

ROCKY – P218BXA

Pentium® II & Sound

SBC

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1

Introduction

Welcome to the ROCKY-P218BXA Pentium® II & Creative Sound Single Board Computer. The ROCKY-P218BXA board is an ISA/PCI form factor board, which comes equipped with high performance Pentium® II 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.

This board has a built-in DiskOnChip™ (DOC) Flash Disk socket for embedded application. The DOC Flash Disk is 100% software compatible to hard disk. User can use any DOS command without any extra software utility. The DOC currently is available from 2MB to 72MB. There also have PROMDISK-Chip™ can be used in the same DOC socket as an alternative solution.

An advanced high performance super AT I/O chip – Winbond W83977TF is used in the ROCKY-P218BXA board. Both on-chip UARTs are compatible with the NS16C550. The parallel port and IDE interface are compatible with IBM PC/AT and XT architectures.

In addition, the ROCKY-218BXA provides Creative Sound capability. The sound chip is ViBRA 16X which provides full-featured, 16-bit audio with 100% Sound Blaster 16 compatibility, wave-table synthesis with Creative Wave Synth™; Creative 3D Stereo Enhancement Technology™; and full-duplex capabilities.

ROCKY-P218BXA uses the advanced INTEL Chipset, 440BX, which is 100% ISA/PCI compatible chipset with PCI 2.1 standard.

1.1 Specifications :

- **Processor** : one Slot1 supports Pentium® II/III up to 500Mhz
- **Bus** : ISA bus and PCI 32-bit local bus, PCI 2.1 standard
- **DMA channels** : 7
- **Interrupt levels** : 15
- **Chipset** : Intel 440BX
- **Real-time clock/calendar** : in 440LX chipset, backup by industrial Li-battery,3V/850mAH.
- **System memory** : Three 168-pin DIMM sockets support SDRAM and EDO RAM module. The max memory is up to 384MB.
- **Second Cache memory** : 512KB Pipelined Burst SRAM in CPU.
- **Ultra DMA/33 IDE Interface** : up to four PCI Enhance IDE hard drives. The Ultra DMA/33 IDE can handle data transfer up to 33MB/s. The best of all is that is new technology is compatible with existing ATA-2 IDE specifications. So there is no need to do any change for customer' s current accessory.
- **Floppy disk drive interface** : two 2.88 MB, 1.44MB, 1.2MB, 720KB, or 360KB floppy disk drives.
- **Two high speed Series ports** : NS16C550 compatible UARTs
- **Bi-directional Parallel Port**
- **Built-in LM78 to monitor power supply voltage and fan speed status.**
- **IrDA port** : Support Serial Infrared(SIR) and Amplitude Shift Keyed IR(ASKIR) interface.
- **USB port** : Support two USB ports for future expansion.

- **Watch-dog timer** : can be set by 1,2,10,20,110 or 220 seconds period. Reset or NMI is generated when CPU does not periodically trigger the timer. Your program uses hex 043 and 443 to control the watch-dog and generate a system reset.
- **Flash Disk - DiskOnChip™ or PROMDISK-Chip™** The Flash Disk provides 100% software compatibility with hard disk. The built-in TrueFFS Transparent Flash Block Management and Space Reclamation will let customer to use the Flash Disk with DOS command, no need any extra software utility.
- **Keyboard connector**
- **Mouse** : PS/2 Mouse Port on-board.
- **Power Consumption** : +5V @ 7.5A
(Pentium® II 300MHz, 32MB EDO RAM)
+12V @ 240mA, -12V @ 40mA
- **Operating Temperature** : 0° ~ 55° C (CPU needs Cooler)

1.2 What You Have

In addition to this *User's Manual*, the ROCKY-P218BXA package includes the following items:

- ROCKY-P218BXA Single Board Computer
- Printer/RS-232 Cable
- FDD/HDD Cable
- 6-pin Mini-Din to 5-pin Din Keyboard and Mouse Adapter Cable

