMIBIOS SETUP - PCI / PLUG AND PLAY SETUP ©1996 American Megatrends, Inc. All Rights Reserved		
Plug and Play Aware O/S	No	Available Options:
Clear NVRAM on Every Boot	No	No
PCI Latency Timer (PCI Clocks)	64	Yes
PCI VGA Palette Snoop	Disabled	
Allocate IRQ to PCI VGA	Yes	
PCI IDE Busmaster	Disabled	
OffBoard PCI IDE Card	Auto	
OffBoard PCI IDE Primary IRQ	Disabled	
OffBoard PCI IDE Secondary IRQ	Disabled	
DMA Channel 0	PnP	
DMA Channel 1	PnP	
DMA Channel 3	PnP	
DMA Channel 5	PnP	
DMA Channel 6	PnP	
DMA Channel 7	PnP	
IRQ3	PCI/PnP	
IRQ4	PCI/PnP	
IRQ5	PCI/PnP	
IRQ7	PCI/PnP	
IRQ9	PCI/PnP	
		ESC:Exit ↑↓:Sel PgUp/PgDn:Modify F2/F3:Color

Plug and Play Aware OS

Set this option to *Yes* if the operating system installed in the computer is Plug and Play-aware. AMIBIOS only detects and enables PnP ISA adapter cards that are required for system boot. The Windows 95 operating system detects and enables all other PnP-aware adapter cards. Windows 95 is PnP-aware.

Set this option to *No* if the operating system (such as DOS, OS/2, Windows 3.x) does not use PnP. You must set this option correctly or PnP-aware adapter cards installed in your computer will not be configured properly. The settings are *No* and *Yes*. The Optimal and Fail-Safe default settings are *No*.

Clear NVRAM on Every Boot

Enabling this option erases the NVRAM containing PnP information on every boot. The Optimal and Fail-Safe settings are *No*.

PCI Latency Timer (in PCI Clocks)

This option sets latency of all PCI devices on the PCI bus. The settings are in units equal to PCI clocks. The settings are *32*, *64*, *96*, *128*, *160*, *192*, *244*, and *248*. The Optimal and Fail-Safe default settings are *64*.

PCI VGA Palette Snoop

Set this option to *Enabled* if any ISA adapter card installed in the computer requires VGA palette snooping. The settings are *Disabled* and *Enabled*. The Optimal and Fail-Safe default settings are *Disabled*.

Allocate IRQ to PCI VGA

Enabling this option allocates an IRQ to the PCI VGA on the motherboard. Normally, PCI VGA does not use any IRQ. If you have several add-on cards on the motherboard and the IRQs are not enough, then this option can be set to *No*. By default, this field is set to *Yes*.

PCI IDE BusMaster

Set this option to *Enabled* to specify that the IDE controller on the PCI local bus has bus mastering capability. The settings are *Disabled* and *Enabled*. The Optimal and Fail-Safe default setting is *Disabled*.

Offboard PCI IDE Card

This option specifies if an offboard PCI IDE controller adapter card is used in the computer. You must also specify the PCI expansion slot on the motherboard where the offboard PCI IDE controller card is installed. If an offboard PCI IDE controller is used, the onboard IDE controller on the motherboard is automatically disabled. The settings are *Disabled*, *Auto*, *Slot1*, *Slot2*, *Slot3*, and *Slot4*.

If *Auto* is selected, AMIBIOS automatically determines the correct setting for this option. The Optimal and Fail-Safe default setting is *Auto*.

Offboard PCI IDE Primary IRQ

The Optimal and Fail-Safe default setting is *Disabled*.

Offboard PCI IDE Secondary IRQ

The Optimal and Fail-Safe default setting is *Disabled*.

DMA Channel 0 / 1 / 3 / 5 / 6 / 7

IRQ3	IRQ5	IRQ9	IRQ11	IRQ14
IRQ4	IRQ7	IRQ10	IRQ12	IRQ15

These options specify the bus that the named interrupt request lines (IRQs) are used on. These options allow you to specify IRQs for use by legacy ISA adapter cards.

These options determine if AMIBIOS should remove an IRQ from the pool of available IRQs passed to BIOS configurable devices. The available IRQs pool is determined by reading the ESCD NVRAM. If more IRQs must be removed from the pool, the end user can use these

PCI/PnP Setup options to remove the IRQ by assigning the option to the ISA setting. Onboard I/O is configurable by AMIBIOS. The IRQs used by onboard I/O are configured *PCI/PnP*.

The settings are *PCI/PnP* and *ISA*. The Optimal and Fail-Safe default setting is ***PCI/PnP***.

Reserved Memory Size

This option specifies the size of the memory area reserved for legacy ISA adapter cards. The settings are *16K*, *32K* and *64K*. The Optimal and Fail-Safe default setting is ***Disabled***.

Reserved Memory Address

This option specifies the beginning address (in hex) of the reserved memory area. The specified ROM memory area is reserved for used by legacy ISA adapter cards. The settings are *C0000*, *C4000*, *C8000*, *CC000*, *D0000*, *D4000*, *D8000* and *DC000*. The Optimal and Fail-Safe default setting is ***Disabled***.

6.9 Peripheral Setup

Peripheral Setup options are displayed by choosing the Peripheral Setup icon from the Setup main menu. All Peripheral Setup options are described in this section.

AMIBIOS SETUP - PERIPHERAL SETUP		
©1996 American Megatrends, Inc. All Rights Reserved		
OnBoard FDC	Auto	Available Options: Auto Disabled Enabled
OnBoard Serial Port1	Auto	
OnBoard Serial Port2	Auto	
Serial Port2 Mode	Normal	
IR Transmission Mode	N/A	
Receiver Polarity	N/A	
Transmitter Polarity	N/A	
OnBoard Parallel Port	Auto	
Parallel Port Mode	Normal	
EPP Version	N/A	
Parallel Port IRQ	Auto	
Parallel Port DMA Channel	N/A	
Onboard IDE	Both	
		ESC:Exit ↑↓:Sel PgUp/PgDn:Modify F2/F3:Color

Onboard FDC

This option enables the floppy drive controller on the motherboard. The Optimal and Fail-Safe default settings are *Auto*.

Onboard Serial Port1

This option enables serial port 1 on the motherboard and specifies the base I/O port address for serial port 1.

The settings are *3F8h*, *3E8h*, *Auto*, and *Disabled*. The Optimal default and Fail-Safe settings are *Auto*.

Onboard Serial Port2

This option enables serial port 2 on the motherboard and specifies the base I/O port address for serial port 2.

The settings are *3F8h*, *3E8h*, *Auto*, and *Disabled*. The Optimal default and Fail-Safe settings are *Auto*.

Onboard Parallel Port

This option enables the parallel port on the motherboard and specifies the parallel port base I/O port address. The settings are *378h*, *278h*, *Auto*, and *Disabled*.

The Optimal and Fail-Safe settings is *Auto*.

Parallel Port Mode

This option specifies the parallel port mode. ECP and EPP are both bi-directional data transfer schemes that adhere to the IEEE P1284 specifications. The settings are:

Setting	Description
<i>Normal</i>	The normal parallel port mode is used. This is the default setting.
<i>EPP</i>	The parallel port can be used with devices that adhere to the Enhanced Parallel Port (EPP) specification. EPP uses the existing parallel port signals to provide asymmetric bi-directional data transfer driven by the host device.
<i>ECP</i>	The parallel port can be used with devices that adhere to the Extended Capabilities Port (ECP) specification. ECP uses the DMA protocol to achieve transfer rates of approximately 2.5MB/sec. ECP provides symmetric bi-directional communications.

