

# **SBC-551/552**

Half-Size PISA/ISA Pentium CPU Card

## **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 UNDESIRE 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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## Packing list

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

- 1 SBC-551/552 CPU Card
- 1 User Manual (this book)
- 1 Hard disk drive (IDE) interface cable (44 pin)
- 1 Floppy disk drive interface cable (34 pin)
- 1 6-pin mini-DIN dual outlet adapter for keyboard and PS/2 mouse
- 1 Parallel port adapter (26 pin) and COM1 adapter (9 pin) kit
- 4 Utility disks with SiS 5598 utility programs and drivers
- 1 bag of screws and miscellaneous parts

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

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## **General Information**

This chapter provides background information for the SBC-551/552.

Sections include:

- Card specifications
- Board layout

# Introduction

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The SBC-551/552 is an all-in-one Single Board Computer (SBC) capable of handling the Intel Pentium P54C, P55C (MMX), AMD K6, as well as the Cyrix 6x86 (M1) and 6x86MX (M2) CPUs. Reliability, performance, flexibility, and adequate expansion capabilities are essential qualities for SBCs and their embedded applications and the SBC-551/552 provides all of these.

The Smart Temperature Control technology (LM75 chip) monitors the CPU temperature and automatically slows down the CPU frequency when the CPU temperature exceeds a specified safe range, helping your system recover from abnormal temperature fluctuations.

The SBC-551/552 supports the M-Systems DiskOnChip 2000 (optional) which is a new generation of high performance single-chip Flash Disk. It provides a Flash Disk (as a BIOS expansion) which doesn't require any bus, slots, or connectors. It is also the optimal solution for Single Board Computers because of its small size, easy integration, plug-and-play functionality, and its low power consumption. The DiskOnChip is available in capacities from 2MB to 72MB and fits in a standard 32-pin DIP socket.

The SBC-551/552 also includes a high speed, local bus IDE controller which supports (through ATA PIO) mode 3 and mode 4 hard disks, Ultra DMA/33 (data transfer rates up to 33MB/sec) and up to 2 IDE devices.

Onboard features include one high speed RS-232 serial port, one RS-232/422/485 serial port with 16C550 UARTs, one bidirectional SPP/EPP/ECP parallel port, and a floppy drive controller. In addition to the 486's 16 KB of onchip cache memory, the SBC-551/552 includes an extra 512 KB of pipeline-burst L2 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 standalone systems.

The SBC-551/552 provides two 72-pin SIMM (Single In-line Memory Module) sockets for installing onboard system DRAM. These sockets give you the flexibility to configure your system from 4 MB to 128 MB of DRAM using the most economical combination of SIMMs.

## Features

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- Supports Pentium P54C/P55C (MMX), AMD K6, and Cyrix M1/M2 CPUs
- Half-size PISA bus CPU Card for SBC-551, and half-size ISA bus CPU Card for SBC-552
- Equipped with a switching power module supporting up to 10 Ampere CPU power consumption
- DiskOnChip (SSD) up to 72MB
- SiS 5598 chipset: XGA controller integrated
- Bus Master IDE and Ultra DMA/33 supported
- LM75 supports CPU temperature & fan monitoring

# Specifications

---

**CPU:** Intel Pentium MMX 166~233MHz, AMD-K6/200~300AFR, Cyrix / IBM/6x86MX-PR166~266GP and IDT winchip C6 180~225MHz

**BIOS:** Award FLASH BIOS

**Chipset:** SiS 5598

**Bus interface:** PISA Bus for SBC-551, ISA Bus for SBC-552

**Level 2 Cache:** Onboard 512KB pipeline-burst L2 cache.

**System memory:** Two 72-pin SIMM sockets. Supports up to 128MB DRAM.

**DMA channels:** 7

**Interrupt levels:** 15

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

**Enhanced IDE:** Supports up to two IDE devices. BIOS auto-detect, supports PIO mode 4 and Bus Master. Also supports multi-word DMA and Ultra DMA/33.

**FDD interface:** Supports up to two floppy disk drives.

**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.

**IrDA interface:** One IrDA connector reserved for future use.

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

**USB connectors:** One USB connector onboard. (Support two USB channels)

**Watchdog Timer:** Can generate a system reset, IRQ15, or NMI. Software selectable time out interval (2 sec ~ 128 min, 1 sec/step).

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

**VGA controller:** SiS 5598

**Display memory:** Supports shared system memory up to 4MB.

**Display type:** Supports a CRT display.

**Resolution:** Support up to 1024 x 768 @ 16.7M colors.

**SSD interface:** One 32-pin DIP socket supports the M-Systems DiskOn-Chip 2000 series, memory capacity from 2MB to 72MB.

**CPU thermal:** LM75 supports CPU temperature & fan monitoring.

**Power supply voltage:** +5V (4.75V to 5.25V)  
+12V (11.4V to 12.6V)

**Power Requirement:**

Bare Board: +5V @ 1.5A

Pentium MMX-200: +5V @ 6A

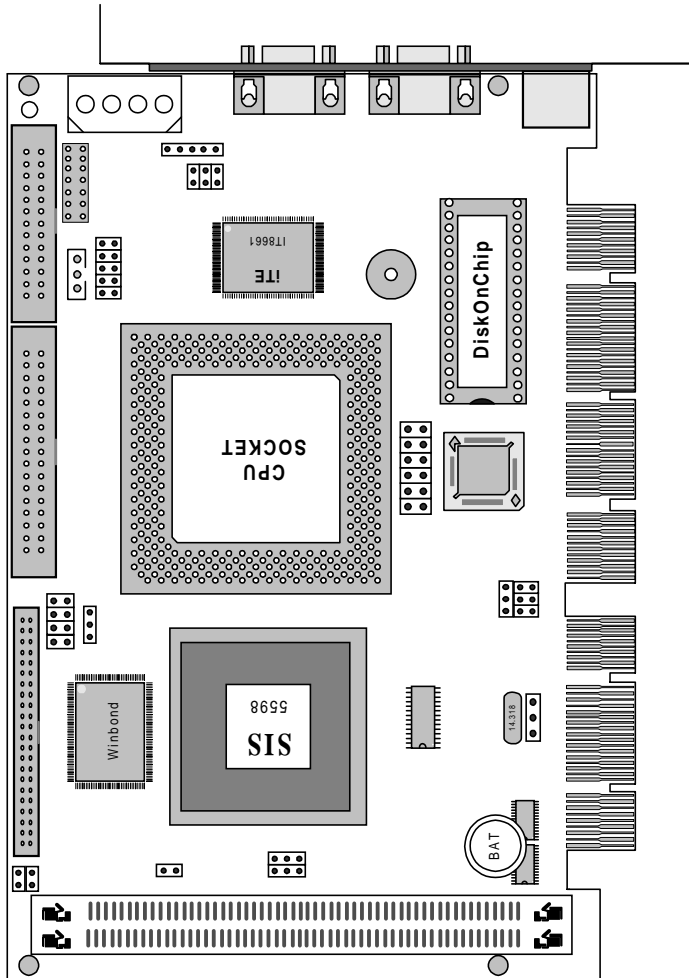
AMD K6-233: +5V @ 10A

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

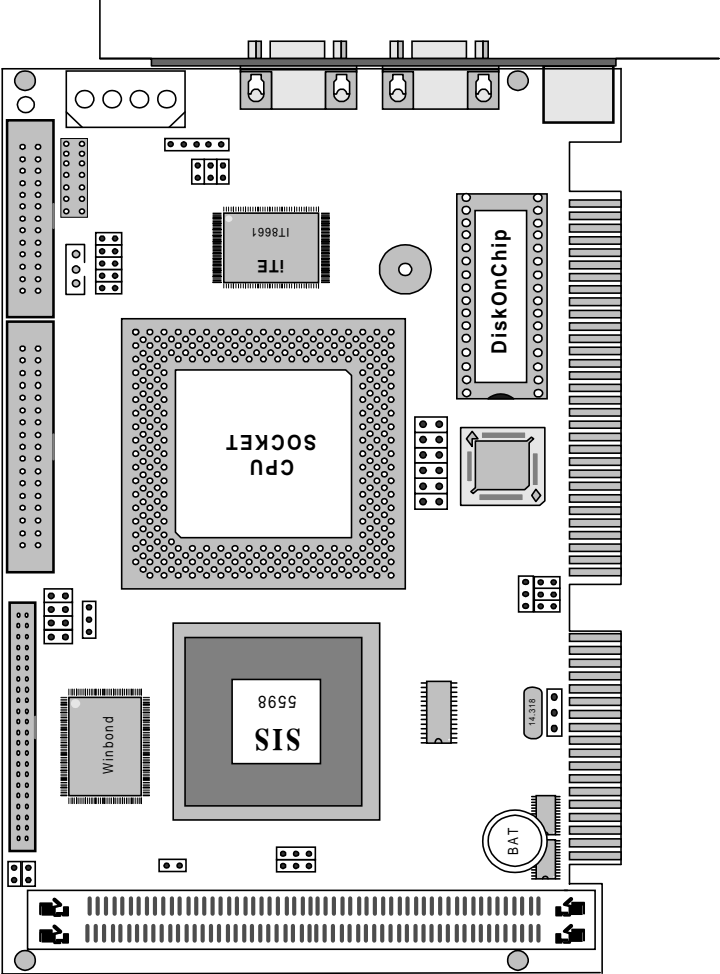
**Board size:** 7.3" (L) x 4.8" (W) (185 mm x 122 mm)

**Board weight:** 0.23 kg

# Board layout (SBC-551)(PISA Slot)

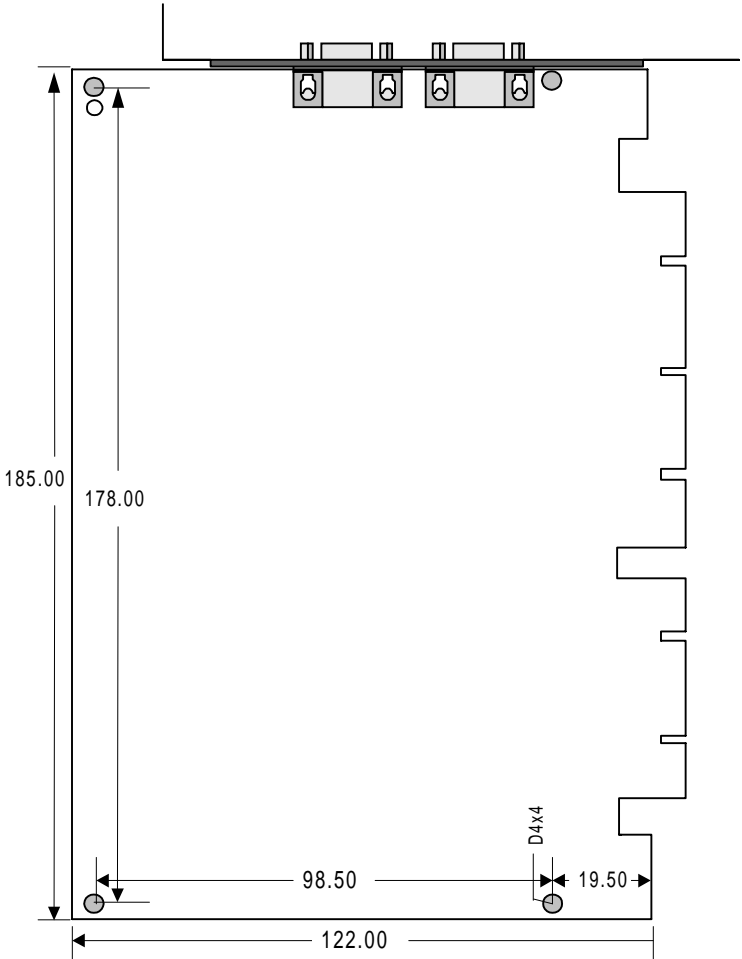


# Board layout (SBC-552)(ISA Slot)



# Card dimensions

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## Installation

This chapter explains setup procedures for the SBC-551/552 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