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

2

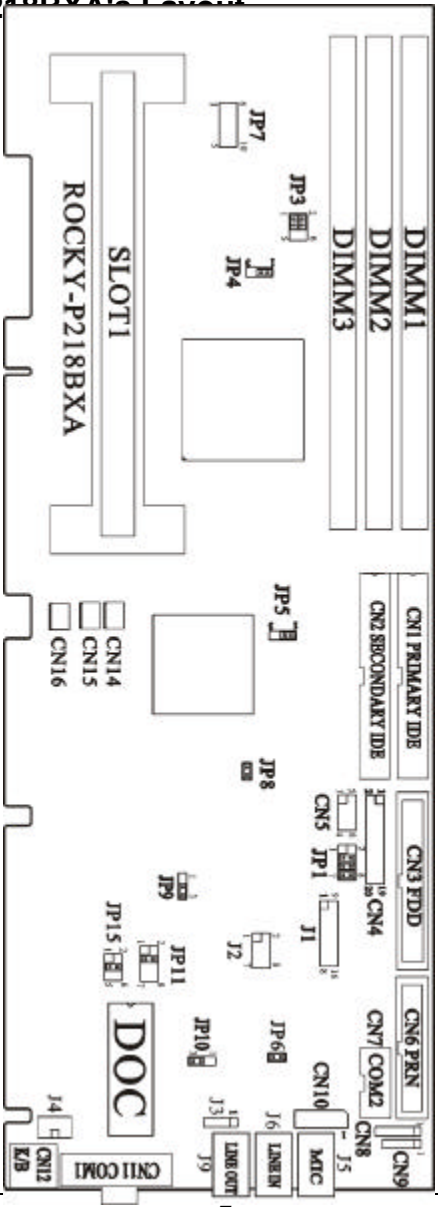
Installation

This chapter describes how to install the ROCKY-P218BXA. At first, the layout of ROCKY-P218BXA is shown. Please read the Unpacking information on page 8 before you install it. The jumpers and switches setting for the ROCKY-P218BXA's configuration, such as CPU type selection, system clock setting, and watch-dog timer, are also included.

2.1 ROCKY – P218BXA's Layout

< Please, refer to next page >

2.1 ROCKY - P218BXA Layout



2.2 Unpacking

Your ROCKY-P218BXA Single Board Computer contains sensitive electronic components that can be easily damaged by static electricity.

In this section, we describe the precautions you should take while unpacking, as well as during installation. It is very important that the instructions be followed correctly, to avoid static damage, and to successfully install the board.

The system board should be done on a grounded anti-static mat. The operator should be wearing an anti-static wristband, grounded at the same point as the anti-static mat.

Inspect the cardboard carton for obvious damage. Shipping and handling may cause damage to your board. Be sure there are no shipping and handling damages on the board before processing.

After opening the cardboard carton, exact the system board and place it only on a grounded anti-static surface component side up.

Again inspect the board for damage. Press down on all the socketed IC's to make sure that they are properly seated. Do this only with the board place on a firm flat surface.

Note: DO NOT APPLY POWER TO THE BOARD IF IT HAS BEEN DAMAGED.

You are now ready to install your ROCKY-P218BXA Single Board Computer.

2.3 Setting the CPU of ROCKY-P218BXA

• **JP3, JP4 : CPU Clock Setting** :

BUS FREQUENCY	JP3		JP4
	FS1	FS0	FS2
66MHz	1-3	2-4	2-3
100MHz	1-3	2-4	1-2

• **JP1 : CPU to Bus Multiple** :

Multiplier	1-2	3-4	5-6	7-8
3.0 x	ON	OFF	ON	ON
3.5 x	ON	OFF	OFF	ON
4.0 x	OFF	ON	ON	ON
4.5 x	OFF	ON	OFF	ON
5.0 x	OFF	OFF	ON	ON
6.0 x	ON	ON	ON	OFF
6.5 x	ON	ON	OFF	OFF

**CPU Frequency = CPU Clock x Multiplier, for example:
Pentium® II 266MHz = 66MHz CPU Clock x 4.0**

2.4 BIOS Flash Type Setting

There are two kind of Flash Chips that can be used as BIOS ROM, one is 12V programming and the other is 5V. JP10 is designed to handle the setting.

• **JP10 : Flash Type Setting**

JP10	DESCRIPTION
2-3	5V Flash
1-2	12V Flash

2.5 System Memory DRAM

There are three 168-pin DIMM sockets to accept SDRAM or EDO RAM, 8MB, 16MB, 32MB, 64MB, 128MB memory modules.

The total capacity is from 8MB to 384MB. Customer can use only one DIMM module and can be populated in any order.

