ICS
A D V E N T ™

The Aviant™ BX Socket 370
Single Board Computer

User's Guide
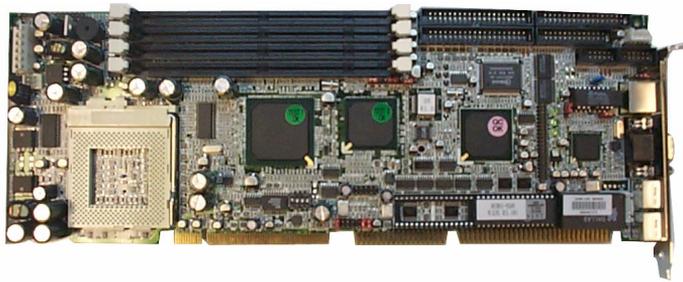
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Mission Critical Applied Computing Solutions

Customer Service

Mailing Address:	ICS Advent
	6260 Sequence Drive
	San Diego, CA 92121-4371

Customer Service or	
Technical Support:	800-480-0044 (in the U.S. and Canada)
	+44 (0) 1243 523505 (UK)
	0800-91-29-04 (France)
	0800-18-30-095 (Germany)

Visit our site at:	www.icsadvent.com

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Preface

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How to Use This Guide

This guide is designed to be used as step-by-step instructions for installation, and as a reference for operation, troubleshooting, and upgrades.

> **Note:** Additional technical information, BIOS updates, and drivers are available on the ICS Advent Web site, **www.icsadvent.com,** under **Support**.

The following is a summary of the chapter contents:

♦ **Chapter 1, Introduction,** presents the product specifications and system architecture for the Aviant BX Socket 370 single board computer.

♦ **Chapter 2, Hardware Configuration Settings,** shows the definitions and locations of jumpers and connectors that you can easily configure for your system.

♦ **Chapter 3, System Installation,** describes how to properly mount the CPU, main memory, M-system's Flash Disk, and the optional flat panel display interface module for safe installation. It also discusses the Watchdog Timer function and introduces the graphics controller driver installation procedure.

♦ **Chapter 4, BIOS Setup Information,** specifies the meaning of each setup parameter and describes how to get advanced BIOS performance. The POST checkpoint list provides a basic troubleshooting guide.

♦ **Appendix A, Abbreviations,** provides definitions for the abbreviations used in this manual.

Customer Comments

If you experience any problems with this manual or just want to provide some feedback, please send us a message using the online form under "Contact Us" on our Web site (*www.icsadvent.com*) under "Technical Support." Detail any errors you find. We will correct the errors or problems as soon as possible and post the revised manual in our online Support Library. Thank you.

Note: You may also use the online form on our Web site to submit comments or concerns about our products, or request technical support.

Advisory Conventions

Three types of advisories are used throughout the manuals to provide helpful information or to alert you to the potential for hardware damage or personal injury. They are Notes, Cautions, and Warnings. The following is an example of each type of advisory. Use caution when servicing any electrical component.

Note: A Note indicates information that will help you make better use of the system.

CAUTION

A CAUTION indicates potential damage to hardware and tells you how to avoid the problem.

WARNING

A WARNING indicates the potential for bodily harm and tells you how to avoid the problem.

Disclaimer: We have tried to identify all situations that may pose a warning or caution condition in this manual. However, ICS Advent does not claim to have covered all situations that might require the use of a Caution or Warning.

Safety Instructions

Before handling the Aviant BX Socket 370, read the following instructions and safety guidelines to prevent damage to the product and to ensure your own personal safety. Refer to the "Advisories" section for advisory conventions used in this manual, including the distinction between Warnings, Cautions, and Notes.

♦ Always use caution when handling/operating the computer. Only qualified, experienced, authorized electronics service personnel should access the interior of the computer. The power supplies produce high voltages and energy hazards, which can cause bodily harm.

♦ Use extreme caution when installing or removing components. Refer to the installation instructions in this manual for precautions and procedures. If you have any questions, please contact ICS Advent Post-Sales Technical Support.

WARNING

High voltages are present inside the chassis when the unit's power cord is plugged into an electrical outlet. Turn off system power, turn off the power supply, and then disconnect the power cord from its source before removing the chassis cover. Turning off the system power switch does not remove power to components.

When Working Inside a Computer

Before taking covers off a computer, perform the following steps:

1) Turn off the computer and any peripherals.

2) Disconnect the computer and peripherals from their power sources to prevent electric shock or system board damage.

3) Follow the guidelines provided in "Protecting Against Electrostatic Discharge" on the following page.

4) Disconnect any telephone or telecommunications lines from the computer.

In addition, take note of these safety guidelines when appropriate:

♦ To help avoid possible damage to system boards, wait five seconds after turning off the computer before removing a component, removing a system board, or disconnecting a peripheral device from the computer.

♦ When you disconnect a cable, pull on its connector or on its strain-relief loop, not on the cable itself. Some cables have a connector with locking tabs. If you are disconnecting this type of cable, press in on the locking tabs before disconnecting the cable. As you pull connectors apart, keep them evenly aligned to avoid bending any connector pins. Also, before connecting a cable, make sure both connectors are correctly oriented and aligned.

CAUTION

Do not attempt to service the system yourself except as explained in this manual. Follow installation and troubleshooting instructions closely.

Protecting Against Electrostatic Discharge

Static electricity can harm system boards. Perform service at an ESD workstation and follow proper ESD procedure to reduce the risk of damage to components. ICS Advent strongly encourages you to follow proper ESD procedure, which can include wrist straps and smocks, when servicing equipment.

You can also take the following steps to prevent damage from electrostatic discharge (ESD):

♦ When unpacking a static-sensitive component from its shipping carton, do not remove the component's antistatic packing material until you are ready to install the component in a computer. Just before unwrapping the antistatic packaging, be sure you are at an ESD workstation or grounded.

♦ When transporting a sensitive component, first place it in an antistatic container or packaging.

♦ Handle all sensitive components at an ESD workstation. If possible, use antistatic floor pads and workbench pads.

♦ Handle components and boards with care. Don't touch the components or contacts on a board. Hold a board by its edges or by its metal mounting bracket.

When Operating a Computer

When operating a computer, observe the following operating guidelines:

♦ To help prevent electric shock, plug computer power cables into properly grounded power sources. Use cables equipped with three-prong plugs to ensure proper grounding. Do not use adapter plugs or remove the grounding prong from the cable.

♦ Be sure nothing rests on chassis cables and that cables are not located where they can be stepped on or tripped over.

♦ Keep objects out of chassis openings. This can cause fire or electric shock by shorting out interior components.

♦ Keep chassis away from radiators and heat sources. Do not block cooling vents or place chassis in a closed-in wall unit.

♦ To help protect chassis from sudden, transient increases and decreases in electrical power, use a surge suppressor, line conditioner, or uninterruptible power supply (UPS).

♦ Consideration should be given to the connection of the equipment to the supply circuit and the effect that circuit overloading might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

♦ The ambient temperature within the rack may be greater than room ambient temperature. Installation should be such that the amount of air flow required for safe operation is not compromised. Consideration should be given to the maximum rated ambient temperature.

Rack Stability

Installation should be such that a hazardous stability condition is not achieved due to uneven loading. The chassis should be secured to the rack frame with retaining screws when it is slid in the rack. This will prevent the chassis from sliding forward on the slide rails if the cabinet is tilted or vibrated, resulting in possible mechanical or electrical damage to the system or injury to personnel.

WARNING

There is a real danger of a rack toppling if a heavy chassis is extended on its slide rails from the rack. ICS Advent strongly recommends you anchor the mounting rack to the floor or wall to prevent this from happening.

Safety Standards

The product(s) described in this manual has met the safety requirements of Underwriters Laboratories (UL) for the US and Canadian market based on UL's published Standards for Safety.

Regulatory Compliance Statements

This section provides the FCC compliance statement for Class A devices and describes how to keep the system CE compliant.

FCC Compliance Statement for Class A Devices

The product(s) described in this manual has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and radiates radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his or her own expense.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: The assembler of a personal computer system may be required to test the system and/or make necessary modifications if a system is found to cause harmful interference or to be noncompliant with the appropriate standards for its intended use.

CE Certification

The product(s) described in this manual complies with all applicable European Union (CE) directives. For computer systems to remain CE compliant, only CE-compliant parts may be used. Maintaining CE compliance also requires proper cable and cabling techniques. Although ICS Advent offers accessories, the customer must ensure that these products are installed with proper shielding to maintain CE compliance. ICS Advent does not offer engineering services for designing cabling systems. In addition, ICS Advent will not retest or recertify systems or components that have been reconfigured by customers.

ICS ADVENT

Guarantee and Warranty Policy

Guarantee

A thirty day money-back guarantee is provided on all standard products sold. Special order products are covered by our Limited Warranty, *however they may not be returned for refund or credit. EPROMs, RAM, Flash EPROMs or other forms of solid electronic media are not returnable for credit - but for replacement* only. An extended warranty is available. Consult the factory.

Refunds

In order to receive a refund on a product for the purchase price, the product must not have been damaged by the customer or by the common carrier chosen by the customer to return the goods and the product must be returned complete (meaning all manuals, software, cables, etc.) within 30 days of receipt and in an as-new and resalable condition. The "Return Procedure" must be followed to assure a prompt refund.

Restocking Charges

Product returned *after* 30 days, and *before* 60 days, of the purchase will be subject to a minimum 20% restocking charge and charges for any damaged or missing parts. Products not returned within 60 days of purchase, or products which are not in an as-new and resaleable condition, are not eligible for a credit return and will be returned to the customer.

Limited Warranty

Effective April 1, 1998, all products carry a 2-year limited warranty. Within 2 years of purchase, ICS Advent will repair or replace, at our option, any defective product. ICS Advent will service the warranty for all standard catalog products for the first two years from the date of shipment. Please note: The 2-year warranty may not apply to special promotion items. Please consult the factory for warranty verification.

The limited warranty is void if the product has been subjected to alteration, neglect, misuse, or abuse; if any repairs have been attempted by anyone other than ICS Advent or its authorized agent; or if the failure is caused by accident, acts of God, or other causes beyond the control of ICS Advent or the manufacturer. Neglect, misuse, and abuse shall include any installation, operation, or maintenance of the product other than in accordance with the user's manual.

No agent, dealer, distributor, service company, or other party is authorized to change, modify, or extend the terms of this Limited Warranty in any manner whatsoever. ICS Advent reserves the right to make changes or improvements in any product without incurring any obligation to similarly alter products previously purchased.

Return Procedure

For any Guarantee or Limited Warranty return, please contact ICS Advent Customer Service at 800-480-0044 or 858-677-0877 and obtain a Return Material Authorization (RMA) Number. All product(s) returned to ICS Advent for service or credit **must** be accompanied by a Return Material Authorization (RMA) Number. Freight on all returned items **must** be prepaid by the customer who is responsible for any loss or damage caused by common carrier in transit. Returns for Warranty **must** include a Failure Report for each unit, by serial number(s), as well as a copy of the original invoice showing the date of purchase.

To reduce risk of damage, returns of product must be in an ICS Advent shipping container. If the original container has been lost or damaged, new shipping containers may be obtained from ICS Advent Customer Service at a nominal cost.

ICS Advent owns all parts removed from repaired products. ICS Advent uses new and reconditioned parts made by various manufacturers in performing warranty repairs and building replacement products. If ICS Advent repairs or replaces a product, its warranty term is not extended.

ICS Advent will normally return your replacement or repaired items via Second Day Air. Overnight delivery or delivery via other carriers is available at an additional charge.

Shipments not in compliance with this Guarantee and Limited Warranty Return Policy will not be accepted by ICS Advent.

Limitation of Liability

In no event shall ICS Advent be liable for any defect in hardware, software, loss, or inadequacy of data of any kind, or for any direct, indirect, incidental, or consequential damages in connection with or arising out of the performance or use of any product furnished hereunder. ICS Advent's liability shall in no event exceed the purchase price of the product purchased hereunder. The foregoing limitation of liability shall be equally applicable to any service provided by ICS Advent or its authorized agent.