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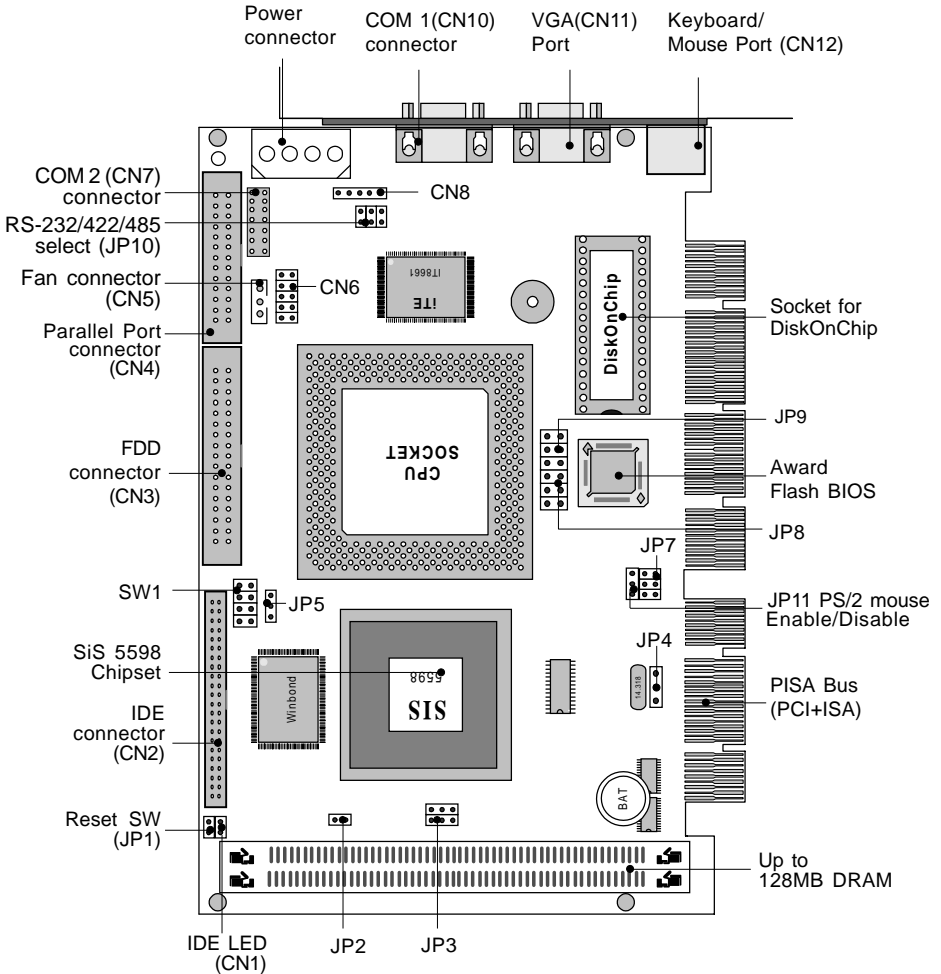
Connectors on the board link to external devices such as hard disk drives, keyboard, or floppy drives. In addition, the board has a number of jumpers that allow you to configure your system to suit your applications.

The tables below lists the function of each of the board jumpers and connectors:

Jumper Label	Function
JP1	Hardware reset
JP2	Thermal alarm LED
JP3	Int VAG setting
JP4	Clear CMOS
JP5	Vio voltage setting
JP7	CPU clock setting
JP8	CPU frequency ratio
JP9	DOC address setting
JP10	RS-232/422/485 select
JP11	PS/2 mouse setting
SW1	CPU voltage setting

Connector Label	Function
CN1	IDE LED connector
CN2	HDD connector
CN3	Floppy drive connector
CN4	Parallel (Printer) connector
CN5	Fan connector
CN6	USB connector
CN7	COM2 connector
CN8	Reserved IR connector
CN9	Power connector
CN10	COM1 connector
CN11	VGA connector
CN12	KB/PS2 mouse connector

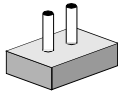
# Locating jumpers, connectors, and sockets



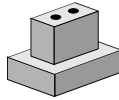
# Setting jumpers

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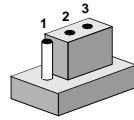
By setting the jumpers, you can configure your card to match the needs of your specific applications. A jumper is the simplest kind of electric switch. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To close a jumper 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 changes.

## 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.

**Conflicts!** The VGA controller of SBC-551/552 uses IDSEL No. 31, which is the same as that of the first PCI slot (i.e., "PCI1") on the PCI backplane (PICMG 2.0 standard). Therefore, when the onboard VGA function is enabled, the first PCI slot on the PCI backplane cannot have a peripheral card plugged in otherwise hardware conflicts can result.

# Installing the CPU

---

The SBC-551/552 CPU card supports most Pentium and its 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 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, in order to accommodate it. Make sure that the settings are correct for your CPU. **Improper settings may damage the CPU.**

## Installing DRAM (SIMM1, SIMM2)

---

The SBC-551/552 provides two 72-pin SIMM (Single In-line Memory Module) sockets. The SIMM supports either Fast Page Mode (FPM) or Extended Data Output (EDO) DRAM with a speed of at least 70 ns. Depending on the combination of modules you use, you can install from 4 MB to 128 MB of RAM.

### Installing SIMMs

**NOTE 1:** Pentium or compatible processors adopt 64 bit data bus. Since 72-pin SIMM can only provide 32 bit data bus width, two SIMM modules are required as one memory bank, and both SIMMs must be the same size and type.


1. Ensure that all power sources are disconnected.
2. Slip the memory module into the socket at a 45 degree angle.
3. Push the module toward the vertical posts at both ends of the socket until the module is upright and the retaining clips at both ends of the module click into place. When positioned correctly, the pins on top of the vertical posts should correspond to the circular holes on the ends of the module.
4. Repeat steps 2 and 3 for each module you install.

**NOTE 2:** Do not insert any SIMM module that contains more than 24 memory chips. SIMMs contain more than 24 chips exceed the driving capability of new generation chipsets.

## Hardware reset (JP1)

---

You can connect an external switch to easily reset your computer. The following table shows the pin assignments.

Hardware reset (JP1)	
Normal	Reset
1 □ ○ 2	1  2

## Thermal alarm LED (JP2)

---





The thermal alarm connector (JP2) allows the user to connect an alarm indicator LED on the case.

Thermal alarm LED (JP2)	
Pin	Signal
1	3.3V (Alarm out)
2	GND

## Internal SVGA setting (JP3)

---

The SBC-551/552 core logic chipset is SiS 5598 which has built-in VGA adapter. You can disable the internal VGA functions by setting JP3.

Internal SVGA setting (JP3)	
Enable*	Disable
1  2 3  4 5 ○ ○ 6	1 □ ○ 2 3  4 5  6

\*default



## Clear CMOS (JP4)

---

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

### Clear CMOS procedure:

1. Disconnect all power source.
2. Move JP4 from 1-2 to 2-3 for few seconds.
3. Move JP4 back to 1-2.

---

#### Clear CMOS (JP4)

---

Normal\*



Clear CMOS



---

\*default

## CPU type select (JP5)

---

JP5 must be set to match the CPU type between Dual-Voltage ( e.g., P55C ) and Single-Voltage ( e.g., P54C ) type CPU. The chart below shows the proper jumper setting for their respective CPU type.

---

#### CPU type select (JP5)

---

Dual-Voltage\*

Single-Voltage

JP5



---

\* default

**WARNING:** Improper setting could damage the CPU.





## CPU clock setting (JP7)

JP7 is used to synchronize the system clock with the CPU type. You may need to adjust the CPU clock according to the base CPU speed.

---

### CPU clock setting (JP7)

---

50 MHz	55MHz	60MHz
2 4 6	2 4 6	2 4 6
		
1 3 5	1 3 5	1 3 5
<hr/>		
66.6MHz*		
2 4 6		
		
1 3 5		

\*default

# CPU frequency ratio (JP8)

JP8 must be set to match the CPU clock ratio. The chart below show the proper jumper settings for P54C, P55C, AMD-K6, and Cyrix 6x86 MX (M2), and their respective clock ratios.

CPU frequency Ratio (JP8)				
JP6	P54C	P55C	AMD-K6	Cyrix 6x86MX
2 4 6 <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="checkbox"/> <input type="radio"/> <input type="radio"/> 1 3 5	1.5	3.5	3.5	3.5
2 4 6 <input type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input type="checkbox"/> <input type="radio"/> <input checked="" type="radio"/> 1 3 5	2.0	2.0	2.0	2.0
2 4 6 * <input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="checkbox"/> <input checked="" type="radio"/> <input type="radio"/> 1 3 5	3.0	3.0	3.0	3.0
2 4 6 <input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="checkbox"/> <input checked="" type="radio"/> <input checked="" type="radio"/> 1 3 5	2.5	2.5	2.5	2.5
2 4 6 <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> <input checked="" type="checkbox"/> <input type="radio"/> <input type="radio"/> 1 3 5	-	-	5.5	5.5
2 4 6 <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input checked="" type="checkbox"/> <input type="radio"/> <input checked="" type="radio"/> 1 3 5	-	-	4.0	4.0
2 4 6 <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="checkbox"/> <input checked="" type="radio"/> <input type="radio"/> 1 3 5	-	-	5.0	5.0
2 4 6 <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="checkbox"/> <input checked="" type="radio"/> <input checked="" type="radio"/> 1 3 5	-	-	4.5	4.5

\* default setting

# CPU voltage setting (SW1)

CPU core voltage can be set by SW1 to reduce power consumption and heat.

