SBC-556/L

Half-size CPU Card with
LCD, Ethernet, & SSD

FCC STATEMENT

THIS DEVICE COMPLIES WITH PART 15 FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS: (1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE. (2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED, INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRED OPERATION.

THIS EQUIPMENT HAS BEEN TESTED AND FOUND TO COMPLY WITH THE LIMITS FOR A CLASS "A" DIGITAL DEVICE, PURSUANT TO PART 15 OF THE FCC RULES. THESE LIMITS ARE DESIGNED TO PROVIDE REASONABLE PROTECTION AGAINST HARMFUL INTERFERENCE WHEN THE EQUIPMENT IS OPERATED IN A COMMERCIAL ENVIRONMENT. THIS EQUIPMENT GENERATES, USES, AND CAN RADIATE RADIO FREQUENCY ENERGY AND , IF NOT INSTALLED AND USED IN ACCORDANCE WITH THE INSTRUCTION MANUAL, MAY CAUSE HARMFUL INTERFERENCE TO RADIO COMMUNICATIONS. OPERATION OF THIS EQUIPMENT IN A RESIDENTIAL AREA IS LIKELY TO CAUSE HARMFUL INTERFERENCE IN WHICH CASE THE USER WILL BE REQUIRED TO CORRECT THE INTERFERENCE AT HIS OWN EXPENSE.

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Printed in Taiwan April 2000

Packing list

Before you begin installing your card, please make sure that the following materials have been shipped:

- 1 SBC-556/L CPU card
- 1 Quick Installation Guide
- 1 6-pin mini-DIN dual outlet adapter for keyboard and PS/2 mouse
- 1 Hard disk drive (IDE) interface cable (40-pin)
- 1 Floppy disk drive interface cable (34-pin)
- 1 Parallel port adapter (26-pin) and dual outlet adapter. (one for Rs-232, another one for RS-422/485)
- 1 CD-ROM Utilities
- 4 Utility disks with CHIPS 69000 utility programs and drivers

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

Notice

Dear Customer,

Thank you for purchasing the SBC-556/L board. The user manual is designed to help you to get the most out of the SBC-556/L, please read it thoroughly before you install and use the board. The product that you have purchased comes with a two years warranty, but AAEON cannot be responsible for misuse of the product. Therefore, we strongly urge that the first read the manual before using the product.

To receive the lastest version of the user manual, please visit our Web site at:

Taiwan: www.aaeon.com.tw

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Contents

Chapter 1: General Information 1

- Introduction 2
- Features 3
- Specifications 4
- Board layout 6
- Card dimensions 7

Chapter 2: Installation 9

- Jumpers and connectors 10
- Locating jumpers and connectors 12
- Setting jumpers 13
- Safety precautions 14
- Installing the CPU 14
- CPU clock ratio (JP1) 16
- DRAM voltage setting (JP2) 17
- RS-232/422/485 select (COM2)(JP3) 18
- CPU VIO voltage setting (JP4) 19
- IR connector (Reserved)(JP5) 20
- CPU external clock select (JP6) 21
- CPU Vcore voltage select (JP7) 23
- DOC address select (JP8) 25
- Ethernet active/link signal LED (JP9)(JP10)(JP11) 26
- Clear CMOS data (JP12) 27
- LCD inverter connector (CN1) 28
- Power LED and keylock connector (CN2) 29
- IDE LED connector (CN3) 30
- Hardware reset connector (CN4) 31
- IDE hard drive connector (CN5) 32
- Fan power connector (CN6) 34
- Floppy drive connector (CN7) 35
- Parallel (Printer) port connector (CN8) 37

Display connectors (CN9, CN15) 38
Serial ports connectors (CN10, CN14) 41
USB connectors (dual-port) (CN11) 42
Ethernet connector (CN12) 43
Power connectors (P8 & P9)(CN13) 44
KB & PS/2 Mouse connector (CN17) 45
DiskOnChip socket 47

Chapter 3: Award BIOS Setup 49

System test and initialization 50
System configuration verification 50
AWARD BIOS setup 51
Entering setup 51
Standard CMOS setup 52
BIOS festures setup 53
Virus Warning 54
Chipset features setup 56
Power management setup 58
PM timers 60
PM Events 61
PnP/PCI Configuration setup 62
Load BIOS DEFAULT / LOAD SETUP DEFAULTS ... 65
Integrated Peripherals 66
Supervisor/User Password setting 70
Auto detect hard disk 72
HDD low level format 73
Save & exit setup 74

Exit without saving 75

Chpater 4: Flat Panel/CRT Controller Display Drivers and Utilities 77

Software drivers 78
Hardware configuration 78
Necessary prerequisites 79
Before you begin 79
Windows® 95 80
Windows® 3.1 88
OS/2 89
Windows® NT3.51 91
Windows® NT4.0 92

Chapter 5: Ethernet Software Configuration 93

Ethernet software configuration 94

Appendix A: Programming the Watchdog Timer 95

Programming the watchdog timer 96
How to program the WATCHDOG TIMER 96
Demo program 97

Appendix B: Installing PC/104 Modules 99

Installing PC/104 modules 100

CHAPTER 1

General Information

This chapter provides background information for the SBC-556/L.

Sections include:

- Card specifications
- Board layout

Introduction

The SBC-556/L is an all-in-one single board Pentium computer card. With an **onboard flat panel/CRT SVGA controller,** the SBC-556/L packs all the functions of an industrial computer and its display capabilities onto a single, half-size card. This means the SBC-556/L is your absolute best solution for embedded applications.

The onboard PCI-bus, flat panel/CRT SVGA controller uses the CHIPS 69000 chipset with 2 MB of SDRAM built in chip. This chipset, used with local PCI-bus, is a 64-bit graphics engine. Excellent for display-intensive applications, this card supports various LCD types, including TFT, DSTN, MONO, and EL.

Another feature of the SBC-556/L is the inclusion of a high speed, local bus IDE controller. This controller supports (through ATA PIO) mode 3 and mode 4 hard disks, and Ultra DMA/33, enabling data transfer rates up to 33 MB/second. Up to two IDE devices can be connected, including large hard disks, CD-ROM drives, tape backup drives, or other IDE devices.

Onboard features include two high-speed RS-232 serial ports with 16C550 UARTs, one bidirectional SPP/EPP/ECP parallel port, and one floppy drive controller. In addition, the SBC-556/L includes an extra 512 KB of second level on-board cache memory.

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 stand alone systems.

The SBC-556/L supports 5V EDO DRAM. It also provides two 72-pin SIMM (Single In-line Memory Module) sockets for its onboard system DRAM. These sockets give you the flexibility to configure your system from 8 MB to 128 MB of DRAM using the most economical combination of SIMMs.

Features

- DiskOnChip (SSD) up to 144MB
- C&T 69000 LCD controller supports 36-bit TFT panels.
- 100Base-T Fast Ethernet
- PC/104 expansion connector
- Optional function to support LVDS (Low Voltage Differential Signaling) for high-speed and low-power data transfer.

Specifications

CPU: Intel Pentium 75~200 MHz, P55C(MMX) 166~233 MHz, Cyrix / IBM / SGS 6X86 PR100+~166+, AMD K5 PR75~166, K6 PR2 166~300

Bus interface: ISA

CPU Socket: Intel Socket 7

BIOS: 256KB FLASH BIOS

Chipset: SiS5582

Super I/O Chipset: Winbond W83877 with Fully 16-bit I/O decoded

Level 2 Cache: Onboard 512 KB pipeline burst 2nd level cache

System memory: 8 MB to 128 MB. Two 72-pin SIMM socket onboard

Enhanced IDE hard disk drive interface: Supports up to two hard disk drives. Supports PIO mode 4 and Bus Master. Also supports Multi-word DMA and Ultra DMA/33

Floppy disk drive interface: supports up to two floppy disk drives, 5.25"(360 KB and 1.2 MB) and/or 3.5" (720 KB, 1.44 MB and 2.88 MB)

Multi-mode parallel port: Configured to LPT1, LPT2, LPT3 or disabled. Supports SPP, ECP, and EPP.

Serial ports: One RS-232 and one RS-232/422/485 serial port. Ports can be configured as COM1, COM2, COM3, COM4 or disabled individually. Two 16C550 serial UARTs. IR connector reserved for future use.

Keyboard/mouse connector: 6-pin mini DIN connector supports PC/AT standard keyboard and PS/2 mouse.

USB connectors: Dual USB connectors onboard

Battery: Lithium battery for data retention of up to 10 years

Watchdog Timer: Can generate a system reset, IRQ15 or NMI. Supports Win95, Win3.1. Software selectable timeout interval (1 sec. ~ 255 sec., 1sec./step).

DMA channels: 7

Interrupt levels: 15

Power management: I/O peripheral devices support power saving and doze/ standby/suspend modes. APM 1.2 compliant.

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

Ethernet interface

Chipset: Realtek RTL8139A 100/10 Base-Tx Fast Ethernet controller.

Ethernet interface: Onboard 100/10 Base-T RJ-45 connector.

Flat panel VGA interface

Chipset: C&T 69000

Display memory: 2 MB SDRAM built in Chip

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

Resolution: Supports up to 1024x768 @ 64K colors.

