CHAPTER 1

General Information

This chapter provides background information for the SBC-357 Rev.C.

Sections include:

- Card specifications
- Board layout

Introduction

The SBC-357 Rev.C is an all-in-one single board with an **onboard flat panel/CRT SVGA controller**. It packs all the functions of an industrial computer and its display capabilities onto a single, half-size card. This means the SBC-357 Rev.C is absolutely your best solution for embedded applications.

The onboard ISA-Bus, flat panel/CRT SVGA controller uses the CHIPS 65545 chipset with up to 1 MB of video memory (512KB onboard). It supports various LCD types including TFT, STN, Normal, and EL.

The SBC-357 Rev.C supports M-Systems DiskOnChip 2000. Moreover, it provides up to 256KB SRAM and up to 1.44MB Flash ROM disk which doesn't require any bus, slots, or connectors. And the most important of all, it **can support 5V EDO**.

The SBC-357 Rev.C also features three high speed RS-232 serial ports, and one RS-232/422/485 serial port with 16C550 UARTs, one bidirectional SPP/EPP/ECP parallel port, and a floppy drive controller. Furthermore, the board can provide 10Mb/s N-way auto-negotiation operation with one ethernet controller.

If program execution is halted by a program bug or EMI, the board's watchdog timer can automatically reset the CPU or generate an interrupt. This ensures reliability in unmanned or standalone systems.

All configuration is done through software. A single Flash chip holds the system BIOS, VGA BIOS, and the network boot ROM image. This minimizes the number of chips and eases configuration. You can change the display BIOS or install a boot ROM simply by programming the Flash chip.

Features

Supports 386SX-40 compatible CPU

Supports DiskOnChip, SRAM, and Flash ROM disk on board (optional)

Supports single LAN

Supports CRT and LCD display simultaneously

Supports PC/104 module expansion

Supports 4 serial ports: Three RS-232 ports and one RS-232/422/485 port

Specifications

CPU: Embedded in ALI M6117C Chipset Intel 80386SX-40 compatible

Data bus: 16-bit

BIOS: AMI Flash BIOS (Supports LBA mode HDD)

Chipset: ALI M6117C

Super I/O Chipset: ITE8661F

RAM memory: 4M EDO RAM

Shadow RAM memory: Supports system and video BIOS shadow memory

IDE hard disk drive interface: Supports up to one IDE (AT bus) hard disk drives. BIOS auto-detect.

Floppy disk drive interface: Supports up to two floppy disk drive, 5.25”(360KB and 2MB) and /or 3.5”(720KB, 1.44MB and 2.88MB)

Bi-directional parallel port: One Bi-directional printer port (Configurable LPT1, LPT2, LPT3 or disable). Support SPP, ECP and EPP modes.

Serial ports: Three RS-232 serial ports and one RS-232/422/485 serial port. Uses 16C550 UARTs with 16 byte FIFO. Supports speeds up to 115Kbps. Ports can be individually configured from COM1 to COM4 or disabled.

Real-time clock/calendar: ALI chipset RTC (internal) and quartz oscillator power by a lithium battery for 10 years of data retention.

DMA channel: 7

Interrupt levels: 15

KB/PS2 Mouse connector: 6 pin mini DIN connector supports a standard PC/AT keyboard and mouse.

Flat panel VGA interface

Chipset: C&T 65545

Display memory: 512KB standard, 1MB option

Display type: Supports CRT and flat panel (TFT , DSTN, mono and EL)display, Can display both CRT and flat panel simultaneously.

Resolution: Option up to 1024 x 768 @ 256 colors.(1MB-display memory). Standard 1024 x 768 @ 16 colors (512KB-display memory)

Ethernet interface

Chipset: RTL8019AS

SSD interface

One 32-pin DIP socket supports M-systems DiskOnChip 2000 series, memory capacity from 2MB to 288 MB.

SRAM: 256 KB (Optional)

Flash ROM Disk: 1.44 MB (Optional)

Expansion Slot

PC/104 connector: 104-pin connector for a 16 -bit bus expansion.

Mechanical and environmental

Power supply voltage: +5V (4.75V to 5.25V)

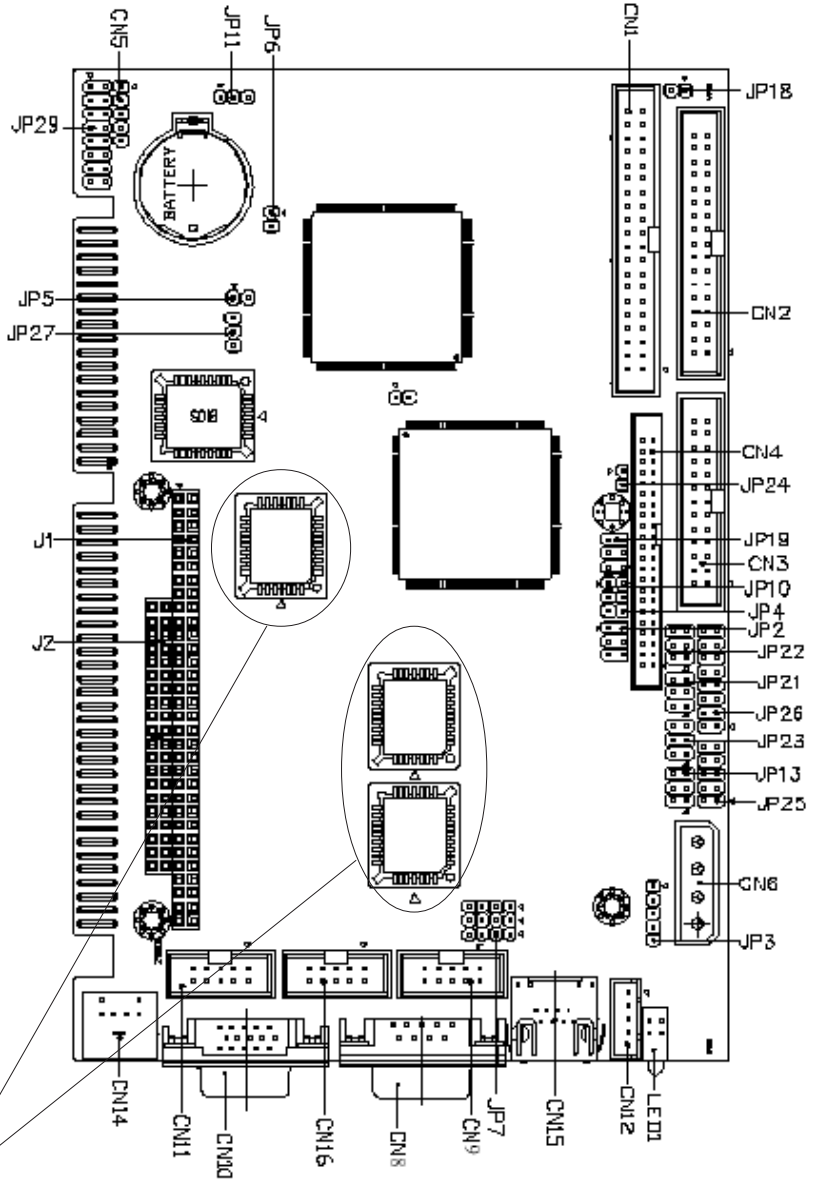
Max. power requirements: +5V @ 2A

Operating temperature: 32 to 140^0F (0 to 60^0C)

Board Size: 7.3" (L) X 4.8" (W) (185mm x 122mm)

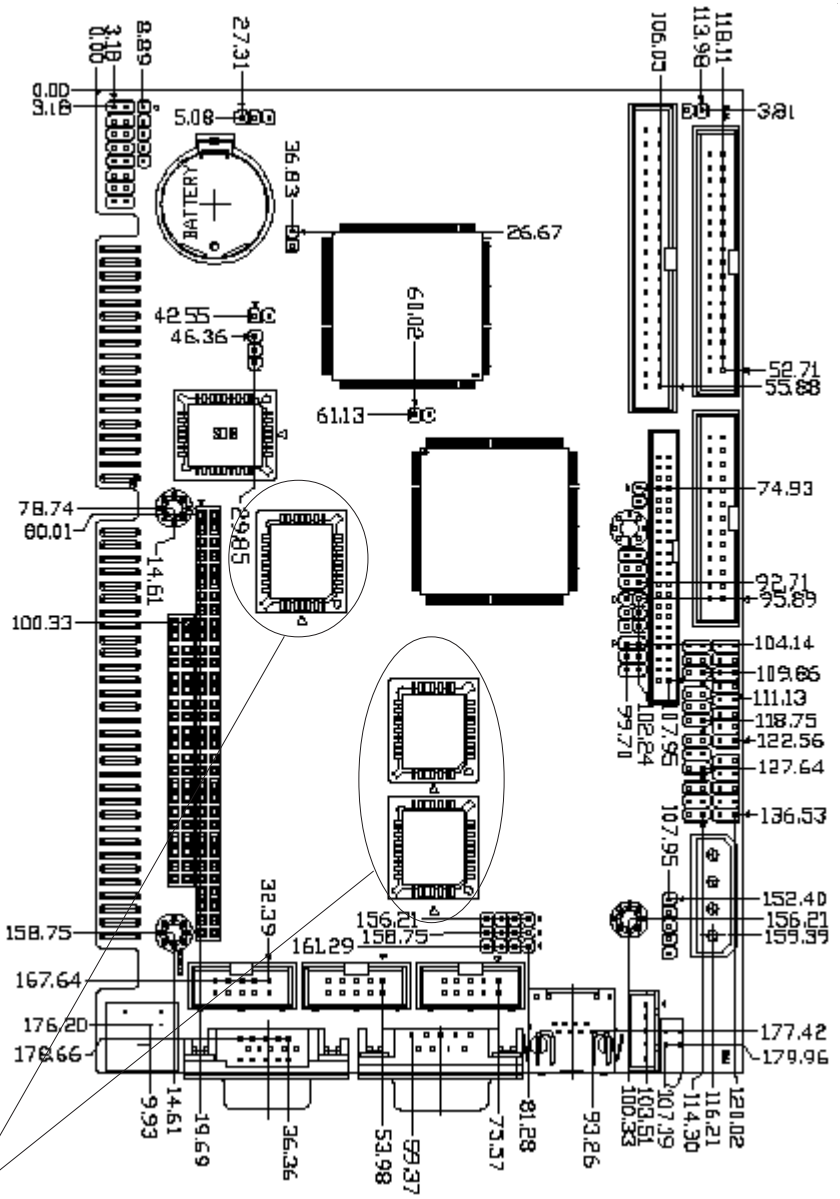
Weight: 0.66 lb. (0.3Kg)

Board Layout



Please notice that SBC-357 Rev.C1.1-01 doesn't have these components.

