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Installing and Configuring the

Model CSBC1200 and CSBC1210

Industrial Single-Board Computers

Manual Ordering No. 1902064-01 Rev. A





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Rev. A – June, 2002

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Preface

This manual was written for a system installer, service provider, or system manager who wants to install or configure the Model CSBC1200 or Model CSBC1210 industrial single-board computer (SBC). It assumes that you have experience installing boards and mass-storage drives and connecting cables in a personal computer. It also assumes that you are familiar with ESD-prevention concepts and general board-handling and drive-handling procedures.

After reading this manual, you will be able to install the single-board computer into a chassis; verify that it is working properly; install the software drivers for on-board communication, networking, and video devices; and use the CMOS Setup Utility and SCSI BIOS Configuration Utility to set up and optimize the board's features.

This manual contains eight chapters and four appendices. The following summarizes the manual's contents.

Chapter 1	Explains how to use the manual. Describes the features of the SBC, its processor, and its chipset. Also describes the video graphics, communications, networking, and operating system support that are built into the board.
Chapter 2	Explains how to unpack the SBC and what to do if you discover shipping damage. Provides procedures for controlling ESD, installing the SBC, connecting cables, and checking jumpers and main memory modules. Finally, it provides general procedures to verify that the SBC powers up correctly.
Chapter 3	Explains how to start and run the CMOS Setup Utility, how to move between the menu screens, and what the various menu options do.
Chapter 4	Explains how to start and run the SCSI BIOS Configuration Utility, how to move between menu screens, and what the various menu options do.
Chapter 5	Contains information on device driver installation.
Chapter 6	Contains information on the optional CompactFlash Module.
Chapter 7	Explains how to replace the processor, memory modules, and system battery.
Chapter 8	Contains information on advanced BIOS features reserved for service providers, including BIOS crisis recovery, BIOS updating, and lost password recovery.
Appendix A	Lists the power, environmental, and physical specifications for the SBC.
Appendix B	Contains connector signal information and the SBC component/jumper location diagram.
Appendix C	Contains information on the CSBC1210 "Non-SCSI" version of the SBC.
Appendix D	Describes the two-stage watchdog timer.

Document Conventions

The following typographic conventions are used in this manual

Type	Example
Manual Chapter	**Installing the SBC**
Manual Section	**Preventing ESD Damage**
Configuration Menu	BIOS Features
Configuration Menu Item	*Gate A20 Option*
Configuration Menu Item Option	"Fast"
User Keystroke	**Enter**
Computer Display Readout	`Press Ctrl-C`

Contacting CG Mupac for Technical Assistance

If you are unable to install the board or resolve a problem using the SBC documentation, telephone support is available with your hardware during the warranty period. Also, contact us if you need general information about our products or replacement parts or accessories.

If your location is within the Western U.S. Region (WA, OR, CA, UT, NV, AZ, or CO), contact the Carlo Gavazzi Customer Support by calling 1-800-968-7220. For all other U.S. or Canada locations, call 1-800-926-8722.

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Introduction 1

1.1 About the CG Mupac CompactPCI® Board Set

CompactPCI is an adaptation of the Peripheral Component Interconnect (PCI) specification and is, therefore, electrically compatible with PCI. However, compared with the PCI specification, the CompactPCI specification provides a more rugged mechanical form factor for industrial- and embedded-PC applications. CompactPCI is an open bus specification supported by the PCI Industrial Computers Manufacturers Group (PICMG).

The CG Mupac CompactPCI (CPCI) board set includes a CPCI single-board computer (SBC) with a CompactFlash connector, an optional mezzanine board, and an optional 80 mm rear I/O transition board (Figure 1-1). To support a diskette drive and one or more IDE mass-storage drives, our CPCI SBC requires at least the mezzanine board or the rear I/O transition board. Also, to support SCSI devices, parallel bus devices, or USB devices, the system requires an optional rear I/O transition board. The sections that follow summarize the features of each board in the set.

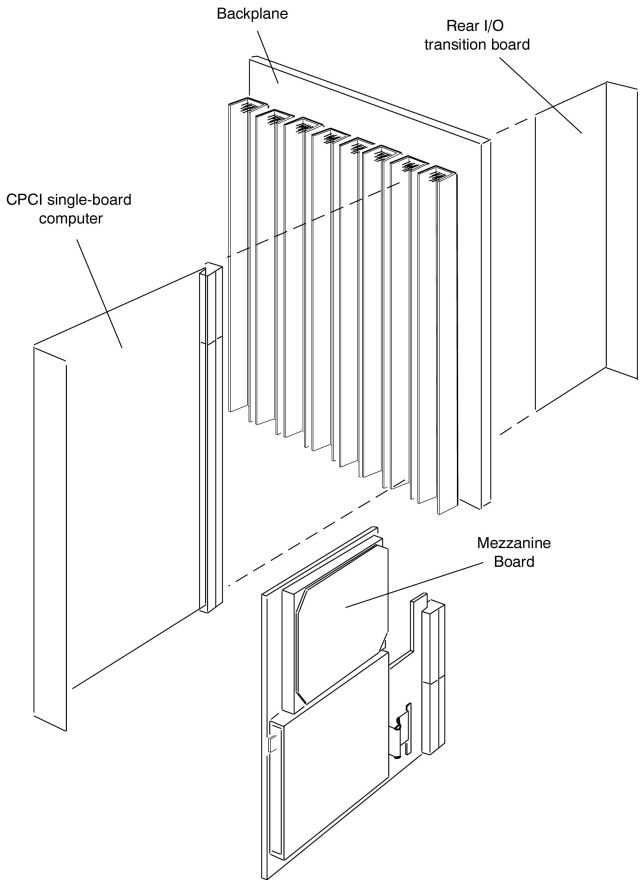


Figure 1-1 Compact PCI single-board computer, mezzanine board, and rear I/O transition board

The SBC, Models CSBC1200 and CSBC1210, is a 6U × 8 HP (double wide) board that contains the processor, the main memory, and the following features:

- PS/2 6-pin mini-DIN keyboard and mouse connectors
- Serial COM 1 port connector
- Video graphics adapter
- Two 10Base-T/100Base-Tx Ethernet controllers
- CompactFlash connector
- System reset button
- Power, IDE, and SCSI activity indicators
- Up to 1 MB of on-board Flash memory

The CompactFlash connector supports the following devices available from CG Mupac:

- **CompactFlash** Card: CFC-xxx SanDisk™ SDCFB-xxx (xxx MB) + PCB connector
- **Microdrives**: MB-1.0GB IBM™ DSCM-11000 1.0 GB Microdrive + PCB connector
  MD-512MB IBM™ DSCM-10512 512 MB Microdrive + PCB connector

The SBC also has interfaces/controllers that support the mezzanine board and rear I/O transition board features described below (SCSI support provided by the CSBC1200 only).

The mezzanine board, Model CM-CBXBR01, contains a PCI-to-PCI bridge circuit for driving a second PCI bus on a CPCI backplane. (The primary PCI bus is driven by the PCI circuit on the SBC.) The mezzanine board can also have

- an optional on-board 3-1/2 inch floppy-disk drive, and
- an optional on-board 2.5-inch EIDE hard-disk drive.

The mezzanine board attaches to the single-board computer using standoffs and screws. Two surface-mounted 100-pin connectors on the SBC, J10 and J13, provide signals for the mass-storage drives and the second PCI bridge. Separate CPCI backplane connectors, J1 and J2, provide PCI signals for a second PCI bus on the backplane. The SBC with an optional mezzanine board requires two CPCI board slots.

Order your SBC with a factory-installed mezzanine board if you require an on-board 3-1/2 inch diskette drive, an on-board hard-disk drive, or a second PCI bus for driving up to eight additional PCI loads.

The rear I/O transition board, available in 8HP (CTM80-CBX02) and 4HP (CTM80-CBX04) versions, contains both surface-mounted header connectors and external rear-panel standard connectors. It expands the I/O connection capability of the system's single-board computer and provides alternate rear-chassis cable connections for many of the connectors located on the single-board computer's front panel.

Signals from the single-board computer's industry-standard interfaces pass through the backplane connectors to the rear I/O transition board, which connects to the opposite side of the backplane through its CPCI connectors.

The **CTM80-CBX02** 8HP version provides the following features:

- **Rear panel connectors:** COM1 (either surface-mounted or rear-panel) and COM2 (rear-panel), alternate video display, alternate 6-pin mini-DIN keyboard and mouse, two alternate 10Base-T/100Base-TX Ethernet, two USB, and a 68-pin Ultra2 Wide SCSI.
- **Surface-mount headers:** floppy drive, EIDE primary and secondary, alternate COM1/COM2, Ultra2 Wide SCSI and parallel bus.

The **CTM80-CBX04** 4HP version provides the following features:

- **Rear panel connectors:** alternate 6-pin mini-DIN combination keyboard/mouse, alternate video display, two alternate 10Base-T/100Base-TX Ethernet, and one USB.
- **Surface-mount headers:** floppy drive, EIDE primary and secondary, alternate COM1/COM2, Ultra2 Wide SCSI, one USB, and parallel bus.

Note: The CSBC1210 does not support SCSI device operation.

Read the next section if you want to learn more about the Model CSBC1200 or CSBC1210 single-board computer (SBC). If you want to install the SBC board right away, skip to **Installing the SBC** (Chapter 2) and follow the procedures to install the board. To find out how to install the rear I/O transition board, refer to the *Installing the Model CTM80-CBX02/04 Rear I/O Transition Board* manual.

1.2 About the Single-Board Computers

The CSBC1200 and CSBC1210 are full-featured single-board computers (SBC) designed with lockable board ejectors for fast replacement in a CPCI (CompactPCI) chassis. The SBCs use Intel® processors and are engineered according to strict design guidelines. They conform electrically and mechanically to existing CPCI backplanes, providing full compatibility for system CPCI expansion slots.

The CSBC1200 Series consists of four basic models (XXX or XXXX refers to processor speed in MHz):

Model CSBC1200–CXXX — Uses the Intel® Celeron™ FC-PGA (flip-chip pin grid array) processor with 128 KB on-die L2 cache @ full core speed, 66 MHz PSB (processor-side bus) and the Intel 440BX AGPset.

Model CSBC1210–CXXX — The "Non-SCSI" version of the CSBC1200 – CXXX (does not support SCSI devices).

Model CSBC1200–PXXXX — Uses the Intel® Pentium™ III FC-PGA processor with 256 KB on-die L2 cache @ full core speed, 100 MHz PSB, and the Intel 440BX AGPset.

Model CSBC1210–PXXXX — The "Non-SCSI" version of the CSBC1200 – PXXXX (does not support SCSI devices).

There are no other major differences among these models.

All four single-board computer models install into a CPCI system chassis using the same board-guide and board-ejector designs as other CPCI add-in boards in the system. The advantage of an SBC-designed industrial system over a motherboard-design system is that you can quickly upgrade an industrial system's computer, either by plugging a new processor in the SBC or by replacing the entire SBC board as easily as you would any other add-in board. The SBCs are also PICMG 2.1 Full Hot Swap compliant, enabling you to install or remove other hot-swappable CPCI boards while the system is turned on. **(Note that the SBC itself is not hot-swappable. You cannot remove it while the system is turned on.)**

The sections that follow describe the SBCs' features in more detail and how the SBCs use the mezzanine board and rear I/O transition board. As you read the next sections, you may want to refer to the SBC component-location diagram (Figure B–1).

1.2.1 Processor

The Intel® Celeron™ and Pentium™ III FC-PGA low-profile processors install in a Socket 370 connector. This connector style eliminates the use of the bulky Slot 1 single-edge cartridge (SEC) design and offers the following advantages:

- It eliminates custom-made processor support brackets often found on SBCs with a Slot 1 processor.
- It uses a 370-pin connector (Socket-370) mounting with a zero-insertion force (ZIF) lever for easy processor replacement and upgrades.

Also, with the processor's flip-chip design, the thermal dissipating device attaches directly to the back of the processor core package, thereby providing better heat dissipation without the need for a thermal plate or heat spreader.

1.2.2 Chipset

The 440BX AGP chipset consists of the Intel® 82443BX AGP (north bridge) and the 82371EB (south bridge) chips.

1.2.3 Memory

The boards' memory consists of on-die level 1 and level 2 caches and replaceable main memory modules. The following describes each of these memory components.

1.2.3.1 Cache

Models CSBC1200–CXXX and CSBC1210–CXXX — The Celeron™ processor contains 16 KB instruction and 16 KB data L1 (level 1) caches. Its 128 KB pipelined burst synchronous static RAM L2 (level 2) cache runs at full core speed. Both caches are 64 bits wide and are built into the processor.

Models CSBC1200–PXXXX and CSBC1210–PXXXX — The Pentium™ III processor contains on-die 16 KB L1 (level 1) instruction and 16 KB L1 data caches. It also features a 256 KB, 8-way set associative L2 (level 2) cache. These caches run at full core speed. The L2 cache uses the Advanced Transfer Cache Architecture with a 256-bit-wide bus.

1.2.3.2 System Main Memory

The board has three 168-pin dual inline memory module (DIMM) sockets that support the following:

- 16 MB to 768 MB of SDRAM,
- Either 64-bit-wide non-ECC memory or 72-bit-wide ECC/ECC Level 2 memory (ECC memory lets the system detect multiple-bit errors and correct single-bit errors), and
- Either 66 MHz or 100 MHz 3.3 V unbuffered SDRAMs (the processor determines the host bus speed).

The BIOS firmware automatically detects the DIMM's memory size and chip speed. No BIOS CMOS setup is required; however, if you install DIMMs that have ECC, ensure that the associated options in the BIOS CMOS Setup Utility menus are set correctly. Refer to the Chipset Features Setup menu section (3.7) for more information.

The following table lists the single-sided or double-sided SDRAM (synchronous DRAM) memory modules that the SBC uses. You can install any of these memory sizes or types in either socket. However, if you install two DIMMs, we recommend that you use DIMMs that are the same type (non-ECC or ECC) and have the same chip speed. If you plan to install DIMMs that are not the same type or same speed, refer to the **Replacing or Adding a Memory Module** section (7.2) for the limitations or performance restrictions you can expect.

Table 1-1 Main memory modules supported by the single-board computer.

Single or Double Sided DIMMs		
Memory Size	**Non-ECC type**	**ECC type**
16 MB	2 Mbit x 64	2 Mbit x 72
32 MB	4 Mbit x 64	4 Mbit x 72
64 MB	8 Mbit x 64	8 Mbit x 72
128 MB	16 Mbit x 64	16 Mbit x 72
256 MB	32 Mbit x 64	32 Mbit x 72
512 MB	64 Mbit x 64	64 Mbit x 72
768 MB	96 Mbit x 64	96 Mbit x 72

All memory components and DIMMS must comply with the PC SDRAM Specifications.

The following lists the SBC's DIMM specifications:

- 3.3 volt only, single-sided or double-sided with gold fingers
- JEDEC MO-161 compliant
- Unbuffered, four-clock, 66 or 100 MHz (determined by the host bus speed)
- Supports the serial presence detect EPROM
- 64-bit non-ECC or 72-bit ECC/ECC Level 2
- SDRAM (only)

The board supports an optional l MB memory hole at the 15 MB to 16 MB memory range. The CMOS Setup Utility in the BIOS firmware lets you select this option. If you choose not to enable the memory hole, main memory uses these address ranges.

All on-board SDRAM memory can be cached. The CMOS Setup Utility lets you select memory caching by address range. Refer to the **Chipset Features Setup** menu (Section 3.7) for more information.

1.2.4 Backplane Bus Support

The board supports a PICMG-compliant CPCI backplane. Its PCI design meets the PCI local bus Specification 2.1, and its PICMG design meets PICMG Specification 2.0.

The SBCs can drive a maximum of seven bus master PCI slots on a completely passive backplane. If the backplane has a PCI bridge chip, the board can drive the bridge and the primary PCI slots (two loads). The optional mezzanine card provides a second PCI bridge (enabling support for up to 14 available PCI slots). Read your backplane documentation for more information about the PCI bridge. The board supplies the backplane with a 33 MHz PCI clock signal.

1.2.5 Mass-Storage Drive Support

The SBC has floppy drive, IDE Ultra DMA/33 drive, PCI-to-Ultra2 Wide SCSI, and CompactFlash module interfaces. (Ultra2 SCSI is also known as Fast 40 SCSI.) The next sections briefly describe each of these interfaces.

1.2.5.1 Floppy Drive Interface

The SBC's floppy drive interface supports one 5-1/4 inch or 3-1/2 inch floppy diskette drive, with media storage capacities of from 360 KB to 2.88 MB. The drive can be mounted in the chassis or on the optional mezzanine board.

- If the system contains a mezzanine board with an optional 3-1/2 inch low-profile diskette drive, the drive gets its signals from the SBC's surface-mounted J3 floppy drive header connector.
- If the system contains an internal chassis-mounted diskette drive, the drive gets its signals from a 34-pin header connector on the optional rear I/O transition board. Refer to the *Installing the Model CTM80-CBX02/04 Rear I/O Transition Board* manual for the location of the header connector.

To install a chassis-mounted floppy diskette drive, your system requires the optional rear I/O transition board. The FDC37M70 Super I/O controller on the SBC provides the floppy drive interface.

1.2.5.2 IDE Ultra DMA/33 Interface

The board has two high-performance IDE PCI Bus Master interfaces: **IDE primary** and **IDE secondary**. Each interface can support up to two IDE drives, providing up to four system drives in a master/slave configuration. Both interfaces support Ultra DMA/33 (also known as Ultra ATA), which provides a transfer rate of up to 33 Mbytes/s.

- If the system contains a mezzanine board, its on-board 2.5-inch low profile hard-disk drive is factory configured as a master on the primary IDE bus. This on-board hard disk drive gets its signals from the 100-pin J5 mezzanine connector on the SBC.
- If the system contains an optional rear I/O transition board, the chassis's internally mounted IDE drives connect to the SBC's IDE primary and IDE secondary interfaces through two 40-pin header connectors on the optional rear I/O transition board. Refer to the *Installing the Model CTM80-CBX02/04 Rear I/O Transition Board* manual for the location of the header connectors. An IDE device activity indicator is located on the front panel.

Both the IDE primary and IDE secondary interfaces also support the 3-1/2 inch LS120 floptical drive either as a boot device or non-boot device. Refer to the *Boot Sequence* menu option in the BIOS Features Setup menu (Section 3.6) if you want to change the drive order boot sequence. **If you want to install chassis-mounted IDE drives, your system requires the optional rear I/O transition board.** The 82371EB south bridge chip provides the IDE interface.

1.2.5.3 PCI-to-Ultra2/ Wide SCSI Interface

The board's 32-bit/33 MHz PCI-to-Ultra2/ Wide SCSI bus supports both single-ended (SE) Ultra and low-voltage differential (LVD) Ultra2 SCSI devices. Ultra2/Wide SCSI doubles the Ultra/Wide SCSI data-transfer rate, providing up to 40 Mbytes/s for narrow (8-bit) operation or up to 80 Mbytes/s for wide (16-bit) operation when LVD SCSI devices are used. LVD Ultra2 SCSI supports up to fifteen SCSI devices and a cable length of up to 12 m (39.4 ft).

To make full use of your legacy SCSI devices, you can connect both LVD SCSI devices and single-ended Ultra SCSI devices to the SBC's Ultra2 SCSI bus. **However, if you mix devices, the bus automatically runs at the slower data transfer rate of the single-ended Ultra drives, and you must reduce the SCSI cable length to 3 m (9.8 ft.) max.**

To connect devices to the SCSI bus, your system requires an optional rear I/O transition board. SCSI drives installed inside the chassis connect to the SBC's SCSI bus through the rear I/O transition board's surface mounted 68-pin SCSI connector. SCSI drives and devices installed in an external chassis connect to the SCSI bus through the 68-pin high-density SCSI connector on the rear panel of the rear I/O transition board. Refer to the *Installing the Model CTM80-CBX02/04 Rear I/O Transition Board* manual for the location of the two 68-pin SCSI connectors. A SCSI device-activity indicator is located on the SBC's front panel.

The SBC uses the LSI/Symbios 53C895A on-board host bus adapter, which has a 292-ball BGA package. The adapter's SCSI Configuration Utility lets you configure the system's SCSI hardware devices. A serial EEPROM stores power-up SCSI configuration information. Refer to **About the SCSI BIOS Firmware** (Chapter 4) for information.

Note: The LSI/Symbios 53C895A adapter is not installed on the optional CSBC1210. This "Non-SCSI" version does not support SCSI device connection to the two CBX02/04 Rear I/O 68-pin connectors.

1.2.5.4 CompactFlash Module Interface

The board has a CompactFlash Module interface that supports CompactFlash (CF) and Microdrive formats. The CompactFlash Module is a small plug-in board that connects a CF+, Type I or Type II CompactFlash memory card and the SBC to provide additional data storage capacity. The CompactFlash Module allows you to use a CompactFlash card – typically less than half the size of a PC card – much as you would a secondary IDE drive.

1.2.6 Accelerated Graphics Port (AGP) Video

The SBC has an on-board high-performance, high-density Intel Chips 69030 graphics adapter with 4 Mbytes of built-in video SDRAM memory. This graphics adapter connects to the system through the accelerated graphics port (AGP) circuits, which are built into the 440BX AGPset. The accelerated graphics port, which is independent of the PCI bus and is used exclusively by a graphical-display device, is Intel's high-performance interface for graphic-intensive applications.

The Video BIOS code and video setup are integrated into the system BIOS ROM. You can connect a video display monitor to either the DB15 VGA connector on the SBC's front panel, or if your system contains the optional rear I/O transition board, to the DB15 VGA connector on the rear panel of the rear I/O transition board. Refer to the *Installing the Model CTM80-CBX02/04 Rear I/O Transition Board* manual for the location of the VGA connector. You can disable the AGP through the CMOS Setup Utility if you want to use an add-in CPCI video board instead. Refer to the **Integrated Peripherals** menu section (3.12) for more information.

1.2.7 Communications

The SBC supports two serial ports, one parallel bus, a universal serial bus (USB) with two ports, and keyboard and mouse ports. The following describes each component.

1.2.7.1 Serial Ports (on SBC and rear I/O transition board)

The board supports two serial ports that are NS16C550-chip compatible. The COM1 port is located on the front panel of the SBC, while COM1 (alternate) and COM2 ports are located on the optional rear I/O transition board (8HP version only).

To support the COM2 and alternate COM1 ports, the rear I/O transition board contains both a DB9 rear-panel-mounted connector and an alternate surface-mounted 10-pin header connector. You can use the surface-mounted header connectors to attach serial devices inside the chassis. **Do not connect serial devices to both the rear-panel mounted external DB9 connector and the surface-mounted internal header connector at the same time.**

Your system requires the rear I/O transition board in order to use the COM2 port. Refer to the *Installing the Model CTM80-CBX02/04 Rear I/O Transition Board* manual for the location of the COM2 port connector. The FDC37M70 Super I/O controller contains the serial port interface.

1.2.7.2 Parallel Bus (on rear I/O transition board)

The SBC has one bi-directional parallel bus that supports Compatible, EPP, and ECP modes (selected through the BIOS setup menu). Parallel bus devices connect to the SBC through the surface-mounted 26-pin parallel header connector located on the optional rear I/O transition board. **Your system requires a rear I/O transition board in order to use the SBC's parallel bus feature.** Refer to the *Installing the Model CTM80-CBX02/04 Rear I/O Transition Board* manual for the location of the parallel bus header connector. The FDC37M70 Super I/O controller contains the parallel bus interface.

