ROCKY – 3708(E2V/EV)
Celeron™ & Pentium® III with
Dual LAN and AGP4X VGA SBC
Ver1.1

Manual Revision 1.1 May 1th,2002

The information in this document is subject to change without prior notice in order to improve reliability, design and function and does not represent a commitment on the part of the manufacturer.

In no event will the manufacturer be liable for direct, indirect, special, incidental, or consequential damages arising out of the use or inability to use the product or documentation, even if advised of the possibility of such damages.

Trademarks
ROCKY-3708E2V is registered trademarks of ICP Electronics Inc.; IBM PC is a registered trademark of International Business Machines Corporation. Intel is a registered trademark of Intel Corporation. AMI is registered trademarks of American Megatrends Inc.. Other product names mentioned herein are used for identification purposes only and may be trademarks and/or registered trademarks of their respective companies.

Support
Any questions regarding the content of this manual or related issues can be e-mailed to us directly at: SUPPORT@IEI.COM.TW

Contents

1

Introduction

Welcome to the ROCKY-3708E2V Celeron & Pentium® III Single Board Computer. The ROCKY-3708E2V board is an ISA/PCI form factor board, which comes equipped with high performance Pentium® III Processor and advanced high performance multi-mode I/O, designed for the system manufacturers, integrators, or VARs that want to provide all the performance, reliability, and quality at a reasonable price.

The ROCKY-3708E2V provides SIS315 AGP4X VGA on board with 32MB frame buffer ,and add SIS301 to provide second CRT output or TV-OUT (include S Video and Composite output)(option) . The SIS315 VGA chip is 3D graphics chipset, which provides up to 2048x1536x16M-color resolution.

This board has a built-in Compact Flash Disk Socket for embedded applications. The Compact Flash Disk is 100% software compatible with hard disks. Users can use any DOS command without any extra software utility.

An advanced high performance super AT I/O chip – ITE 8705 is used in the ROCKY-3708E2V board. Both on-chip UARTs are compatible with the NS16C550. The parallel port interface are compatible with IBM PC/AT architecture.

The ROCKY-3708E2V has dual Fast Ethernet LAN controller(SIS900 and Intel82559). The ROCKY-3708EV has one Fast Ethernet LAN controller (SIS900) .(It's the master difference between ROCKY-3708E2V and ROCKY-3708EV) .Which are fully integrated 10BASE-T/100BASE-TX LAN solution with high performance networking functions and low power features.

The ROCKY-3708E2V uses the advanced SIS635 Chipset which is 100% PCI software compatible chipset with PCI 2.1 standard.

1.1 Specifications

CPU(PGA370)	Intel Celeron® and Pentium® III (FC-PGA) Processor, supports 66/100/133 MHz FSB (Support to 1.26GHZ /133MHZ or above)
Bus interface	PCI/ISA bus, PICMG compliant
Bus speed	ISA : 8MHz, PCI: 33MHz
DMA channels	7
Interrupt levels	15
Chipset	SIS635
Real-time clock/calendar	SIS635
RAM memory	Two 168-pin DIMM sockets support SDRAM module. The max. Memory is up to 1.0GB.
ATA/100 IDE interface	Up to four PCI Enhanced IDE hard drives. The ATA/100 IDE can handle data transfer up to 100MB/s. Compatible with existing ATA-2 IDE specifications its best advantage, so there is no need to do any changes for users' current accessories.
Floppy disk drive interface	Supports up to two floppy disk drives, 5.25"(360KB and 1.2MB) and/or 3.5" (720KB, 1.44MB, and 2.88MB)
Serial ports	Two RS-232 ports with 16C550 UART (or compatible) with 16-byte FIFO buffer. Support up to 115.2Kbps. Ports can be individually configured to COM1, COM2 or disabled.
Bi-directional parallel port	Configurable to LPT1, LPT2, LPT3 or disabled. Supports EPP/ECP/SPP

Hardware monitor	Built-in to monitor power supply voltage and fan speed status
IrDA port	Supports Serial Infrared(SIR) and Amplitude Shift Keyed IR(ASKIR) interface
USB port	Supports two USB ports for future expansion
Watch-dog timer	Software Programmable Reset is generated when CPU does not periodically trigger the timer. Your can use I/O Port hex 043 and 443 to control the watchdog and generate a system reset.
VGA controller	SIS315 AGP4X 3D graphics Core plus Advanced Memory Controller with 32MB frame buffer on board. Screen Resolution: up to 2048x1536x16M.
Sound	CMI8738LX support 6CH DAC for AC3 5.1 channel purpose. HRTF –based positional audio, supporting Directsound 3D and A3D interface.
Ethernet	ROCKY-3708E2V : Intel 82559 and SIS900 Fast Ethernet controllers, IEEE 802.3u Auto-Negotiation support for 10BASE-T/100BASE-TX standard. Two RJ45 connectors are located on the mounting bracket for easy connection. (ROCKY-3708EV : only SIS900 Fast Ethernet controller be provided)
Flash disk socket	The Compact Flash socket is provided for Flash Disk application that will let users to use the Flash Disk with DOS command, without any extra software utility.
Keyboard and PS/2 mouse connector	A 6-pin mini DIN connector is located on the mounting bracket for easy connection to a keyboard or PS/2 mouse. For alternative application, a keyboard and a PS/2 mouse pin header connector are also available on board.
Power consumption	+5V @ 5.4A (Pentium® III 1200MHz/133MHZ,1.0GB SDRAM)

	+12V @ 240mA ,5VSB @270mA
Operating temperature	0◦ ~ 55◦ C (CPU needs Cooler)

1.2 What You Have

In addition to this *User's Manual*, the ROCKY-3708E2V package includes the following items:

- One ROCKY-3708E2V Single Board Computer
- Two RS-232 Cable (Part NO. 32200-000041)
- One Printer Cable with bracket (Part NO.32200-000040)
- One FDD cable (Part NO.32200-000017)
- One AUDIO cable. (Part NO.19800-000015)
- One ATA/100 IDE cables (Part NO. 32200-000052)
- One 6-pin Mini-Din converts to two 6-pin mini-Din cables for keyboard and mouse connection. (Part NO. 32000-000138)
- One CD-ROM Disc (Driver)

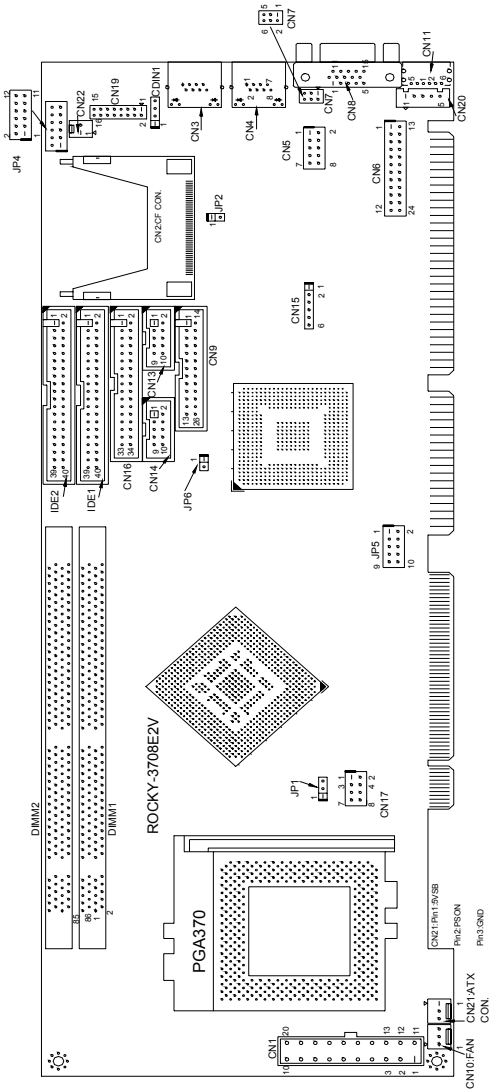
If any of these items are missing or damaged, contact the dealer from whom you purchased this product. Save the shipping materials and carton in case you want to ship or store the product in the future.

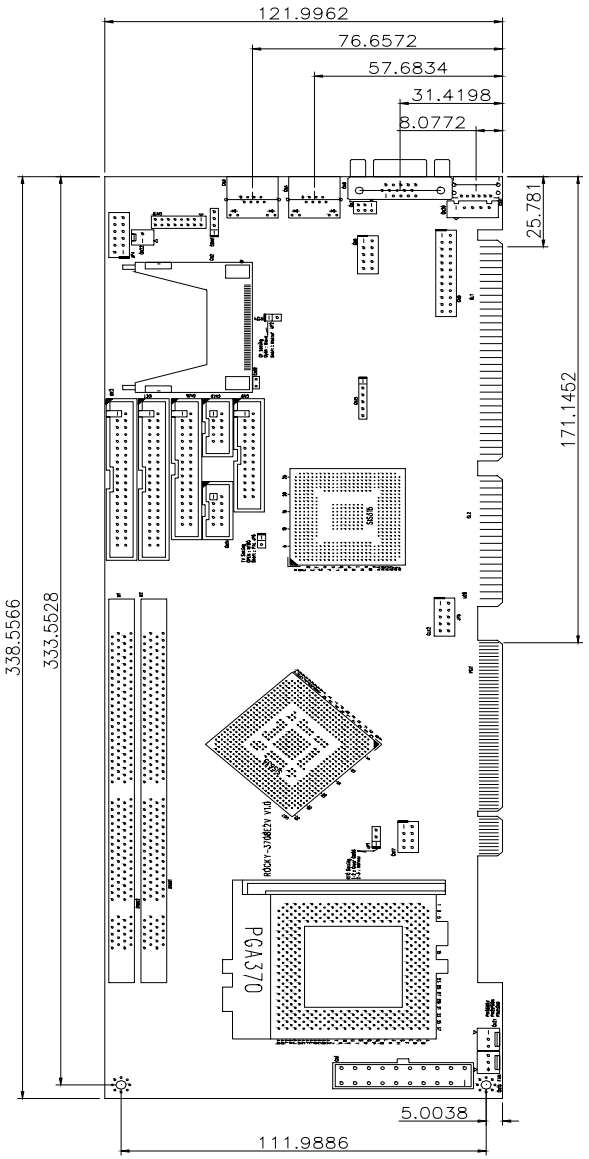
2

Installation

This chapter describes how to install the ROCKY-3708E2V. At first, the layout of ROCKY-3708E2V is shown, and the unpacking information that you should be careful is described. The jumpers and switches setting for the ROCKY-3708E2V's configuration, such as CPU clock setting, and watchdog timer, are also included.