Card Dimensions



Please notice that SBC-357 Rev.C1.1-01 doesn't have these components.

CHAPTER 2

Installation

This chapter describes how to set up the SBC-357 hardware, including instructions on setting jumpers and connecting peripherals, switches, and indicators. Be sure to read all safety precautions before you begin the installation procedure.

Jumpers

The board has a number of jumpers that allow you to configure your system to suit your applications. The table below lists the function of each jumper:

Name	Function
JP2	COM2 RS-232/422/485 selection-1
JP3	Buzzer or external speaker selection
JP4	LCD clock selection
JP5	External SMI option
JP6	Reset Switch
JP7	COM2 RS232/422/485 selection-2
JP10	C&T65545 VGA chip voltage selection
JP11	CMOS status
JP12	VGA chip IRQ option
JP13	COM2 RI/Volt selection
JP18	DOM install selection
JP19	LCD voltage selection
JP21	COM4 RI/Volt selection
JP22	COM3 RI/Volt selection
JP23	COM1 RI/Volt selection
JP24	Backlight Voltage output
JP25	CPLD JTAG pin module
JP26	Flash ROM/SRAM function selection
JP27	SRAM size selection
JP29	Flash ROM memory address and I/O setting

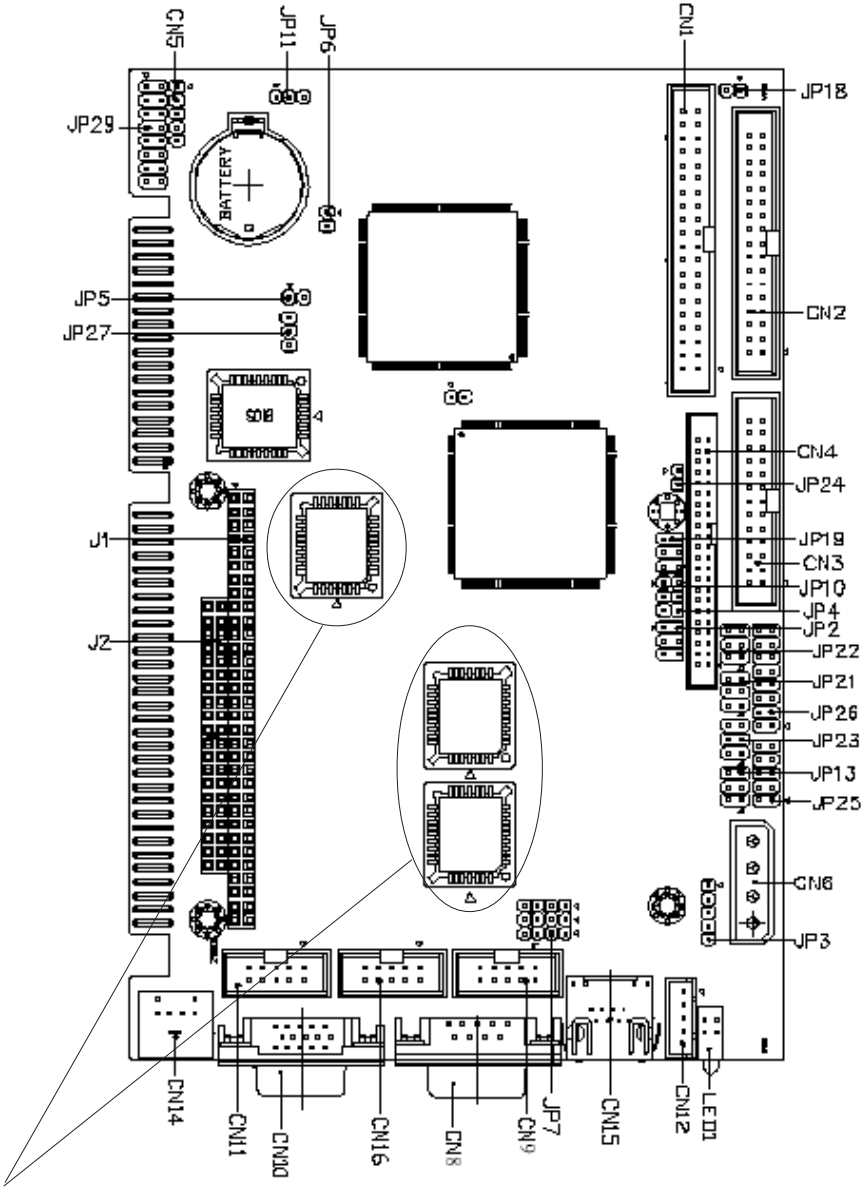
Please notice that SBC-357 Rev.C1.1-01 doesn't have JP26, JP27, and JP29.

Connectors

Connectors on the board link themselves to external devices, such as hard disk drives, a keyboard, or floppy drives. The table below lists the function of each connector:

Name	Function
CN1	IDE connector
CN2	Floppy connector
CN3	Parallel (printer) port connector
CN4	LCD connector
CN5	IrDA connector
CN6	Power connector
CN8	COM2 connector
CN9	COM1 connector
CN10	CRT/D-Sub 15
CN11	COM4 connector
CN12	External Keyboard connector (KB only)
CN14	PS/2 Mini Din (support Y-Cable)
CN15	RJ-45 ethernet phone jack
CN16	COM3 connector
J1&J2	PC-104 slot (ISA I/F)

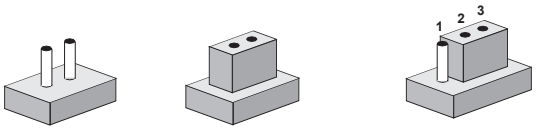
Locating jumpers and connectors



Please notice that SBC-357 Rev.C1.1-01 doesn't have these components.

Setting Jumpers

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



Open **Closed** **Closed 2-3**

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

Open **Closed** **Closed 2-3**

A pair of needle-nose pliers may be helpful when working with jumpers.

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

Generally, you simply need a standard cable to make most connections.

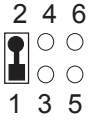
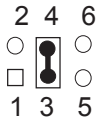
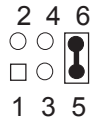
Safety Precautions

Warning! *Always completely disconnect the power cord from your chassis whenever you are working on it. Do not make connections while the power is on because sensitive electronic components can be damaged by the sudden rush of power. Only experienced electronics personnel should open the PC chassis.*

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

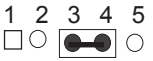
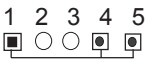
COM2 RS-232/422/485 Selection-1 (JP2)

The COM2 serial port can be selected as RS-232, RS-422, or RS-485 by setting JP2. The follwing chart shows the jumper setting:

COM2 RS-232/422/485 Selection-1 (JP2)	
RS-232*	
RS-422	
RS-485	

*** Default**

Buzzer / External Speaker Selection (JP3)

Buzzer or External Speaker Selection (JP3)	
Buzzer*	**External Speaker**
	

*** Default**

LCD Clock Selection (JP4)

LCD Clock Selection (JP4)	
SHF CLK from C&T65545*	ASHF CLK from SHF CLK
1 2 3 	1 2 3 

*** Default**

External SMI Option (JP5)

The user can connect an external switch or jumper cap enabling the SMI (System Management Interrupt) and making the system enter Green function mode.

System Management Interrupt Option (JP5)	
* 	(SMI Mode) 

*** Default**

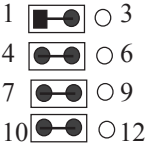
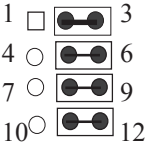
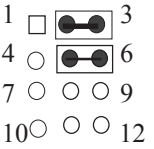
Reset Switch (JP6)

You can connect an external switch to easily reset your computer. This switch restarts your computer as if you turned off the power then turned it back on.

Reset Switch (JP6)	
Normal * 	Reset 

*** Default**

COM2 RS232/422/485 Selection-2 (JP7)

COM2 RS-232/422/485 Selection-2 (JP7)	
RS-232 *	
RS-422	
RS-485	

*** Default**

C&T65545 VGA Chip Voltage Selection (JP10)

VGA Chip Voltage Selection (JP10)	
5 Volt.*	**3.3 Volt.**
	

*** Default**

CMOS Status (JP11)

You can connect an external switch to clear the CMOS. This switch closes JP11 and turns on the power, at which time the CMOS setup will be cleaned.

CMOS Status (JP11)

Normal*	Clear CMOS
1 2 3	1 2 3
	

*** Default**

VGA Chip's IRQ Option (JP12)

VGA Chip's IRQ Option (JP12)

VGA Chip Occupy IRQ9	IRQ9 Was Released For System*
1 2	1 2
	

*** Default**

COM1/COM2/COM3/COM4 RI/Volt Selection (JP23/JP13/JP22/JP21)

COM1/COM2/COM3/COM4 RI/Volt Selection (JP23/JP13/JP22/JP21)

12V For RS232	5V For RS232	Normal RI Function*
2 4 6 1 3 5	2 4 6 1 3 5	2 4 6 1 3 5

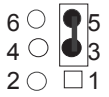
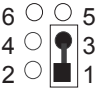
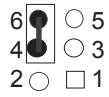
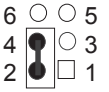
**** Default***

DOM Install Selection (JP18)

DOM Install Selection (JP18)	
Enable DOM Power Supply	**Disable DOM Power Supply***
1 2 	1 2 

*** Default**

LCD Voltage Select (JP19)

LCD Voltage Select (JP19)		
	+3.3V *	**+5V**
LCD Operating Voltage	 ** default*	
	+12V *	**+5V**
LCD Backlight Voltage	 ** default*	

Flash ROM Disk & SRAM Installation

In addition to Flash Disk space for user's programming files and data storage, **SBC-357 Rev.C1.1 (not SBC-357 Rev.C1.1-01)** also supplies 256KB of SRAM to provide more capacity and reliability for your versatile application requirement. And the following content is the installation guide for them:

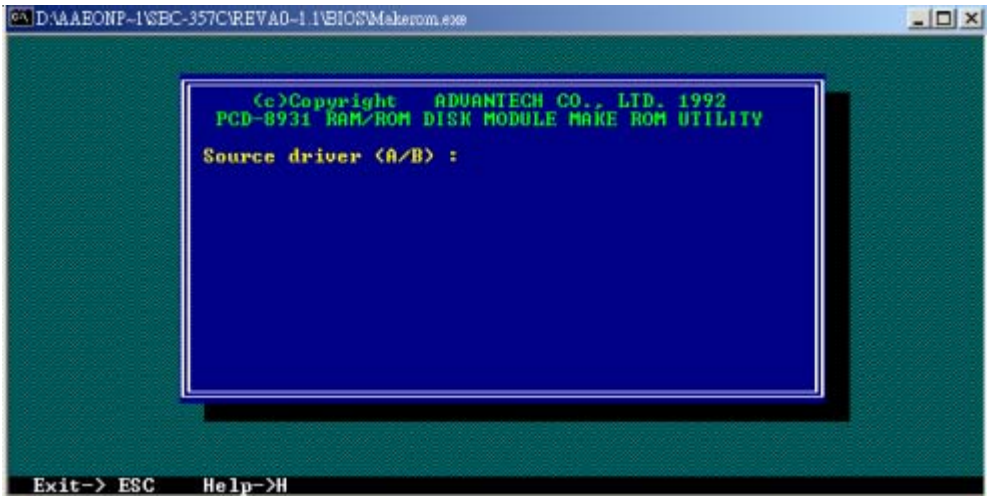
Step1: First, please make sure to close the pin1to pin2 and pin5 to pin6 to disable the function of Flash ROM/SRAM disk.

Step2: Put 3 pieces of Flash IC into the Flash IC socket, U59, U82, and U83.

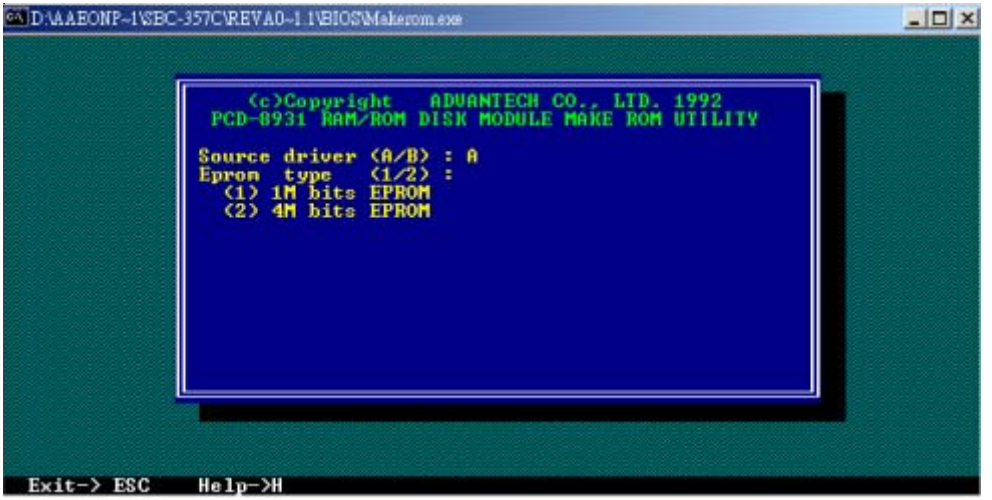
Step3: Then, connect the FDD and HDD.

Step4: Save the files you need in one 1.44MB bootable floppy disk.

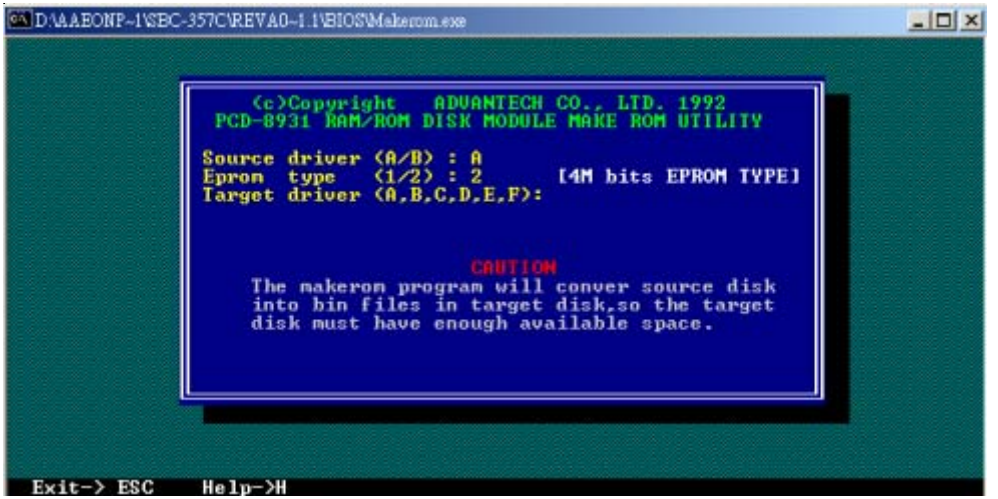
Step5: Boot up the system and enter DOS mode from HDD to perform "makerom.exe", thus producing 3 ROM files shown as Pic1 to Pic5.



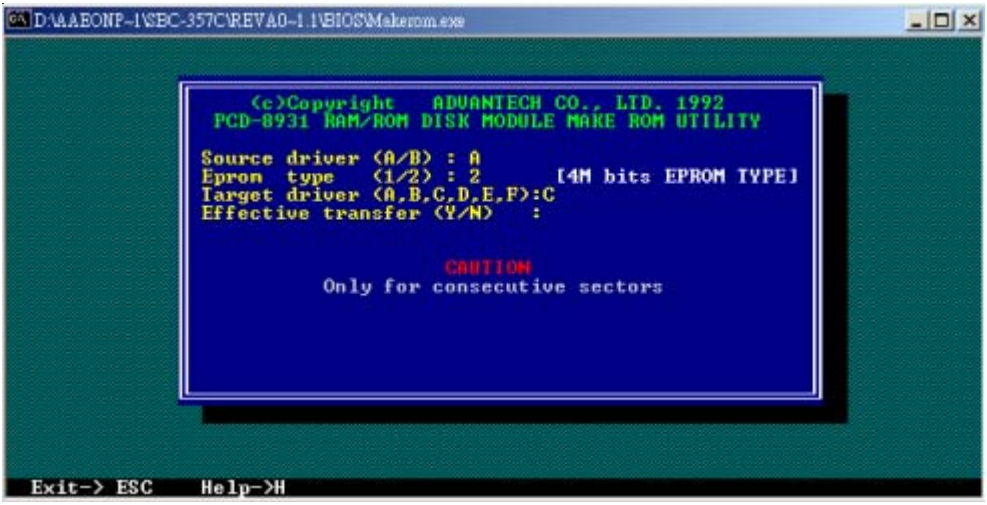
Pic1 Select the source disk drive and insert the floppy you made in Step 4.



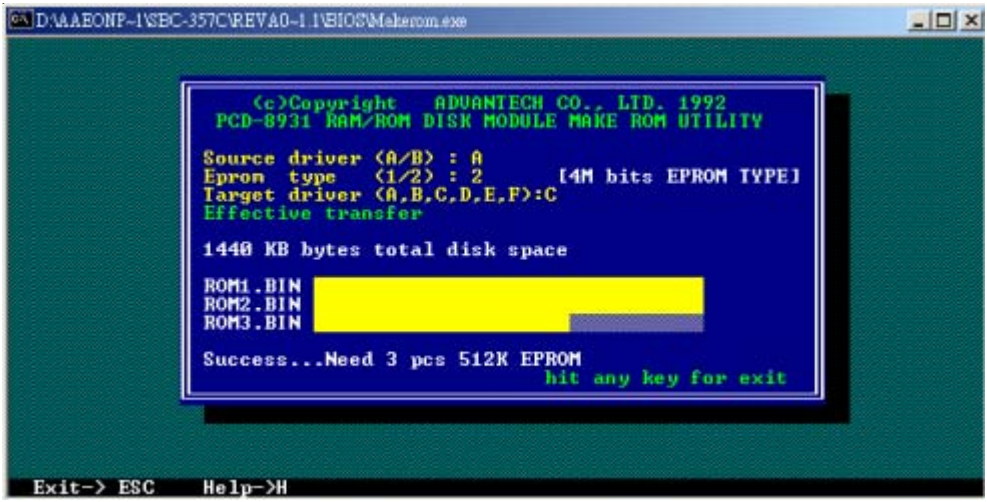
Pic2 Select the source drive A and specify the capacity of Flash ROM.



Pic3 Select "2" in "Eprom type" for SBC-357 Rev.C is with 4M bits (512 Kbytes) on board. And then choose the target disk drive to save the ROM files.

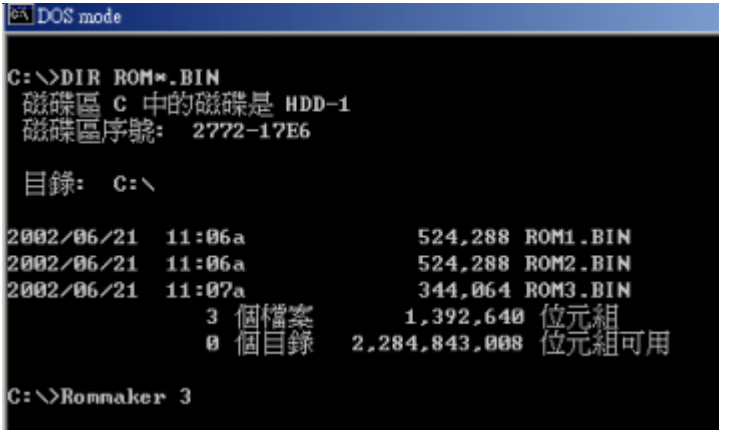


Pic4 Suppose you choose "C" as target disk drive and make sure every step performed correctly0. Then enter "Y" to carry out the process of producing ROM files.



Pic5 It will appear 3 ROM files and show the success message.

Step6: After creating ROM files, go to the location where you saved the ROM files and perform the "Rommaker.exe" to format Flash ROM shown as Pic6.



Pic6 The number "3" after "Rommaker" means there's 3 ROM files. So "Rommaker2" represents 2 ROM files.