Some sales items and customized systems are **not** subject to the guarantee and limited warranty. However in these instances, any deviations will be disclosed prior to sales and noted in the original invoice. **ICS Advent reserves the right to refuse returns or credits on software or special order items.**

Chapter 1

Introduction

Overview

The Aviant BX Socket 370 (Figure 1-1) supports Intel Celeron or Pentium III FC-PGA processors, and supports up to 1GB of Dynamic Random Access Memory (DRAM) in Dual Inline Memory Modules (DIMM). The enhanced onboard PCI Integrated Drive Electronics (IDE) interface can support four drives up to Programmed Input/Output (PIO) mode 4 timing and Ultra DMA/33 synchronous mode. The onboard Super I/O Chipset integrates a floppy controller, two serial ports, one Fast Infrared (FIR) port and one parallel port. Two high performance 16C550-compatible Universal Asynchronous Receiver Transmitters (UARTs) provide 16-byte
send/receive First In/First Out (FIFOs), and the multi-mode parallel port supports PC-compatible Printer Port (SPP)/Enhanced Parallel Port (EPP)/Extended Capabilities Port (ECP) functions. In addition, two Universal Serial Bus (USB) ports provide a high speed data communication between peripherals and the single board computer (SBC).

The Aviant BX Socket 370 supports the PCI Industrial Computer Manufactures Group (PICMG) standard allowing it to work with the legacy ISA, ISA/PCI or multi-slot PCI-bus backplane. The onboard 32-pin Disk-On-Chip (DOC) socket supports M-systems Disk-On-Chip Flash disk up to 144MB. The built-in Watchdog Timer function allows for a system reset if there is a failure. Two 6-pin Mini-DIN connectors are provided to connect to a Personal System/2 (PS/2) mouse and keyboard. The onboard Flash Read Only Memory (ROM) is used to update the BIOS. A standard P8 power connector is reserved to directly provide more power for embedded applications, and the additional 5-pin shrouded connector is reserved for connecting the keyboard interface to a different location. The high precision Real-Time Clock/calendar is built to support Y2K for accurate scheduling and storing configuration information. One 4-pin header is designed to support Advanced Technology Extended (ATX) power. Central Processing Unit (CPU) overheat protection will give you more security and stability. All of these features make the Aviant BX Socket 370 excellent in stand-alone applications.
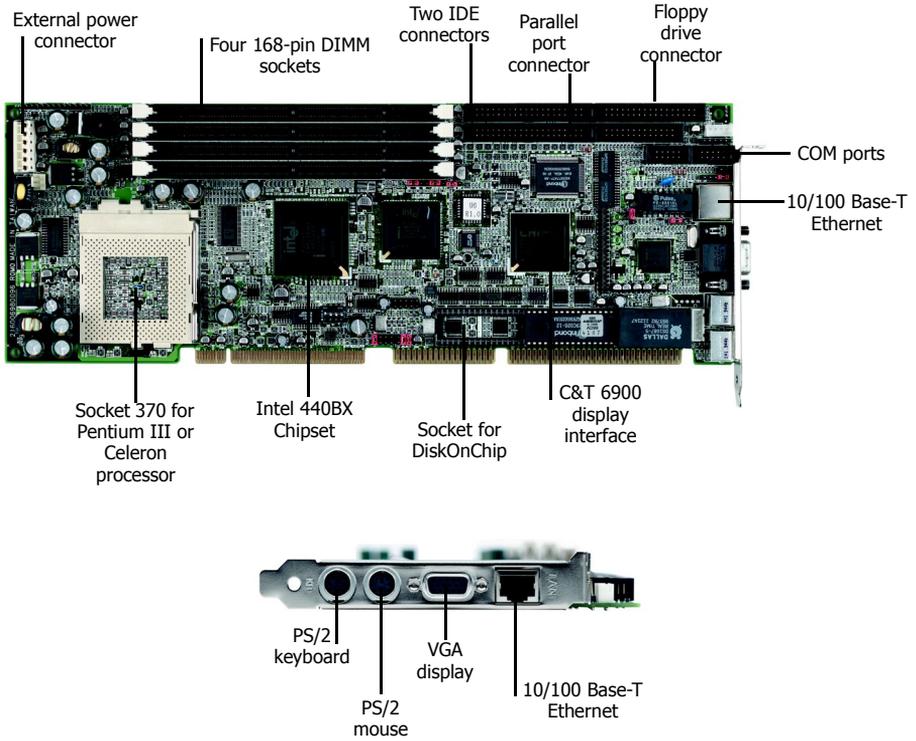
Figure 1-1. Aviant BX Socket 370

Checklist

The Aviant BX Socket 370 is shipped with each of the following items:

- ◆ Aviant BX Socket 370 single board computer

- ◆ Parallel (LPT) port cable

- ◆ Serial (COM) port cable supporting two interfaces

- ◆ Floppy drive cable

- ◆ IDE cable

- ◆ 5-pin to 5-pin keyboard cable for backplane connection

- ◆ 4-pin ATX power control cable

- ◆ Intel 82559 LAN driver

- ◆ C & T 69000 PCI VGA display driver

- ◆ Dual USB port cable

- ◆ USB connector filler panel

If any of these items is damaged or missing, please contact ICS Advent. Save all packing materials for future replacement and maintenance.

Product Specifications

♦ **Main processor:** Intel Celeron or Pentium III FC-PGA processors, CPU bus clock of 66/100 MHz, CPU core/bus clock ratio of x2 to x8

♦ **BIOS:** AMI system BIOS with 256kB Flash ROM to support Desktop Management Interface (DMI), Plug-n-Play (PnP), the Green function, and an Advanced Configuration and Power Interface (ACPI) (option)

♦ **Main Memory:** Four 168-pin DIMM sockets, supporting 3.3V Synchronized Dynamic Random Access Memory (SDRAM) with parity/ECC support up to 1GB

♦ **L2 Cache Memory:** 128kB L2 cache in Celeron processor and 256kB L2 cache in Pentium III processor

♦ **Chipset:** Intel 440BX chip set

♦ **Bus Interface:** Follows the PICMG standard (32-bit PCI and 16-bit ISA bus), fully complies with PCI bus specification V2.1

♦ **PCI IDE Interface:** Supports two enhanced IDE ports for up to four Hard Disk Drive (HDD) devices up to Ultra DMA/33 mode 2 timing transfer

♦ **Floppy Drive Interface:** Supports one Floppy Disk Drive (FDD) port up to two floppy drives [5.25-inch (360k, 1.2MB), 3.5-inch (720k, 1.2MB, 1.44MB, 2.88MB) diskette format].

♦ **Serial Ports:** Supports two high-speed 16C550 compatible UARTs with 16-byte T/R FIFOs

♦ **IR Interface:** Supports one 6-pin header for serial Fast/Standard Infrared wireless communication

♦ **Parallel Port:** Supports SPP, EPP/ECP, and bi-directional modes

♦ **USB Interface:** Supports two USB ports for high speed I/O peripheral devices

♦ **PS/2 Mouse and Keyboard Interface:** Supports two 6-pin Mini-DIN connectors and one 5-pin shrouded connector for PS/2 mouse, keyboard, and backplane connections

♦ **ATX Power Control Interface:** One 4-pin header to support ATX power control with Modem Ring-On and Wake-On-Local Area Network (LAN) functions

♦ **Auxiliary I/O Interfaces:** System reset switch, external speaker, keyboard lock, and HDD LED interface

♦ **Real-Time Clock/Calendar:** Supports Y2K Real Time Clock/calendar with battery backup for 10 year data retention

♦ **Watchdog Timer:** 0.5, 1, 2, 4, 8, 16, 32, 64 second time-out intervals by jumper setting or 255 intervals from 0.5 to 254.5 minutes by software programming

♦ **Disk-On-Chip Feature:** Reserves one 32-pin socket for M-systems Flash Disk up to 144MB

♦ **Onboard Video Graphics Array (VGA) Interface:** Adopts C & T 69000 HiQVideo Accelerator with integrated memory 2MB to provide high performance graphics and panel display capabilities

♦ **Onboard Ethernet:** Uses the Intel 82559 Fast Ethernet controller to support a Registered Jack 45 (RJ-45) interface at 10/100 Base-T speed

♦ **CPU Overheat Protection:** Automatically slows down the system when the CPU overheats (Operating System (OS) independent and driverless). Refer to Chapter 4, "BIOS Setup Information".

♦ **System Monitoring Feature:** Monitors the CPU and system temperatures, operating voltages, and fan status

♦ **Power Good:** Onboard power good generator with reset time of 300 – 500ms

♦ **Physical and Environmental Requirements:**

- Dimension (L X W): 13.33 X 4.8in (338.5 X 121.5mm)

- Board Weight: 0.92 lb (0.42 kg)

- Printed Circuit Board (PCB) layout: Six layers

- Power Requirements: +5V @ 6A (typical), +12V @ 140mA, -12V @ 30mA

- Operating Temperature: 0 ^{o}C to 55 ^{o}C (32 ^{o}F to 131 ^{o}F)

- Storage Temperature: -20 ^{o}C to 80 ^{o}C (-4 ^{o}F to 176 ^{o}F)

- Relative Humidity: 5% to 95%, non-condensing

- MTBF: 100,000 hours

System Architecture

The following block diagram illustrates how the Aviant BX Socket 370 provides a highly integrated system solution. The system architecture of the Aviant BX Socket 370 includes two main chips, the 82443BX Host Bridge and the 82371EB PCI ISA IDE Xcelerator (PIIX4E), to support Celeron and Pentium III processors, SDRAM with ECC, PCI bus interface, a USB port, and Ultra DMA/33 IDE Bus Master. The onboard super I/O chip supports a PS/2 keyboard/mouse, two UARTs (16550 compatible), floppy drives, Parallel and Infrared interfaces. In addition, an onboard PCI device VGA/panel display provides the user with additional flexibility and reliability.

The Aviant BX Socket 370 supports the Intel Celeron processor and the Pentium III Flip-Chip Pin Grid Array (PC-PGA) Coppermine processor for high performance and cost-effective applications. The Intel Celeron processor, like the Intel Pentium Pro and Intel Pentium II processor, features a Dynamic Execution microarchitecture and also executes MMX technology instructions for enhanced media and communication performance. The Pentium III FC-PGA processor provides twice the L2 cache (256k) of the Celeron processor (128k).

The North Bridge 82443BX provides a completely integrated solution for the system controller and data path components. It provides a 64-bit GTL+ based host bus interface, optimized 64-bit DRAM interface with ECC to support 3.3V DIMMs at the maximum bus frequency of 100MHz, and 32-bit PCI bus interface to support PCI devices.

The South Bridge, 82371EB PIIX4E, provides a highly integrated multifunction PCI-to-ISA bridge. It supports Ultra DMA-33 IDE interface, full Plug-n-Play compatibility, and Advanced Programmable Interrupt Controller (APIC) interface on the Aviant BX Socket 370. It also supports a 2-port USB and PCI 2.1 Compliance. In addition, it also provides control to support BIOS read/write access and external Real-Time Clock (RTC) to maintain the date and time of the system.

The Super I/O chip W83977ATF integrates two high-speed serial ports, one parallel port, FIR/Speaker Independent (Voice) Recongition (IR) interface, 8042 keyboard controller with PS/2 mouse ports and FDD interface. The parallel port supports SPP,EPP, and ECP.

The Aviant BX Socket 370 contains a Watchdog Timer (WDT) enabled by jumper settings and triggered by software, and a M-systems Flash disk. An advanced feature is used on the Aviant BX Socket 370 to support the detection of CPU temperature. The CPU operation is automatically forced to slow down when overheating occurs. Refer to Chapter 4, "BIOS Setup Information".