Parallel Port DMA Channel

This option is only available if the setting for the **Parallel Port Mode** option is ECP. The settings are *Disabled*, *DMA CH (channel) 0*, *DMA CH 1*, and *DMA CH 3*. The default setting is *N/A*.

Onboard IDE

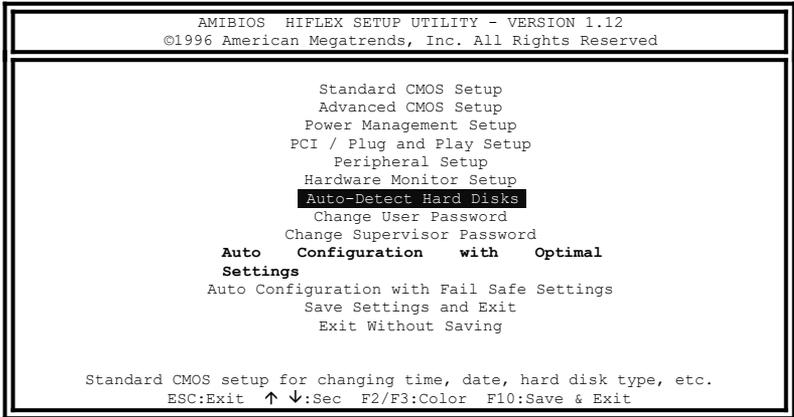
This option specifies the onboard IDE controller channels that will be used. The settings are *Primary*, *Secondary*, *Both*, and *Disabled*. The Optimal and Fail-Safe default settings are ***Both***.

6.10 Hardware Monitor Setup

AMIBIOS SETUP - PERIPHERAL SETUP		
©1996 American Megatrends, Inc. All Rights Reserved		
---System Hardware Monitor---	Available Options:	
Current CPU Temperature	39°C/102°F	-
Current CPU Fan Speed	6463RPM	-
Current Chassis Fan Speed	6875RPM	
Vcore	2.832V	
Vio	3.408V	
+5.000V	5.013V	
+12.000V	12.567V	
-12.000V	-11.930V	
-5.000V	-5.124	
		ESC:Exit ↑↓:Sel
		PgUp/PgDn:Modify
		F2/F3:Color

The Hardware Monitor Setup is for read-only. It shows the current status of the system hardware being monitored by the motherboard through the **optional** LM78 Hardware Monitor ASIC. The items monitored include the system temperature, system voltages, CPU fan speed and chassis fan speed.

6.11 Auto-Detect Hard Disks



This option detects the parameters of an IDE devices and automatically enters them into the Standard CMOS Setup screen. Both CD-ROMs and FLOPTICAL drives can also be detected.

6.12 Password

```
AMIBIOS HIFLEX SETUP UTILITY - VERSION 1.12
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Standard CMOS Setup
Advanced CMOS Setup
Power Management Setup
PCI / Plug and Play Setup
Peripheral Setup
Hardware Monitor Setup
Auto-Detect Hard Disks
Change User Password
Change Supervisor Password
Auto Configuration with Optimal
Settings
Auto Configuration with Fail Safe Settings
Save Settings and
Exit
Exit Without Saving

Standard CMOS setup for changing time, date, hard disk type, etc.
ESC:Exit ↑ ↓:Sec F2/F3:Color F10:Save & Exit
```

If You Do Not Want to Use a Password

Just press <Enter> when the password prompt appears.

Setting a Password

The password check option is enabled in Advanced Setup by choosing either *Always* (the password prompt appears every time the system is powered on) or *Setup* (the password prompt appears only when BIOS is run). The password is stored in the CMOS RAM.

You can enter a password by typing the password on the keyboard.

When you select *Supervisor* or *User*, AMIBIOS prompts for a password. You must set the *Supervisor* password before you can set the *User* password. Enter a 1-6 character password. The password does not appear on the screen when typed. Make sure you write it down. If you forget it, you must drain the CMOS RAM and reconfigure the system.

Chapter 7 Onboard VGA Installation Guide

This chapter describes the VGA onboard with the installation procedures necessary to take advantage of the features of the S3 ViRGE/GX2 graphics accelerator. The topics covered in this chapter are as follows:

7.1	Introduction.....
7.2	Software Installation.....
7.2.1	Drivers
7.2.2	Installations
7.2.2-1	First Time Installation of Microsoft Windows 95
7.2.2-2	Microsoft Windows 95 Driver
7.2.2-3	Installing ViRGE/GX2 VGA Drivers for Windows NT 4.0
7.3	TV Output Feature (for the optional TV output cable).....
7.3.1	Introduction
7.3.2	Timing Option
7.3.3	Settings for Composite/S-Video and NTSC/PAL
7.4	Technical Information.....
7.4.1	Display Memory Configuration
7.4.2	Monitor Connector Pin Assignments

7.1 Introduction

The TI6NLM's onboard AGP VGA is powered by S3 ViRGE/GX2. It combines high-performance integrated SGRAM-based 2D/3D graphics accelerator and full-motion video playback including MPEG-1. It provides a boost in system performance for general Windows and DOS applications, as well as graphics-intensive desktop publishing, CAD and digital video software application.

The onboard VGA features include:

- * S3 ViRGE/GX2 64 bits GUI & Multimedia Accelerator,
- * Windows 95 Plug & Play compliant
- * Base AGP 1.0 compliance
- * High-performance Windows graphics acceleration
- * Compatible with VGA and VESA standards
- * DPMS and DDC2B support
- * YUV 4:2:2 support accelerates MPEG-1 and MPEG-2 playback
- * Hardware windows support video conferencing local view
- * Integrated 230MHz RAMDAC
- * TV output (Composite or S-Video)

DISPLAY RESOLUTIONS

- * 1600x1200x256 colors at 75Hz refresh rates
- * 1280x1024x256 colors at 85Hz refresh rates
- * 1024x768x16.8M colors at 85Hz refresh rates
- * 800x600x16.8M colors at 85Hz refresh rates

DISPLAY MEMORY CONFIGURATION

- * 4MB SGRAM (100MHz)

7.2 Software Installation

7.2.1 Drivers

A diskette shipped with the TI6NLM motherboard provides the drivers for Microsoft Windows 95 and Windows NT 4.0. To achieve high resolution, HiColor and True Color display, appropriate drivers must be loaded in your system.