Step7: Shut down the computer and configure the jumper according to the following tables.

	Jumper Cap Short	Jumper Cap Open
Pin1-Pin2	Disable Flash ROM Disk	Enable Flash ROM Disk
Pin3-Pin4	Set Flash Rom Disk as Drive A	Set Flash Rom Disk as Drive B
Pin5-Pin6	Disable SRAM Disk	Enable SRAM Disk
Pin7-Pin8	Set SRAM Disk as Drive A	Set SRAM Disk as Drive B
Pin9-Pin10	Set SRAM size as 128K	Set SRAM size as 32K
Pin11-Pin12	Reserved	
Pin13-Pin14	Reserved	
Pin15-Pin16	Reserved	

Table1 The jumper setting of JP26. Please follow the setting in gray background. And the next table shows you the default setting when you get the board.

	Jumper Short	Jumper Open
Pin1-Pin2	Disable Flash ROM Disk	Enable Flash ROM Disk
Pin3-Pin4	Set Flash Rom Disk as Drive A	Set Flash Rom Disk as Drive B
Pin5-Pin6	Disable SRAM Disk	Enable SRAM Disk
Pin7-Pin8	Set SRAM Disk as Drive A	Set SRAM Disk as Drive B
Pin9-Pin10	Set SRAM size as 128K	Set SRAM size as 32K
Pin11-Pin12	Reserved	
Pin13-Pin14	Reserved	
Pin15-Pin16	Reserved	

Table2 The default jumper setting of JP26 when you get the board.

Caution:

If you want to configure the size of SRAM, you will need to set the pin 9-10 of JP26 as Table1 and set JP27 as below.

JP27	SRAM Size Selection (Voltage)
Pin1-2 Short *	128K*8 bir SRAM
Pin2-3 Short	32K*8 SRAM

*** Default**

Although the size of SRAM is defined as 360KB in BIOS, the actual size of SRAM onboard is 256KB (2x128KB). So if the files you save exceed 256KB, they couldn't be saved and read.

Pin1-Pin2	Pin3-Pin4	Flash ROM Memory Address
Short	Short	D8000 ~ D9FFF
Short	Open	DC000 ~ DDFFF
Open	Short	D0000 ~ D1FFF
Open	Open	Reserved

Table3 The jumper setting of JP29 for Flash ROM Memory Addrress. The setting in grey background is the default.

Pin5-Pin6	Pin7-Pin8	Flash ROM IO Base
Short	Short	22C & 22D
Short	Open	26C & 26D
Open	Short	2AC & 2AD
Open	Open	2DC & 2DD

Table4 The jumper setting of JP29 for Flash ROM IO Base. The setting in grey background is the default.

Note: The function of JP29's other pins is "reserved".

Step8: Power on the computer and press "Delete" on the keyboard to enter the setting of BIOS. And the following is an example for configuration:

1. Enter "Standard CMOS Setup".

   Next, set Floppy Drive A as "1.44MB, 3.5 in."

   Then set Floppy Drive B as "360KB, 5.25 in."

Note: Please remove the FDD from the floppy connector and follow the instructions above to set Flah ROM Disk as "Floopy Drive A" and SRAM as "Floopy Drive B" Moreover, please make sure the jumper setting of JP26 matches the configuration in BIOS, or it will cause "CMOS Checksum error" and the lost of data in CMOS.

Jumper Setting of JP26	Configuration in BIOS
Pin1,Pin2 Open	Enable Flash ROM Disk(1.44MB)
Pin3,Pin4 Closed	Set Flash ROM Disk as Drive A
Pin5,Pin6 Open	Enable SRAM Disk(360KB)
Pin7,Pin8 Open	Set SRAM Disk as Drive B
Pin9,Pin10 Closed	Set the size of SRAM as 128K

2. Enter "Advanced CMOS Setup" to decide each drive's boot up sequence.

Step9: At last, enter DOS mode to perform "Format SRAM disk" after reboot the system.

IDE hard drive connector (CN1)

You can attach two Enhanced Integrated Device Electronics hard disk drives to the SBC-357's internal controller. The card comes with a 40-pin flat piggyback cable. This cable has three identical 40-pin flat-cable connectors.

Connecting the hard drive

Wire number 1 on the cable is red or blue, and the other wires are gray.

1. Connect one end of the cable to the IDE connector. Make sure that the red (or blue) wire corresponds to pin 1 on the connector, which is labeled on the board (on the right side).
2. Plug the other end of the cable to the Enhanced IDE hard drive, with pin 1 on the cable corresponding to pin 1 on the hard drive. See your hard drive's documentation for the location of the connector.

Unlike floppy drives, you can make the connections with any of the connectors on the cable. If you install two drives, you will need to set one as the master and one as the slave. You do this using jumpers on the drives. If you install just one drive, set it as the master.

Pin assignments

The following table lists the pin numbers and their respective signals:

IDE Connector (CN1)

Pin	Signal	Pin	Signal
1	Reset	2	GND
3	D7	4	D8
5	D6	6	D9
7	D5	8	D10
9	D4	10	D11
11	D3	12	D12
13	D2	14	D13
15	D1	16	D14
17	D0	18	D15
19	GND	20	N.C.
21	N.C.	22	GND
23	IOW	24	GND
25	IOR	26	GND
27	IORDY	28	BALE
29	N.C.	30	GND
31	IRQ 14	32	-I/O CS16
33	A1	34	N.C.
35	A0	36	A2
37	CS0	38	CS1
39	-ACT	40	GND

Floppy drive connector (CN2)

You can attach up to two floppy disks to the SBC-357's onboard controller. You can use any combination of 5 1/4" (360 KB and 1.2 MB) and/or 3 1/2" (720 KB, 1.44 MB, and 2.88 MB) drives.

The SBC-357 CPU card comes with a 34-pin daisy-chain drive connector cable. On one end of the cable is a 34-pin flat-cable connector. There are two sets of floppy disk drive connectors, one in the middle, and one on the other end. Each set consists of a 34-pin flat-cable connector (usually used for 3.5" drives) and a printed-circuit board connector (usually used for 5.25" drives).

Connecting the floppy drive

1. Plug the 34-pin flat-cable connector into the CN2 connector.
2. Attach the appropriate connector on the other end of the cable to the floppy drive(s). You can use only one connector in the set. The set on the end (after the twist in the cable) connects to the A: drive. The set in the middle connects to the B: drive.

Pin assignments

The following table lists the pin assignments for the CN2 connector:

Floppy drive connector (CN2)

Pin	Signal	Pin	Signal
1~33 (odd)	GND	2	High density
4, 6	Unused	8	Index
10	Motor enable A	12	Driver select B
14	Driver select A	16	Motor enable B
18	Direction	20	Step pulse
22	Write data	24	Write enable
26	Track 0	28	Write protect
30	Read data	32	Select head
34	Disk change		

Parallel (printer) connector (CN3)

Normally, the parallel port is used to connect the card to a printer. The SBC-357 includes an onboard parallel port, accessed through the CN3 connector, a 26-pin flat-cable connector. The CPU card comes with an adapter cable, which lets you use a traditional DB-25 connector. The cable has a 26-pin connector on one end and a DB-25 connector on the other, mounted on a retaining bracket.

Installing the retaining bracket

The retaining bracket installs at an empty slot in your system's chassis. It provides an external port that gives your parallel peripheral access to the card's parallel port connector.

1. Find an empty slot in your chassis.
2. Unscrew the plate that covers the end of the slot.
3. Screw in the bracket in place of the plate.
4. Next, attach the flat-cable connector to the CN3 connector. Wire 1 of the cable is red or blue, and the other wires are gray. Make sure that Wire 1 connects to Pin 1 of the CN3 connector. Pin 1 is on the right side of the CN3 connector.

Pin assignments

Parallel (printer) Connector (CN3)

Pin	Signal	Pin	Signal
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	+Select	14	-Auto feed
15	-Error	16	-Init printer
17	-Select input	18~25	GND

Display connectors (CN10, CN4)

The SBC-357 CPU card's SVGA connector (CN10) supports monochrome displays as well as high resolution color displays. The card also features an LCD connector (CN4), which allows you to connect various flat panel displays. The following table lists their pin assignments:

SVGA connector (CN10)

Pin	Signal
1	Red video
2	Green video
3	Blue video
4	Not used
5	GND
6	Red return (GND)
7	Green return (GND)
8	Blue return (GND)
9	Key (no pin)
10	Sync return (GND)
11	Monitor ID (not used)
12	Monitor ID
13	Horizontal sync
14	Vertical sync
15	Not used

LCD connector (CN4)

Pin	Signal	Pin	Signal
1	+12 V_{DC}	2	+12 V_{DC}
3	GND	4	GND
5	+5 V_{DC}	6	+5 V_{DC}
7	ENA VEE	8	GND
9	P0	10	P1
11	P2	12	P3
13	P4	14	P5
15	P6	16	P7
17	P8	18	P9
19	P10	20	P11
21	P12	22	P13
23	P14	24	P15
25	P16	26	P17
27	P18	28	P19
29	P20	30	P21
31	P22	32	P23
33	GND	34	GND
35	SHIFT CLK	36	FLM
37	M	38	LATCH CL/C
39	GND	40	ENABKL
41	N.C.	42	N.C.
43	N.C.	44	N.C.

Reserved IR connector (CN5)

IR connector (CN5)	
Pin	**Function**
5	IR_TX
4	GND
3	IR_RX
2	FIR_RX
1	V_{CC}

Power connector (CN6)

In single board computer (non-passive backplane) applications, you will need to connect the power directly to the SBC-357 board using CN6. This connector is fully compatible with the standard PC power supply connectors. See the following table for its pin assignments:

Power port connector (CN6)	
Pin	**Signal**
1	+5 V_{DC}
2	GND
3	GND
4	+12 V_{DC}

Serial port connectors (CN7, CN8, CN9, CN11)

The SBC-357 offers three RS-232 serial ports, and one RS-232/422/485 serial port. You can select or disable the address for each port with the BIOS Peripheral Setup program.

The card mounting bracket holds COM1(CN8), the DB-9 serial port connector for the first port. The COM port connectors on the SBC-357 board are CN7 (COM2), CN9 (COM3), CN11 (COM4). The COM2 can be assigned as RS-232 I/F or RS-422/485 I/F.