The onboard PCI device, graphics display port, is powered by the C & T 69000 graphics accelerator. Another onboard PCI device, the LAN port, powered by Intel 82559 10/100 Ethernet Controller, supports a Fast Ethernet interface through a RJ-45 port.

System Block Diagram

Celeron/Pentium II/III™ Processors (Socket 370)

CK100 CLOCK GENERATOR

GTL Terminal

CPU BUS

82443BX (492 BGA)

MEMORY SDRAM DIMM 1 2 3 4

C&T 69000 VGA / Panel Display

Intel 82559 10/100 Base-T

CKBF Clock Buffer

PCI Bus

ULTRA 33 Dual Channel IDE Bus Master

82371EB (324 BGA)

Two USB Ports

Temp. Sensor

IDE 1   **IDE 2**

CNTL

ISA Bus

Buffer

Buffer Logic

ISA Bus

BIOS   RTC

Disk-On-Chip

WDT

Keyboard

Mouse

SUPER I/O W83977ATF (128 PQFP)

2UART/LPT/FDD/IR

Chapter 2

Hardware Configuration Settings

Contents

Overview

This chapter provides the definitions and locations of jumpers, headers, and connectors. All of the configuration jumpers on the Aviant BX Socket 370 are shipped with the default settings. The default settings are marked with a star (*).

Jumpers

In general, the jumpers are used to select options for certain features (Figure 2-1). Some of the jumpers are user-configurable, allowing system enhancement. Other jumpers are used for testing purposes only and should not be altered. To select any option, insert the jumper cap (Short) or remove (NC) the jumper cap from the jumper pins according to the following instructions. (Here NC stands for "Not Connected".)
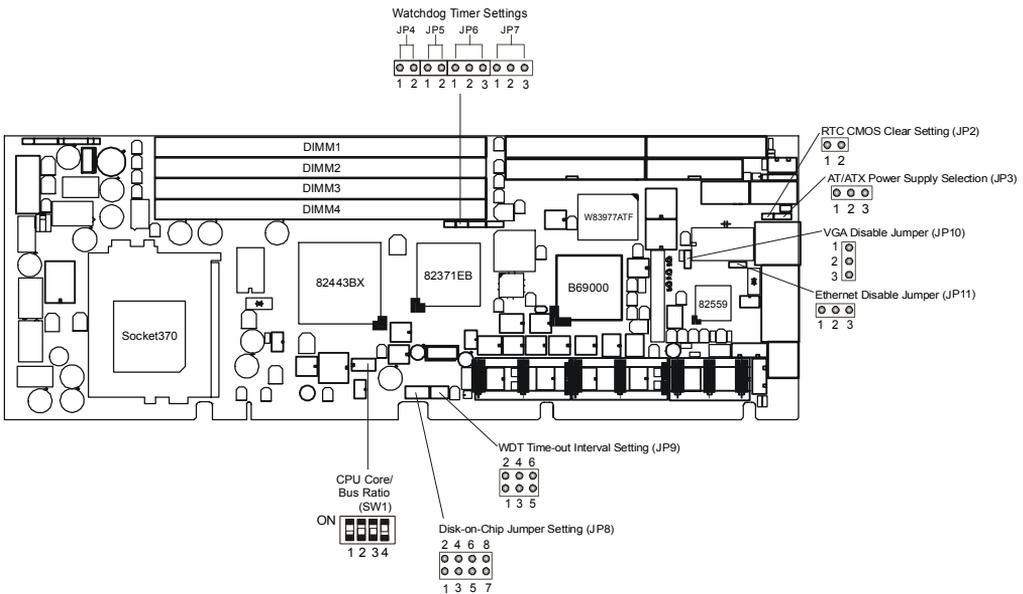
Figure 2-1. Jumper Locations

Note: To determine the correct jumper settings, calculate the CPU Core/Bus Ratio as follows:

Core/Bus Ratio = processor speed divided by base speed

Base Speeds: Celeron = 66MHz, Pentium III = 100MHz

Example: The Core/Bus Ratio of a 466MHz Celeron processor is calculated as 466MHz divided by 66MHz = 7.0

SW1: Switch Settings for CPU Core/Bus Ratio				
Core/Bus Ratio	SW-1	SW-2	SW-3	SW-4
1.5x	NC	NC	Short	NC
2.0x	NC	NC	NC	NC
2.0x	Short	Short	Short	Short
2.5x	Short	NC	Short	Short
3.0x	Short	Short	NC	Short
3.5x	Short	NC	NC	Short
4.0x	Short	Short	Short	NC
4.5x	Short	NC	Short	NC
5.0x	Short	Short	NC	NC
5.5x *	Short	NC	NC	NC
6.0x	NC	Short	Short	Short
6.5x	NC	NC	Short	Short
7.0x	NC	Short	NC	Short
7.5x	NC	NC	NC	Short

SW1: Switch Settings for CPU Core/Bus Ratio				
Core/Bus Ratio	SW-1	SW-2	SW-3	SW-4
8.0x	NC	Short	Short	NC
Reserved	NC	Short	NC	NC

CAUTION

For system stability, do not overclock the CPU unless the system can handle those BIOS parameters. This may damage the board and will void the warranty.

JP8: Disk On Chip Jumper Settings				
1-2	3-4	5-6	7-8	Memory Address Window
Short	NC	NC	NC	D0000 – D1FFF*
NC	Short	NC	NC	D2000 – D3FFF
NC	NC	Short	NC	D4000 – D5FFF
NC	NC	NC	Short	D6000 – D7FFF

---

* *Default setting*

JP4, JP5, JP6, and JP7: Watchdog Timer Jumper Settings			
JP4		**JP5**	
NC:	Enabled WDT function	NC:	Allocate I/O port 0533H / 0033H for programming of H/W WDT *
Short:	Disabled WDT function*	Short:	Allocate I/O port 0543H / 0343H for programming of H/W WDT
JP6		**JP7**	
1-2:	Connect WDT output to system reset *	1-2	Initiated from hardware WDT by setting JP9 *
2-3:	Connect WDT output to NMI	2-3	Initiated from software WDT by programming super I/O chipset W83977ATF

Note: To disable the Disk on Chip, set all jumpers to NC.

* *Default setting*

JP9: WDT Time-out Interval (Twd) Settings			
5-6	**3-4**	**1-2**	**Time-out Interval**
Short	Short	Short	0.5 second
Short	Short	NC	1 second*
Short	NC	Short	2 seconds
Short	NC	NC	4 seconds
NC	Short	Short	8 seconds
NC	Short	NC	16 seconds
NC	NC	Short	32 seconds
NC	NC	NC	64 seconds

JP2: RTC CMOS Clear Setting	
NC:	Normal operation*
Short:	Clear CMOS contents

JP3: AT/ATX Power Supply Selection	
1-2:	Select ATX power supply
2-3:	Select AT power supply *

---

* *Default setting*

JP10 and JP11: Onboard Devices (VGA/Ethernet) Enable/Disable				
JP10	**Description**		**JP11**	**Description**
1-2:	Normal operation *		1-2:	Normal operation *
2-3:	Disable onboard VGA		2-3:	Disable onboard Ethernet

* *Default setting*

Connectors

I/O peripheral devices and the Flash disk are connected to the connectors or to the DOC socket as described in this section (Figure 2-2).

CAUTION

Your Aviant single board computer will be permanently damaged if you install USB cables backwards into the two-port USB connector. Refer to the drawing below for the correct orientation. Note red wires should be on opposite sides.
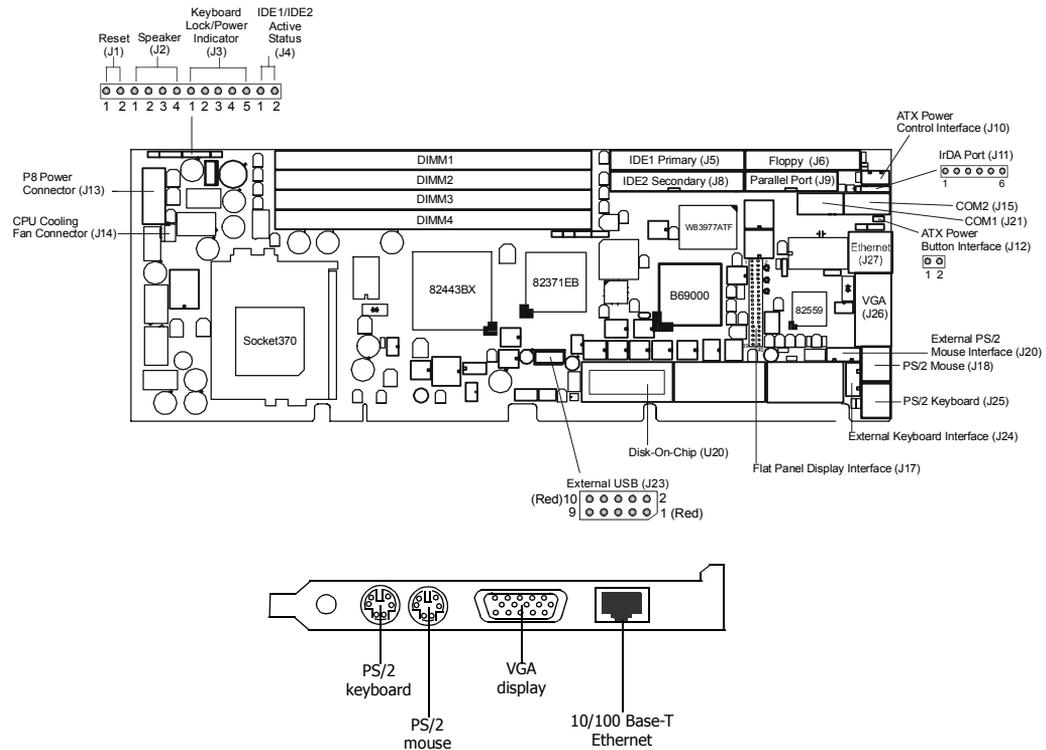
Figure 2-2. Connector Locations

Table 2-1. Connector Functions		
Connector	**Function**	**Remark**
J1	System reset	
J2	External speaker interface	
J3	Keyboard lock and power indicator	
J4	IDE active LED interface	
J5	IDE1 (Primary) interface	
J6	Floppy connector	
J8	IDE2 (Secondary) interface	
J9	Parallel port connector	
J10	ATX power control interface	For use with chassis with ATX power supply only
J11	IrDA (infrared) port	Support FIR/SIR
J12	ATX power button interface	For use with chassis with ATX power supply only
J13	Standard P8 power connector	
J14	CPU cooling fan power connector	Support +12V
J15	COM1 serial port	2 x 5 shrouded

Table 2-1. Connector Functions		(Continued)
Connector	**Function**	**Remark**
J17	Flat Panel display module interface	2x20 pin header
J18	PS/2 mouse connector	6-pin Mini-DIN
J20	External PS/2 mouse connector	Connect mouse cable kit
J21	COM2 serial port	2 x 5 shrouded
J23	External USB interface	Support two ports
J24	External keyboard interface	Connect to backplane
J25	PS/2 keyboard connector	6-pin Mini-DIN
J26	VGA connector	DSUB-15
J27	Ethernet connector	RJ-45
U20	Onboard Flash disk (Disk-On-Chip)	32-pin DIP socket

Connector Pin Assignments

J11: Fast & Standard IrDA Header			
Pin	Signal	Pin	Signal
1	VCC (+5V)	2	FIRRX
3	SIRRX	4	Ground
5	IRTX	6	NC

J1: Reset Header			
Pin	Signal	Pin	Signal
1	Reset	2	Ground

J2: External Speaker Header			
Pin	Signal	Pin	Signal
1	Speaker signal	2	NC
3	Ground	4	+5V

J3: Keyboard Lock Header	
Pin	Signal
1	+5V (330 ohm pull-up for power LED)
2	NC
3	Ground
4	Keyboard inhibit
5	Ground

J4: IDE1 Active LED Header	
Pin	Signal
1	+5V (470 ohm pull-up for HDD LED)
2	HDD Active # (LED cathode terminal)

