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SBC-845D-VEA Single Board Computer User's Guide



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Safety Instructions

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Before You Begin

Before handling the SBC-845D-VEA, read the instructions and safety guidelines on the following pages to prevent damage to the product and to ensure your own personal safety. Refer to the "Advisories" section in the Preface for advisory conventions used in this user's guide, including the distinction between Warnings, Cautions, Important Notes, 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 user's guide for precautions and procedures. If you have any questions, please contact Kontron 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 or subsystems to prevent electric shock or system board damage. This does not apply when hot swapping parts.

3) Follow the guidelines provided in "Preventing 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 user's guide. Follow installation and troubleshooting instructions closely.



Preventing 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. Kontron 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. This willl discharge any static electricity that may have built up in your body.
- 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.
- Do not handle or store system boards near strong electrostatic, electromagnetic, magnetic, or radioactive fields.

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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 our web site, *www.kontron.com*, under Technical Support.

The following is a summary of the chapter contents:

- **Chapter 1, Introduction,** presents the product specifications and system architecture for the SBC-845D-VEA single board computer.
- **Chapter 2, Jumpers and Connectors,** 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, and M-system's Flash Disk for safe installation. It also includes a programming guide for the Watchdog Timer function.
- **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.
- **Chapter 5, ATX Power Settings,** provides additional information to properly configure the SBC-845D-VEA to support ATX power.

Customer Comments

If you have any difficulties using this user's guide, discover an error, or just want to provide some feedback, please send us a message using the online form under "Contact Us" on our web site (*www.kontron.com*) under "Technical Support." Detail any errors you find. We will correct the errors or problems as soon as possible and post the revised user's guide 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

Four types of advisories are used throughout this user's guide 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 is used to make helpful information stand out.



Important: An important note indicates information that is important for you to know.



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 user's guide. However, Kontron does not claim to have covered all situations that might require the use of a Caution or Warning.

Unpacking

When unpacking, follow these steps:

1) After opening the box, save it and the packing material for possible future shipment.

2) Remove all items from the box. If any items listed on the purchase order are missing, notify Kontron customer service immediately.

3) Inspect the product for damage. If there is damage, notify Kontron customer service immediately. Refer to “Guarantee and Warranty Policy” for the return procedure.

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

Changes or modifications not expressly approved by Kontron 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

CE

The product(s) described in this user's guide complies with all applicable European Union (CE) directives if it has a CE marking. The CE declaration of conformity is provided on the last page of this user's guide. 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 Kontron offers accessories, the customer must ensure that these products are installed with proper shielding to maintain CE compliance. Kontron does not offer engineering services for designing cabling systems. In addition, Kontron will not retest or recertify systems or components that have been reconfigured by customers.

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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 user's guides, 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 resalable 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, Kontron will repair or replace, at our option, any defective product. Kontron 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 Kontron or its authorized agent; or if the failure is caused by accident, acts of God, or other causes beyond the control of Kontron 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 guide.

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. Kontron 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 Kontron Customer Service at 800-480-0044 or 858-677-0877 and obtain a Return Material Authorization (RMA) Number. All product(s) returned to Kontron 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 Kontron shipping container. If the original container has been lost or damaged, new shipping containers may be obtained from Kontron Customer Service at a nominal cost.

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

Kontron 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 Kontron.

Limitation of Liability

In no event shall Kontron 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. Kontron'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 Kontron 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. **Kontron reserves the right to refuse returns or credits on software or special order items.**

Maintaining Your Computer

Cleaning Components

Internal fans cool the computer by drawing in air through air vents in the front of the computer and blowing it out the rear-side panels. Dust and other debris is drawn in with the air and, if allowed to build up, will interfere with the operation of various system components and insulate components, preventing heat from dissipating. To prevent this, an air filter has been installed in front of the air vents in the front panel to block dust and other debris from entering the computer.

Dust and debris builds up on the air filter over time. When the air filter becomes very dirty, it is difficult for cooling air to pass through the air filter and enter the computer. So, the air filter must be cleaned to prevent the computer from overheating. Remove and clean the air filter on a regular basis following the steps described in the "Air Filter" section of Chapter 2. Also, regularly vacuum the exterior of the chassis to remove dust that has accumulated around the air vents.

Environmental Factors

Temperature

The ambient temperature within an enclosure may be greater than room ambient temperature. Installation in an enclosure 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. Overheating can cause a variety of problems, including premature aging and failure of chips or mechanical failure of devices.

If the system has been exposed to abnormally cold temperatures, allow a two-hour warm-up period to bring it up to normal operating temperature before turning it on. Failure to do so may cause damage to internal components, particularly the hard disk drive.