SSD interface

One 32-pin DIP socket supports M-System DiskOnChip 2000 series, memory capacity from 2 MB to 144 MB

Mechanical and environmental

Power supply voltage: +5V (4.75V to 5.25V),
+12V (11.75V to 12.25V)

Power Requirement:

Bare Bone power consumption: +5V @ 1.5A

Power Requirement (with Pentium MMX): +5V @ 6A

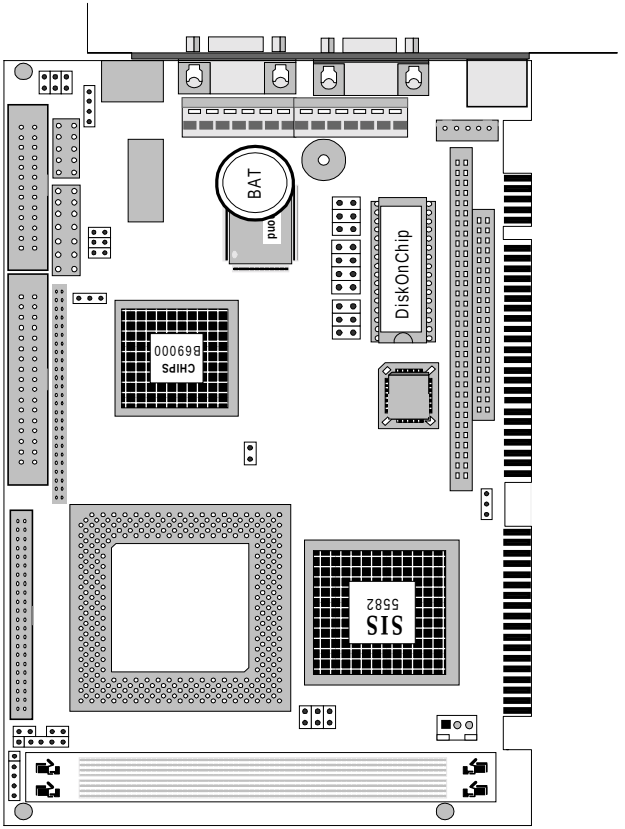
Power Requirement (with K6-233): +5V @ 10A

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

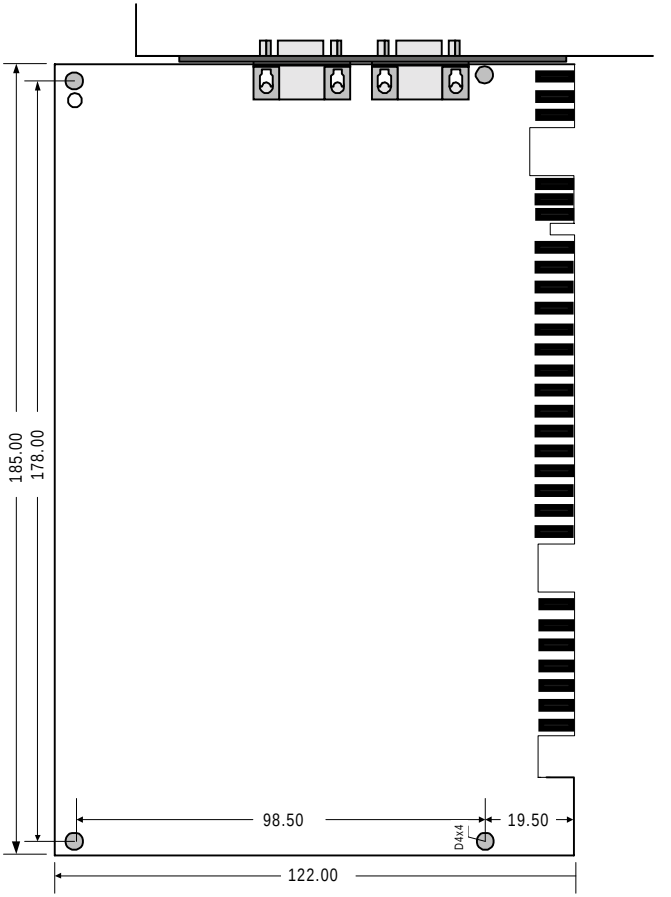
Board size: 7.3" (L) x 4.8" (W) (185 mm x 122 mm)

Board weight: 1.32 lb. (0.6 Kg)

Board layout



Card dimensions



CHAPTER 2

Installation

This chapter explains set-up procedures for the SBC-556/L 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 and connectors

Connectors on the board link it to external devices such as hard disk drives, keyboard, or floppy drives. In addition, the board has a number of jumpers that allow you to configure your system to suit your applications.

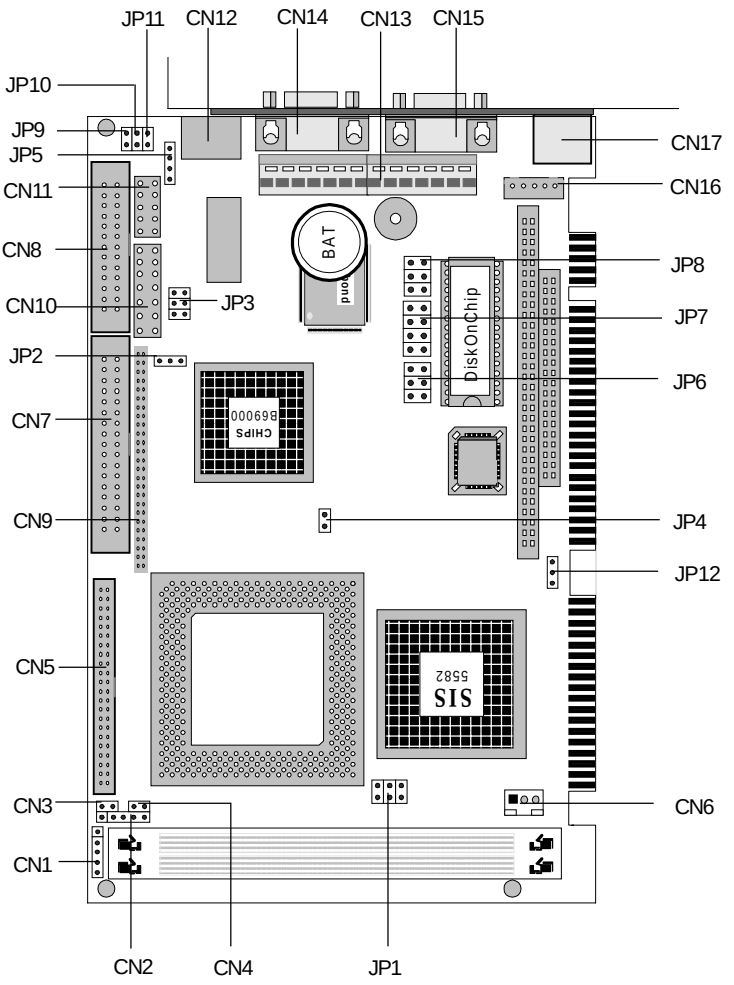
The table below lists the function of each of the jumpers and connectors:

Jumpers	
Label	**Function**
JP1	CPU clock ratio
JP2	LCD driving voltage select
JP3	RS-232/422/485 select (COM2)
JP4	CPU VIO voltage setting
JP5	IR connector (Reserved)
JP6	CPU external clock select
JP7	CPU Vcore voltage select
JP8	DOC address select
JP9	Ethernet RX signal LED connector
JP10	Ethernet Linkage signal LED connector
JP11	Externet TX signal LED connector
JP12	Clear CMOS data

connector

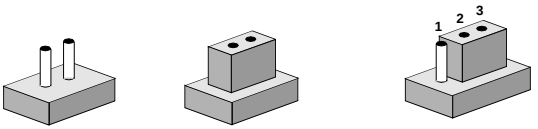
Label	Function
CN1	LCD inverter power connector
CN2	Powe LED & keylock connector
CN3	IDE LED connector
CN4	Hardware reset connector
CN5	IDE hard drive connector
CN6	Fan power connector
CN7	Floppy drive connector
CN8	Parallel (Printer) port connector
CN9	LCD panel connector
CN10	RS-232/422/485 connector (COM2)
CN11	USB connectors (dual-port)
CN12	Ethernet connector
CN13	Power connectors (P8 & P9)
CN14	COM1 connector
CN15	VGA connector
CN16	External Keyboard connector
CN17	KB & PS/2 mouse connector

Locating jumpers and connectors



Setting jumpers

You configure your card to match the needs of your application by setting jumpers. A jumper is the simplest kind of electric switch. It consists of two metal pins and a small metal 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 doubt about the best hardware configuration for your applications, contact your local distributor or sales representative before you make any change.

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.*

Installing the CPU

The SBC-556/L CPU card supports most Pentiums and their compatible CPUs. The system's performance depends on the CPU you choose. You can install or upgrade the CPU in the board's PGA socket by following the procedures outlined below. If your system has an existing CPU, you need to remove it before installing the new CPU.

Removing a CPU

1. Disconnect power from the chassis, and unplug all connections to the CPU card. Then, remove the CPU card from the chassis by following the instructions in the user's manual for your chassis.
2. Lift the CPU out of the PGA socket. The old chip may be difficult to remove. You may find spray chip lubricant, designed for pin-grid-array (PGA) devices, and a chip puller helpful. These are available at electronics hobbyists' supply stores.

Installing a CPU

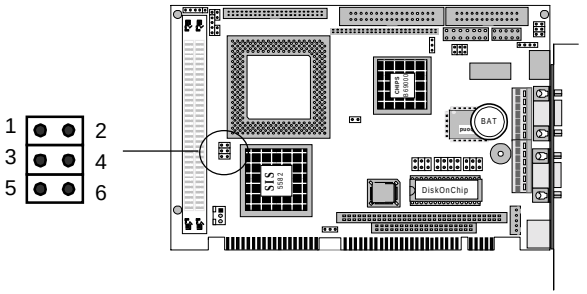
To install the CPU, follow the instructions that came with it. If no documentation was provided, the general procedures for installing a CPU are outlined below:

1. Lubricate the pins on the CPU with lubricant for PGA devices. This makes the CPU slide in much easier and greatly reduces the chance of damaging the pins and other components.
2. Carefully align the CPU so that it is parallel to the socket. Make sure that the notch on the corner of the CPU matches the notch on the inside of the socket.
3. Gently push the CPU into the socket. There will probably be a small gap between the CPU and the socket even when it is fully seated. DO NOT USE EXCESSIVE FORCE!

When you install a new CPU, you may have to adjust other settings on the board, such as CPU type, CPU clock, and PCI speed, to accommodate it. Make sure that the settings are correct for your CPU. **Improper settings may damage the CPU.**

CPU clock ratio (JP1)

JP1 must be set to match the CPU clock ratio. The chart below shows the proper jumper settings for P54C, P55C, and AMD-K6, and their respective clock ratio.