Pin	RS-232	RS-422/485	Pin	RS-232	RS-422/485
1	DCD	DCD	2	DSR	DSR
3	RX	RX	4	RTS	RTS
5	TX	TX	6	CTS	CTS
7	DTR	DTR	8	RI	RI
9	GND	GND	10	NC	NC
11	NC	422TXD+ (485TXD+)	12	NC	422TXD- (485TXD-)
13	NC	422TXD+	14	NC	422RXD-

KB and PS/2 mouse connectors (CN12, CN14)

The SBC-357 board provides two keyboard and one PS/2 mouse connectors. A 5-pin connector (CN9) supports passive backplane applications. A second 6-pin mini-DIN keyboard and PS/2 mouse connector (CN12) on the card mounting bracket supports single board computer applications.

Keyboard connector (CN12)

Pin	Function
1	K.B. clock
2	K.B. data
3	N.C.
4	GND
5	+5 V_{DC}

KB & PS/2 mouse connector (CN14)

Pin	Function
1	K.B. data
2	PS/2 mouse data
3	GND
4	+5 V_{DC}
5	K.B. clock
6	PS/2 mouse clock

Keyboard lock function (CN13)

You can use a switch (or a lock) to disable the keyboard. In this state the PC will not respond to any input. This is useful if you don't want anyone to change or stop a running program. Simply connect the switch between Pins 4 and 5. The pin assignments appear in the following table:

keylock (CN13)

Pin	Function
1	LED Power (+5 V)
2	N.C
3	Ground
4	Keyboard lock
5	Ground

CHAPTER 3

AMIBIOS Setup

This chapter describes how to set the BIOS configuration data.

General information

AMIBIOS Setup configures system information that is stored in CMOS RAM.

Starting AMIBIOS setup

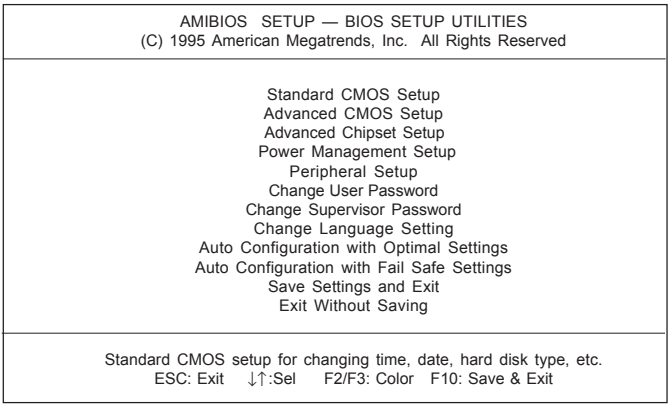
As POST executes, the following appears;

```
Hit <DEL> if you want to run SETUP
```

Press <DEL> to run AMIBIOS setup.

AMIBIOS main menu

The AMIBIOS setup screen appears as follows:



Using a mouse with AMIBIOS setup

AMIBIOS Setup can be accessed via keyboard, mouse. The mouse click functions are:

- single click to change or select both global and current fields
- double click to perform an operation in the selected field

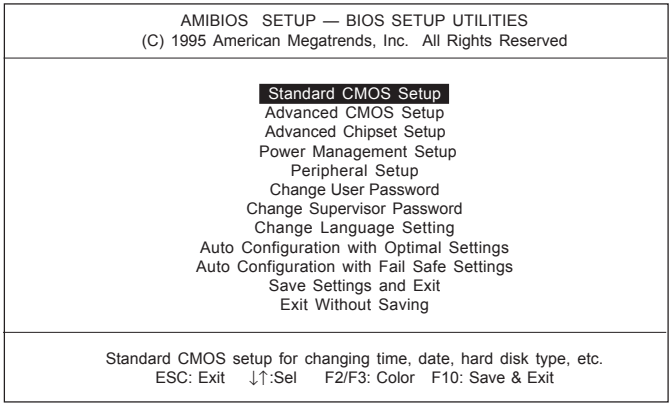
Using the keyboard with AMIBIOS setup

AMIBIOS Setup has a built-in keyboard driver that uses simple keystroke combinations:

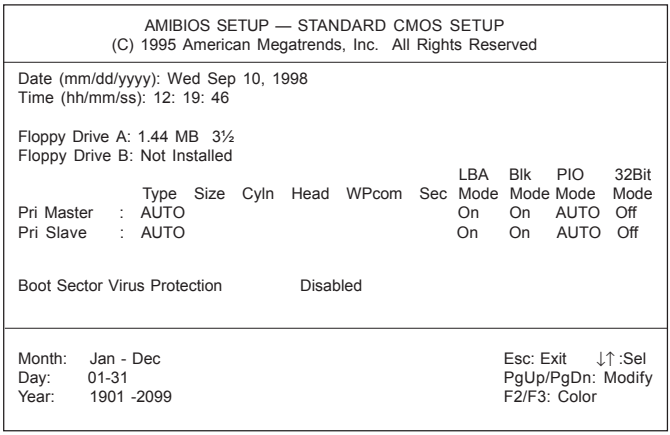
Keystroke	Function
<tab>	Move to the next window or field.
→, ←, ↑, ↓	Move to the next field to the right, left, above, or below.
<ENTER>	Select the current field.
+	Increments a value.
-	Decrements a value.
<ESC>	Close the current operation and return to the previous level.
<PgUp>	Return to the previous page.
<PgDn>	Advance to the next page.
<Home>	Return to the beginning of the text.
<End>	Advance to the end of the text.
<ALT>+H	Access a help window.
<ALT>+<Spacebar>	Exit AMIBIOS Setup.
Alphabetic keys	A to Z are used in the Virtual keyboard, and are not case sensitive.
Numeric keys	0 to 9 are in the Virtual keyboard and Numeric keypad.

Standard CMOS setup

The AMIBIOS Setup options described in this section are selected by choosing the Standard CMOS Setup from the AMI-BIOS Setup main menu selection screen, as shown below.



Press enter, the Standard CMOS Setup screen appears:



Date and Time Configuration
Select the Date and Time icon in the Standard CMOS setup. The current values for each category are displayed. Enter new values through the keyboard or hit the "+" or "-" key to change values.

Floppy A, Floppy B
Select the appropriate specifications to configure the type of floppy drive that is attached to the system: 360 KB 5¼", 1.2 MB 5¼", 720 KB 3½", and/or 1.44 MB 3½". The settings have not been pre-installed.

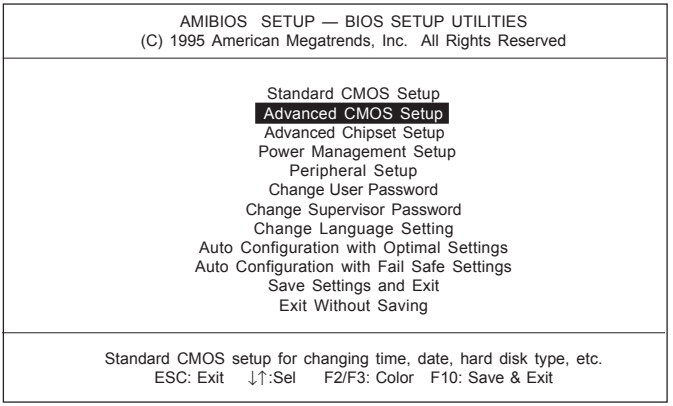
Master Disk, Slave Disk
Select the appropriate values to configure the hard disk type you are using for the master and the slave. Available types are *1~46*, *USE*R, *AUTO*, *Not Installed*, and *CDROM*. The settings have not been preinstalled.

Boot Sector Virus Protection
Enabling this option allows the system to issue a warning when any program (or virus) issues a disk format command or attempts to write to the boot sector of the hard disk drive. Further confirmation is required before accessing this particular section of the hard disk drive.

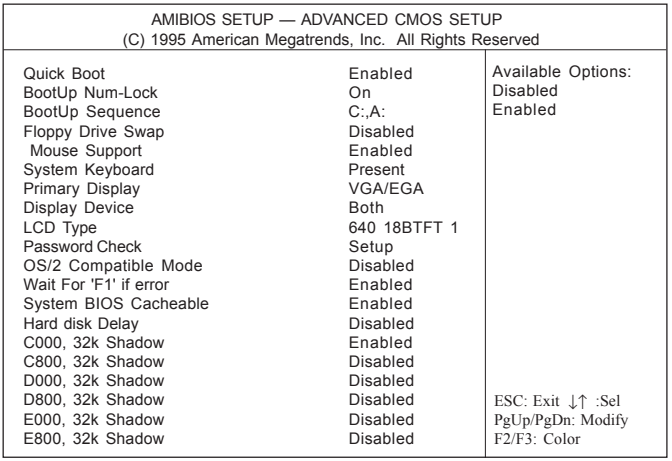
Advanced CMOS setup

Select the Advanced CMOS Setup icon from the AMIBIOS Setup main menu to enter Advanced CMOS setup.

The "Advanced CMOS Setup" options described in this section are the standard options as shown on the following screen.



Press enter, the Advanced CMOS Setup screen appears:



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.

Setting	Description
Disabled	AMIBIOS tests all system memory. AMIBIOS waits up to 40 seconds for a READY signal from the IDE hard disk drive. AMIBIOS waits for .5 seconds after sending a RESET signal to the IDE drive to allow the IDE drive time to get ready again. AMIBIOS checks for a <Del> key press and runs AMIBIOS Setup if the key has been pressed.
Enabled	AMIBIOS does not test system memory above 1 MB. AMIBIOS does not wait up to 40 seconds for a READY signal from the IDE hard disk drive. If a READY signal is not received immediately from the IDE drive, AMIBIOS does not configure that drive. AMIBIOS does not wait for .5 seconds after sending a RESET signal to the IDE drive to allow the IDE drive time to get ready again. You cannot run AMIBIOS Setup at system boot, because there is no delay for the *Hit <Del> to run Setup* message.

Boot Up 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* or *Off*. The default setting is *On*.

Boot Up Sequence

This option sets the sequence of boot drives (floppy drive A:, or hard disk drive C:) that the AMIBIOS attempts to boot from after AMIBIOS POST completes. The settings are *C:,A:,CDROM*, *CDROM,A:,C:*, or *A:,C:,CDROM*. The default setting is *A:, C:,* CDROM.