Humidity

High-humidity can cause moisture to enter and accumulate in the system. This moisture can cause corrosion of internal components and degrade such properties as electrical resistance and thermal conductivity. Extreme moisture buildup inside the system can result in electrical shorts, which can cause serious damage to the system.

Buildings in which climate is controlled usually maintain an acceptable level of humidity for system equipment. However, if a system is located in an unusually humid location, a dehumidifier can be used to maintain the humidity within an acceptable range. Refer to the "Specifications" section of this user's guide for the operating and storage humidity specifications.

Altitude

Operating a system at a high altitude (low pressure) reduces the efficiency of the cooling fans to cool the system. This can cause electrical problems related to arcing and corona effects. This condition can also cause sealed components with internal pressure, such as electrolytic capacitors, to fail or perform at reduced efficiency.

Power Protection

The greatest threats to a system's supply of power are power loss, power spikes, and power surges caused by electrical storms, which interrupt system operation and/or damage system components. To protect your system, always properly ground power cables and one of the following devices.

Surge Protector

Surge protectors are available in a variety of types and usually provide a level of protection proportional with the cost of the device. Surge protectors prevent voltage spikes from entering a system through the AC power cord. Surge protectors, however, do not offer protection against brownouts, which occur when the voltage drops more than 20 percent below the normal AC line voltage level.

Line Conditioner

Line conditioners go beyond the overvoltage protection of surge protectors. Line conditioners keep a system's AC power source voltage at a fairly constant level and, therefore, can handle brownouts. Because of this added protection, line conditioners cost more than surge protectors. However, line conditioners cannot protect against a complete loss of power.

Uninterruptible Power Supply

Uninterruptible power supply (UPS) systems offer the most complete protection against variations on power because they use battery power to keep the server running when AC power is lost. The battery is charged by the AC power while it is available, so when AC power is lost, the battery can provide power to the system for a limited amount of time, depending on the UPS system.

UPS systems range in price from a few hundred dollars to several thousand dollars, with the more expensive unit s allowing you to run larger systems for a longer period of time when AC power is lost. UPS systems that provide only 5 minutes of battery power let you conduct an orderly shutdown of the system, but are not intended to provide continued operation. Surge protectors should be used with all UPS systems, and the UPS system should be Underwriters Laboratories (UL) safety approved.

Chapter 1

Introduction

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Overview

The SBC-845D-VEA single board computer is based on the 845D chipset with the ATI-Mobility Radeon High performance graphic integrated chipset and Intel fast Ethernet controller that support Intel® 478-pin Pentium® 4 processors. This board supports DIMM memory up to 2GB of DDR SDRAM maximum. The enhanced on-board PCI IDE interface can support 4 drives up to PIO mode 4 timing and Ultra DMA/33/66/100 synchronous mode feature. The on-board Super I/O Chipset integrates one floppy controller, two serial ports, one keyboard controller, one hardware monitor, one IrDA port and one parallel port. In addition, three Universal Serial Bus (USB) ports provide high-speed data communication between peripherals and the PC.

The SBC-845D-VEA has a proprietary PCI extension connector providing an easy way to add additional functions like U160 SCSI or a 2nd LAN device in minutes. The compact form factor with proprietary PCI connection interface makes it the best and most flexible daughter board solution for increasing functionality in a limited space environment.

The PICMG standard makes the SBC-845D-VEA compatible with the legacy ISA, ISA/PCI or multi-slot PCI-bus backplane. The on-board 32-pin DIP socket supports M-systems DiskOnChip 2000 up to 512MB. The Watchdog Timer function can be used to restart you system whenever the system goes abnormal. One 6-pin Mini-DIN connector (with Y-Cable) is provided to connect PS/2 Mouse and Keyboard. The on-board Flash ROM is used to make updating the BIOS easier; the ROM chip can be replaced quickly. All of these features make SBC-845D-VEA excellent in many applications and one of the best performing single board computers on the market.

Check List

The SBC-845D-VEA package should cover the following basic items with the Quick Installation Guide.

- SBC-845D-VEA single board computer
- Parallel port cable kit
- Serial port cable to support two interfaces
- FDC cable
- IDE cable
- Y-Cable cable for PS/2 Keyboard and Mouse
- 5-pin to 5-pin keyboard cable for backplane connection
- 4-pin ATX power control cable for backplane connection
- CPU holder
- Kontron CPU Board Driver CD
- Kontron CPU Board Technical Reference CD

If any of these items is damaged or missing, please contact your vendor and keep all packing materials for future replacement and maintenance.