CPU Clock Ratio (JP1)

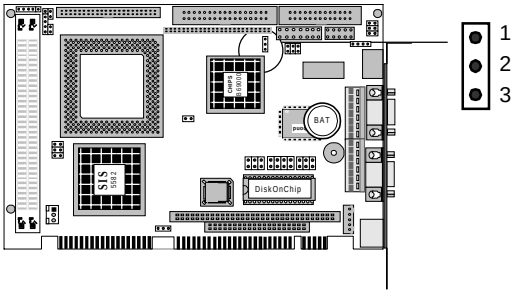
P54C x1.5 P55C x3.5	P54C x2.0 P55C x2.0	P54C x3.0 P55C x3.0	P54C x2.5 P55C x2.5
1 ○ ○ 2 3 ○ ○ 4 5 ○ ○ 6	1 ○ ○ 2 3 ○ ○ 4 5 ▬ 6	1 ○ ○ 2 * 3 ▬ 4 5 ○ ○ 6	1 ○ ○ 2 3 ▬ 4 5 ▬ 6
AMD-K6 x3.5	**AMD-K6 x2.0**	**AMD-K6 x3.0**	**AMD-K6 x2.5**
1 ○ ○ 2 3 ○ ○ 4 5 ○ ○ 6	1 ○ ○ 2 3 ○ ○ 4 5 ▬ 6	1 ○ ○ 2 3 ▬ 4 5 ○ ○ 6	1 ○ ○ 2 3 ▬ 4 5 ▬ 6
AMD-K6 x5.5	**AMD-K6 x4.0**	**AMD-K6 x5.0**	**AMD-K6 x4.5**
1 ▬ 2 3 ○ ○ 4 5 ○ ○ 6	1 ▬ 2 3 ○ ○ 4 5 ▬ 6	1 ▬ 2 3 ▬ 4 5 ○ ○ 6	1 ▬ 2 3 ▬ 4 5 ▬ 6

*default

LCD driving voltage setting (JP2)

JP2 allows users to select the LCD driving voltage.

The configurations as belows:



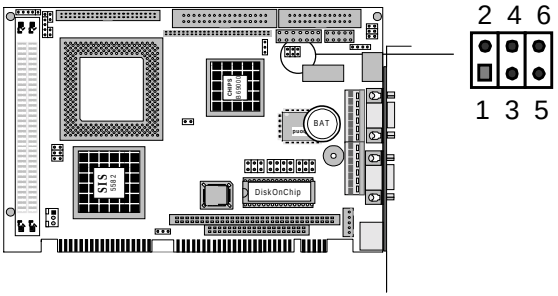
LCD driving voltage setting (JP2)

5 V *	3.3V
1 2 3	1 2 3

*default

RS-232/422/485 select (COM2)(JP3)

The COM2 can be configured to operate in RS-232, RS-422, or RS-485 mode. The operation mode can be set via JP3.

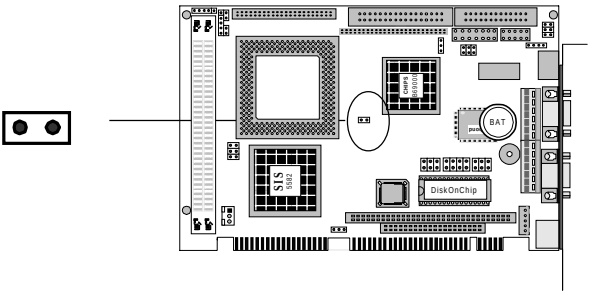


RS-232*	RS-422	RS-485
2 4 6 1 3 5	2 4 6 1 3 5	2 4 6 1 3 5

*default

CPU VIO voltage setting (JP4)

JP4 must be set to match the CPU type. The chart below shows the proper jumper settings for their respective CPU I/O voltage:

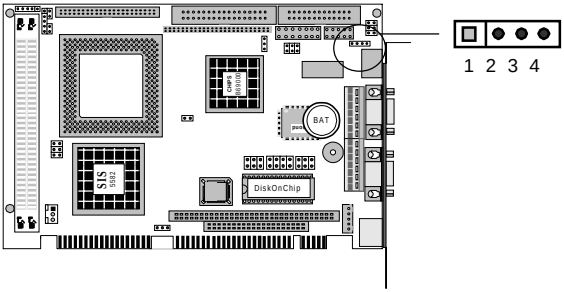


CPU VIO voltage setting (JP4)	
3.5 V	**3.3 V***
○ ○	● ●

*default

IR connector (Reserved)(JP5)

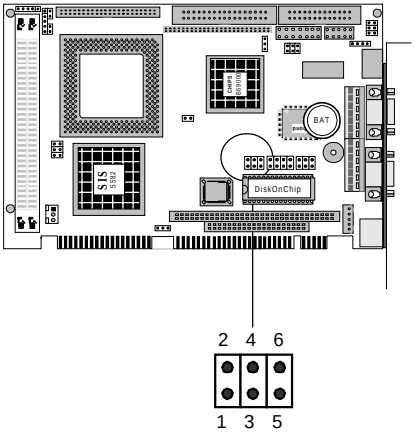
The onboard IR connector supports an Infra-Red port module that enables wireless communication between the computer and other computers and devices with infrared capability. The port module is an optional component. If it is installed, you must set the IR Transfer Mode in the Peripheral section of the CMOS setup utility.

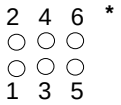
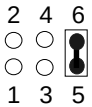
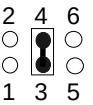
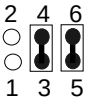
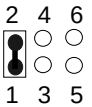
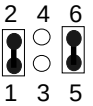
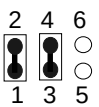
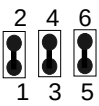


IR connector (JP5)	
Pin	**Function**
1	RX
2	GND
3	TX
4	5V

CPU external clock select (JP6)

The JP6 is used to sychronize the system clock with the CPU type. You may need to adjust the CPU clock according the base CPU speed.



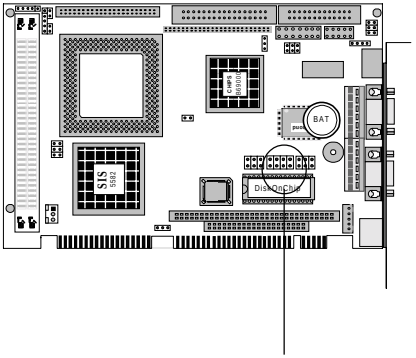
CPU External clock select (JP6)		
JP6	CPU	PCI BUS
 *	66.8M	33.4M
	60M	30M
	75M	37.5M
	83.8M	33.3M
	68.5M	34.5M
	83.8M	41.65M
	75M	32M
	50M	25M

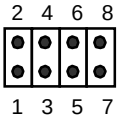
*default

CPU Vcore voltage select (JP7)

The JP7 must be set to match the CPU type.

The chart below shows the proper jumper settings for their respective Vcc.

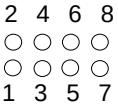
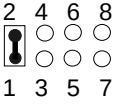
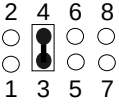
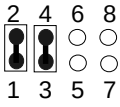
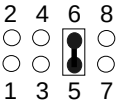
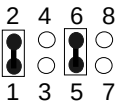
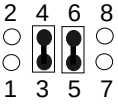
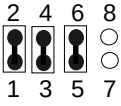
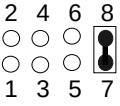
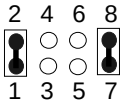
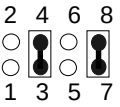
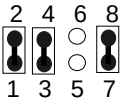
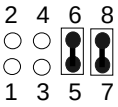
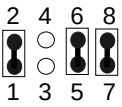
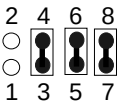
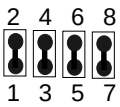




Note:

Please be kindly reminded that all related network function and warning temperature described in this user manual are only valid for the SBC-556.

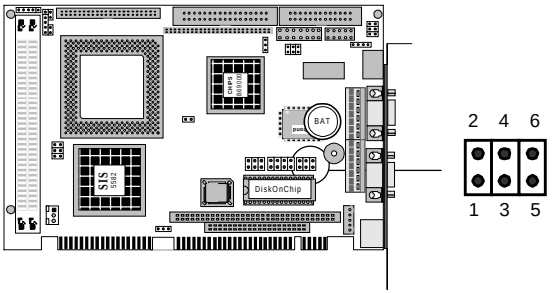
CPU Vcore Voltage settings (JP7)

2.0 V	**2.1 V**	**2.2 V**
		
2.3 V	**2.4V**	**2.5V**
		
2.6 V	**2.7 V**	**2.8 V** *
		
2.9 V	**3.0V**	**3.1 V**
		
3.2 V	**3.3V**	**3.4 V**
		
3.5 V		
		

*default

DOC address select (JP8)

The DiskOnChip 2000 occupies an 8 K byte window in the upper memory address range of CC00 to DC00. You should ensure this does not conflict with any other device's memory address.



Address	CC00	D000	D400
	2 4 6 ○ ○ ○ ○ ○ ○ 1 3 5	2 4 6 ○ ○ ▮ ○ ○ ▮ 1 3 5	2 4 6 ○ ▮ ○ ○ ▮ ○ 1 3 5

Address	D800*	DC00
	2 4 6 ○ ▮ ▮ ○ ▮ ▮ 1 3 5	2 4 6 ▮ ○ ○ ▮ ○ ○ 1 3 5

*default

These addresses might conflict with the ROM BIOS on some of the other peripheral boards. Please select appropriate memory address to avoid memory conflict.

Ethernet active/link signal LED (JP9)(JP10)(JP11)

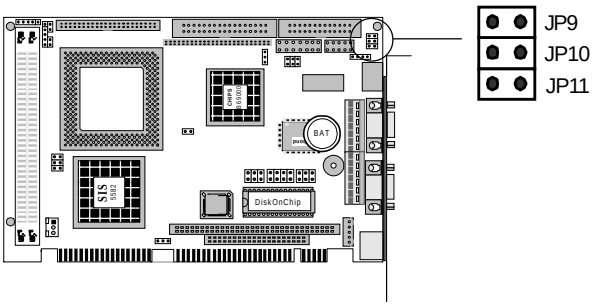
The mainboard can connect three LED indicators to show the status of the communication link and traffic. The functions are showed as follows:

Ethernet active signal LED (JP9)(JP11)

A flashing LCD indicates that the SBC-556 is transmitting (JP11) or receiving (JP9) data.

Ethernet link signal LED (JP10)

A continuously lit LED indicates good linkage between the SBC-556 and its supporting hub.



Note:

Please be kindly reminded that all related network function and warning temperature described in this user manual are only valid for the SBC-556.

Clear CMOS data (JP12)

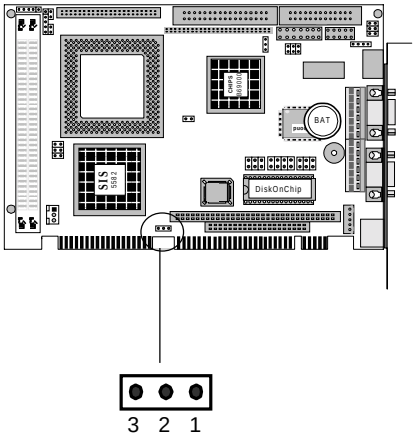
You can connect an external jumper cap or switch to clear CMOS.