J10: ATX Power Control Connector	
Pin	**Signal**
1	ATX Power Good Signal
2	ATX 5V Standby
3	ATX Power On Control
4	Ground

J9: Parallel Port Connector			
Pin	**Signal**	**Pin**	**Signal**
1	Strobe#	2	Data 0
3	Data 1	4	Data 2
5	Data 3	6	Data 4
7	Data 5	8	Data 6
9	Data 7	10	Acknowledge#
11	Busy	12	Paper Empty
13	Printer Select	14	Auto Form Feed#
15	Error#	16	Initialization#
17	Printer Select IN#	18	Ground
19	Ground	20	Ground
21	Ground	22	Ground
23	Ground	24	Ground
25	Ground	26	NC

J15/J21: Serial Port (2x5 Shrouded Connector)			
Pin	Signal	Pin	Signal
1	Data Carrier Detect (DCD)	2	Receive Data (RXD)
3	Transmit Data (TXD)	4	Data Terminal Ready (DTR)
5	Ground (GND)	6	Data Set Ready (DSR)
7	Request to Send (RTS)	8	Clear to Send (CTS)
9	Ring Indicator (RI)	10	NC

J18: PS/2 Mouse Connector (6-pin Mini-DIN)	
Pin	Signal
1	Mouse data
2	NC
3	Ground
4	+5V
5	Mouse clock
6	NC

J25: PS/2 Keyboard Connector (6-pin Mini-DIN)	
Pin	Signal
1	Keyboard data
2	NC
3	GND
4	+5V
5	Keyboard clock
6	NC

J5/J8: IDE1/IDE2 Interface Connector			
Pin	Signal	Pin	Signal
1	RESET#	2	Ground
3	Data 7	4	Data 8
5	Data 6	6	Data 9
7	Data 5	8	Data 10
9	Data 4	10	Data 11
11	Data 3	12	Data 12
13	Data 2	14	Data 13
15	Data 1	16	Data 14
17	Data 0	18	Data 15
19	Ground	20	NC
21	DMA REQ	22	Ground
23	IOW#	24	Ground
25	IOR#	26	Ground
27	IOCHRDY	28	Pull-down
29	DMA ACK#	30	Ground
31	INT REQ	32	NC
33	SA1	34	NC
35	SA0	36	SA2
37	HDC CS0#	38	HDC CS1#
39	HDD Active#	40	Ground

J6: FDC Interface Connector			
Pin	**Signal**	**Pin**	**Signal**
1	Ground	2	Density Select
3	Ground	4	NC
5	Ground	6	NC
7	Ground	8	Index#
9	Ground	10	Motor ENA#
11	Ground	12	Drive Select B#
13	Ground	14	Drive Select A#
15	Ground	16	Motor ENB#
17	Ground	18	Direction#
19	Ground	20	Step#
21	Ground	22	Write Data#
23	Ground	24	Write Gate#
25	Ground	26	Track 0#
27	Ground	28	Write Protect#
29	Ground	30	Read Data#
31	Ground	32	Head Select#
33	Ground	34	Disk Change#

J17: Flat Panel Display Module Interface			
Pin	Signal	Pin	Signal
1	P0	2	P1
3	P2	4	P3
5	P4	6	P5
7	P6	8	P7
9	P8	10	P9
11	P10	12	P11
13	P12	14	P13
15	P14	16	P15
17	Ground	18	P16
19	SHFCLK	20	P17
21	Ground	22	Ground
23	P18	24	P19
25	P20	26	P21
27	P22	28	P23
29	FLM	30	ENAVEE
31	LP	32	PCLK
33	M	34	+5V
35	+12V	36	+5V
37	+12V	38	+5V
39	Ground	40	Ground

J26: VGA DSUB-15 Connector			
Pin	Signal	Pin	Signal
1	R	2	Ground
3	B	4	NC
5	Ground	6	Ground
7	Ground	8	Ground
9	NC	10	Ground
11	NC	12	MONID1
13	HSYNC	14	VSYNC
15	MONID2		

J27: Ethernet RJ-45 Interface Connector			
Pin	Signal	Pin	Signal
1	TX+	2	TX-
3	RX+	4	Termination to Ground
5	Termination to Ground	6	RX-
7	Termination to Ground	8	Termination to Ground

J23: External USB Interface Connector			
Pin	**Signal**	**Pin**	**Signal**
1	+5V	2	NC
3	SBD0-(USBP0-)	4	Ground
5	SBD0+ (USBP0+)	6	SBD1+ (USBP1+)
7	Ground	8	SBD1- (USBP1-)
9	NC	10	+5V

J20: External PS/2 Mouse Connector	
Pin	**Signal**
1	Mouse clock
2	Mouse data
3	NC
4	Ground
5	+5V

J24: External PS/2 Keyboard Connector	
Pin	**Signal**
1	Keyboard clock
2	Keyboard data
3	NC
4	Ground
5	+5V

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J13 : Standard P8 Power Connector	
Pin	**Signal**
1	N/C
2	+5V
3	+12V
4	-12V
5	Ground
6	Ground

J14: CPU Cooling Fan Power Connector	
Pin	**Signal**
1	Ground
2	+12V
3	Pull-up +5V (reserved for fan sense)

J12: ATX Power Button Interface	
Pin	**Signal**
1	Power Button Control Signal
2	Ground

Chapter 3

System Installation

Contents

Overview

This chapter describes how to set up your system, install M-system's Flash disk, set up the LCD display, and handle WDT operation.

Socket 370 Processor

Installing a CPU

1) Note the CPU speed and voltage type to adjust the jumper settings properly.

2) Lift the CPU socket lever outwards and upwards.

3) Align the processor pins with the pin holes in the socket. Make sure the notched corner or dot mark (pin 1) of the CPU corresponds to the socket's beveled end. Press the CPU gently until it fits into place.

4) Push down the lever to lock the processor chip into the socket.

5) Follow the installation instructions for the cooling fan and heat sink to mount it on the CPU surface and lock it on the socket 370.

Main Memory

The Aviant BX Socket 370 provides four 168-pin Dual In-line Memory Modules (DIMM) to support onboard main memory. The maximum memory size for 3.3V Extended Data Out (EDO) DRAM or SDRAM is 1GB. Normally, the DIMM used can be either 3.3V EDO memory with a speed less than 70ns or 3.3V Synchronized DRAM (SDRAM) with a speed less than 10ns. If you use a Pentium III processor with a 100MHz system clock it is best to use PC100-compliant memory.

For system compatibility and stability, do not use generic DIMM. Use single- or double-sided DIMM without parity and ECC functions.

Note: Do not change DRAM from setup defaults. See Chapter 4 for details.

Flash Disk

The Aviant BX Socket 370 includes one 32-pin DIP socket for installing Flash disk from 2MB to 144MB, such as those from M-systems. This operation structure operates with pure ISA bus without the Plug-n-Play (PnP) function. Before installing it, make certain that the I/O address jumper setting is set to the correct position to prevent an I/O resource conflict. Remember to follow the Disk-On-Chip (DOC) installation procedure to prevent the Flash chip from burning out due to incorrect installation.

Installing DOC

CAUTION

Make sure your DOC is properly inserted. Placing the DOC in reverse will damage it severely.

Align the DOC with the pin holes on the socket. Make sure that the notched corner or dot mark (pin 1) of the DOC corresponds to the notched corner of the socket. Then press the DOC gently until it fits into place. When correctly installed, the Flash disk can be viewed as a normal hard disk to access read/write data.

If you want to boot from the Flash disk, refer to the application note from M-systems. You can easily obtain information from M-system's shipping package (such as the product manual) or their Web site: (*www.m-sys.com)*.

Installing the Single Board Computer

To install the Aviant BX Socket 370 into a chassis, perform the following steps:

1) Ensure all jumpers are set properly.

2) Install and configure the CPU and memory module.

3) Place the Aviant BX Socket 370 into the dedicated position in your system.

4) Attach cables to the existing peripheral devices and secure it.

Note: Refer to the "CHIPS 69000 Graphics Controller" and "Driver Support" sections in this chapter for instructions on how to install the display driver and set up your system.

CHIPS 69000 Graphics Controller

The following table will show you how to enable and disable the onboard C&T 69000 VGA interface by setting jumpers to their proper positions.

JP10	FUNCTION
1-2	Enable onboard VGA
2-3	Disable onboard VGA

The onboard graphics controller adopts the C & T 69000, integrating high performance memory technology for the graphics frame buffer. It incorporates 2MB of integrated SDRAM for the graphics/video frame buffer. The integrated SDRAM memory can support up to 83MHz operation, thus increasing the available memory bandwidth for the graphics subsystem to support high color/high resolution applications.

The 69000 supports a wide variety of monochrome and color Single-Panel, Single-Drive and Dual-Panel, Dual Drive, standard and high resolution, passive STN and active matrix TFT/MIM LCD, and EL panels. It is designed to support high performance graphics and video acceleration for all supported display resolutions, display types, and color modes. This PCI device can be configured to operate an analog CRT monitor and flat panel at the same time.

Display Modes Supported

The 69000 supports the following display modes:

Resolution	Color (bpp)	Refresh Rates (Hz)
640x480	8, 16, 24	60, 75, 85
800x600	8, 16, 24	60, 75, 85
1024x768	8, 16	60, 75, 85
1280x1024	8	60

The Aviant BX Socket 370 utilizes the onboard C & T 69000 and an optional panel display module to support 16 types of panels. You can select one of sixteen LCD panel types using the BIOS panel setting in Advanced CMOS Setup.

LCD Driver Support

> **Note:** For successful installation of the VGA driver in NT3.51 environments, ICS Advent recommends that you build a diskette with the VGA drivers to support a valid data path to "Disk 1". Please prepare one diskette and create a directory \disk1 under its root. Copy all files under \Drivers\Graphics from the CD into \disk1. Then when prompted for VGA drivers during the installation of NT3.51, the VGA drivers will all be located on the diskette.

The Aviant BX Socket 370 onboard VGA (or 69000) device drivers are provided on CD. Before installing the device driver, please see the reference files in each sub-directory.

The VGA69000 supports NT3.5, NT4.0, Win95, and Win98 environments.

Intel 82559 Fast Ethernet Controller

The following table will show you how to enable and/or disable the onboard Intel 82559 LAN interface by putting jumpers at their proper positions.

JP11	FUNCTION
1-2	Enable the onboard LAN
2-3	Disable the onboard LAN

Ethernet Driver Support

The 82559 LAN driver is located in the Drivers directory under the Ethernet subdirectory of the CD.

Onboard LED Indicator

The Aviant BX Socket 370 provides three LED indicators to show the status of the LAN interface. These messages will assist in troubleshooting.

LED1 (top) (LAN speed)
    ON: indicates 100Mbps activity
    OFF: indicates 10Mbps activity

LED2 (center) (LAN active)
    ON: indicates Tx/Rx activity
    OFF: no activity

LED3 (bottom) (LAN Link Integrity)
    ON: indicates link is good
    OFF: link is bad

Watchdog Timer Programming

There are two methods of activating the Watchdog Timer (WDT) function. One way is to utilize the hardware jumper settings and program it using a software command. After this feature is enabled, a system reset will be generated unless a user created application triggers the timer periodically within the time-out period. This allows the system to restart in case any abnormal condition is found. Another way is to program the super I/O W83977ATF chip to start the WDT time-out counting. **ICS Advent recommends using the first approach**. The second approach is comparatively difficult and complicated. In addition, you may also connect the WDT output to the NMI input by setting jumper JP6 to generate an NMI event.

The WDT comes with eight possible ranges of time intervals from 500 ms to 64 seconds, which can be adjusted by setting jumper positions. The two port WDT can be enabled and programmed by reading I/O port 0533H or 0543H to issue a trigger continuously, and disabled by reading I/O port 0033H or 0343H. A 30% tolerance timer limit must be considered for the WDT function. For instance, if the time-out interval is set to 1 second, the WDT trigger command must be issued within 700ms.