Product Specification

- **Main processor:** Intel® Pentium® 4 processors with400 MHz front side bus (FSB)
- **BIOS:** Award system BIOS with 512KB Flash ROM with easy upgrade function ACPI, DMI, Green function and Plug and Play Compatible
- **Main Memory:** Two DIMM sockets support non-buffered 200/266 DDR-SDRAM up to 2GB with 512kB L2 Cache Memory in Pentium-IV processor
- **Chipset:** Intel 82845 Chipset
- **Bus Interface:** Follows PICMG 1.0 Rev 2.0 standard (32-bit PCI and 16-bit ISA) and fully complies with PCI Local Bus specification V2.1 (support 4 master PCI slots)
- **PCI IDE Interface:** Supports two enhanced IDE ports up to four HDD devices with PIO mode 4 and Ultra DMA/33/66/100 mode transfer and Bus Master feature
- **Floppy Drive Interface:** Supports one FDD port up to two floppy drives and 5-1/4"(360K, 1.2MB), 3-1/2" (720K, 1.2MB, 1.44MB, 2.88MB) diskette format and 3-mode FDD
- **Serial Ports:** Supports two high-speed 16C550 compatible UARTs with 16-byte T/R FIFOs
- **IR Interface:** Supports one 6-pin header for serial Standard Infrared wireless communication
- **Parallel Port**: Support one parallel port with SPP, EPP and ECP modes
- **USB Interface:** Support three USB (Universal Serial Bus) ports for high-speed I/O peripheral devices
- **PS/2 Mouse and Keyboard Interface:** Support one 6-pin Mini-DIN connector and one 5-pin shrouded connector for PS/2 mouse/keyboard connection through Y-Cable and backplane connection
- **ATX Power Control Interface:** One 4-pin header to support ATX power control with Modem Ring-On and Wake-On-LAN function

- **Auxiliary I/O Interfaces:** System reset switch, external speaker, Keyboard lock and HDD active LED
- **Real Time Clock/Calendar (RTC):** Support Y2K Real Time Clock/calendar with battery backup for 7-year data retention
- **Watchdog Timer:** Support WDT function through software programming.
- **Disk-On-Chip (DOC) Feature:** One 32-pin socket for M-systems Flash Disk up to 512MB supporting DOS, Windows, Win95, NT (bootable) drivers and utilities
- **On-board VGA:** ATI-Mobility Radeon graphic controller works in combination with a 16MB DDR-SDRAM
- **On-board Ethernet LAN:** Intel 82801 ICH2 integrated LAN controller to support RJ-45 connector
- **On-board 68-pin PCI device connector:** Supports one additional PCI device daughterboard
- **High Driving Capability:** Supports 64mA high driving capability for multi-slots ISA-bus
- **CPU Cooling Fan:** Supports three 3-pin headers with wafer
- **System Monitoring Feature:** Monitor CPU and system temperature
- **Bracket:** Supports one Mini-DIN, one-port USB, one Ethernet port with indicator and one CRT port
- **Physical and Environmental Requirements:**
  - Outline Dimension (L X W): 338.5mm (13.33") X 122mm (4.8")
  - PCB layout: 8 layer
  - Power Requirements:
  - +12V (CPU) @2.7A
  - +12v (System) @0.6A
  - +5V @3.7A

- **Test Configuration:**

  CPU: Intel P4 1.8GHz/ 400MHz PSB, 512KB L2 Cache
  Memory: DDR SDRAM 512MBx2
  Primary Master IDE HDD: Seagate ST330620A
  O.S.: Microsoft Windows 2000 + SP2
  Test Program: 3D Mark 2001
  Burning Test V2.2

  - Operating Temperature: 0°C ~ 60°C (32°F ~ 140°F)
  - Storage Temperature: -20°C ~ 80°C
  - Relative Humidity : 0% ~ 95%, non-condensing

System Architecture

The most up-to-date system architecture of the SBC-845D-VEA includes two main Intel chips: the 845D chipset and the 82801BA ICH2. The Intel 845D chipset supports Pentium-4 processors, DDR-SDRAM, and 2D/3D graphic display. The 82801BA ICH2 supports a PCI bus interface, APM, ACPI-compliant power management, USB port, SMBus communication, and Ultra DMA/33/66/100 IDE Master, and a Fast Ethernet controller. The W83627HF (I/O Controller) controls the PS/2 Keyboard/Mouse, UARTs, FDC, Hardware Monitor, Parallel, Watchdog Timer and Infrared interface.