Clear CMOS procedure:

1. Disconnect all power source.

2. Move JP12 from 1-2 to 2-3 for few seconds.

3. Move JP12 back to 1-2.



Clear CMOS data (JP12)

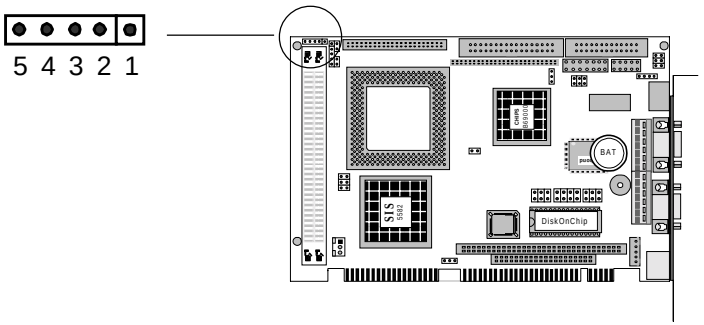
	Project *	Clear CMOS data
J12	3 2 1	3 2 1

*default

LCD inverter power connector (CN1)

The CN1 is a 5-pin invertor connector which could provide the power for LCD invertor. The following table shows the pin assignments of CN1. The pin-5 “BKL_ON” is normally active “high”. Please refer to “Power Management Setup” in the BIOS SETUP Menu and select “LCD off Option” to enable power management.

CN1 offers LCD backlight control signals for your applications. The pin assignments are as follows:



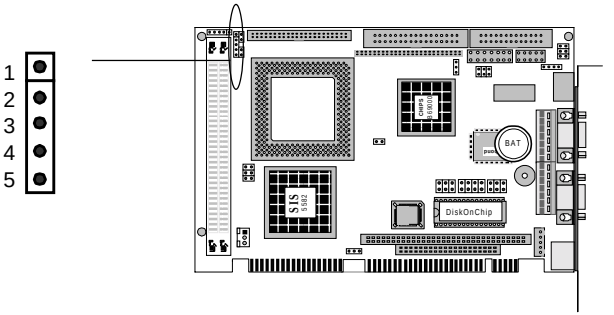
LCD inverter power connector (CN1)

Pin	Function
1	+12V
2	GND
3	GND
4	NC
5	+5V

Power LED and keylock connector (CN2)

You can connect an LED to indicate when the CPU card is on. Pin 1 of CN2 supplies power to the LED; Pin 3 is the ground.

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 do not 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:

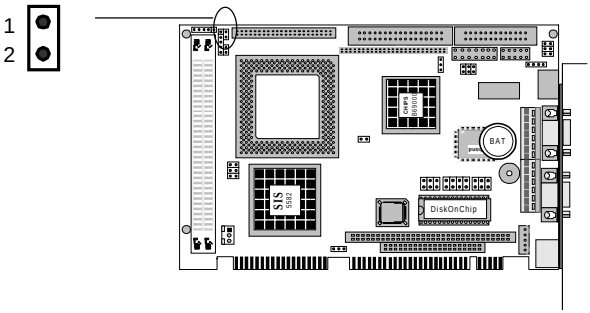


Power LED and keylock connector (CN2)

Pin	Function
1	LED Power (+5 V)
2	No Connector
3	Ground
4	Keyboard lock
5	Ground

IDE LED connector (CN3)

You can connect an LED to indicate that an IDE device is in use.The pin assignments for this connector are as follows:

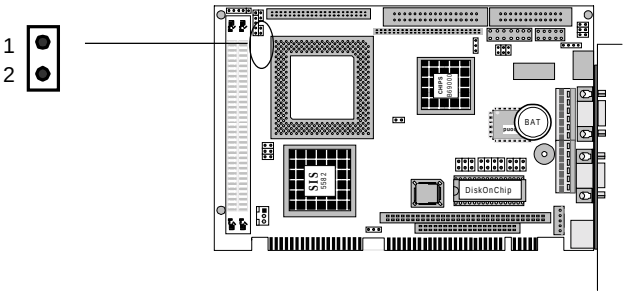


IDE LED connector (CN3)

Pin	Function
1	-R/W IDE
2	Pull high (Vcc)

Hardware reset connector (CN4)

You can connect an LED to indicate that an IDE device is in use. The pin assignments for this connector are as follows:



Hardware reset connector (CN4)

Pin	Function
1	Reset
2	Ground

IDE hard drive connector (CN5)

You can attach one or two Enhanced Integrated Device Electron-ics hard disk drives to the SBC-556's internal controller. The SBC-556's IDE controller uses a PCI local-bus interface and supports faster data transfer.

Connecting the hard drive

Connecting drives is done in a daisy-chain fashion and requires one of two cables, depending on the drive size. 1.8" and 2.5" drives need a 1 x 44-pin to 2 x 44-pin flat-cable connector. 3.5" drives use a 1 x 44-pin to 2 x 40-pin connector.

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

1. Connect one end of the cable to CN5. 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.)

Connect a second drive as described above.

Unlike floppy drives, IDE hard drives can connect to either end of the cable. If you install two drives, you will need to set one as the master and one as the slave by using jumpers on the drives. If you install just one drive, set it as the master.

Pin assignments

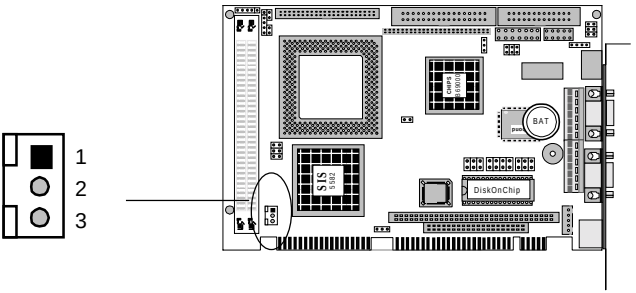
The following table lists the pin numbers and their respective signals:

IDE Connector (CN5)

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

Fan power connector (CN6)

The SBC-556/L onboard offer +12V voltage for the CPU cooler fan used.



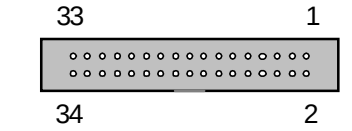
Fan power connector (CN6)

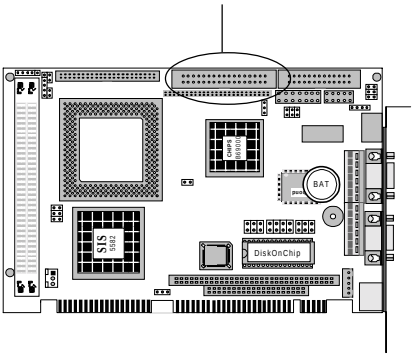
Pin	Signal
1	Speed Detect
2	+12V
3	GND

Floppy drive connector (CN7)

You can attach up to two floppy disks to the SBC-556/L onboard controller. You can use any combination of 5¼" (360 KB and 1.2 MB) and/or 3½" (720 KB, 1.44 MB, and 2.88 MB) drives.

A 34-pin daisy-chain drive connector cable is required for a dual-drive system. On one end of the cable is a 34-pin flat-cable connector. On the other end are two sets of floppy disk drive connectors. Each set consists of a 34-pin flat-cable connector (usually used for 3½" drives) and a printed-circuit board connector (usually used for 5¼" drives).





Connecting the floppy drive

1. Plug the 34-pin flat-cable connector into CN7. Make sure that the red wire corresponds to pin 1 on the 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.
3. If you are connecting a 5¼" floppy drive, line up the slot in the printed circuit board with the blocked-off part of the cable connector.

If you are connecting a 3½" floppy drive, you may have trouble determining which pin is pin number 1. Look for a number printed on the circuit board indicating pin number 1. Also, the connector on the floppy drive connector may have a slot. When the slot is up, pin number 1 should be on the right. Check the documentation that came with the drive for more informa-tion.

If you desire, connect the B: drive to the connectors in the middle of the cable as described above.

Pin assignments

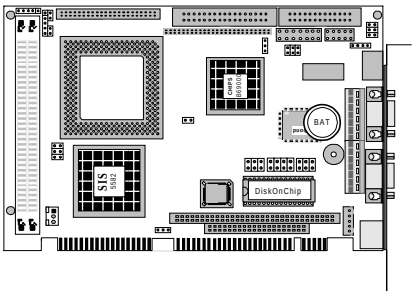
The following table lists the pin assignments for the CN7 connector:

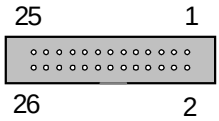
FLOPPY drive connector (CN7)

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) port connector (CN8)

Normally, the parallel port CN8 is used to connect the card to a printer. You need an adapter cable if 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.





Parallel port IRQ

The SBC-556/L supports one parallel port. The port is designated as LPT1 and can be disabled or changed to LPT2 or LPT3 in the system BIOS setup.

Pin assignments

Parallel (printer) Connector (CN8)

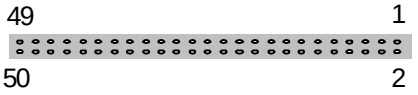
Pin	Signal	Pin	Signal
1	Strobe	2	Data 0
3	Data 1	4	Data 2
5	Data 3	6	Data 4
7	Data 5	8	Data 6
9	Data 7	10	-Acknowledge
11	Busy	12	Paper empty
13	+Select	14	-Auto feed
15	-Error	16	-Init printer
17	-Select input	18~25	GND

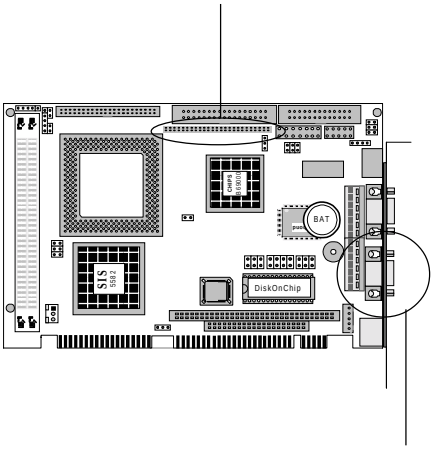
Display connectors (CN9, CN15)

The SBC-556/L's PCI SVGA interface can drive conventional CRT displays and is capable of driving a wide range of flat panel displays, including electroluminescent (EL), gas plasma, passive LCD and active LCD displays. The card has two connectors to support these displays, one for standard CRT VGA monitors(CN15) and one for flat panel displays(CN9).