1.2.7.3 Universal Serial Bus (on rear I/O transition board)

The SBC contains a universal serial bus (USB) interface that supports either a 1.5-Mbit/s slow-channel or a 12-Mbit/s transfer rate. The slow channel is used for slower devices such as keyboards and mice. The interface includes the root hub with two USB ports for supporting up to two USB devices. USB devices connect to the SBC through the USB 1 and USB 2 series connectors located on the rear panel of the optional rear I/O transition board. **Your system requires a rear I/O transition board in order to use the USB interface.** Refer to the *Installing the Model CTM80-CBX02/04 Rear I/O Transition Board* manual for the location of the USB 1 and USB 2 connectors. The board's 82371EB chip provides the USB interface.

Note: The 4HP version of the rear I/O transition board does not feature the USB ports on its rear panel, but contains a surface-mounted 5-pin header for connecting USB devices.

1.2.7.4 Keyboard/ Mouse Connectors (on SBC and rear I/O transition board)

The SBC has two PS/2-style mouse and keyboard connectors (6-pin mini-DIN) on its front panel. If your system has an optional rear I/O transition board, you can connect either the keyboard and mouse to the alternate mouse and keyboard connectors on the rear I/O transition board's rear panel. Refer to the *Installing the Model CTM80-CBX02/04 Rear I/O Transition Board* manual for the location of these connectors. Separate self-resetting fuses protect the keyboard's or mouse's +5 volt line from short circuits. The FDC37M70 Super I/O controller contains the keyboard and mouse interface.

1.2.8 LAN Interface (on SBC and rear I/O transition board)

The board uses the Intel 82559 chip, which offloads LAN communications tasks from the processor. The dual Ethernet, IEEE 802.3u PCI LAN interfaces support either 10Base-T or 100Base-TX LAN networks in either full-duplex or half-duplex mode. You can connect the network to either of the RJ45 LAN connectors on the front panel of the SBC, or if you have an optional rear I/O transition board, to the alternate RJ45 LAN connectors on the rear panel. You can either enable the front or rear connectors through the system's BIOS Features Setup menu. Refer to the *Installing the Model CTM80-CBX02/04 Rear I/O Transition Board* manual for the location of the rear I/O LAN connectors.

The front and rear LAN connectors have two built-in LEDs. The yellow LED indicates LAN activity or link integrity, and the green LED indicates a transfer-rate setting of either 10 Mbps or 100 Mbps. This LAN interface automatically sets its transfer rate and operation mode to match the connecting network. The table below lists the on, off, and flashing state of the LEDs and describes what they indicate.

Table 1-2 The LED indicators found on the RJ45 LAN connectors

Link/ Act(ivity) (Yellow)	10/100Mbps (Green)	Indicates
Off	Off	No link established
On	Off	10 Mbps link established
On	On	100 Mbps link established
Flashing	Off	10 Mbps data transfer
Flashing	On	100 Mbps data transfer

Users can run their existing 82557-chip and 82558-chip software on the 82559 chip. The 82559 chip has a 196-pin BGA package and operates at 3.3 V. The system stores power-on hardware and software configuration information in EEPROM. It uses this information during power-up to test and configure the PCI LAN interface.

1.2.9 System Hardware Monitoring and Power Management

The board has a built-in sensor that monitors the processor's internal temperature. If the processor exceeds a factory-preset temperature of 85° C (185° F), the board's clock-throttling mechanism reduces the system processing speed to minimize the risk of heat damage to the processor. When this happens, system performance also decreases. To restore full performance, you must restart the system once the temperature fault is resolved. In addition to temperature monitoring, the board also incorporates a device for monitoring all system-level voltages. The system displays these voltage levels numerically, which you can view in the BIOS Chipset Features Setup menu (see Section 3.6).

The board offers local- and system-level power management to conserve power when the system is idle for long periods. For local-level power management, the board can place the hard disk drive and video subsystem into a low power consumption state. For system-level power management, the board offers both doze and standby modes. You can choose and customize both levels through the BIOS Power Management menu (see Section 3.8). Note that many video displays have additional power-management features; refer to the display monitor documentation for more information.

1.2.10 Battery/RTC

The board contains a battery-backed real-time clock (RTC) with a time-of-day clock, a multi-century calendar with alarms, and century-rollover capability. The RTC battery is easy to replace in the field. For information about replacing the battery, refer to **Replacing Components** (Chapter 7).

1.2.11 Front Panel LEDs and Reset Switch

The SBC's front panel features the following components. Refer to Figure B–1 for the location of these devices.

Power LED	Lights when the chassis power switch is turned on or power is applied to the SBC.
IDE bus activity LED	Lights when IDE mass-storage drives send or receive data or instructions over the IDE bus.
SCSI bus activity LED	Lights when SCSI devices send or receive data or instructions over the SCSI bus.
LAN connector LEDs	Refer to the "LAN Interface" section for a complete description of these two LEDs.
Reset switch	Pressing this recessed momentary switch forces the SBC to reboot.

1.2.12 Operating System Support

Operating systems that support the SBC include MS-DOS® 6.2, Windows® 95/98/2000, Windows® NT 4.0, Sun Solaris® x86 2.s, and VxWorks® 5.4 (also Novell Netware® and SCO Openserver®/UnixWare®). If you have questions about operating system support, contact us by following the instructions in the Preface or visit our website at www.gavazzi-mupac.com.

1.2.13 BIOS Firmware

The boot-block-protected flash BIOS ROM contains the BIOS firmware, POST, CMOS Setup Utility, SCSI BIOS, Video BIOS, and PCI auto-configuration utility. The flash ROM's protected boot-block section lets you safely reload or update the BIOS software by using a loader utility program. See Section 8.4 for details.

By default, the system loads a shadowed copy of the BIOS firmware into main memory RAM. Executing BIOS from RAM rather than the flash BIOS ROM improves system performance. The CMOS Setup menu provides this option.

The BIOS firmware can boot system software from floppy, hard disk, CD-ROM, SCSI, or LS120 floptical drives. The board also supports the desktop management interface (DMI) 2.0 specification, which allows a system administrator to monitor hardware and software configurations of desktop systems and servers from a central station in a network. This monitoring information can include the SBC's installation date, operational status, and type, to name just some of the DMI capabilities.

The system BIOS complies with the Advanced Configuration and Power Interface (ACPI) specification, revision 1.0, and supports Advanced Power Management (APM) BIOS specifications through 1.2. For more information about the system BIOS features, refer to Award BIOS revision 4.51 or Award BIOS user support at www.phoenix.com or contact us as described in the Preface.

1.2.14 Hot-Swap Capability

The SBC supports the removal and installation of hot-swap-capable boards while the system is powered up. The PICMG hot-swap specification (rev 1.0) describes the features that a hot-swap-capable board requires. For information about setting up the system to support hot-swap-capable boards, refer to the **Setting Up the Hot-Swap Feature** section (2.4.3).

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Installing the SBC 2

This section explains how to unpack and install the SBC. Before proceeding, make sure you read and understand the general procedures contained in **Preventing ESD Damage**. Also, if you intend to install a rear I/O transition board in the chassis, refer to the board's manual for additional information.

2.1 Preventing ESD Damage

ESD (electrostatic discharge) damage occurs when the electrostatic charge that has accumulated on your body discharges through a computer's sensitive circuits. When properly secured, the computer's cover, filler panels, and filler brackets protect the electronic circuits inside from ESD damage. However, when you remove the covers to replace or install circuit boards, mass-storage drives, or subassemblies, you can inadvertently damage sensitive electronic circuits by simply touching them.

To prevent severe equipment damage, follow these general guidelines.

CAUTION: Failure to follow these procedures could cause equipment damage and void the product warranty.

- Before removing any covers, filler panels, or filler brackets from the computer chassis, disconnect the chassis's power cord from the power source, and when possible, from the power inlet on the back of the chassis.
- Gather all tools and manuals, the ESD kit, and any other materials you will need before you remove the cover from the chassis. (Procedures found in manuals for removing circuit boards or subassemblies usually list required materials and tools at the beginning.) After you remove the chassis's cover, you should avoid moving away from the chassis's work site; otherwise, you may build up an electrostatic charge.
- If you are removing the chassis from a rackmount cabinet, clear the work site beforehand of any unnecessary materials or materials that naturally build up electrostatic charge, such as foam packaging, foam cups, cellophane wrappers, and similar materials. Provide ample room to work on the chassis. Make sure that a metal part of the chassis rests on at least part of the antistatic ESD mat.
- Never remove a circuit board or mass-storage drive from its antistatic packaging until you are ready to install it.
- Use an ESD antistatic mat and wrist strap (ESD kit) when handling circuit boards or when touching anything inside the chassis. ESD kits are available from your local full-line electronic component- or computer-equipment supplier. Follow the instructions that are included with the ESD kit.
- In an emergency, when no ESD kit is available, read the "Suggested Emergency Procedure (no ESD kit)" section.
- Once you install a circuit board or mass-storage drive, replace the cover, filler panels, and filler I/O brackets on the computer chassis as soon as possible so that the electronic circuits are protected.
- Do not connect the computer chassis to the input power source until you replace the cover, filler panels, or filler brackets.

If no ESD kit is available and you absolutely must install or remove a circuit board or a mass-storage drive, read and understand the suggested procedure below to reduce the possibility of equipment damage.

CAUTION *This suggested emergency procedure is not a substitute for the use of an ESD kit, and using it may not prevent equipment damage. Carlo Gavazzi Mupac does not support or endorse its use. ESD damage caused by not using an ESD kit or by using an ESD kit improperly is the sole responsibility of the installer or service provider and will void the product warranty.*

Step	Action
1	Make sure the computer chassis is powered down and then disconnect the power cord from the power source and, when possible, from the power inlet at the back of the computer chassis.
2	After removing the cover, and before touching anything inside the chassis, firmly touch a bare (unpainted) metal surface of the chassis.
3	Avoid moving around the room. If you must move around the room or touch other surfaces before installing a circuit board in the chassis, repeat step 2.
4	Before removing a circuit board or mass-storage drive from its antistatic bag, place one hand firmly on an unpainted metal surface of the chassis and, at the same time, pick up the board or drive while it is still sealed in the antistatic bag.
5	Remove the board or drive from the antistatic bag. Handle a circuit board by the edges and a mass-storage drive by the frame. Avoid touching components and circuits on a board or on a mass-storage drive's exposed circuit board.
6	Once you have removed the board or drive from its antistatic bag, do not move around the room or contact other furnishings, personnel, or surfaces until you have installed and secured the board or drive in the computer chassis. If you must move around the room or touch other surfaces before installing the board or drive, place the board or drive into its antistatic bag; when you return, repeat steps 2 through 5.
7	Once the board or drive is installed, replace the cover, filler panels, and filler brackets on the computer chassis to protect the electronic circuits.
8	Order an ESD kit today so that you will have it the next time you need to repair or upgrade a computer chassis.

2.2 Verifying the SBC Requirements

Before you begin to install the SBC (single-board computer), make sure the chassis into which you intend to install the board has the following features:

- PICMG revision 2.0 compliance with a CPCI backplane.
- A power supply that can provide sufficient power for the single-board computer in addition to the other power loads in the chassis.
- A cooling system that can dissipate the heat produced by the single-board computer in addition to the heat produced by other devices in the chassis.

Refer to the **Technical Specification** section for the SBC's heat output and power requirements.

2.3 Unpacking, Inspecting, and Handling

Follow this procedure to unpack the SBC and to report any shipping damage.

Step	Action
1	Remove the packing slip from the outside of the shipping carton.
2	Before opening the carton, make sure that the outside has no visible damage. Report damage immediately to the shipping company. (If a camera is available, take several photographs of the damage.)
3	Open the carton, carefully remove the contents, and inspect them for damage. If there is damage, contact us to receive further instructions. *CAUTION: Do not remove the board from its antistatic bag until you are ready to install it and you have read the* **Preventing ESD Damage** *section.*
4	Using the packing slip, take inventory of the carton's contents. 1. Make sure the model number on the SBC is the one that you ordered. 2. If you ordered a mezzanine board, make sure it is attached to the SBC. (The mezzanine board is **not** customer installable. It should arrive mounted on the SBC.) 3. Make sure you received the correct size and number of DIMM main memory modules. The memory modules arrive installed in the SBC's DIMM connectors. 4. Make sure you received any optional external cables that you ordered to complete the installation of the board.
5	Save the shipping carton and packing materials should you need to return the SBC.

2.4 Installing the SBC

Before you install the SBC, check the jumpers and memory modules for proper configuration. The following sections provide information on jumpers and memory as well as the pre-installation setup for using the SBC's hot-swap feature.

2.4.1 Checking Jumpers

The SBC has five jumper blocks, which are listed below. Make sure each jumper is set to its default setting. (Refer to Figure B-1 for the location of the jumpers on the board.)

Jumper	Description
J11	Program serial number Install a jumper on pins 1-2 to prevent changes to the SBC serial number *(default setting)*. Install a jumper on pins 2-3 to program the serial number.
J12	Enable mezzanine board Install a jumper on pins 1-2 to enable communication between the optional mezzanine board and the SBC *(default setting)*. Install a jumper on pins 2-3 to disable SBC/mezzanine board communication.
J15	Hot swap setup Default *setting is no jumper installed.* Install a jumper on pins 2-3 to use the IRQ5 interrupt for hot swap boards (using Windows 2000). Install a jumper on pins 5-6 to use the GPI_1 interrupt for hot swap boards (the ACPCI setting). *IMPORTANT* *If you want to set up the SBC's hot-swap feature, refer to the* **Setting Up the Hot Swap Feature** *section (2.4.3) for more information about this jumper.*
J16	Clear hardware configuration from CMOS Install a jumper on pins 1-2 for normal operation *(default setting).* Install a jumper on pins 2-3 momentarily to clear CMOS RAM. Refer to the **Recovering From a Lost Password** section (8.3) for more information about this jumper.
J24	Boot Block Flash protect Install a jumper on pins 1-2 to prevent boot-block programming *(default setting).* Install a jumper on pins 2-3 to enable boot-block programming. Contact us as described in the **Preface** if you need more information about this jumper.

2.4.2 Checking Memory Modules

The SBC was shipped to you with main memory modules installed. Make sure you received the correct capacity and quantity of memory modules. Refer to the **System Main Memory** section (1.2.3.2) for a full description of main memory.

2.4.3 Setting Up the Hot-Swap Feature

The SBC lets you remove and install hot-swap capable boards while the system is powered on. Currently, the SBC supports hot swap using interrupt IRQ5 and only when the system is running Windows 2000 system software. To setup the hot-swap feature, follow the procedure below.

IMPORTANT The SBC itself is not hot-swappable. Do not attempt to remove it while the system power is turned on.

Step	Action
1	Install a jumper on pins 2-3 of Jumper Block J15 (see Figure B-1).
2	After you install the SBC in a chassis with a full hot-swap capable backplane, power up the system and install the SBC's hot-swap driver by following the driver instructions. To obtain the driver software and instructions, visit our website (www.gavazzi-mupac.com), click on "Computer Systems," "Support." Select "Drivers" for the software and instructions. You can also contact us as described in the Preface.
3	Install the hot-swap driver for the board that you plan to make hot-swappable. To obtain the driver software for the hot-swap capable board, contact the board manufacturer.

If you need more information about the SBC's hot-swap feature, contact us as described in the **Preface**.

2.4.4 General Board Installation Procedure

To install the SBC, do the following:

- Read, understand, and follow the procedures in the **Preventing ESD damage** section (2.1). Failure to follow these procedures could cause equipment damage and void the product warranty.
- Make sure you have the external optional I/O cables needed to install the SBC. Read the **Connecting I/O Device Cables** section (2.5) to find out what optional cables you will require. Contact us as described in the **Preface** for a list of optional cables or to order optional cables.
- Read the documentation that came with the computer chassis or with the CPCI backplane. If it does not tell you how to install a single-board computer, follow these general instructions.

Step	Action
1	Make sure the computer chassis is turned off and its power cord is disconnected from both the power source and from the back of the computer chassis. *WARNING Failure to unplug the computer from the power source could cause personal injury and equipment damage and void the product warranty.*
2	Read, understand, and follow the procedures in the **Preventing ESD damage** section. *CAUTION Failure to follow these procedures could cause equipment damage and void the product warranty.*
3	Locate the slot in the chassis for the SBC. Often, the SBC slot guides are a different color than the slot guides for other CPCI boards. Refer to the CPCI backplane or chassis documentation to determine the correct slot for the SBC, or contact the chassis manufacturer if no documentation is available.
4	Make sure the board's two ejector handles are in the outward (ejected) position.
5	Align the edges of the SBC in the slot guides of the chassis and gently push the SBC into the chassis until the latches on the ejectors seat in the slot rails of the chassis.
6	Carefully push the board the rest of the way into the chassis until it seats in the backplane's connectors. Press both ejector handles inward to lock the board in place.
7	Tighten the two captive screws on the board's front panel to secure the board in the chassis.
8	Make sure the computer is turned off; then, reconnect the power cord to the back of the computer chassis and to the power source.
9	Once you have installed the SBC, attach the cables to the board's front panel, and when available, to the optional rear I/O transition board's rear panel by following the procedures in the "Connecting I/O Device Cables" section.

2.4.5 Installing the Rear I/O Transition Board

To install the rear I/O transition board, refer to the *Installing the Model CTM80-CBX02/04 Rear I/O Transition Board* manual for instructions and guidelines.

2.4.6 Installing the Mezzanine Board

The mezzanine board is not a customer-installable or field-installable option. It is installed on the SBC at the factory. You must order the optional mezzanine board when you order the SBC. If your want to add an optional mezzanine board to your SBC, contact us as described in the **Preface** for upgrade information.

2.4.7 Installing the CompactFlash Module

If you are using the CompactFlash Module, refer to Chapter 6, **Using the CompactFlash Module**, for installation and configuration information.

2.5 Connecting I/O Device Cables

After you install and secure the SBC in the chassis, refer to Figure B– 1 for the location of the SBC's front-panel I/O connectors. Your chassis could also contain an optional rear I/O transition board, which provides the only connectors for many of the features on the SBC as well as alternate mouse, keyboard, VGA, and LAN connectors.

Table 2-1 lists the connectors found on the SBC and on the optional rear I/O transition board. It also shows whether alternate connectors are present on the rear I/O transition board. **However, regarding SBC features that have alternate connectors, you should never operate devices from both connectors at the same time.**

Table 2-1 SBC and Rear I/O Connectors

SBC Connectors	Optional Rear I/O Transition Board Connectors
PS2 Mouse 6-pin mini-DIN	PS2 Mouse 6-pin mini DIN (alternate connector – 8HP only)
PS2 Keyboard 6-pin mini-DIN	PS2 Keyboard 6-pin mini-DIN (alternate connector – 8HP only)
	PS2 Keyboard/Mouse combination 6-pin mini-DIN (alternate connector, 4HP only – requires the CBL-KB/M-12 splitter cable)
VGA DB15	VGA DB15 (alternate connector)
Dual10/100 LAN, RJ45	Dual 10/100 LAN, RJ45 (alternate connector)
COM1 Serial DB9	COM1 Serial DB9 (alternate external connector – 8HP only)
No connector	COM2 Serial DB9 (external connector – 8HP only)
No connector	COM2 Serial 10-pin header (internal connector)
No connector	Ultra2 Wide SCSI 68-pin (external connector – 8HP only)
No connector	Ultra2 Wide SCSI 68-pin (internal connector)
No connector	IDE Primary 40-pin header
No connector	IDE Secondary 40-pin header
No connector	Parallel Bus DB25
No connector	Floppy Drive 34-pin header
No connector	USB1 4-pin series-A socket
No connector	USB2 4-pin series-A socket (8HP only) or USB2 5-pin header (4HP only)

To connect cables to the SBC, read the next sections. To find out how to install the rear I/O transition board and connect cables to it, refer to the *Installing the Model CTM80-CBX02/04 Rear I/O Transition Board* manual.

WARNING With the exception of the LAN port and the USB port, always make sure that the power to the single-board computer and the power to the devices that you are connecting to the single-board computer are turned off before connecting cables. Failure to unplug the computer from the power source could cause personal injury and equipment damage and void the product warranty.

2.5.1 Connecting Serial, Parallel, and USB Cables

The SBC has one serial port connector, COM1. To use the SBC's other serial port (COM2) or its parallel bus interface or USB interface, the system requires an optional rear I/O transition board. To find out how to install the rear I/O transition board and how connect cables to it, refer to the *Installing the Model CTM80-CBX02/04 Rear I/O Transition Board* manual.

To connect the serial port cable: Make sure the computer is turned off. Plug a serial cable into the DB9 COM1 connector on the SBC's front panel (refer to Figure B– 1 for the location of the connector). Tighten the cable's two captive screws. After you power up the system, refer to the **CMOS Setup Utility** section. Make sure the *COM1 Front/Rear* option in the BIOS Features menu (see 3.6) is set to "Front" (the default setting).

2.5.2 Connecting the Keyboard, Mouse, Video, and LAN Cables

The SBC features PS/2 keyboard, PS/2 mouse, LAN and video display (VGA) connectors. Procedures to connect cables for these components are provided in this section.

IMPORTANT If the system has an optional rear I/O transition board, you can choose to connect the keyboard, mouse, or video display monitor to the rear panel of this board instead. However, do not connect more than one keyboard, mouse, or video display monitor to the system at the same time. Doing so will cause an error when the system runs the POST.

To connect a keyboard cable: Make sure the computer is turned off and then plug the keyboard cable into the PS/2, 6-pin mini-DIN KEYBOARD connector on the SBC's front panel.

To connect a mouse cable: Make sure the computer is turned off and then plug the mouse cable into the PS/2, 6-pin mini-DIN MOUSE connector on the SBC's front panel.

To connect a video cable: Make sure the computer is turned off. Plug the display-monitor cable into the DB15 VGA connector on the SBC's front panel. Tighten the cable's two captive screws. Refer to Figure B– 1 for location.

To connect a LAN cable: Plug the network cable into one of the RJ45 LAN connectors on the SBC's front panel. Tighten the cable's two captive screws. Refer to Figure B– 1 for connector location. After you power up the system, refer to the **CMOS Setup Utility** section. Make sure the appropriate menu option (*LAN1 Front/Rear* or *LAN2 Front/Rear*) in the BIOS Features Setup menu (see 3.6) is enabled (the default setting).

Once you have installed the SBC in the computer chassis and have connected its power cord, follow the procedures in this chapter to make sure the computer powers up properly.