The special pin configuration of the CPU socket utilizes a total of 478 pins. This new generation CPU provides better performance to many applications.

The PCI-to-ISA bridge supports a standard 16-bit ISA bus interface which is applied for all slower I/O operations. The SBC-845D-VEA supports DiskOnChip (DOC) for M-systems Flash disk.

The onboard PCI Fast Ethernet interface is accessible via RJ-45 ports and supports 10/100bps data transfer rates. The onboard 68-pin PCI connector supports additional daughterboards for further system extension.

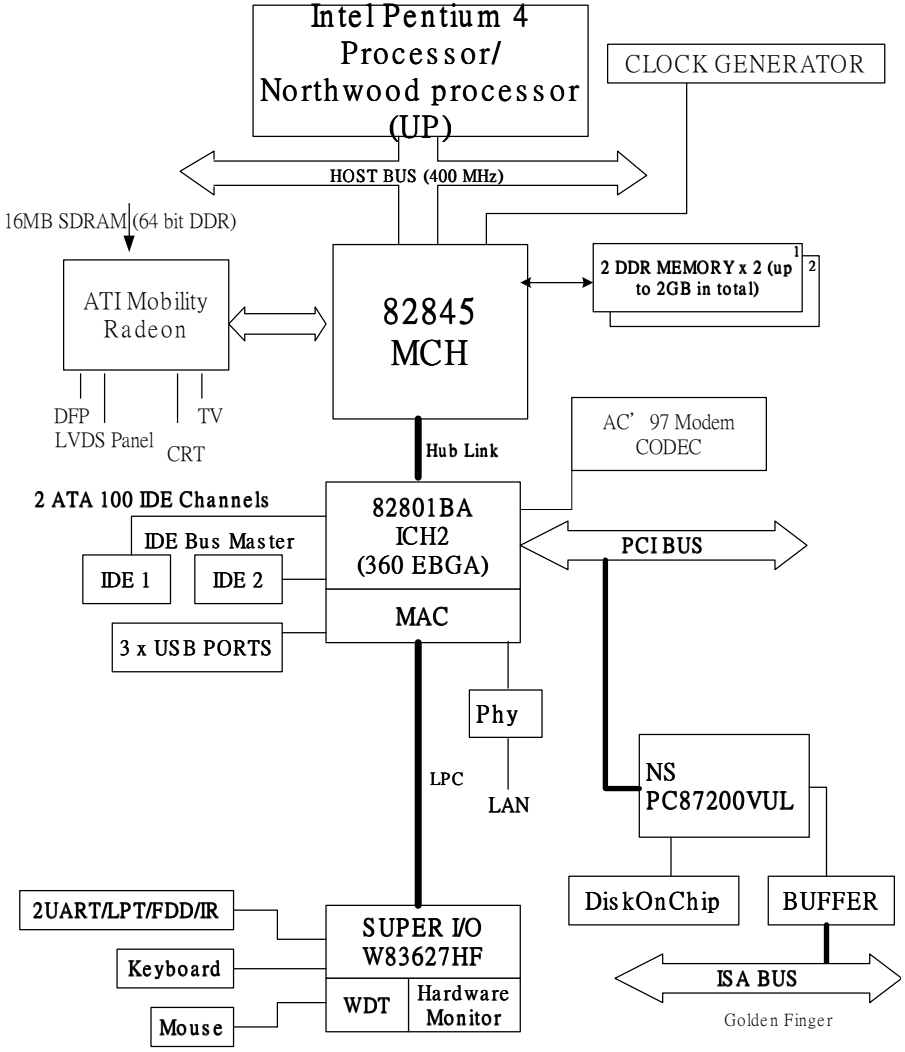


Figure 1-1. SBC-845D-VEA Block Diagram

Chapter 2

Jumpers and Connectors

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Overview

This chapter provides the definitions and locations of jumpers, headers, and connectors. All of the configuration jumpers on the SBC-845D-VEA single board computer 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”.)