7.2.2 Installations

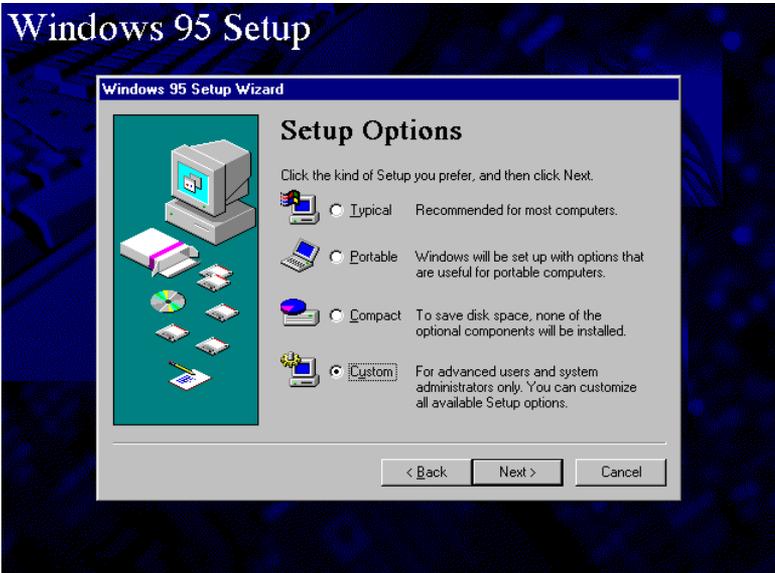
7.2.2-1 First Time Installation of Microsoft Windows 95

The procedures below are to be followed when you are installing Windows 95 for the first time. After which, you can proceed to the next section on installing the ViRGE/GX2 driver for Windows 95. *S3 ViRGE/GX2 is a new VGA accelerator and requires proper driver installation to avoid any problem during the auto hardware detection under Windows 95.*

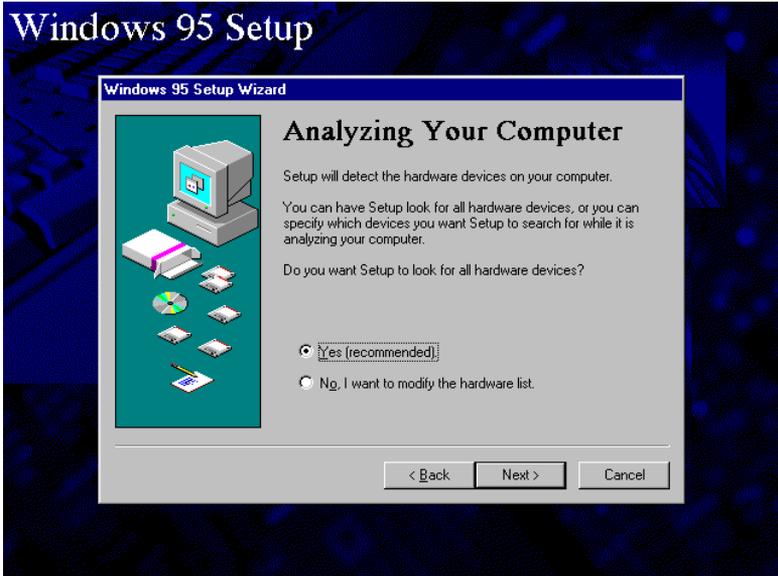
Installation procedure:

Refer to the following procedures when installing Windows 95 for the first time.

1. □ Start the installation and continue until the Windows 95 Setup Wizard appears.
2. □ Select “Custom” under the Setup Options menu.



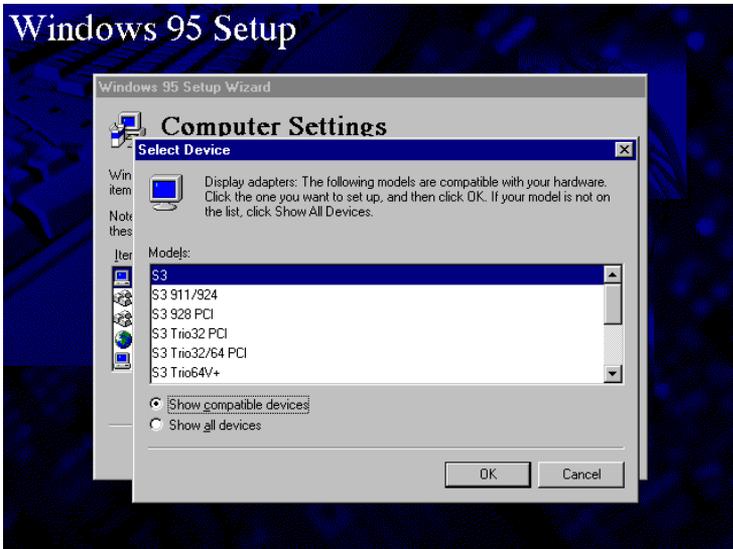
3. □ Continue the installation procedures until the Analyzing Your Computer menu appears. When prompted, choose “Yes”, then select “Next” for Setup to check the system’s hardware devices.



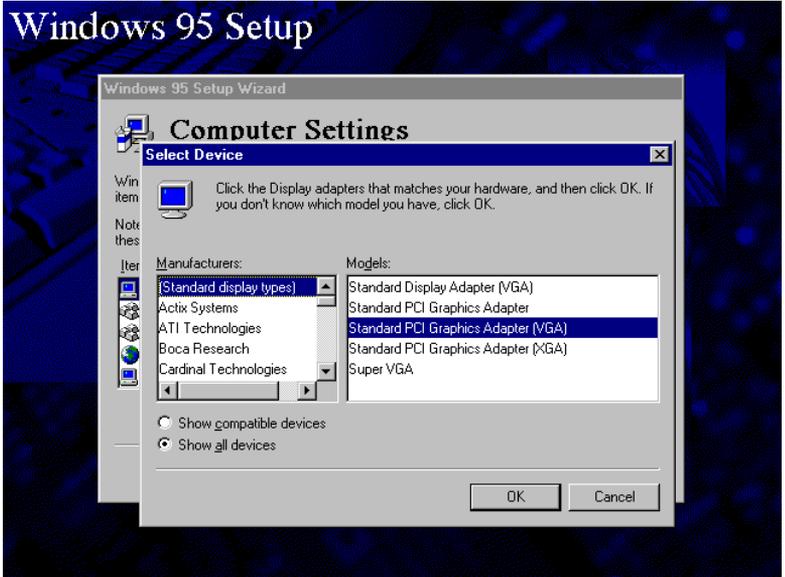
4. In gathering hardware information, Setup will prompt you for the correct hardware such as sound cards, networking cards, etc. Make your selections accordingly, or go to the next menu as shown in the following figure when Setup does not list your hardware device.



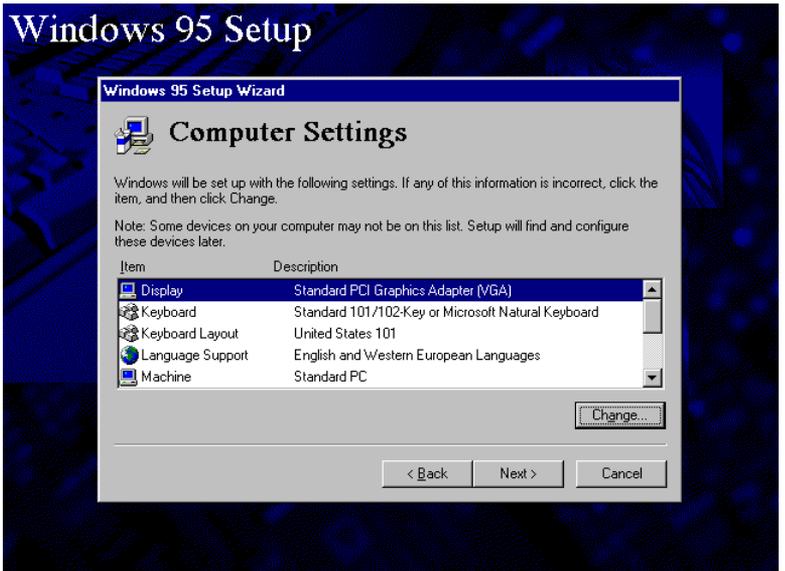
5. □ Setup automatically detects the “Display” with an “S3” display adapter type. Click “Change” and the selections for the display adapter appear as shown in the following figure.