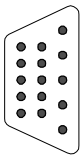
The SBC-556/L's SVGA connector (CN15) with PCI bus supports monochrome display as well as high-resolution color displays. The card also features a LCD connector (CN9), which allows you to connect various flat panel displays. The following table lists pin assignments of CN9:

CN9





CN15



LCD connector (CN9)

Pin	Function	Pin	Function
1	+12VDC	2	+12VDC
3	GND	4	GND
5	+5VDC	6	+5VDC
7	ENAVEE	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	P24	34	P25
35	SHFCLK	36	FLM (V SYS)
37	M	38	LP (H SYS)
39	GND	40	ENABKL
41	P26	42	P27
43	P28	44	P29
45	P30	46	P31
47	P32	48	P33
49	P34	50	P35

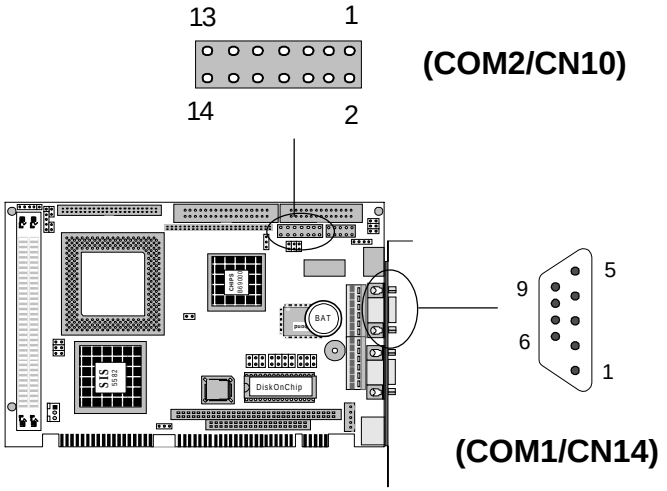
SVGA connector (CN15)

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

Serial ports connectors (CN10, CN14)

The SBC-556/L offers one RE-232 serial port and one selectable RS-232/422/485 serial ports. You can enable or disable the address for each port within the BIOS Peripheral Setup Menu.

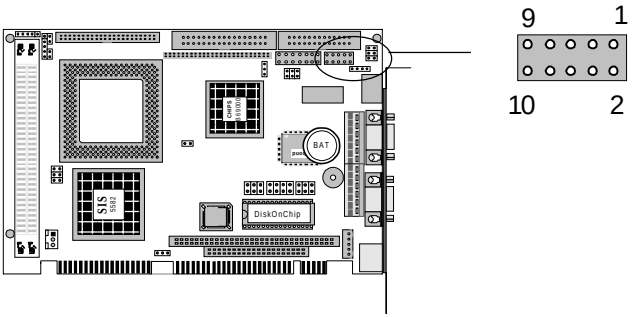
The card mounting bracket holds COM1(CN14), the DB-9 serial port connector for the first port For COM2(CN10) selection, please refer to Jumper settings one the previous page.



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	N/A	N/A
11	N/A	422TXD + (485 DATA+)	12	N/A	422TXD - (485 DATA-)
13	N/A	422RXD+	14	N/A	422RXD-

USB connectors (dual-port) (CN11)

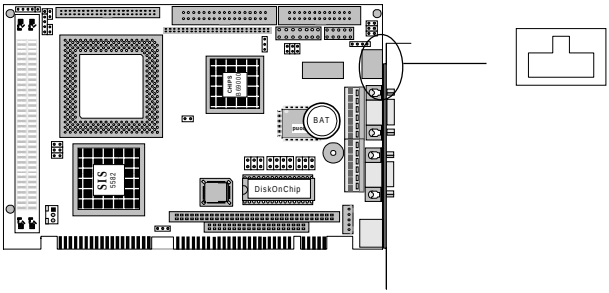
The USB connector supports two universal serial ports. This connector allows optional external port bracket and attached cable to connect external USB devices. If the USB ports are installed, the USB setting in the CMOS setup should be set to “Enabled”. The USB ports also require operating system support for USB devices.



USB Connector		
Pin		Function
1	2	+5V
3	4	-Data
5	6	+Data
7	8	GND
9	10	NC

Ethernet connector (CN12)

The Ethernet interface on the SBC-556/L via an standard RJ-45 connector for 100/10 Base-T operation.

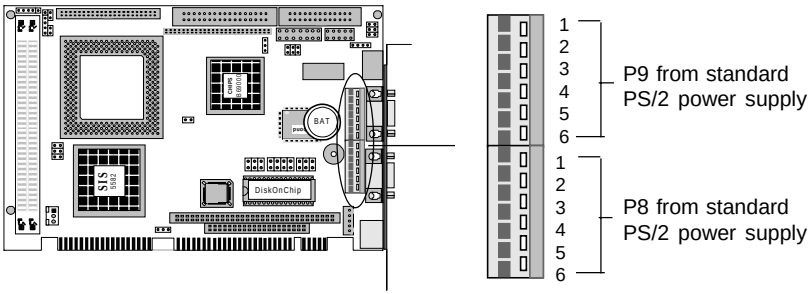


Note:

Please be kindly reminded that all related network function and warning temperature described in this user manual are only valid for the SBC-556.

Power connectors (P8 & P9)(CN13)

In single board computer (non-passive backplane) application. You will need to connect the power directly to the SBC-556/L board using CN13. This connector is fully compatible with the standard PC PS/2 power supply connector, P8 & P9. see the following table for its pin assignments:



Power connector pin assignments (CN13)

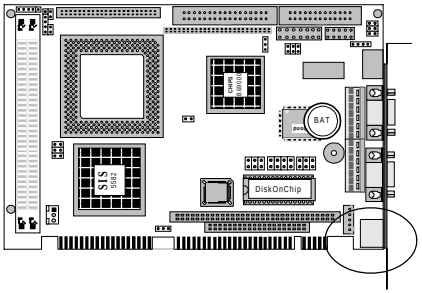
Pin	Signal	Pin (P8)	Signal
1	+5V	1	GND
2	+5V	2	GND
3	+5V	3	-12V
4	-5V	4	+12V
5	GND	5	+5V
6	GND	6	N.C.

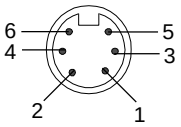
Power connector pin assignments (CN13)

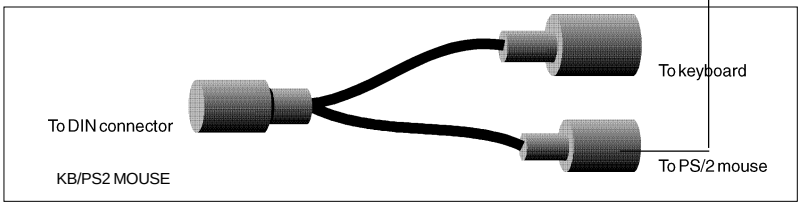
Pin (P9)	Color	Pin (P8)	Color
1	Red	1	Black
2	Red	2	Black
3	Red	3	Blue
4	White	4	Yellow
5	Black	5	Red
6	Black	6	Orange

KB & PS/2 Mouse connector (CN17)

The SBC-556/L board provides two 6-pin mini-DIN connectors (KB/PS/2 MOUSE) on the card mounting bracket supports single board computer applications. The card comes with an adapter to convert the 6-pin mini-DIN connector, used for the mouse, to the standard DIN connector for the keyboard.







Keyboard connector

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

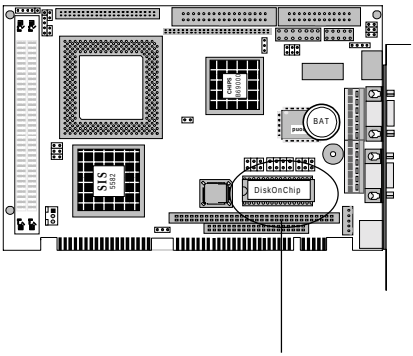
Keyboard & PS/2 mouse connector

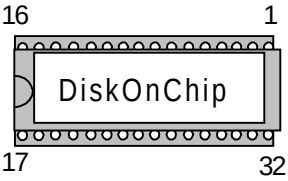
Pin	Function
1	K.B. data
2	PS/2 mouse data
3	GND
4	+5 V DC
5	K.B. clock
6	PS/2 mouse clock

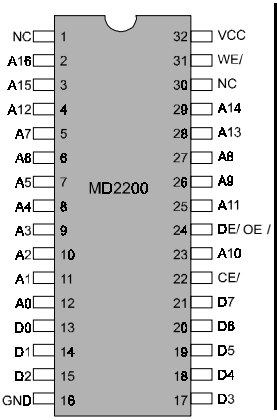
DiskOnChip socket

The DiskOnChip 2000 family of products provides a single chip solid-state flash disk in a standard 32-pin DIP package. The DiskOnChip 2000 is a solid-state disk with no moving parts, resulting in a significant reduction in power consumption and an increase in reliability. The DiskOnChip is a small, plug and play Flash disk. It is easy to use and saves integration overhead.

The DiskOnChip 2000 family of products is available in capacities ranging from 2MB up to 72 MB, unformatted. In order to manage the disk, the DiskOnChip 2000 includes the TrueFFS, M-Systems' Flash File System proprietary software. The DiskOnChip 2000 package is pin-to-pin compatible with standard 32-pin EPROM devices.







pin Name	Description	Pin Number	Direction	Note
A0-A12	Address bus	4-12,23,25-27	Inputs	
A13-A16	Address bus	2,3,28,29	Inputs	1
D0-D7	Data bus	13-15,17-21	I/O	
CE/	Chip Enable	22	Input	
OE/	Output Enable	24	Input	
WE/	Write Enable	31	Input	
NC	Not connected	1.30		2
VCC	Power	32		
GND	Ground	16		

Note 1: Pins A13 through A16 are not used by the MD2200. They are kept for socket backward compatibility with ED 1100 (DiskOnChip 1000)

Note 2: Pins 1 and 30 are not used by MD2200

CHAPTER 3

Award BIOS Setup

This chapter describes how to set BIOS configuration data.

System test and initialization

These routines test and initialize board hardware. If the routines encounter an error during the tests, you will either hear a few short beeps or see an error message on the screen. There are two kinds of errors: fatal and non-fatal. The system can usually continue the boot-up sequence with non-fatal errors. Non-fatal error messages usually appear on the screen along with the following instructions:

press <F1> to RESUME

Write down the message and press the F1 key to continue the boot-up sequence.