2.1 ROCKY – 3708E2V's Layout





2.2 Unpacking Precautions

Some components on ROCKY-3708E2V SBC are very sensitive to static electric charges and can be damaged by a sudden rush of power. To protect it from unintended damage, be sure to follow these precautions:

- ✓ Ground yourself to remove any static charge before touching your ROCKY-3708E2V SBC. You can do it by using a grounded wrist strap at all times or by frequently touching any conducting materials that is connected to the ground.
- ✓ Handle your ROCKY-3708E2V SBC by its edges. Don't touch IC chips, leads or circuitry if not necessary.
- ✓ Do not plug any connector or jumper while the power is on.

Table of Jumpers

LABEL	FUNCTION
JP1	RTC Setting
JP2	Compact Flash setting
JP4	External switches and indicators
JP5	System and AGP clock setting
JP6	TV-OUT setting

Note: All shaded rows in tables of this manual are the default settings for the ROCKY-3708E2V.

2.3 Clear CMOS Setup (JP1)

If want to clear the CMOS Setup (for example forgot the password you should clear the setup and then set the password again.), you should close the JP1 (1-2) about 3 seconds, then open it again. Set back to normal operation mode JP1(2-3).

- **JP1 : Clear CMOS Setup**

JP1	DESCRIPTION
1-2	Clear CMOS Setting
2-3	**Normal Operation**

2.4 Compact Flash Setting (JP2)

Set the operating mode of the Compact Flash Disk.

- **JP2 : Compact Flash Setting**

JP2	DESCRIPTION
OPEN	**Slave**
Close	Master

2.5 External Switches and Indicators (JP4)

There are several external switches and indicators for monitoring and controlling your CPU board. All the functions are in the JP4 connector.

CN31 : External Switches and Indicators

	PIN	DESCRIPTION	PIN	DESCRIPTION	
Power LED	1	+5V	2	Speaker	Speaker
	3	GND	4	N/C	
	5	GND	6	N/C	
	7	EXTSMI#	8	+5V	
HDD Indicator	9	+5V	10	Reset Switch	Reset button
	11	IDELED-	12	GND	

2.6 System and AGP clock setting (JP5)

CPU FSB default clock be set to 133MHZ by jumper JP5; it can be set through software in CMOS setup (please refer CMOS SETUP setting in page 33).

- **JP5 (1 – 8) : CPU and SDRAM Clock Setting**

1-2	3-4	5-6	7-8	CPU/RAM CLOCK
OPEN	OPEN	OPEN	OPEN	66.6/66.6
CLOSE	OPEN	OPEN	OPEN	100/100
CLOSE	CLOSE	OPEN	OPEN	133.3/133.3

- **JP5 (9,10): AGP CLOCK Setting**

9-10	AGP CLOCK
OPEN	66.6 MHZ
CLOSE	50 MHZ

2.7 TV-Output mode Setting (JP6)

The ROCKY-3708E2V has TV-output function that be provided from SIS301(option) . It can be selected NTSC or PAL mode to output .

- **JP6 : TV-Output mode setting**

JP6	DESCRIPTION
OPEN	**NTSC**
Close	PAL

3

Connection

This chapter describes how to connect peripherals, switches and indicators to the ROCKY- 3708E2V board.

Table of Connectors

LABEL	FUNCTION
CN1	ATX power supply Connector
CN2	Compact Flash Socket
CN3	LAN port (RJ45/Intel82559) Connector
CN4	LAN port (RJ45/SIS900) Connector
CN5	Secondary CRT Connector(optional)
CN6	DVI-Output Connector (reserve)
CN7	TV-Output Connector(optional)
CN8	Primary CRT Output Connector
CN9	Parallel Port Connector
CN10	FAN Connector
CN11	PS2 Mouse/Keyboard Connector
CN13	Serial Port 2 Connector
CN14	Serial Port 1 Connector
CN15	IRDA Connector
CN16	Floppy Disk Connector
CN17	USB Connector
CN19	Audio Connector
CN21	5VSB/PSON Power supply connector
CN22	Power Button Connector
ID1	Primary IDE Connector
ID2	Secondary IDE Connector

3.1 ATX 20-PIN Power Connector (CN1)

This connector supports the ATX power, functions such as modem Ring on, wake-up LAN and soft power off are supported by mainboard. (Power source from Mainboard)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	3.3V	2	3.3V
3	GND	4	5V
5	GND	6	5V
7	GND	8	PW_OK
9	5VSB	10	12V
11	3.3V	12	-12V
13	GND	14	ATX-ON
15	GND	16	GND
17	GND	18	-5V
19	5V	20	5V

3.2 Compact Flash Connector--TYPEII (CN2)

The ROCKY-3708E2V supports one CompactFlash socket that be provided from IDE2 . If it already be connected device (like HDD or CD-ROM) in IDE2 , you must set the jumper to avoid the conflict.(like master or slave)

- **CN2 : CompactFlash Socket**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GROUND	26	VCC-IN CHECK2
2	DATA3	27	DATA11
3	DATA4	28	DATA12
4	DATA5	29	DATA13
5	DATA6	30	DATA14
6	DATA7	31	DATA15
7	HDC_CS0#	32	HDC_CS1#
8	N/C	33	N/C
9	GROUND	34	IOR#
10	N/C	35	IOW#
11	N/C	36	N/C
12	N/C	37	INTERRUPT
13	+5V	38	+5V
14	N/C	39	CSEL
15	N/C	40	N/C
16	N/C	41	RESET#
17	N/C	42	IORDY
18	SA2	43	N/C
19	SA1	44	+5V
20	SA0	45	HDD_ACTIVE#
21	DATA0	46	N/C
22	DATA1	47	DATA8
23	DATA2	48	DATA9
24	N/C	49	DATA10
25	VCC-IN CHECK2	50	GROUND

3.3 LAN Port RJ45 Connector (CN3,CN4)

The ROCKY-3708E2V is equipped with two built-in 10/100Mbps Ethernet controllers. You can connect it to your LAN through RJ45 LAN connectors. There are two LED on the connector indicating the status of LAN. The pin assignments are as following:

Yellow LED : Speed (100Mbps : ON , 10Mbps : OFF)
Green LED : Activity

- **CN3/CN4: LAN RJ45 Connector**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	TX+	8	N/C
2	TX-	9	GROUND
3	RX+	10	GROUND
4	N/C	11	SPEED
5	N/C	12	GROUND
6	RX-	13	ACTIVITY
7	N/C	14	GROUND

Notes: The ROCKY-3708EV only provides CN4 for using SIS900 Fast Ethernet controller.

3.4 VGA/TV-OUT Connector (CN8/CN5/CN7)

The ROCKY-3708E2V has a built-in 15-pin VGA connector (CN8) directly connects to your CRT monitor and a pin header 10pin (CN5)(option) provide secondary output through attached cable in the box.

The primary CRT output be provided from SIS315. The secondary CRT output be provided from SIS301. (option)
They can support dual-view function.

The SIS301 also provides other functions that are TV-OUT and DVI-OUT . It is can provide one function at the same time. So it supports dual-view combination, like CRT1/CRT2 , CRT1/TV-OUT, or CRT1/DVI-OUT.(option)

• **CN8 : 15-pin Female Connector**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RED_1	2	GREEN_1
3	BLUE_1	4	N/C
5	GROUND	6	GROUND
7	GROUND	8	GROUND
9	+5V	10	GROUND
11	N/C	12	DDCDAT_1
13	HSYNC_1	14	VSYNC_1
15	DDCCLK_1		

• **CN5 : 10-pin header Connector (2x5_2.54mm)(optional)**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RED_2	2	DDCCLK_2
3	GREEN_2	4	DDCDAT_2
5	BLUE_2	6	GROUND
7	HSYNC_2	8	GROUND
9	VSYNC_2	10	GROUND

• **CN7 : TV-OUT Connector (2x3_2.00mm)(optional)**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GROUND	2	Y/Luminance
3	GROUND	4	C/Chrominance
5	GROUND	6	CVBS/Composite

• **CN6 : DVI-OUT Connector (2x12_2.00mm) (Reserve)**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DVI2-	13	N/C
2	DVI2+	14	+5V
3	GROUND	15	GROUND
4	N/C	16	SENSE
5	N/C	17	DVI0-
6	DDCCLK_2	18	DVI0+

7	DDCDAT_2	19	GROUND
8	N/C	20	N/C
9	DVI1-	21	N/C
10	DVI1+	22	GROUND
11	GROUND	23	TXC+
12	N/C	24	TXC-

3.5 Parallel Port (CN9)

This port is usually connected to a printer. The ROCKY-3708E2V includes an on-board parallel port, accessed through a 26-pin flat-cable connector CN9.

• **CN9 : Parallel Port Connector (2x13_2.54mm)**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	STROBE#	2	DATA 0
3	DATA 1	4	DATA 2
5	DATA 3	6	DATA 4
7	DATA 5	8	DATA 6
9	DATA 7	10	ACKNOWLEDGE
11	BUSY	12	PAPER EMPTY
13	PRINTER SELECT	14	AUTO FORM FEED #
15	ERROR#	16	INITIALIZE
17	PRINTER SELECT LN#	18	GROUND
19	GROUND	20	GROUND
21	GROUND	22	GROUND
23	GROUND	24	GROUND
25	GROUND		

3.6 CPU Fan Connector (CN10)

The ROCKY-3708E2V provides one CPU cooling fan connectors. This connector can supply 12V/500mA to the cooling fan that supply full speed.

• **CN10 : Fan Connector**

PIN NO.	DESCRIPTION
1	Ground
2	12V
3	Sensor

3.7 Keyboard & PS/2 Mouse Connector (CN11)

A 6-pin mini DIN connector (CN11) is located on the mounting bracket for easy connection to a keyboard or a PS/2 mouse. The card comes with a cable to convert from the 6-pin mini-DIN connector to two 6-pin mini-DIN connectors for keyboard and mouse connection.