2.6 Watch-Dog Timer

The Watch-Dog Timer is enabled by reading port 443H. It should be triggered before the time-out period ends, otherwise it will assume the program operation is abnormal and will issue a reset signal to start again, or activate NMI to CPU. The Watch-Dog Timer is disable by reading port 043H.

• JP9 : Watch-Dog Active Type Setting

JP9	DESCRIPTION
2-3	RESET WHEN WDT TIME-OUT
1-2	ACTIVATE NMI TO CPU WHEN WDT TIME-OUT
OPEN	DISABLE WDT

• JP11 : WDT Time-Out Period

PERIOD	1-2	3-4	5-6	7-8
1 sec.	OFF	OFF	ON	OFF
2 sec.	OFF	OFF	ON	ON
10 sec.	OFF	ON	OFF	OFF
20 sec.	OFF	ON	OFF	ON
110 sec.	ON	OFF	OFF	OFF
220 sec.	ON	OFF	OFF	ON

2.7 DiskOnChip™ Flash Disk

The DiskOnChip™Flash Disk Chip (DOC) is produced by M-Systems. Because the DOC is 100% compatible to hard disk and DOS. Customer doesn't need any extra software utility. It is just "plug and play", easy and reliable. Right now the DOC is available from 2MB to 72MB. There also have PROMDISK-Chip™ can be used with the same socket.

• **JP15 : DiskOnChip Memory Address Setting**

Address	PIN NO.
CE00-CFFF	1-2
D600-D7FF	3-4
DE00-DFFF	5-6

2.8 Clear CMOS Setup

If you forget the CMOS password, you can clear or reset it by closing the pin 2-3 of **JP5** for about 3 seconds. Now, the password has been cleared from your CMOS. Set it back to normal operation mode by closing pin 1-2.

• **JP5 : Clear CMOS Setup**

PIN NO.	DESCRIPTION
1-2	Normal Operation
2-3	Clear CMOS Setup

2.9 Creative Sound Function

The on board Creative Sound provides a 100% Sound Blaster 16 compatible function. You can use the JP6 to enable or disable the sound function.

• **JP6 : Enable/Disable on board Sound function**

JP6	DESCRIPTION
ON	Enable Sound Function
OFF	Disable Sound Function

2.10 PS/2 MOUSE

JP8 : PS/2 MOUSE	
ON	ENABLE
OFF	DISABLE

3

Connection

This chapter describes how to connect peripherals, switches and indicators to the ROCKY- P218BXA board.

3.1 Floppy Disk Drive Connector

ROCKY-P218BXA board is equipped with a 34-pin daisy-chain driver connector cable.

• CN3 : FDC CONNECTOR

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#

3.2 PCI E-IDE Disk Drive Connector

You can attach four IDE (Integrated Device Electronics) hard disk drives to the ROCKY-P218BXA IDE controller.

CN1 (IDE 1) : Primary IDE Connector

CN2 (IDE 2) : Secondary IDE Connector

• **CN1/CN2 : IDE Interface Connector**

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	IDE DRQ	22	GROUND
23	IOW#	24	GROUND
25	IOR#	26	GROUND
27	IDE CHRDY	28	GROUND
29	IDE DACK	30	GROUND - DEFAULT
31	INTERRUPT	32	N/C
33	SA1	34	N/C
35	SA0	36	SA2
37	HDC CS0#	38	HDC CS1#
39	HDD ACTIVE#	40	GROUND

3.3 Parallel Port

This port is usually connected to a printer, The ROCKY-P218BXA includes an on-board parallel port, accessed through a 26-pin flat-cable connector CN6.

• **CN6 : Parallel Port Connector**

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	26	NC

3.4 Serial Ports

The ROCKY-P218BXA offers two high speed NS16C550 compatible UARTs with Read/Receive 16 byte FIFO serial ports.

• **CN11 : Serial Port DB-9 Connector (COM1)**

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)

• **CN7 : Serial Port 10-pin Header (COM2)**

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	GROUND (GND)

3.5 Keyboard/Mouse Connector

The ROCKY-P218BXA provides two keyboard/mouse connectors.

• **CN9 : 5-pin PS/2 Mouse Connector**

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

• **CN10 : 5-pin Header Keyboard Connector**

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

• **CN12 : 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

3.6 External Switches and Indicators

There are several external switches and indicators for monitoring and controlling your CPU board. All the functions are in the CN4 connector.