6. □ Select “Show all devices” for Setup to list all other selections. In the “Manufacturers” field, select “Standard display types” and “Standard PCI Graphics Adapter (VGA)” at the right field. Then click “OK”.



7. □ The following menu appears:

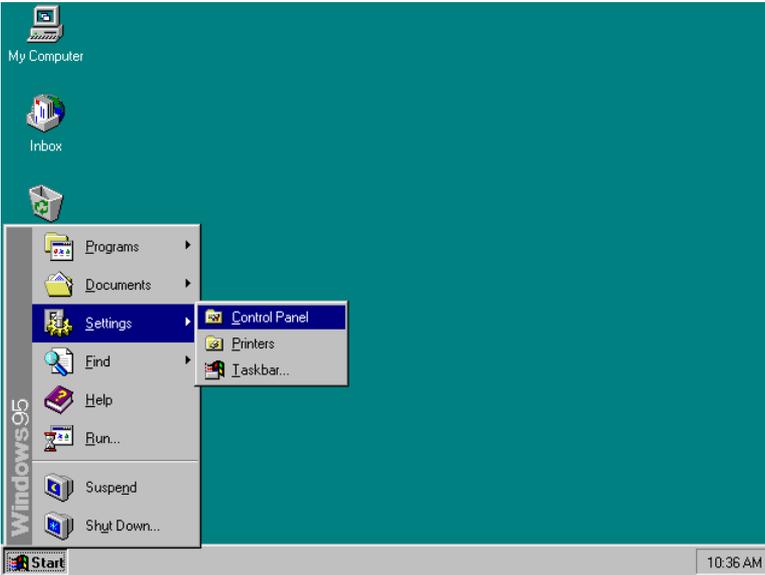


8.□ For other installation procedures, please refer to your Windows 95 installation manual.

7.2.2-2 Microsoft Windows 95 Driver

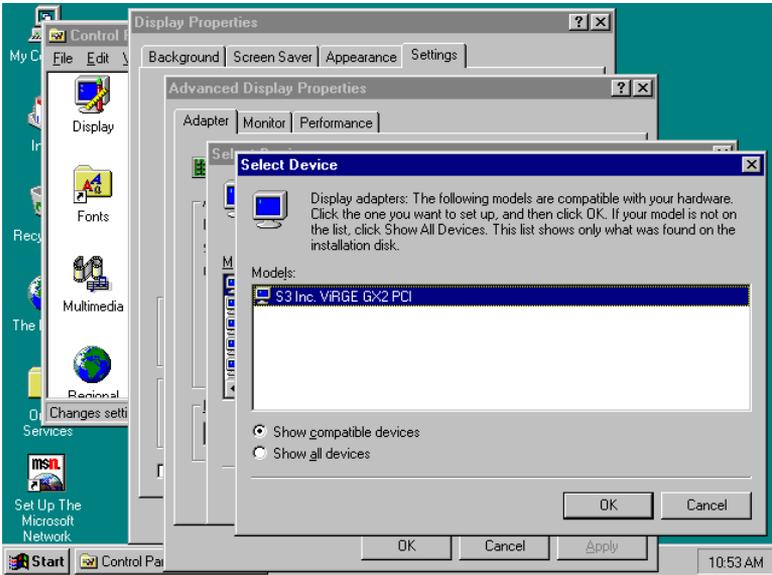
Installation procedure:

- 1.□ You must have Windows 95 installed and operating in standard VGA mode.
- 2.□ Turn on your computer and start your Windows 95 under the standard PCI Graphics Adapter (VGA) mode.
- 3.□ Insert the CD-ROM disk that comes with your motherboard. It is assumed in this chapter that Drive D is your CD-ROM drive.
- 4.□ Click the “Start” button. Select “Settings”, then click “Control Panel”.



5. Click the “Display” icon.
6. Click “Settings”.
7. Click “Advanced Properties”.
8. Click “Change”.
9. Click the “Have Disk ...” button.
10. Type "D:\VGA\VIRGE.GX2\WIN95".

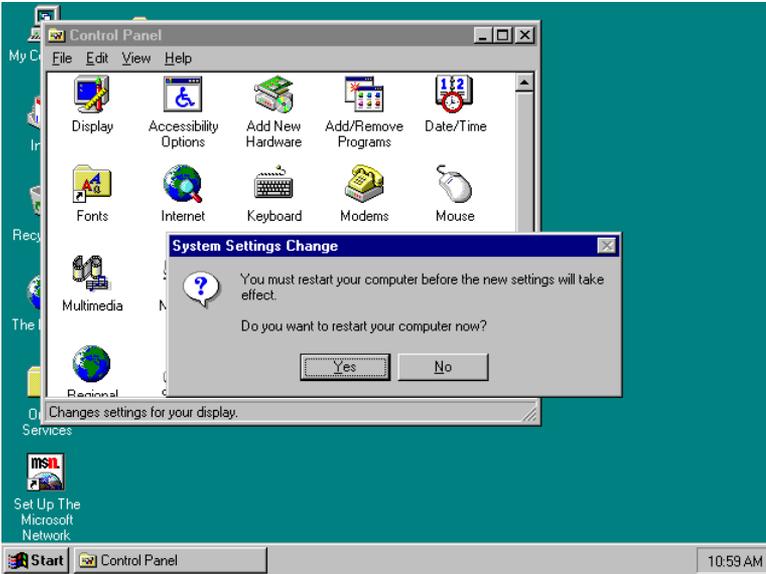
11. Click “OK”, and the following screen appears.



12. Select “S3 Inc. V1RGE/GX2”, then click “OK”. After the files are copied, click the “Close” button and the following screen appears.



13. Click the “Yes” button to restart your computer and for the new settings to take effect.



14. You have now finished the Microsoft Windows 95 Driver software installation.

7.2.2-3 Installing ViRGE/GX2 VGA Drivers for Windows NT 4.0

Installation procedure:

Your Windows NT 4.0 is default to the standard VGA mode (640 x 480, 16 colors).

IMPORTANT: You should install the Windows NT 4.0 Service Pack 3 first before installing the S3 ViRGE/GX2 VGA drivers. If you don't have the Windows NT 4.0 Service Pack 3, please contact your software vendor or download it from Microsoft's web site.

The procedures below show you how to install the S3 ViRGE/GX2 VGA drivers for Windows NT 4.0.

1. Boot Windows NT 4.0.
2. Double click the “My Computer” icon.
3. Double click “Control Panel”.
4. Double click the “Display” icon.
5. Click “Change Display Type”.
6. Click “Change”.

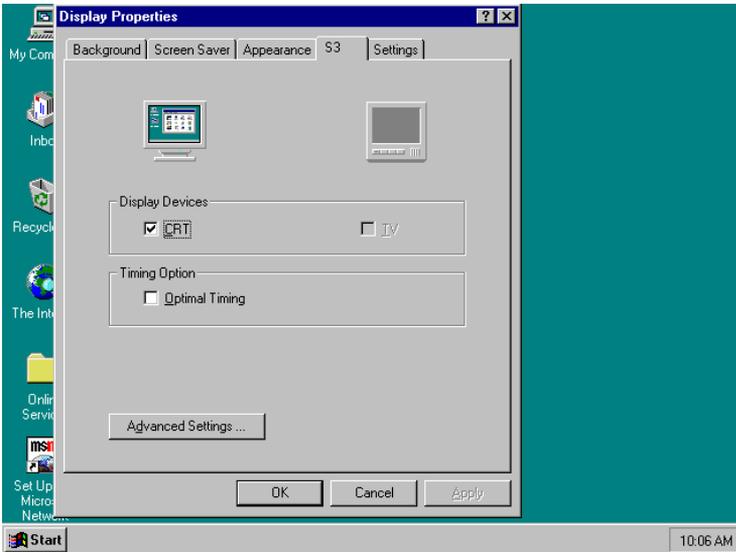
- 7.
8. Click "Have Disk ...", then insert the CD-ROM disk containing the drivers "ViRGE/GX2 VGA drivers ", then type "D:\VGA\VIRGE.GX2\NT40" and press "Enter".
9. Select "S3 ViRGE/GX2", then click "OK".
10. Click "Yes" to copy the drivers to the hard disk.
11. When copying is done, click "OK".
12. Click "Close".
13. Click "OK".
14. Windows NT 4.0 will prompt you to restart computer. Click "OK" to change the Windows NT configuration.