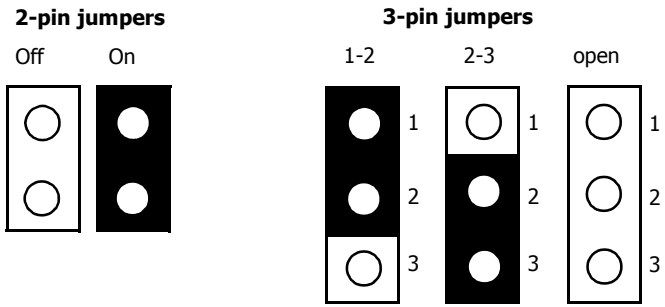


Figure 2-1. Examples of 2-pin and 3-pin jumpers

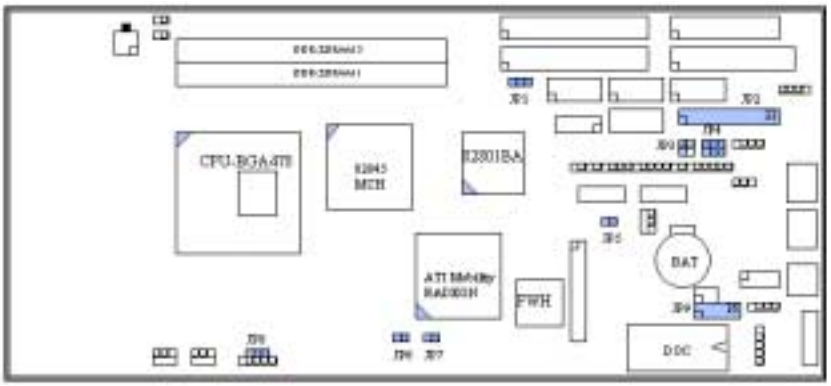


Figure 2-2. Jumper Locations

JP1: CMOS Clear Setting	
Pins	**Description**
1-2	Normal operation*
2-3	Clear CMOS contents

JP8: COM2 Interface Selection	
Pins	**Description**
5-6, 9-11, 10-12, 15-17, 16-18	RS-232*
2-3, 7-9, 8-10, 13-15, 14-16, 21-22	RS-422
1-2, 7-9, 8-10, 19-20	RS-485

JP4: AT/ATX Power Selection	
Pins	**Description**
1-3, 2-4	AT Power
3-5, 4-6	ATX Power*

JP6 & JP7: Onboard VGA Enable/Disable		
JP6	**JP7**	**Description**
NC	NC	Enable*
1-2	1-2	Disable

JP9: LVDS Configuration		
Pins		**Description**
1-6	1-2, 5-6	5V cctive low
	1-2, 4-6	5V active high*
	1-3, 5-6	12V active low
	1-3, 4-6	12V active low
7-10	7-8	5V*
	9-10	3.3V
11-16	NC	ID0 (disable panel)*
	11-12	ID1 (800 x 600, 18 bits)
	13-14	ID2 (1024 x 768, 18 bits)
	11-12, 13-14	ID3 (1024 x 768, 24bits)



Note: To avoid damage to the LCD panel, the power-up sequence and scheme on the backlight and panel VDD must be controlled by following the LVDS jumper setting instructions.

Connectors

I/O peripheral devices are connected to the connectors as described in this section (Figure 2-2).

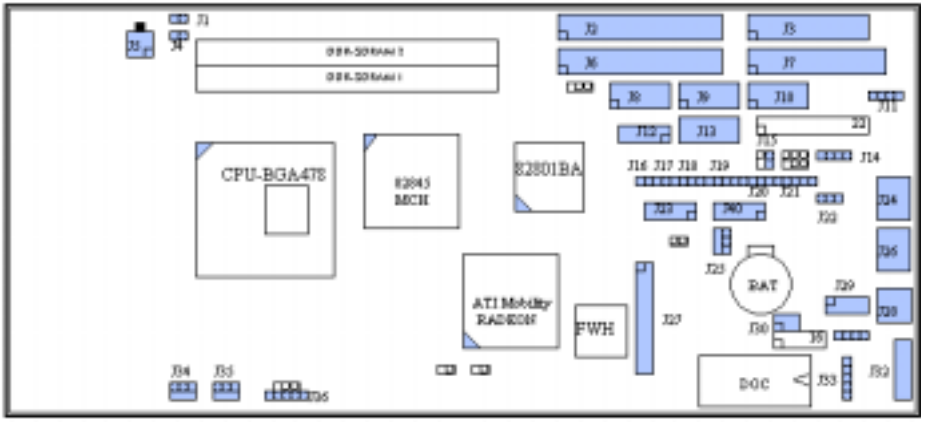


Figure 2-3. Connector Locations

Table 2-1. Connector Functions

Connector	Function	Remark
J1	Case-open Detection Connector	Connect to chassis
J2	Secondary IDE Connector (IDE2)	
J3	Parallel Port Connector	
J4	External Thermal Sensor Connector	
J5	12V CPU Power Connector	
J6	Primary IDE Connector (IDE1)	40-pin shrouded header
J7	FDC Interface Connector	
J8	COM2 Serial Port (RS-232/422/485)	10-pin shrouded header
J9	COM1 Serial Port (RS-232)	10-pin shrouded header
J10	General Purpose I/O Connector	
J11	ATX Power Control Connector	Connect to backplane
J12	External USB Connector	
J13	Standalone Power Connector	
J14	LNDS Panel Control Connector	
J15	Wake On Ring Connector	
J16	ATX Power Button Interface	Connect to chassis
J17	Reset Button Connector	Connect to chassis
J18	External Speaker Connector	Connect to chassis
J19	Power LED and Keyboard Lock Connector	Connect to chassis
J20	Hard Disk Drive LED Connector	
J21	IrDA Connector	
J22	External Wake On LAN Connector	