• **CN4 : MULTI PANEL Con2nector**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	SPEAKER	2	VCC
3	N/C	4	N/C
5	N/C	6	GND
7	VCC	8	KEYLOCK
9	RESET SW	10	GND
11	GND	12	GND
13	VCC	14	N/C
15	IDE LED	16	ATX Power Control
17	ATX Power Button	18	ATX 5VSB
19	ATX 5VSB	20	ATX 5VSB

3.7 USB Port Connector

The ROCKY- P218BXA has two built-in USB ports for the future new I/O bus expansion.

• **CN5: 2 ports USB Connector**

Pin 1-4 for USB 0

Pin 5-8 for USB 1

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1.	VCC	5.	GND
2.	SBD0-	6.	SBD1+
3.	SBD0+	7.	SBD1-
4.	GND	8.	VCC

3.8 IrDA Infrared Interface Port

The ROCKY-P218BXA has a built-in IrDA port which supports Serial Infrared (SIR) or Amplitude Shift Keyed IR(ASKIR) interface. When the IrDA port is used, user has to set SIR or ASKIR model in the BIOS' s Peripheral Setup' s COM 2. Then the normal RS-232 COM 2 will be disabled.

- **CN8 : IrDA connector**

PIN NO.	DESCRIPTION
1	VCC
2	FIR-RX
3	IR-RX
4	GND
5	IR-TX
6	CIRRX

3.9 Fan Connector

The ROCKY-P218BXA provides three cooling fan connectors. These connectors can supply 12V/500mA to the cooling fan. In the connector there is a “rotation” pin. The rotation pin gets the fan's rotation signal to system. So the system BIOS can recognize the fan speed. Please note that only specified fan offers the rotation signal.

- **CN14/15/16 : Fan Connector**

PIN NO.	DESCRIPTION
1	GND
2	+12V
3	FAN SENSOR

3.10 Sound Function Connectors

The ROCKY-P218BXA' s Creative Sound Function provides several connectors for audio in, audio out and game. The details are:

• **J1 : MIDI/GAME Port**

Pin No.	Description	Pin No.	Description
1	5V	9	5V
2	JOYF0	10	JOYF2
3	JRC0	11	JRC2
4	GROUND	12	MIDI OUT
5	GROUND	13	JRC3
6	JRC1	14	JOYF3
7.	JOYF1	15	MIDI IN
8.	5V	16	NC

• **J2 : WAVE TABLE UPGRADE**

PIN NO	DESCRIPTION
1	EMUR
2	GND
3	EMUL
4	GND
5	NC
6	GND
7	GND
8	GND

• **J3 : CD AUDIO IN (SONY)**

PIN NO.	DESCRIPTION
1	GROUND
2	JCD-L
3	GROUND
4	JCD-R

• **J4 : CD AUDIO IN (MITSUMI)**

PIN NO.	DESCRIPTION
1	JCD-L
2	GND
3	GND
4	JCD-R

• **J5 : MIC INPUT**

• **J6 : LINE IN**

• **J9 : LINE OUT**

4

AMI BIOS Setup

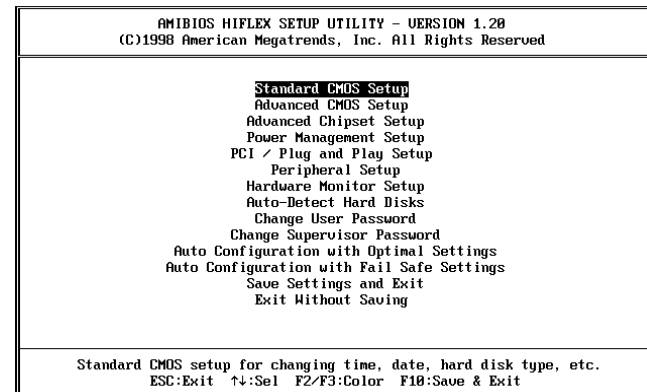
The ROCKY-P218BXA uses the AMI PCI/ISA BIOS for system configuration. The AMI BIOS setup program is designed to provide maximum flexibility in configuring the system by offering various options, which may be selected for end-user requirements. This chapter is written to assist you in the proper usage of these features.