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

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

System Keyboard
This option specifies that a keyboard is attached to the computer. The settings are *Present* or *Absent.* The default setting is *Present.*

Primary Display
This option specifies the type of display monitor and adapter in the computer. The settings are *Mono*, *CGA40x25, CGA80x25, VGA/EGA,* or *Absent.* The default setting is *EGA/VGA.*

Display Device
This option allows user to select the display device. The settings are *CRT*, *LCD,* and *Both*. The default setting is *Both*.

LCD type
This option allows the user to select the LCD type.

The SBC357 supports the following LCD types:

Brand name	Model name	Format	SBC-357
Sharp	640x480 16bit Color DSTN TFT	LM64C08P	YES
Sharp	640x480 8bit Dual-Scan Mono STN	LM64P11	YES
Sharp	640x480 8bit Dual-Scan EL	LJ64H052	YES
Sharp	640x480 18bit Color TFT 1	LQ10D41	YES
NEC	640x480 12bit Color TFT	NL6448AC30-10	YES
NEC	640x480 18bit Color TFT 2	NL6448AC33-18	YES
NEC	800x600 18bit Color TFT	NL8060AC26-11	YES
NEC	640x480 4 bit PLASMA	PG6404SORM16-3	YES

Password Check
This option enables password checking every time the computer is powered on or every time AMIBIOS 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 as AMIBIOS is executed. The default is *Setup*.

OS/2 Compatible Mode
Set this option to *Enabled* to permit AMIBIOS to run with IBM OS/2. The settings are *Enabled* or *Disabled.* The default setting is *Disabled.*

Wait for F1 if Error:
AMIBIOS POST error messages are followed by:

```
Press <F1> to continue
```

If this option is set to *Disabled*, AMIBIOS does not wait for you to press the <F1> key after an error message. The setting is *Enabled* or *Disabled.* The default setting is *Enabled.*

System BIOS cacheable

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

The settings are *Enabled* or *Disabled*. The default setting is *Disabled*.

Hard Disk Delay
This option allows you to select the hard disk delay time from 5 sec to 15 sec. The default setting is *Disabled*.

ROM Location Setting

C000, 32K Shadow	C800, 32K Shadow
D000, 32K Shadow	D800, 32K Shadow
E000, 32K Shadow	E800, 32K Shadow

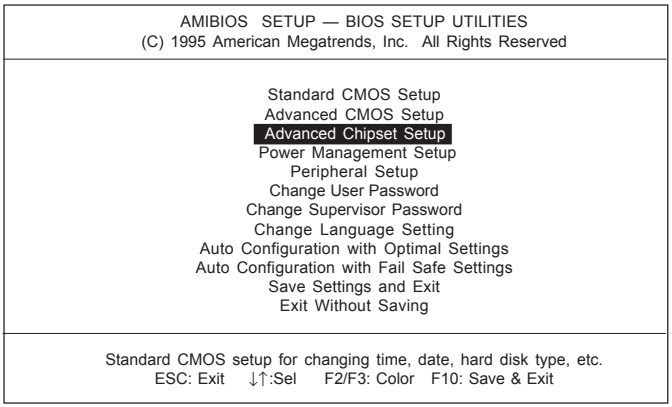
These options control the location of the contents of the 16KB of ROM beginning at the specified memory location. If no adapter ROM is using the named ROM area, this area is made available to the local bus. The settings are:

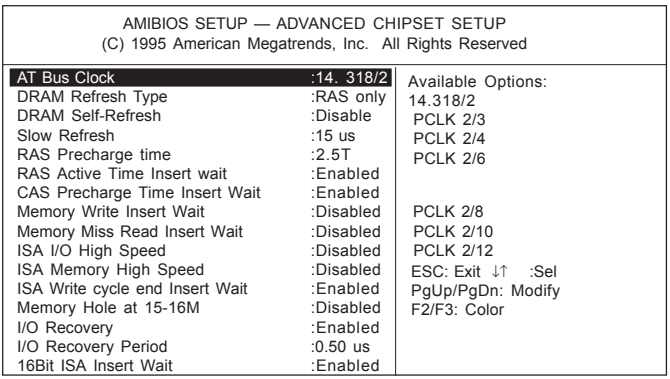
Setting	Description
Shadow	The contents of C0000h - C3FFFh are written to the same address in system memory (RAM) for faster execution.
Enabled	If an adapter ROM will be using the named ROM area, ROM area are written to the same address in system memory (RAM) for faster execution. Also, the contents of the RAM area can be read from and written to cache memory.
Disabled	The video ROM is not copied to RAM. The contents of the video ROM cannot be read from or written to cache memory.

Advanced chipset setup

Select the Advanced Chipset Setup from the AMIBIOS Setup main menu to enter the Chipset Setup. The following configurations are based on the manufacturer's default settings.

This section allows you to configure the system based on the specific features of the installed chipset. This chipset manages bus speeds and access to system memory resources, such as DRAM and the external cache. It also coordinates communications between the conventional ISA bus and the PCI bus. It must be stated that these items should never need to be altered. The default settings have been chosen, because they provide the best operating conditions for your system.





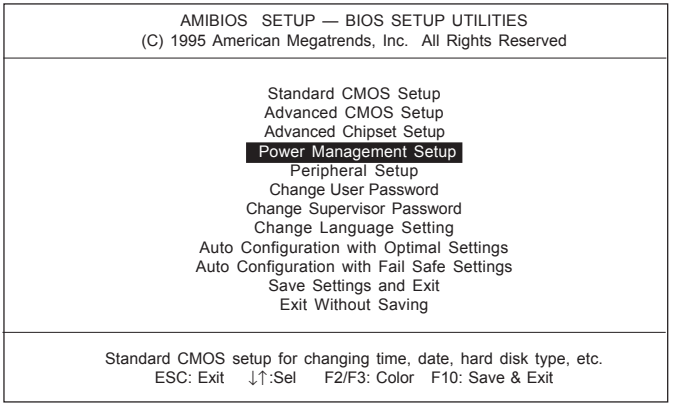
Chipset setup options

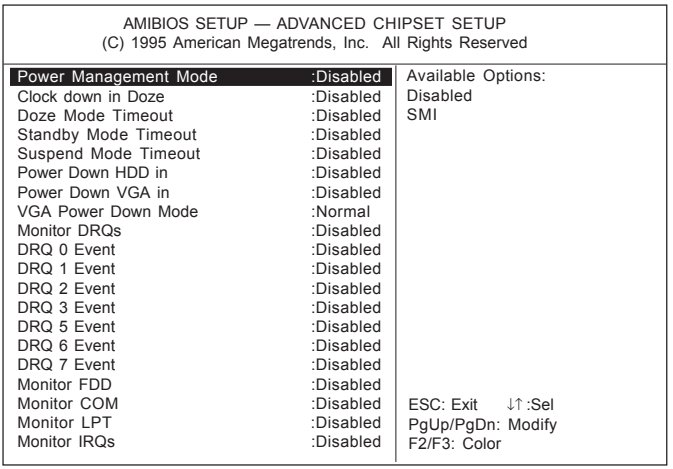
Function	option
At Bus Clock	14.318/2 PCLK 2/3 PCLK 2/4 PCLK 2/5 PCLK 2/6 PCLK 2/8 PCLK 2/10 PCLK 2/12
DRAM Refresh Type	CAS/RAS RAS only
DRAM Self-Refresh	Disabled Enabled
Slow Refresh	15 µs 60 µs 120 µs
RAS Precharge Time	2.5T 1.5T 3.5T
RAS Active Time Insert Wait	Disabled Enabled
CAS Precharge Time Insert Wait	Disabled Enabled
Memory Write Insert Wait	Disabled Enabled
Memory Miss Read Insert Wait	Disabled Enabled
ISA I/O High Speed	Disabled Enabled
ISA memory High Speed	Disabled Enabled
ISA Write Cycle and Insert Wait	Disabled Enabled

Memory Hole At 15-16M	Disabled Enabled
I/O Recovery	Enabled Disabled
I/O Recovery Peried	0 µs 0.25 µs 0.50 µs 0.75 µs 1.00 µs 1.25 µs 1.50 µs 1.75 µs 2.00 µs 2.25 µs 2.50 µs 2.75 µs 3.00 µs 3.25 µs 3.50 µs
16 Bit ISA Insert Wait	Enabled Disabled

Power management setup

The Power management setup offers options to help reduce power consumption. To see the options in this group, choose the Power management setup icon from the AMIBIOS setup main menu.





Power management mode

Power management lets you set up your computer to save electricity when it is not actively in use by putting the system into progressively greater power saving modes. In the power management scheme there are four system states which proceed in the following sequence:

Disabled → *SMI*

There are two selections for Power Management (Mode):

Disabled	Turns off PM
SMI	Maximized power saving by activating maximum power saving settings after one minute of system inactivity.

With the exception of *Disabled*, SMI selections have "fixed-mode" settings. Therefore, when PM is set to *Disabled*, some items which are predefined will become unmodifiable.

Power down HDD in

When enabled and after the selected time of system inactivity, the hard disk drive will be powered down while all other devices will remain active.

Doze mode timeout

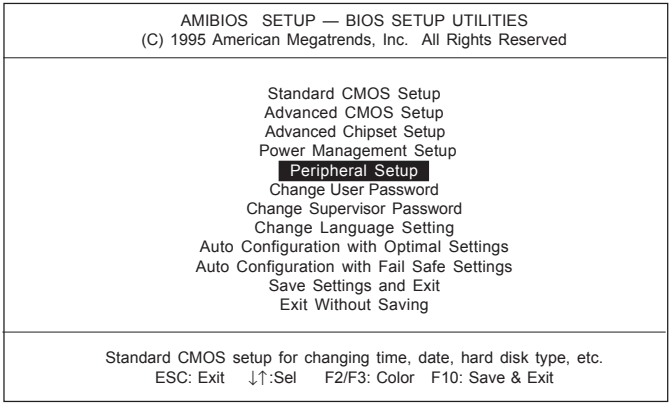
This sets the period of system inactivity after which the system goes into *Doze* mode, the most limited power saving state. The settings range from 10 seconds to 2 hours and can be set manually when power management is in *SMI*. The default setting is *Disabled*. When the system goes into power saving mode, power management will skip to the next mode in the sequence if this is disabled.