Table 2-1. Connector Functions (Continued)

Connector	Function	Remark
J23	TMDS Panel Connector	
J24	Ethernet RJ-45 Connector	
J25	Power FAN Connector	
J26	Single port USB Connector	
J27	68-pin PCI Connector	
J28	PS/2 Keyboard/Mouse Connector	6-pin mini-DIN
J29	Audio MIC/Line-in/Line-out Connector	
J30	TV-out Connector	
J31	Audio CD-in Connector	
J32	Onboard VGA CRT Connector	
J33	External Keyboard Connector	Connect to backplane
J34	CPU Fan Connector	
J35	System Fan Connector	
J36	SM-BUS Connector	
J40	LVDS Panel Connector	

Connector Pin Assignments

J1: Case-open Detection Connector	
Pin	**Signal**
1	Case-open signal (active low)
2	Ground

J3: Parallel Port Connector			
Pin	**Signal**	**Pin**	**Signal**
1	Strobe#	14	Auto Form Feed#
2	Data 0	15	Error#
3	Data 1	16	Initialization#
4	Data 2	17	Printer Select IN#
5	Data 3	18	Ground
6	Data 4	19	Ground
7	Data 5	20	Ground
8	Data 6	21	Ground
9	Data 7	22	Ground
10	Acknowledge#	23	Ground
11	Busy	24	Ground
12	Paper Empty	25	Ground
13	Printer Select	26	N/C

J4: External Thermal Sensor Connector	
Pin	**Signal**
1	Thermistor Pin 1
2	Thermistor Pin 2



Note: An external thermistor can be connected to these 2 pins for temperature monitoring remotely, such as chassis ambient temperature, etc. Normally, the resistance selected for thermistor should be 10K0hm at 25 degrees centigrade.

J5: 12V CPU Power Connector	
Pin	**Signal**
1	Ground
2	Ground
3	12V
4	12V

J6/J2: Primary IDE / Secondary IDE			
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

J6/J2: Primary IDE / Secondary IDE			
Pin	**Signal**	**Pin**	**Signal**
17	Data 0	18	Data 15
19	Ground	20	N/C
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	N/C
33	SA1	34	CBLID#
35	SA0	36	SA2
37	HDC CS0#	38	HDC CS1#
39	HDD Active#	40	Ground

J7: FDC Interface Connector			
Pin	**Signal**	**Pin**	**Signal**
1	Ground	2	Density Select 0
3	Ground	4	N/C
5	Ground	6	Density Select 1
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#

J7: FDC Interface Connector			
Pin	**Signal**	**Pin**	**Signal**
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#

J9/J8: COM1/COM2 Serial Ports			
Pin	**Signal Description**		
	RS-232	**RS-422**	**RS-485**
1	DCD (Data Carrier Detect)	TX-	DATA-
2	RXD (Receive Data)	TX+	DATA+
3	TXD (Transmit Data)	RX+	N/C
4	DTR (Data Terminal Ready)	RX-	N/C
5	GND (Ground)	GND	GND
6	DSR (Data Set Ready)	N/C	N/C
7	RTS (Request to Send)	N/C	N/C
8	CTS (Clear to Send)	N/C	N/C
9	RI (Ring Indicator)	N/C	N/C
10	N/C	N/C	N/C

Note: J9 is fixed as RS-232. J8 is configurable as RS-232/422/485 with jumper JP2.

J10: General Purpose I/O Connector	
Pin	**Signal**
1	General Purpose I/O Port 1 (GPIO1)
2	General Purpose I/O Port 2 (GPIO2)
3	General Purpose I/O Port 3 (GPIO3)
4	General Purpose I/O Port 4 (GPIO4)
5	Ground
6	Buffered Digital Output Port 1 (DO1)
7	Buffered Digital Output Port 2 (DO2)
8	Buffered Digital Output Port 3 (DO3)
9	Buffered Digital Output Port 4 (DO4)
10	+5V

Note: All General Purpose I/O ports can only adapt standard TTL signal levels (0V/5V). The 4 extra DO ports are provided for applications that need higher driving capabilities. By inverting the amplitude of a related GPIO port, each open-drain DO port can stand a maximum fan out of up to 100mA, rather than 12mA when directly driven by the GPIO port.