The example below provides a reference algorithm for WDT programming via I/O port 0533H and 0033H:

Enable WDT		**Re-trigger WDT**	
MOV	DX, 0533H	MOV	DX, 0533H
IN	AL, DX	IN	AL, DX

Disable WDT	
MOV	DX, 0033H
IN	AL, DX

Power Switch Setup

Momentary Power Switch Setup (ATX Power Supplies Only)[*]

To configure the single board computer to accommodate Omnix chassis with a momentary power switch, follow these steps:

1) Select jumper pins 1-2 on JP3, AT/ATX Power Select (Figure 3-1).

2) Connect J12, ATX Power Button Interface, to the momentary power switch on the chassis.

3) Route ATX signals from the power supply to J10, ATX Power Control Connector.

Select Jumper Pins 1-2

JP3

1   2   3
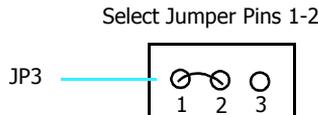
Figure 3-1. JP3, AT/ATX Power Select, Jumper Pins

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[*] *See "Wiring Diagrams" in your chassis user's guide.*

On/Off Power Switch Setup (AT and ATX Power Supplies)[*]

To configure the single board computer to accommodate Omnix chassis with an on/off power switch, follow these steps:

1) Select jumper pins 2-3 on JP3, AT/ATX Power Select.

2) Make sure that J12, ATX Power Button Interface, is not connected.

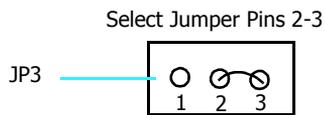**3)** Make sure that J10, ATX Power Control Connector, is not connected.

Figure 3-2. JP3, AT/ATX Power Select, Jumper Pins

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* *See "Wiring Diagrams" in your chassis user's guide.*

Chapter 4
BIOS Setup Information

Contents

Overview

The Aviant BX Socket 370 is equipped with AMI BIOS, which is stored in Flash ROM. AMI BIOS features a built-in setup program, allowing users to modify the system configuration. The system configuration is stored in CMOS RAM so it is retained during power-off periods. When the computer is turned on, the Aviant BX Socket 370 communicates with peripheral devices and checks its hardware resources against the information stored in CMOS memory. If an error is detected or CMOS parameters need to be initially defined, the diagnostic program will prompt the user to enter the SETUP program. Some errors will abort the start-up.

The Setup program is for viewing and changing the BIOS settings for a computer. Setup is accessed by pressing the [F2] key after the POST memory test begins and before the operating system boot begins.

Entering Setup

1) Turn on or reboot the computer.

2) When the message "Hit <DEL> if you want to run SETUP" appears, press the [Del] key immediately to enter the BIOS setup program. If the message disappears before you respond and you want to enter Setup, you can:

♦ Press the [RESET] button.

♦ Restart from a "WARM START" by pressing the [Ctrl], [Alt], and [Delete] keys simultaneously.

In the HIFLEX BIOS setup, use the keyboard's editing keys, as shown in the table below, to choose among the options or modify the system parameters to match your system's options.

Editing Keys	Function
[Tab]	Move to the next field
←↑→↓	Move to the next field to the left, above, right, or below
[Enter]	Select in the current field
+ /–	Increment / Decrement a value
[Esc]	Close the current operation and return to previous level
[PgUp]	Returns to the previous option
[PgDn]	Advances to the next option
[F2] / [F3]	Elect background color
[F10]	Show "Save current settings and exit (Y/N)" in Main Menu"

Main Menu

Once you enter the Aviant BX Socket 370 AMI BIOS CMOS Setup Utility, the Main Menu will appear. From the Main Menu, you can select from eleven SETUP functions and two exit choices. Use the arrow keys to select an item and press the [Enter] key to accept or enter the sub-menu.

```
        AMI BIOS HIFLEX SETUP UTILITY-VERSION 1.30
              (C)1998 American Megatrends, Inc.
                    All Rights Reserved

                    Standard CMOS SETUP
                    Advanced CMOS SETUP
                  Advanced Chipset SETUP
                  Power Management SETUP
                 PCI/Plug and Play SETUP
                      Peripheral SETUP
                  Hardware Monitor SETUP
                  Auto-Detect Hard Disks
                   Change User Password
                Change Supervisor Password
         Auto Configuration with Optimal Settings
        Auto Configuration with Fail Safe Settings
                  Save Settings and Exit
                    Exit Without Saving


   Standard CMOS SETUP for changing time, date, hard
                   disk type, etc.
     ESC:Exit↓↑: Sel F2/F3: Color F10: Save & Exit
```

Note: It is strongly recommended to reload the Optimal Setting if CMOS is lost or the BIOS is updated.

CMOS Setup Reference Table

This setup reference table includes all the Optimal, Failsafe, and Other Options settings in each BIOS setup item. For details, you can refer to the item description in the sub-section.

Table 4-1. Advanced CMOS Setup Defaults			
BIOS Setup Items	**Optimal Default**	**Failsafe Default**	**Other Options**
Quick Boot	Enabled	Disabled	
1st Boot Device	Floppy	Floppy	IDE-1, IDE-2, IDE-3, Floppy, CD-ROM, ATAPI ZIP, LS-120, SCSI, Network
2nd Boot Device	IDE-0	IDE-0	IDE-1, CD-ROM
3rd Boot Device	ATAPI CD-ROM	ATAPI CD-ROM	IDE-1, ATAPI ZIP
4th Boot Device	Disabled	Disabled	IDE-1, CD-ROM
Try Other Boot Device	Yes	Yes	No
S.M.A.R.T. for Hard Disks	Enabled	Enabled	Disabled
BootUp Num-Lock	On	On	Off
PS/2 Mouse Support	Enabled	Enabled	Disabled
System Keyboard	Absent	Absent	Present

Table 4-1. Advanced CMOS Setup Defaults

BIOS Setup Items	Optimal Default	Failsafe Default	Other Options
Initial Display Mode	BIOS	BIOS	Silent
Primary Display	Absent	Absent	VGA/EGA, CGA, Mono
Password Check	Setup	Setup	Always
Boot To OS/2 > 64MB	No	No	Yes
L1 Cache	Write Back	Write Back	Disabled Write Thru
L2 Cache	Write Back	Disabled	Write Thru
System BIOS Cacheable	Enabled	Disabled	
C000, 16K Shadow	Cached	Cached	Enabled, Disabled
C400, 16K Shadow	Cached	Cached	Enabled, Disabled
C800, 16K Shadow	Cached	Cached	Enabled, Disabled
CC00, 16K Shadow	Disabled	Disabled	Cached, Enabled
D000, 16K Shadow	Disabled	Disabled	Cached, Enabled
D400, 16K Shadow	Disabled	Disabled	Cached, Enabled
D800, 16K Shadow	Disabled	Disabled	Cached, Enabled

BIOS Setup

Table 4-1. Advanced CMOS Setup Defaults

BIOS Setup Items	Optimal Default	Failsafe Default	Other Options
DC00, 16K Shadow	Disabled	Disabled	Cached, Enabled

Table 4-2. Advanced Chipset Setup Defaults

BIOS Setup Items	Optimal Default	Failsafe Default	Other Options
Configure SDRAM Timing by SPD	Disabled	Disabled	Enabled
SDRAM RAS# to CAS# delay	3 SCLKs	3 SCLKs	2 SCLKs
SDRAM RAS# Precharge	3 SCLKs	3 SCLKs	2 SCLKs
SDRAM CAS# Latency	3 SCLKs	3 SCLKs	2 SCLKs
SDRAM Leadoff Cmd Timing	Auto	Auto	4 SCLKs, 3 SCLKs
DRAM Integrity Mode	Non-ECC	Non-ECC	EC-Only, ECC H/W
DRAM Refresh Rate	15.6 us	15.6 us	31.2 us, 62.4 us, 124.8 us, 249.6 us
Memory Hole	Disabled	Disabled	512kB-640kB, 15MB-16MB

Table 4-2. Advanced Chipset Setup Defaults		(Continued)	
BIOS Setup Items	**Optimal Default**	**Failsafe Default**	**Other Options**
8bit I/O Recovery Time	1 Sysclk	1 Sysclk	Disabled, 2, 3, 4, 5, 6, 7, 8 Sysclk
16-bit I/O Recovery Time	1 Sysclk	1 Sysclk	Disabled, 2, 3, 4 Sysclk
USB Passive Release	Enabled	Enabled	Disabled
PIIX4 Passive Release	Enabled	Enabled	Disabled
PIIX4 Delayed Transaction	Disabled	Disabled	Enabled
USB Function	Enabled	Enabled	Disabled
USB Keyboard Legacy Support	Enabled	Enabled	Disabled
LCD CRT Selection	CRT Only	CRT Only	Simultaneous, LCD Only
LCD Type	Type 3	Type 3	Type 1, 2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16

Table 4-3. Power Management Setup Defaults

BIOS Setup Items	Optimal Default	Failsafe Default	Other Options
Power Management / APM	Enabled	Disabled	
Green PC Monitor Power State	Off	Off	Standby, Suspend
Video Power Down Mode	Disabled	Disabled	Standby, Suspend
Hard Disk Power Down Mode	Disabled	Disabled	Standby, Suspend
Standby Time-out (Minute)	Disabled	Disabled	1, 2, 4, 8, 10, 20, 30, 40, 50, 60 minutes
Suspend Time-out (Minute)	Disabled	Disabled	1, 2, 4, 8, 10, 20, 30, 40, 50, 60 minutes
Throttle Slow Clock Ratio	50 to 62.5%	50 to 62.5%	0 to 12.5%, 12.5 to 25%, 25 to 37.5%, 37.5 to 50%, 62.5 to 75%, 75 to 87.5%
Display Activity	Ignore	Ignore	Monitor
Device 6 (Serial Port 1)	Monitor	Monitor	Ignore
Device 7 (Serial Port 2)	Monitor	Monitor	Ignore

Table 4-3. Power Management Setup Defaults   (Continued)

BIOS Setup Items	Optimal Default	Failsafe Default	Other Options
Device 8 (Parallel Port)	Ignore	Ignore	Monitor
Device 5 (Floppy disk)	Monitor	Monitor	Ignore
Device 0 (Primary master IDE)	Monitor	Monitor	Ignore
Device 1 (Primary slave IDE)	Ignore	Ignore	Monitor
Device 2 (Secondary master IDE)	Monitor	Monitor	Ignore
Device 3 (Secondary slave IDE)	Ignore	Ignore	Monitor
System Thermal	Ignore	Ignore	Monitor
Thermal Slow Clock Ratio	50 to 62.5%	50 to 62.5%	0 to 12.5%, 12.5 to 25%, 25 to 37.5%, 37.5 to 50%, 62.5 to 75%
CPU Critical Temperature	75 ºC/167 ºF	75 ºC/167 ºF	Disabled, 45 ºC/113 ºF, 50 ºC/122 ºF, 55 ºC/131 ºF, 60 ºC/140 ºF, 65 ºC/149 ºF, 70 ºC/158 ºF
Power Button Function	On/Off	On/Off	Suspend

BIOS Setup

Table 4-3. Power Management Setup Defaults			(Continued)
BIOS Setup Items	**Optimal Default**	**Failsafe Default**	**Other Options**
Ring Resume From Soft Off	Disabled	Disabled	Enabled

Table 4-4. PCI/PnP Setup Defaults			
BIOS Setup Items	**Optimal Default**	**Failsafe Default**	**Other Options**
Plug-n-Play Aware O/S	No	No	Yes
Clear NVRAM	No	No	Yes
PCI Latency Timer (PCI Clocks)	64	64	32, 96, 128, 160, 192, 224, 248
PCI VGA Palette Snoop	Disabled	Disabled	Enabled
Allocate IRQ to PCI VGA	Yes	Yes	No
PCI IDE BusMaster	Disabled	Disabled	Enabled
Offboard PCI IDE Card	Auto	Auto	Slot1, Slot2, Slot3, Slot4
Offboard PCI IDE Primary IRQ	Disabled	Disabled	INTA, INTB, INTC, INTD, Hardwired
Offboard PCI IDE Secondary IRQ	Disabled	Disabled	INTA, INTB, INTC, INTD, Hardwired