4.1 Getting Start

When the system is turned on, the BIOS will enter the Power-On-Self-Test 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 key.



4.2 Standard CMOS Setup

The standard CMOS Setup is used for basic hardware system configuration. The main function is for Date/Time setting and Floppy/Hard Disk setting. Please refer to the following screen for this setup

AMIBIOS SETUP - STANDARD CMOS SETUP											
(C)1998 American Megatrends, Inc. All Rights Reserved											
Date (mm/dd/yyyy):	Mon Jun 07, 1999	Base Memory:	0 KB								
Time (hh/mm/ss) :	17:49:50	Extd Memory:	0 MB								
Floppy Drive A:	1.44 MB 3½										
Floppy Drive B:	Not Installed										
	Type	Size	Cyln	Head	WPcom	Sec	LBA	Blk	PIO	32Bit	
Pri Master :	Auto								Auto	On	
Pri Slave :	Auto								Auto	On	
Sec Master :	Not Installed										
Sec Slave :	Not Installed										
Boot Sector Virus Protection		Disabled									
1-46	: Predefined types						ESC:Exit	↑:Sel			
USER	: Enter parameters manually						PgUp/PgDn:	Modify			
AUTO	: Set parameters automatically on each boot						F2/F3:	Color			
CDROM	: Use for ATAPI CDROM drives										
FLOPTICAL:	Use for ATAPI FLOPTICAL drives										
Or press ENTER to autodetect											

To set the Date, for example, press either the arrow or <Enter> button on your keyboard to select one of the fields (Months, Date or Year) then press either <PgUp> or <PgDn> to set it to the current Months, Date and Year. Do the same steps for Time setting.

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 Auto-Detect Hard Disk option in the main menu; the computer will automatically detect the HDD specifications.
3. Manually enter the specifications by yourself from the "User" option.

4.3 Advanced CMOS Setup

This Advanced CMOS Setup is designed for tuning the best performance of the ROCKY-P218BXA board. As for normal operation customers don't have to change any default setting. The default setting is pre-set for most reliable operation.

The following screen will be displayed if you select Advanced CMOS Setup:

AMIBIOS SETUP - ADVANCED CMOS SETUP (C)1998 American Megatrends, Inc. All Rights Reserved		
Quick Boot	Enabled	Available Options:
1st Boot Device	Floppy	Disabled
2nd Boot Device	IDE-0	Enabled
3rd Boot Device	CDROM	▶ Cached
Try Other Boot Devices	Yes	
Floppy Access Control	Read-Write	
Hard Disk Access Control	Read-Write	
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	Absent	
Password Check	Setup	
Boot To OS/2 > 64MB	No	
CPU Serial Number	Disabled	
Cache Bus ECC	Disabled	
System BIOS Cacheable	Enabled	ESC:Exit ↑:Sel
CG00,16k Shadow	Cached	PgUp/PgDn:Modify
CG00,16k Shadow	Cached	F2/F3:Color

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

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 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.

Floppy Access Control > to define the read/write access which is set when booting from a floppy drive.

Hard Disk Access Control > to define the read/write access which is set when booting from a HDD.

S.M.A.R.T. for Hard Disks > to allow BIOS to use the **S**ystem **M**anagement and **R**eporting **T**echnologies protocol for reporting server system information on a network

BootUp Num-Lock > to turn on/off the Num-Lock option on a 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 > to testify whether or not a PS/2 mouse is supported.

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

Primary Display > to define the type of display monitor of the system. The Absent option is for network file servers.

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 F000H can be read from or written to cache memory. Setting it Enabled will give faster execution in your system.

XXXX, 16k Shadow > ROM Shadow is a technique in which BIOS code is copied from slower ROM to faster RAM. If you enable it then the BIOS will be executed from the RAM. Each option allows 16KB segment to be shadowed to the RAM.

4.4 Advanced Chipset Setup

These setup functions are working mostly for Chipset (Intel 440BX). These options are used to change the Chipset's registers. Please carefully change any default setting, otherwise the system will run unstably.