2.6 Powering Up the System (first time)

To power up the computer, do the following:

Step	Action
1	Make sure a video display, a keyboard, and a mouse are connected to the SBC or to the optional rear I/O transition board, and that you have downloaded the appropriate device drivers from our website (www.gavazzi-mupac.com).
2	Turn on the video display.
3	Turn on the chassis power switch. When you do, the SBC begins its power-on self-test (POST). In general, the POST checks the SBC, the main memory, the keyboard, the mouse, and most installed I/O expansion boards that it recognizes. It also displays the amount of memory that it can access. At the end of the POST, the system displays two screens. The first screen contains information similar to the following: *The BIOS banner, revision number, and copyright* *Manufacturer's model number and engineering rev number* *CPU model* *System memory test and size* *Plug-and-Play BIOS extension revision* *Detecting IDE Primary Master …xxxx* *Detecting IDE Primary Slave …xxxx* *Detecting IDE Secondary Master …xxxx* *Detecting IDE Secondary Slave …xxxx* *The SCSI BIOS banner and revision number* The second screen contains information similar to the following*:* *CPU clock speed, extended memory size, and cache size* *Information about the diskette drive, primary and secondary disks, display type, serial port addresses, parallel port address, and SDRAM row location.* *Information about the PCI devices* *Verifies DMI pool data* Make sure the computer performs as described and displays similar information. • If it does, the SBC has successfully completed its power-up verification. To finish the installation of the computer system, go to the next step. • If it doesn't, contact us by following the instructions in the **Preface**.
4	Make sure the BIOS configuration is correct for the boards and drives that are installed in the computer. Refer to Chapter 3, **Using the CMOS Setup Utility**, for more information.
5	Make sure the SCSI configuration is correct (if your SBC supports SCSI operation). Refer to Chapter 4, **About the SCSI BIOS Firmware**, for more information.
6	Load the operating system software (refer to the operating system documentation for instructions).
7	Load the operating system device driver software. Refer to Chapter 5, **Installing Operating System Device Driver Software,** for more information.
8	Load the application software (refer to the application documentation for instructions).

❐ ❐ ❐

Using the CMOS Setup Utility 3

When you turn on the computer, the first program to load and run is the system BIOS firmware, which is permanently stored in a flash ROM. In reality, the system BIOS is actually not one program, but a collection of programs that have the following four functions:

POST (power-on self-test)	This program tests the computer's processor, processor chipset, main memory, video graphics system, disk controller, mass-storage drives, keyboard, and other critical components to make sure they are working properly before loading operating system software. Note that when you warm boot the system (Ctrl+Alt+Del), the POST bypasses the memory tests.
Bootstrap loader	This program locates the operating system (whether it is stored on removable media or hard disk) and loads it. It then relinquishes system control to the operating system.
BIOS (basic input/output system)	The BIOS is a collection of basic software device drivers that interfaces the system's hardware with the system's operating system software.
CMOS Setup Utility	This program lets you configure (optimize) the computer's hardware and set the date, time, and password as well as customize other settings.

The last program listed, the CMOS Setup Utility, is a menu-driven program that lets you optimize and enable/disable hardware features by modifying the computer system's basic hardware-configuration settings. The utility saves these settings in the CMOS, where the processor can access them each time the system powers up. This chapter describes the CMOS Setup Utility and its features.

IMPORTANT The system BIOS firmware number for Models CSBC1200 and CSBC1210 is CSBC12x0. The system BIOS firmware part number appears in the title of each menu of the CMOS Setup Utility. If you contact us for information about your system BIOS, you may be asked for this number.

3.1 Starting the CMOS Setup Utility

You can start the CMOS Setup Utility manually, or the system starts it automatically, as follows:

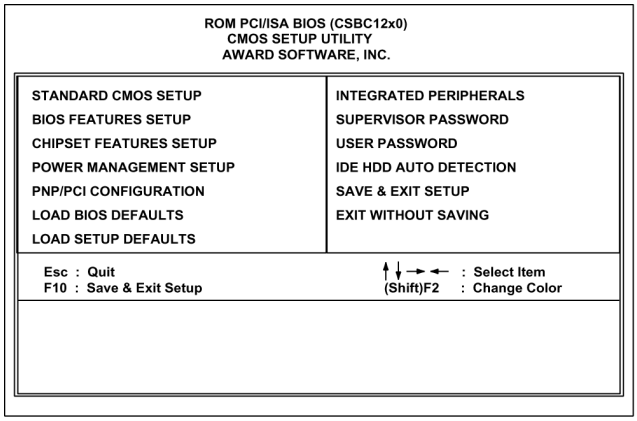
Manually — Press the **`Delete`** key immediately after turning on the computer or within a few seconds after the message `TO ENTER SETUP BEFORE BOOT PRESS DEL KEY` appears. The system may prompt you for a password before you can start the utility. If it does, refer to the **Entering a Password** section that follows for additional information. (If you wait too long after the message appears before you press the **`Delete`** key, the system boots the operating system software. If this happens and you still want to start the CMOS Setup Utility, shut down the operating system, turn off the system, and begin this procedure again.)

Automatically — The system prompts you to start the CMOS Setup Utility after a POST error or catastrophic error by asking you to press the **`F1`** key to continue or the **`Delete`** key to enter the Setup Utility. The system may also ask you for a password before you can start the utility. If it does, refer to the **Entering a Password** section that follows for additional information. (Refer to the **Obtaining Beep Codes, BIOS Error Messages, and POST Codes** section for more information about error messages and codes.)

3.2 Entering a Password

The SBC's BIOS features two privilege levels of password security: **Supervisor** password and **User** password. You may need to provide a user or supervisor password before you can start the CMOS Setup Utility (depending on whether one or both password levels are enabled). If the system prompts you for a password, enter it to start the utility. If you don't know the password, contact your system administrator. If the password is lost, refer to the **Recovering From a Lost Password** section. For more information about creating passwords, refer to the **Supervisor Password and User Password** section.

3.3 Navigating the CMOS Setup Utility



Once started, the CMOS Setup Utility displays the first screen, which is the Main Menu screen shown here. By selecting the Main Menu screen, you can go to other menu screens, or you can perform operations such as setting the user or supervisor password or saving and exiting the CMOS Setup Utility.

You can change menu options by moving from menu screen to menu screen using the keys listed here. The following sections contain tables that describe options for each of the menu screens in the Setup Utility. As you use the Setup Utility, refer to this list of keys and the tables as needed.

Key	Function
Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item at left
Right arrow	Move to the item at right
Esc	1. From the Main Menu only, quit the CMOS Setup Utility without saving CMOS RAM changes
	2. From all other menus, exit current menu and return to the Main Menu
Page Up	Increase the numeric value or make changes
Page Down	Decrease the numeric value or make changes
+	Increase the numeric value or make changes
–	Decrease the numeric value or make changes
F1	General help pop-up window (when available on the menu); press Esc or F1 to close the pop-up window
F2	Change menu screen to one of 16 colors: F2 to view colors forward, Shift-F2 to view colors backward
F3	Calendar (when available on the menu)
F5	Restore the previous CMOS value from CMOS (when available on the menu)
F6	Load the BIOS defaults (when available on the menu)
F7	Load the SETUP defaults (when available on the menu)
F10	Save all CMOS RAM changes (Main Menu only)

3.4 About the Menu Options

The tables in the following sections describe the menus and options for the CMOS Setup Utility. Each table contains the following four columns:

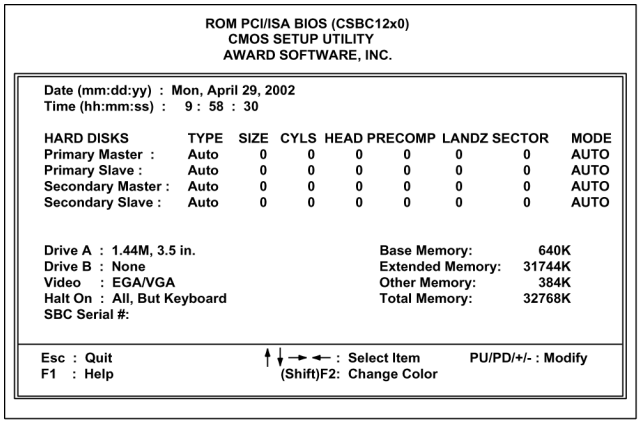
- **Menu Option**— This column lists the options that are available through the board's BIOS. In a few cases, because of the board's design, the option is not available, and changing the setting has no effect on the board's operation.
- **Setup or BIOS (defaults)**— This column lists both the setup and BIOS default settings. When these default settings are the same, only one entry is shown beside the menu option. When the settings are different, the BIOS default is shown in italic type.

The setup default settings are optimal settings that were tested for best system performance and loaded at the factory. They are read from CMOS each time the system powers up, or they are read from BIOS ROM automatically if the CMOS should fail or lose its battery backup power or if they are purposely cleared from the CMOS. (You can purposely clear and reload the setup default settings in CMOS. However, if you do, you will need to manually re-input any custom settings.) Refer to the **Load SETUP Defaults** section to find out how to reload the setup default settings. Refer to the "Custom" heading further on in this section to find out about custom settings.

The BIOS default settings provide stable system operation for a system that is having hardware or software problems. Many system features are not available when the BIOS default settings are used. This simplifies system troubleshooting. Refer to the **Load BIOS Defaults** section to find out how to load the BIOS default settings.

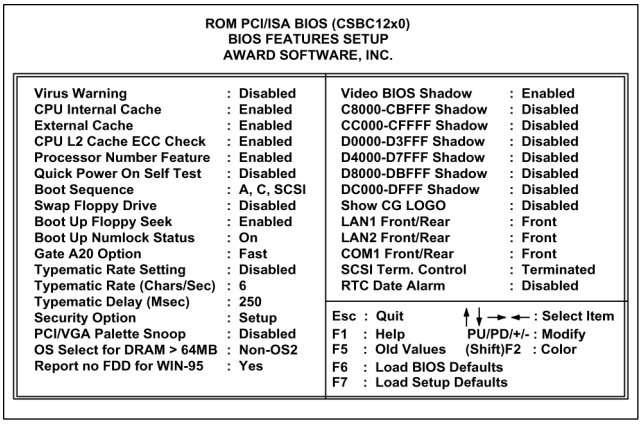
- **Custom**— These are the settings that you changed because you added or removed hardware or you wanted to optimize system performance. If you change any of the Setup (default) settings, record your change in this column of the table. You must manually change these settings if CMOS fails or loses its battery backup power or is purposely cleared.
- **Description**— This column describes the menu option, including the available choices, and whether the board uses this option.

3.5 Standard CMOS Setup (menu screen)



If you change any of these option settings, record your choice in the Custom settings column of the table. Knowing the custom settings will make it easier to reconfigure your system if the CMOS fails and loses the settings.

Menu Option	Settings		Standard CMOS Setup Menu Description
	Setup ***BIOS***	Custom	
Date	Current Date		This option lets you change the current date. Press the left or right arrow key to move to the desired field (month, day, year). Press the Page Up or Page Down key to increment the setting, or type the desired value into the field. (You cannot change the day-of-the-week field. This field is for information only.)
Time	Current Time		This option lets you change the system's time of day. Time uses the 24-hour clock format. For example, 1 PM is 13:00:00 hours. Press the left or right arrow to select the hour, minute, or second field. Type in the desired value or press the Page Up or Page Down key to increment or decrement the values.
Hard Disks	Auto		This option lets you enter information about your hard drives. For optimum system performance, do not enter drive information. Instead, choose Auto in the Type field and let the BIOS enter the information for you.
Drive A	1.44M, 3.5in		The SBC supports one floppy drive. This option lets you assign the drive as either A:/ or B:/ and specify the capacity of the floppy drive as follows: None = No floppy drive attached 360K, 5.25 in = 5-1/4 inch PC-style standard drive; 360 KB capacity 1.2M, 5.25 in = 5-1/4 inch AT-style high-density drive; 1.2 MB capacity 720K, 3.5 in = 3-1/2 inch double-sided drive; 720 KB capacity 1.44M, 3.5 in = 3-1/2 inch double-sided drive; 1.44 MB capacity 2.88 M, 3.5 in = 3-1/2 inch double-sided drive; 2.88 MB capacity
Drive B	None		
Video	EGA/VGA		This option lets you specify the type of video display. EGA/VGA Enhanced graphics adapter/ video graphics array for EGA, VGA, SEGA, SVGA, or PGA displays CGA 40 Color Graphics Adapter (powers up in 40-column mode) CGA 80 Color Graphics Adapter (powers up in 80-column mode) MONO Monochrome or high-resolution monochrome adapter Note that selecting Load BIOS Defaults or Load Setup Defaults does not change this setting.
Halt On	All, But Keyboard		During the POST, the system halts (stops) if it detects a hardware error. These options allow you to configure the system so that it does not stop for certain errors. No errors POST does not stop for any errors All errors POST stops for all errors and prompts you to take action All, But Keyboard Stops for all errors except keyboard errors All, But Diskette Stops for all errors except floppy diskette drive errors All, But Disk/Key Stops for all errors except disk drive and keyboard errors Note that selecting Load BIOS Defaults or Load Setup Defaults does not change this setting.
SBC Serial #	Serial #		Displays the board's serial number.
Total Memory	—		Reports the amount of base memory, extended memory, and other memory in kilobytes (read only).



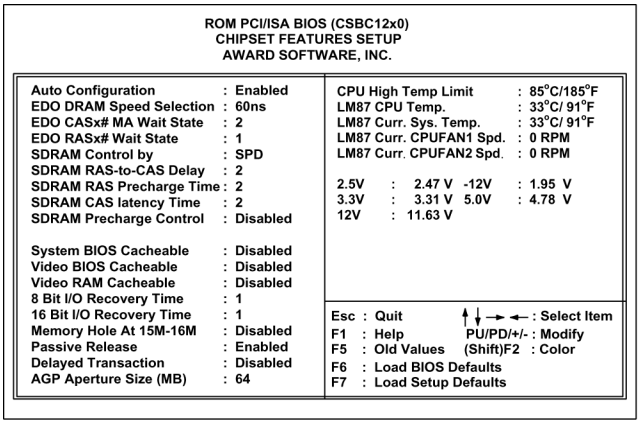
3.6 BIOS Features Setup (menu screen)

If you change any of these option settings, record your choice in the Custom settings column of the table. Knowing the custom settings will make it easier to reconfigure your system if the CMOS fails and loses the settings.

Menu Option	Settings		BIOS Features Setup Menu Description
	Setup ***BIOS***	Custom	
Virus Warning	Disabled		When enabled, the system warns you if any program attempts to write to the boot sector or the partition table of the disk drive. Generally, when you receive this virus warning, you will want to run an anti-virus program. Be aware that this feature protects only the boot sector of the operating system disk drive. It does not protect any other disk drives or disk drive sectors. Also, note that any disk drive diagnostic program or disk drive utility that accesses the boot sector can trigger this virus-warning message. If you plan to run a disk diagnostic or disk utility often, keep this feature disabled.
CPU Internal Cache	Enabled		When enabled, the processor uses an internal cache memory (L1 cache) to hold program data or instructions that it anticipates it will need for processing. When disabled the L1 cache is not available. Cached data and instructions allows the system to run faster.
External Cache	Enabled		Some processors use an external cache memory (L2 cache) to hold program data or instructions. Cached data and instructions let the system run faster. The L2 cache memory for the board's processor is internal, not external, and cannot be disabled. Therefore, selecting enabled or disabled for either option has no effect.
CPU L2 Cache ECC Checking	Enabled		
Processor Number Feature	Enabled		Allows you to control whether the Pentium III processor's serial number can be read by external programs for identification purposes.
Quick Power On Self-test	Disabled		When enabled, this option lets you choose to have the POST skip certain tests, which reduces the time it takes for your computer to bring up the operating system. Enabling this option is not recommended, as it is better to find hardware problems at power-up than it is to find them later, when you could lose valuable data.
Boot Sequence	A, C, SCSI		This option lets you specify the drive order that the BIOS uses when looking for the operating system bootstrap loader code. Normally, PC-compatible systems look first on drive A and then on C. You can change this order. Note that the board lets you boot also from a SCSI disk drive, an LS-120 floptical drive, or a CD-ROM drive. The following lists the Boot Sequence option settings: A, C, SCSI — CD-ROM, A, C — F, A, SCSI — C only C, A, SCSI — D, A, SCSI — SCSI, A, C — LS/ZIP, C C, CD-ROM, A — E, A, SCSI — SCSI, C, A
Swap Floppy Drive	Disabled		The SBC supports one floppy drive. This option is effective only when the system has two floppy drives. Disable this option.
Boot Up Floppy Seek	Enabled		When enabled, this option automatically senses older 360 KB floppy drives. To do this the BIOS tests (seeks) the floppy drive to determine whether the floppy drive has 40 tpi or 80 tpi. Only 360 KB floppy drives have 40 tpi. All others have 80 tpi. To reduce system power-up time, enable this option only if you have a 360 KB drive.
Boot Up NumLock Status	On		When this option is on at boot-up, the keyboard's numeric keypad produces numbers rather than controlling cursor movement. When it is off, it controls cursor movement. With either option, you can toggle the numeric keypad after boot up from number input to cursor movement using the NumLock key.

Menu Option	Settings		BIOS Features Setup Menu Description
	Setup ***BIOS***	Custom	
Gate A20 Option	Fast *Normal*		This option controls the use of the A20 address line, which is used to access extended memory above 1 MB. Normally all RAM access above 1 MB is handled by the A20 address-line logic gate, which is located inside the keyboard controller chip. When this option is set to Fast, the SBC's chipset controls the A20 address-line gate. When set to normal, a pin in the keyboard controller chip controls the A20 address-line gate. Setting Gate A20 to Fast improves system speed.
Typematic Rate Setting	Disabled		**When this option is disabled, the Typematic Rate and the Typematic Delay options below are not used.** A pressed key repeats at a rate determined by the keyboard's controller. When enabled, this option lets you set the Typematic Rate and the Typematic Delay (as described below).
Typematic Rate (Chars/Sec)	6		This option selects the rate (in seconds) at which characters repeat when you hold down a key. You can select 6, 8, 10, 12, 15, 20, 24, or 30 characters per second. **This option is enabled only when you enable the Typematic Rate Setting above.**
Typematic Delay (Msec)	250		This option selects the delay in milliseconds before characters begin to repeat when you hold down a key. You can select 250, 500, 750, or 1000 milliseconds. **This option is enabled only when you enable the Typematic Rate Setting described previously.**
Security Option	Setup		When you choose Setup for this option and you have created a password, you must type the password every time you enter the Setup menu. When you choose System for this option and you have created a password, you must type the password every time you enter the Setup menu or boot the system. Select the Supervisor Password or User Password entries in the main screen to create a password. If you forget the password, see Section 8.3 to find out how to recover from a lost password.
PCI/VGA Palette Snoop	Disabled		Not applicable to the SBC. Make sure this option is disabled.
OS Select for DRAM >64MB	Non-OS2		Select OS2 only if you are running the OS2 operating system and your system has more than 64 MB of main-memory RAM. Otherwise, select Non-OS2.
Report No FDD for WIN 95	Yes *No*		When the system has no floppy disk, select Yes to release IRQ6. If you select Yes, make sure the Onboard FDC Controller option in the Integrated Peripherals menu is disabled. This option maintains Windows 95/98 logo certification.
Video BIOS Shadow	Enabled		When enabled, this option allows the lower two-thirds of the AGP video BIOS to run from the faster main-memory DRAM. When this option is disabled, the lower two-thirds of the video BIOS runs from the slower video BIOS ROM.
C8000-CBFFF Shadow	Disabled		When enabled, this option allows the upper third of the SBC's AGP video BIOS to run from the faster main-memory DRAM. When this option is disabled, the upper third of the video BIOS runs from the slower video BIOS ROM.
CC000-CFFFF Shadow	Disabled		When enabled, this option allows the adapter ROM at address CC000 to run from the faster main memory DRAM. If no adapter ROM is at this address, disable this option.
D0000-D3FFF Shadow	Disabled		When enabled, this option allows the adapter ROM at address D0000 to run from the faster main memory DRAM. If no adapter ROM is at this address, disable this option.
D4000-D7FFF Shadow	Disabled		When enabled, this option allows the adapter ROM at address D4000 to run from the faster main memory DRAM. If no adapter ROM is at this address, disable this option.
D8000-DBFFF Shadow	Disabled		When enabled, this option allows the adapter ROM at address D8000 to run from the faster main memory DRAM. If no adapter ROM is at this address, disable this option.
DC000-DFFFF Shadow	Disabled		When enabled, this option allows the adapter ROM at address DC000 to run from the faster main memory DRAM. If no adapter ROM is at this address, disable this option.
Show CG Logo	Disabled		When enabled, this option allows the system to display the system manufacturer's company logo during power-up. When this option is disabled, the system displays the ongoing POST results during power-up.
LAN1 Front/Rear LAN2 Front/Rear COM1 Front/Rear	Front		These options enable either the front or the rear COM1 and LAN connectors. Choose Rear to enable any of these connectors on the rear panel of the optional rear I/O transition board. Choose Front to enable these connectors on the front panel of the SBC.
SCSI Term. Control	Terminate		This option lets the SCSI host adapter terminate its end of the SCSI bus automatically without the need of installing SCSI termination jumpers. The option settings are Terminate and Un-Terminate. **Note: This option is not available with the CSBC1210 "Non-SCSI" version.**
RTC Date Alarm	Disabled		When disabled, sets the real time clock date register (0x0D bits 0-5) to 000000, allowing the other time alarms to work.

3.7 Chipset Features Setup (menu screen)



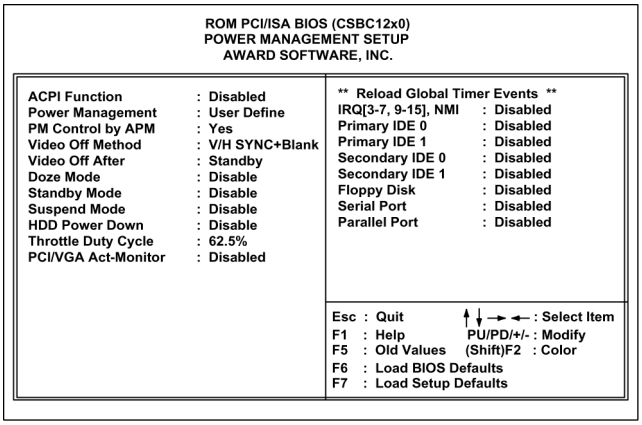
This menu is provided for system designers, service providers, and highly technical end-users who understand these menu options and want to modify system performance. The factory default settings in this menu have been thoroughly tested. **Do not change them unless you fully understand the consequences.** If you change any of these option settings, record the setting in the Custom settings column of the table below. Knowing the custom settings will make it easier to reconfigure the system if the CMOS fails and loses the settings. If changing these settings causes the system to become unstable and you cannot remember the old settings, reload the default settings. (Refer to the "Load SETUP Defaults" section for more information.)

IMPORTANT Arbitrarily changing settings in this menu may make the system unstable or inoperative.