7.3 TV Output Feature (for the optional TV output cable)

7.3.1 Introduction

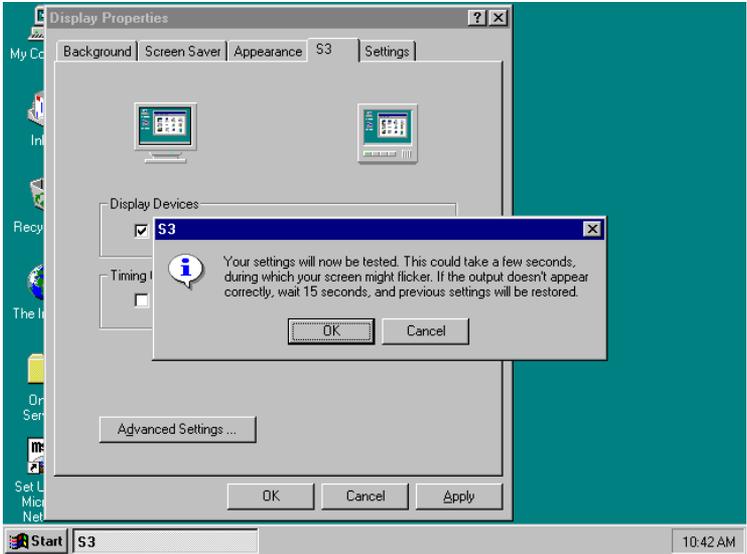
The TI6NLM motherboard provides an optional TV output cable that allows connection of your computer to a television. This function is enabled after you have installed the ViRGE/GX2 VGA drivers for Windows 95. To enable the TV Output function, attach the Composite or S-Video cable (both included with the optional TV output cable) from the television to the external TV output cable. S-Video will give best results. The following describes the procedures on how to enable the TV Output feature.

1. Click the “Start” button.
2. Select “Settings”.
3. Click “Control Panel”.
4. Double click “Display”.
5. Click “S3”. Refer to the figure below.



6. In the previous figure, the TV option cannot be enabled. This happens when there is no connector attached from the television to the computer or the television is not turned on. To enable the TV option, attach the connector (S-Video or Composite) and turn on the television first, then repeat steps 1-5.

7. Afterwards, check the TV checkbox and click “Apply”. The following figure appears.



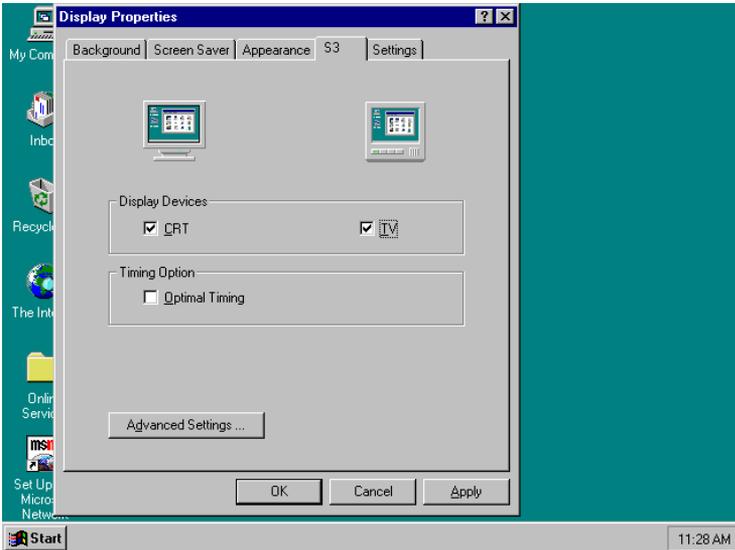
8. When prompted to test the new settings, click “OK”.
9. When the settings have been changed, images are displayed on both your PC monitor and televisions simultaneously.

7.3.2 Timing Option

When TV Output is enabled, both the PC monitor and the television maintains a resolution of 640 x 400. The 80 horizontal lines difference on the television can be displayed by scrolling up or down using the mouse. The Optimal Timing option sets the PC monitor to use standard VGA resolution (640 x 480), while the television resolution remains unchanged. Follow the steps below to enable the Optimal Timing option.

1. Click the “Start” button.
2. Select “Settings”.
3. Click “Control Panel”.
4. Double click “Display”.

5. Click “S3” and the following figure appears.



6. Check the “Optimal Timing” checkbox and click “Apply”. When prompted to test the new settings, click “OK”.
7. After enabling “Optimal Timing”, the computer’s display mode will be changed to standard display mode. *The Optimal Timing option and the TV Output should be simultaneously enabled.*

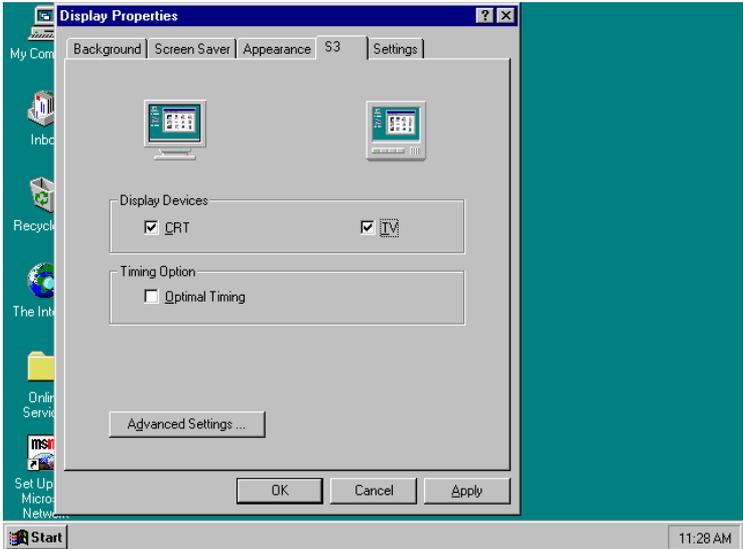
7.3.3 Settings for Composite/S-Video and NTSC/PAL

The optional cable has connectors for Composite Output and S-Video Output that provide different TV output signals. The default setting under Windows 95 is set to Composite output signals. If you are using an S-Video connector, then change the default to S-video after you have enabled the TV Output function.