AMIBIOS SETUP - ADVANCED CHIPSET SETUP (C)1998 American Megatrends, Inc. All Rights Reserved		
***** SDRAM Timing *****		
Configure SDRAM Timing by SPD	Disabled	Available Options: ▶ Non-ECC EC-Only ECC Hardware
SDRAM RAS# to CAS# delay	3 SCLKs	
SDRAM RAS# Precharge	3 SCLKs	
SDRAM CAS# Latency	3 SCLKs	
SDRAM Leadoff Cmd Timing	Auto	
DRAM Integrity Mode	Non-ECC	
DRAM Refresh Rate	15.6 us	
Memory Hole	Disabled	
UGA Frame Buffer USMC	Disabled	
PCI Frame Buffer USMC	Disabled	
USMC Write Post	Enabled	ESC:Exit ↑↓:Sel PgUp/PgDn:Modify F2/F3:Color
Graphics Aperture Size	64MB	
8bit I/O Recovery Time	1 Sysclk	
16bit I/O Recovery Time	1 Sysclk	
USB Passive Release	Enabled	
PIIX4 Passive Release	Enabled	
PIIX4 Delayed Transaction	Disabled	
USB Function	Disabled	
USB Keyboard Legacy Support	Disabled	

Configure SDRAM Timing by SPD > *Enabled* will select predetermined optimal values of chipset parameters. When Disabled, chipset parameters return to setup information stored in CMOS.

SDRAM RAS# to CAS delay > to specify the relative delay between row and column address strobe form SDRAM.

SDRAM RAS# Precharge > this option specifies the length of time for Row Address Strobe form SDRAM to precharge.

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

DRAM Integrity Mode > to choose DRAM Integrity Mode; *ECC/EC* will enable the **Error Checking and Correction** DRAM integrity mode.

DRAM Refresh Rate > to specify the timing for DRAM Refresh

Memory Hole: to specify the location of a memory hole in the CMOS RAM. This setting reserves 15MB to 16MB memory address space for ISA expansion cards that specifically require this setting. Memory from 15MB and up will be unavailable to the system because expansion cards can only access memory up to 16MB.

VGA Frame Buffer USWC > to specify whether or not a caching of the video A000-BFFF RAM is allowed. *Enabled* will give you better system performance.

PCI Frame Buffer USWC > to specify whether or not a caching of the PCI VGA frame buffer is allowed.

USWC Write Post > to Enable or Disable the use of Uncacheable, Speculatable, Write-Combined memory.

Graphics Aperture Size > to define the size of Graphics Aperture.

Search for MDA Resources > to allow the BIOS to search for MDA resources or not.

8bit I/O Recovery Time > to define the length of time for 8 bit I/O recovery.

16bit I/O Recovery Time > to define the length of time for 16 bit I/O recovery.

USB Passive Release > to specify whether or not PIIX4 is allowed to use Passive Release while transferring control data for USB transactions.

PIIX4 Passive Release > *Enabled* will let the Passive Release mechanism encoded when CPU to PCI bus accesses.

PIIX4 Delayed Transaction > to enable or disable the embedded 32-bit posted write buffer which supports delay transaction.

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

4.5 Power Management Setup

AMIBIOS SETUP - POWER MANAGEMENT SETUP (C)1998 American Megatrends, Inc. All Rights Reserved		
ACPI Aware O/S	No	Available Options: ▶ No Yes
Power Management/APM	Disabled	
Green PC Monitor Power State	Off	
Video Power Down Mode	Disabled	
Hard Disk Power Down Mode	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	
Power Button Function	Suspend	
		ESC:Exit ↑:Sel PgUp/PgDn:Modify F2/F3:Color

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

Green PC Monitor Power State > to specify the power state of the monitor after the specified period of display-idle has ended.

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

Hard Disk Power Down Mode > to specify the power state of the hard disk after the specified period of hard drive-idle has ended.

Standby Time Out (Minute) > to specify the length of the system-idle period while the system is in full power on state. After this period of time has ended, the system will go into Standby state.

Suspend Time Out (Minute) > to specify the length of the system-idle period while the system is in Standby state. After this period of time has ended, the system will go into Suspend state.

Throttle Slow Clock Ratio > to specify the speed of system clock under power saving state. The figure is a ratio between power conserving and normal state CPU clock.

Modem Use IO Port > to assign a port for modem.

Modem Use IRQ > to assign an IRQ for modem

Display Activity > to specify if BIOS has to monitor display activity or not.

Device X > to monitor specified device IRQ or Ignore.

Power Button Function > to specify how the power button on the chassis is operated.