System configuration verification

These routines check the current system configuration against the values stored in the card's CMOS memory. If they don't match, the program outputs an error message. You will then need to run the BIOS setup program to set the configuration information in memory.

There are three situations in which you will need to change the CMOS settings:

1. You are starting your system for the first time.
2. You have changed the hardware attached to your system.
3. The CMOS memory has lost power, and the configuration information has been erased.

The SBC-556/L's CMOS memory has an integral lithium battery backup. The battery backup should last ten years in normal service, but when it finally runs down, you will need to replace the complete unit.

AWARD BIOS setup

Entering setup

Power up the computer and press <Del> immediately. This will allow you to enter Setup.

Award's BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backed CMOS RAM so that it retains the Setup information when the power is turned off.

Standard CMOS setup

When you choose the STANDARD CMOS SETUP option from the INITIAL SETUP SCREEN menu, the screen shown below is displayed. This standard Setup Menu allows users to configure system components such as date, time, hard disk drive, floppy drive, display, and memory. Once a field is highlighted, on-line help information is displayed in the left bottom of the Menu screen. In the Panel selection item, you can use Page/Up/Down key to select requried LCD BIOS. There are eight various. LCD BIOS available in this BIOS selection table:

1	640 x 480 18Bit TFT	5	640 x 480 MONO
2	1024 x 768 TFT	6	640 x 480 DSTN
3	800 x 600 TFT	7	800 x 600 DSTN
4	1024 x 768 DSTN	8	640 x 480 12Bit TFT

BIOS features setup

By choosing the BIOS FEATURES SETUP option from the INITIAL SETUP SCREEN menu, the screen below is displayed. The following configurations are based on the manufacturer's SETUP DEFAULTS settings.

Virus Warning

When this item is enabled, the Award BIOS will monitor the boot sector and partition table of the hard disk drive for any attempt at modification. If an attempt is made, the BIOS will halt the system and the following error message will appear. Afterwards, if necessary, you will be able to run an anti-virus program to locate and remove the problem before any damage is done.

> **! WARNING !**
>
> Disk boot sector is to be modified
>
> Type "Y" to accept write or "N" to abort write
>
> Award Software, INC.

CPU Internal Cache/External Cache

These two categories speed up memory access. However, it depends on CPU/chipset design.

Quick Power On Self Test

This category speeds up Power On Self Test (POST) after you power up the computer. If it is set to Enable, BIOS will shorten or skip some check items during POST.

Boot Sequence

This category determines which drive to search first for the disk operating system (i.e., DOS).

Swap Floppy Drive

This item allows you to determine whether you want to swap floppy drive or not.

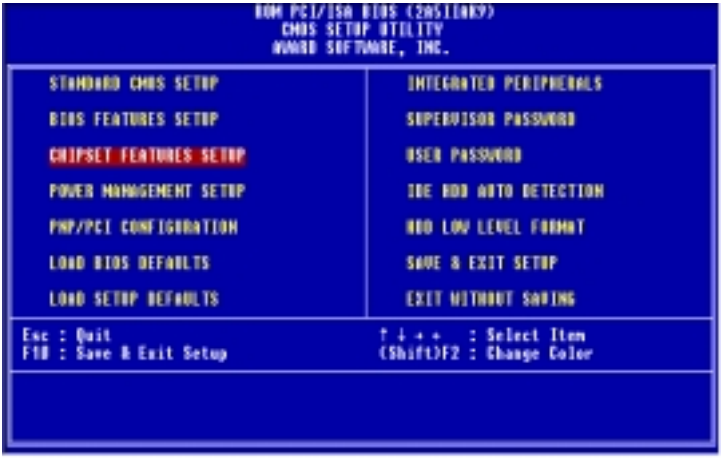
Boot Up Floppy Seek
During POST, BIOS will determine if the floppy disk drive installed is 40 or 80 tracks. 360K type is 40 tracks while 760K, 1.2 M and 1.44M are all 80 tracks.

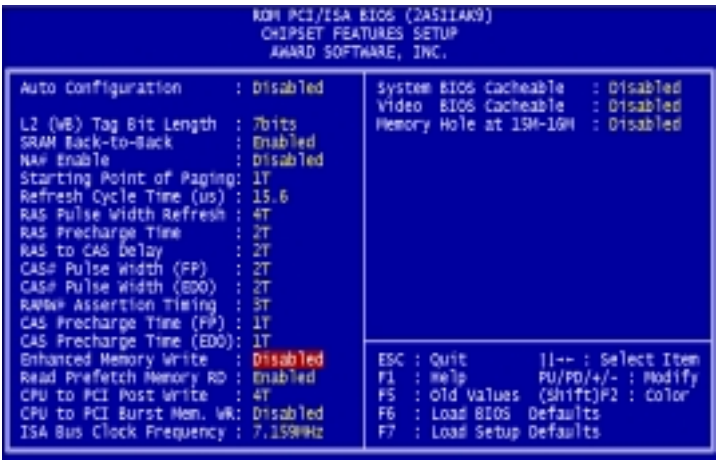
Boot Up NumLock Status
This allows you to determine the default state of the numeric keypad.

Gate A20 Option
This entry allows you to select how the gate A20 is handled. The gate A20 is a device used to address memory above 1 Mbyte. Initially, the gate A20 was handled via a pin on the keyboard. Today, while keyboards still provide this support, it is more common, and much faster, for the system chipset to provide support for gate A20.

Security Option
This category allows you to limit access to the system.

Chipset features setup





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.

The only time you might consider making any changes would be if you discovered that data was being lost while using your system.

Auto Configuration

Set this item to *Enabled* to pre-defined values for DRAM, cache.. timing according to CPU type & system clock. Thus, each item value may display differently depending on your system configurations.

When this item is enabled, the pre-defined items will become SHOW-ONLY.

System BIOS Cacheable

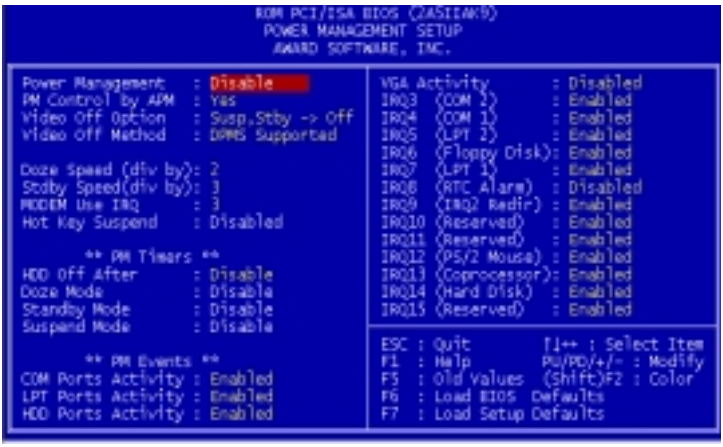
When enabled, accesses to the system BIOS ROM addressed at F0000H-FFFFFH are cached, provided that the cache controller is enabled.

Video BIOS Cacheable

As with caching the System BIOS above, enabling the Video BIOS cache will cause access to video BIOS addressed at C0000H to C7FFFH to be cached, if the cache controller is also enabled.

Power management setup

By choosing the POWER MANAGEMENT SETUP option from the INITIAL SETUP SCREEN menu, the screen below is displayed. The following configurations are the setup menu on the screen.



Power Management
There are four selections for Power Management, Disabled, Min Saving, Max Saving, User Define. Except Disabled, three of above selections have fixed mode settings. When PM is set Disabled, the pre-defined items will become show only.

PM Control by APM
When enabled, an Advanced Power Management device will be activated to enhance the Max. Power Saving mode and stop the CPU internal clock.

Video Off Option
User can select All Modes→Off , Always On, Suspend→Off, or Susp, Stby→Off to execute the PM mode.

Video Off Method
This determines the manner in which the monitor is blanked.

Blank screen	This option only writes blanks to the vide buffer.
DPMS	Initial display power management signaling.

PM Timers

The following four modes are Green PC power saving functions which are only user configurable when User Defined Power Management has been selected. See above for available selections.

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

Doze Mode
When enabled and after the set time of system inactivity, the CPU clock will run at a slower speed while all other devices still operate at full speed.

Standby Mode
When enabled and after the set time of system inactivity, the fixed disk drive and the video will be shut off while all other devices still operate at full speed.

Suspend Mode
When enabled and after the set time of system inactivity, all devices except the CPU will be shut off.

PM Events

PM events are I/O events whose occurrence can prevent the system from entering a power-saving mode or can awaken the system from such a mode. In effect, the system remains alert for anything which occurs to a device which is configured as *Enabled*, even when the system is in a power down mode.

The following is a list of IRQ (Interrupt ReQuests) which can be exempted much as the COM ports and LPT ports above can. When an I/O device wants to gain the attention of the operating system, it signals this by causing an IRQ to occur. When the operating system is ready to respond to the request, it interrupts itself and performs the service.

- IRQ3 (COM 2)
- IRQ4 (COM 1)
- IRQ5 (LPT 2)
- IRQ6 (Floppy Disk)
- IRQ7 (LPT 1)
- IRQ8 (RTC Alarm)
- IRQ9 (IRQ2 Redir)
- IRQ10 (Reserved)
- IRQ11 (Reserved)
- IRQ12 (PS/2)
- IRQ13 (Coprocessor)
- IRQ14 (Hard Disk)
- IRQ15 (Reserved)

PNP/PCI Configuration setup

By choosing the PCI CONFIGURATION SETUP option from the INITIAL SETUP SCREEN menu, the screen below is displayed. This section describes configuring the PCI bus system. PCI, or Personal Computer Interconnect, is a system which allows I/O devices to operate at speeds nearing the speed the CPU itself uses when communicating with its own special components. This section covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings. The following configurations are based on the manufacturer's SETUP DEFAULTS Settings.

Resource Controlled by

The Award Plug and Play BIOS has the capacity to automatically configure all of the boot, Plug and Play compatible devices. However, this capability means absolutely nothing unless you are using a Plug and Play operating system such as Windows® 95.

Reset Configuration data

This item allows you to determine whether to reset the configuration data or not.

PCI IRQ Activated by

This sets the method by which the PCI bus recognizes that an IRQ service is being requested by a device. Under all circumstances, you should retain the default configuration unless advised otherwise by your system manufacturer.

Choices are *Level* and *Edge*.

PCI IDE IRQ Map to

This allows you to configure your system to the type of IDE disk controller in use. The more apparent difference is the type of slot being used.