J11: ATX Power Control Connector	
Pin	**Signal**
1	ATX Power Good Signal (PW-OK)
2	ATX +5V Stand-by (5VSB)
3	ATX Power On Control (PS-ON)
4	Ground

J12: External USB Connector			
Pin	**Signal**	**Pin**	**Signal**
1	5V Dual	2	Frame Ground
3	USB2-	4	Ground
5	USB2+	6	USB3+
7	Ground	8	USB3-
9	Frame Ground	10	5V Dual
1	5V Dual	2	Frame Ground
3	USB2-	4	Ground
5	USB2+	6	USB3+
7	Ground	8	USB3-
9	Frame Ground	10	5V Dual



Note: 5V for pin1 and pin10 is always available. When the power scheme is in standby mode, the standby 5V supplies voltage source to these 2 pins. 5V VCC will take over after the system wakes up.

J13: Stand Alone Power Connector	
Pin	**Signal**
1	+12V
2	GND
3	GND
4	+5V



Note: For the system to run correctly in standalone operation, both pin 1 and pin 3 must be connected.

J14: LVDS Panel Control Connector	
Pin	**Signal**
1	+12V
2	GND
3	Panel VDD
4	Backlight-on Signal Output

J15: Wake On Ring Connector	
Pin	**Signal**
1	Ring Signal Input (active low)
2	GND

J16: ATX Power Button Interface	
Pin	**Signal**
1	Pull High 100 Ohm to +5V
2	Power Button Signal Input (active high)

J17: Reset Button Connector	
Pin	**Signal**
1	Reset Signal Input (active low)
2	GND

J18: External Speaker Connector	
Pin	**Signal**
1	Speaker Signal Output (open-drain w/ internal series 33 ohm)
2	NC
3	GND
4	+5V



Note: The pull-high voltage of the external speaker is limited at 5V maximum.

J19: Power LED and Keyboard Lock Connector	
Pin	**Signal**
1	+5V (330 Ohm pull-up for power LED+)
2	NC
3	GND (for power LED-)
4	Keyboard Lock Signal Input (active low)
5	GND

J20: Hard Disk Drive LED Connector	
Pin	**Signal**
1	+5V (270 Ohm pull-up for HDD LED+)
2	HDD Active # (HDD LED-)

J21: IrDA Connector	
Pin	**Signal**
1	+5V
2	NC
3	IRRX
4	GND
5	IRTX
6	NC

J22: External Wake On LAN Connector	
Pin	**Signal**
1	5VSB
2	GND
3	External WOL Signal Input (active low)

J23: TMDS Panel Connector			
Pin	**Signal**	**Pin**	**Signal**
1	TMDS DATA0- (TX0N)	2	TMDS DATA0+ (TX0P)
3	Ground	4	Ground
5	TMDS DATA1- (TX1N)	6	TMDS DATA1+ (TX1P)
7	Ground	8	Ground
9	TMDS DATA2- (TX2N)	10	TMDS DATA2+ (TX2P)
11	Ground	12	Ground
13	TMDS CLOCK- (TXCN)	14	TMDS CLOCK+ (TXCP)
15	+5V	16	+5V
17	DVI DDC Clock (5V I/F)	18	DVI DDC Data (5V I/F)
19	Hot Plug Detect (HPD)	20	N/C

J24: Ethernet RJ-45 Connector	
Pin	**Signal**
1	TD+
2	TD-
3	RD+
4	Termination to Ground
5	Termination to Ground
6	RD-
7	Termination to Ground
8	Termination to Ground

J25/34/35: Power/CPU/System Fan Connector	
Pin	**Signal**
1	Ground
2	+12V PWM Output
3	Fan Speed Detecting signal

J26: Single-port USB Connector	
Pin	**Signal**
1	5V Dual
2	USB0-
3	USB0+
4	Ground