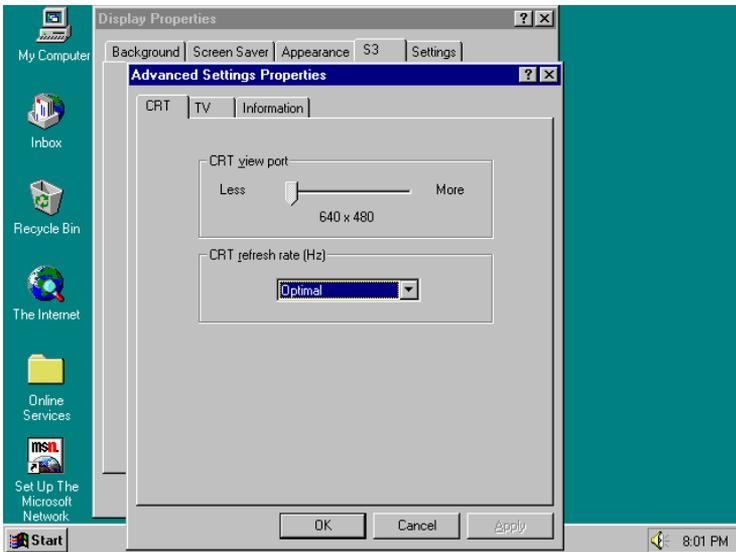
The TV output signals support both NTSC and PAL specifications. The driver for Windows 95 sets the default as NTSC (North American standard). For PAL signals (European standard), change the settings accordingly.

The section below describes the advanced display setting procedures for Composite/S-video and NTSC/PAL options.

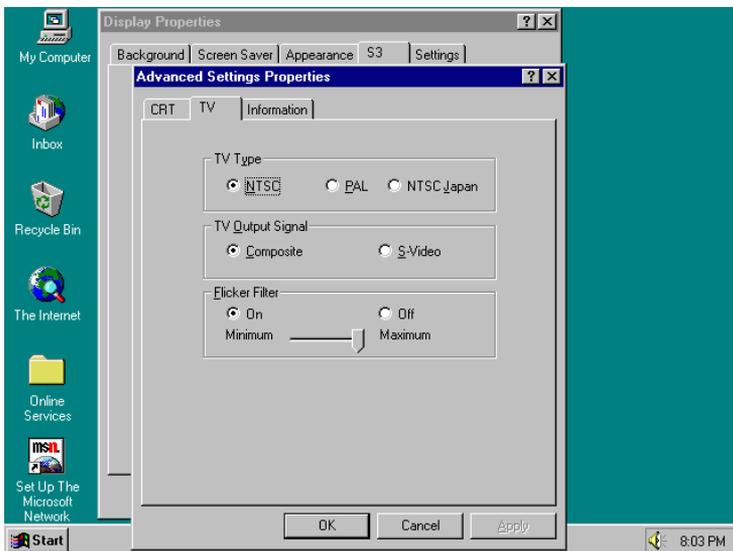
1. Click the “Start” button.
2. Select “Settings”.
3. Click “Control Panel”.
4. Double click “Display”.
5. Click “S3” and the following figure appears.



6. Click “Advanced Settings”.



7. Select “TV”.



8. To change the TV Output Signal to S-Video, select the S-Video option. To change the TV type to PAL, select the PAL option.

- 9.
10. After you have finished changing the settings, click “Apply”.
When prompted to test the new settings, click “OK”.

7.4 Technical Information

7.4.1 Display Memory Configuration

Memory-Resolution/Color Base support

Resolution	2MB	4MB
640x480x256	4	4
640x480x64K	4	4
640x480x16M	4	4
800x600x256	4	4
800x600x64K	4	4
800x600x16M	4	4
1024x768x256	4	4
1024x768x64K	4	4
1024x768x16M	4	4
1280x1024x256		4
1280x1024x64K		4
1280x1024x16M		
1600x1200x256	4	4
1600x1200x64K		4

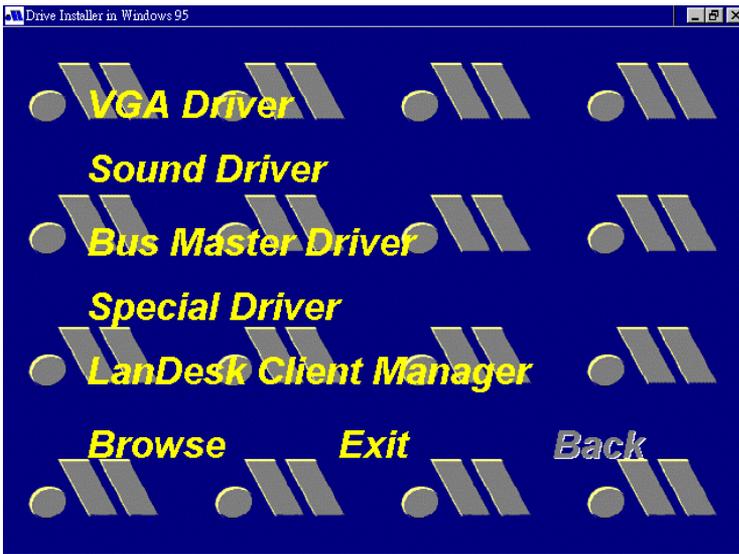
7.4.2 Monitor Connector Pin Assignments

Pin No.	Function
1	Red Video
2	Green Video
3	Blue Video
4	NC
5	Ground
6	Red Return (ground)
7	Green Return (ground)
8	Blue Return (ground)
9	Key (no connection)
10	Sync Return (ground)
11	NC
12	DDC DATA
13	Horizontal Sync
14	Vertical Sync
15	DDC CLOCK

Chapter 8 Onboard Audio Installation Guide

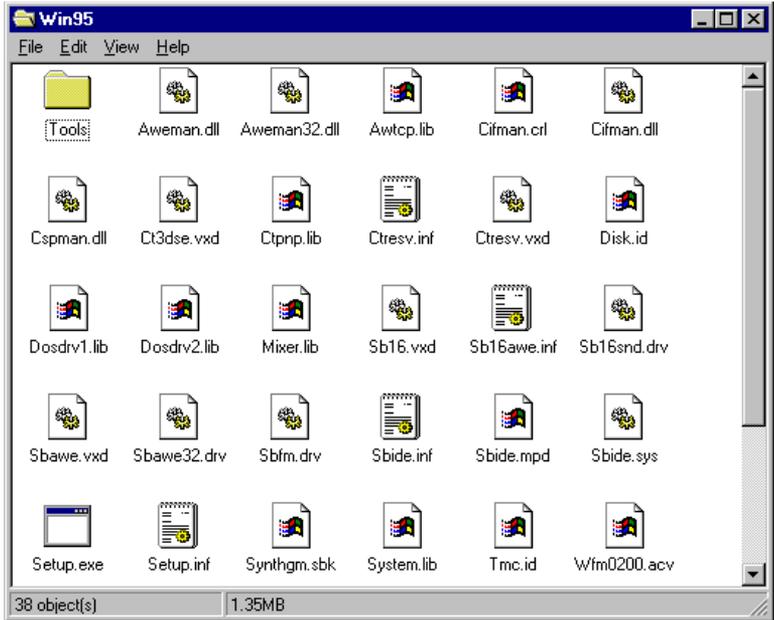
This chapter contains information on Creative ViBRA 16CL Windows 95 Driver and Application Software Installation procedures. Follow the procedures to complete the installation.

1. Turn on the computer and start Windows 95.
2. Insert the CD that is provided with your motherboard into the CD-ROM drive
3. Windows 95 automatically runs the CD and shows the following screen.