If you have equipped your system with a PCI controller, changing this allows you to specify which slot has the controller and which PCI interrupt (A, B, C, or D) is associated with the connected hard drives.

Remember that this setting refers to the hard disk drive itself, rather than individual partitions. Since each IDE controller supports two separate hard drives, you can select the INT# for each. Again, you will note that the primary has a lower interrupt than the secondary.

Selecting *PCI Auto* allows the system to automatically determine how your IDE disk system is configured.

Primary IDE INT#

Refer to the above description of PCI IDE IRQ.

Load BIOS DEFAULTS / LOAD SETUP DEFAULTS

LOAD BIOS DEFAULTS loads the default system values directly from ROM. The BIOS DEFAULTS provide the most stable settings, though they do not provide optimal performance. LOAD SETUP DEFAULTS, on the other hand, provides for maximum system performance. If the stored record created by the Setup program becomes corrupted (and therefore unusable), BIOS defaults will load automatically when you turn on the SBC-556.

Integrated Peripherals

Integrated Peripherals options are displayed by choosing the INTEGRATED PERIPHERALS icon from the INITIAL SETUP SCREEN. This section sets the IDE transfer mode for all IDE channels. It also configures the other onboard ports. The following configurations are based on the manufacturer's SETUP DEFAULTS settings.

Internal PCI/IDE

You can choose *Disable* to terminate the onboard PCI/IDE controller and then support external HDD devices. When the setting is Primary, users can set up IDE Mode or UltraDMA mode depending on the respective HDD drive.

IDE Primary Master/Slave PIO

These four lines set the hard disk PIO transfer mode, which affects the hard disk data transfer rate. The system will auto-detect the PIO mode of a device in any of these positions when they are set to 'Auto', the recommended setting. Alternatively, you can set the mode manually. Modes 0 to 4 are supported.

Primary Master/Slave UltraDMA

These four lines enable hard disk UltraDMA transfer mode, which requires a drive that supports this data transfer method. The system will auto-detect an UltraDMA device in any of these four positions when they are set to 'Auto', the recommended setting. The other setting is 'Disabled'. You can leave these setting on Auto if there are no UltraDMA devices installed.

IDE Burst Mode
When this item is *Enabled*, the system will support burst data transfer mode to increase HDD transfer speed.

IDE Data Port Post Write
This item allows users to select *Enabled* to use data port post write for IDE drive.

IDE HDD Block Mode
Set this item to *Enabled* to use HDD block transfer mode.

Onboard FDD Controller
Enables or *Disables* the onboard Floppy Drive controllers.

Onboard Serial Port 1/2
Sets the I/O address for serial ports 1/2. The system will auto-detect the COM port address when this item is set to Auto, the default setting.

COM1/3F8 (Default of onboard serial port)
COM2/2F8 (Default of onboard serial port)
COM3/3E8
COM4/2E8

Onboard Parallel Port
Sets the I/O address for the onboard parallel port. The setting options are:

378H/IRQ7 (default)
Disabled
278H/IRQ5
3BCH/IRQ7

Onboard Parallel mode
Selects the parallel port mode. The setting options are:

SPP (default)
ECP+EPP
EPP +SPP
ECP

If you set this option to 'SPP' or 'EPP', the 'ECP Mode Use DMA' option will not appear on the screen. If you set this option to 'SPP' or 'ECP', the 'Parallel Port EPP Type' option will not appear on the screen.

ECP Mode Use DMA
Selects the ECP Mode DMA channel. The setting options are:

3
1

USB Controller/ USB Keyboard Support
Enables or Disables the onboard USB port controller and USB Keyboard support.

Supervisor/User Password Setting

You can set either supervisor or user password, or both. The differences between them are:

supervisor password: can enter and change the options of the setup menus.

user password : can only enter but does not have the right to change the options of the setup menus.

When you select this function, the following message will appear at the center of the screen to assist you in creating a password.

ENTER PASSWORD:

Type the password, up to eight characters in length, and press <Enter>. The password typed now will clear any previously entered password from the CMOS memory. You will be asked to confirm the password. Type the password again and press <Enter>. You may also press <Esc> to abort the selection and not enter a password.

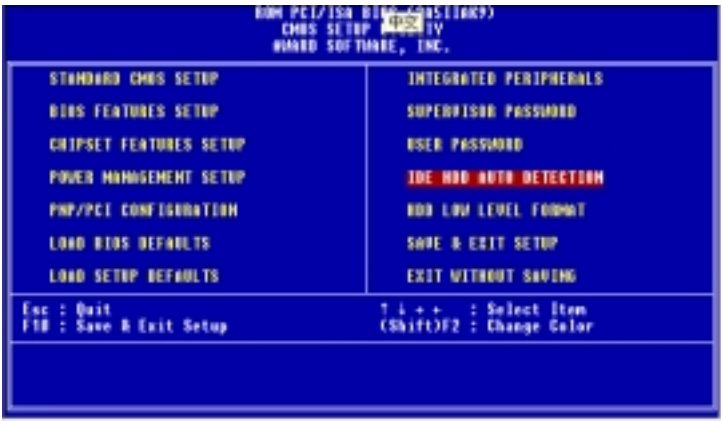
To disable a password, just press <Enter> when you are prompted to enter the password. A message will confirm the password will be disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

PASSWORD

When a password has been enabled, you will be prompted to enter it every time you try to enter Setup. This prevents unauthorized use of your computer.

Auto detect hard disk

The IDE HDD AUTO DETECTION utility can automatically detect the IDE hard disk installed in your system. You can use it to self-detect and/or correct the hard disk type configuration.



ROM PCI/ISA BIOS (2A5L9AKD)
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

	CYLS.	HEADS	PRECOMP	LANDZONE	SECTORS	MODE
Drive C : (Mb) 790	15	35535	789	57		

Select Drive C Option (N=Skip) : N

OPTION	Size	CYLS	HEADS	PRECOMP	LANDZONE	SECTORS	MODE
1 (Y)	0	0	0	0	0	0	NORMAL

Notes: Some OSes (line SCO-UNIX) Must use "NORMAL" for installation

ESC = SKIP

IDE HDD auto detection screen

HDD low level format

Selecting this utility allows you to execute HDD low level formatting. This Award Low-Level-Format Utility is designed as a tool to save you time formatting your hard disk. The Utility automatically looks for the necessary information of the drive you selected. The Utility also searches for bad tracks and lists them for your reference.

Shown below is the menu that appears after you enter into the Award Low-Level-Format Utility.

Save & exit setup

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 on 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

Flat Panel/CRT Controller Display Drivers and Utilities

This chapter provides information about:

- Driver types and installation

Software drivers

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

The onboard VGA adapter is based on the CHIPS VGA Flat Panel/CRT controller and is fully IBM VGA compatible. This controller offers a large set of extended functions and higher resolutions. If you intend to use your VGA adapter in standard VGA modes only, you do not need to install any of these drivers. Since your VGA adapter is fully compatible, it does not require any special drivers to operate in standard modes.

The purpose of the enclosed software drivers is to take advantage of the extended features of the CHIPS VGA Flat Panel/CRT controller.

Hardware configuration

Some of the high-resolution drivers provided in this package will work only in certain system configurations. If a driver does not display correctly, try the following:

1. Change the display controller to CRT-only mode, rather than flat panel or simultaneous display mode. Some high-resolution drivers will display correctly only in CRT mode.
2. If a high-resolution mode is not supported on your system, try using a lower-resolution mode. For example, 1024 x 768 mode will not work on some systems, but 800 x 600 mode is supported on most.

Necessary prerequisites

The instructions in this manual assume that you understand elementary concepts of MS-DOS and the IBM Personal Computer. Before you attempt to install any driver from the *Supporting CD-ROM*, you should:

- Know how to copy files from a CD-ROM to a directory on the hard disk
- Understand the MS-DOS directory structure

If you are uncertain about any of these concepts, please refer to the DOS or OS/2 user reference guides for more information *before* you proceed with the installation.

Before you begin

Make sure you know the version of the application for which you are installing drivers. The *Supporting CD-ROM* contain drivers for several versions of certain applications. For your driver to operate properly, you must install the driver for your version of the application program.

Windows® 95

These drivers are designed to work with Microsoft® Windows®. You just install these drivers through the Windows® operating system.

Driver installation

1. Install Windows® 95 as you normally would for a VGA display. Click the **Start** button, go to **Settings** and click on **Control Panel**. Choose the **Display** icon and double click on the icon. In the ***Display Properties*** window, show as figure 1:

figure 1

Click the setting buttom, then click the Advanced Properties icon into the ***Advanced Display properties*** windows, show as figure2:

figure 2

click on **Change Display Type**. In the ***Change Display Type*** window, click on the **Change** button under Adapter Type into the select Device window show as figure 3: This will bring up the ***Select Device*** window.

figure 3

2. Place the *Supporting CD-ROM* in your CD-ROM drive.

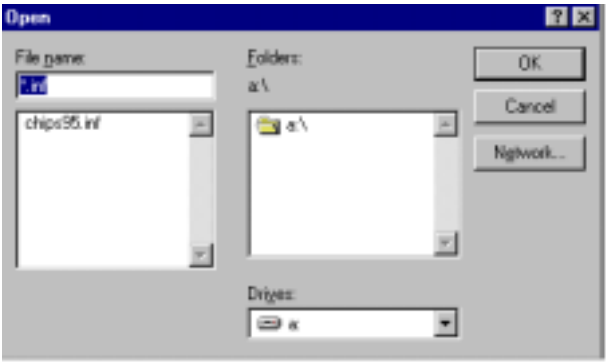


figure 4

In the ***Select Device*** window, click on **Have Disk**, Select **Browse**, and find the Win95 driver "chips95.inf" in the *Supporting CD-ROM*:

cd-rom: \CD ROM\model name\driver\vga driver
\win95\chips95.inf and then click OK.