- **CN11 : 6-pin Mini-DIN Keyboard Connector**

PIN NO.	DESCRIPTION
1	KEYBOARD DATA
2	MOUSE DATA
3	GROUND
4	+5V
5	KEYBOARD CLOCK
6	MOUSE CLOCK

For alternative application, a keyboard pin header connector is also available on board, located on CN20.

- **CN20 : 5-pin Header Keyboard Connector**

PIN NO.	DESCRIPTION
1	KEYBOARD CLOCK
2	KEYBOARD DATA
3	N/C
4	GROUND
5	+5V

3.8 Serial Ports (CN13, CN14)

The ROCKY-3708E2V offers two high speeds NS16C550 compatible UART.

CN14 (COM1) : 10-pin header on board
CN13 (COM2) : 10-pin header on board

Serial port connections (CN14, CN13)

Connector	Ports	Address	Interrupt
CN14	COM1	3F8	IRQ4
CN13	COM2	2F8	IRQ3

- **Serial Port 10-pin Connector (2x5_2.54mm)**

PIN NO.	DESCRIPTION
1	DATA CARRIER DETECT (DCD)
2	RECEIVE DATA (RXD)
3	TRANSMIT DATA (TXD)
4	DATA TERMINAL READY (DTR)
5	GROUND (GND)
6	DATA SET READY (DSR)
7	REQUEST TO SEND (RTS)
8	CLEAR TO SEND (CTS)
9	RING INDICATOR (RI)
10	NC

3.9 IrDA Infrared Interface Port (CN15)

The ROCKY-3708E2V has a built-in IrDA port which supports Serial Infrared (SIR) or Amplitude Shift Keyed IR (ASKIR) interface. If you want to use the IrDA port, you have to configure SIR or ASKIR model in the BIOS under Peripheral Setup COM2. Then the normal RS-232 COM 2 will be disabled.

- **CN24: IrDA connector**

PIN NO.	DESCRIPTION
1	VCC
2	CIR-RX
3	IR-RX
4	Ground
5	IR-TX
6	CIR-TX

3.10 Floppy Disk Drive Connector (CN16)

The ROCKY-3708E2V board is equipped with a 34-pin daisy-chain drive connector cable.

- **CN16 : FDC Connector (2x17_2.54mm)**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GROUND	2	REDUCE WRITE
3	GROUND	4	N/C
5	GROUND	6	N/C
7	GROUND	8	INDEX#
9	GROUND	10	MOTOR ENABLE A#
11	GROUND	12	DRIVE SELECT B#
13	GROUND	14	DRIVE SELECT A#
15	GROUND	16	MOTOR ENABLE B#
17	GROUND	18	DIRECTION#
19	GROUND	20	STEP#
21	GROUND	22	WRITE DATA#
23	GROUND	24	WRITE GATE#
25	GROUND	26	TRACK 0#
27	GROUND	28	WRITE PROTECT#
29	GROUND	30	READ DATA#
31	GROUND	32	SIDE 1 SELECT#
33	GROUND	34	DISK CHANGE#

3.11 USB Port Connector (CN17)

The ROCKY- 3708E2V provide two built-in USB ports for the future new I/O bus expansion.

CN17			
PIN NO.	**DESCRIPTION**	**PIN NO.**	**DESCRIPTION**
1	VCC	2	GROUND
3	DATA1-	4	DATA2+
5	DATA1+	6	DATA2-
7	GROUND	8	VCC

3.12 AUDIO Connector (CN19)

The ROCKY-3708E2V has a built-in AUDIO chipset (CMEDIA CMI8738LX) ; connector directly connects to the pin-header (CN9) . The Audio chipset can support 5.1 channel sounds that include LINEOUT, REAR, and CENTER/BASS .

- **CN9 : Audio Connector (2x8_2.00mm)**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	LINEOUT_L	2	GROUND
3	LINEOUT_R	4	GROUND
5	CENTER	6	BASS
7	GROUND	8	GROUND
9	LININ_L	10	LINEIN_R
11	GROUND	12	GROUND
13	REAR_L	14	REAR_R
15	MIN_IN	16	GROUND

Notice: LINE OUT be amplified through one amplifier .
When RL=4 ohm , the amplifier provides power 6 W to output.

3.13 ATX Power Button Connector (CN21)

When the ROCKY-3708E2V want to use ATX power, but the power be provided from backplane . The ROCKY-3708E2V provide two connectors (CN21, CN22) to get this function. The detail combination be described in Appendix C.

- **CN21 : Backplane to Mainboard Connector**

PIN NO.	DESCRIPTION
1	5VSB
2	ATX-ON
3	GND

- **CN22 : 2-pin header ATX BUTTON Connector**

PIN NO.	DESCRIPTION
1	ATX POWER BUTTON
2	GND

★ **Power source from Backplane with ATX Connector (Through Power Button & +5VSB)**

3.14 PCI E-IDE Disk Drive Connector (IDE1, IDE2)

You can attach four IDE(Integrated Device Electronics) hard disk drives on two channels. These connectors support Ultra-DMA100 IDE devices. Non-DMA100 devices are suggested to be connecting to the secondary IDE connector.

IDE 1 : Primary IDE Connector
IDE 2 : Secondary IDE Connector

• **IDE1/IDE2 : IDE Interface Connector (2x20_2.54mm)**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RESET#	2	GROUND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	GROUND	20	N/C
21	N/C	22	GROUND
23	IOW#	24	GROUND
25	IOR#	26	GROUND
27	N/C	28	BALE - DEFAULT
29	N/C	30	GROUND - DEFAULT
31	INTERRUPT	32	IOCS16#-DEFAULT
33	SA1	34	Ultra-66 Cable ID
35	SA0	36	SA2
37	HDC CS0#	38	HDC CS1#
39	HDD ACTIVE#	40	GROUND

4

BIOS SETUP

4.1 Introduction

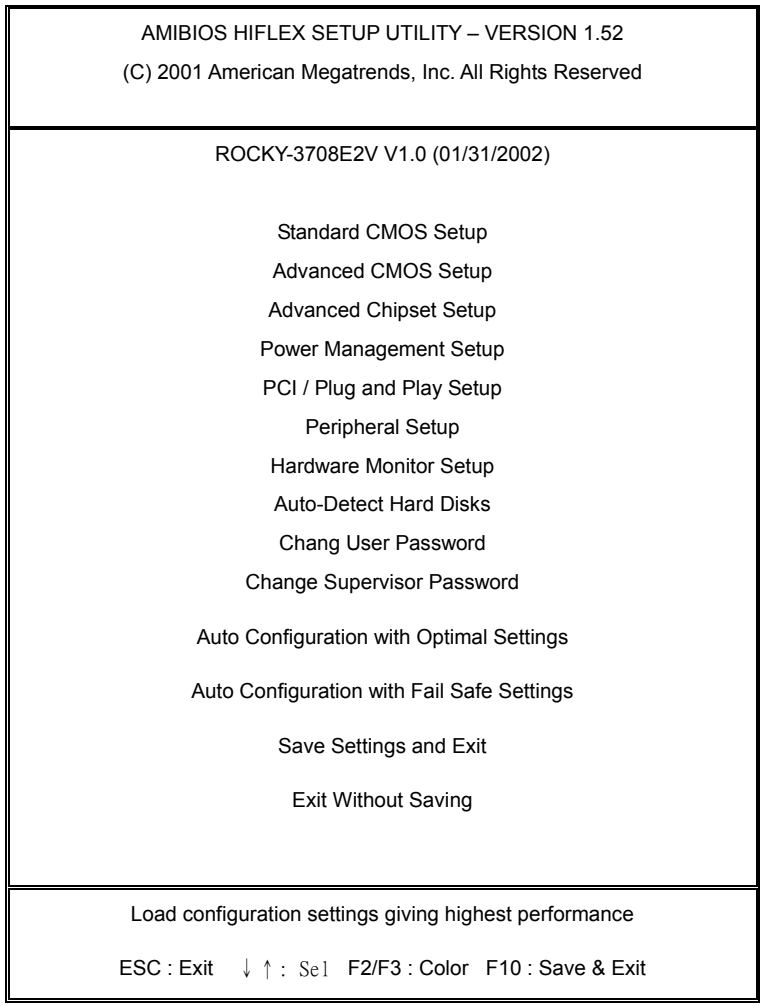
The ROCKY-3708E2V uses the AMI PCI/ISA BIOS for system configuration. The AMI BIOS setup program is designed to provide maximum flexibility in configuring the system by offering various options, which may be selected for end-user requirements. This chapter is written to assist you in the proper usage of these features.