4. Click on 'Browse'.
5. Double click on 'sound'.
6. Double click on 'vibracl'.
7. Double click on 'win95'.

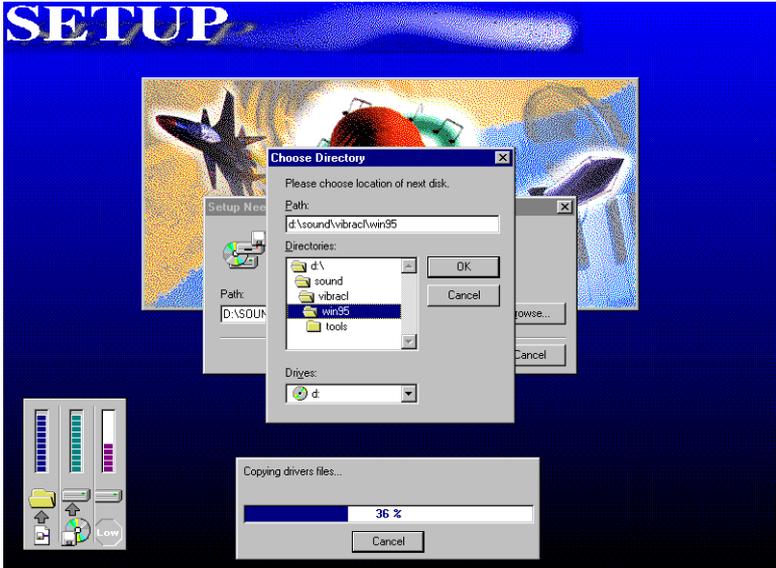
- When the figure below appears, double click on 'Setup.exe'. The necessary drivers will be copied onto your hard drive. When copying is done, restart Windows 95 to enable audio function or proceed with the application software installation.



- To proceed with the application software installation, double click on 'Tools'.
- Double click on 'Setup.exe' to install the audio applications and the welcome screen will be displayed.
- Carefully follow the installation wizard displayed and click the "Next" button to continue the installation process.

12.

13. When prompted to choose the location of the next disk, click “Browse” and select the path “d:\sound\vibracl\win95\” as shown below and click “OK”.



14. Upon completion of the driver and application software installation, the system will prompt you to restart the system. Restart the system to activate the drivers.

Chapter 9 LANDesk User's Guide

This chapter gives a brief introduction to the optional LANDesk® Client Manager (LDCM) utility, as well as the installation procedures.

The following items are covered in this chapter:

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9.2.1 Installing the Local Version of LDCM	
9.2.2 Installing the Administrative Version of LDCM	

LANDesk is a registered trademark of Intel Corporation.

9.1 Introduction

LANDesk Client Manager (LDCM 3.1) provides the capability for managing components (network interface cards, memory, printers, software applications, etc.) within a PC system. It uses the Desktop Management Interface (DMI) standard established by the Desktop Management Task Force (DMTF). Manageable components can be viewed, monitored, and administrated across multiple platforms, either locally or remotely on a network.

The LDCM package has been implemented in two different ways: a user (client/local) version and an administrative version (Remote Companion). The user version provides the ability to only manage the local PC. The administrative version allows a network administrator to manage the local PC and other PC nodes on the network. This means that the administrative version has the ability to gather information about remote PCs, as well as remotely controlling the PCs. The remote access is based upon granted rights by the managed client.

LDCM provides the user with self-help diagnostics, including a PC health meter, local alerting of potential problems, and hardware and software inventory. Automatic polling and alerting of memory and hardware conditions and predictive failure mechanisms minimize downtime and increase effective troubleshooting. LDCM can take periodic "snapshots" of critical configuration files for easy change management and restoration when needed.

To use LDCM, your computer must meet the following requirements:

- Operating System: Windows 95, Windows NT 3.51, or Windows NT4.0
- Memory: about 200KB
- Disk Storage Space: 3-5MB
- Hardware System: a DMI BIOS is required for full LDCM functionality

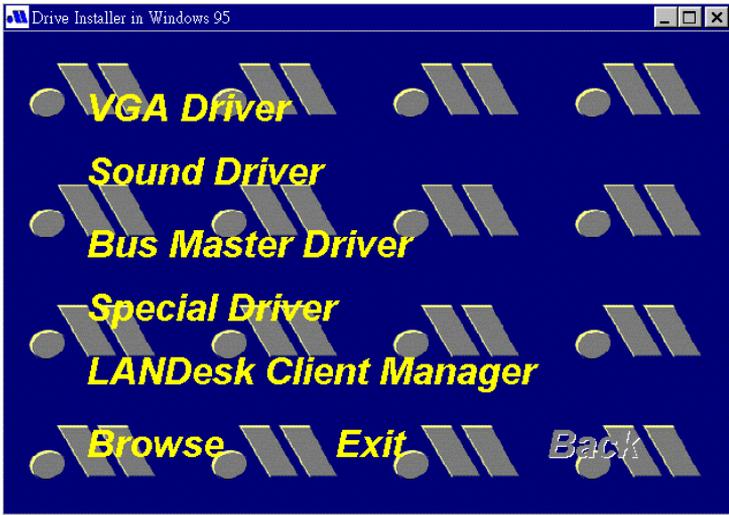
For network computers, the following requirements also apply:

- Protocols: IPX or IP (WinSock-enabled) communication protocol loaded on the client
 - Hardware Interfaces: a network card for communication on the network
-

9.2 Installation

The optional LANdesk utility that comes with the CPU card runs in Windows NT or Windows 95 operating system.

Upon entering the Windows NT 4.0 or Windows 95 environment, insert the CD. Windows will autorun the installation program and show the following screen.



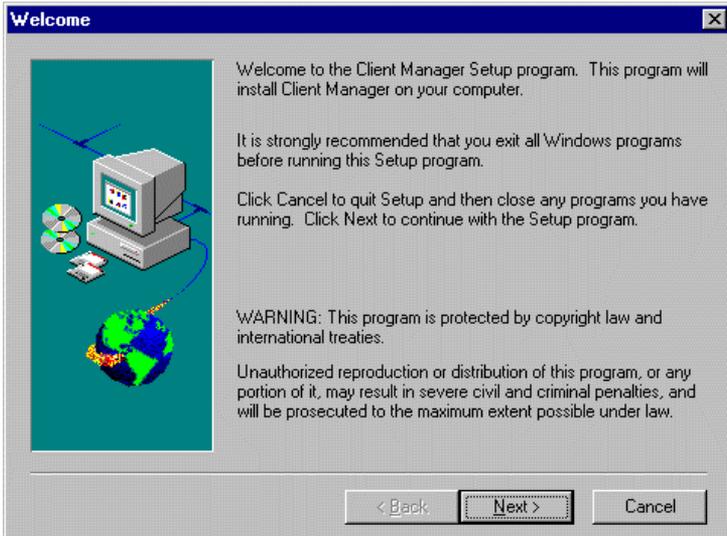
NOTE: During Setup, you will be asked to install Internet Explorer 3.02 in order to continue, or else Setup will be aborted. LDCM supports various languages and will default to English if it is unable to load 'language.dl'.