---

## CPU voltage setting (SW1)

---

2.0V	2.1V	2.2V
2 4 6 8 ○ ○ ○ ○ □ ○ ○ ○ 1 3 5 7	2 4 6 8 ■ ○ ○ ○ □ ○ ○ ○ 1 3 5 7	2 4 6 8 ○ ■ ○ ○ □ ■ ○ ○ 1 3 5 7
2.3V	2.4V	2.5V
2 4 6 8 ■ ■ ○ ○ □ ○ ○ ○ 1 3 5 7	2 4 6 8 ○ ○ ○ ○ □ ○ ■ ○ 1 3 5 7	2 4 6 8 ■ ■ ○ ○ □ ○ ○ ○ 1 3 5 7
2.6V	2.7V	2.8V*
2 4 6 8 ○ ■ ■ ○ □ ■ ■ ○ 1 3 5 7	2 4 6 8 ■ ■ ■ ○ □ ■ ■ ○ 1 3 5 7	2 4 6 8 ○ ○ ○ ■ □ ○ ○ ■ 1 3 5 7
2.9V	3.0V	3.1V
2 4 6 8 ■ ○ ○ ■ □ ○ ○ ■ 1 3 5 7	2 4 6 8 ○ ■ ■ ○ □ ○ ■ ○ 1 3 5 7	2 4 6 8 ■ ■ ■ ○ □ ■ ■ ○ 1 3 5 7
3.2V	3.3V	3.4V
2 4 6 8 ○ ○ ■ ■ □ ○ ■ ■ 1 3 5 7	2 4 6 8 ■ ○ ■ ■ □ ○ ■ ■ 1 3 5 7	2 4 6 8 ○ ■ ■ ■ □ ■ ■ ■ 1 3 5 7
3.5V	2 4 6 8 ■ ■ ■ ■ □ ■ ■ ■ 1 3 5 7	

\*default

**WARNING:** Improper setting could damage the CPU!

## DOC address setting (JP9)

The DiskOnChip (DOC) 2000 is a flash disk and occupies an 8 KB window in the upper memory address range of CC000 to DC000. You should ensure this does not conflict with any other devices' memory addresses. JP9 controls the starting memory address of the flash disk. For more information about the DOC chip, refer to the "*DiskOnChip Socket (U15)*" section in this chapter .

DiskOnChip 2000 memory address

Memory address (HEX)	JP9																								
CC000	D0000 (Default)																								
<table style="border: none;"> <tr><td>2</td><td>4</td><td>6</td></tr> <tr><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td></tr> <tr><td><input type="checkbox"/></td><td><input type="radio"/></td><td><input type="radio"/></td></tr> <tr><td>1</td><td>3</td><td>5</td></tr> </table>	2	4	6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	1	3	5	<table style="border: none;"> <tr><td>2</td><td>4</td><td>6</td></tr> <tr><td><input type="radio"/></td><td><input type="radio"/></td><td><input checked="" type="radio"/></td></tr> <tr><td><input type="checkbox"/></td><td><input type="radio"/></td><td><input checked="" type="checkbox"/></td></tr> <tr><td>1</td><td>3</td><td>5</td></tr> </table>	2	4	6	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="checkbox"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	1	3	5
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\*default

\* Before installation, refer to page 38, please.

**WARNING :** These addresses might conflict with the ROM BIOS of other peripheral boards. Please select appropriate memory address to avoid memory conflicts.

## RS-232/422/485 select (JP10)

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The SBC-551/552 offers two serial ports. One RS-232 COM1 (CN10) and one RS-232/422/485 COM2 (CN7). The mode of CN7 can be selected via JP10.

The following charts show the available options:

---

### RS-232/422/485 select (JP10)

---

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

---

\* default



## PS/2 mouse enable/disable (JP11)

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---

### PS/2 mouse enable/disable (JP11)

---











1-2 (Enable)	2-3 (Disable)
1 2 3  ○	1 2 3 □ 

---

## CPU Jumper Setting Example






CPU	Clock Int/Ext(MHz)	Clock Ratio	JP8 (Ratio)	JP7 (External)	SW1 (Vcore)	JP5 (Dual/Single)																																														
Intel Pentium <b>P54C</b> (3.3V)	200/66	3	<table style="margin: auto; border-collapse: collapse;"> <tr><td>2</td><td>4</td><td>6</td></tr> <tr><td>○</td><td>●</td><td>○</td></tr> <tr><td>□</td><td>●</td><td>○</td></tr> <tr><td>1</td><td>3</td><td>5</td></tr> </table>	2	4	6	○	●	○	□	●	○	1	3	5	<table style="margin: auto; border-collapse: collapse;"> <tr><td>2</td><td>4</td><td>6</td></tr> <tr><td>●</td><td>○</td><td>●</td></tr> <tr><td>■</td><td>○</td><td>●</td></tr> <tr><td>1</td><td>3</td><td>5</td></tr> </table>	2	4	6	●	○	●	■	○	●	1	3	5	<table style="margin: auto; border-collapse: collapse;"> <tr><td>2</td><td>4</td><td>6</td><td>8</td></tr> <tr><td>●</td><td>○</td><td>●</td><td>●</td></tr> <tr><td>■</td><td>○</td><td>●</td><td>●</td></tr> <tr><td>1</td><td>3</td><td>5</td><td>7</td></tr> </table>	2	4	6	8	●	○	●	●	■	○	●	●	1	3	5	7	<table style="margin: auto; border-collapse: collapse;"> <tr><td>□</td><td colspan="2">●—●</td></tr> <tr><td>1</td><td>2</td><td>3</td></tr> </table>	□	●—●		1	2	3
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Intel Pentium <b>P54C</b> (3.3V)	166/66	2.5	<table style="margin: auto; border-collapse: collapse;"> <tr><td>2</td><td>4</td><td>6</td></tr> <tr><td>○</td><td>●</td><td>●</td></tr> <tr><td>□</td><td>●</td><td>●</td></tr> <tr><td>1</td><td>3</td><td>5</td></tr> </table>	2	4	6	○	●	●	□	●	●	1	3	5	<table style="margin: auto; border-collapse: collapse;"> <tr><td>2</td><td>4</td><td>6</td></tr> <tr><td>●</td><td>○</td><td>●</td></tr> <tr><td>■</td><td>○</td><td>●</td></tr> <tr><td>1</td><td>3</td><td>5</td></tr> </table>	2	4	6	●	○	●	■	○	●	1	3	5	<table style="margin: auto; border-collapse: collapse;"> <tr><td>2</td><td>4</td><td>6</td><td>8</td></tr> <tr><td>●</td><td>○</td><td>●</td><td>●</td></tr> <tr><td>■</td><td>○</td><td>●</td><td>●</td></tr> <tr><td>1</td><td>3</td><td>5</td><td>7</td></tr> </table>	2	4	6	8	●	○	●	●	■	○	●	●	1	3	5	7	<table style="margin: auto; border-collapse: collapse;"> <tr><td>□</td><td colspan="2">●—●</td></tr> <tr><td>1</td><td>2</td><td>3</td></tr> </table>	□	●—●		1	2	3
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Intel Pentium <b>P54C</b> (3.3V)	90/60	1.5	<table style="margin: auto; border-collapse: collapse;"> <tr><td>2</td><td>4</td><td>6</td></tr> <tr><td>○</td><td>○</td><td>○</td></tr> <tr><td>□</td><td>○</td><td>○</td></tr> <tr><td>1</td><td>3</td><td>5</td></tr> </table>	2	4	6	○	○	○	□	○	○	1	3	5	<table style="margin: auto; border-collapse: collapse;"> <tr><td>2</td><td>4</td><td>6</td></tr> <tr><td>○</td><td>●</td><td>●</td></tr> <tr><td>□</td><td>●</td><td>●</td></tr> <tr><td>1</td><td>3</td><td>5</td></tr> </table>	2	4	6	○	●	●	□	●	●	1	3	5	<table style="margin: auto; border-collapse: collapse;"> <tr><td>2</td><td>4</td><td>6</td><td>8</td></tr> <tr><td>●</td><td>○</td><td>●</td><td>●</td></tr> <tr><td>■</td><td>○</td><td>●</td><td>●</td></tr> <tr><td>1</td><td>3</td><td>5</td><td>7</td></tr> </table>	2	4	6	8	●	○	●	●	■	○	●	●	1	3	5	7	<table style="margin: auto; border-collapse: collapse;"> <tr><td>□</td><td colspan="2">●—●</td></tr> <tr><td>1</td><td>2</td><td>3</td></tr> </table>	□	●—●		1	2	3
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Intel Pentium <b>P54C</b> (3.3V)	100/66	1.5	<table style="margin: auto; border-collapse: collapse;"> <tr><td>2</td><td>4</td><td>6</td></tr> <tr><td>○</td><td>○</td><td>○</td></tr> <tr><td>□</td><td>○</td><td>○</td></tr> <tr><td>1</td><td>3</td><td>5</td></tr> </table>	2	4	6	○	○	○	□	○	○	1	3	5	<table style="margin: auto; border-collapse: collapse;"> <tr><td>2</td><td>4</td><td>6</td></tr> <tr><td>●</td><td>○</td><td>●</td></tr> <tr><td>■</td><td>○</td><td>●</td></tr> <tr><td>1</td><td>3</td><td>5</td></tr> </table>	2	4	6	●	○	●	■	○	●	1	3	5	<table style="margin: auto; border-collapse: collapse;"> <tr><td>2</td><td>4</td><td>6</td><td>8</td></tr> <tr><td>●</td><td>○</td><td>●</td><td>●</td></tr> <tr><td>■</td><td>○</td><td>●</td><td>●</td></tr> <tr><td>1</td><td>3</td><td>5</td><td>7</td></tr> </table>	2	4	6	8	●	○	●	●	■	○	●	●	1	3	5	7	<table style="margin: auto; border-collapse: collapse;"> <tr><td>□</td><td colspan="2">●—●</td></tr> <tr><td>1</td><td>2</td><td>3</td></tr> </table>	□	●—●		1	2	3
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Intel Pentium <b>P54C</b> (3.3V)	133/66	2.0	<table style="margin: auto; border-collapse: collapse;"> <tr><td>2</td><td>4</td><td>6</td></tr> <tr><td>○</td><td>○</td><td>●</td></tr> <tr><td>□</td><td>○</td><td>●</td></tr> <tr><td>1</td><td>3</td><td>5</td></tr> </table>	2	4	6	○	○	●	□	○	●	1	3	5	<table style="margin: auto; border-collapse: collapse;"> <tr><td>2</td><td>4</td><td>6</td></tr> <tr><td>●</td><td>○</td><td>●</td></tr> <tr><td>■</td><td>○</td><td>●</td></tr> <tr><td>1</td><td>3</td><td>5</td></tr> </table>	2	4	6	●	○	●	■	○	●	1	3	5	<table style="margin: auto; border-collapse: collapse;"> <tr><td>2</td><td>4</td><td>6</td><td>8</td></tr> <tr><td>●</td><td>○</td><td>●</td><td>●</td></tr> <tr><td>■</td><td>○</td><td>●</td><td>●</td></tr> <tr><td>1</td><td>3</td><td>5</td><td>7</td></tr> </table>	2	4	6	8	●	○	●	●	■	○	●	●	1	3	5	7	<table style="margin: auto; border-collapse: collapse;"> <tr><td>□</td><td colspan="2">●—●</td></tr> <tr><td>1</td><td>2</td><td>3</td></tr> </table>	□	●—●		1	2	3
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Intel Pentium <b>P54C</b> (3.3V)	150/60	2.5	<table style="margin: auto; border-collapse: collapse;"> <tr><td>2</td><td>4</td><td>6</td></tr> <tr><td>○</td><td>○</td><td>○</td></tr> <tr><td>□</td><td>○</td><td>○</td></tr> <tr><td>1</td><td>3</td><td>5</td></tr> </table>	2	4	6	○	○	○	□	○	○	1	3	5	<table style="margin: auto; border-collapse: collapse;"> <tr><td>2</td><td>4</td><td>6</td></tr> <tr><td>○</td><td>●</td><td>●</td></tr> <tr><td>□</td><td>●</td><td>●</td></tr> <tr><td>1</td><td>3</td><td>5</td></tr> </table>	2	4	6	○	●	●	□	●	●	1	3	5	<table style="margin: auto; border-collapse: collapse;"> <tr><td>2</td><td>4</td><td>6</td><td>8</td></tr> <tr><td>●</td><td>○</td><td>●</td><td>●</td></tr> <tr><td>■</td><td>○</td><td>●</td><td>●</td></tr> <tr><td>1</td><td>3</td><td>5</td><td>7</td></tr> </table>	2	4	6	8	●	○	●	●	■	○	●	●	1	3	5	7	<table style="margin: auto; border-collapse: collapse;"> <tr><td>□</td><td colspan="2">●—●</td></tr> <tr><td>1</td><td>2</td><td>3</td></tr> </table>	□	●—●		1	2	3
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## CPU Jumper Setting Example