4.2 Getting Started

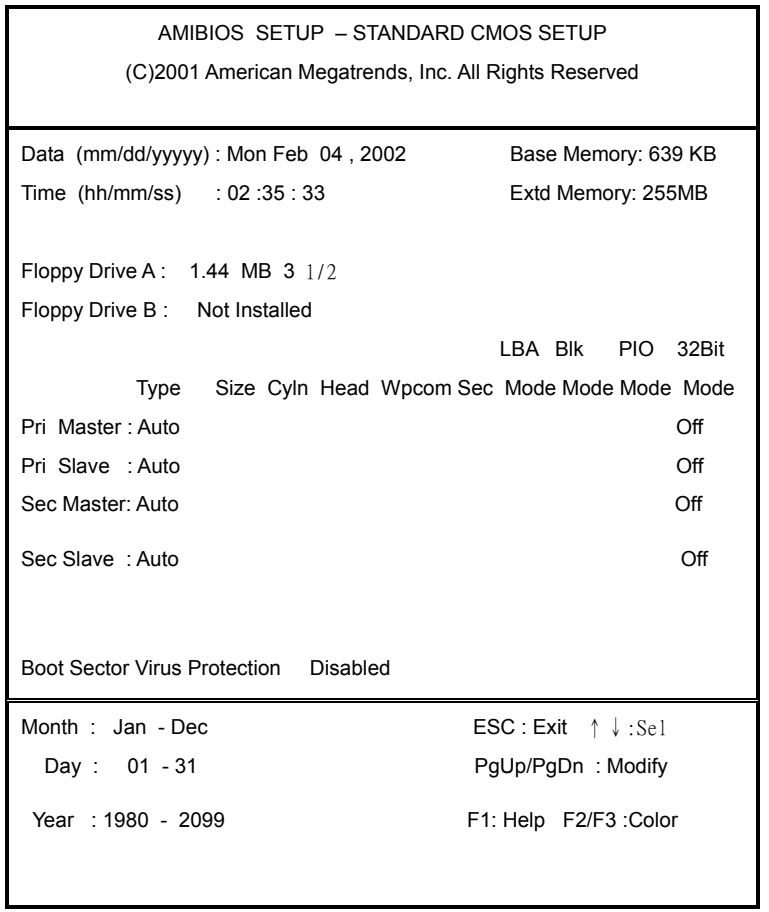
When powering on the system, the BIOS will enter the Power-On-Self-Test (POST) routines. These routines will be executed for system test, initialization and system configuration verification. After the POST routines are completed, the following message appears:

" Hit DEL if you want to run SETUP"

To access AMI PCI/ISA BIOS Setup program, press <Del> key. The following screen will be displayed at this time



4.3 Standard CMOS Setup



For IDE hard disk drive setup, please check the following possible setup procedure,

1. Use the Auto setting for detection during boot up.
2. Use the IDE HDD AUTO DETECTION in the main menu to automatically enter the drive specifications.

3. Manually enter the specifications by yourself from the ”User“ option.

Primary/Secondary Master/Slave IDE >
Select these options to configure the drive named in the option. Select Auto Detect IDE to let AMIBIOS automatically configure the drive. A screen with a list of drive parameters appears. Click on OK to configure the drive.

Primary/Secondary Master/Slave LBA Mode >
LBA(Logical Block Addressing) is a new IDE HDD accessing method to overcome the 528 megabyte capacity bottle neck. If your IDE hard disk over 528MB, AMIBIOS can enable this LBA mode feature. The option only for Primary Master IDE LBA mode.

Primary/Secondary Master/Slave Block Mode >
If your hard disk drive supports IDE block transfer mode, enable this option for faster IDE hard disk drive transfer rate. The option only for Primary Master Block mode.

Primary/Secondary Master/Slave 32Bit Mode >
This option enables Primary Master IDE 32-bit data transfers on the IDE data port. If disabled,16-bit data transfer is used by the BIOS.32-bit data transfers can only be enabled if IDE prefetch mode is also enabled.

Primary/Secondary Master/Slave PIO Mode >
This option enables Primary Master IDE PIO mode on the IDE may have to set to proper cycle timings. Cycle timing relation between the IDE PIO mode value and IDE cycle timing is shown below :
Mode 0 -> Timing (600ns) Mode 1 -> Timing (383ns)
Mode 2 -> Timing (240ns) Mode 3 -> Timing (180ns)
Mode 4 -> Timing (120ns) Mode 5 -> Timing (60ns)

4.4 Advanced CMOS Setup

AMIBIOS SETUP – ADVANCED CMOS SETUP

Quick Boot	Enabled	Available Options : Disabled ▼ Enabled
1st Boot Device	Floppy	
2 nd Boot Device	IDE-0	
3 rd Boot Device	CDROM	
Try Other Boot Devices	Yes	
S.M.A.R.T. for Hard Disks	Disabled	
BootUp Num-Lock	On	
Floppy Drive Swap	Disabled	
Floppy Drive Seek	Disabled	
PS/2 Mouse Support	Enabled	
System Keyboard	Present	
Primary Display	VGA/EGA	
Password Check	Setup	
Boot To OS/2	No	
System BIOS Cacheable	Enabled	
C000,32k Shadow	Cached	
C800,16K Shadow	Disabled	ESC :Exit ↑ ↓ :Sel
CC00,16K Shadow	Disabled	PgUp/PgDn: Modify
D000,16K Shadow	Disabled	F1 : Help F2/F3: Color
D400,16K Shadow	Disabled	

Quick Boot > *Enabled*: this will enable the BIOS to boot quickly when you turn on your computer. The BIOS will only check the first 1MB of the system memory.
Quick Boot > *Disabled:* the BIOS will test all system memory when it boots up. It will spend about 40 seconds until it receives a Ready signal from the HDD. It will also wait for you to press the <Del> key or not.

1st, 2nd, 3rd Boot Device > to define the sequence of boot drives after the routines check up completes. If the 1st Boot Device fails, the BIOS will attempt to boot from the 2nd or the 3rd device.

Try Other Boot Devices > the BIOS will try to boot from any other available device in the system if the 1st, 2nd and 3rd device fails to boot.
The settings are Yes or No.

S.M.A.R.T. for Hard Disks >Self-Monitoring, Analysis and Reporting Technology. This option can help BIOS to warn the user of the possible device failure and give user a chance to back up the device before actual failure happens.
The settings are Auto, Disabled, Enabled

BootUp Num-Lock > to turn on/off the Num-Lock option on an enhanced keyboard when you boot. If you turn it off, the arrow keys on the numeric keypad can be used just as the other set of arrow keys on the keyboard and vice versa.

Floppy Drive Swap > this function enables you to swap the floppy disk drives via software or without moving the hardware.

Floppy Drive Seek > when this option is turned Enabled, BIOS will perform a Seek command on floppy drive A: before boot-up.

PS/2 Mouse Support > When this option is enabled, BIOS support a PS/2- type mouse.

System Keyboard > to configure the keyboard. If you set it Absent, BIOS will not report keyboard errors.

Primary Display >Select this option to configure the type of monitor attached

to the computer. The settings are Monochrome, Color 40x25,Color 80x25,VGA/PGA/EGA, or Not Install.

Password Check > to define if a password is necessary or not for access to the BIOS setup.

Boot to OS/2 > if you run the OS/2 operating system, this option must be set to yes. It means you permit BIOS to run properly if OS/2 or any other OS that does not support Plug and Play is found in your computer.

System BIOS Cacheable > to define whether or not the memory segment FOOOH can be read from or written to cache memory. Setting it Enabled will give faster execution in your system.

C000,32k Shadow > When this option is set to enabled, the Video ROM area from C0000-C7FFF is copied (shadowed) to RAM for faster execution.
Disabled :The contents of the video ROM are not copied to RAM.
Cached :The contents of the video ROM area from C0000h - C7FFFh are copied from ROM to RAM and can be written to or read from cache memory.
Enabled :The contents of the video ROM area from C0000h - C7FFFh are copied
(shadowed) from ROM to RAM for faster execution.

C800,16k Shadow > These options enable shadowing of the contents of the ROM area named in the option title. The settings are Enable Disable, Cached.
The ROM area that is not used by ISA adapter cards will be allocated to PCI adapter cards.

CC00,16k Shadow > These options enable shadowing of the contents of the ROM area named in the option title. The settings are Enable Disable, Cached.
The ROM area that is not used by ISA adapter cards will be allocated to PCI adapter cards.

D000,16k Shadow >These options enable shadowing of the contents of the ROM area named in the option title. The settings are Enable Disable, Cached.
The ROM area that is not used by ISA adapter cards will be allocated to PCI adapter cards.

D400,16k Shadow > These options enable shadowing of the contents of the ROM area named in the option title. The settings are Enable Disable, Cached.

The ROM area that is not used by ISA adapter cards will be allocated to PCI adapter cards.

D800,16k Shadow > These options enable shadowing of the contents of the ROM area named in the option title. The settings are Enable Disable, Cached. The ROM area that is not used by ISA adapter cards will be allocated to PCI adapter cards.

DC00,16k Shadow > These options enable shadowing of the contents of the ROM area named in the option title. The settings are Enable Disable, Cached. The ROM area that is not used by ISA adapter cards will be allocated to PCI adapter cards.

Note : You can change the value of each option by using <PgUp> and <PgDn> key. The available values are shown on the right screen.

4.5 Advanced Chipset Setup

AMIBIOS SETUP – ADVANCED CHIPSET SETUP

CPU/DRAM Base Frequency	100/100MHZ
CPU Multiple Factory	H/W TRAP
HOST Frequency	100MHZ
DRAM Frequency	100MHZ
Graphic Win Size	64M
Timing Setting Mode	Normal
DRAM CAS# Latency	3T

Available Options:
H/W TRAP
66/66MHZ
▼100/100MHZ
133/133MHZ

ESC :Exit ↑ ↓ :Sel

PgUp/PgDn: Modify

F1 : Help F2/F3: Color

CPU/DRAM Base Frequency > to set the CPU and DRAM frequency by software. It provide three option to set (66/66 , 100/100,133/133) . The default is 100/100 in order to bootable when you use Celeron CPU first time.

CPU Multiple Factory > to set the multiple of the CPU . We suggest you to use H/W TRAP.

DRAM CAS# Latency > to specify the CAS latency timing form SDRAM DRAM.

4.6 Power Management Setup

AMIBIOS SETUP – POWER MANAGEMENT SETUP

(C)2001 American Megatrends, Inc. All Rights Reserved

Power Switch Type	On/Off
ACPI Aware O/S	No
ACPI Standby State	S1
InItalize VGA BIOS By S3	Enabled
Power Management	Enabled
Wake up on Ring/Lan	Disabled
Power Type Select	AT

Available Options:
▼On/Off
Suspend

ESC :Exit ↑ ↓ :Sel

PgUp/PgDn: Modify

F1 : Help F2/F3: Color

Power Switch Type > to specify how the powers button on the chassis is operated.

ACPI Standby State: S1/POS

This item allows you to select power Management ACPI mode.

Power Management/APM: Disable, Max Saving, Min Saving, or User Defined > Max Saving puts the system into power saving mode after a brief inactivity period. Min Saving is almost the same as Max Saving except that the inactivity period is longer. User Defined allows you to set power saving options according to your requirement.

Note: Advanced Power Management (APM) has to be installed to keep the system time updated when the computer enters suspend mode activated by the Power Management.