9.2.1 Installing the Local Version of LDCM

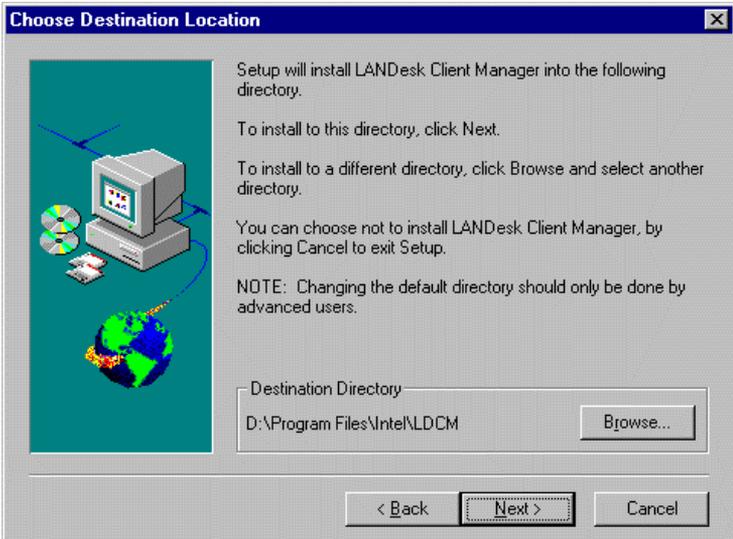
Double Click on 'LANdesk Client Manager' in the initial screen and the following screen will appear. Double click on the local version of LANdesk Client Manager.



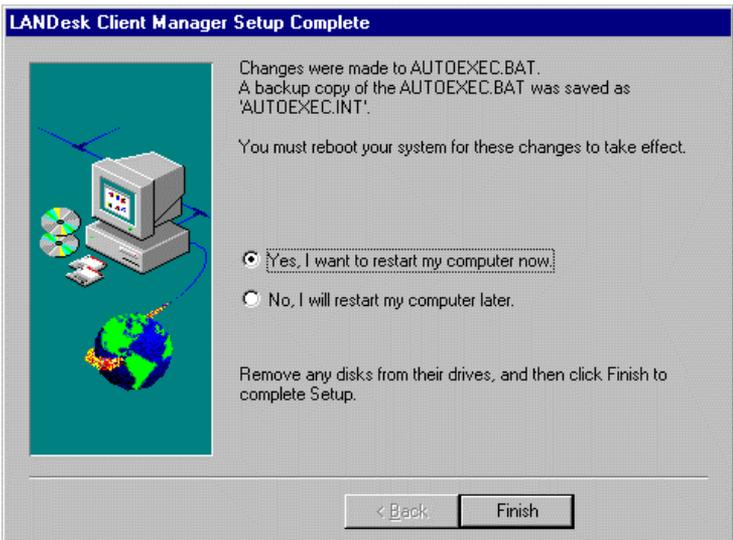
When the Welcome screen appears, click on "Next" to continue with Setup.



Choose the directory location where Setup will install LANdesk Client Manager. Click “Browse” if you want to change the directory suggested. Otherwise, click “Next” to start installing LDCM.

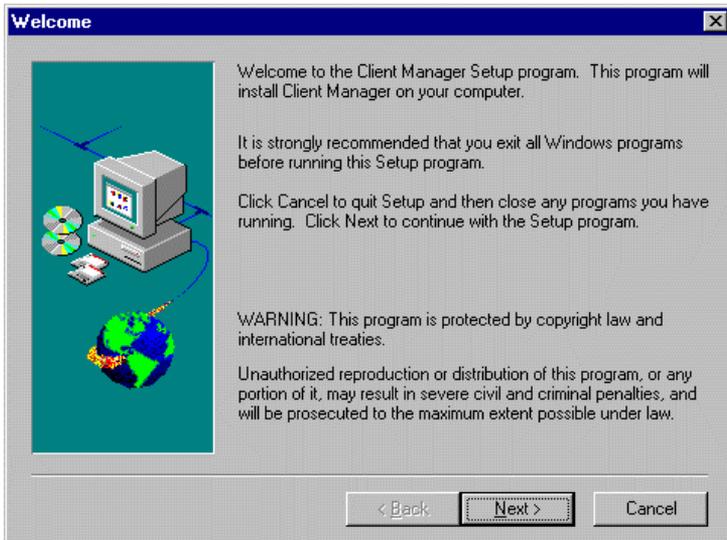


When Setup is finished, changes will have been made to the file AUTOEXEC.BAT. Restart your computer for the changes to take effect.

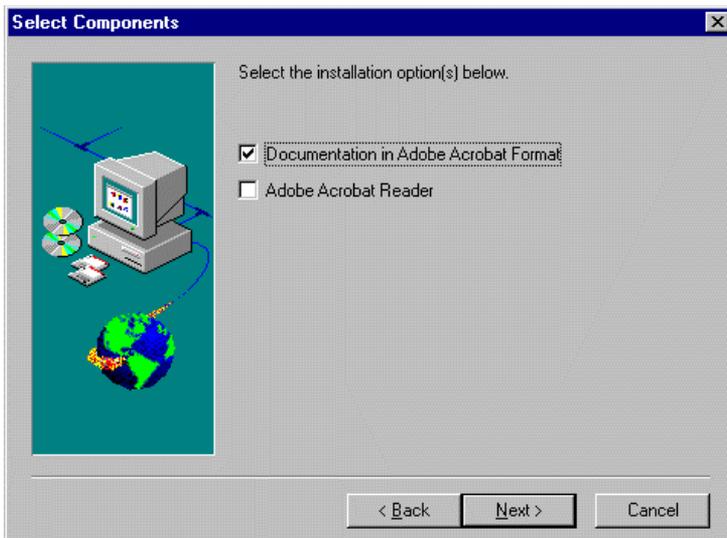


9.2.2 Installing the Administrative Version of LDCM

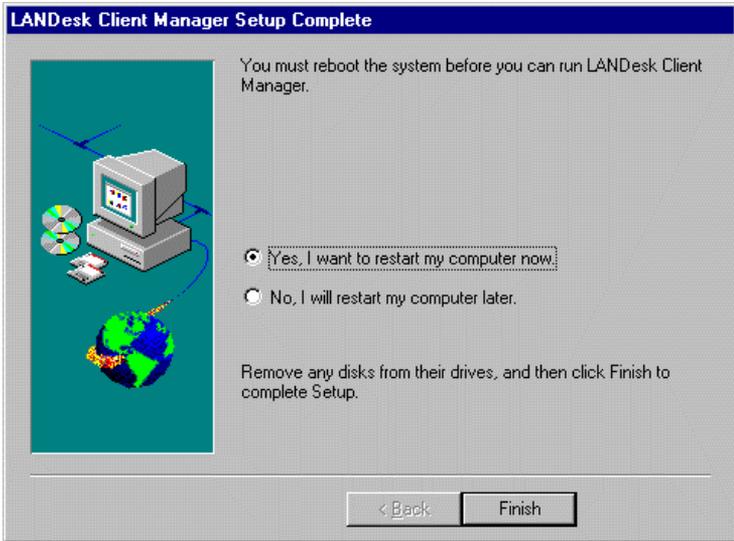
After double clicking on 'LANdesk Client Manager' in the initial screen, select the administrative version of the LDCM and the Welcome screen below will appear. Click on "Next" to continue.



The screen below allows you to install the documentation in Adobe Acrobat format and the Adobe Acrobat Reader software. Select the options you need and click on "Next" to start the installation.



After LANdesk Client Manager Setup is complete, restart your computer to be able to use the LANdesk Client Manager.



Appendix

A. Slot 1 Retention Mechanism

1. To install the Slot 1 mechanism, fasten it with the four screws from underneath the motherboard. Refer to the drawing below.
2. To release the CPU module from the retention mechanism, press the two sides of the module. Refer to the drawing below.