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Table 4-4. PCI/PnP Setup Defaults			(Continued)
BIOS Setup Items	**Optimal Default**	**Failsafe Default**	**Other Options**
IRQ15	PCI/ PnP	PCI/ PnP	ISA/ EISA
Reserved Memory Size	Disabled	Disabled	16K, 32K, 64K
Reserved Memory Address	C8000	C8000	C0000, C4000, CC000, D0000, D4000, D8000, DC000

Table 4-5. Peripheral Setup Defaults			
BIOS Setup Items	**Optimal Default**	**Failsafe Default**	**Other Options**
Onboard FDC	Auto	Auto	Enabled, Disabled
Onboard Serial PortA	Auto	Auto	3F8h/COM1, 2F8h/COM2, 3E8h/COM3, 2E8h/COM4, Disabled
Onboard Serial PortB	Auto	Auto	3F8h/COM1, 2F8h/COM2, 3E8h/COM3, 2E8h/COM4, Disabled

Table 4-5. Peripheral Setup Defaults		(Continued)	
BIOS Setup Items	**Optimal Default**	**Failsafe Default**	**Other Options**
Onboard IR Port	Disabled	Disabled	3F8h/COM1, 2F8h/COM2, 3E8h/COM3, 2E8h/COM4, Auto
IR Mode Select	N/A	N/A	IrDA, ASK-IR, FIR
IR IRQ Select	N/A	N/A	3, 4, 5, 9, 10, 11, 12
IR DMA Select	N/A	N/A	0, 1, 3
OnBoard Parallel Port	Auto	Auto	Disabled, 378h, 278h, 3BCh
Parallel Port Mode	ECP	ECP	EPP, Normal, Bi-Dir
EPP Version	N/A	N/A	1.7 , 1.9
Parallel Port IRQ	Auto	Auto	5, 7
Parallel Port DMA Channel	Auto	Auto	0, 1, 3
Onboard IDE	Both	Both	Disabled, Primary, Secondary

BIOS Setup

Standard CMOS Setup Menu

This setup page includes all the items in a standard compatible BIOS. Use the arrow keys to highlight the item and then use the [PgUp] / [PgDn] or [+] / [-] keys to select the value or number you want in each item and press the [Enter] key to make the selection.

Follow the command keys in the CMOS setup table to change the Date, Time, Drive type, and Boot Sector Virus Protection Status.

Advanced CMOS Setup Menu

This setup includes all of the advanced features of the system. The detailed descriptions are specified as below.

Quick Boot

Set **Disabled** for normal booting or select **Enabled** to skip minor BIOS test items to obtain quick boot response.

Boot Up Sequence

This category includes six items to determine which drive the computer searches first to find the Operating System. You can select **Disabled**, **IDE-0, IDE-1, IDE-2, IDE-3, Floppy, LS-120, ATAPI ZIP, CD-ROM, SCSI,** or **NETWORK**.

Boot Up Num-Lock

Select **On** at boot to enable the numeric function of the numeric keypad. Select **Off** at boot to disregard it.

PS/2 Mouse Support

Select **Enabled** to enable the PS/2 mouse, or **Disabled** to make the IRQ12 interrupt available for other ISA-bus I/O devices.

System Keyboard

This option will be used to ignore a "keyboard error" if you choose the **Absent** setting in your BIOS setup and the system has no keyboard attached.

Primary Display

Choose **Absent, VGA/EGA, CGA40x25, CGA80x25,** or **Mono** to meet your monitor type. If you select **Absent**, the "CMOS Display Type Wrong" message will be ignored regardless of the mismatched display card.

Password Check

This option enables password checking when the system boots up or runs the CMOS Setup. It only takes effect after setting the Change Supervisor Password.

Setup – This option will force the system to run a password check before running setup if you have already entered the current user password in "Change User Password". The system will boot, denying access to setup.

Always – Password prompt appears every boot-up. The system will not boot and will deny access to Setup with an invalid password. The best method is to clear CMOS or to reload BIOS Setup to boot up the system.

Boot To OS/2 > 64MB

Set this option to **Yes** to support the OS/2 environment.

System BIOS Cacheable

Enable this option to enhance system performance by shadowing and caching system BIOS. When disabled, this BIOS shadow function will be ignored.

Video BIOS Shadow

Select the **Cached** option to get a higher display performance by shadowing and caching the VGA BIOS. If you choose the **Enabled** option, the BIOS shadow function is active. The **Disabled** option will ignore this BIOS caching and shadowing function.

BIOS Setup

Shadow Memory
(from address C000 – DFFF, 16K per segment)

Each segment provides three options **Disabled**, **Enabled**, and **Cached** for a faster adapter's ROM execution. However this shadow function is chipset oriented and dependent on system hardware features. In general, C000 and C800 will be allocated for VGA BIOS and set to **Cached** to get a higher display performance using the shadowing and caching features. If the user chooses the **Enabled** setting, only the BIOS shadow function is active.

Advanced Chipset Setup Menu

This setup is very important to maintain system stability. The optimal default setting is recommended.

Configure SDRAM Timing by SPD

This option provides DIMM Plug-n-Play support by the Serial Presence Detect (SPD) mechanism via the System Management Bus (SMBus) interface. You can disable this option to manage the following four SDRAM timing options by yourself. In addition, SDRAM operating timings may follow serial presence from the EEPROM content by setting this option to **Enabled**, and all of SDRAM timing options will be not available and hidden.

SDRAM RAS# to CAS# Delay

This option controls the number of SDRAM Clocks (SCLKs) from a row activate command to a read or write command. Normally, the option will be set to **3 SCLKs**.

SDRAM RAS# Precharge

This option controls the number of SCLKs for RAS# precharge.

SDRAM CAS# Latency

This option controls the number of SCLKs between the time a read command is sampled by the SDRAMs and the time the North Bridge, 82443BX, samples correspondent data from the SDRAMs. For a registered DIMM with CAS# Latency = 2, this option should be set to **2 SCLKs** to acquire better memory performance.

SDRAM Leadoff Cmd Timing

This option is used to control when the SDRAM command pins (SRASx#, SCASx# and Wex#) and CSx# are considered valid on leadoffs for CPU cycles. If you select **Auto**, this timing will be automatically initialized and set by the BIOS.

DRAM Integrity Mode

There are three options in this feature: Non-Error Checking and Correction hardware (Non-ECC), Error Check Only (EC-Only) and Error Checking and Correction Hardware (ECC). The DRAM integrity mode will be implemented by the parity algorithm when this option is set to **Non-ECC**.

DRAM Refresh Rate

This option specifies the refresh rate frequency for the installed system memory SDRAM DIMMs.

Memory Hole

This option allows the end user to specify the location of a memory hole for memory space requirements from ISA-bus cards.

8bit I/O Recovery Time

This option specifies the length of the delay (in Sysclks) inserted between consecutive 8-bit I/O operations.

16bit I/O Recovery Time

This option specifies the length of the delay (in Sysclks) inserted between consecutive 16-bit I/O operations.

USB Passive Release

When enabled, this allows PIIX4 to use Passive Release to obtain better USB performance while transferring control information or data for USB transactions. When disabled, PIIX4 will perform PCI functions for the USB without using Passive Release.

PIIX4 Passive Release

Choose the **Enabled** option to help raise the available bandwidth of the PCI bus for increasing PCI bus performance.

PIIX4 Delayed Transaction

Choose the **Enabled** option to increase PCI bus performance for slower ISA bus applications.

Spread Spectrum Control

This option is for Electromagnetic Interference (EMI) test issues only.

USB Function

This option will enable the on-chip USB function to support USB peripheral devices if the user chooses the **Enabled** setting.

USB Keyboard Legacy Support

This feature will be automatically disabled and hidden if the user chooses the **Disabled** setting from the foregoing USB Function option. Otherwise, enabling this option provides support for a USB keyboard without the auxiliary driver in a DOS environment.

CMOS RAM Clear Function

Set this option to **Enabled** to support hardware CMOS clearing operation.

Liquid Crystal Display (LCD) CRT Selection

There are three options used to support the display function: CRT Only, LCD Only, and Simultaneous. The default setting is **CRT Only**.

LCD Type

There are sixteen options from "Type 1" to "Type 16" used to support the LCD panel display function. The final Panel Type will be decided by CMOS settings. You can find out the supporting resolution on page 2-7. The default setting is **Panel Type 7**.

Power Management Setup Menu

This APM (Advanced Power Management) determines how much energy can be saved by setting the below items to handle system power resources. The following descriptions will specify the definition of each item.

Power Management/APM

Use this feature to control system power resources. Set this option to **Enabled** to enable the power management function. It becomes effective when based on the following parameter settings.

Green PC Monitor Power State

This option is used to decide what kind of power states are effective. There are three options **Standby**, **Suspend**, and **Off** . The **Standby** option is to turn off light power by handling monitor signals. The **Suspend** mode is to turn off heavy power. The **Off** state is really to turn off the power of the monitor.

Video Power Down Mode

This option specifies the power conserving state that the Video Electronics Standards Association (VESA) VGA video subsystem enters after the specified period of display inactivity has expired.

Hard Disk Power Down Mode

This option specifies the power management state that the HDD enters after the specified period of hard drive inactivity has expired. It is the same as video power control. If the user chooses **Standby** or **Suspend**, it will depend on the duration of **Standby Time-out** or **Suspend Time-out**.

Standby Time-out (Minute)

This option specifies the length of the period of system inactivity while the computer is in full-on power state before the computer is placed in **Standby** mode. When this length of time expires, the computer enters the **Standby Time-out** state. In **Standby** mode, some power use is curtailed.

Suspend Time-out (Minute)

This option is the same as the **Standby Time-out** function. These two features are enabled to monitor the power of sub-items **Display Activity**, **Serial Port**, **Parallel Port**, **Floppy**, **Pri-HDD**, and **Sec-HDD** independently. It is also used to control CPU throttle running function. All of the sub-items will be ineffective in disabling **Standby Time-out** or **Suspend Time-out** even if they can be chosen by the user in the BIOS setup menu.

Throttle Slow Clock Ratio

This option specifies the speed at which the system clock runs in power saving modes. The settings are expressed as a duty cycle of the STPCLK# signal. This duty cycle indicates the percentage of time the STPCLK# signal is asserted while in the throttle mode.

Display Activity

This option specifies whether the BIOS will monitor activity on the display monitor for power conservation purposes. If set to **Monitor** and the computer is in a power saving state, BIOS watches for video display activity. The computer enters the full-on power state if any activity occurs. BIOS reloads the Standby and Suspend timeout timers if activity occurs on the specified IRQ lines. If set to **Ignore**, video display monitor activity is not monitored.

Device 6/7/8/5/0/1/2/3
(Serial 1&2, Parallel, FDD, Pri/Sec HDD)

When set to **Monitor**, these options enable event monitoring on the specified hardware device. If set to **Monitor** and the computer is in a power saving state, BIOS watches for activity on the device with specified IRQ line. The computer enters the full-on power state if any activity occurs. BIOS reloads the Standby and Suspend time-out timers if activity occurs on the specified device. No monitoring activity occurs if the option is set to **Ignore**. The settings for each of these options are **Monitor** or **Ignore**.

System Thermal

Set this option to **Monitor** for CPU thermal monitoring and speed down control. The system will automatically supervise the CPU temperature. If the CPU surface temperature reaches the trip point set in the Hardware Monitor Setup, the thermal detection will be effective and the CPU will run in the throttle control mode. The overall system performance will be reduced to half. This option is a trade-off between system performance and stability and is configurable by the user. The default setting is **Ignore**. You can choose **Monitor** setting to enable this thermal function.