Under DOS environment, you need to add

DEVICE=C:\DOS\POWER.EXE in your CONFIG.SYS

Under Windows 3.x and Windows 95, you have to install Windows with APM feature. A battery and power cord icon labeled "Power" will appear in the "Control Panel"

Power Management/APM > to enable or disable the Advanced Power Management feature.

Video Power Down Mode > to specify the power state of the VESA VGA video subsystem after the specified period of display-idle has ended.

4.7 PCI/Plug and Play Setup

AMIBIOS SETUP – PCI / PLUG AND PLAY SETUP

Plug and Play Aware O/S	No
Clear NVRAM on Every Boot	No
On Board PCI LAN Controller	Enabled
On Board PCI AUDIO Controller	Enabled
PCI Latency Timer (PCI Clocks)	64
The Vga Card After Bridge	Yes
Primary Graphics Adapter	AGP
Primary Graphics Adapter	PCI
Allocate IRQ to PCI VGA	No
PCI Slot1 IRQ Priority	Auto
PCI Slot2 IRQ Priority	Auto
PCI Slot3 IRQ Priority	Auto
PCI Slot4 IRQ Priority	Auto
DMA Channel 0	PnP
DMA Channel 1	PnP
DMA Channel3	PnP
DMA Channel5	PnP
DMA Channel6	PnP
DMA Channel7	PnP
IRQ3	PCI/PnP
IRQ4	PCI/PnP
IRQ5	PCI/PnP
IRQ7	PCI/PnP
IRQ9	PCI/PnP

Available Options:
▼No
Yes

ESC :Exit ↑ ↓ :Sel

PgUp/PgDn: Modify

F1 : Help F2/F3: Color

Plug and Play Aware O/S > Yes or No

When PnP OS is installed, the OS may reassign interrupts when the setting is “Yes”. When a non-PNP OS is installed or to prevent reassigning of interrupt settings, select setting to “No”.

Clear NVRAM on Every Boot > if *yes*, BIOS will auto-clear NVRAM on every boot.

On Board PCI LAN Controller > to enable and disable the on board PCI LAN Controller (Intel 82559)

On Board PCI AUDIO Controller > to enable and disable the on board PCI AUDIO Controller (C-MEDIA 8738)

PCI Latency Timer (PCI Clocks) > to define the latency timing (PCI clock) for all PCI devices on the PCI bus.

The Vga Card After Bridge > to specify the PCI vga card location. If you add one PCI vga card after the PCI bridge in the backplane, the option must be set YES. If add one vga card before the PCI bridge in the backplane, the option must be set NO.

Primary Graphics Adapter > to specify the first VGA to display when have many VGA card in the system.

Allocate IRQ to PCI VGA > to allocate IRQ to PCI VGA, answer Yes and vice versa.

PCI Slot (1,2,3,4) IRQ Priority > to specify the IRQ priority to be used by the PCI devices on slot 1 to 4.

DMA Channel (0,1,3,5,6,7) > to indicate whether or not the DMA channel is assigned for a PnP or ISA card.

IRQ (3,4,5,7,9,10,11,14,15) > to assign the displayed IRQ to be used by a legacy ISA adapter card. The settings are ISA/EISA or PCI/PnP.

4.8 Peripheral Setup

AMIBIOS SETUP – PERIPHERAL SETUP

(C)2001 American Megatrends, Inc. All Rights Reserved

Etherent Device	Enabled
USB Function	Enabled
USB KB/Mouse/FDD Legacy Support	Disabled
OnBoard FDC	Enabled
OnBoard Serial PortA	3F8/COM1
OnBoard Serial PortB	2F8/COM2
Serial Port2 Mode	Normal
OnBoard Parallel Port	378h
Parallel Port Mode	SPP
Parallel Port IRQ	7
Parallel Port DMA	N/A
OnBoard PCI IDE	Both

Available Options:
Disabled
▼ Enabled

ESC :Exit ↑ ↓ :Sel

PgUp/PgDn: Modify

F1 : Help F2/F3: Color

Ethernet Device > to enable the Ethernet controller . (MAC :SIS900 PHY : ICS1893)

USB Function > to enable or disable the USB (Universal Serial Bus) functions.

USB KB/Mouse/FDD Legacy Support > to enable or disable the USB functions in DOS mode.

Onboard FDC > to enable the FDC on your board. If you set it Auto, the BIOS will decide if the FDC should be enabled, automatically).

Onboard Serial Port A (/B) > to specify the I/O port address of the serial port A (/B). If you set it Auto, the BIOS will decide the correct I/O port address, automatically.

Serial Port B Mode > to specify the mode of serial port B.

IR Duplex Mode > to specify the mode of IR device that is connected to the IR port.

IrDA Protocol > to specify the function mode if an IrDA mode is selected.

Onboard Parallel Port > to specify the I/O port address of the parallel port.

Parallel Port Mode > to specify the mode of parallel port. The options are:

Normal (normal parallel port mode),

Bi-Dir (supports bi-directional transfer),

EPP (supports devices that comply with the Enhanced Parallel Port specification),

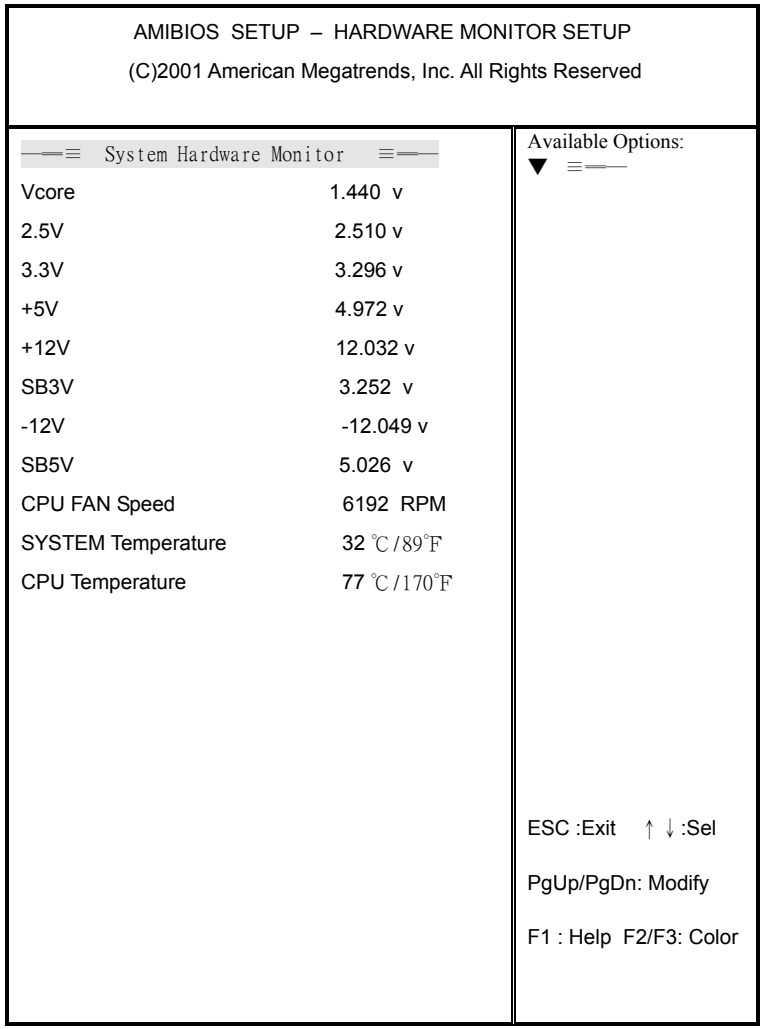
ECP (supports devices that comply with the Extended Capabilities Port).

Parallel Port IRQ > to assign certain IRQ to the parallel port. The optimal and fail-safe settings are 7.

Parallel Port DMA Channel > available only if the parallel port mode is ECP. The optimal and fail-safe settings are 3.

Onboard IDE > to define which on-board IDE controller channel(s) to be used. Available options are primary, Secondary, Both and Disabled.

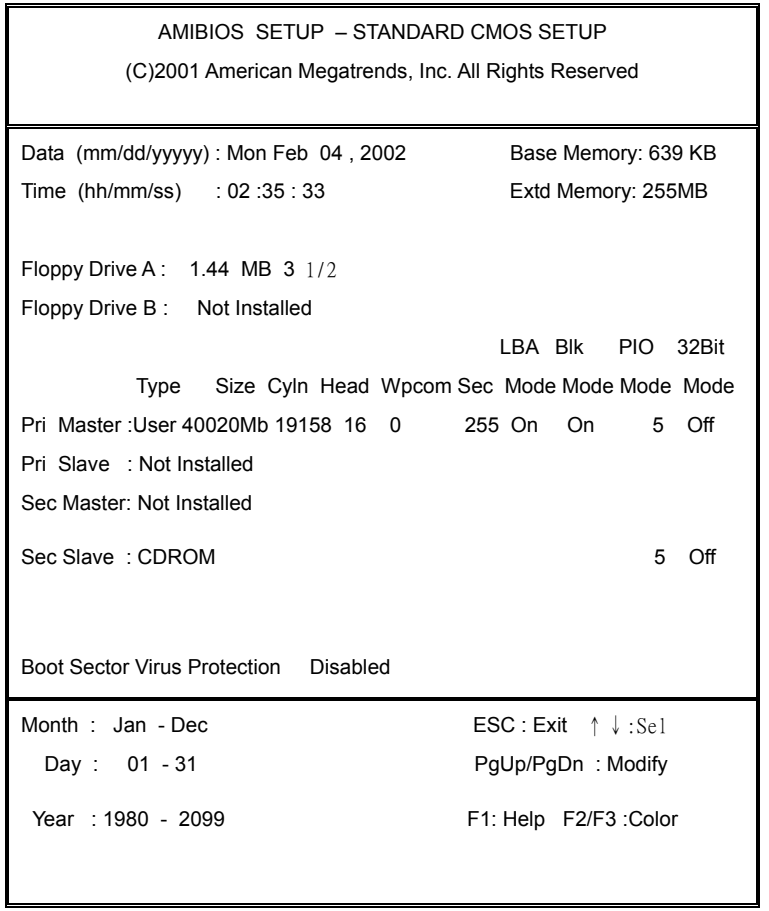
4.9 Hardware Monitor Setup



This setup helps users monitor the ROCKY-3708E2V board on board system voltage and fan speed. The function is implemented by on board ITE8705 chip. The voltage monitoring will cover Vcore, 2.5V, +3.3V, SB3V, SB5V, +5V, +12V, -12V,and –5V. And there is one fan connector for CPU fan.