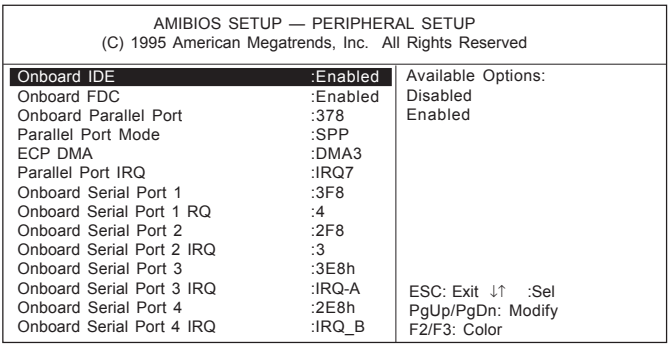
Standby mode timeout
This sets the period of system inactivity after which the system goes into *Standby* mode, the intermediate power saving state. The settings range from 10 seconds to 2 hours and can be set manually when power management is in *SMI*. The default setting is *Disabled*. When the system goes into power saving mode, power management will skip to the next mode in the sequence if this is disabled.

Suspend mode timeout
This sets the period of system inactivity after which the system goes into *Suspend* mode, the maximum power saving state. The settings range from 10 seconds to 2 hours and can be set manually when power management is in *SMI*. The default setting is *Disabled*. When the system goes into power saving mode, power management will skip to the next mode in the sequence if this is disabled.

Peripheral Setup

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





Onboard IDE

This option specifies the onboard IDE controller channels that will be used. The settings are *Disabled or Enabled.*

Onboard FDC

This option enables the floppy drive controller on the motherboard. The settings are *Enabled,* or *Disabled*.

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 *Disabled, 278, 378,* and *3BC*. The default setting is *Enabled.*

Parallel Port Mode
This option specifies the parallel port mode. ECP and EPP are both bidirectional data transfer sechemes that adhere to the IEEE P1284 specification. The settings are:

Setting	Description
Normal	The normal parallel port mode is used. This is the default setting.
EPP	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 bidirectional data transfer driven by the host device.
ECP	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 2.5 Mbs. ECP provides symmetric bidirectional communications.

ECP DMA
This option is setting for the **Parallel Port Mode**.

The settings are *DMA, CH (channel) 0, DMA CH 1,* DMA CH2, or *DMA CH3.*

Parallel Port IRQ
IRQ7 is used for the Parallel Port (LPT 1). The IRQ can be changed to IRQ5.

Onboard Serial Port 1/2/3/4
This option enables serial port 1 on the motherboard and specifies the base I/O port address for serial port 1~4.

The settings are *Disabled, 3F8h, 3E8h, 2E8h,* and *2F8h.*

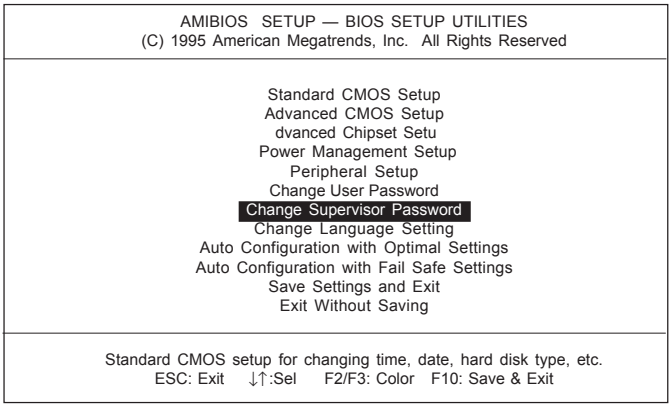
Change supervisor password

1) Select this option from the main menu

2) Enter the Password and Press <Enter>

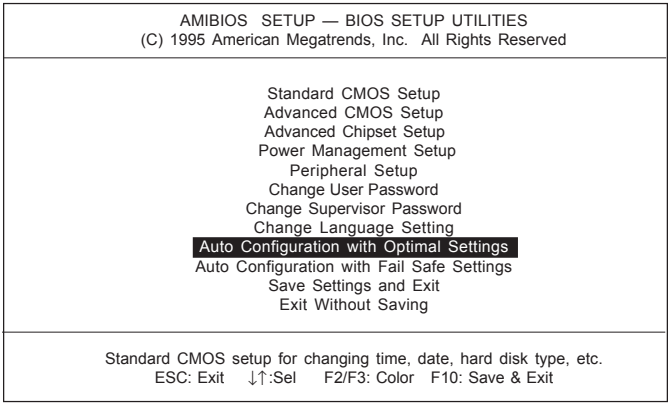
3) Retype the Password and Press <Enter>

If you forget the password, please contact your distributor for another password which you can use to enter the AMIBIOS setup and change your own password.



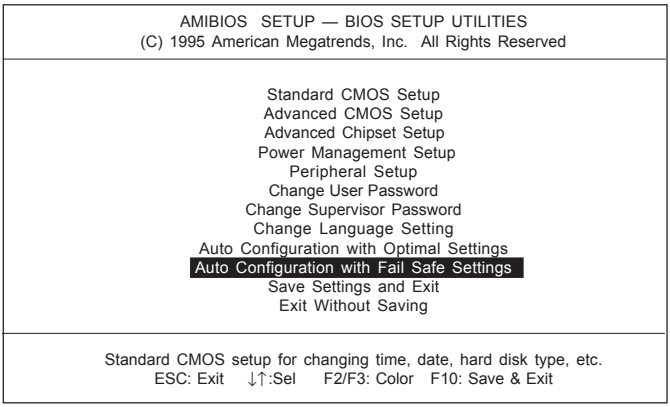
Auto configuration with optimal settings

You can load the optimal default settings for the AMIBOIS setup options by selecting it from the main menu. The optimal default settings are best case values that should optimize system performance. If CMOS RAM is corrupted, the optimal settings are loaded automatically.



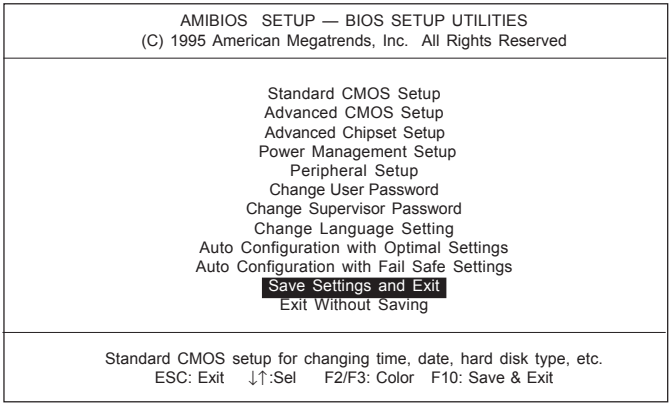
Auto configuration with fail safe settings

You can load the Fail Safe settings for the AMIBOIS setup options by selecting it from the main menu. The Fail Safe settings provide the most stable settings, though they may not provide optimal performance. Use this option as a diagnostic aid if the system is behaving erratically.



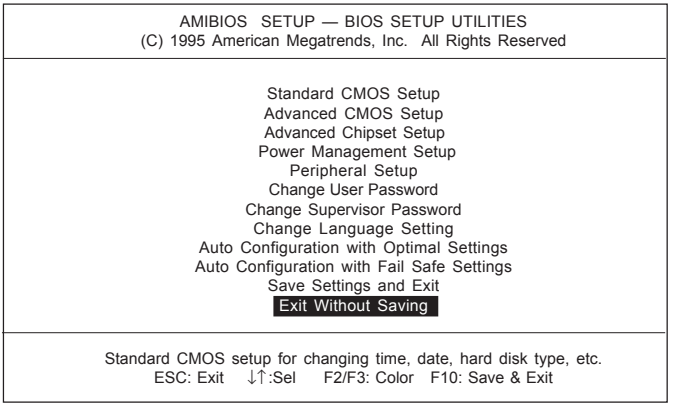
Save settings and exit

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



Exit without saving

Selecting this option and pressing <Enter> lets you exit the Setup program, without recording any new values or changing old ones.



CHAPTER 4

SVGA Setup

The SBC-357 features an onboard flat panel/SVGA interface. This chapter provides instructions for installing and operating the software drivers on the included display driver diskette.

Windows 3.1

These drivers are designed to work with Microsoft Windows Version 3.1. You may install these drivers either through Windows or in DOS.

Driver installation - Windows Setup

1. Install Windows as you normally would for a VGA display. Run Windows to make sure that it is working correctly.

2. Place the *Supporting CD-ROM* into your CD-ROM drive. In the Windows Program Manager, choose *File* from the Options Menu. Then from the pull-down menu, choose *Run*. At the Command Line prompt, type

   cd-rom drive: \CD ROM\vga driver
   \Oemsetup.inf.

   "**cd-rom**": the drive letter of your CD-ROM drive

   Press the <ENTER> key or click OK to begin the installation. At this point the setup program locates the directory where Windows is installed. **For proper operation, the drivers must be installed in the Windows subdirectory**.

3. Press <ENTER> to complete the installation. Once completed, the Display Driver Control Panel appears on the screen. You can find the ChipCPL under the Control Panel. The icon allows you to select and load the installed drivers.

Changing Display Drivers from Windows

To change display drivers from Windows, select the ***Windows Setup*** icon from the ***Main*** window. You will be shown the current setup configuration. Select ***Change System Settings*** from the ***Option*** menu. Click on the arrow at the end of the ***Display*** line. You will be shown a list of display drivers. Click on the driver you want to select. Then click on the ***OK*** button. Follow the directions to complete the setup.

Changing Color Schemes

After you change display drivers, you may notice that the color scheme used by Windows looks strange. This is because different drivers have different default colors. You can correct this by choosing the same color scheme or a new color scheme. First select the ***Control Panel*** from the ***Main*** window. Select the ***Color*** icon. You will be shown the current color scheme. Choose a new color scheme and click the ***OK*** button.

DOS

Driver installation - DOS Setup

1. Install Windows as you normally would for a VGA display. Run Windows to make sure that it is working correctly. Then exit from Windows.
2. Place the Supporting CD-ROM into yur CD-ROM drive. Type

   cd-rom drive:

   <ENTER> to make this the default drive.
3. Type "\CD ROM\vga driver\setup"

   <ENTER> to run the driver SETUP program. Press any key to get to the applications list.