Thermal Slow Clock Ratio

This option specifies the speed at which the system clock runs in the thermal trip point. The settings are expressed as duty cycle of the STPCLK# signal. This duty cycle indicates the percentage of time the STPCLK# signal is asserted while in the over heat mode.

CPU Critical Temperature

Set this option to monitor the CPU thermal trip point defined by the user. If the System Thermal option in CMOS setup is set to the **Monitor** state and the CPU surface temperature is above this critical temperature, the system will automatically enter slow down mode.

Power Button Function

This feature is only available on systems with an ATX power control interface. If you use a standard AT power supply, this option will be ignored. If you set it to **on/off**, you can easily power on/off the system by pressing the power button (toggle switch). However, if the **Suspend** setting is chosen, the system will be forced into suspend mode when the user turns it off, unless the power button is continuously pressed for more than 4 seconds to initiate soft off mode.

Ring Resume From Soft Off

This item wakes up the system from remote ringing control under a soft off condition. If you choose the **Disabled** setting, the system will not be resumed by a modem ring.

PCI/Plug-n-Play Setup

This section describes how to configure the PCI bus system. PCI is a system which allows I/O devices to operate at speeds close to the CPU's speed when they communicate.

All of the options described in this section are important and technical and it is strongly recommended that only experienced users make changes to the default settings.

Plug-n-Play Aware O/S

Set this option to **Yes** if the operating system installed in the computer is Plug-n-Play (PnP) aware. The BIOS only detects and enables PnP ISA adapter cards that are required for the system to boot. The Windows 95/98/2000 operating systems detect and enable all other PnP aware adapter cards and are PnP aware. Set this option to **No** if the operating system (such as DOS, OS/2, Windows 3.x) does not use PnP.

> **Note:** Set this option correctly or the PnP aware adapter cards installed in your computer will not be configured properly.

Clear NVRAM

This option is used to clear NVRAM and to check or update the Extended System Configuration Data (ESCD) data after a system power on. Setting this option to **No** will not clear NVRAM. Updating the ESCD is effective in a different ESCD data comparision. If you select the **Yes** setting, the BIOS will update the ESCD every power on.

PCI Latency Timer (PCI Clocks)

This option is used to control the PCI latency timer period (follow PCI clocks). Based on PCI specification 2.1 or later and the PCI bus frequency in the system, the user can select a different timer to meet their PCI bus environment.

PCI VGA Palette Snoop

Some display cards that are non-standard VGA, such as graphics accelerators or MPEG video cards, may not show colors properly. You can choose the **Enabled** setting to correct this display mismatch problem. Supporting ISA adapter cards installed in the computer requires VGA palette snooping.

Allocate IRQ to PCI VGA

This option will be used to allocate an IRQ for a PCI VGA card.

PCI IDE BusMaster

Set this option to **Enabled** to specify that the IDE controller on the PCI local bus has a bus mastering capability.

Offboard PCI IDE Card

This option specifies if an offboard PCI IDE controller adapter board is used in the computer. You must also specify the PCI expansion slot on the Single Board Computer (SBC) where the offboard PCI IDE controller card is installed. If an offboard PCI IDE controller is used, the onboard IDE controller on the SBC is automatically disabled. If **Auto** is selected, BIOS automatically determines the correct setting for this option. If you want to respectively control offboard PCI IDE primary/secondary IRQ resources, you should set this option between **Slot 1** and **Slot 4**. Otherwise, all of these sub-options will not be available.

Offboard PCI IDE Primary/Secondary IRQ

This option specifies the PCI interrupt used by the primary/secondary IDE channel on the offboard PCI IDE controller. The settings are **Disabled**, **INTA**, **INTB**, **INTC**, **INTD**, or **Hardwired** for installing offboard non-compliant PCI IDE cards.

PCI Slot 1/2/3/4 IRQ Priority

These options specify the priority IRQ to be used for PCI devices installed in PCI expansion slots 1 through 4, but do not force selection. The settings are Auto (AMI BIOS automatically determines the priority IRQ), (IRQ) 3, 4, 5, 7, 9, 10, or 11.

DMA Channel 0/1/3/5/6/7

These options specify if the named DMA channel is available for use on the ISA/EISA bus or PnP.

IRQ 3/4/5/7/9/10/11/12/14/15

These options specify the bus that the named interrupt request lines (IRQs) are used on. These options allow you to specify IRQs for use by legacy ISA adapter cards. These options determine if AMI BIOS should remove an IRQ from the pool of available IRQs passed to devices that are configurable by the system BIOS. The available IRQ pool is determined by reading the ESCD NVRAM. If more IRQs are needed, the user can use the PCI/PnP setup to remove the IRQ by assigning the option to the ISA/EISA setting. All IRQs used by onboard I/O peripherals are configured as PCI/PnP.

Peripheral Setup

This section describes the I/O resources assignments for all onboard peripheral devices.

Onboard FDC

If you want to install a different add-on super I/O card to connect floppy drives, set this field to **Disabled**. Otherwise, set it to **Auto** to call BIOS to automatically determine if the floppy controller should be enabled.

Onboard Serial Port A/Port B

These fields control the resource assignments of two onboard serial interfaces: SIO1 and SIO2. The following list shows the options of onboard serial port A/port B:

Auto → set serial I/O resources automatically
Disabled → indicates onboard COM port function is disabled
3F8h/COM1 → assign I/O address 3F8h to COM1
2F8h/COM2 → assign I/O address 2F8h to COM2
3E8h/COM3 → assign I/O address 3E8h to COM3
2E8h/COM4 → assign I/O address 2E8h to COM4

Onboard IR Port

This option controls the resource assignments of onboard serial port 3. The IR Mode Select has three settings **IrDA**, **ASK IR**, and **FIR**.

Onboard Parallel Port

There are four optional items used to control the onboard parallel port interface while the user selects the I/O base address manually: **Parallel Port Mode**, **EPP Version**, **Parallel Port IRQ**, and **Parallel Port DMA Channel**. The following lists the available options of the onboard parallel port:

Auto → LPT port I/O resources assigned automatically
Disabled → onboard parallel port function is disabled
378h → IRQ7 for this default I/O address
278h → assign this I/O address to LPT1
3BCh → assign this I/O address to LPT1

Parallel Port Mode:

This option specifies the parallel port mode. **ECP** and **EPP** are both bi-directional data transfer schemes that adhere to the IEEE 1284 specifications. This parallel port mode includes four options: **Normal**, **Bi-Dir**, **EPP**, and **ECP**. The optimal default setting is **Bi-Dir**.

Setting	Description
Normal	Uni-direction operation at normal speed
Bi-Dir	Bi-direction operation at normal speed
EPP	The parallel port can be used with devices that adhere to the Enhanced Parallel Port (EPP) specification. EPP uses the existing parallel port signals to provide asymmetric bi-directional data transfer driven by the host device.
ECP	The parallel port can be used with devices that adhere to the Extended Capabilities Port (ECP) specification. ECP uses the DMA protocol to achieve data transfer rates up to 2.5 Megabits per second. ECP provides symmetric bi-directional communication.

EPP Version:

This option is only valid if the parallel port mode option is set to **EPP**. This option specifies the version of the Enhanced Parallel Port specification that will be used by the AMI BIOS.

Parallel Port IRQ:

This option is only valid if the onboard parallel port option is set to **Enabled**. This option sets the IRQ used by the parallel port.

Parallel Port DMA Channel:

This option is only available if the onboard parallel port is set to fixed I/O address and the setting of parallel port mode is ECP. This option sets the DMA channel used by the ECP-compatible parallel port.

Onboard IDE

This option specifies the onboard IDE controller channels that will be used. The settings are **Disabled**, **Primary**, **Secondary**, or **Both**.

Hardware Monitor Setup

This setup describes the current system status detected by the hardware monitor sensor. The status shown on screen will include:

♦ Current CPU Temperature (Generally indicates the surface temperature of the SBC) and the Basic Critical Temperature (BCT),

♦ Current CPU Fan Speed, and

♦ System operating voltages including **Vcore**, **Vtt**, **Vio**, **+5V**, **+12V**, **-12V**, and **-5V**.

BIOS POST Check Point List

The AMI BIOS provides all IBM standard Power On Self Test (POST) routines as well as enhanced AMI BIOS POST routines. The POST routines support CPU internal diagnostics. The POST checkpoint codes are accessible via the Manufacturing Test Port (I/O port 80h).

Whenever a recoverable error occurs during the POST, the system BIOS will display an error message explaining the problem in detail so that the problem can be corrected.

During the POST, the BIOS signals a checkpoint by issuing one code to I/O address 80h. This code can be used to establish the status of the BIOS power-on sequence and what test is currently being performed. This is done to help troubleshoot a faulty system board.

If the BIOS detects a terminal error condition, it will halt the POST process and attempt to display the checkpoint code written to I/O address port 80h. If the system hangs before the BIOS detects the terminal error, the value at port 80h will be the last test performed. In this case, the terminal error cannot be displayed on the screen. The following POST checkpoint codes are valid for all AMI BIOS products with a core BIOS date of 07/15/95 version 6.27 (Enhanced).

Uncompressed Initialization Codes

The uncompressed initialization checkpoint hex codes are listed below in order of execution:

Code	Description
D0	NMI is disabled. CPU ID saved. INIT code checksum verification will be started.
D1	Initializing the DMA controller, performing the keyboard controller BAT test, starting memory refresh, and going to 4GB flat mode.
D3	To start memory sizing.
D4	Returning to real mode. Executing any OEM patches and setting the stack.
D5	Passing control to the uncompressed code in shadow RAM at E000:0000h. The INIT code is copied to segment 0 and control will be transferred to segment 0.
D6	Control is in segment 0. Next, checking if [Ctrl + Home] was pressed and verifying the system BIOS checksum. If [Ctrl + Home] was pressed or the system BIOS checksum is bad, will go to checkpoint code E0h. Otherwise, going to checkpoint code D7h.
D7	To pass control to interface module.
D8	Main BIOS runtime code is to be decompressed.
D9	Passing control to the main system BIOS in shadow RAM.

Bootblock Recovery Codes

The bootblock recovery checkpoint hex codes are listed in order of execution:

Code	Description
E0	The onboard floppy controller is initialized. Beginning the base 512kB memory test.
E1	Initializing the interrupt vector table.
E2	Initializing the DMA and Interrupt controllers.
E6	Enabling the floppy drive controller and Timer IRQs. Enabling internal cache memory.
ED	Initializing the floppy drive.
EE	Looking for a diskette in drive A: and reading first sector of the diskette.
EF	A read error occurred while reading the floppy drive in drive A:.
F0	Searching for the AMIBOOT.ROM file in the root directory.
F1	The AMIBOOT.ROM file is not in the root directory.
F2	Reading and analyzing the floppy diskette FAT to find the clusters occupied by the AMIBOOT.ROM file.
F3	Reading AMIBOOT.ROM file, cluster by cluster.
F4	The AMIBOOT.ROM file is not the correct size.
F5	Disabling internal cache memory.
FB	Detecting the type of Flash ROM.
FC	Erasing the Flash ROM.
FD	Programming the Flash ROM
FF	Flash ROM programming was successful. Restarting the system BIOS.

Uncompressed Initialization Codes

The following runtime checkpoint hex codes are listed below in order of execution. These codes are uncompressed in F0000h shadow RAM.

Code	Description
03	The NMI is disabled. Checking for a soft reset or a power on condition.
05	The BIOS stack has been built. Disabling cache memory.
06	Uncompressing the POST code next.
07	Initializing the CPU and the CPU data area.
08	The CMOS checksum calculation is done next.
0B	Performing required initialization before the keyboard BAT command is issued.
0C	The keyboard controller input buffer is free. Issuing the BAT command to the keyboard controller.
0E	The keyboard controller BAT command result has been verified. Performing necessary initialization after the K/B controller BATcommand test.
10	Issuing pin 23 and 24 blocking and unblocking commands.
11	Checking if the [End] or [Ins] keys were pressed during power on.
12	Initializing CMOS if the "initialize CMOS RAM in every boot" is set or the [End] key is pressed. Disabling DMA and Interrupt controllers.
13	The video display has been disabled. Port B has been initialized. Initializing the chipset.
14	The 8254 timer test will begin next.
19	The 8254 timer test is finished. Starting the memory refresh test.