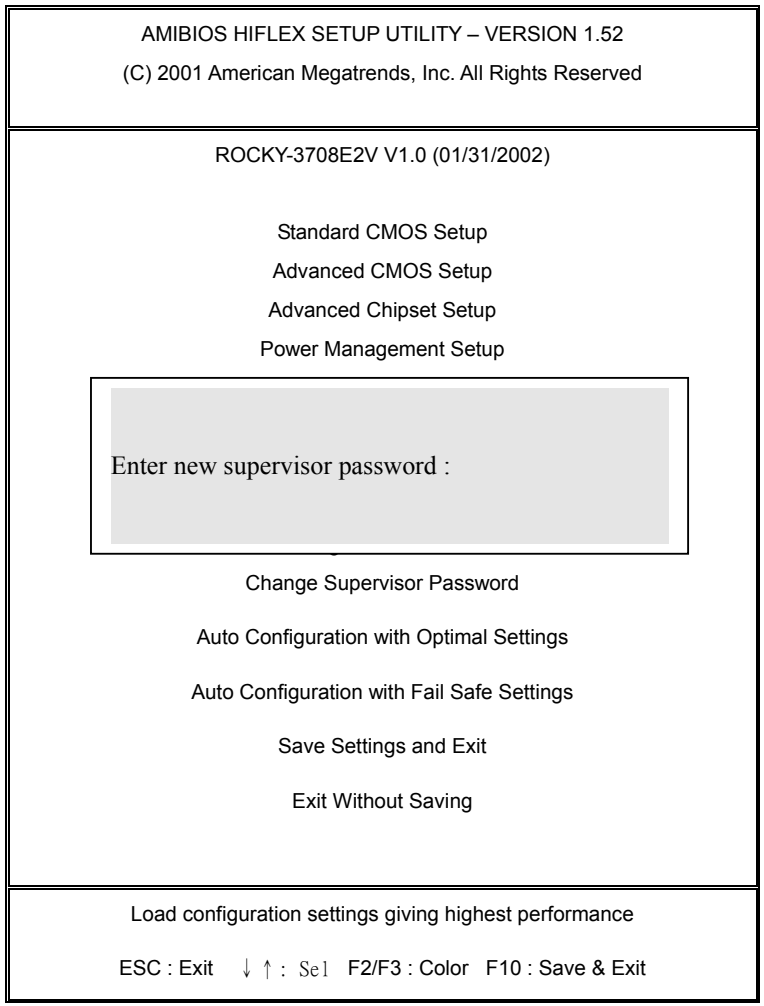
Note: normal CPU Fan RPM is over than 5000 RPM. If your CPU Fan RPM is less than that figure, something is wrong and the CPU will be in overheat condition. Make sure that the connection at CN10 is correct.

4.10 Auto-Detect Hard Disks



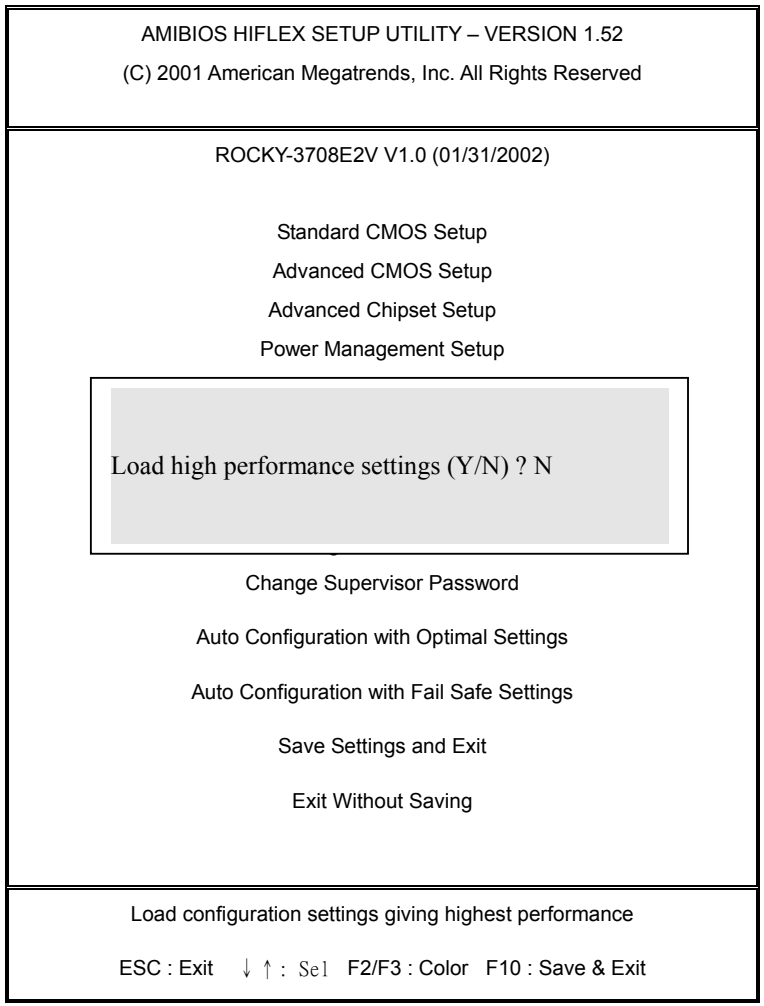
This setup helps users to detect the hard disks or CDROM parameters automatically.

4.11 Change Supervisor Password



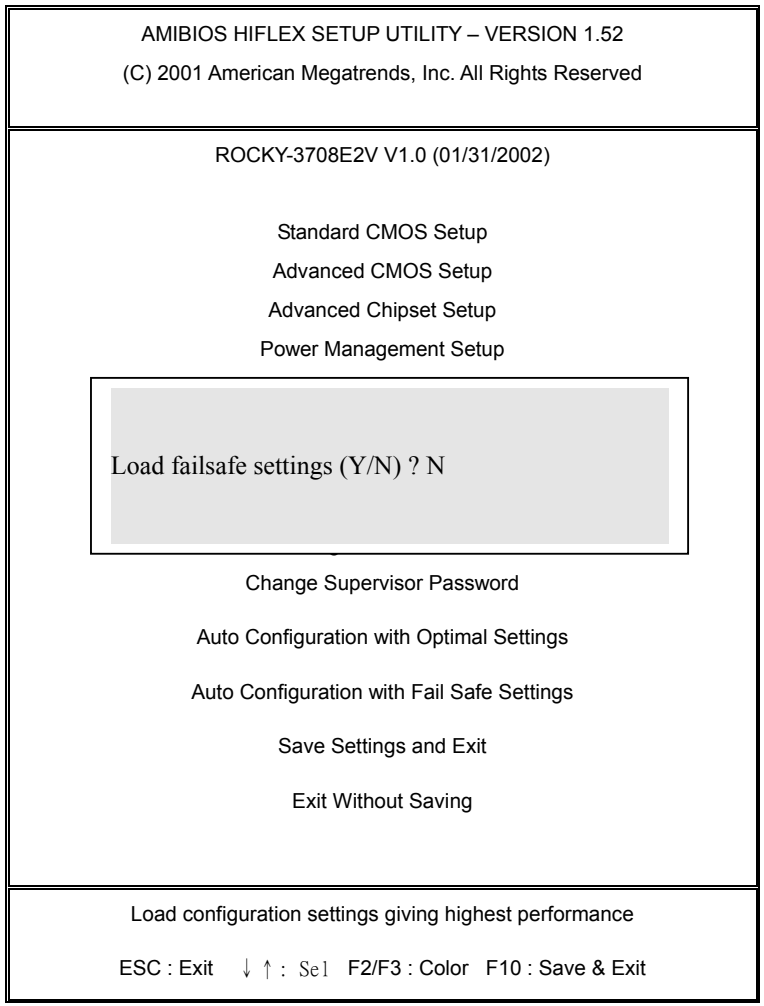
Password set to help users against the system to be broken by strangers.
If users forget the password, set the JP1 at clear cmos position to clear the password.

4.11 Auto Configuration with Optimal Setup



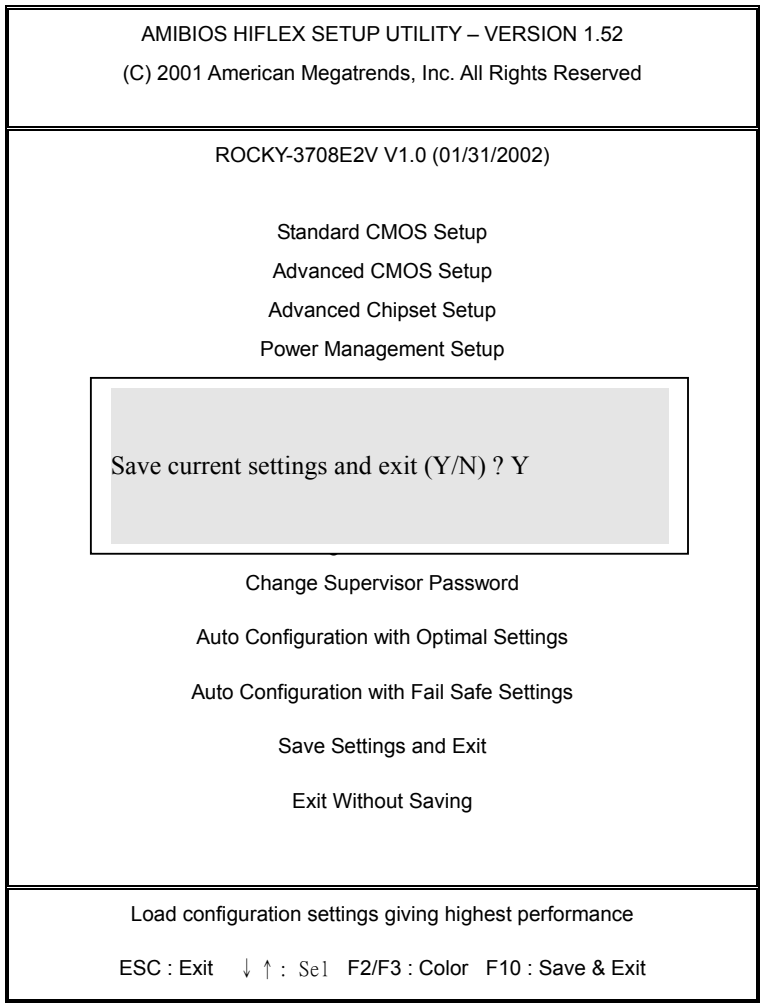
When choose **Auto Configuration with Optimal Settings** will load optimized defaults for regular use. Choosing this setting will modify all applicable settings.