Menu Option	Settings		Chipset Features Setup Menu Description
	Setup ***BIOS***	Custom	
Auto Configuration	Enabled		When enabled, this option selects predetermined optimal chipset settings, and many options in the Chipset Features Setup menu are no longer available. When disabled, chipset settings are those that are stored in CMOS RAM.
EDO DRAM Speed Selection	60 nS		The value of this option corresponds to the speed of EDO DRAM.
EDO CASx# MA Wait State	2		This option inserts one additional wait state before assertion of the first CASx# for page hit cycles. This allows one additional clock of MA setup time to the CASx# for the leadoff page hit cycle.
EDO RASx# Wait State	1		This option inserts one additional wait state before RAS# is asserted for row misses. This allows one additional MAX [13:0] setup time to RASx# assertion. This option applies only when EDO DRAM is installed
SDRAM Control by	SPD *Manual*		This option setting lets you change the SDRAM RAS-to-CAS Delay, the SDRAM RAS Precharge Timer, and the SDRAM CAS Latency Timer. The SPD setting is 2. The Manual setting is 3.
SDRAM RAS-to-CAS Delay	2 *3*		This option sets the number of DCLKs between Row Activate command and a read or write command. See the SDRAM Control menu option above. CAUTION Changing the Setup default value will make the system unstable or inoperative.
SDRAM RAS Precharge Time	2 *3*		This option sets the number of cycles it takes for RAS to accumulate its charge before refresh. Insufficient time will cause the DRAM to lose data. See the SDRAM Control menu option above. CAUTION Changing the Setup default value will make the system unstable or inoperative**.**

Menu Option	Settings		Chipset Features Setup Menu Description
	Setup ***BIOS***	Custom	
SDRAM CAS Latency Time	*2* *3*		This option sets the number of CLKs from the time SDRAM samples a read command to when the controller samples the read data from the SDRAM. See SDRAM Control above. CAUTION Changing the Setup default value will make the system unstable and inoperative. NOTE: Whenever the CMOS battery loses power, or when you add memory to the SBC, the following message could occur at boot-up: Suggested SDRAM CAS Latency is "x" Where "x" is either "2" (for PC100 SDRAM) or "3" (for PC66 or PC133 SDRAM). Section 7.4 on page 62 outlines the procedure for eliminating this message.
SDRAM Precharge Control	Disabled		When this option is enabled, all CPU cycles to SDRAM result in an All Banks Precharge Command on the SDRAM interface. CAUTION Changing the Setup default value will make the system unstable and inoperative.
System BIOS Cacheable	Disabled		When enabled, this option allows caching of system BIOS ROM at F0000–FFFFF for increased system performance. However, if any other device writes to this address range, a system error will result.
Video BIOS Cacheable	Disabled		When enabled, this option allows caching of video BIOS ROM at C0000–C7FFF for increased video performance. However, if any other device writes to this address range, a system error will result.
Video RAM Cacheable	Disabled		When enabled, this option allows caching of video RAM at A0000–AFFFF for increased video performance. However, if any other device writes to this address range, a memory-access error will result.
8 Bit I/O Recovery Time	1 *3*		The I/O recovery mechanism adds bus clock cycles between PCI-originated 8-bit I/O cycles that are going to the slower ISA.
16 Bit I/O Recovery Time	1 *2*		The I/O recovery mechanism adds bus clock cycles between PCI-originated 16-bit I/O cycles that are going to the slower ISA.
Memory Hole At 15M–16M	Disabled		When this option is enabled, the main memory from 15 MB to 16 MB is reserved for the ROM of older ISA-type controllers, and the area is not available for caching. Refer to your ISA-controller's documentation to find out if it needs this main-memory area.
Passive Release	Enabled		When enabled, CPU-to-PCI bus accesses are allowed during passive release. When disabled the arbiter accepts only PCI master-to-local DRAM access.
Delayed Transaction	Disabled		The chipset has an embedded 32-bit posted write buffer to support delay transactions cycles. Select Enabled to support PCI Specification 2.1 compliance.
AGP Aperture Size	64		The size of the AGP's aperture in megabytes. The AGP aperture is a block of PCI memory addresses used specifically for graphics data. Processor cycles that access this aperture are forwarded to the AGP chip without translation.
CPU High Temp Limit	85°C/185°F		The temperature at which the system begins throttling the CPU (read only).
LM87 CPU Temp	_ °C / _°F		The *CPU* temperature in degrees centigrade and Fahrenheit (read only) as reported by the LM87 monitor sensor.
LM87 Curr Sys. Temp.	_ °C / _°F		The *system* temperature in degrees centigrade and Fahrenheit (read only) as reported by the LM87 monitor sensor.
LM87 Current CPUFANx Speed	_ RPM		The CPUFAN1 and CPUFAN2 speeds in revolutions per minute (rpm, read only) as reported by LM87.
2.5V:	_ V		The voltage reading of the 2.5 V subsystem (read only) as reported by LM87.
3.3V:	_ V		The voltage reading of the 3.3 V subsystem (read only) as reported by LM87.
5.0V:	_ V		The voltage reading of the 5 V subsystem (read only) as reported by LM87.
12V:	_ V		The voltage reading of the 12 V subsystem (read only) as reported by LM87.
-12V:	_ V		The voltage reading of the –12V subsystem (read only) as reported by LM87.

3.8 Power Management Setup (menu screen)

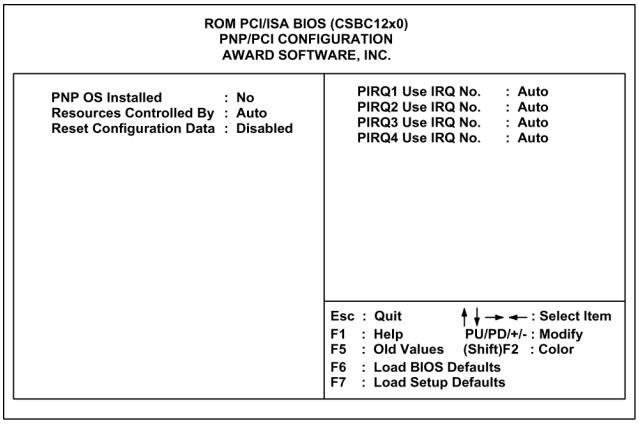


If you change any of these option settings, record your choice in the Custom settings column of the table. Knowing the custom settings will make it easier if the CMOS fails and loses the settings.

Menu Option	Settings		Power Management Setup Menu Description
	Setup ***BIOS***	Custom	
ACPI function	Disabled *Enabled*		Enable this option only if your operating system supports the Advanced Configuration and Power Interface (ACPI) specification.
Power Management	User Define		The option selects the degree of power savings for Doze, Standby, and Suspend modes. The following are the optional settings: Max Saving — Maximum power savings available only for SL CPUs. Inactivity period is 1 minute for each mode. User Define — Set each mode individually. Select time-out periods for Doze Mode, Standby Mode, and Suspend Mode below. Min Saving — Minimum power savings. Inactivity period is 1 hour for each mode.
PM Control by APM	Yes		Select Yes for better power-saving operation if the operating system supports Advanced Power Management (APM); otherwise, select No.
Video Off Method	V/H SYNC + Blank		This option selects the way the video is “blanked.” (Do not confuse this option with the screen-save mode supported by most operating system software.) The following are the optional settings: V/H SYNC + Blank — System turns off vertical and horizontal synchronization ports and writes blanks to the video buffer. DPMS Support — Select this option if your monitor supports the Display Power Management Signaling (DPMS) standard of the Video Electronics Standards Association (VESA); then, choose video power management values through the software supplied with your video controller. Blank Screen — System writes only blanks to the video buffer
Video Off After	Standby		This option selects the mode in which the video display screen goes blank. The options are Doze, Standby, and Suspend. (See these menu options below.)
Doze Mode	Disable		If the Power Management setting is User Defined and the system is inactive for this time-period setting, the board’s CPU clock throttles to a duty cycle less than 100%. (See the Throttle Duty Cycle menu option for the duty-cycle percentage settings.) The system inactivity time-period settings are 1, 2,4, 8, 12, 20, 30, and 40 minutes; 1 hour; and Disable. If this mode is disabled, the system skips this mode and enters the Standby mode during inactivity. (See the Standby Mode menu option for more information.)
Standby Mode	Disable		If the Power Management setting above is User Defined and the system is inactive for this time-period setting, the board’s CPU clock stops, disk drives enter an idle state, and the L2 cache enters a power-save mode. All other system devices operate normally. The system inactivity time-period settings are 1, 2,4, 8, 12, 20, 30, 40 minutes, 1 hour, and Disable. If this mode is disabled, the system remains in the previously enabled power-saving mode.
Suspend Mode	Disable		If the Power Management setting above is User Defined and the system is inactive for the time period set here, the chipset enters a hardware suspend mode, which stops the CPU clock and causes other system devices to enter a global power management mode. The system inactivity time-period settings are 1, 2,4, 8, 12, 20, 30, 40 minutes, 1 hour, and Disable. If this mode is disabled, the system remains in one of the previous power-saving modes that is not disabled.

Menu Option	Settings		Power Management Setup Menu Description
	Setup ***BIOS***	Custom	
HDD Power Down	Disable		After this inactivity time-period setting, any IDE drive that is ATA-2 (or later) compliant puts itself into an idle state and then awakens only when accessed. The drive-inactivity time-period setting is 1 to 15 minutes and Disable. (Note that this menu option does not affect SCSI drives.)
Throttle Duty Cycle	62.5%		In Doze mode, the CPU clock runs less than 100% of the time. The percentage is known as the throttle duty cycle. The settings are 12.5%, 25.0%, 37.5%, 50.0%, 62.5%, and 75.0%. (Also see the Doze Mode menu option for the inactivity time-period setting.)
PCI/VGA Act-Monitor	Disabled		When this option is enabled, any video activity restarts the global timer during Standby mode. (Also, see the Standby Mode menu option.).
IRQ[3–7, 9–15], NMI	Disabled		–Reload Global Timer Events– An event occurring for any of these menu options (when they are enabled) restarts the global timer. An event occurring for any of these menu options (when they are disabled) does not restart the global timer.
Primary IDE 0	Disabled		
Primary IDE 1	Disabled		
Secondary IDE 0	Disabled		
Secondary IDE 1	Disabled		
Floppy Disk	Disabled		
Serial Port	Disabled		
Parallel Port	Disabled		

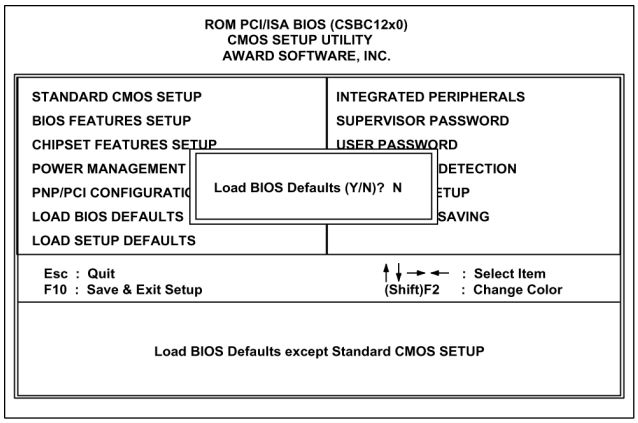
3.9 PNP/PCI Configuration (menu screen)



If you change any of these option settings, record your choice in the Custom settings column of the table. Knowing the custom settings will make it easier to reconfigure your system if the CMOS fails and loses the settings.

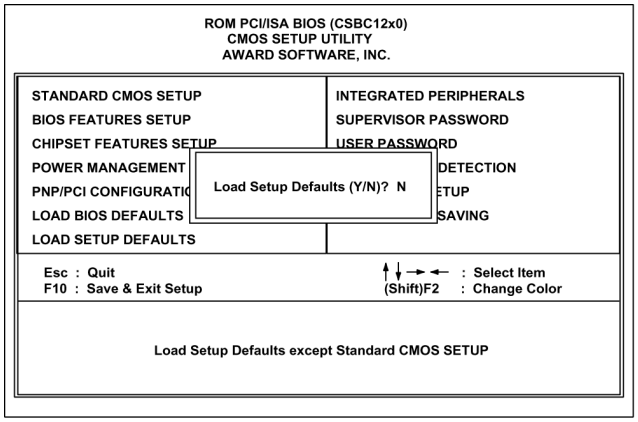
Menu Option	Settings		PNP/PCI Configuration Menu Description
	Setup ***BIOS***	Custom	
PNP OS Installed	No		This option enables Plug-and-Play (PnP) BIOS features. Select Yes if the operating system has the Plug-and-Play feature; select No if it does not.
Resources Controlled By	Auto		When you select Auto, the BIOS automatically configures the IRQ and DMA assignment fields, and the IRQ and DMA fields do not appear in this menu. When you select Manual, the DMA and IRQ fields appear, and you must configure them.
Reset Configuration Data	Disabled		Select Enabled if you install a new add-on device and the resulting new system causes a conflict that will not let the operating system boot; otherwise, select Disabled. Choosing Enabled resets the Extended System Configuration Data (ESCD).
IRQ-*n* Assigned to	PCI/ISA PnP		**When the Resources Controlled By option above is set to Manual**, assign each system interrupt (*n* = 3, 4, 5, 7, 9, 10, 11, 12,14, and 15) according to the type of device using the interrupt. PCI/ISA PnP Choose this setting for devices that are Plug-and-Play compliant, whether designed for PCI- or ISA-bus architecture. Legacy ISA Choose this setting for a device that is PC-AT compliant and requires a specific interrupt (for example, IRQ4 for serial port).
DMA-*n* Assigned to	PCI/ISA PnP		**When the Resources Controlled By option above is set to Manual**, assign each system DMA channel (*n* = 0 – 7) according to the type of device using the interrupt. PCI/ISA PnP Choose this setting for devices that are Plug-and-Play compliant, whether designed for PCI or ISA bus architecture. Legacy ISA Choose this setting for a device that is PC-AT compliant and requires a specific DMA channel.
PIRQ*x* Use IRQ No.	Auto		This option lets you assign IRQ numbers to each PCI slot. When you select Auto, the BIOS assigns the IRQ numbers. The settings for this option are 3 – 15 and Auto.
Used Mem base addr	N/A		This option lets you assign a base address for the memory area used by any device that requires high memory. The settings for this option are C800, CC00, D000, D400, D800, DC00, and N/A.
Used Mem Length	—		**This option disappears and is disabled when the Used Mem base addr option is set to N/A.** The settings for this option are 8K, 16K, and 32K.

3.10 Load BIOS Defaults (Y/N selection)



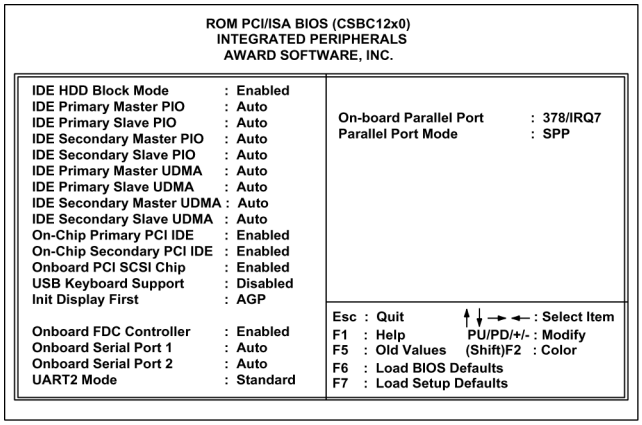
The Load BIOS Defaults entry in the Main Menu screen loads BIOS settings that provide stable system performance, but not necessarily the best system performance. Load them only when the system is operating erratically or when diagnosing BIOS or hardware problems. Choose Y to load the BIOS default settings stored in the BIOS ROM; choose N if you don't want to load these settings. Be aware that some system features may not work when you operate the system using the BIOS default settings.

3.11 Load SETUP Defaults (Y/N selection)



The Load SETUP Defaults entry in the Main Menu screen loads BIOS settings that provide the best system performance. Use this menu entry if you want to reload the Setup defaults without cold-rebooting the system. Choose Y to load the Setup default settings stored in the BIOS ROM; choose N if you don't want to load these settings. Note that the system reloads the SETUP Default settings automatically during a cold reboot if the CMOS becomes corrupted or loses its battery power. Once the system reloads these settings, you must manually enter any custom settings; the system does not reload custom settings.

3.12 Integrated Peripherals (menu screen)



If you change any of these option settings, record your choice in the Custom settings column of the table. Knowing the custom settings will make it easier to reconfigure your system if the CMOS fails and loses the settings.

Menu Option	Settings		Integrated Peripherals Menu Description
	Setup	Custom	
	BIOS		
IDE HDD Block Mode	Enabled		Select Enabled if your IDE drives support block mode; otherwise, select Disabled.
	Disabled		
IDE Primary Master PIO	Auto		These menu options set the PIO mode number for up to four IDE drives. The settings for these options are Auto and Mode 0 – 4. If you select Auto, the system automatically chooses the best PIO mode number for you.
IDE Primary Slave PIO	Auto		
IDE Secondary Master PIO	Auto		
IDE Secondary Slave PIO	Auto		
IDE Primary Master UDMA	Auto		When you select Auto for each of the four IDE drives, the system determines the optimal Ultra 33/DMA data-transfer rate of the drive. When you select Disabled, the drive operates in PIO mode.
	Disabled		
IDE Primary Slave UDMA	Auto		
	Disabled		
IDE Secondary Master UDMA	Auto		
	Disabled		
IDE Secondary Slave UDMA	Auto		
	Disabled		
On-Chip Primary PCI IDE	Enabled		The SBC's Intel 440 BX chipset features a PCI IDE interface that supports two IDE channels: primary and secondary. Select Enabled to activate the channels; select Disabled to deactivate the channels. This option is useful when you install a separate IDE interface add-in board and you need to disable one or both channels.
On-Chip Secondary PCI IDE	Enabled		
Onboard PCI SCSI Chip	Enabled		The SBC has an integrated Ultra2 SCSI adapter. This option lets you enable or disable the adapter. **Note: This option is not available with the CSBC1210.**
USB Keyboard Support	Disabled		Select Enabled if your system has a USB keyboard; otherwise, select Disabled.
Init Display First	AGP		Select AGP to make the AGP display become the primary display. Select PCI Slot to make the video controller installed in a PCI slot become the primary display.
	PCI Slot		
Onboard FDC Controller	Enabled		Select Enabled to use the SBC's integrated floppy disk controller. Select Disabled if you do not want to use the controller. This option is useful when you install an add-in floppy disk controller board and you need to disable the one on the SBC.
Onboard Serial Port 1	Auto		This option selects the logical COM port address for integrated serial ports 1 and 2 (COM1 and COM2). Choose Auto to have the system choose a logical address. Choose Disabled to deactivate the port. The settings for this option are 3F8/IRQ4, 2F8/IRQ3, 3E8/IRQ4, 2E8/IRQ3, Auto, and Disabled.
Onboard Serial Ports 2	Auto		
UART2 Mode	Standard		This option selects an operating mode for serial port 2 (COM2): Standard RS-232C serial port IrDA 1.0 Infrared port compliant with IrDA 1.0 specification ASK IR Amplitude shift keyed infrared port (IrDA-compliant)
Duplex Select	—		This option selects the transmission mode of the infrared port and is not available when the UART2 Mode option is set to Standard. Full allows simultaneous two-direction transmission (full-duplex mode). Half allows transmission in one direction at a time (half-duplex mode). Select the value required by the IR device connected to serial port 2.
TxD, RxD Active	—		This option selects the active logical level of the TxD and RxD signals and is not available when the UART2 Mode option is set to Standard. Refer to the infrared device's documentation to choose the correct setting. The settings for this option are Lo, Lo; Hi, Hi; Hi, Lo; and Lo, Hi
Onboard Parallel Port	378/IRQ7		This option selects the logical LPT port address and corresponding interrupt for the SBC's integrated parallel port. Choose Disabled to deactivate the port. The settings for this option are 3BC/IRQ7, 378/IRQ7, 278/IRQ5, and Disabled
Parallel Port Mode	SPP		This option selects the operating mode for the integrated parallel port. The settings for this option are Normal, EPP1.7+SPP, ECP+EPP1.7, SPP, EPP1.9+SPP, and ECP, ECP+EPP1.9
	ECP+ EPP1.9		
ECP Mode Use DMA	—		This option selects DMA with ECP Mode. It is turned off when the Parallel Port Mode option is set to SPP, EPP1.9+SPP, and Normal. The settings for this option are 1 and 3.
	3		

3.13 Supervisor Password and User Password (selections)

These selections let you create passwords that supervisors (system administrators) or users must enter every time they want to boot the operating system and/or run the CMOS Setup Utility. When properly configured, the supervisor password (which has the highest access-privilege level) prevents users from running the CMOS Setup Utility, where they could inadvertently disable the system by making improper changes. If no passwords are set (i.e. passwords are disabled), anyone can boot the operating system or run the Setup Utility.

The following table serves to simplify the setup of supervisor and user passwords. The table shows the five possible combinations of supervisor-access and user-access privileges. The left side lists the privileges that you can choose for Supervisor Access of the CMOS Setup Utility and for Operating System booting. It also shows the privileges for User Access of the CMOS Setup Utility and for Operating System booting. **Yes** in the column indicates you want the privilege, and **No** indicates that you don't want that privilege.

The following describes each privilege combination listed in the table.

1. Only the supervisor can run the Setup Utility and boot the operating system. No user access.
2. Only the user can run the Setup Utility and boot the operating system. No supervisor access.
3. The supervisor can run the Setup Utility and boot the operating system. The user can boot the operating system and run the Setup Utility to change only the user password. (This is the combination that is chosen most often.)
4. Only the supervisor can run the Setup Utility. Anyone can boot the operating system without entering a password.
5. Only the user can run the Setup Utility. Anyone can boot the operating system without entering a password.

To use the table:

Step	Action
1	Choose one of the five combinations from the left side of the table.
2	Follow the arrow to the right side of the table and create the password and the Security Option for the areas checked. For example, for combination 5, create a User password and select *Setup* for the Security Option

	Required Privileges					Required Settings			
	Supervisor Access		User Access			Password		Security Option	
	Setup	***System***	***Setup***	***System***		***Supervisor***	***User***	***Setup***	***System***
1	Yes	Yes	No	No	➡	✔	–	–	✔
2	No	No	Yes	Yes	➡	–	✔	–	✔
3	Yes	Yes	No	Yes	➡	✔	✔	–	✔
4	Yes	Yes	No	Yes	➡	✔	–	✔	–
5	No	Yes	Yes	Yes	➡	–	✔	✔	–

To enable or disable a supervisor password or user password and set the Security Option, do the following:

Step	Action
1	Select either the Supervisor Password or User Password option from the Setup Utility's Main Menu. The system displays **Enter Password** At this point, you can do one of the following: • Type a new password (which also replaces any password that was previously entered). • Press Enter to disable (or clear) the previous password so that no password is required. • Warm boot the system (Ctrl+Alt+Del) to abort this procedure and leave the previous passwords (and any previous settings that you changed during this session) in effect.
2	Enter a password that has no more than eight characters. The system displays **Confirm Password** If you chose to disable (or clear) the password in the previous step, finish the procedure by pressing Enter. Also, warm booting the system (Ctrl+Alt+Del) now aborts this procedure, leaving the previous passwords (and any previous settings that you changed during this session) in effect.
3	Re-enter the new password to confirm it.
4	Go to the Security Option in the BIOS Features Setup menu and choose one of the following security levels: • System — to prevent unauthorized use of the system and the CMOS Setup Utility • Setup —to prevent unauthorized use of only the CMOS Setup Utility.
5	Save and exit the utility. The new password takes effect. *IMPORTANT* *If you should ever forget the password, refer to the* **Recovering from a Lost Password** *section to find out how to regain use of te system or the CMOS Setup Utility.*

3.14 IDE HDD Autodetection (selection)

With older systems, it was necessary to gather disk drive information such as the number of cylinders, heads, and sectors and then enter this information in the Standard CMOS Setup menu. In current systems, the BIOS can automatically handle this task. To have the BIOS automatically detect the system's hard-disk type and enter the correct information in the Standard CMOS Setup menu, select IDE HDD Autodetection from the Main Menu.

IMPORTANT For optimum disk drive performance, we recommend that you allow the IDE HDD Autodetection selection to enter the disk drive information rather than entering it manually.

3.15 Save & Exit SETUP (selection)

When you are ready to exit the CMOS Setup Utility, choose this selection if you want to save your changes. The system overwrites the previous settings with any changes that you made and stores the settings in CMOS.