4.6 PCI / Plug and Play Setup

The setup help user handles the ROCKY-P218BXA board's PCI function. All PCI bus slots on the system use INTA#, thus all installed PCI slots must be set.

AMIBIOS SETUP - PCI / PLUG AND PLAY SETUP (C)1998 American Megatrends, Inc. All Rights Reserved		
Plug and Play Aware O/S	No	Available Options: ▶ No Yes
Clear NURAM	No	
PCI Latency Timer (PCI Clocks)	64	
PCI UGA Palette Snoop	Disabled	
Allocate IRQ to PCI UGA	Yes	
OffBoard PCI IDE Card	Auto	
OffBoard PCI IDE Primary IRQ	Disabled	
OffBoard PCI IDE Secondary IRQ	Disabled	
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 Channel 3	PnP	
DMA Channel 5	PnP	
DMA Channel 6	PnP	
DMA Channel 7	PnP	
IRQ3	PCI/PnP	ESC:Exit ↑↓:Sel
IRQ4	PCI/PnP	PgUp/PgDn:Modify F2/F3:Color

Plug and Play Aware O/S > Yes or No

When PNP OS is installed, interrupts will be reassigned by the OS 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 > if yes, BIOS will auto-clear NVRAM on every boot.

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

PCI VGA Palette Snoop > this option is useful only for system with more than one VGA devices connected to it through different bus (one PCI and one ISA). To enable those various VGA devices to handle signal from the CPU on each set of palette registers of every video devices, it must be set *Enabled*.

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

Offboard PCI IDE Card > to specify if an offboard PCI IDE card is installed in your computer or not. You must specify the slot number on the board which will be used for the card.

Offboard PCI IDE Primary (/Secondary) IRQ > to specify the PCI interrupt that is assigned to the Primary (/Secondary) IDE channel on the offboard PCI IDE controller.

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.

4.7 Peripheral Setup

This setup is working mostly on Multi-I/O Chip (W83977). The options are used to change the Chipset's registers. Please carefully change any default setting to meet your application need perfectly. The only special concern is Onboard Serial Port 2. If you want to use the IrDA port, you have to configure the

SIR or ASKIR model in the BIOS's Peripheral Setup's COM2; the RS-232 COM2 will be disabled.

AMIBIOS SETUP - PERIPHERAL SETUP		
(C)1998 American Megatrends, Inc. All Rights Reserved		
OnBoard FDC	Enabled	Available Options: Auto Disabled ▶ Enabled
OnBoard Serial Port1	3F8h/COM1	
OnBoard Serial Port2	2F8h/COM2	
Serial Port2 Mode	Normal	
Serial Port2 IR DMA Channel	N/A	
Serial Port2 IR Interface	N/A	
Serial Port2 Receiver Polarity	High	
Serial Port2 Xmitter Polarity	Low	
OnBoard Parallel Port	378h	
Parallel Port Mode	ECP+EPP	
EPP Version	N/A	
Parallel Port IRQ	7	
Parallel Port ECP DMA Channel	3	
OnBoard IDE	Both	
		ESC:Exit ↑:Sel PgUp/PgDn:Modify F2/F3:Color

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 1(/2). 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 2.

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 bidirectional 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.

4.8 Hardware Monitor Setup

There is a LM78 chip on your board, which can monitor on board system voltage and fan speed. The voltage monitoring will cover +5V,+12V,-12V,and -5V.

AMIBIOS SETUP - HARDWARE MONITOR SETUP		(C)1998 American Megatrends, Inc. All Rights Reserved	
-- System Hardware Monitor --		Available Options:	
Current System Temperature	48 °C/118 °F	▶ -	
Fan3 Speed	5440 RPM		
Fan2 Speed	5430 RPM		
Fan1 Speed	5120 RPM		
Utt	1.520 V		
Ucore	1.984 V		
Uio	3.392 V		
+ 5.000U	5.113 V		
+12.000U	12.728 V		
-12.000U	-12.209 V		
- 5.000U	-5.124 V		
		ESC:Exit ↑:Sel	
		PgUp/PgDn:Modify	
		F2/F3:Color	

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 CN14/CN15/CN16 is correct.