CPU	Clock		JP8			JP7			SW1				JP5					
	Int/Ext(MHz)	Ratio	(Ratio)			(External)			(Vcore)				(Dual/Single)					
Intel Pentium	233/66	3.5	2	4	6	2	4	6	2	4	6	8						
P55C PP/MT			○	○	○		○		○	○	○		1	2	3			
(2.8V)			□	○	○	1	3	5	1	3	5	1	3	5	7			
Intel Pentium	200/66	3.0	2	4	6	2	4	6	2	4	6	8						
P55C PP/MT			○		○		○		○	○	○		1	2	3			
(2.8V)			□		○	1	3	5	1	3	5	1	3	5	7			



## CPU Jumper Setting Example

CPU	Clock Int/Ext(MHz)	Clock Ratio	JP8 (Ratio)	JP7 (External)	SW1 (Vcore)	JP5 (Dual/Single)
<b>AMD K5</b> <b>PR-75</b> (3.54V)	75/50	1.5	2 4 6 <input type="radio"/> <input type="radio"/> <input type="radio"/> 1 3 5	2 4 6 <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> 1 3 5	2 4 6 8 <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> 1 3 5 7	<input type="checkbox"/>  1 2 3
<b>AMD K5</b> <b>PR-90</b> (3.54V)	90/60	1.5	2 4 6 <input type="radio"/> <input type="radio"/> <input type="radio"/> 1 3 5	2 4 6 <input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> 1 3 5	2 4 6 8 <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> 1 3 5 7	<input type="checkbox"/>  1 2 3
<b>AMD K5</b> <b>PR-100</b> (3.54V)	100/66	1.5	2 4 6 <input type="radio"/> <input type="radio"/> <input type="radio"/> 1 3 5	2 4 6 <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/> 1 3 5	2 4 6 8 <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> 1 3 5 7	<input type="checkbox"/>  1 2 3
<b>AMD K5</b> <b>PR-120</b> (3.54V)	90/60	1.5	2 4 6 <input type="radio"/> <input type="radio"/> <input type="radio"/> 1 3 5	2 4 6 <input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> 1 3 5	2 4 6 8 <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> 1 3 5 7	<input type="checkbox"/>  1 2 3
<b>AMD K5</b> <b>PR-133</b> (3.54V)	100/66	1.5	2 4 6 <input type="radio"/> <input type="radio"/> <input type="radio"/> 1 3 5	2 4 6 <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/> 1 3 5	2 4 6 8 <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> 1 3 5 7	<input type="checkbox"/>  1 2 3

## CPU Jumper Setting Example

CPU	Clock Int/Ext(MHz)	Clock Ratio	JP8 (Ratio)	JP7 (External)	SW1 (Vcore)	JP5 (Dual/Single)
<b>AMD K6 PR2-166</b> (2.9V)	166/66	2.5	2 4 6 <input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="checkbox"/> <input checked="" type="radio"/> <input checked="" type="radio"/> 1 3 5	2 4 6 <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/> 1 3 5	2 4 6 8 <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> <input checked="" type="radio"/> 1 3 5 7	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1 2 3
<b>AMD K6 PR2-200</b> (2.9V)	166/66	3.0	2 4 6 <input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="checkbox"/> <input checked="" type="radio"/> <input type="radio"/> 1 3 5	2 4 6 <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/> 1 3 5	2 4 6 8 <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> <input checked="" type="radio"/> 1 3 5 7	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1 2 3
<b>AMD K6 PR2-233</b> (3.2V)	233/66	3.5	2 4 6 <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="checkbox"/> <input type="radio"/> <input type="radio"/> 1 3 5	2 4 6 <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/> 1 3 5	2 4 6 8 <input type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="checkbox"/> <input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> 1 3 5 7	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> 1 2 3
<b>AMD K6 PR2-266</b> (2.0V)	266/66	4.0	2 4 6 <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/> 1 3 5	2 4 6 <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/> 1 3 5	2 4 6 8 <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="checkbox"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> 1 3 5 7	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> 1 2 3

## CPU Jumper Setting Example

CPU	Clock Int/Ext (MHz)	Clock Ratio	JP8 (Ratio)	JP7 (External)	SW1 (Vcore)	JP5 (VIO)
<b>Cyrix 6x86M2</b> <b>MX-PR166</b> (2.9V)	133/66	2.0	2 4 6 <input type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1 3 5	2 4 6 <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1 3 5	2 4 6 8 <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1 3 5 7	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1 2 3
<b>Cyrix 6x86M2</b> <b>MX-PR166</b> (2.9V)	150/60	2.5	2 4 6 <input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 1 3 5	2 4 6 <input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 1 3 5	2 4 6 8 <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1 3 5 7	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1 2 3
<b>Cyrix 6x86M2</b> <b>MX-PR200</b> (2.9V)	166/66	2.5	2 4 6 <input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 1 3 5	2 4 6 <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1 3 5	2 4 6 8 <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1 3 5 7	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1 2 3
<b>Cyrix 6x86M2</b> <b>MX-PR233</b> (2.9V)	200/66	3.0	2 4 6 <input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1 3 5	2 4 6 <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1 3 5	2 4 6 8 <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1 3 5 7	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1 2 3
<b>Cyrix 6x86M2</b> <b>MX-PR266</b> (2.9V)	233/66	3.5	2 4 6 <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1 3 5	2 4 6 <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1 3 5	2 4 6 8 <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1 3 5 7	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1 2 3

## IDE LED connector (CN1)

---

You can connect an LED to indicate that an IDE device is in use. The pin assignments of CN1 are as follows:

IDE LED connector (CN1)	
Pin	Signal
1	-R/W IDE
2	VCC

## IDE hard drive connector (CN2)

---

You can attach two Enhanced Integrated Device Electronics hard disk drives to the SBC-551/552'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

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 for CN6. 3.5" drives use a 1 x 40-pin to 2 x 40-pin connector for CN5.

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

1. Connect one end of the cable to CN5 or CN6. 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 (CN2)			
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 (CN3)

---

You can attach up to two floppy disks to the SBC-551/552 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 CN3. Make sure that the red wire corresponds to pin one 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.

### Pin assignments

The following table lists the pin assignments for the CN3 connector:

---

FLOPPY drive connector (CN3)			
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 (CN4)

---

Normally, the parallel port is used to connect the card to a printer. The SBC-551/552 includes an onboard parallel port, accessed through CN4, a 26-pin flat-cable connector. 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. Mounted on a retaining bracket.

### Parallel port IRQ

The SBC-551/552 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) port connector (CN4)

---

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

---

## Fan connector (CN5)

---

The SBC-551/552 provides a connector for CPU cooling fan.

---

Fan power connector (CN5)

---

Pin	Signal
1	+12 V
2	FAN_ON
3	+5V

---

## USB connector (CN6)

---

The USB connector supports two universal serial ports. This connector allows an optional external adaptor 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 supporting for USB devices.

The SBC-551/552 CPU card has one USB Connector ( support two USB channels), their connection pin assignment is as follows.

---

USB connector (CN6)

---

Pin	Signal	Pin	Signal
1	VCC	2	VCC
3	-DATA0	4	-DATA1
5	+DATA0	6	+DATA1
7	GND	8	GND
9	NC	10	NC

---



## Serial port connectors (CN10, CN7)

---

The SBC-551/552 offers one RS-232 and one RS-232/422/485 serial port. You can select the port address or disabled for each port with the BIOS Peripheral Setup program.

The card mounting bracket holds COM 1(CN10), the DB-9 serial port connector for the first port. The connector on the SBC-551/552 board is and COM 2(CN7) for RS-232/422/485. The following sections tell how to make connections.

### RS-232 connector (CN10)

The following table shows the pin assignments for the card's RS-232 port:

---

RS-232 connector (CN10, COM1)

---

Pin	Signal
1	DCD
2	RX
3	TX
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI
10	NC

---

## RS-232/422/485 connector (CN7)

RS-232/422/485 connector pin assignment (CN7)

Pin	Signal
1	DCD
2	DSR
3	RX
4	RTS
5	TX
6	CTS
7	DTR
8	RI
9	GND
10	NC
11	B485TXD+
12	B485TXD-
13	B422RXD+
14	B422RXD-

## Reserved IR connector (CN8)

---

The onboard IR connector supports an Infrared 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 Peripherals section of the CMOS setup utility.

---

Ir Connector	
Pin	Function
1	VCC
2	FIR_RX (High Frequency)
3	IR_RX (Low Frequency)
4	GND
5	IR_TX

---

## Power connector (CN9)

---

In single board computer without passive backplane applications, you need to connect power directly to the SBC-551/552. This connector is fully compatible with the standard PC power supply connector. See the following table for its pin assignments:

---

Power connector (CN9)	
Pin	Signal
1	+12V
2	GND
3	GND
4	+5V

---

## VGA connector (CN11)

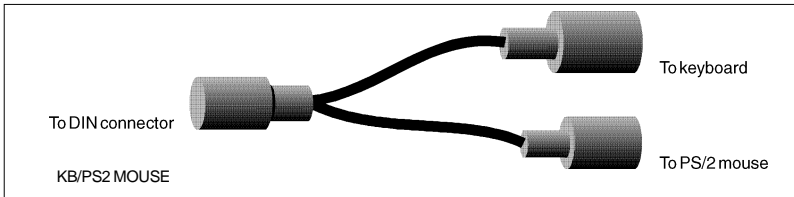
---

The SBC-551/552 CPU card's VGA connector supports monochrome display as well as high resolution color displays. The following table lists their pin assignments:

VGA connector (CN11)	
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

## KB/PS2 mouse connector (CN12)

The SBC-551/552 board provides one keyboard connectors. There is a second 6-pin mini-DIN connector (CN12) on the card mounting bracket. 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.