4.12 Auto Configuration with Fail Safe Setup



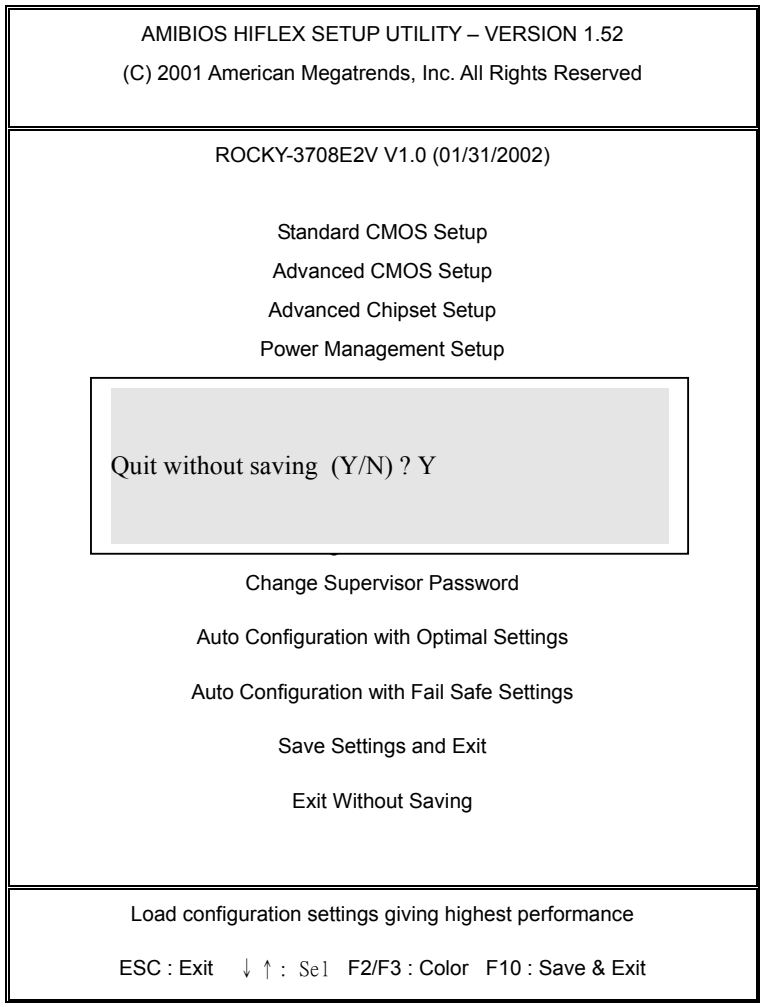
When choose **Auto Configuration with Fail Safe Settings** will load the minimized settings for Troubleshooting. The performance should be very poor when use this setting.

4.13 Save settings and Exit



This setup will save the settings and exit the CMOS setup , then reboot the system.

4.14 Exit without saving



This setup will not save the settings that will be lost ,then exit the CMOS setup.

5

Appendix A. Watch-Dog Timer

The WatchDog Timer is a device to ensure that standalone systems can always recover from abnormal conditions that cause the system to crash. These conditions may result from an external EMI or a software bug. When the system stops working, hardware on the board will perform hardware reset (cold boot) to bring the system back to a known state. Three I/O ports control the operation of WatchDog Timer.

443 (hex)	Write	Set WatchDog Time period
443 (hex)	Read	Enable the refresh the WatchDog Timer.
043/843 (hex)	Read	Disable the WatchDog Timer.

Prior to enable the WatchDog Timer, user has to set the time-out period. The resolution of the timer is 1 second and the range of the timer is from 1 sec to 255 sec. You need to send the time-out value to the I/O port – 443H, and then enable it by reading data from the same I/O port – 443H. This will activate the timer that will eventually time out and reset the CPU board. To ensure that this reset condition won't occur, the WatchDog Timer must be periodically refreshed by reading the same I/O port 443H. This must be done within the time-out period that is set by the software, please refer to the example program. Finally, we have to disable the WatchDog timer by reading the I/O port -- 843H or 043H. Otherwise the system could reset unconditionally.

A tolerance of at least 5% must be maintained to avoid unknown routines in the operating system (DOS), such as disk I/O that can be very time-consuming. Therefore if the time-out period has been set to 10 seconds, the I/O port 443H must be read within 7 seconds.

Example assembly program:

TIMER_PORT = 443H

TIMER_START = 443H

TIMER_STOP = 843H

;;INITIAL TIMER COUNTER

MOV DX, TIMER_PORT

MOV AL, 8 **;;8 seconds**

OUT DX, AL

MOV DX, TIMER_START

IN AL, DX. **;;START COUNTER**

W_LOOP:

MOV DX, TIMER_STOP

IN AL, DX

MOV DX, TIMER_START

IN AL, DX **;;RESTART COUNTER**

;;ADD YOUR APPLICATION HERE

CMP EXIT_AP, 0

JNE W_LOOP

MOV DX, TIMER_STOP

IN AL, DX

;;EXIT AP

Appendix B. I/O Address Map

- **I/O Address Map**

I/O Address Map	Description
000-01F	DMA Controller #1
020-021	Interrupt Controller # 1, Master
040-05F	System Timer
060-06F	Standard 101/102 keyboard Controller
070-07F	Real time Clock, NMI Controller
080-0BF	DMA Page Register
0A0-0BF	Interrupt Controller # 2
0C0-0DF	DMA Controller # 2
0F0-0F0	Clear Math Coprocessor Busy
0F1-0F1	Reset Math Coprocessor
0F8-OFF	Math Coprocessor
170-1F7	BUS Master PCI IDE Controller
278-27F	Parallel Printer Port 2
2F8-2FF	Serial Port 2
294-297	PCI bus
376-376	BUS Master PCI IDE Controller
378-37F	Parallel Printer Port 1
3B0-3DF	Standard AGP Graphic Adapter
3F0-3F7	Floppy Disk Controller
3F8-3FF	Serial Port 1
443	Watch dog timer enable
843/043	Watch dog timer disable

1 st MB Memory Address Map

Memory address	Description
00000-9FFFF	SYSTEM MEMORY
A0000-BFFFF	VGA BUFFER
C0000-C7FFF	VGA BIOS
C8000-CFFFF	NO USE
D6000-D7FFF	DEFAULT DOC2000 ADDRESS
E0000-FFFFF	SYSTEM BIOS
100000	EXTEND MEMORY

IRQ Mapping Chart

IRQ0	System Timer	IRQ8	RTC clock
IRQ1	Keyboard	IRQ9	SCSI PORT A
IRQ2	IRQ Controller	IRQ10	LAN
IRQ3	COM2	IRQ11	IDE RAID
IRQ4	COM1	IRQ12	PS/2 mouse
IRQ5	LAN	IRQ13	FPU
IRQ6	FDC	IRQ14	Primary IDE
IRQ7	Printer	IRQ15	Secondary IDE

DMA Channel Assignment

Channel	Function
0	Available
1	Available
2	Floppy disk
3	Available
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available

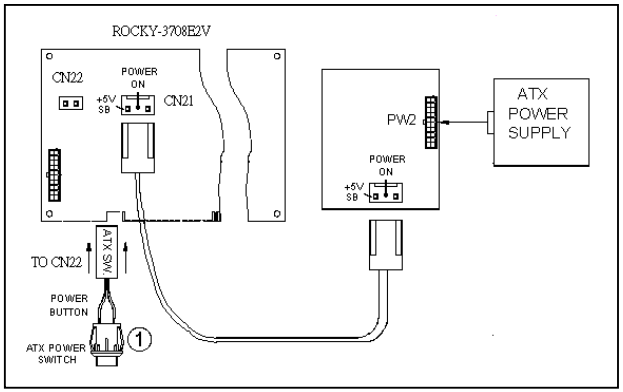
Appendix C. ATX Power Supply

The following notes show how to connect ATX Power Supply to the backplanes and / or the ISBC card.

A. For backplanes with ATX Connector

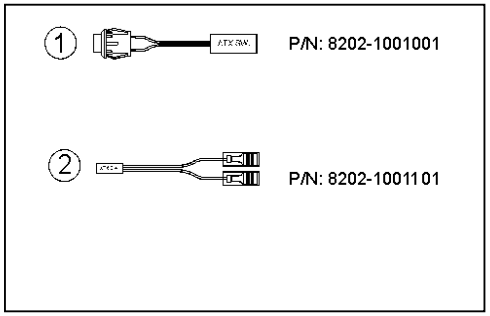
1. Please, disconnect the AC cord of the Power Supply from the AC source to prevent sudden electric surge to the board.
2. Please, check the type of your CPU board. All CPU board listed on the next page support ATX power supply but has two types of power switch connection:

2.1. ROCKY-3703EVR (through Power Button & GND):



Connect the ATX power button switch to the CN29 (power button). And connect the power cable from Backplane to CN30 of CPU card.

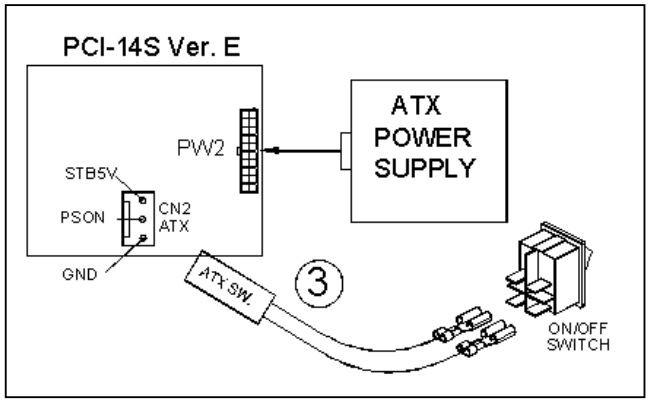
If you want to turn ON the system, just press the button once. And if you want to turn off the power supply, please press the ATX power switch button for about 4 seconds.