3.16 Exit Without Saving (selection)

When you are ready to exit the CMOS Setup Utility, choose this selection if you do not want to save your changes. The system discards any changes that you made and continues to use the previous settings, which are also stored in CMOS.

3.17 Obtaining Beep Codes, BIOS Error Messages, and POST Codes

When you turn on the computer, the POST (power-on self-test) tests the system's hardware. If all tests pass, the system begins to boot the operating system software. If an error occurs, it will fall into one of two categories: fatal and non-fatal.

A **fatal error** halts the system and prevents it from booting. You must resolve the problem before the system will run. Fatal errors often occur before the video display is ready, which prevents the system from displaying a BIOS error message. In this case, the system attempts to tell you what has failed by generating one or more beeps through the system's speaker.

A **non-fatal error** allows the system to continue to run so that it is able to display a BIOS error message. The error message usually gives you an opportunity to repair the problem, or the BIOS will repair it by using default settings.

While the system is running the POST, it generates POST codes (also called port-80 codes). These codes, which are primarily used by system developers for debugging purposes, require special decoder hardware. **Although we list the POST codes here, we do not recommend that you use POST codes for debugging the system.**

The next three tables list BIOS beep codes, BIOS error messages, and POST codes. For additional information about the BIOS firmware, consult the Phoenix website.

Table 3-1 BIOS beep codes

Beep Code	Description
One short beep	No error during POST.
One long beep	Memory problem— A memory chip in the first bank of memory has failed, or the module for the first bank of memory is incorrectly installed.
One long beep, two short beeps	Video problem— The BIOS cannot write error messages to the display monitor. There may be a problem with the video board, video chip, or display monitor.
One long, three short beeps	Video problem— The BIOS cannot access the video system. There may be a problem with the video board or video chip.
One long, three short beeps, with system halt	Keyboard controller error.
Two short beeps with PRESS F1 KEY TO CONTINUE	Non-fatal error.
Continuous beeping (no specific pattern)	SBC problem— Single-board computer failure or cannot access the disk drive (possibly due to poor cable connections or incorrect jumper settings).

Table 3-2 BIOS error messages

Message	Error Description
BIOS ROM checksum error - System halted	The BIOS code's checksum is incorrect. The BIOS ROM's code may be corrupted. Contact us as described in the Preface.
CMOS battery failed	The CMOS battery has failed. Contact us as described in the Preface.
CMOS checksum error - Defaults loaded	The system has loaded the SETUP Defaults. A checksum error often indicates that CMOS is corrupted (often caused by a weak battery). Check the battery and replace it if necessary.
CPU at nnnn	Displays the running speed of the CPU.
Press ESC to skip memory test	Press Esc to skip the full memory test.
Floppy disk(s) fail	Cannot find or initialize the floppy drive controller or the floppy drive. Make sure the controller is installed correctly. If the system does not have a floppy drive, make sure the Drive A and the Drive B menu options in the Standard CMOS Setup menu are set to None.
HARD DISK initializing Please wait a moment...	Some hard drives require extra time to initialize.
HARD DISK INSTALL FAILURE	Cannot find or initialize the hard drive controller or the hard drive. Make sure the controller is installed correctly. If the system does not have a hard drive, make sure the Hard Disks menu option in the Standard CMOS Setup menu is set to None.
Hard disk(s) diagnosis fail	The system may run specific disk diagnostic routines. This message appears if one or more hard disks return an error when the diagnostics run.
Keyboard error or no keyboard present	Make sure the keyboard is attached correctly and that no keys are pressed during the POST. To operate the system without a keyboard, set the Halt On menu option in the Standard CMOS Setup menu to HALT ON ALL, BUT KEYBOARD. With this setting, the BIOS does not check for a keyboard during the POST.
Keyboard is locked out - Unlock the key	When displayed during the POST keyboard test, this message usually indicates that one or more keys are pressed. Be sure no objects are resting on the keys during the keyboard test.
Memory Test:	This message displays during a full memory test, and it counts down the memory areas that the POST is testing.
Memory test fail	If the POST detects an error during memory testing, additional information appears, giving specifics about the type and location of the memory error.
Override enabled - Defaults loaded	The system cannot boot using the current CMOS configuration. The BIOS has loaded the BIOS Defaults settings. These settings provide the most stable, minimal-performance system operation.
Press TAB to show POST screen	Press the Tab key to display the POST messages rather than the Carlo Gavazzi corporate screen banner.
Primary master hard disk fail	The POST detects an error in the primary master IDE hard drive.
Primary slave hard disk fail	The POST detects an error in the secondary master IDE hard drive.
Resuming from disk, Press TAB to show POST screen	This message may appear when the operator re-starts the system after a save-to-disk shutdown. See the Press TAB message above for a description of this feature.
Secondary master hard disk fail	The POST detects an error in the primary slave IDE hard drive.
Secondary slave hard disk fail	The POST detects an error in the secondary slave IDE hard drive.

Table 3-3 POST codes

Code	Meaning
C0	1.Turn off OEM specific cache, shadow 2.Initialize standard devices with default values: DMA controller (8237) Programmable Interrupt Controller (8259) Programmable Interval Timer (8254) RTC chip
C1	Auto detection of onboard DRAM & Cache
C3	1.Test the first 256K DRAM 2.Expand the compressed codes into temporary DRAM area, including the compressed system BIOS & Option ROMs
C5	Copy the BIOS from ROM into E000FFFF shadow RAM so that POST will go faster
01-02	Reserved
03	Initialize EISA registers (EISA BIOS only)
04	Reserved
05	1.Keyboard Controller Self Test 2.Enable Keyboard Interface
06	Reserved
07	Verifies CMOS's basic R/W functionality
BE	Program default values into chipset according to the MODBINable Chipset Default Table
09	1.Verify type of CPU is right for this board (or, program configuration register of Cyrix CPU according to the MODBINable Cyrix Register Table). 2.Check the type of video memory present (OEM specific cache initialization)
0A	1.Initialize the first 32 interrupt vectors with corresponding interrupt handlers Initialize INT No from 33120 with Dummy (Spurious) interrupt handler 2.Issue CPUID instruction to identify CPU type 3.Early Power Management initialization (OEM specific)
0B	1.Verify validity of RTC time 2.Detect bad battery 3.Read CMOS data into BIOS stack area 4.PnP initializations including (PnP BIOS only) Assign CSN to PnP ISA card Create resource map from ESCD 5.Assign IO & Memory for PCI devices (PCI BIOS only)
0C	Initialization of the BIOS data area (40:040:FF)
0D	1.Program some of the chipset's values according to setup (early setup value program). 2.Measure CPU speed for display and decide the system clock speed 3.Video initialization including Monochrome, CGA, EGA/VGA. If no display device is found, the speaker will beep.
0E	1.Initialize the APIC (MultiProcessor BIOS only) 2.Test video RAM (If Monochrome display device found) 3.Show message including: Award logo Copyright string BIOS date code & Part No OEM specific sign on messages Energy Star logo (Green BIOS only) CPU brand, type & speed
0F	DMA channel 0 test
10	DMA channel 1 test
11	DMA page registers test
12-13	Reserved
14	Test 8254 timer 0 counter 2
15	Test 8259 interrupt mask bits for channel 1
16	Test 8259 interrupt mask bits for channel 2
17	Reserved

Code	Meaning
19	Test 8259 functionality
1A-1D	Reserved
1E	If EISA NVM checksum is good, execute EISA initialization (EISA BIOS only)
1F-29	Reserved
30	Get base memory & extended memory size
31	1.Test base memory from 256K to 640K 2.Test extended memory from 1M to the top of memory
32	1.Display the Award Plug & Play BIOS extension message (PnP BIOS only) 2.Program all onboard super I/O chips (if any), including COM ports, LPT ports, and FDD port, according to setup value
33-3B	Reserved
3C	Set flag to allow users to enter CMOS setup utility
3D	1.Initialize keyboard 2.Install PS2 mouse
3E	Try to turn on level 2 cache Note: Some chipsets may need to turn on the L2 cache in this stage. Usually, the cache is turned on later in Post 61h
3F-40	Reserved
BF	1.Program the rest of the chipset's value according to setup (later setup value program) 2.If auto configuration is enabled, programmed the chipset with predefined values in the MODBINable AutoTable
41	Initialize floppy disk drive controller
42	Initialize hard drive controller
43	If it is a PnP BIOS, initialize serial & parallel ports
44	Reserved
45	Initialize math coprocessor
46-4D	Reserved
4E	If there is any error detected (such as video, KB....), show all the error messages on the screen & wait for user to press <F1> key
4F	1.If password is needed, ask for password 2.Clear the Energy Star logo (Green BIOS only)
50	Write all the CMOS values currently in the BIOS stack back into the CMOS
51	Reserved
52	1.Initialize all ISA ROMs 2.Later PCI initializations (PCI BIOS only): Assign IRQ to PCI devices Initialize all PCI ROMs 3.PnP initializations (PnP BIOS only): Assign IO, Memory, IRQ & DMA to PnP ISA devices Initialize all PnP ISA ROMs 4.Program shadow RAM according to setup utility settings 5.Program parity according to setup utility setting 6.Power Management initialization: Enable/Disable global PM APM interface initialization
53	1.If not using a PnP BIOS, initialize serial and parallel ports 2.Initialize time value in BIOS data area by translating the RTC time value into a timer tick value
54-5F	Reserved
60	Set up virus protection (boot sector protection) functionality according to setup utility setting
61	1.Try turning on level 2 cache (if L2 cache already turned on in post 3D, this part will be skipped) 2.Set the boot-up speed 3.Last chance for chipset initialization 4.Last chance for Power Management initialization (Green BIOS only) 5.Show the system configuration table
62	1.Setup daylight saving according to setup values 2.Program the NUM lock, typematic rate & typematic speed according to setup utility setting

Code	Meaning
63	1.If there are any changes in the hardware configuration, update the ESCD information (PnP BIOS only) 2.Clear any memory that has been used 3.Boot system via INT 19h
88	CPU failed to initialize
FF	Boot

❒ ❒ ❒

About the SCSI BIOS Firmware 4

IMPORTANT This chapter is not applicable to the CSBC1210 “non-SCSI” version of the SBC.

The SCSI BIOS firmware, which resides in the system BIOS boot-block-protected flash ROM, is the bootable ROM code that manages SCSI hardware devices. The SCSI BIOS works with the board’s system BIOS, extending the standard disk-service routine provided through interrupt INT13.

During boot-time initialization, the SCSI BIOS looks for other types of disk drives (such as IDE drives). If it finds any, it maps its SCSI drives behind these drives. If it doesn’t find other drives, it installs its SCSI drives beginning with the system boot drive. Once this is accomplished, the operating system boots from a drive controlled by the SCSI BIOS.

4.1 Boot Initialization with BIOS Boot Specification (BBS)

The board’s SCSI BIOS supports the BIOS Boot Specification (BBS), which lets you choose the boot device by selecting the drive order. To use this feature, you need to change the *Boot Sequence* option in the BIOS Features Setup menu of the CMOS Setup Utility to “SCSI, A, C.” Exit to continue the boot process.

4.1.1 Booting From a CD-ROM Drive

The board’s SCSI BIOS also supports booting from a CD-ROM drive. The SCSI BIOS assigns a drive letter to the CD-ROM drive based on the type of emulation disk used. There are four types of CD-ROM emulation disks:

- Floppy 1.2 MB emulation disk
- Floppy 1.44 MB emulation disk
- Floppy 2.88 MB emulation disk
- Hard drive emulation disk

For example, if you load a Floppy 1.44 MB emulation CD-ROM disk, then the CD-ROM drive is assigned A:, and any floppy drive in the system is assigned B:.

4.1.2 Disaster-Recovery Boot-From-Tape Support

Disaster-Recovery Boot-from-Tape support is used when a catastrophic event prevents the system from booting from a disk drive. Having this support eliminates the need to reload the operating system, reformat the disk drive, or replace the disk drive to restart the system.

Similar to booting a system with a CD-ROM, disaster-recovery boot-from-tape requires that the tape be written in a particular data format and that a special “$DR” character string be written in the tape headers.

When the BIOS sees the “$DR,” it forces the tape drive into the first position of the boot order, which allows the initial program load to come from the tape drive.

IMPORTANT The board’s SCSI BIOS supports booting from a tape drive as long as the tape drive can emulate a CD-ROM drive and the tape is formatted correctly. Tape drives that emulate a CD-ROM drive can handle CD-ROM commands and return CD-ROM status. Only a few tape-drive manufacturers provide "disaster-recovery boot-from-tape" support.

4.2 Using the SCSI Configuration Utility

The SCSI Configuration Utility is a menu-driven program that lets you change the hardware-configuration settings and save them in the EEPROM. You may need to use the SCSI Configuration Utility to change these settings if:

- you add SCSI devices,
- you need to optimize system performance, or
- there is a conflict between SCSI devices.

4.2.1 Starting the SCSI Configuration Utility

Follow this procedure to start the SCSI Configuration Utility.

Step	Action
1	Turn on the computer and wait until the system displays the message **Press `Ctrl-C` to start Symbios Configuration Utility…**
2	Press CTRL-C as soon as the message appears. The system displays `Please wait, invoking Symbios Configuration Utility...` After a brief pause, your computer monitor displays the Main Menu of the SCSI Configuration Utility.

IMPORTANT If you wait more than 5 seconds to press Ctrl-C, the system will boot the operating system software. If it does and you still want to start the SCSI Configuration Utility, power down the system and begin this procedure again.

4.2.2 Error Messages

These messages may appear during the boot process:

- `Adapter removed from boot order, parameters will be updated accordingly"` — appears when an adapter is removed from the system or relocated behind a PCI bridge.
- `Configuration data invalid, saving default configuration!` — appears if none of the information in the CMOS is valid.
- `Found SCSI Controller not in following Boot Order List, to Add: Press Ctrl-C to start Symbios Configuration Utility...` — appears when less than four adapters are in the boot order and more adapters exist than are shown.

4.3 SCSI Configuration Utility Menus

This section describes the SCSI Configuration Menus:

- Main Menu
- Adapter Properties Menu
- Device Properties Menu
- Boot Adapter List Menu
- Global Properties Menu
- Exit Menu

4.3.1 Using the Menus

The commands used to make configuration changes are shown in the footer area and described in Table 4-1. Settings with black text can be changed; settings with white text cannot.

Table 4-1 Menu Command Keys

Command	Description
F1 = Help	Provides context-sensitive help for the cursor-resident field.
Arrow Keys = Select Item	Moves the cursor up, down, left, or right.
+/- = Change [Item]	Changes items with values in [ ] brackets. Only the numeric keypad '+' and '-' are enabled. When pressed, they toggle a modifiable field to its next relative value. '+' toggles the value up and '-' toggles the value down.
Esc = Abort/Exit	Aborts the current context operation and/or exits the current screen. This option calls an Exit menu.
Home/End = Select Item	Moves the cursor to the start/end of a scrollable field.
Enter = Execute <Item>	Executes options with values in <> brackets. Press Enter to execute the field's associated function.
F2 = Menu	Sets cursor context to the Optional Menu area. Select a menu item and press Enter. This option is available from only the Main and Adapter Properties menus.

4.3.2 Main Menu

When you start the SCSI Configuration Utility, the Main Menu, shown in Figure 4-1, appears. This menu displays a list of installed PCI-to-SCSI host adapters, information about each of them, and a series of other menu options.

At the opening menu, the cursor is on one of the listed adapters. If you need to change the configuration of an adapter, use the arrow keys to highlight the adapter and press **Enter** to call the Adapter Properties Menu. From this menu, you can view and/or change the current settings for that adapter and the SCSI devices attached to it. You can select an adapter only if *Current Status* is "On."

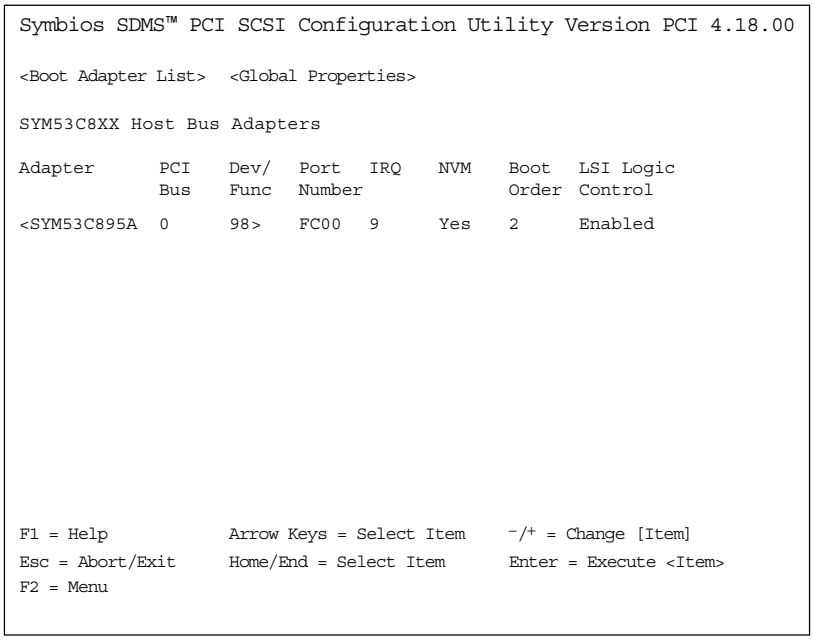


Figure 4-1 Main Menu

Table 4-2 Main Menu Fields

Field	Description
Adapter	Indicates the specific SYM53C8XX Host Adapter.
PCI Bus	Indicates the PCI Bus Number (range 0x00–0xFF, 0–255 decimal) assigned by the system BIOS to an adapter.
Dev/Func	Indicates the PCI Device/Function assigned by the system BIOS to an adapter. The 8-bit value is mapped as follows: Bit #7 6 5 4 3 2 1 0 Bits [7:3]: Device (range 0x00–0x1F, 0–31 decimal) Bits [2:0]: Function (range 0–7)
Port Number	Indicates which I/O port communicates with an adapter, as assigned by the system BIOS.
IRQ	Indicates the Interrupt Request Line used by an adapter, as assigned by the system BIOS.
NVM	Indicates whether an adapter has NVM (NonVolatile Memory) associated with it. An adapter's configuration is stored in its associated NVM. NVM can refer to NVRAM that is resident on a host adapter or to system NonVolatile Storage (NVS).
Boot Order	Indicates the relative boot order (0 to 3) of an adapter. The Symbios SCSI BIOS traverses up to four adapters in the specified order in search of bootable media. To modify this field, access the Boot Adapter List Menu.
LSI Logic Control	Indicates whether an adapter is eligible for LSI Logic Symbios software control or is reserved for control by non-Symbios software.

4.3.3 Adapter Properties Menu

The Adapter Properties menu allows you to view and modify adapter settings as well as the SCSI devices connected to it. To display this menu, select a device in the Adapter field on the Main Menu and press **Enter**. After pressing **Enter**, the following message flashes before the menu appears:

"Initializing the adapters, reading for non-volatile settings, and scanning for devices..."

After a few seconds, the menu appears. Figure 4-2 provides an example of the Adapter Properties menu.

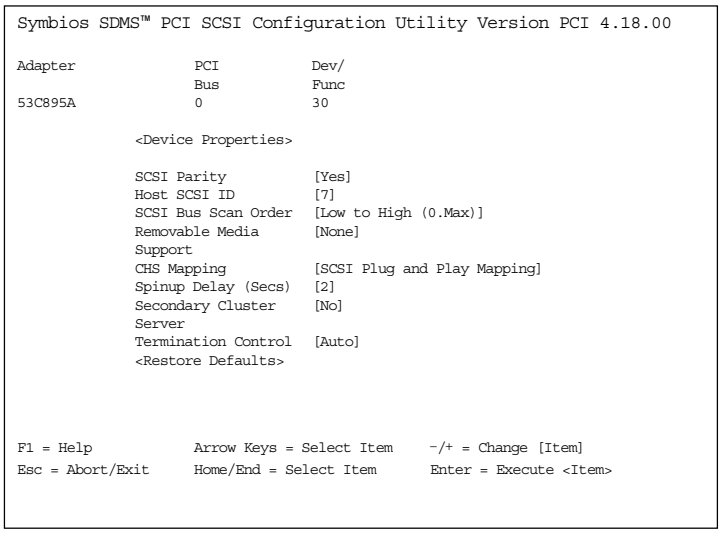


Figure 4-2 Adapter Properties Menu

Table 4-3 Adapter Properties Fields and Descriptions

Field	Field Type [Value]	Description
Device Properties	Executable	Select this option and press Enter to view and modify device properties.
SCSI Parity	Configuration [Yes/No]	Indicates whether SCSI parity is enabled for an adapter. When it is disabled, it is also necessary to disable disconnects for all devices, as parity checking for the reselection phase is not disabled. If a non-parity generating device disconnects, its operation will never complete, as parity errors cause the reselection to fail.
Host SCSI ID	Configuration [0 to 7 / 0 to 15]	Indicates the SCSI identifier of an adapter. It is recommended that this field be set to the highest priority SCSI identifier, which is 7.
SCSI Bus Scan Order	Configuration [Low to High (0 to Max)/High to Low (Max to 0)]	Indicates the order in which to scan SCSI identifiers on an adapter. Changing this item will affect drive letter assignment(s) if more than one device is attached to an adapter.

Table Cont.

Field	Field Type [Value]	Descriptions
Removable Media Support	Configuration [None / Boot Drive Only / With Media Installed]	Specifies the removable media support option for an adapter. Removable media support only applies to devices that report themselves as a hard drive. It does not apply to CD-ROM devices or Magnetic Optical devices. None indicates no removable media support whether the drive is selected as first (BBS), or is first in the scan order (non-BBS). Boot Drive Only provides removable media support for a removable hard drive if it is first in the scan order. With Media Installed provides removable media support regardless of the drive number assignment.
CHS Mapping	Configuration [SCSI Plug and Play Mapping / Alternate CHS Mapping]	Defines how the Cylinder Head Sector (CHS) values are mapped onto a disk without pre-existing partition information. SCSI Plug-and-Play Mapping automatically determines the most efficient and compatible mapping. Alternate CHS Mapping utilizes an alternate, possibly less efficient mapping that may be required if a device is moved between adapters from different vendors. **Caution:** Neither of these options has any effect after a disk has been partitioned using the FDISK command. The FDISK utility is a tool that the user can use to delete partition entries, one or all of them. If all partition entries are deleted, it is necessary to reboot to clear memory or the old partitioning data will be reused, thus nullifying the previous operation. Use care to ensure that the correct disk is the target of an FDISK command.
Spinup Delay (Seconds)	Configuration [1 to 15]	Indicates the delay in seconds between spinups of devices attached to an adapter. Staggered spinups balance the total electrical current load on the system during boot. The default value is 2 seconds.
Secondary Cluster Server	Configuration [Yes / No]	Indicates whether an adapter has one or more devices attached that are shared with one or more other adapters and therefore, the Symbios SCSI BIOS should avoid SCSI bus resets as much as possible. This option allows the user to enable an adapter to join a cluster of adapters without doing any SCSI bus resets. This is a requirement for Microsoft Cluster Server. The default value is No.
Termination Control	Configuration [Auto / Off]	If available, the field indicates whether an adapter has automatic termination control. Auto means that the adapter automatically determines whether it should enable or disable its termination. Auto is the default state unless termination is done manually, in which case, the configuration is Off.
<Restore Defaults>	Executable	Press Enter to obtain default settings.