**Adaptor for connecting a keyboard and PS/2 Mouse.**

---

### Mini-Din 6-Pin connector pin definition

---

Pin	Function
1	KBDATA
2	MDATA
3	GND
4	VCC
5	KBCLK
6	MSCLK

---

## DiskOnChip socket (U15)

The M-Systems DiskOnChip 2000 (DOC-2000) family of products provides a single chip solid-state flash disk in a standard 32-pin DIP package. The DOC-2000 is a small, plug-and-play, solid-state disk with no moving parts, resulting in a significant reduction in power consumption and an increase in reliability.

The DOC-2000 family of products is available in capacities ranging from 2MB up to 72 MB, unformatted. This way, the same socket on the target platform will not have to be changed. In order to manage the disk, the DOC-2000 includes the TrueFFS, M-Systems Flash File System proprietary software. The DOC-2000 package is pin-to-pin compatible with standard 32-pin EPROM devices.

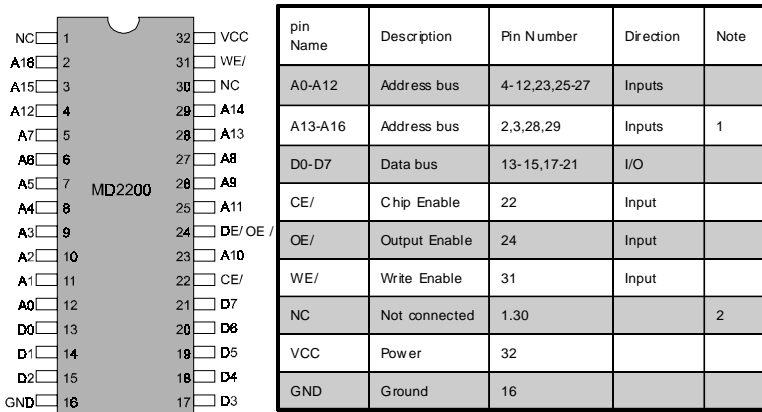


Figure1-MD2200 Pin-out

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 the MD2200

Refer to pages 21 for configuring the DOC address (JP9).

## **DiskOnChip (DOC) 2000 Installation**

When the DOC is installed correctly, a DOC will work like a HDD or a FDD. To install the DOC on the board, follow the instructions below:

1. Plug the DOC into the socket. Make sure pin 1 of the DOC is aligned with pin 1 of the socket.
2. Push the DOC into the socket until it is firmly seated in the socket.

**Caution: the DOC may be permanently damaged if it is installed incorrectly.**

3. Set the jumper for the memory address of the DOC.

### **Note:**

**The memory shadow function sometimes will create conflicts with the memory window. You should disable the memory shadow from the BIOS SETUP if the DOC cannot be accessed.**

## **Configure DOC as a boot device**

To configure a DOC as a boot drive, you should copy the operating system files into the DOC. The following procedure is an example of the initialization process.

1. Install a DOC into your system.
2. Insert a bootable floppy disk in drive A: and boot the system.
3. At the DOS prompt, type **SYS C:** to transfer the DOS system files to the DOC (assuming the DiskOnChip is installed as drive C:). Reboot the system.
4. Go to the BIOS Setup Utility by hitting the <DEL> key. Set the type of Primary Master or C: Drive as *Not Installed*.
5. Remove the floppy disk from the drive A: and leave the BIOS Setup Utility. The system should boot from the DOC.





CHAPTER

# 3

## **Award BIOS Setup**

This chapter describes how to configure the BIOS for the SBC-551/552.

## 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 bootup sequence.

## System configuration verification

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

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

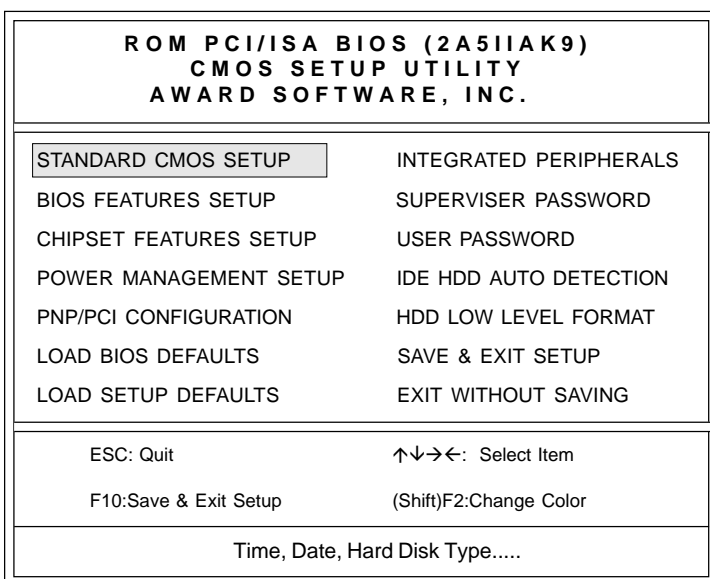
1. You are starting your system for the first time.
2. You have changed the hardware attached to your system.
3. The CMOS memory has lost power and the configuration information has been erased.

The mainboard 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 on the computer and press <DEL> immediately. This will allow you to enter the utility and the utility screen should appear (below).



**Setup Utility Initial Screen**

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

Many fields in the setup screens have on-line help descriptions available: press F1 to access the help.

# Standard CMOS setup

---

<b>ROM PCI/ISA BIOS (2A511AK9) CMOS SETUP UTILITY AWARD SOFTWARE, INC.</b>	
<b>STANDARD CMOS SETUP</b>	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISER PASSWORD
CHIPSET FEATURES SETUP	USER PASSSWORD
POWER MANAGEMENT SETUP	IDE HDD AUTO DETECTION
PNP/PCI CONFIGURATION	HDD LOW LEVEL FORMAT
LOAD BIOS DEFAULTS	SAVE & EXIT SETUP
LOAD SETUP DEFAULTS	EXIT WITHOUT SAVING
ESC: Quit	↑↓→←: Select Item
F10: Save & Exit Setup	(Shift)F2: Change Color
Time, Date, Hard Disk Type ....	

## CMOS setup screen

When you choose the STANDARD CMOS SETUP option from the INITIAL SETUP SCREEN menu, the screen below is displayed. This standard setup menu allows users to configure system components such as the date, time, hard disk drive, floppy drive, display, and memory. Online help for each field can be accessed by pressing F1.

<b>ROM PCI/ISA BIOS (2A5IIAK9)</b> <b>STANDARD CMOS SETUP</b> <b>AWARD SOFTWARE, INC.</b>													
Date (mm:dd:yy) : Fri, Aug 16, 1998 Time (hh:mm:ss) : 8:20:23													
HARDDISKS	CYLS	HEAD	PRECOMP	LANDZ	SECTOR	MODE							
Drive C: Auto (0b)	: 0	0	0	0	0	AUTO							
Drive D: Auto (0b)	: 0	0	0	0	0	AUTO							
Drive A: 1.44M, 3.5in. Drive B: None Video: EGA/VGA Halt On: All Errors	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Base Memory</td> <td style="text-align: right; padding: 2px;">: 640K</td> </tr> <tr> <td style="padding: 2px;">Extended Memory</td> <td style="text-align: right; padding: 2px;">: 27648K</td> </tr> <tr> <td style="padding: 2px;">Other Memory</td> <td style="text-align: right; padding: 2px;">: 384K</td> </tr> <tr> <td style="padding: 2px;">Total Memory</td> <td style="text-align: right; padding: 2px;">: 28672K</td> </tr> </table>					Base Memory	: 640K	Extended Memory	: 27648K	Other Memory	: 384K	Total Memory	: 28672K
Base Memory	: 640K												
Extended Memory	: 27648K												
Other Memory	: 384K												
Total Memory	: 28672K												
<table style="width: 100%; border: none;"> <tr> <td style="width: 33%; padding: 2px;">ESC: Quit</td> <td style="width: 33%; padding: 2px;">↑↓→← :Select Item</td> <td style="width: 33%; padding: 2px;">PU/PD/+/-:Modify</td> </tr> <tr> <td style="padding: 2px;">F1:Help</td> <td style="padding: 2px;">(Shift)F2:Change Color</td> <td></td> </tr> </table>							ESC: Quit	↑↓→← :Select Item	PU/PD/+/-:Modify	F1:Help	(Shift)F2:Change Color		
ESC: Quit	↑↓→← :Select Item	PU/PD/+/-:Modify											
F1:Help	(Shift)F2:Change Color												

### **Date and Time Configuration**

Select the Date and Time in the Standard setup. The current values for each category are displayed. Enter new values through the keyboard.

### **Floppy A, Floppy B**

Select these fields to configure the type of floppy drive that is attached to the system: 360 KB 5 1/4", 1.2 MB 5 1/4", 720 KB 3 1/2", 1.44 MB 3 1/2", and/or 2.88 MB 3 1/2".

# BIOS features setup

---

<b>ROM PCI/ISA BIOS (2A511AK9)</b> <b>CMOS SETUP UTILITY</b> <b>AWARD SOFTWARE, INC.</b>	
STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
<b>BIOS FEATURES SETUP</b>	SUPERVISER PASSWORD
CHIPSET FEATURES SETUP	USER PASSSSWORD
POWER MANAGEMENT SETUP	IDE HDD AUTO DETECTION
PNP/PCI CONFIGURATION	HDD LOW LEVEL FORMAT
LOAD BIOS DEFAULTS	SAVE & EXIT SETUP
LOAD SETUP DEFAULTS	EXIT WITHOUT SAVING
ESC: Quit	↑↓→←: Select Item
F10: Save & Exit Setup	(Shift)F2: Change Color
Virus Protection, Boot Sequence ....	

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 SETUP DEFAULTS settings.

<b>ROM PCI/ISA BIOS (2A511AK9)</b> <b>BIOS FEATURES SETUP</b> <b>AWARD SOFTWARE, INC.</b>			
Virus Warning : <span style="border: 1px solid black; padding: 2px;">Enabled</span> CPU Internal Cache : Enabled External Cache : Enabled Quick Power On Self Test : Disabled Boot Sequence : C, A Swap Floppy Drive : Disabled Boot Up Floppy Seek : Enabled Boot Up NumLock Status : On Boot Up System Speed : High Gate A20 Option : Fast Security Option : Setup	Video BIOS Shadow : Enabled C8000-CBFFF Shadow : Disabled CC000-CFFFF Shadow : Disabled D0000-D3FFF Shadow : Disabled D4000-D7FFF Shadow : Disabled D8000-DBFFF Shadow : Disabled DC000-DFFFF Shadow : Disabled		
Esc:Quit                    ↑↓→←: Select Item F1 : Help                    PU/PD/+/- : Modify F5 : Old Values            (Shift)F2 : Color F6 : Load BIOS Defaults F7 : Load Setup Defaults			

### BIOS features setup

#### 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 modification attempts. If an attempt is made, the BIOS will halt the system and the following error message will appear. Afterwards, you can 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, if enabled, can speed up memory access. However, it depends on the 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 *Enabled*, BIOS will shorten or skip some check items during POST.

**Boot Sequence**

This category determines which drive to search first for the operating system.

**Swap Floppy Drive**

This item allows you to swap the floppy drive assignments so that drive A is treated as drive B and drive B is treated as drive A under DOS. The default setting is *Disabled*.