   "**cd-rom**": the drive letter of your CD-ROM drive
4. Using the arrow keys, select *Windows Version 3.1* and press the <ENTER> key. Press the <ENTER> key to select *All Resolutions*, then press <END> to begin the installation.
5. At this point you will be asked for the path to your Windows System directory (default C:\WINDOWS). When the installation is complete, press any key to continue. Press <ESC> followed by Y to exit to DOS.
6. Change to the directory where you installed Windows (usually C:\WINDOWS).
7. Type SETUP <ENTER> to run the Windows Setup program. It

will show the current Windows configuration. Use the up arrow key to move to the *Display* line and press <ENTER>.

8. A list of display drivers will be shown. Use the arrow keys to select one of the drivers starting with an asterisk (*) and press <ENTER>.

9. Follow the directions on the screen to complete the setup. In most cases, you may press <ENTER> to accept the suggested option.

Start Windows with the new display driver.

Changing Display Drivers from DOS

To change display drivers from DOS, change to the Windows directory and run Setup, repeating steps 4 and 5 from the previous page. Besides the special display drivers marked by an asterisk (*), you should be able to use the following standard drivers:

VGA	640 x 480, 16 colors
Super VGA	800 x 600, 16 colors

Panning Drivers

Special panning drivers are provided to allow high-resolution modes to be displayed on a flat panel or CRT. These drivers will show a section of a larger screen, and will automatically pan or scroll the screen horizontally and vertically when the mouse reaches the edge of the display.

SOFTWARE UTILITIES

This chapter describes the operation and installation of the display drivers supplied on the *Supporting CD-ROM* that are shipped with your product.

- CHIPSCPL

The CHIPSCPL utility program

This utility program is designed to work with Microsoft® Windows™ Version 3.1.

Installing the utility

CHIPSCPL.CPL is a Windows™ based utility to select resolutions and color depth. It is a Control Panel Applet with its own icon that is automatically installed when installing the CHIPS Windows™ 3.1 linear drivers. The **Control Panel** icon is in the ***Main*** Windows™ group. To invoke the control panel applet, simply-double click on the icon. The driver resolution and color depth take effect only after Windows is rebooted with the new driver.

How to use the utility

SCREEN SIZE <ALT S> allows you to select from the following resolutions:

- 640 x 480
- 800 x 600
- 1024 x 786
- 1280 x 1024

If you select the resoution first, the allowable color depth choices will automatically be shown.

COLOR <ALT O> allows you to select the number of colors from the following:

- 16 (4 bits per pixel)
- 256 (8 bpp)
- 32K (15 bpp)
- 64K (16 bpp)
- 16M (24 bpp)

If you select color depth first, the allowable resolution choices will automatically be shown.

DPI<ALT P> allows you to select a large or small font.

DISPLAY<ALT D> allows you to select the display type from the following:

- CRT only
- LCD (Flat Panel) only
- Both CRT and LCD (flat Panel)

APPENDIX A

Watchdog Timer Sample Programs

The following sample programs illustrates the programming steps required to enable, set, and disable the watchdog timer.

Watchdog timer

The watchdog timer uses 32.768 MHz frequency source to counter a 24-bit Counter, so the timer range is from 30.5u sec to 512 sec with resolution 30.5u sec. When timer times out, a system reset, NMI or IRQ may happen to be decided by user's programming.

Configuration register

The watchdog timer of SBC-357/4M is located on the chipset - ALI M6117C. If you want to use it, you have to know how to read/ write the configuration register of M6117C. Following is the basic procedure.

1. Open the chip.
2. Write/Read data to/from register.
3. Close the chip.

To Open/Close the chip is to write a specific value to register 13h.

Index 13h:

c5h: **open the chip**

ooh: **close the chip**

Here we give you an example of writing data to register.

```
mov     al, 13h
Out     22h, al
jmp     $+2     ;;delay
jmp     $+2     ;;delay
mov     al, oc5h
out     23h, al
```

* note: 22h is the index I/O port, 23h is the data I/O port.

How to set the watchdog timer

1. Set index 37h bit 6 = o to disable the timer.

2. Write the desired counter value to 3Bh, 3Ah, 39h.
3. Set index 37h bit 6 = 1 to enable the timer.
4. When counter reaches the setting value, the timer will generate signal setting by index 38h bit [7:4]

Index 3Bh, 3Ah, 39H

	3Bh	3Ah	39h
	D7……D0	D7……D0	D7……D0
counter	MSB		LSB

Index 38h

D[7:4]	timeeout signal
0000	Reservd
0001	IRQ3
0010	IRQ4
0011	IRQ5
0100	IRQ6
0101	IRQ7
0110	IRQ9
0111	IRQ10
1000	IRQ11
1001	IRQ12
1010	IRQ14
1011	IRQ15
1100	NMI
1101	System reset
1110	Reserved
1111	Reserved

Example

Following is an example of programming 1 sec period for watchdog timer in assembly language. When timer times out, is will generate system reset.

```
IO_Delay MACRO
         jcxz    $+2
         jcxz    $+2
         ENDM

Open_Chip MACRO
         push    ax
         mov     al,013h
         out     22h,al
         IO_Delay
         mov     al,0c5h
         out     23h,al
         IO_Delay
         pop     ax
         ENDM

Close_Chip MACRO
         push    ax
         mov     al,13h
         out     22h,al
         IO_Dealy
         mov     al,0
         out     23h,al
         IO_Delay
         pop     ax
         ENDM

Write_To_Chip PROC
;;Input: ah - Data
;;       al - Index#
         cli
         Open_Chip
         out     22h,al
         IO_Delay
         xchg    ah,al
         out     23H,AL
         IO_Delay
         Close_Chip
         sti
         ret
         ENDP
```

```
Read_From_Chip   PROC
;;Input: al - Index#
;;Output al - Data

         cli
         Open_Chip
         out     22h,al
         IO_Delay
         in      al,23h
         IO_Delay
         Close_chip
         sti
         ret
         ENDP

Watchdog_Timer_Program:
         Open_Chip
         mov     al,37h
         call    Read_From_Chip
         mov     bl,al           ;;save register data
         and     al,10111111b    ;;set bit6=0 to disable
                                           timer
         mov     ah,al
         mov     al,37h
         call    Write_To_Chip
         mov     ah,33           ;;1 msec=33x30.5u sec
         mov     al,39h
         call    Write_To_Chip
         mov     ax,003ah
         call    Write_To_Chip
         mov     ax,003bh
         call    Write_To_Chip
         mov     al,bl
         mov     al,38h
         call    Read_From_Chip
         and     al,00001111B
         or      al,11010000b    ;;set time-out event aas
                                   system reset
         mov     ah,al
         mov     al,38h

         call    Write_to_Chip
         mov     al,bl
         or      al,01000000b    ;;set bit6 = 1 to enable
                                             timer
         mov     ah,al
         mov     al,37h
         call    Write_To_Chip
```

APPENDIX B

Installing PC/104 Modules

This appendix gives instructions for installing PC/104 Modules.

Installing PC/104 modules

The SBC-357/4M's PC/104 connectors give you the flexibility to attach PC/104 expansion modules. These modules perform the functions of traditional plug-in expansion cards, but save space and valuable slots. Modules include:

- **PCM-3110B** PCMCIA Module (one-slot)
- **PCM-3115B** PCMCIA Module (two-slot)
- **PCM-3200** PC/104 Sound Module
- **PCM-3420** PC/104 Fast SCSI Module
- **PCM-3521** Advanced Flat-Panel/CRT VGA Module
- **PCM-3522** LCD Panel Adapter
- **PCM-3600** PC/104 Fax/Modem Module
- **PCM-3610** Isolated RS-232 and RS-422/485 Module
- **PCM-3640** PC/104 4-port RS-232 Module
- **PCM-P50** PC/104 vehicle Power Supply
- **PCM-3660** Ethernet Module
- **PCM-3718** 30 KHz A/D Module
- **PCM-3724** 48-channel DIO Module
- **PCM-3910** Breadboard Module
- **PCM-3810** Solid State Disk Module
- **PCM-3820** High Density Flash Solid State Disk Module

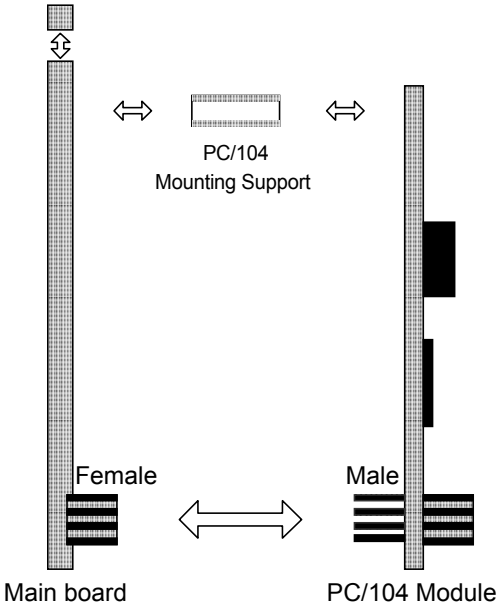
Installing these modules on the SBC-357/4M is a quick and simple operation. The following steps show how to mount the PC/104 modules:

Step1 Remove the SBC-357/4M from your system, paying particular attention to the safety instructions already mentioned above.

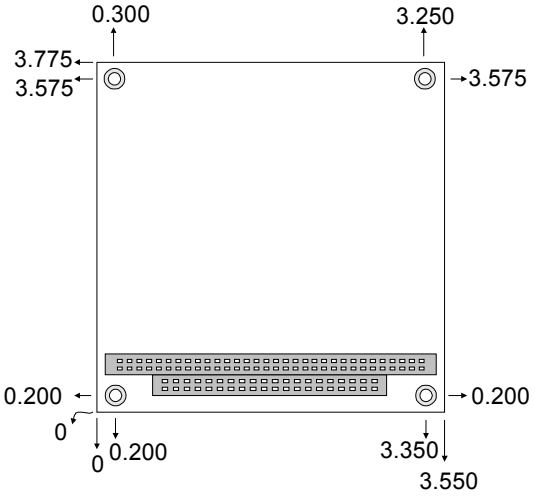
Step2 Make any jumper or link changes required to the CPU card now. Once the PC/104 module is mounted, you may have difficulty in accessing these.

Step3 Mount the PC/104 module onto the CPU card. Do this by pressing the module firmly but carefully onto the mounting connectors.

Step4 Secure the PC/104 module onto the CPU card using the four mounting spacers and srews.



PC/104 Module Mounting Diagram



PC/104 module dimensions (inches ±5%)