4.3.4 Device Properties Menu

The Device Properties Menu allows you to view and update individual device settings for an adapter. Changing a setting for the host device (for example, SCSI ID 7) changes the setting for all devices. The scroll indicator on the bottom of the menu shows where the cursor is located (relative to the first and last columns). The example for the Device Properties Menu is split (Figure 4-3 and Figure 4-4) due to the width of its multiple fields/columns.

```
Symbios SDMS™ PCI SCSI Configuration Utility Version PCI 4.18.00


Device Properties

SCSI   Device Identifier    MB     MT     Data   Scan     Scan    Disconnect
ID                          Sec    Sec    Width  ID       LUNs>0

0                           [80]   [40]   [16]   [Yes]    [Yes]   [On]
1                           [80]   [40]   [16]   [Yes]    [Yes]   [On]
2                           [80]   [40]   [16]   [Yes]    [Yes]   [On]
3                           [80]   [40]   [16]   [Yes]    [Yes]   [On]
4                           [80]   [40]   [16]   [Yes]    [Yes]   [On]
5                           [80]   [40]   [16]   [Yes]    [Yes]   [On]
6                           [80]   [40]   [16]   [Yes]    [Yes]   [On]
7      SYM53C895A           [80]   [40]   [16]   [Yes]    [Yes]   [On]
8                           [80]   [40]   [16]   [Yes]    [Yes]   [On]
9                           [80]   [40]   [16]   [Yes]    [Yes]   [On]
10                          [80]   [40]   [16]   [Yes]    [Yes]   [On]
11                          [80]   [40]   [16]   [Yes]    [Yes]   [On]
12                          [80]   [40]   [16]   [Yes]    [Yes]   [On]
13                          [80]   [40]   [16]   [Yes]    [Yes]   [On]
14                          [80]   [40]   [16]   [Yes]    [Yes]   [On]
15                          [80]   [40]   [16]   [Yes]    [Yes]   [On]

F1 = Help            Arrow Keys = Select Item     -/+ = [Change Item]
Esc = Abort/Exit     Home/End = Select Item       Enter = Execute <Item>
```

Figure 4-3 Device Properties Menu (Left Half)

```
Symbios SDMS™ PCI SCSI Configuration Utility Version PCI 4.18.00


Device Properties

SCSI  Device Identifier  SCSI     Queue  Boot    Format     Verify      Restore
ID                       Timeout  Tags   Choice                         Defaults

0                        <10>     [On]   [No]    [Format]   [Verify]    <Defaults>
1                        <10>     [16]   [Yes]   [Format]   [Verify]    <Defaults>
2                        <10>     [On]   [No]    [Format]   [Verify]    <Defaults>
3                        <10>     [On]   [No]    [Format]   [Verify]    <Defaults>
4                        <10>     [On]   [No]    [Format]   [Verify]    <Defaults>
5                        <10>     [On]   [No]    [Format]   [Verify]    <Defaults>
6                        <10>     [On]   [No]    [Format]   [Verify]    <Defaults>
7    SYM53C895A          <10>     [On]   [No]    [Format]   [Verify]    <Defaults>
8                        <10>     [On]   [No]    [Format]   [Verify]    <Defaults>
9                        <10>     [On]   [No]    [Format]   [Verify]    <Defaults>
10                       <10>     [On]   [No]    [Format]   [Verify]    <Defaults>
11                       <10>     [On]   [No]    [Format]   [Verify]    <Defaults>
12                       <10>     [On]   [No]    [Format]   [Verify]    <Defaults>
13                       <10>     [On]   [No]    [Format]   [Verify]    <Defaults>
14                       <10>     [On]   [No]    [Format]   [Verify]    <Defaults>
15                       <10>     [On]   [No]    [Format]   [Verify]    <Defaults>

F1 = Help            Arrow Keys = Select Item     -/+ = Change [Item]
Esc = Abort/Exit     Home/End = Select Item       Enter = Execute <Item>
```

Figure 4-4 Device Properties Menu (Right Half)

Table 4-4 Device Properties Fields

Field	Field Type [Value]	Description
SCSI ID	Information	Device's SCSI Identifier.
Device Identifier	Information	Indicates the ASCII device identifier string, as extracted from the device's inquiry data.
MB/Sec	Information [0/5/10/20/40/80/160]	Indicates the maximum synchronous data transfer rate of the adapter in megabytes per second corresponding to the width and transfer rate settings that follow.
MT/Sec	Configuration [0/5/10/20/40/80]	Indicates the maximum synchronous data transfer rate of the adapter in megatransfers per second. Can be changed to a lower transfer rate.
Data Width	Configuration [8 /16]	Maximum data width in bits. Can be changed to narrower, if available.
Scan ID	Configuration [Yes / No]	Indicates whether to scan for this SCSI identifier at boot time. Utilizing this setting allows you to ignore a device. This decreases boot time by disabling inquiry of unused SCSI identifiers. Set this option to No if there is a device that you do not want to be available to the system. Also, on a bus with only a few devices attached, you can speed up boot time by changing this setting to No for all unused SCSI IDs.
Scan LUNs > 0	Configuration [Yes / No]	Indicates whether to scan for LUNs greater than zero for a device. LUN 0 is always queried. This option should be used if a multi-LUN device responds to unoccupied LUNs or you wish to reduce the visibility of a multi-LUN device to LUN 0 only. Set this option to No if you have problems with a device that responds to all LUNs whether they are occupied. Also, if a SCSI device with multiple LUNs exists on your system but you do not want all of those LUNs to be available to the system, set this option to No. This setting limits the scan to LUN 0.
Disconnect	Configuration [On / Off]	Indicates whether to allow a device to disconnect during SCSI operations. Some (usually newer) devices run faster with disconnect enabled, while some (usually older) devices run faster with disconnect disabled.
SCSI Time-out	Executable [0–9999]	Indicates the maximum allowable time for completion of a SCSI operation in seconds. Since time-outs provide a safeguard that allows the system to recover should an operation fail, it is recommended that a value greater than zero be used. A value of zero allows unlimited time for an operation to complete and could result in a system hang should an operation fail. **Not**e: This field is executable and must be selected with the Enter key. You also input the new value with the number keys from the keyboard rather than the number pad.
Queue Tags	Configuration [On / Off]	This field indicates whether to allow the use of queue tags for a device. Currently the BIOS does not use queue tags. This item specifies queue tag control to higher level device drivers.
Boot Choice	Configuration [Yes / No]	Indicates whether this device can be selected as the boot device. This option is only applicable to devices attached to adapter number zero in the boot list on non-BBS systems. It provides primitive BBS flexibility to non-BBS systems.
Format	Executable	Allows low-level formatting on a disk drive, if enabled. Low-level formatting completely and irreversibly erases all data on the drive. To low level format a device, select the device from the menu and use the arrow keys to move the cursor to the Format column. Press Enter. **Note:** Formatting will default the drive to a 512-byte sector size even if the drive had previously been formatted to another sector size.
Verify	Executable	Allows verification of all sectors on a device and reassigns defective Logical Block Addresses, if enabled. To verify all sectors, select the device from the menu and use the arrow keys to move the cursor to the Verify column. Press Enter.
<Restore Defaults>	Executable	Press Enter to obtain default settings.

4.3.5 Boot Adapter List Menu

The Boot Adapter List Menu specifies the order in which adapters boot when more than one adapter is in a system. Up to four of the total adapters in a system can be selected as bootable. This menu may also list additional adapters in your system that are not bootable; as many as 256 adapters can be listed. To select this menu:

1. Press **F2** while on the Main Menu to move the cursor to the Optional Menu area.
2. Move the cursor to *Boot Adapter List* with the arrow keys.
3. Press **Enter**.

Adapters can be added or deleted by using this menu. To add an adapter to the boot list, press the **Insert** key while on the *Boot Adapter List*. Use the arrow keys to select the desired adapter and press **Enter**. To remove an adapter from the boot list, press the **Delete** key while on the desired adapter in the *Boot Adapter List*. If a new device is added after this utility loads, it can only be seen in the adapter configuration section of this utility after a reboot. **You must exit the utility and restart it for the new device to be seen by the Configuration Utility**.

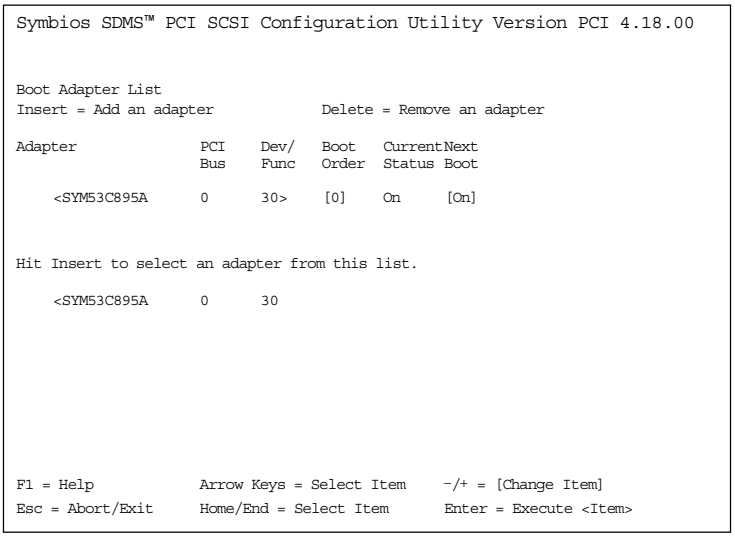


Figure 4-5 Boot Adapter List Menu

Table 4-5 Boot Adapter List Fields and Descriptions

Field	Field Type [Value]	Description
Adapter	Information	Indicates the specific SYM53C8XX Host Adapter.
PCI Bus	Information	Indicates the PCI Bus number (range 0x00–0xFF, 0–255 decimal) assigned by the system BIOS to an adapter.
Dev/Func	Information	Indicates the PCI Device/Function assigned to an adapter. An 8-bit value is mapped as follows: Bit #7 6 5 4 3 21 0 Bits [7:3]: Device (range 0x00–0x1F, 0–31 decimal) Bits [2:0]: Function (range 0–7)
Boot Order	Configuration [0 to 3]	Indicates the relative boot order of the listed adapter. The SCSI BIOS traverses up to four adapters, in the specified order, searching for bootable media.
Current Status	Information	Indicates whether an adapter in the boot list was enabled during the most recent boot. Disabled adapters and their attached devices are ignored by the SCSI BIOS, although they are still visible to the configuration utility.
Next Boot	Configuration [On / Off]	Indicates whether to enable an adapter upon the next boot. The SCSI BIOS ignores disabled adapters and their attached devices although they are still visible to the configuration utility.

4.3.6 Global Properties Menu

The Global Properties Menu allows you to view display boot information and to set display and video modes. Figure 4-6 provides an example of the Global Properties Menu.

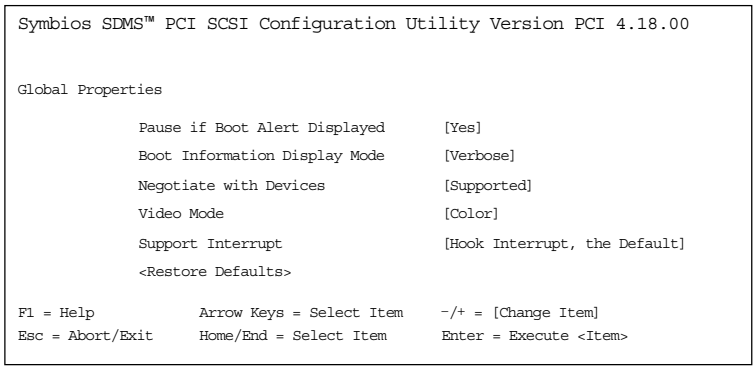


Figure 4-6 Global Properties Menu

Table 4-6 Global Properties Fields

Field	Field Type [Value]	Description
Pause When Boot Alert Displayed	Configuration [Yes / No]	Specifies a pause during the boot for user acknowledgement. The pause occurs after an alert message is displayed. To continue after displaying a message, specify No. To wait for any key after displaying a message, specify Yes.
Boot Information Display Mode	Configuration [Terse / Verbose]	Specifies how much BIOS information displays during boot. To display minimum information, specify **Terse** mode. To display detailed information, specify **Verbose** mode.
Negotiate with Devices	Configuration [All, None, Supported]	Sets the default value for synchronous and wide negotiations with specified devices.
Video Mode	Configuration [Color / Monochrome]	Specifies the default video mode for the SCSI BIOS Configuration Utility. The monochrome setting enhances readability on a monochrome monitor.
Support Interrupt	Configuration for BBS Systems [Hook Interrupt, the default/Bypass Interrupt Hook]	This option allows the ability to prevent a hook on INT40h, if required. The two settings are: Hook Interrupt, the default, and Bypass Interrupt Hook. Hook Interrupt is the normal operation that supports booting CD-ROMS in floppy emulation mode on most machines.
	Fixed for non-BBS systems	On certain platforms, the system BIOS uses the INT40h interrupt chain in a nonstandard way. On these platforms, you should use the “Bypass Interrupt Hook” setting. This setting prevents a hook into the INT40h chain. If the “Bypass Interrupt Hook” setting is used on systems that do not require it, the CD-ROM may fail to boot, and an error message may appear to indicate the system is unable to read the boot device.
<Restore Defaults>	Executable	Press Enter to obtain default settings.

4.3.7 Exit Menu

The Exit Menu for the Configuration Utility is used for all five menus previously described. However, the available functionality is different for the Main Menu and the four subordinate menus. Figure 4-7 provides an example of the Exit Menu.

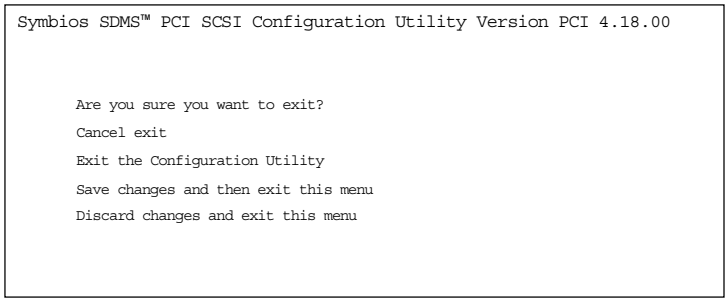


Figure 4-7 Exit Menu

If you are exiting Adapter Properties, Device Properties, Boot Adapter List, or Global Properties, the Exit Menu gives you the following options:

Option	Description
Cancel exit	This option returns you to the previous menu.
Save changes and exit this menu	This option implements any changes you made on the previous menu and returns you to the Main Menu.
Discard changes and exit this menu	This option restores the default settings and returns you to the Main Menu.

If you are exiting the Main Menu, the Exit Menu gives you the following options:

IMPORTANT: You must reboot for the changes you make to take effect.

Option	Description
Cancel exit	This returns you to the Main Menu.
Exit the Configuration Utility	This option exits the configuration and automatically reboots your system.

❐ ❐ ❐

Installing Operating System Device Driver Software

5

Once you verify that the system powers up correctly, you should install the appropriate operating system device driver software.

Device drivers for the following on-board devices and for each operating system that the on-board device currently supports are available on the CG Mupac website (www.gavazzi-mupac.com).

- Intel™ 82559 LAN controller
- Symbios™ 53C895A SCSI host adapter
- Asiliant™ 69030 VGA controller

Instructions for accessing and downloading these drivers are provided on our website (www.gavazzi-mupac.com , "Computer Systems," "Support"). On the Support page, you'll find the link to "Drivers." Click on this link to go to the Drivers page. If your operating system is not listed on our website, contact your operating system manufacturer or CG Mupac for more information.

All three devices named above are Plug-and-Play PCI, so the operating system should automatically detect them. In most cases, when the operating system detects the device, it will prompt you enter the drive and directory into which you downloaded the driver installation file.

❐ ❐ ❐

Using the CompactFlash Module 6

The CompactFlash Module is a 2.325” x 1.125” plug-in board that connects a CF+, Type I or Type II CompactFlash memory card and the SBC to provide additional data storage capacity. The CompactFlash Module allows you to use a CompactFlash card – typically less than half the size of a PC card – much as you would a secondary IDE drive.

CompactFlash cards use electrically-erasable programmable read-only memory (EEPROM) and “flash” technology to store data. Just as a BIOS can be flashed (erased and written electrically), data written to a CompactFlash card is flashed as part of its normal operation; however, the flashing operation is transparent to users. Data written to the CompactFlash card is non-volatile (retained at power-down); therefore, you can read, write, and erase data just as you would with an IDE drive. The CompactFlash Module can be configured as a master or slave device; see the **Jumper Block J3** section for more information.

The CompactFlash connector supports the following devices available from CG Mupac:

- **CompactFlash Card:** CFC-xxx SanDisk™ SDCFB-xxx (xxx MB) + PCB module
- **Microdrives**: MB-1.0GB IBM™ DSCM-11000 1.0 GB Microdrive + PCB module
  MD-512MB IBM™ DSCM-10512 512 MB Microdrive + PCB module

6.1 Installing the CompactFlash Card

Before you install the CompactFlash Module, insert a CompactFlash card into the module. Align the red arrow on the CompactFlash card with the arrow on the CompactFlash Module slot J2 (it’s keyed, so you can’t install it incorrectly) and insert the module into the slot (see figure below).

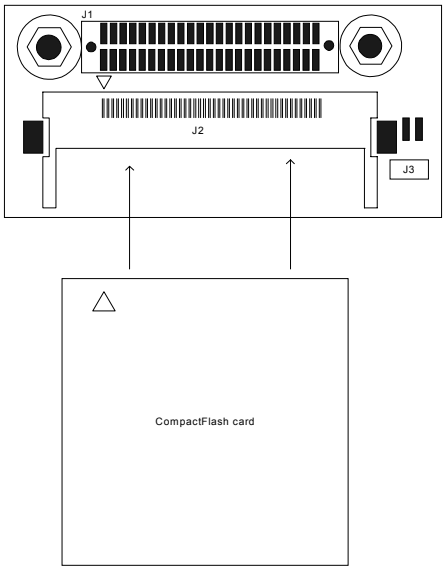


Figure 6-1 Installing the CompactFlash card into the CompactFlash Module

6.2 Jumper Block J3

Jumper Block J3 on the CompactFlash Module is used to configure the CompactFlash card as either a Secondary Master or Secondary Slave IDE 2 device.

- Jumper present – Secondary Master IDE 2 device
- No jumper – Secondary Slave IDE 2 device

Note that J3 uses a miniature jumper; standard jumpers cannot be installed on this jumper block.

A hard drive or CD-ROM can also be connected to the SBC at Connector J2 (Secondary IDE 2) provided its configuration (either master or slave) is different from that of the CompactFlash Module.

6.3 Installing the CompactFlash Module

To install the CompactFlash Module, perform the following:

Step	Action
1	Align the CompactFlash Module Connector J1 and screw posts with Connector J8 on the SBC (the CompactFlash Module will be “upside down”), insert the module, and press firmly.

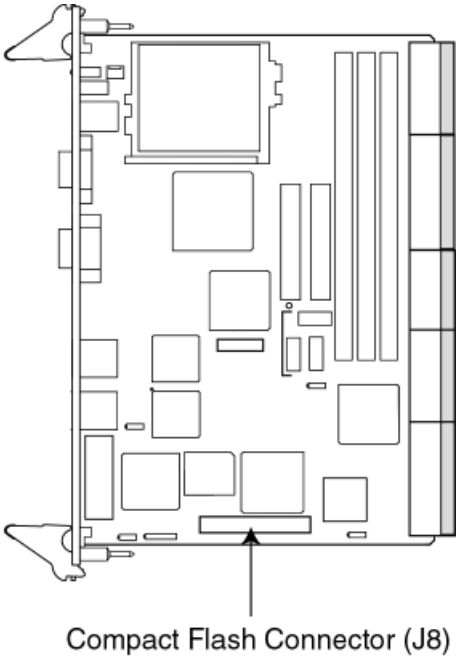


Figure 6-2 J8 location on the SBC

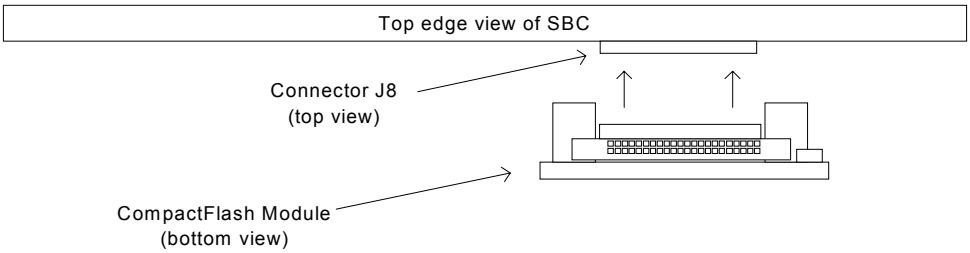


Figure 6-3 Installing the CompactFlash Module

Step	Action
2	Secure the CompactFlash Module to the SBC via two 6-32 screws inserted through the other side of the SBC.

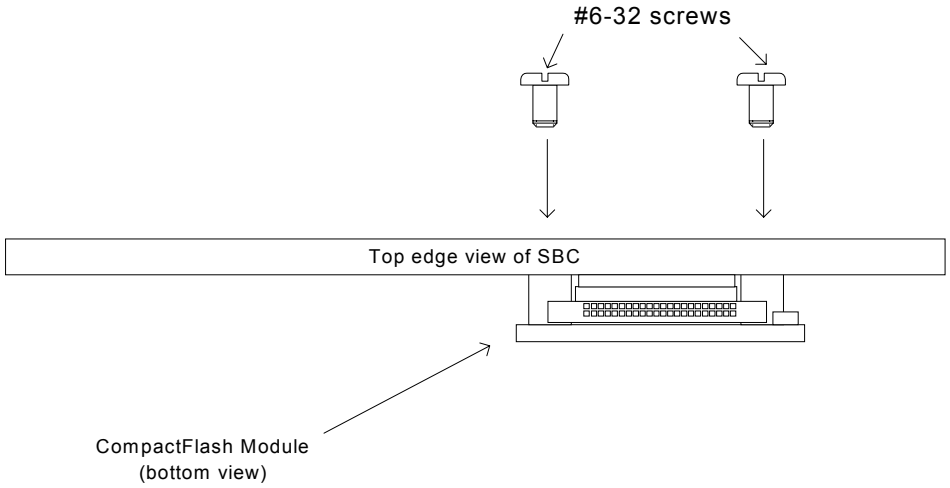


Figure 6-4 Securing the CompactFlash Module to the SBC

Step	Action
3	Boot your system as you normally would.

The CompactFlash Module is now ready for operation as a storage device (IDE hard drive). If you wish to use the CompactFlash Module as a bootable device, read the following section.

6.4 Configuring the CompactFlash Module as a Bootable Device

To be able to boot from the CompactFlash Module, you must

- Format the CompactFlash Card as a bootable device, and
- Use the CMOS Setup Utility to set the system boot sequence to the desired order.

6.4.1 Formatting the CompactFlash Card

The procedure for formatting the CompactFlash card as a bootable device depends on your operating system.

- **If you are running DOS**, type **`format x:/S`** at a system prompt (where **x** is the drive letter for the CompactFlash module).
- **If you are running Windows**, perform the following:

Step	Action
1	Boot your system as you normally would.
2	Access Windows Explorer.
3	Right-click on the CompactFlash Module icon in the “Folders” screen area. A drop-down menu should be displayed.
4	Select Format. The Format menu is displayed.
5	Select “Full” in the Format Type menu.
6	Select “Copy system files” in the “Other options” menu.