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

"**model name**" : the model number of your product

The name of the ***Chips And Tech*** **"69000** ***PCI "*** driver will appear highlighted in the ***Models*** list boxfhow as figure. Click OK to start the driver installation show as figure 5:

figure 5

3. Once the installation is complete, the ***Advanced display Properties*** window will reappear. Show as figure 6:

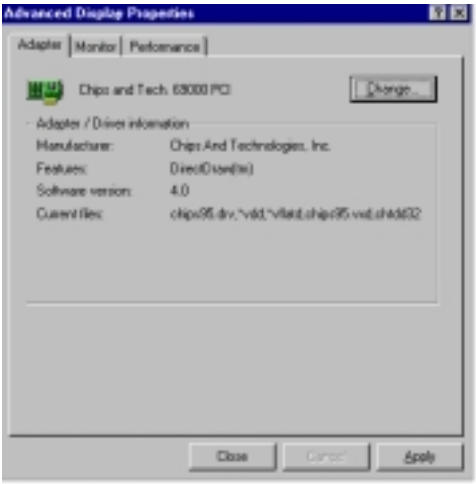


figure 6

Click on close to close the window. Then the ***Display Properties*** window will reappear. Show as figure 7:

figure 7

Click on **Apply**. Restart the system for the new settings to take effect, show as figure 8:

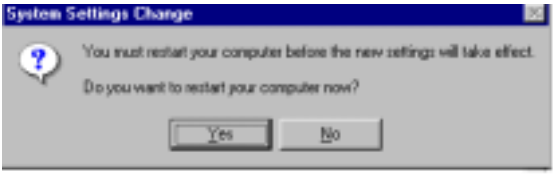


figure 8

Windows® 3.1

These drivers are designed to work with Microsoft Windows Version 3.1. You should install these drivers through Windows.

Driver installation

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 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:\CD ROM\model name\driver\vga driver\win31\setup.exe

   Press the <ENTER> key or click OK to begin the installation.

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

   "**model name**" : the model number of your product

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, you can find the icon Chips CPL under the Control Panel. The icon allows you to select and load the installed drivers.

OS/2

These drivers are designed to function with the OS/2 Version 4.0, 3.0 and 2.11 operating systems.

To install this driver, do the following steps:

1. Open an OS/2 full screen or windowed session.
2. Place the *Supporting CD-ROM* into your CD-ROM drive.
3. At the OS/2 command prompt, type the following commands to copy the files to the OS/2 drive:

   Type cd-rom drive:\CD ROM\model name\driver\vga driver\os2\

When the Setup Program is completed, you will need to perform a shutdown and then restart the system in order for changes to take effect.

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

"**model name**" : the model number of your product

A log of the information output during the install can be found

in <root>:\OS2\INSTALL\DISPLAY.LOG

4. After restarting the system, perform the following steps:

   1. Open the OS/2 System folder.
   2. Open the System Setup folder.
   3. Open the Display Driver Install Object.

This step will execute the Display Driver Installation (DSPINSTL) utility program to finish installation of the new drivers.

   4. When the Display Driver Install window appears, select Primary Display and then select OK.
   5. When the Primary Display Driver List window appears, select "Chips and Technologies 69000" from the list of adapter types, then select OK or install the video driver.

6. When the installation is complete, you will need to shut down and then restart the system for the changes to take effect. Make sure to remove the installation diskette before restarting the system.

Windows® NT 3.51

These drivers are designed to work with Microsoft® Windows®.

Driver installation

1. Install Windows® NT 3.51 as you normally would for a **VGA** display. Click the **Star** buttom, go to **Settings** and click on **Control Panel** icon. Then choose the **Display** and double click on the icon. In the **Display Properties** window, click the **Setting** buttom, then click the **Display Type** buttom into the **Display Type** windows, then click on **Change** buttom from the **Adapter Type** icon. And click on **Have Disk** buttom in the change display window.

2. Place the *Supporting CD-ROM* into your CD-ROM drive.

   and type:

   cd-rom: \CD ROM\model name\drive\vga drive\
   win98 nt\windows.nt\nt35\Oemsetup.inf

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

   "**model name**" : the model number of your product

   Select the adapter "Chips and Tech 69000PCI" and click OK.

   Click on Install to install the selected driver. Once the installation is complete, shut down and restart the system.

Windows® NT 4.0

Driver installation

1. Install Windows® NT 4.0 as you normally would for a **VGA** display. Click the **Star** buttom, go to **Settings** and click on **Control Panel** icon. Then choose the **Display** and double click on the icon. In the **Display Properties** window, click the **Setting** buttom, then click the **Display Type** buttom into the **Display Type** windows, then click on **Change** buttom from the **Adapter Type** icon. And click on **Have Disk** buttom in the change display window.

2. Place the *Supporting CD-ROM* into your CD-ROM dirve. In the ***Select Device*** window, click on **Have Disk**, select "**Browse**" and find the NT 4.0 driver from:

   cd-rom : \CD ROM\model name\dirver\vga driver\
   win98 nt\windows.nt\nt40\Oemsetup.inf

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

   "**model name**" : the model number of your product

   and then click OK. The name of the ***Chips and Technologies, Inc***. ***Video Controller*** driver will appear highlighted in the Modules list box. Select Chips and Tech. 69000 and Click **OK**. Click **OK** to start the driver installation.

3. Once the installation is complete, the ***Change Display Type*** window will reappear. Click on close to close the window. Then the ***Display Properties*** window will reappear. Click on **Apply**. Restart the system for the new settings to take effect.

CHAPTER 5

Ethernet Software Configuration

This chapter describes how to configure the Etherent interface to match your application requirements.

Ethernet software configuration

The onboard Ethernet interface supports all major network operating systems. I/O addresses and interrupts are easily configured via the Award Setup. To configure the medium type, to view the current configuration, or to run diagnostics, please refer to the following istructions:

1. Power the mainboard on. Ensure that the RSET8139.EXE file is located in the working drive.
2. Choose RSET8139.EXE from:

   cd-rom : \CD ROM\mode name\ driver\ethernet\
   Oem8139.exe and press <ENTER>.

   The Ethernet configuration program will then be displayed.

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

   "**model name**" : the model number of your product
3. This simple screen shows all the available options for the Ethernet interface. Just highlight the option you wish to change by using the Up and DOWN keys. To change a selected item, press <ENTER>, and a screen will appear with the available options. Highlight your option and press <ENTER>. Each highlighted option has a helpful message guide displayed at the bottom of the screen for additional information.
4. After you have made your selections and the configuration is what you want, press <ESC>. A prompt will appear asking if you want to save the configuration. Press "Y" if you want to save.

The Ethernet Setup Menu also offers three very useful diagnostic functions. These are:

1. Run EEPROM test
2. Run Diagnostics on Board
3. Run Diagnostics on Network

Each option has its own display screen which shows the format and result of any diagnostic tests undertaken.

APPENDIX A

Programming the Watchdog Timer

The SBC-556/L is equipped with a watchdog timer that resets the CPU or generates an interrupt if processing comes to a standstill for whatever reason. This feature ensures system reliability in industrial stand-alone and unmanned environments.

Programming the watchdog timer

How to program the WATCHDOG TIMER

1. To set the time-out interval of watchdog timer:

   -- output the desired value to port **0x443**. Since the data is of 1 byte, the maximum value will be 255. In our design 1 ~ 127 will denote 1sec ~ 127sec, though 129 ~ 255 will denote lmin ~ 127min. e.g.

   outportb(0x443, 30); // set interval to 30 seconds
   outportb(0x443, 0x85); // set interval to 5 minutes

2. To set the time-out event:

   -- output data to **prot 0x444,**

   - 0: reset system
   - 1, 2, 3: IRQ 10, 15, 11 respectively
   - 4: NMI

   e.g.
   outportb(0x444, 0); // set time-out event to reset-system

3. To disable watchdog timer:

   -- output any value to port 0x80, e.g.
   outportb(0x80, data); // disable watchdog timer

4. To ebable or refresh watchdog timer(the watchdog timer will return to its initial value, then count down):

   -- access the I/O port ***0x443***, e.g.
   outportb(0x80, 0); // disable watchdog timer
   inportb(0x443); // refresh watchdog timer

   * note: if you want to refresh the watchdog timer, you have to disable it first.

Demo program

```
outportb(0x444, 0):          // set time-out event to reset-system
outportb(0x443x 10);         // set time-out interval to 10 seconds
iutportb(0x443);             // enable watchdog timer
customer_job();              // execute your job here, be sure your
                                job will finished in 10 seconds
outportb(0x80, 0);           //  refresh watchdog timer, otherwise
                                the system will reset after time-out
inportb(0x443);
another_job();               // another job finished in 10 seconds
outportb(0x80, 0)            // disable watchdog timer
...
...
```

APPENDIX B

Installing PC/104 Modules

This appendix gives instructions for installing PC/104 modules.

Installing PC/104 modules

The SBC-556/L'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

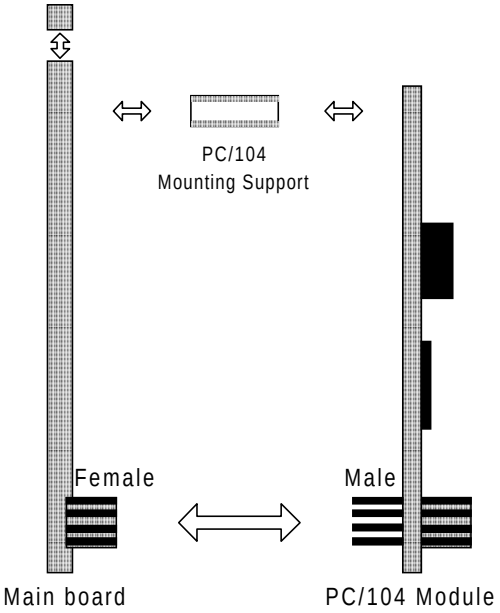
Installing these modules on the SBC-556/L is a quick and simple operation. The following steps show how to mount the PC/104 modules:

Step1 Remove the SBC-556/L from your system, paying particular attention to the safety instructions already mentioned above.

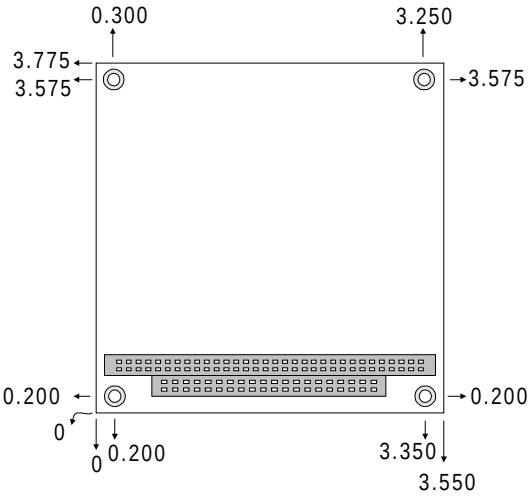
Step2 Make any jumper or link changes required to the CPU card now. Once the PC/104 module is mounted, you may have difficulty in accessing these.

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 dimenstions (inches ± 5%)