Code	Description (Continued)
1A	The memory refresh line is toggling. Checking the 15us on/off time.
23	Reading the 8042 input port and disabling the MEGAKEY Green PC feature. Making the BIOS code segment writable and performing any necessary configuration before initializing the interrupt vectors.
24	The configuration or setup required before interrupt vector initialization has been completed. Interrupt vector initialization is about to begin.
25	Interrupt vector initialization is done. Clearing the password if the POSTDIAG switch is on.
27	Performing initialization before setting video mode.
28	Beginning monochrome mode and color mode settings.
2A	Bus initialization system, static, output devices will be done, if present.
2B	Passing control to the video ROM to perform any required configuration before the video ROM test.
2C	Looking for optional video ROM to transfer control.
2D	The video ROM has returned control to BIOS POST. Performing any required processing after the video ROM had control.
2E	Completed post-video ROM test processing. If the EGA/VGA controller is not found, perform the display memory read/write test.
2F	EGA/VGA not found. Begin the display memory R/W test.
30	Display memory R/W test passed. Look for retrace checking.
31	Display memory R/W test or retrace checking failed. Begin alternate display retrace checking.

Code	Description (Continued)
32	Alternate display memory R/W test passed. Looking for the alternate display retrace checking.
34	Video display checking is over. Setting the display mode next.
37	The display mode is set. Displaying the power on message next.
38	Initializing the bus input, IPL, and general devices, if present.
39	Displaying bus initialization error message.
3A	The new cursor position has been read and saved. Displaying the "Hit [DEL]" message next.
40	Preparing the descriptor tables next.
42	Entering protected mode for the memory test.
43	Entered protected mode. Enabling interrupts for diagnostics mode.
44	Interrupts enabled if the diagnostics switch is on. Initializing data to check memory wraparound at 0:0.
45	Data initialized. Checking for memory wraparound at 0:0 and finding the total system memory size.
46	The memory wraparound test has completed. The memory size calculation has been done. Writing patterns to test memory.
47	The memory pattern has been written to extended memory. Writing patterns to the base 640kB memory test.
48	Patterns written in base memory. Determining the amount of memory below 1MB.
49	The amount of memory below 1MB has been found and verified. Determining the amount of memory above 1MB memory.

Code	Description (Continued)
4B	The amount of memory above 1MB has been found and verified. Checking for a soft reset and clearing the memory below 1MB for the soft reset. If this is a power on situation, checkpoint 4Eh is next.
4C	The memory below 1MB has been cleared via a soft reset. Clearing the memory above 1MB.
4D	The memory above 1MB has been cleared via soft reset. Saving the memory size. Going to checkpoint 52h next.
4E	The memory test started, but not as the result of a soft reset. Displaying the first 64kB memory size.
4F	Memory size display started. This will be updated during the memory test. Performing the sequential and random memory test.
50	Memory testing/initialization below 1MB completed. Adjusting the displayed memory size for relocation and shadowing.
51	The memory size display was adjusted for relocation and shadowing. Testing the memory above 1MB.
52	The memory above 1MB has been tested and initialized. Saving the memory size information.
53	The memory size information and the CPU registers are saved. Entering real mode.
54	Shutdown was successful. The CPU is in real mode. Disabling the Gate A20 line, parity, and the NMI.
57	The A20 address line, parity, and the NMI are disabled. Adjusting the memory size depending on relocation and shadowing.
58	The memory size was adjusted for relocation and shadowing. Clearing the "Hit [DEL]" message.

Code	Description (Continued)
59	The "Hit [DEL]" message is cleared. The "[WAIT...]" message is displayed. Staring the DMA and interrupt controller test.
60	The DMA page register test passed. DMA#1 base register test is next.
62	DMA#1 base register test passed. DMA#2 base register test is next.
65	DMA#2 base register test passed. To program DMA units 1 and 2.
66	DMA units 1 and 2 programming finished. Initializing the 8259 interrupt controller.
7F	Extended NMI sources enabling is in progress.
80	The keyboard test has started. Clearing the output buffer and checking for stuck keys. Issuing the keyboard reset command.
81	A keyboard reset error or stuck key was found. Issuing the keyboard controller interface test command.
82	The keyboard controller interface test completed. Writing the command byte and initializing the circular buffer.
83	The command byte has been written and the global data initialization complete. Checking for locked key.
84	Locked key checking is finished. Checking for a memory size mismatch with the CMOS RAM data.
85	The memory size check is done. Displaying a soft error and checking for a password or bypassing setup.
86	Password checked. About finish the programming before setup.
87	The programming before setup has been completed. Uncompressing the setup code and executing the AMI BIOS setup utility.

Code	Description (Continued)
88	Returned from CMOS setup program and screen is cleared. About to do programming after setup.
89	The programming after setup has been completed. Displaying the power on screen message.
8B	The first screen message has been displayed. The "[WAIT...]" message is displayed. Performing the PS/2 mouse check and the extended BIOS data area allocation check.
8C	Programming the setup options next.
8D	Hard disk controller reset is next.
8F	Hard disk controller reset done. Floppy setup is next.
91	The floppy drive controller has been configured. Configuring the hard disk drive controller.
95	Initializing the bus option ROMs from C800.
96	Initializing before passing control to the adaptor ROM at C800.
97	Initialization before the C800 adaptor ROM gains control has been completed. The adaptor ROM check is next.
98	The adaptor ROM had control and has now returned control to the BIOS POST. Performing the required processing after the BIOS POST regained control.
99	Any initialization required after the option ROM test has been completed. Configuring the timer data area and printer base address.
9A	Returned after setting the timer and printer base addresses. Setting the RS-232 base address.
9B	Returned after setting the RS-232 base address. Performing any required initialization before the coprocessor test.

Code	Description	(Continued)
9C	Required initialization before the coprocessor test is over. Initializing the coprocessor.	
9D	Coprocessor initialized. Initialization after coprocessor test.	
9E	Initialization after the coprocessor test is complete. Checking the extended keyboard, keyboard ID, and Num Lock key. Issuing the keyboard ID command.	
A2	Displaying any soft errors.	
A3	Soft error display complete. Setting keyboard typematic rate.	
A4	Keyboard typematic rate set. Programming memory wait states.	
A5	Memory wait state programming is over. Clearing the screen and enabling parity and the NMI.	
A7	NMI and parity enabled. Performing any initialization required before passing control to the adaptor ROM at E000.	
A8	Initialization before passing control to the adaptor ROM at E000h completed. Passing control to the adaptor ROM at E000h.	
A9	Returned from adaptor ROM at E000h control. Performing any initialization required after the E000 option ROM had control.	
AA	Initialization after E000 option ROM control has been completed. Displaying the system configuration.	
AB	Building the multiprocessor table, if necessary.	
AC	Uncompressing the DMI data and initializing DMI POST.	
B0	The system configuration is displayed.	
B1	Copying code to specific areas.	
00	Code copying to specific areas is done. Passing control to INT 19h boot loader.	

Flash BIOS Utility

Utilize the AMI Flash BIOS programming utility to update the onboard BIOS for future BIOS versions. Please contact ICS Advent to get this utility if necessary.

Note: Boot to a clean DOS system.

Appendix A
Abbreviations

Abbreviations

ACPI - Advanced Configuration and Power Interface

AGPset - A chipset that supports the Accelerated Graphics Port

ACPI - Advanced Configuration and Power Interface

APM - Advanced Power Management

AT - Advanced Technology

ATX - Advanced Technology Extended

BIOS - Basic Input-Output System

bps - bits per second

CE - European Community

CFM - Cubic Feet per Minute, such as 47 CFM of air flow

COM - Component Object Model

CPU - Central Processing Unit

DIMM - Dual Inline Memory Module

DIP - Dual Inline Processor

DMA - Direct Memory Access

DMI - Desktop Management Interface

DOC - Disk-On-Chip

DOS - Disk Operating System

DRAM - Dynamic Random Access Memory

DSTN - Dual-scan super twisted nematic

ECC - Error Correction Code

ECP - Extended Capabilities Port

EDO - Extended Data Out

EIDE - Enhanced Integrated Drive Electronics

EMI - Electromagnetic Interference

EN - European Norm

EPP - Enhanced Parallel Port

ESD - Electrostatic Discharge

FDD - Floppy Disk Drive

FIFO - First In First Out

FIR - Fast Infrared

GTL+ - Gunning Transceiver Logic

HDD - Hard Disk Drive

IDE - Integrated Drive Electronics

I/O - Input/Output

IRQ - Interrupt Request Lines

ISA - Industry Standard Architecture

LAN - Local Area Network

LCD - Liquid Crystal Display

LED - Light Emitting Diode

LVDS - Low Voltage Differential Signal

NC - Not Connected

NVRAM - Non-volatile Random Access Memory

OS - Operating System

PBSRAM - Pipeline Burst Static Random Access Memory

PC - Personal Computer

PCB - Printed Circuit Board

PCI - Peripheral Component Interconnect

PICMG - PCI Industrial Computer Manufactures Group

PIIX4 - 82371EB PCI ISA IDE Xcelerator

PG - Power Good

PIO - Programmed Input/Output

POST - Power On Self Test

PPGA - Plastic Pin Grid Array

PS/2 - Personal System/2

RAM - Random Access Memory

RFI - Radio Frequency Interference

RJ11 - Registered Jack 11

RJ12 - Registered Jack 12

RJ45 - Registered Jack 45

ROM - Read Only Memory

RTC - Real-Time Clock

SBC - Single Board Computer

SDRAM - Synchronous Dynamic Random Access Memory

SIMM - Single Inlin Memory Module

SIR - Speaker Independent (Voice) Recongition (ASR)

SMBUS - System Management Bus

SPD - Serial Presence Detect

SPP - PC-compatible Printer Port

SRAM - Static Random Access Memory

STN - Super Twisted Nematic

SVGA - Super Video Graphics Array

TFT - Thin Film Transistor

UARTS - Universal Asynchronous Receiver Transmitter

USB - Universal Serial Bus

VESA - Video Electronics Standards Association

VGA - Video Graphics Array

VLSI - Very Large Scale Integration

WDT - Watchdog Timer

XGA - Extended Graphics Array

Declaration of Conformity

Information Technology Equipment

ICS ADVENT

6260 Sequence Drive
San Diego, CA 92121-4371
800 523-2320 / 858-677-0877

The product(s) covered by this declaration:

Aviant Socket 370 Single Board Computer – SBC-SBX-VE

The European Union directives covered by this declaration:

EMC Directive 89/336/EEC and Low Voltage Directive 73/23/EEC

The basis on which conformity is declared:

EN 50081-1:1992 Emissions, Generic Requirements
-EN 55022 Limits and Methods of Measurement of Radio Disturbance
Characteristics of Information Technology Equipment

EN 50082-1:1992 Immunity, Generic Requirements
- EN61000-4-2: 1995 Electrostatic Discharge (ESD) Immunity
- EN61000-4-3: 1995 Radiated RF Field Immunity
- EN61000-4-4: 1995 EFT Immunity for AC and I/O Lines

EN 60950:1992 Safety of Information Technology Equipment

The technical documentation required to demonstrate this product meets the requirements of the EMC Directive and the Low Voltage Directive has been compiled by ICS Advent and is available for inspection by the relevant enforcement authorities.

Attention

The attention of the specifier, purchaser, installer, or user is drawn to special measures and limitations for use which must be observed when the product is taken into service to maintain compliance with the above directives.

Details of these special measures and limitations are in the product manual.

Mr. Jim Jameson
President & Chief Executive Officer

ICS ADVENT

ICS Advent Europe
Ben Turner Industrial Estate
Oving Road
Chichester, West Sussex
PO19 4ET, UK