Consult your OS documentation for complete information or if you are using a different operating system.

6.4.2 BIOS Configuration for Bootable CompactFlash

When the CompactFlash Module is formatted as a bootable device, and other IDE devices are installed in the system, you must select the desired boot sequence for proper operation.

Step	Action
1	Turn on the system and press the **`Delete`** key immediately to access the CMOS Setup Utility (see Section 3.1 if you need more information on accessing the Setup Utility).
2	Select the BIOS Features Setup menu.
3	Select the *Boot Sequence* option.
4	Select the desired boot sequence.

The table below provides information on setting the boot sequence for your particular system configuration.

Please note the following:

- **Hard Drive Req** – a hard drive must be installed in this position.
- *HD/CDROM OK* – either a CDROM or a hard drive can be installed in this position.
- No Hard Drive – no hard drive should be installed in this position.

Boot Sequence	Primary (IDE 1) Master	Primary (IDE 1) Slave	Secondary (IDE 2) Master	Secondary (IDE 2) Slave
A,C,SCSI	No Hard Drive	No Hard Drive	CompactFlash	HD/CDROM OK
A,C,SCSI	No Hard Drive	No Hard Drive	No Hard Drive	CompactFlash
C,A,SCSI	No Hard Drive	No Hard Drive	CompactFlash	HD/CDROM OK
C,A,SCSI	No Hard Drive	No Hard Drive	No Hard Drive	CompactFlash
C,CDROM,A	CDROM	No Hard Drive	CompactFlash	HD/CDROM OK
C,CDROM,A	CDROM	No Hard Drive	No Hard Drive	CompactFlash
C,CDROM,A	No Hard Drive	CDROM	CompactFlash	HD/CDROM OK
C,CDROM,A	No Hard Drive	CDROM	No Hard Drive	CompactFlash
C,CDROM,A	No Hard Drive	No Hard Drive	CDROM	CompactFlash
CDROM,A,C	CDROM	No Hard Drive	CompactFlash	HD/CDROM OK
CDROM,A,C	CDROM	No Hard Drive	No Hard Drive	CompactFlash
CDROM,A,C	No Hard Drive	CDROM	CompactFlash	HD/CDROM OK
CDROM,A,C	No Hard Drive	CDROM	No Hard Drive	CompactFlash
CDROM,A,C	No Hard Drive	No Hard Drive	CDROM	CompactFlash
D,A,SCSI	Hard Drive Req.	No Hard Drive	CompactFlash	HD/CDROM OK
D,A,SCSI	No Hard Drive	Hard Drive Req.	No Hard Drive	CompactFlash
D,A,SCSI	No Hard Drive	No Hard Drive	Hard Drive Req.	CompactFlash
E,A,SCSI	Hard Drive Req	Hard Drive Req	CompactFlash	HD/CDROM OK
E,A,SCSI	Hard Drive Req	No Hard Drive	Hard Drive Req	CompactFlash
E,A,SCS	No Hard Drive	Hard Drive Req	Hard Drive Req	CompactFlash
F,A,SCSI	Hard Drive Req	Hard Drive Req	Hard Drive Req	CompactFlash
SCSI,A,C	No Hard Drive	No Hard Drive	CompactFlash	HD/CDROM OK
SCSI,A,C	No Hard Drive	No Hard Drive	No Hard Drive	CompactFlash
SCSI,C,A	No Hard Drive	No Hard Drive	CompactFlash	HD/CDROM OK
SCSI,C,A	No Hard Drive	No Hard Drive	No Hard Drive	CompactFlash
C only	No Hard Drive	No Hard Drive	CompactFlash	HD/CDROM OK
C only	No Hard Drive	No Hard Drive	No Hard Drive	CompactFlash
LS/ZIP,C	No Hard Drive	No Hard Drive	CompactFlash	HD/CDROM OK
LS/ZIP,C	No Hard Drive	No Hard Drive	No Hard Drive	CompactFlash

Table 6-1 Valid Boot Sequences for the CompactFlash Module

Replacing Components 7

Follow the procedures in this section to remove and install the processor, a memory module, or the system battery.

7.1 Removing and Installing the Processor Module

Perform this procedure when you want to replace the SBC's processor.

Step	Action
1	Make sure the computer chassis is turned off and its power cord is disconnected from both the power source and from the back of the computer chassis. *WARNING Failure to unplug the computer from the power source may cause personal injury and equipment damage and void the product warranty.*
2	Read, understand, and follow the procedures in the "Preventing ESD damage" section. *CAUTION: Failure to follow these procedures could cause equipment damage and void the product warranty.*
3	Loosen the two captive screws located on the SBC's front panel.
4	Pull out the red locking tabs on the SBC's ejector handles.
5	Press the two board-ejector handles outward, and slide the SBC from the chassis.
6	Disconnect the heat-sink/fan assembly's power cable.
7	Lift the lever on the side of the processor socket, and remove the processor and heat-sink/fan assembly as one unit. If you plan to reuse the heat-sink/fan assembly, remove it from the processor.
8	Make sure the heat sink /fan assembly has a thermal pad attached to it. If you are reusing the heat-sink/fan assembly, also make sure the thermal pad is not damaged. *CAUTION Failure to use either a thermal pad or thermal compound between the heatsink and the processor could cause processor failure.*
9	Attach the heat-sink/fan assembly to the replacement processor.
10	Make sure the lever on the processor socket is raised and then place the processor and heat-sink/fan assembly into the SBC's processor socket. The processor pins align with the holes in the socket so that the assembly drops effortlessly into the socket. Do not force the assembly into the socket.
11	Gently lower the socket lever to lock the assembly in place.
12	Reconnect the heatsink/fan assembly's power cable.
13	Locate the slot in the chassis for the SBC. Refer to the CPCI backplane or chassis documentation to determine the correct slot, or contact the manufacturer if the documentation is not available.
14	Make sure the board's two ejector handles are in the outward (ejected) position.
15	Align the edges of the SBC in the slot guides of the chassis and push the SBC into the chassis until the catches on the ejector handles seat in the slot rails of the chassis.
16	Carefully push the board into the chassis until it seats in the backplane's connectors. Press both ejector handles inward to lock the board in place.
17	Tighten the two captive screws to secure the board in the chassis.
18	Make sure the computer is turned off; then, reconnect the power cord to the back of the computer chassis and to the power source.
19	Power up the system to make sure it runs properly.

7.2 Replacing or Adding a Memory Module

When you replace one of the three memory modules or add a memory module, we recommend that the new module's type (either non-ECC or ECC) and speed (either 66 MHz or 100 MHz) match those already installed on the board. If you plan to install a memory module whose type and speed do not match the ones installed, keep the following in mind:

- You can mix 100 MHz and 66 MHz memory modules on the same SBC only if its host bus is running at 66 MHz.
- You can mix non-ECC and ECC memory modules; however, the system will default to non-ECC operation.
- You can mix memory modules with different CAS latency specifications; however, the system will default to the slower value.

Follow these steps to remove and install a memory module.

Step	Action
1	Make sure the computer chassis is turned off and its power cord is disconnected from both the power source and the back of the computer chassis. *WARNING* *Failure to unplug the computer from the power source may cause personal injury and equipment damage and void the product warranty.*
2	Read, understand, and follow the procedures in the "Preventing ESD damage" section. *CAUTION:* *Failure to follow these procedures could cause equipment damage and void the product warranty.*
3	Loosen the two captive screws located on the SBC's front panel.
4	Pull out the red locking tabs on the SBC's ejector handles.
5	Press the two board-ejector handles outward and slide the SBC from the chassis.
6	Place the board on an antistatic mat.
7	Locate the memory module that you want to remove. Gently push outward on both memory module ejector handles, which are located on the ends of the module socket.
8	Lift the memory module from the socket and place it in an antistatic bag.
9	To install a memory module, locate the empty memory module socket. *IMPORTANT* *If the SBC has only one memory module, we recommend that you install it in the Bank 0 socket (DIMM-1). Refer to Figure B– 1 for its location.*
10	Make sure the memory module ejector handles are in the eject (outward) position.
11	Inspect the contacts in the socket to ensure they are not bent or missing. *IMPORTANT* *Two areas in the socket may appear to have missing pins. Actually, these areas contain the plastic locating and indexing pins that prevent you from installing the wrong type of memory module.*
12	Align the two notches on the memory module's contact edge with the socket's locating/indexing pins.
13	Gently press the memory module into the socket until it is firmly seated.
14	Once the module is seated, push both ejector handles against the ends of the module to lock the module in place.
15	Locate the slot in the chassis for the SBC. Refer to the CPCI backplane documentation or chassis documentation to determine the correct slot for the SBC, or contact the manufacturer if no documentation is available. *CAUTION:* *Failure to follow these procedures could cause equipment damage and void the product warranty.*

Continued from previous page

Step	Action
16	Make sure the board's two ejector handles are in the outward (ejected) position.
17	Align the edges of the SBC in the slot guides of the chassis and push the SBC into the chassis until the catches on the ejector handles seat in the slot rails of the chassis.
18	Carefully push the board into the chassis until it seats in the backplane's connectors. Press both ejector handles inward to lock the board in place.
19	Push each ejector's locking tab until it locks the ejector in place.
20	Tighten the two captive screws to secure the board in the chassis.
21	Make sure the computer is turned off and then reconnect the power cord to the back of the computer chassis and to the power source.
22	Power up the system to make sure it runs properly. *IMPORTANT* *After you add memory, the following message could occur at boot-up:* ***Suggested SDRAM CAS Latency is "x"*** *where "x" is either "2" (for PC100 SDRAM) or "3" (for PC66 or PC133 SDRAM). See Section 7.4 for the procedure to eliminate this message.*

7.3 Replacing the Battery

The system stores basic and custom hardware configuration information, the date, and the time in the battery-backed CMOS. The battery (see Figure B-1 for location), which allows the CMOS to retain this information when system power is turned off, is designed for long life. However, one indication that the battery may be failing is the need to reset the system's date and time each time you power up the system.

If the battery fails, remove the SBC from the chassis (be sure you follow steps 1—6 of the Adding or Replacing the Memory Module procedure), use a small screwdriver to pry the battery gently from its socket, remove the failed battery, and insert a new battery into the socket. Complete the procedure by following steps 15—22 of the Adding or Replacing the Memory Module procedure.

When the battery fails, the board's BIOS firmware ROM automatically loads the Setup default configuration values at powerup. However, because custom hardware configuration settings are lost when the battery fails, custom settings are not loaded. Therefore, to restore optimum system operation and retain the date and time when the system is turned off, replace the battery; then, use the CMOS Setup Utility to change and save any of the hardware-configuration settings that were previously customized.

CAUTION: *The replacement battery must be a UL Recognized component. Suggested OEM part numbers for the replacement battery (20mm Coin Cell, 3 VDC Lithium) are provided below:*

- *Duracell DL2032*
- *Sanyo CR2032*
- *Rayovac CR2032*

CAUTION *If your SBC has a mezzanine board attached to it, do not attempt to replace the battery. Instead, contact us to return the board for battery replacement service. Attempting to replace the battery could damage the SBC or mezzanine board and void the product warranty.*

CAUTION *Discard the old battery according to the battery manufacturer's instructions or contact your local, state, or Federal waste-disposal authority for the correct disposal procedure.*

7.4 Eliminating the "Suggested SDRAM CAS Latency" Error Message

After you add memory to the SBC, or whenever the CMOS battery fails, the following message could occur at boot-up:

```
Suggested SDRAM CAS Latency is "x"
```

where "x" is either "2" (for PC100 SDRAM) or "3" (for PC66 or PC133 SDRAM).

To eliminate this message, follow this procedure:

Step	Action
1	Note the number being suggested as the SDRAM CAS Latency value ("x").
2	Reboot the SBC and enter the CMOS Setup Utility.
3	Open the Chipset Features Setup Menu.
4	Verify *SDRAM Control*, *SDRAM RAS-to-CAS Delay*, *SDRAM RAS Precharge Time*, and *SDRAM Latency Time* based on the suggested SDRAM CAS Latency value ("x"): • If the suggested "x" value is "2", *SDRAM Control* should be set to "SPD," and the other listed options should be set to "2." • If the suggested "x" value is "3," *SDRAM Control* should be set to "Manual," and the other listed options should be set to "3."
5	Close the Chipset Features Setup Menu.
6	Select *Save and Exit Setup*. (IMPORTANT: Select *Save* even if no changes were made.)
7	Verify that the message has been eliminated.

BIOS Crisis Recovery 8

The following explains how to perform a system BIOS crisis recovery. We recommend that a CG Mupac qualified service provider perform these procedures. Contact CG Mupac as outlined in the Preface.

8.1 Downloading the BIOS and the CGFLASH Utility

Before you perform the crisis recovery procedure, download the desired BIOS file, the CGFLASH loader utility, and the CGFLASH Technical Notice from our website (www.gavazzi-mupac.com , "Computer Systems," "Support"). On the support page, you'll find links to "Drivers" (for downloading the BIOS file and CGFLASH utility) and "Documentation" (for downloading the CGFLASH Technical Notice).

8.2 Crisis Recovery Procedure

Follow the procedure in this section if the BIOS becomes corrupted because

- the power failed or the system was turned off while the CGFLASH update loader utility was running, or
- the system halted on a BIOS checksum error during power-up.

IMPORTANT: After the BIOS becomes corrupted and the system halts, wait at least five (5) minutes before attempting the Crisis Recovery procedure below.

Step	Action
1	Using a working computer, format a DOS bootable diskette (a system diskette). Make sure the diskette contains only the COMMAND.COM and IO.SYS files.
2	Copy the CGFLASH.EXE utility and the BIOS file to the root directory (A:\) of the bootable diskette.
3	Create an AUTOEXEC.BAT file on the diskette containing the command line: **`CGFLASH NEWBIOS.BIN /Py /Sn..`** (Substitute the actual filename of the new BIOS file for *NEWBIOS*.)
4	Install this crisis recovery diskette in drive A of the system that contains the corrupted BIOS firmware.
5	Reboot the system to begin the BIOS recovery process (the LED on the floppy drive lights).
6	When the BIOS reprogramming is successful, the system reboots automatically. **Immediately eject the crisis recovery diskette from the drive to prevent the loader utility from running again.**
7	Ensure that the correct BIOS revision is loaded.

8.3 Recovering from a Lost Password

If you cannot boot the system software or start the CMOS Setup Utility because you have forgotten the password, follow the steps in Section 8.2, **Crisis Recovery Procedure**, to clear the CMOS hardware configuration settings (including the supervisor and user passwords).

8.4 Updating BIOS Firmware

Procedures for updating the BIOS firmware using the CGFLASH Utility can be found in the CGFLASH Technical Notice available on our website (see section 8.1 for information).

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Technical Specifications | Appendix A

Power Requirements (Model CSBC1200)

+5 VDC	3.5 A (maximum)
+12 VDC	0.1A
–12 VDC	0.1A
+3.3 VDC	2.15 A

Operating Limits

Ambient temperature	0 °C to 60 °C (32°F to 140 °F)
Relative humidity	5% to 95% at 40°C (104°C), non-condensing
Altitude	4572 m (15,000 ft.)

Non-Operating Limits

Ambient temperature	–40°C to 70°C (-40°F to 158°F)
Relative humidity	0% to 95%, 40°C (104°F), non-condensing
Altitude	15,240 m (50,000 ft.)

Shock and vibration

Shock	Meets IEC 68-2-27 requirements
Vibration	Meets IEC 68-2-6 requirements

Physical

Size	6U high, 8HP wide, 233 mm × 160 mm × 61 mm (9.1 in × 6.2 in × 2.4 in)

Reliability

MTBF	>100,000 hours @ 55ºC (131ºF) MIL-HDBK_217F

Industry Standards

Meets the following:	CE mark, Class A; FCC, class A devices; UL; cUL

Processor (Model CSBC12x0-CXXX)

- Intel Celeron 566, 733, and 850 MHz in an FC-PGA package with zero-insertion force (ZIF) lever
- 128 Kbyte on-chip L2 cache (full core speed)
- 64-bit, 66 MHz system bus

Processor (Model CSBC12x0-PXXXX)

- Intel Pentium III 600, 700, 850 MHz and 1 GHz in an FC-PGA package with zero-insertion force (ZIF) lever
- 256 Kbyte on-chip L2 cache (full core speed)
- 64-bit, 100 MHz system bus

Chip Set

- Intel 440BX AGP set, two-chip set

Main Memory

- Three banks in three 168-pin gold latching DIMM sockets
- Up to 768 Mbytes of 72-bit PC100 DIMMs, ECC level 2
- +3.3 V unbuffered (R) SDRAM

Bus Interfaces

- CompactPCI 32-bit, 33 MHz bus for 3.3 V or 5 V systems
- Proprietary mezzanine board bus with PCI and FD/HD support
- Intel 21150 PCI-to-PCI Bridge with support for 7 REQ/GNT

Input/Output

- Two universal serial buses (USB)
- Two serial ports
- One IEEE 1284 parallel bus
- VGA, 64-bit AGP, 4 MB SDRAM
- LAN (Ethernet) 10Base-T/ 100Base-TX port
- Two channel ATA-4 (Ultra DMA/33) IDE bus
- Ultra2 Wide SCSI bus
- Mouse PS2 6-pin mini-DIN
- Keyboard PS2 6-pin mini-DIN
- Floppy interface

All specifications are subject to change without notice.



Connector Signals and Locations

Appendix B

The following sections list the signals for the connectors located on the single-board computer and the mezzanine board. For the location of the header connectors, refer to Figure B– 1. All connector illustrations are viewed from the front of the connector (the side opposite the conductor connections).

Serial Port COM 1 Connector (J9)

Table B– 1 Signals for the DB9 male serial COM 1 Connector (J9)

Pin	Signals
1	DCD 1
2	RxD 1
3	TxD 1
4	DTR 1
5	GND
6	DSR 1
7	RTS 1
8	CTS 1
9	RI 1

Keyboard and Mouse Connectors (J6A and J6B)

Table B– 2 Signals for 6-Pin Mini-DIN, PS/2 keyboard and mouse connectors, J6A and J6B. (Note that the optional rear I/O transition board has alternate mouse and keyboard connectors.)

J6A - Keyboard	
Pin	**Signal**
1	KBDATA
2	N.C.
3	GND
4	KBPWR
5	KBCLK
6	N.C.

J6B - Mouse	
Pin	**Signal**
1	MSDATA
2	N.C.
3	GND
4	MSPWR
5	MSCLK
6	N.C.

VGA Connector (J7)

Table B– 3 Signals for the DB15 female VGA display connector, J7. (Note that the optional rear I/O transition board has an alternate VGA connector.)

Pin	Signal	Pin	Signal
1	Red	9	+5 V
2	Green	10	GND
3	Blue	11	N.C.
4	N.C.	12	DDC DATA
5	TTL GND	13	HSYNC
6	Red GND	14	VSYNC
7	Green GND	15	DDC CLK
8	Blue GND		

CPU Fan Connector (J17)

Table B– 4 Signals for the 3-pin CPU fan connector (J17).

Pin	Signal (J17)
1	GND
2	+12 V
3	TACH

LAN Connectors (J18-J19)

Table B– 5 Signals for the RJ45 LAN connectors (J18 and J19). Refer to the “LAN Interface” section for a description of the LAN connectors’ built-in status indicators.

Pin	Signal	Pin	Signal
1	+Tx	5	N.C.
2	-Tx	6	-Rx
3	+Rx	7	N.C.
4	N.C.	8	N.C.

Mezzanine Board Connectors (J13, J5, J10, J6, J1 and J2)

Connectors J13 and J10 carry the mass storage device (Primary IDE) signals and primary PCI signals from the SBC to the J5 and J6 connectors on the mezzanine board. Connectors J1 and J2 on the mezzanine board carry the optional secondary PCI bus signals to the backplane. Refer to the table below for the list of J13 and J10 signals and refer to the **CompactPCI Edge Connectors (J1 - J5)** section for the list of signals for the J1 and J2 connectors.

Table B– 6 Signals for the two 100-pin mezzanine board connectors: mass storage device (Primary IDE) signal connector J13 (J5) and primary PCI bus signal connector J10 (J6).

Primary IDE Signal Connector , J13 (J5)				
Pin	**A**	**B**	**C**	**D**
25	Reserved	Reserved	Reserved	Reserved
24	Reserved	Reserved	Reserved	Reserved
23	Reserved	Reserved	Reserved	Reserved
22	Reserved	Reserved	Reserved	Reserved
21	Reserved	Reserved	Reserved	Reserved
20	Reserved	Reserved	Reserved	Reserved
19	+3.3V	+3.3V	+3.3V	+3.3V
18	+12V	+12V	GND	GND
17	GND	GND	GND	GND
16	+5V	+5V	+5V	+5V
15	+5V	+5V	Reserved	PD_IRQ
14	PD_LED	IDE_RESET#	PD_CS1#	PD_CS3#
13	PD_DACK#	PD_DREQ	PD_IORDY	PD_IOW#
12	PD_A0	PD_A1	PD_A2	PD_IOR#
11	GND	GND	GND	GND
10	PD_D12	PD_D13	PD_D14	PD_D15
9	PD_D8	PD_D9	PD_D10	PD_D11
8	PD_D4	PD_D5	PD_D6	PD_D7
7	PD_D0	PD_D1	PD_D2	PD_D3
6	GND	GND	GND	GND
5	FD_DIR#	FD_WDATA#	FD_RDATA#	Reserved
4	FD_WGATE#	Reserved	FD_DRVEN0	FD_DRVEN1
3	FD_DSKCHG#	FD_DS0#	FD_WRTPT#	FD_MTR0#
2	FD_INDEX#	FD_STEP#	FD_TRK0#	FD_HDSEL#
1	GND	GND	GND	GND

Primary PCI Bus Signal Connector, J10 (J6)				
Pin	**A**	**B**	**C**	**D**
25	ENUM#	PRST#	SYSEN#	TCK
24	TMS	TDO	TDI	TRST#
23	P_AD0	P_AD1	P_AD2	P_AD3
22	P_AD4	P_AD5	P_AD6	P_AD7
21	GND	GND	GND	P_C/BE[0]#
20	P_AD8	P_AD9	P_AD10	P_AD11
19	P_AD12	P_AD13	P_AD14	P_AD15
18	P_C/BE[1]#	GND	GND	GND
17	P_AD16	P_AD17	P_AD18	P_AD19
16	P_AD20	P_AD21	P_AD22	P_AD23
15	GND	GND	GND	P_C/BE[2]#
14	P_AD24	P_AD25	P_AD26	P_AD27
13	P_AD28	P_AD29	P_AD30	P_AD31
12	GND	P_C/BE[3]#	GND	GND
11	P_SERR#	GND	P_PAR	P_PERR#
10	GND	P_IDSEL	SBO#	P_LOCK#
9	P_DEVSEL#	SDONE	GND	P_TRDY#
8	GND	P_FRAME#	P_IRDY#	GND
7	P_REQ#	GND	GND	P_STOP#
6	DEG#	GND	P_CLK	GND
5	FAL#	P_RST#	GND	P_GNT#
4	+5V	+5V	+5V	+5V
3	INTA#	INTB#	INTP	INTS
2	GA4	GND	INTC#	INTD#
1	GA0	GA1	GA2	GA3

Mezzanine Board Floppy Drive Connector (J3)

Table B– 7 Signals for mezzanine board floppy drive connector (J3)

Pin	Signals	Pin	Signals
1	5V	18	DIR
2	0	19	GND
3	GND	20	Step
4	N.C.	21	GND
5	GND	22	WDATA
6	DRVDEN1	23	GND
7	GND	24	WGATE
8	Index	25	GND
9	GND	26	TRK0
10	MTRON 0	27	GND
11	GND	28	WRTPRT
12	DS1 (N.C.)	29	GND
13	GND	30	RDATA
14	DS0	31	GND
15	GND	32	HDSEL
16	MTRON 1 (N.C.)	33	GND
17	GND	34	DSKCHG

Mezzanine Board IDE Drive Connector (J4)

Table B– 8 Signals for mezzanine board IDE drive connector (J4)

Pin	Signals	Pin	Signals
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	NC
21	DRQ0	22	GND
23	IOW	24	GND
25	IOR	26	GND
27	IORDY	28	GND
29	DACK0	30	GND
31	IRQ14	32	N.C.
33	AD1	34	N.C.
35	AD0	36	AD2
37	CS 0	38	CS 1
39	DASP	40	GND
41	5V Logic	42	5V Motor
43	GND	44	N.C.