4.9 Change User/Supervisor Password



This option sets a password that is used to protect your system and Setup Utility. Supervisor Password has higher priority than User Password. Once you setup the password, the system will always ask you to key-in password every time you enter the

BIOS SETUP. If you enter the BIOS SETUP with Supervisor Password, you can access every setup option on the main menu but with User Password you can only choose three setup options (USER PASSWORD, SAVE SETTING AND EXIT and EXIT WITHOUT SAVING). To disable these passwords, enter the BIOS SETUP menu with Supervisor Password and then just press the <Enter> key instead of entering a new password when the 'Enter Password' prompt pop-up.

4.10 Auto-Detect Hard Disks

This option detects the parameters of an IDE hard disk drive (HDD sector, cylinder, head, etc) automatically and will put the parameters into the Standard CMOS Setup screen. Up to 4 IDE drives can be detected and the parameters will be listed in the box. Press <Y> if you accept these parameters. Press <N> to skip the next IDE drives.

Note: If your IDE HDD was formatted in previous older system, incorrect parameters may be detected. In this case, you need to enter the correct parameters manually or low-level format the disk.

4.11 Auto Configuration with Optimal Settings

This option lets you load the *optimal* default settings. These settings are *best-case values*, which will provide the best performance. Whenever your CMOS RAM is damaged, this optimal settings will be loaded automatically.



4.12 Auto Configuration with Fail Safe Settings

This option lets you load the *Fail Safe* default settings when something happens to your computer so that it cannot boot normally. These settings are not the most optimal settings but are the most stable settings.



4.13 Save Settings and Exit

Select this option when you finish setting all the parameters and want to save them into the CMOS. Just simply press <Enter> key and all the configuration changes will be saved.

4.14 Exit Without Saving

Select this option if you want to exit the Setup without saving the changes that you made. Just simply press <Enter> key and you will exit the BIOS SETUP without saving the changes.



E² Key™ Function

The ROCKY-P218BXA provides an outstanding E²KEY™ function for system integrator. Based on the E²KEY™ you could free to store the ID Code, Pass Word, or Critical Data in the 1Kbit EEPROM. Because the EEPROM is nonvolatile memory, you don't have to worry the losing of the very important data.

Basically the E²KEY™s based on a 1Kbit EEPROM which is configured to 64 words (from 0 to 63). You could access (read or write) each word at any time.

When you start to use the E²KEY™ you should have the utility in the package. The software utility will include four files as follows,

README.DOC
E2KEY.OBJ
EKEYDEMO.C
EKEYDEMO.EXE.

The E²KEY.OBJ provides two-library function for user to integrate their application with E²KEY™ function. These libraries (**read_e2key** and **write_e2key**) are written and compiled in C format. Please check the following statement, then you will know how to implement it easily.

unsigned int read_e2key(unsigned int address)

/* This function will return the E2KEY™s data at address. The address range is from 0 to 63. Return data is one word,16 bits */

void write_e2key(unsigned int address,unsigned data)

/* This function will write the given data to E²KEY™ at address. The address range is from 0 to 63. The data value is from 0 to 0xffff. */

To easy start to use the function, please refer the included EKEYDEMO.C code first.

Please note the E²KEY™ function is based on the working of parallel port. So you should enable the ROCKY-P218BXA's parallel port, otherwise it will be not working.

Appendix A. Watch-Dog Timer

The Watch-Dog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that caused the CPU to crash. This condition may have occurred by external EMI or a software bug. When the CPU stops working correctly, hardware on the board will either perform a hardware reset (cold boot) or a non-maskable interrupt (NMI) to bring the system back to a known state.

The Watch-Dog Timer is controlled by two I/O ports.

443 (hex)	Read	Enable the refresh the Watch-Dog Timer.
--------------	------	---

043 (hex)	Read	Disable the Watch-Dog Timer.
--------------	------	------------------------------

To enable the Watch-Dog Timer, a read from I/O port 443H must be performed. This will enable and activate the countdown timer which will eventually time out and either reset the CPU or cause an NMI depending on the setting of JP9. To ensure that this reset condition does not occur, the Watch-Dog Timer must be periodically refreshed by reading the same I/O port 443H. This must be done within the time out period that is selected by jumper group JP11.

A tolerance of at least 30% must be maintained to avoid unknown routines within 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.

Note: when exiting a program it is necessary to disable the Watch-Dog Timer, otherwise the system will reset.