**Boot Up Floppy Seek**

During POST, the BIOS will determine if the floppy disk drive installed is 40 or 80 tracks. 360KB type is 40 tracks while 760KB, 1.2MB, and 1.44MB are all 80 tracks.

**Boot Up NumLock Status**

This allows you to determine the default state of the numeric keypad on an IBM-compatible extended keyboard.

**Boot Up System Speed**

This allows you to determine the Boot Up Speed. The choices are *High/Low*.



**Gate A20 Option**

This entry allows you to select how gate A20 is handled. Gate A20 is a device used to address memory above 1 MB. Initially, gate A20 was handled via a pin on the keyboard. Today keyboards still provide this support, however it is more common and much faster for the system chipset to provide support for gate A20. The choices are thus: *Normal* and *Fast*.

**Security Option**

This category allows you to limit access to the system. The choices are *System*: which requires a password at boot up and *Setup*: which only requires a password to access the setup utility.

**Video BIOS Shadow**

Determines whether the video display card BIOS will be copied into system DRAM in order to increase display speed and is required for system performance. However, it is optional depending on the chipset design. The default setting is *Enabled*.

**Shadowing Address Ranges**

The next six lines, from C8000-CBFFF Shadow to DC000-DFFFF Shadow are address ranges for shadowing other expansion card ROMs. If there are any expansion cards with ROMs installed in your system, you have to know the address range they use in order to shadow them specifically. The default setting for all of these is *Disabled*.

# CHIPSET features setup

ROM PCI/ISA BIOS (2A511AK9) CMOS SETUP UTILITY AWARD SOFTWARE, INC.	
STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISER PASSWORD
<b>CHIPSET FEATURES SETUP</b>	USER PASSSSWORD
POWER MANAGEMENT SETUP	IDE HDD AUTO DETECTION
PNP/PCI CONFIGURATION	HDD LOW LEVEL FORMAT
LOAD BIOS DEFAULTS	SAVE & EXIT SETUP
LOAD SETUP DEFAULTS	EXIT WITHOUT SAVING
ESC: Quit	↑↓→←: Select Item
F10:Save & Exit Setup	(Shift)F2:Change Color
AT clock, DRAM timings ....	

By choosing the **CHIPSET FEATURES SETUP** option from the **INITIAL SETUP SCREEN** menu the screen below is displayed. The displayed configuration is based on the manufacturer's **SETUP DEFAULTS** 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. The only time you might consider making any changes would be if you discovered that data was being lost while using your system.

Because of the complexity and technical nature of some of the options, not all of the options are described here.

### **Auto Configuration**

Set this item to *Enabled* to select predefined values for DRAM, cache, timing, etc., according to your CPU type and system clock. Thus, each item value may display differently depending on your current system configuration.

### **System BIOS Cacheable**

When enabled, access to the system BIOS ROM addressed at F0000H-FFFFFH are cached if the cache controller is enabled.

### **Video BIOS Cacheable**

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

### **Memory Hole At 15M-16M**

In order to improve performance, certain space in memory can be reserved for ISA cards, but must be mapped below 16 MB.

### **VGA Shared Memory Size**

This sets the size of the 5598 model's onboard video display memory, which is drawn from the total installed system memory. The options range from *0.5MB* to *4MB* in *0.5MB* intervals. Remember, when you increase the amount of display memory you are subtracting from the system memory.

### **VGA Memory Clock**

You can choose different speeds for the VGA Memory Clock: from *40* up to *70MHz* in *1MHz* increments.

### **Smart Temperature Control Settings**

One of the key features of the SPC-551/552 is its "Smart Temperature Control" function that automatically trigger events in the event of CPU overheating. The sensitivity of the triggers are determined by the user. The following 5 items can be customized.

**CPU Warning Temperature**

The LM75 chip monitors the CPU temperature and triggers alarms depending on the BIOS settings. The temperature at which the events are triggered range from *50C/122F* to *100C/212F* in 5C increments.

**Current CPU Temperature**

Provides the current temperature of the CPU in both Celsius and Fahrenheit.

**CPU Speed Overheat**

This setting determines what happens to the CPU speed if it is detected to be overheating (as determined by the "CPU Warning Temperature" setting above). The available choices are *Full Speed*, *1/4*, *1/3*, and *1/2*.

**Speaker Alarm Overheat**

The user can choose to have a speaker alarm sound if the CPU is detected to be overheating (as determined by the "CPU Warning Temperature" setting above). The choices are *Enabled* or *Disabled*.

**System Fan Work Control**

The user can determine what happens to the additional fan connected to CN5 (see CN5 - Fan Connector) if the CPU is detected to be overheating (as determined by the "CPU Warning Temperature" setting above). The choices are *Overheat* or *Always On*.

# Power management setup

<b>ROM PCI/ISA BIOS (2A511AK9) CMOS SETUP UTILITY AWARD SOFTWARE, INC.</b>	
STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISER PASSWORD
CHIPSET FEATURES SETUP	USER PASSSSWORD
<b>POWER MANAGEMENT SETUP</b>	IDE HDD AUTO DETECTION
PNP/PCI CONFIGURATION	HDD LOW LEVEL FORMAT
LOAD BIOS DEFAULTS	SAVE & EXIT SETUP
LOAD SETUP DEFAULTS	EXIT WITHOUT SAVING
ESC: Quit	↑↓→←: Select Item
F10: Save & Exit Setup	(Shift)F2: Change Color
Sleep timer, Suspend timer ....	

By choosing the POWER MANAGEMENT SETUP option from the initial SETUP SCREEN menu the screen below is displayed. The displayed configuration is based on the manufacturer's SETUP DEFAULTS settings.

<b>ROM PCI/ISA BIOS (2A51IAK9)</b> <b>POWER MANAGEMENT SETUP</b> <b>AWARD SOFTWARE, INC.</b>					
Power Management	:	<input type="text" value="Disable"/>	IRQ3 (COM 2)	:	Enabled
PM Control by APM	:	Yes	IRQ4 (COM 1)	:	Enabled
Video Off Option	:	Always on	IRQ5 (LPT 2)	:	Enabled
Video Off Method	:	DPMS Supported	IRQ6 (Floppy Disk)	:	Enabled
Doze Speed (div by)	:	2	IRQ7 (LPT 1)	:	Enabled
Stdbby Speed (div by)	:	3	IRQ8 (RTC Alarm)	:	Disabled
MODEM Use IRQ	:	3	IRQ9 (IRQ2 Redir)	:	Enabled
Hot Key SMI	:	Disabled	IRQ10 (Reserved)	:	Enabled
**PM Timers**			IRQ11 (Reserved)	:	Enabled
HDD Off After	:	Disable	IRQ12 (PS/2 Mouse)	:	Enabled
Doze Mode	:	Disable	IRQ13 (Coprocessor)	:	Enabled
Standby Mode	:	Disable	IRQ14 (Hard Disk)	:	Enabled
Suspend Mode	:	Disable	IRQ15 (Reserved)	:	Enabled
**PM Events**			Esc:Quit      ↑↓→←: Select Item		
COM Ports Activity	:	Enabled	F1 : Help      PU/PD/+/-: Modify		
LPT Ports Activity	:	Enabled	F5 : Old Values (Shift)F2 : Color		
HDD Ports Activity	:	Enabled	F6 : Load BIOS Defaults		
VGA Activity	:	Disabled	F7 : Load Setup Defaults		

## Power Management

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:

*Normal* → *Doze* → *Standby* → *Suspend*

There are four selections for Power Management (PM):

<i>Disabled</i>	Turns off PM
<i>Max Saving</i>	Maximized power saving by activating maximum power saving settings after one minute of system inactivity.
<i>Min Saving</i>	Produces less power saving by activating moderate power saving settings after one hour of system inactivity.
<i>User Defined</i>	You set the power saving options manually.

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

## PM Control by APM

When this is set to *Yes*, the Advanced Power Management feature in Microsoft Windows controls power management operation. The default setting is *No*.

## Video Off Option

User can select 4 different modes for turning off the video. The modes are a function of the PM mode of the computer. The choices are *All Modes* → *Off*, *Always On*, *Suspend* → *Off*, and *Susp, Standby* → *Off*.

The table below summarizes the behavior of the monitor in relation to the four PM modes.

<u>PM Mode</u>	<u>Monitor Behavior</u>
<i>All Modes</i>	<i>Off</i>
-	<i>Always On</i>
<i>Suspend</i>	<i>Off</i>
<i>Susp, Stby</i>	<i>Off</i>

For example, if you choose *Suspend* → *Off*, then the monitor will turn off if the computer is in the *Suspend* PM mode.

### **Video Off Method**

This governs monitor power saving by controlling how power management blanks the monitor screen. The default setting blanks the screen and turns off vertical and horizontal scanning and requires a monitor with "green" features. If you don't have this type of monitor, use the *Blank* option. DPMS (Display Power Management System) allows the BIOS to control the video display card if the card has the DPMS feature.

<b>V/H SYNC+Blank</b>	<b>(Default)</b>
BLANK	(non-green monitor, less saving)
DPMS	(Display card must support DPMS)

### **Modem Use IRQ**

If you have a modem installed in your system, you can enter which IRQ it is using so that APM can control it.

### **Hot Key SMI**

This allows the user to use the <CTL-ALT-BACK SPACE> hot key to enter the Suspend mode. Press any key to wake up the computer. The default setting is *Disabled*.



### **PM Timers**

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

### **HDD Off After**

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**

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 20 seconds to 40 minutes and can be set manually when power management is in *User Define* mode. 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**

This sets the period of system inactivity after which the system goes into *Standby* mode, the intermediate power saving state. The settings range from 20 seconds to 40 minutes and can be set manually when power management is in *User Define* mode. 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**

This sets the period of system inactivity after which the system goes into *Suspend* mode, the maximum power saving state. The settings range from 20 seconds to 40 minutes and can be set manually when power management is in *User Define* mode. 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.

## **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.

When an I/O device wants to gain the attention of the operating system, it signals this by causing an IRQ (Interrupt ReQuest) to occur. When the operating system is ready to respond to the request, it interrupts itself and performs the service. The following is a list of IRQs, which can be disabled:

- COM Ports Activity
- LPT Ports Activity
- HDD Ports Activity
- VGA Activity
- 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 Mouse)
- 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. The displayed configuration is based on the manufacturer's SETUP DEFAULTS settings.

ROM PCI/ISA BIOS (2A511AK9) CMOS SETUP UTILITY AWARD SOFTWARE, INC.	
STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISER PASSWORD
CHIPSET FEATURES SETUP	USER PASSSWORD
POWER MANAGEMENT SETUP	IDE HDD AUTO DETECTION
<b>PNP/PCI CONFIGURATION</b>	HDD LOW LEVEL FORMAT
LOAD BIOS DEFAULTS	SAVE & EXIT SETUP
LOAD SETUP DEFAULTS	EXIT WITHOUT SAVING
ESC: Quit	↑↓→←: Select Item
F10:Save & Exit Setup	(Shift)F2:Change Color
TIRQ Setting, Latency Timers ....	