CompactPCI Edge Connectors (J1–J5)

The SBC complies with the CompactPCI connector design. It provides PCI signals to the CPCI backplane through its J1and J2 connectors, and provides proprietary signals to a rear I/O transition board through its J3, J4, and J5 connectors. The SBC connects to all CPCI backplanes that support the J4 telecom H.110 signals. The following tables list signals for these edge connectors. Refer to Figure B-1 for the location of the connectors on the SBC.

Table B– 9 CompactPCI Connector J1 (signals for 32-bit PCI bus)

Pin	F	E	D	C	B	A
25	GND	+5V	3.3V	ENUM#	REQ64#	+5V
24	GND	ACK64#	S_AD0	S_VIO	+5V	S_AD1
23	GND	S_AD2	+5V	S_AD3	S_AD4	3.3V
22	GND	S_AD5	S_AD6	3.3V	GND	S_AD7
21	GND	S_C/BE0#	M66EN	S_AD8	S_AD9	3.3V
20	GND	S_AD10	S_ AD11	S_VIO	GND	S_AD12
19	GND	S_AD13	GND	S_AD14	S_AD15	3.3V
18	GND	S_C/BE1#	S_PAR	3.3V	GND	S_SERR#
17	GND	S_PERR#	GND	SBO#	SDONE	3.3V
16	GND	S_LOCK#	S_STOP#	S_VIO	GND	S_DEVSEL#
15	GND	S_TRDY#	BD_SEL#	S_IRDY#	S_FRAME#	3.3V
14	KEY					
13						
12						
11	GND	S_C/BE2#	GND	S_AD16	S_AD17	S_AD18
10	GND	S_AD19	S_AD20	3.3V	GND	S_AD21
9	GND	S_AD22	GND	S_AD23	S_IDSEL	S_C/BE3#
8	GND	S_AD24	S_ AD25	SV_IO	GND	S_AD26
7	GND	S_AD27	GND	S_AD28	S_AD29	S_AD30
6	GND	S_AD31	S_CLK0	3.3V	GND	S_REQ0#
5	GND	S_GNT0#	GND	S_RST#	BRSVP1B5	BRSVP1A5
4	GND	INTS	INTP	S_VIO	HEALTHY#	BRSVP1A4
3	GND	INTD#	+5V	INTC#	INTB#	INTA#
2	GND	TDI	TDO	TMS	+5V	TCK
1	GND	+5V	+12V	TRST#	-12V	+5V

Table B– 10 CompactPCI Connector J2 (additional signals for 64-bit PCI bus)

Pin	F	E	D	C	B	A
22	GND	GA0[1]	GA1[1]	GA2[1]	GA3[1]	GA4[1]
21	GND	RSV	RSV	RSV	GND	S_CLK6
20	GND	RSV	GND	RSV	GND	S_CLK5
19	GND	RSV	RSV	RSV	GND	GND
18	GND	BRSVP2E18	GND	BRSVP2C18	BRSVP2B18	BSRVP2A18
17	GND	S_GNT6#	S_REQ6#	PRST#[1]	GND	BSRVP2A17
16	GND	BRSVP2E16	GND	DEG#[1]	BRSVP2B16	BSRVP2A16
15	GND	S_GNT5#	S_REQ5	FAL#[1]	GND	BSRVP2A15
14	KEY	S_AD32[1]	GND	S_AD33[1]	S_AD34[1]	S_AD35[1]
13	KEY	S_AD36[1]	S_AD37[1]	S_VIO	GND	S_AD38[1]
12	KEY	S_AD39[1]	GND	S_AD40[1]	S_AD41[1]	S_AD42[1]
11	GND	S_AD43[1]	S_AD44[1]	S_VIO	GND	S_AD45[1]
10	GND	S_AD46[1]	GND	S_AD47[1]	S_AD48[1]	S_AD49[1]
9	GND	S_AD50[1]	S_AD51[1]	S_VIO	GND	S_AD52[1]
8	GND	S_AD53[1]	GND	S_AD54[1]	S_AD55[1]	S_AD56[1]
7	GND	S_AD57[1]	S_AD58[1]	S_VIO	GND	S_AD59[1]
6	GND	S_AD60[1]	GND	S_AD61[1]	S_AD62[1]	S_AD63[1]
5	GND	S_PAR64[1]	S_C/BE4#[1]	S_VIO	64EN[2]	S_C/BE5#
4	GND	S_C/BE6#[1]	GND	S_C/BE7#[1]	BRSVP2B4	S_VIO
3	GND	S_GNT4#	S_REQ4#	S_GNT3#	GND	S_CLK4
2	GND	S_REQ3#	S_GNT2#	SYSEN#[1]	S_CLK3	S_CLK2
1	GND	S_REQ2#	S_GNT1#	S_REQ1#	GND	S_CLK1

[1]Not used in design [2]Under Investigation RSV=Reserved BRSV=Bussed Reserved

Table B– 11 CompactPCI Connector J3 (proprietary rear I/O signals)

Pin	F	E	D	C	B	A
19	GND	VGA_BLU	GND	VGA_CLK	LAN1_SPDLED	LAN1_RX-
18	GND	GND	VGA_GREEN	VGA_DATA	LAN2_LNKLED	LAN1_RX+
17	GND	VGA_RED	GND	+5V	LAN1_LNKLED	LAN1_TX-
16	GND	GND	VGA_HSYNC	VGA_VSYNC	GND	LAN1_TX+
15	GND	SP2_TXD	SP2_CTS	SP2_DSR	SP2_RI	GND
14	GND	SP2_RXD	SP2_RTS	SP2_DTR	SP2_DCD	LAN2_RX-
13	GND	GND	GND	GND	GND	LAN2_RX+
12	GND	SC_MSG_M	SC_ACK_M	SC_DIFFSENSE	SC_TRMPWR	LAN2_TX-
11	GND	SC_MSG_P	SC_ACK_P	LAN1_SPDLED	SC_TRMPWR	LAN2_TX+
10	GND	SC_DM_15	SC_DM_7	SC_DM_5	SC_DM_12	SC_DM_13
9	GND	SC_DP_15	SC_DP_7	SC_DP_5	SC_DP_12	SC_DP_13
8	GND	SC_DM_2	SC_CD_M	SC_ATN_M	SC_DM_14	SC_DM_0
7	GND	SC_DP_2	SC_CD_P	SC_ATN_P	SC_DP_14	SC_DP_0
6	GND	SC_DM_6	SC_RST_M	SC_BSY_M	SC_DPM_1	SC_DM_4
5	GND	SC_DP_6	SC_RST_P	SC_BSY_P	SC_DPP_1	SC_DP_4
4	GND	SC_DM_9	SC_IO_M	SC_SEL_M	SC_DM_1	SC_DPM_0
3	GND	SC_DP_9	SC_IO_P	SC_SEL_P	SC_DP_1	SC_DPP_0
2	GND	SC_DM_11	SC_DM_8	SC_REQ_M	SC_DM_3	SC_DM_10
1	GND	SC_DP_11	SC_DP_8	SC_REQ_P	SC_DP_3	SC_DP_10

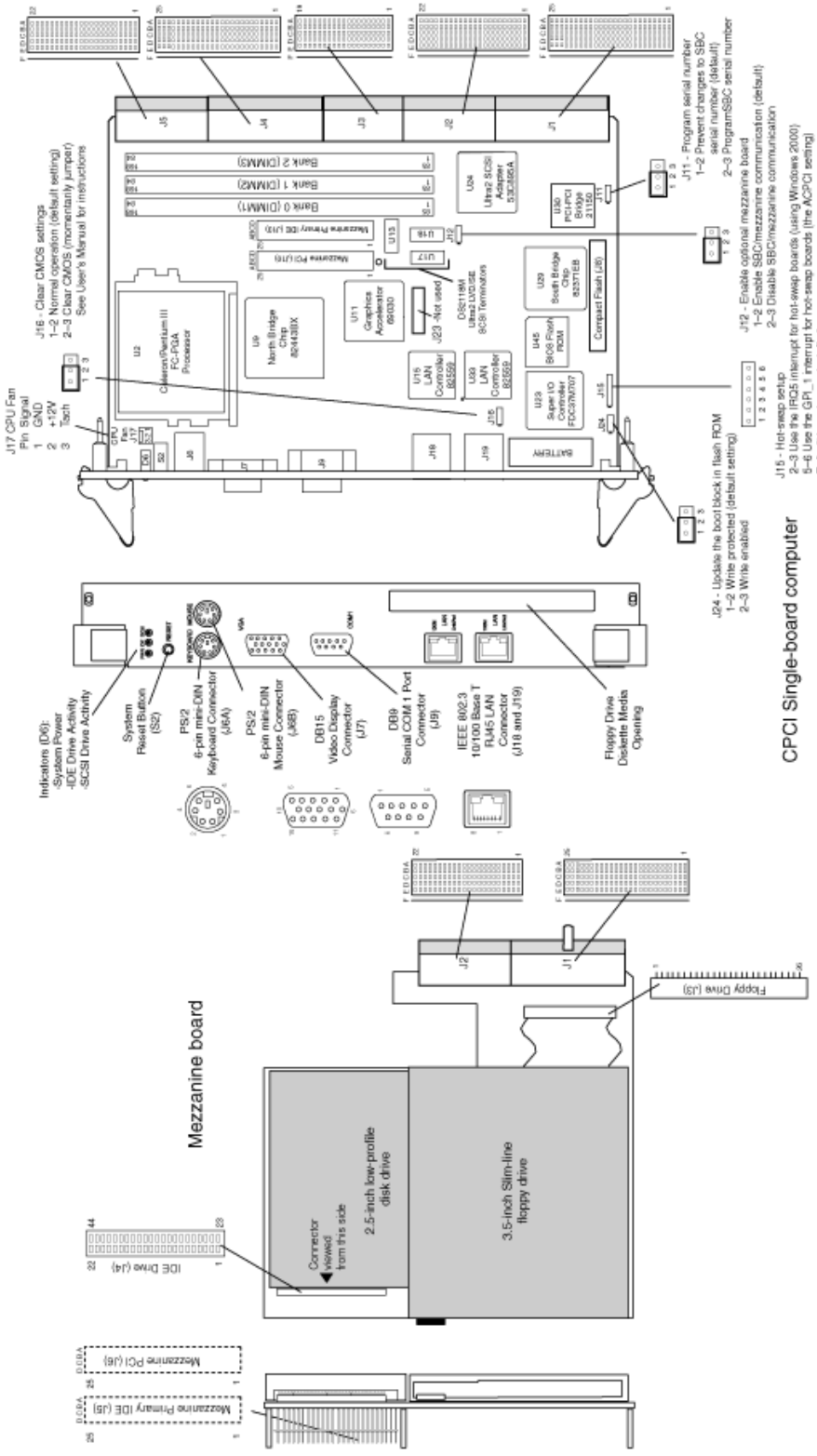
Table B–12 CompactPCI Connector J4 (proprietary rear I/O signals)

Pin	F	E	D	C	B	A
25	GND	Reserved	Reserved	Reserved	Reserved	Reserved
24	GND	Reserved	Reserved	Reserved	Reserved	Reserved
23	GND	Reserved	Reserved	Reserved	Reserved	Reserved
22	GND	Reserved	Reserved	Reserved	Reserved	Reserved
21	GND	Reserved	Reserved	Reserved	Reserved	Reserved
20	GND	Reserved	Reserved	Reserved	Reserved	Reserved
19	GND	Reserved	Reserved	Reserved	Reserved	Reserved
18	GND	Reserved	Reserved	Reserved	Reserved	Reserved
17	GND	Reserved	Reserved	Reserved	Reserved	Reserved
16	GND	Reserved	Reserved	Reserved	Reserved	Reserved
15	GND	Reserved	Reserved	Reserved	Reserved	Reserved
14	Key	Key	Key	Key	Key	Key
13	Key	Key	Key	Key	Key	Key
12	Key	Key	Key	Key	Key	Key
11	GND	Reserved	Reserved	Reserved	Reserved	Reserved
10	GND	Reserved	Reserved	Reserved	Reserved	Reserved
9	GND	Reserved	Reserved	Reserved	Reserved	Reserved
8	GND	Reserved	Reserved	Reserved	Reserved	Reserved
7	GND	Reserved	Reserved	Reserved	Reserved	Reserved
6	GND	Reserved	Reserved	Reserved	Reserved	Reserved
5	GND	Reserved	Reserved	Reserved	Reserved	Reserved
4	GND	Reserved	Reserved	Reserved	Reserved	Reserved
3	GND	Reserved	Reserved	Reserved	Reserved	Reserved
2	GND	Reserved	SP1_CTS	SP1_RXD	SP1_DSR	SP1_RI
1	GND	Reserved	SP1_RTS	SP1_TXD	SP1_DTR	SP1_DCD

Table B–13 CompactPCI Connector J5 (proprietary rear I/O signals)

Pin	F	E	D	C	B	A
22	GND	USB_DP1+	USB_DP0+	+5V	MS_CLK	KB_CLK
21	GND	USB_DP1-	USB_DP0-	+5V	MS_DATA	KB_DATA
20	GND	USB_OC1#	USB_OC0#	SPKR_OUT	GND	GND
19	GND	Reserved	GND	GND	PP_ACK#	PP_STB#
18	GND	PP_ERR#	PP_SELECT	PP_PE	PP_BUSY	PP_ALF#
17	GND	PP_INIT#	PP_D7	PP_D6	PP_D5	PP_D4
16	GND	PP_SLCTIN#	PP_D3	PP_D2	PP_D1	PP_D0
15	GND	GND	FD_DRVDEN1	FD_DRVDEN0	FD_NDEX#	FD_TRK0#
14	GND	FD_WRTPRT#	FD_MTR0#	FD_DSO#	FD_DSKCHG#	FD_STEP#
13	GND	FD_DIR#	FD_HDSEL#	FD_WDATA#	FD_WGATE#	FD_RDATA#
12	GND	PD_PDI	GND	PD_LED_P	PD_IRQ	PD_IORDY
11	GND	PD_CS3#	PD_CS1#	PD_A2	PD_A1	PD_A0
10	GND	PD_DACK#	PD_D15	PD_D14	PD_D13	PD_D12
9	GND	PD_IOR#	PD_D11	PD_D10	PD_D9	PD_D8
8	GND	PD_IOW#	PD_D7	PD_D6	PD_D5	PD_D4
7	GND	PD_REQ	PD_D3	PD_D2	PD_D1	PD_D0
6	GND	IDE_RESET#	SD_PDI	SD_LED	SD_IRQ	SD_IORDY
5	GND	SD_CS3#	SD_CS1#	SD_A2	SD_A1	SD_A0
4	GND	SD_ACK#	SD_D15	SD_D14	SD_D13	SD_D12
3	GND	SD_OR#	SD_D11	SD_D10	SD_D9	SD_D8
2	GND	SD_IOW#	SD_D7	SD_D6	SD_D5	SD_D4
1	GND	SD_REQ	SD_D3	SD_D2	SD_D1	SD_D0

Figure B-1 SBC/Mezzanine Board Component Location



CSBC1210 Non-SCSI Version

Appendix C

The CSBC1210 does not include the LSI/Symbios 53C895A on-board SCSI adapter. This configuration eliminates the SCSI device support normally provided via the SCSI connectors located on the optional rear I/O transition board.

Two CMOS Setup Utility menus have been altered to accommodate the CSBC1210:

- The “Onboard PCI SCSI Chip” option in the BIOS Features Menu (see Section 3.6) has been removed.
- The “SCSI Term. Control” option in the Integrated Peripherals Menu (see Section 3.12) has been removed.

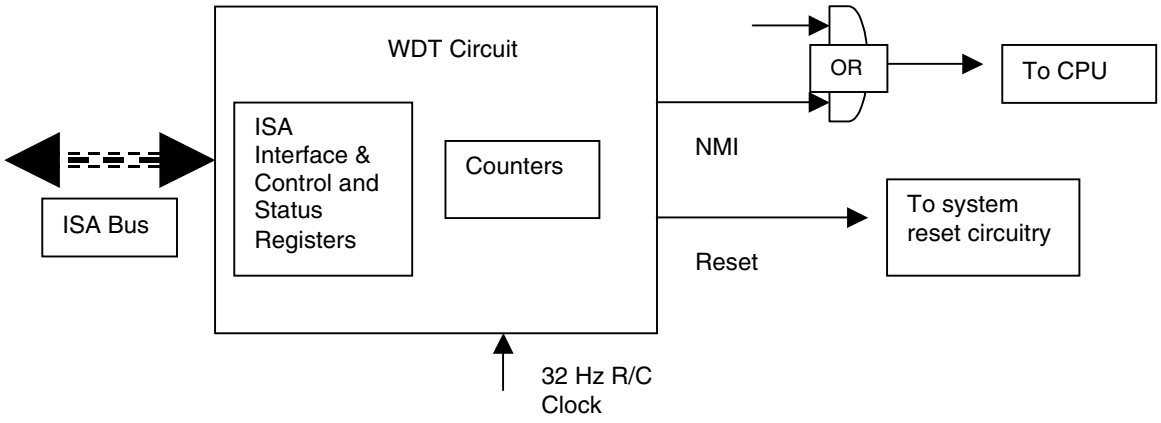
Any information in this manual concerning SCSI operation or support does not pertain to the CSBC1210 version. The remainder of the information in the manual is valid for both the CSBC1200 and the CSBC1210.

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Two-stage Watchdog Timer Operation | Appendix D

The CSBC1200 watchdog timer (WDT) is a two-stage component (*NMI* and *Reset*) configured as a single circuit. The first stage generates an NMI (Non-Maskable Interrupt) upon expiring. The second stage generates a system reset upon expiring. The circuits that control the watchdog timers are realized in programmable logic. The following block diagram illustrates the basic WDT architecture.

Figure D-1 Watchdog timer architecture



NMI WDT

The NMI WDT features

- Fixed location ISA IO accesses for configuration and control,
- Programmable timeout values in the range of 250 ms to 256 seconds, and
- Individual enable/disable for NMI and Reset generation (gated outputs).

The Reset WDT, when enabled, follows the NMI WDT by 256 ms.

Enabling the NMI WDT

To enable the NMI WDT feature, access the WDT Control and Status register at IO location 3Fh. Setting bit 5 will enable the NMI output. Setting bit 4 enables the Reset output.

Setting the NMI WDT Timeout Value

To set the WDT timeout value, access the WDT control register at IO location 3Fh. Set bits 2:0 appropriately as described below. Note that clearing these three bits effectively disables the WDT. Once the Timer Value bits are set, the timer will immediately start counting down.

Table D-1 WDT Control and Status Register

Default = 0x00

Bit	Register	Description
7	WDT NMI occurred	R Default = 0 This bit will be set if the WDT NMI has been triggered. This bit may be read by system software to determine the reason for a NMI. Default is cleared.
6	WDT Reset occurred	R Default = 0 This bit will be set if the WDT NMI has been triggered. This bit may be read by system software to determine the reason for an NMI. Default is cleared.
5	Enable NMI WDT	W Default = 0 This bit must be set for an NMI to be generated when the NMI WDT expires.
4	Enable Reset WDT	W Default = 0 This bit must be set for a Reset to be generated when the Reset WDT expires.
3	Reserved	Reserved
2	Timer Value MSB	R/W Default = 0 Use bits 2:0 to set the timeout value for the WDT. The minimum setting (001) sets the timer to 250ms. The maximum setting (111) sets the timer to 256 seconds. Settings between min and max are linearly scaled (see below). Setting these bits to 000 disables the WDT.
1	Timer Value bit 1	
0	Timer Value LSB	

To determine the clock range and design the clock registers, you must make some choices. For example, if you use a 32 Hz clock (period = .03125s), the following results are valid:

Number of clocks	Timeout value
8 (3 bits)	250 ms*
16 (4 bits)	500 ms*
32 (5 bits)	1 s*
64 (6 bits)	2 s
128 (7 bits)	4 s
256 (8 bits)	8 s*
512 (9 bits)	16 s
1024 (10 bits)	32 s*
2048 (11 bits)	64 s*
4096 (12 bits)	128 s*
8192 (13 bits)	256 s*

If you choose a minimum timeout of 250 ms, the basic clock counter then becomes a 3-bit (8 clocks) counter. Further, assuming you want eight (8) discrete selectable values as dictated by the three bits assigned to the timer, you must omit some of the multiples in the table above. These values are denoted with an asterisk (*).

Strobing the WDT

To prevent the WDT from timing out, the system software must periodically "strobe" the WDT by simply reading it. If the system software fails to strobe the WDT, the WDT will time out and cause an NMI (if NMI is enabled) and/or a system reset (if Reset is enabled).

```
<Strobing pseudo code >

Read Control and Status register @ IO 3FH
```

Handling the NMI

When the NMI WDT expires, an "NMI WDT occurred" flag (located in IO space at address 0x3F, bit 7) is set. This flag may be accessed by the system's NMI handler to determine the reason for the NMI. Note that the NMI handler is not a component of the NMI WDT system as defined herein. The NMI handler must be modified to check the NMI WDT Expired flag before passing control to the normal OS-based or BIOS-based NMI handler.

Note: The NMI Handler code is an OEM-custom component.

```
< NMI handler pseudo code >

Read existing NMI vector from vector table
Store the old vector
Replace the vector with vector to WDT NMI handler code
Load the new WDT NMI handler code into memory
Chain the old NMI vector to the new WDT NMI handler code
```

Resetting the NMI WDT

To reset the NMI WDT, a read or write access must be made to the WDT control port at IO address 0x3Fh. Accessing this port resets the NMI WDT, thus preventing it from timing out (this process is also known as "strobing" the WDT). If this port is not accessed within the time-out period established when the NMI WDT is enabled, the NMIWDT times out, and an NMI is issued.

System Cold-Reset WDT

The other SBCPxBX WDT circuit causes the system to reset upon expiring. The Reset WDT (if enabled) automatically occurs approximately 250 ms after the NMI WDT expires.

To enable the Reset WDT, access the WDT Control and Status Register and set bit 6. To disable the Reset WDT, clear bit 6 in the WDT Control and Status Register.

Note: The time-out value is hard-wired to 250 ms after the WDT time-out setting.

To strobe the Reset WDT timer, the NMI WDT must be strobed as previously described. When the Cold-Reset times out, the system is reset. There is no associated handler.

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