B. For the backplanes with ATX power supply connector

For some SBC without ATX power ON/OFF function, then you can control the ATX power supply through backplane's PS ON connector. Refer to the figure below: for the backplanes with ATX connector, the connection can be made simply as following:

1. Connect the ON/OFF (ordinary one) switch to Pin 2 (PS ON) and Pin 3 (GND) of connector CN2
2. You may now turn the power ON/OFF by the power switch



Appendix D. How to use Wake-Up Function

The ROCKY-3708E2V provides two kind of Wake up Function. This page describes how to use Modem Wake-Up and LAN Wake-Up function.

Wake-Up function is working while you use ATX power supply,

Wake-Up By Ring:

You must set the option ***Power On By Ring*** of CMOS SETUP to be enabled. The ATX power supply will be switched on when there is a ring signal detected on pin "RI" of serial port.

Wake-Up On LAN:

When your computer is in power-down status, you can see LAN Link/Active LED is flashing. This status indicates that the LAN chip has entered standby mode and waits for Wake-Up signal. You can use other computers to wake up your computer by sending ID to it.

ID: ID is the address of your system LAN. Every LAN chip has a factory-set ID, which you can find it from network information in WINDOWS.

ID's format is xxxxxxxxxxxx
Example ID: 009027388320

Appendix E. ROCKY-3708E2V Driver List

The ROCKY-3708E2V has many components on board, so it has to install the drivers. The detail lists describe below.

Function	Component	Description
AGP	SIS635 1.CDROM\ others \ SIS \ AGP	The system needs to install the driver of the AGP to run the AGP interface perfectly.
LAN1	SIS635 1.CDROM\ LAN\ SIS\ SIS630\	The SIS635 has included LAN MAC (SIS900). It needs to install the LAN driver if you want to use the function.
IDE	SIS635 1.CDROM\ others \SIS \AGP\	The SIS635 has to install the IDE driver in APM mode when the operation system is Windows2000 or Windows XP .
LAN2	INTEL 82559	The ROCKY-3708E2V provides the other LAN chipset (Intel 82559).It needs to install the driver if you want to use the function. The ROCKY-3708EV does not provide this chipset.
AUDIO	C-Media 8738LX	The ROCKY-3708E2V /ROCKY-37089EV provides an Audio chipset on board. It needs to install driver if you want to use this function.
VGA	SIS315 AGP 4X	The ROCKY-3708E2V/ ROCKY-3708EV provides an VGA chipset on board.

Appendix F. How to install Audio Driver

The ROCKY-3708E2V provide one 3D audio chipset (C-MEDIA 8738)on board. It supports 4.1/5.1 speakers. This page describes how to install audio chipset driver.

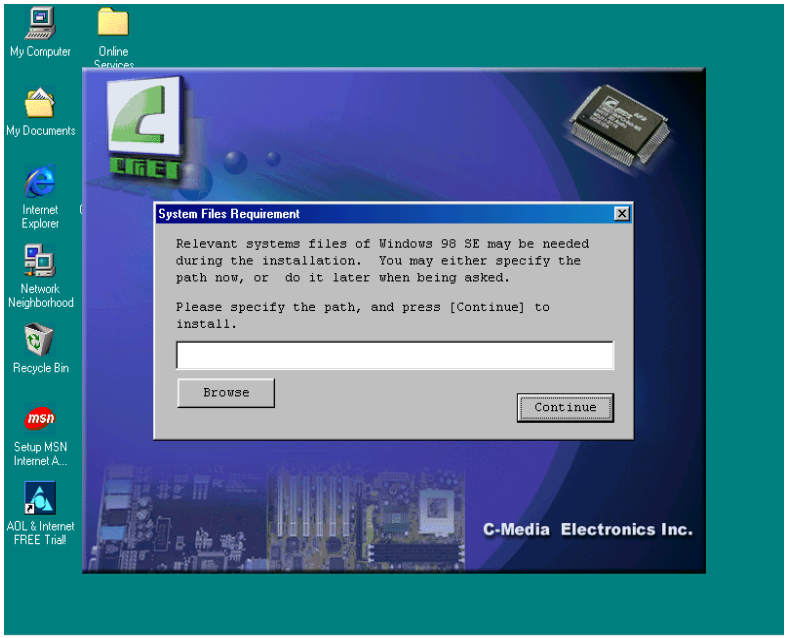


Figure F.1

First , Press **SETUP.EXE .** The screen will display like **Figure F.1** . You can browse the path or continue the installation.

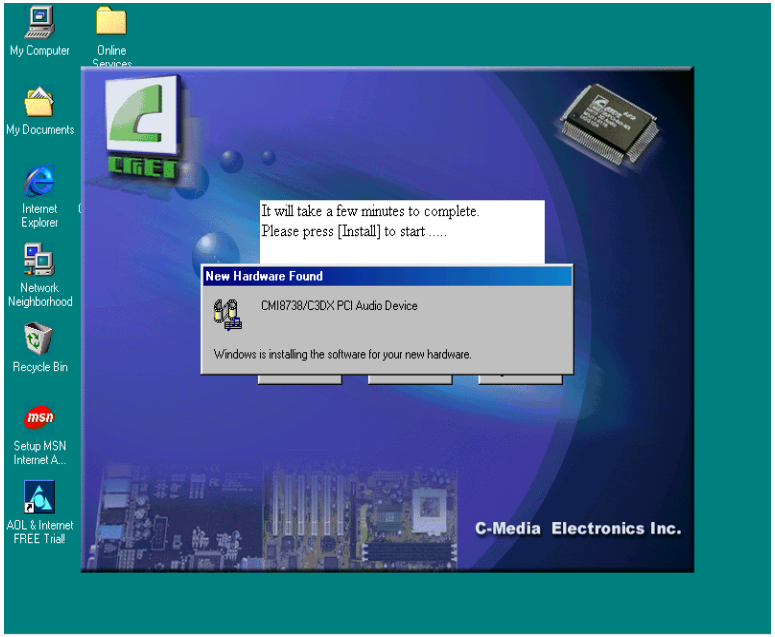


Figure F.2

After first step, the system will detect an Audio Device like **Figure F.2** .

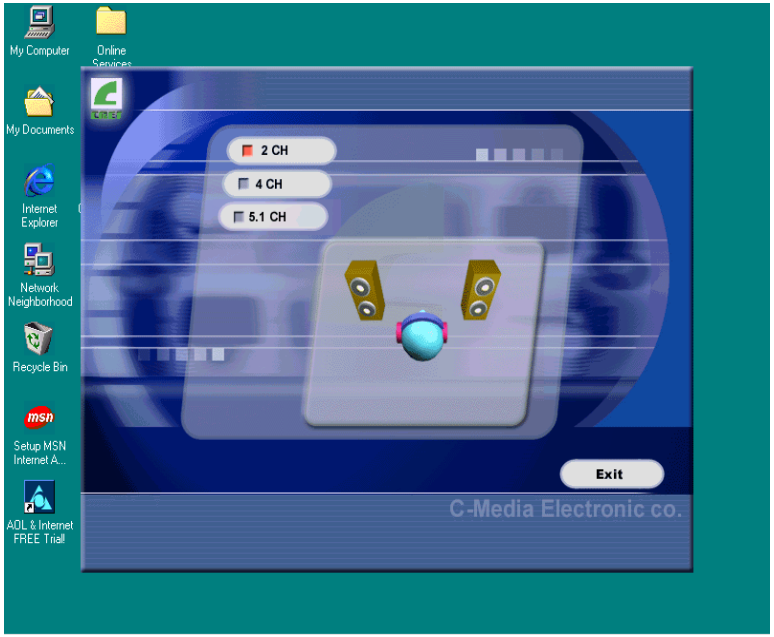


Figure F.3

After detect the Audio device, you must indicate your environment that has 2 , 4, or 5.1 speakers like **Figure F.3** .

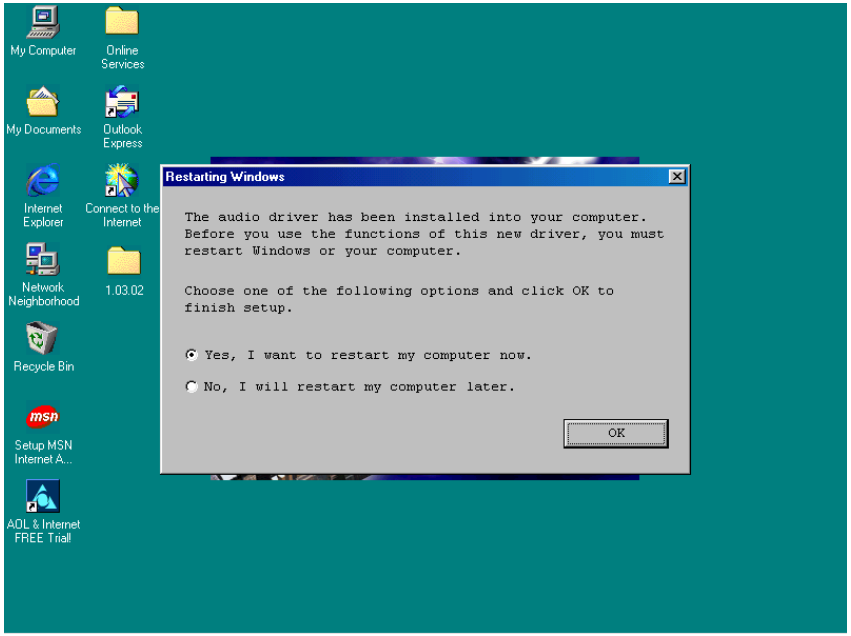


Figure F.4

When finish the installation , please reboot your system like **Figure F.4 .**