**ROM PCI/ISA BIOS (2A5IIAK9)  
PNP/PCI CONFIGURATION SETUP  
AWARD SOFTWARE, INC.**

Resources Controlled By	: <input type="text" value="Manual"/>	PCI IRQ Activated By	: Level
Reset Configuration Data	: Disabled	PCI IDE IRQ Map To	: PCI/AUTO
IRQ-3 assigned to	: Legacy ISA	Primary IDE INT#	: A
IRQ-4 assigned to	: Legacy ISA		
IRQ-5 assigned to	: PCI/ISA PnP		
IRQ-7 assigned to	: Legacy ISA		
IRQ-9 assigned to	: PCI/ISA PnP		
IRQ-10 assigned to	: PCI/ISA PnP		
IRQ-11 assigned to	: PCI/ISA PnP		
IRQ-12 assigned to	: PCI/ISA PnP		
IRQ-14 assigned to	: Legacy ISA		
IRQ-15 assigned to	: Legacy ISA		
DMA-0 assigned to	: PCI/ISA PnP		
DMA-1 assigned to	: PCI/ISA PnP	Esc:Quit	↑↓→← : Select Item
DMA-3 assigned to	: PCI/ISA PnP	F1 : Help	PU/PD/+/-: Modify
DMA-5 assigned to	: PCI/ISA PnP	F5 : Old Values	(Shift)F2 : Color
DMA-6 assigned to	: PCI/ISA PnP	F6 : Load BIOS Defaults	
DMA-7 assigned to	: PCI/ISA PnP	F7 : Load Setup Defaults	

**PNP/PCI Configuration setup**

This section describes configuring the Peripheral Component Interconnect (PCI) bus system which allows I/O devices to operate at speeds nearing the speed of the CPU when communicating with its own special components. This section covers some very technical items and it is strongly recommended that only experienced users make any changes to the default settings.

**Resource Controlled by**

The Award Plug and Play BIOS has the capacity to automatically configure all of the boot and Plug and Play compatible devices.

However, this will only work if you are running a Plug and Play operating system such as Windows® 95.

### **Reset Configuration Data**

This item allows you to reset the configuration data of PnP devices.

### **IRQ3/4/5/7/9/10/11/12/14/15, DMA0/1/3/5/6/7 Assigned to**

These items allow you to determine the IRQ/DMA assigned to the ISA bus and is not available to any PCI slot.

### **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 by your system manufacturer. The choices are *Level/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) is associated with the connected hard drives.

This setting refers to the hard disk drive itself, rather than individual partitions.

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

# Load BIOS defaults/Load SETUP defaults

These options allow users to load BIOS DEFAULTS the default system values directly from ROM. LOAD BIOS DEFAULTS provides the most stable settings, though they do not provide optimal performance. LOAD SETUP DEFAULTS, on the other hand, provides maximum system performance. If the stored record created by the setup utility becomes corrupted (and therefore unusable), BIOS defaults will load automatically when you turn the SBC-551/552 on.

ROM PCI/ISA BIOS (2A511AK9) CMOS SETUP UTILITY AWARD SOFTWARE, INC.	
STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISER PASSWORD
CHIPSET FEATURES SETUP	USER PASSSWORD
POWER MANAGEMENT SETUP	IDE HDD AUTO DETECTION
PNP/PCI CONFIGURATION	HDD LOW LEVEL FORMAT
<input type="checkbox"/> LOAD BIOS DEFAULTS	SAVE & EXIT SETUP
<input type="checkbox"/> LOAD SETUP DEFAULTS	EXIT WITHOUT SAVING
ESC: Quit	↑↓→←: Select Item
F10: Save & Exit Setup	(Shift)F2: Change Color
Load BIOS Defaults except Standard CMOS SETUP	

# Integrated peripherals setup

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<b>ROM PCI/ISA BIOS (2A511AK9) CMOS SETUP UTILITY AWARD SOFTWARE, INC.</b>	
STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISER PASSWORD
CHIPSET FEATURES SETUP	USER PASSSWORD
POWER MANAGEMENT SETUP	IDE HDD AUTO DETECTION
PNP/PCI CONFIGURATION	HDD LOW LEVEL FORMAT
LOAD BIOS DEFAULTS	SAVE & EXIT SETUP
LOAD SETUP DEFAULTS	EXIT WITHOUT SAVING
ESC: Quit	↑↓→←: Select Item
F10: Save & Exit Setup	(Shift)F2: Change Color
Onboard I.O, IRQ, DMA Assignment ...	

## Integrated Peripherals Setup

### 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 setup IDE Mode or UltraDMA mode depending on the HDD device.

**ROM PCI/ISA BIOS (2A5IIAK9)  
INTEGRATED PERIPHERALS  
AWARD SOFTWARE, INC.**

Internal PCI/IDE	: Primary	USB Controller	: Enabled
IDE Primary Master PIO	: Auto	USB Keyboard Support	: Disabled
IDE Primary Slave PIO	: Auto		
Primary Master UltraDMA	: Auto		
Primary Slave UltraDMA	: Auto		
IDE Burst Mode	: Disabled		
IDE Data Port Post Write	: Enabled		
IDE HDD Block Mode	: Enabled		
Onboard FDC Controller	: Enabled		
Onboard Serial Port 1	: 3F8H		
Onboard Serial Port2	: 2F8H		
IR Address Select	: Disable		
IR Mode	: HP SIR		
IR IRQ Select	: IRQ10	Esc:Quit	↑↓→← : Select Item
Onboard Parallel Port	: 378	F1 : Help	PU/PD/+/-: Modify
Parallel Port Mode	: SPP	F5 : Old Values	(Shift)F2 : Color
PS/2 mouse function	: Enabled	F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

**IDE Primary / Master / Slave PIO**

This sets 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 2 are supported.

**Primary / Master / Slave UltraDMA**

This sets the transfer mode of the UltraDMA hard disk, which requires a drive that supports this data transfer method. The system will auto-detect an UltraDMA device in any of these two positions when they are set to *Auto* without effect 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 *Enable* to use HDD block transfer mode.

**Onboard FDD Controller**

*Enables* or *Disables* the onboard Floppy Drive controllers.

**Onboard Serial Port 1 & 2**

You can set the I/O address for serial ports 1/2. The system will auto-detect the COM port address when this item set to *Auto*.

---

3F8/IRQ4 (default for port 1)

---

2F8/IRQ3 (default for port 2)

---

3E8/IRQ4

---

2E8/IRQ3

---

**IR Address Select**

The address of the IR port can be changed from *Disabled*, *2E8H*, *3E8H*, *2F8H*, to *3F8H*.

**IR Mode**

The IR mode can be either set to *HPSIR* or *ASKSIR*.

**IR IRQ Select**

The user can manually set the IRQ of the IR port.

**Onboard Parallel Port**

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

378/IRQ7 (default)

---

Disabled

---

278/IRQ5

---

3BC/IRQ7

---

**Parallel Port Mode**

Selects the parallel port mode. The setting options are:

SPP

---

ECP+EPP

---

EPP

---

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.

**PS/2 Mouse Function**

The user can disable the PS/2 Mouse if desired.

**USB Controller/Keyboard Support**

*Enable* or *Disable* the onboard USB port controller, as well as USB Keyboard support.

## Supervisor/user password setting

You can set either supervisor or user password, or both of them. The difference between the two is that the supervisor password allows unrestricted access to enter and change the options of the setup menus, while the user password only allows entry to the program, but not modify options.

<b>ROM PCI/ISA BIOS (2A511AK9) CMOS SETUP UTILITY AWARD SOFTWARE, INC.</b>	
STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	<input type="text" value="SUPERVISOR PASSWORD"/>
CHIPSET FEATURES SETUP	<input type="text" value="USER PASSWORD"/>
POWER MANAGEMENT SETUP	IDE HDD AUTO DETECTION
PNP/PCI CONFIGURATION	HDD LOW LEVEL FORMAT
LOAD BIOS DEFAULTS	SAVE & EXIT SETUP
LOAD SETUP DEFAULTS	EXIT WITHOUT SAVING
ESC: Quit	↑↓→←: Select Item
F10: Save & Exit Setup	(Shift)F2: Change Color
Change / Set / Disable Password	

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

<b>ROM PCI/ISA BIOS (2A511AK9)</b> <b>CMOS SETUP UTILITY</b> <b>AWARD SOFTWARE, INC.</b>	
STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISER PASSWORD
CHIPSET FEATURES SETUP	USER PASSWORD
POWER MANAGEMENT SETUP	IDE HDD AUTO DETECTION
PNP/PCI CON	ENTER PASSWORD:
LOAD BIOS DEFAULTS	SAVE & EXIT SETUP
LOAD SETUP DEFAULTS	EXIT WITHOUT SAVING
ESC: Quit	↑↓→←: Select Item
F10: Save & Exit Setup	(Shift)F2: Change Color
Change / Set / disable Password ....	

Type the password, up to eight characters in length, and press <ENTER>. The password typed now will clear any previously entered password from 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.

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

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 the utility freely.

# IDE HDD auto detection

---

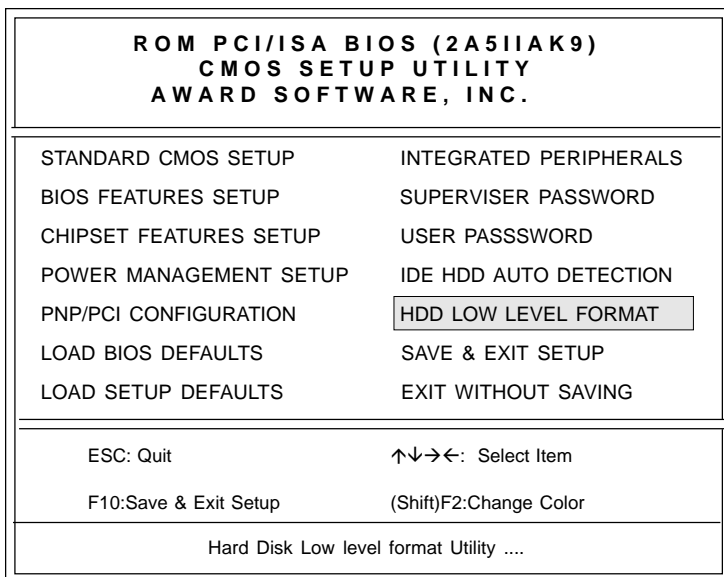
<b>ROM PCI/ISA BIOS (2A511AK9) CMOS SETUP UTILITY AWARD SOFTWARE, INC.</b>	
STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISER PASSWORD
CHIPSET FEATURES SETUP	USER PASSSSWORD
POWER MANAGEMENT SETUP	<b>IDE HDD AUTO DETECTION</b>
PNP/PCI CONFIGURATION	HDD LOW LEVEL FORMAT
LOAD BIOS DEFAULTS	SAVE & EXIT SETUP
LOAD SETUP DEFAULTS	EXIT WITHOUT SAVING
ESC: Quit	↑↓→←: Select Item
F10: Save & Exit Setup	(Shift)F2: Change Color
Auto-Configure HDD : Sector, Cylinder, Head....	

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. You need to repeat the setup for each of the IDE combinations:

ROM PCI/ISA BIOS (2A511AK9) CMOS SETUP UTILITY AWARD SOFTWARE, INC.							
Hard Disks	SIZE	CYLS.	HEAD	PRECOMP	LANDZ	SECTOR	MODE
Drive C: ( Mb)							
Select Drive C Option (N=Skip) : N							
OPTIONS	SIZE	CYLS	HEAD	PRECOMP	LANDZ	SECTOR	MODE
	1(Y) 0	0	0	0	0	0	Normal
ESC = SKIP Some OSes (like SCO-UNIX) must use "NORMAL" for installation ESC : Skip							

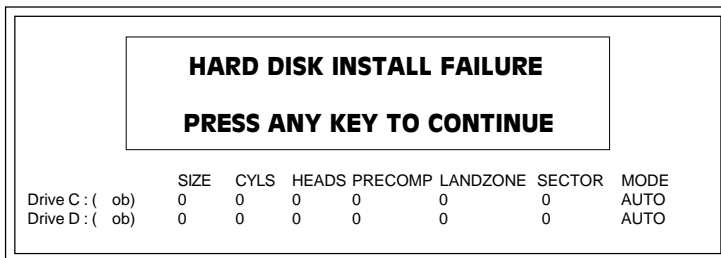
### IDE HDD Auto Detection Screen

# HDD low level format utility



Selecting this utility allows you to execute HDD low level formatting. This low level format utility is designed as a tool to save your time pre-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 appears after you enter into the utility.



## Save & exit setup

If you select this option and press <ENTER>, the values entered in the setup utility 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.

ROM PCI/ISA BIOS (2A51IAK9) CMOS SETUP UTILITY	
STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISER PASSWORD
CHIPSET FEATURES SETUP	USER PASSSSWORD
POWER MANAGEMENT SETUP	IDE HDD AUTO DETECTION
PNP/PCI CONFIGURATION	HDD LOW LEVEL FORMAT
LOAD BIOS DEFAULTS	<b>SAVE &amp; EXIT SETUP</b>
LOAD SETUP DEFAULTS	EXIT WITHOUT SAVING
ESC: Quit	↑↓→←: Select Item
F10:Save & Exit Setup	(Shift)F2:Change Color
Save Data to CMOS & Exit SETUP...	



## Exit without saving

---

Selecting this option and pressing <ENTER> lets you exit the setup utility without recording any new values or changing old ones.

<b>ROM PCI/ISA BIOS (2A511AK9) CMOS SETUP UTILITY AWARD SOFTWARE, INC.</b>	
STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISER PASSWORD
CHIPSET FEATURES SETUP	USER PASSSWORD
POWER MANAGEMENT SETUP	IDE HDD AUTO DETECTION
PNP/PCI CONFIGURATION	HDD LOW LEVEL FORMAT
LOAD BIOS DEFAULTS	SAVE & EXIT SETUP
LOAD SETUP DEFAULTS	<b>EXIT WITHOUT SAVING</b>
ESC: Quit	↑↓→←: Select Item
F10: Save & Exit Setup	(Shift)F2: Change Color
Abandon all dates & Exit SETUP ....	



## **SiS 5598 VGA Drivers**

The content of this chapter includes SiS 5598 VGA Driver installation instructions for the SBC-551/552.

# System requirements

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This section describes system requirements for the SiS 5598 VGA Driver and how to install the drivers.

1. The hardware system must contain a 5598 chipset.
2. A mouse is optional.
3. Set the *VGA Shared Memory Size* in the BIOS CHIPSET Features Setup. Please refer to Chapter 3 for more information on how to set the *VGA Shared Memory Size* in the BIOS CHIPSET FEATURES SETUP section.

# Windows 95

---

## Windows 95 (display driver installation)

1. Click on the "Start" button and select "Control Panel" from the *Settings* menu.
2. Double-click on the Display icon.
3. Select the *Settings* tab in the Display Properties window.
4. Click on the "Change Display Type" or the "Advanced Properties" button.
5. Click on "Change..." in the *Adapter* tab.
6. Click on "Have Disk..."
7. Place the Windows 95 Installation Disk into the floppy drive.
8. When the Install from Disk dialog box appears, type the directory storing the drivers and click "OK" or click the "Browse..." button to manually locate the drivers.

The directory is "A:\Win95\" and the file is called "SiS5597.INF"

9. The name of the VGA driver (SiS 5597/5598) will appear in the Models list box of the Select Device dialog.

10. When the Change Display dialog box appears, click on "Close".
11. Select the "OK" or the "Apply" button.
12. A message will appear stating you must restart Windows 95, click on "Yes" to restart.
13. After restarting, Windows 95 will run on 640 x 480 @ 256 colors with VGA driver just installed.

## **Selecting resolution, color depth, and refresh rate**

1. Click on the "Start" button and select "Control Panel" from the *Settings* menu.
2. Double-click on the Display icon.
3. Select the *Settings* tab in the Display Properties window.
4. In the *Color Palette* area, change between 16, 256, High, and True color.
5. To select a new desktop resolution size, go to the *Desktop Area* section and use the slider to change resolution from 640 x 480, 800 x 600, 1024 x 768, to 1280 x 1024.
6. Select the *Refresh Rate* list box to change the screen refresh rate.
7. Click "OK" or "Apply."

# Windows 3.x

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## Installation

1. Click on the *File* menu and select the "Run..." menu item.
2. In the Run dialog, type the source execution file then press "OK".  
The execution file in the Win 3.1 Driver diskette is "A:\SETUP.EXE".
3. Follow the setup program's on-screen instructions.
4. The setup procedure will create a "*SiS Multimedia Vx.xx*" program group and there are 5 items in the program group:
  - Multimedia Manager
  - SiS MMPlayer
  - SVGA Setup
  - Center Screen
  - Uninstall
5. A setup successful dialog will appear when setup is completed, and the user can choose to restart the system now or later.

## Graphics setup

1. In the "*SiS Multimedia Vx.xx*" program group, double-click on the SVGA Setup icon to enter the *SiS VGA Configuration System* screen.
2. In the *SiS VGA Configuration System* screen, choose the options you would like to use.
3. After completing your selections, choose "OK" to make all your selections effective.
4. Choose "Restart Windows" to reboot Windows using the new settings. Or, choose "Continue" to not reboot now.

## Power saving setup in Windows 3.x

1. In the *SiS VGA Configuration System* screen, choose the *power saver* item to enter the Power Saver screen.
2. In the Power Saver screen, choose which options you would like to use.
3. After completing the selections, choose "OK" to make all your selections effective.
4. After a complete setup, the power saver mode should take effect.

## NT 3.5x

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### Windows NT 3.5x display drivers installation:

1. Double-click on "Control Panel" in the *Main* group.
2. Double-click on the Display icon.
3. Select *Change Display Type* from *Display Settings*.
4. Select "Change" from *Display Type*.
5. Select "Other" from *Select Device*.
6. Insert the Windows NT 3.5x Installation Disk into the floppy drive.
7. When the Install from Disk dialog box appears, type the directory storing the drivers and click "OK"  
  
The Win NT 3.5x directory is "A:\WINNT35".
8. Select "Install" and click "Yes" when the Installing Driver dialog box appears.
9. Select "New" when the Windows NT Setup dialog box appears.
10. Click "Continue".

A message will appear stating that the drivers were successfully installed; click "OK". You must now restart Windows NT 3.51.

## Selecting resolution and color depth:

1. Click on the "Start" button and select "Control Panel" from the *Settings* group.
2. Select "Control Panel" from the *Main* group.
3. Select the Display icon.
4. Select the *Color Palette* to change between 16, 256, 32768, 65536, and 16777216 colors.
5. To select a new desktop resolution size, go to the *Desktop Area* and use the slider to change resolution from 640 x 480, 800 x 600, 1024 x 768, and 1280 x 1024.
6. Select "Test" to test the resolution.

If the display test screen was good then select "Yes" when the Testing Mode dialog box appears. If the display test screen was bad then select "No". Windows NT 3.5 will give you an error message.

7. If the display test screen was good and you selected "Yes", Windows NT 3.5 will prompt you to restart.

## NT 4.0

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### Windows NT 4.0 display drivers installation:

1. Click on the "Start" button and select "Control Panel" from the *Settings* group.
2. Double-click on the Display icon.
3. Select the *Settings* tab in the Display Properties window.
4. Select *Display Type*.
5. Select "Change" in the *Adapter Type* tab.



6. Select "Have Disk..."
7. Place the Windows NT 4.0 Installation Disk into the floppy drive.
8. When the Install from Disk dialog box appears, type the directory storing the drivers and click "OK."

The WIN NT 4.0 directory is located in "A:\WINNT40".

9. When the Change Display dialog box appears, click "OK."
10. When the Third-party Drivers dialog box appears, click "Yes."

A message will appear stating that the drivers were successfully installed, click "OK." You must now restart Windows NT 4.0.

## **Selecting resolution and color depth**

1. Click on the "Start" button and select "Control Panel" from the *Settings* group.
2. Double-click on the Display icon.
3. Select *Settings* tab in the Display Properties window.
4. In the *Color Palette* area, change between 16, 256, 32768, 65536, and 16777216 colors.
5. To select a new desktop resolution size, go to the Desktop Area and use the slider to change resolution from 640 x 480, 800 x 600, 1024 x 768, to 1280 x 1024.
6. Select "Test" to test the resolution. If the display test screen was good then select "Yes" when the Testing Mode dialog box appears. If the display test screen was bad then select "No." Windows NT 4.0 will give you an error message.
7. Click "OK." If the display test screen was good and you selected "Yes", Windows NT 4.0 will change the mode without restarting.

# DOS

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VGA drivers do not have to be installed when operating in DOS. Changing the VGA settings requires running the program "*SVGAUTIL.EXE*."

## VGA utility

1. Insert the disk which contains the SiS 5598 DOS VGA Utility installation program
2. Run the setup program called "*SVGAUTIL.EXE*"

You should now see the screen for setting various VGA options:

- a) Video Mode Setting,
  - b) Frame Rate Setting, and
  - c) Power Saving Setting.
- 3) Once you have made your changes, you can choose to save the changes to the "*AUTOEXEC.BAT*" file or not.

## Video mode setting

A list of the different video modes that can be supported is displayed. Be sure to first test the video mode, by highlighting the mode and then by pressing <F1>, before making a final selection.

## Frame rate setting

Much like the Video Mode Setting, a list of valid frame rate modes will be displayed which includes the monitor display resolution and the corresponding frame rate. Again, first press <F1> to test if the monitor can support the frame rate before finalizing your frame rate selection.

## Power saving setting

Here you can set the timers for the Standby and Suspend power saving modes. Highlight the "Standby Timer" or "Suspend Timer" option to change the timer values.

## **Programming the Watchdog Timer**

The SBC-551/552 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 wtachdog 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 enable 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 within 10 seconds

outportb(0x80, 0);         // refresh watchdog timer, otherwise
                             // the system will reset after time-out

outputb(0x443, 20);       // set time-out interval to 20 seconds
inportb(0x443);           // enable watchdog timer
another_job();            // another job finished in 20 seconds
outportb(0x80, 0)         // disable watchdog timer

...

...
```



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