J27: 68-pin PCI Connector			
Pin	**Signal**	**Pin**	**Signal**
1	+5V	2	AD0
3	AD1	4	AD2
5	AD3	6	AD4
7	AD5	8	AD6
9	AD7	10	Ground
11	+5V	12	AD8
13	AD9	14	AD10
15	AD11	16	AD12
17	AD13	18	AD14
19	AD15	20	Ground
21	+5V	22	AD16
23	AD17	24	AD18
25	AD19	26	AD20
27	AD21	28	AD22
29	AD23	30	Ground
31	+5V	32	AD24
33	AD25	34	AD26
35	AD27	36	AD28
37	AD29	38	AD30
39	AD31	40	Ground
41	+5V	42	C/BE#0
43	C/BE#1	44	C/BE#2
45	C/BE#3	46	PAR

J27: 68-pin PCI Connector (Continued)			
Pin	**Signal**	**Pin**	**Signal**
47	FRAME#	48	TRDY#
49	IRDY#	50	Ground
51	+5V	52	STOP#
53	DEVSEL#	54	PERR#
55	SERR#	56	REQ#4
57	GNT#4	58	REQ#5
59	GNT#5	60	Ground
61	PCI Clock1	62	PCI Clock2
63	PCIRST#	64	LOCK#
65	IRQ#A	66	IRQ#B
67	IRQ#C	68	IRQ#D

J28: PS/2 Keyboard/Mouse Connector	
Pin	**Signal**
1	Mouse Data
2	Keyboard Data
3	Ground
4	5V Dual
5	Mouse Clock
6	Keyboard Clock



Note: The SBC-845D-VEA provides TV-out (C-Video and S-Video) and audio (line-in, line-out, and mic-in) functions via headers. Kontron PN: 845D-AUDIO is available to convert these headers into connectors.

J29: Audio MIC/Line-in/Line-out Connector			
Pin	**Signal**	**Pin**	**Signal**
1	MIC with Reference Voltage	2	Analog Ground
3	Line-in Left Channel	4	Analog Ground
5	Line-in Right Channel	6	Analog Ground
7	Line-out Left Channel	8	Analog Ground
9	Line-out Right Channel	10	N/C



Note: The Reference Voltage offers 2.25V - 2.75V with a 5mA drive.

J30: TV-out Connector			
Pin	**Signal**	**Pin**	**Signal**
1	Ground	2	COMP/B
3	Y/G	4	C/R
5	SYNC	6	N/C

Video Interface Selection			
	SCART RGB	**S-Video**	**Composite**
C/R	red	SVID C (Color)	
Y/G	green	4SVID Y (Luminance)	
COMP/B	blue	6	Composite Video
SYNC	Sync Signal		



Note: Different video interfaces will be auto selected. Selection is based on the varying impedance combinations from each signal line.

J31: Audio CD-in Connector	
Pin	**Signal**
1	CD-in Left Channel
2	CD Ground
3	CD Ground
4	CD-in Right Channel

J32: Onboard VGA CRT Connector	
Pin	**Signal**
1	Red
2	Green
3	Blue
4	Monitor ID0 (MONID0) (5V I/F)
5	Ground
6	Ground
7	Ground
8	Ground
9	+5V
10	Ground
11	Monitor ID1 (MONID1) (5V I/F)
12	VGA DDC Data (5V I/F)
13	Horizontal Sync. (HSYNC) (5V I/F)
14	Vertical Sync. (VSYNC) (5V I/F)
15	VGA DDC Clock (5V I/F)

J33: External Keyboard Connector	
Pin	**Signal**
1	Keyboard Clock
2	Keyboard Data
3	N/C
4	Ground
5	5V Dual

J36: SM-BUS Connector	
Pin	**Signal**
1	SM-bus Clock
2	N/C
3	Ground
4	SM-bus Data
5	+5V

J40: LVDS Panel Connector			
Pin	**Signal**	**Pin**	**Signal**
1	Lower DATA0- (TXL0N)	2	Lower DATA0+(TXL0P)
3	Lower DATA1- (TXL1N)	4	Lower DATA1+(TXL1P)
5	Lower DATA2- (TXL2N)	6	Lower DATA2+(TXL2P)
7	Lower DATA3- (TXL3N)	8	Lower DATA3+(TXL3P)
9	Lower CLOCK- (TXLCN)	10	Lower CLOCK+(TXLCP)
11	Upper DATA0- (TXU0N)	12	Upper DATA0+(TXU0P)
13	Upper DATA1- (TXU1N)	14	Upper DATA1+(TXU1P)
15	Upper DATA2- (TXU2N)	16	Upper DATA2+(TXU2P)
17	Upper DATA3- (TXU3N)	18	Upper DATA3+(TXU3P)
19	Upper CLOCK- (TXUCN)	20	Upper CLOCK+(TXUCP)



Note: It only takes the lower channel to support panels with high resolution. The signals of the upper channel will only be used in dual-channel LVDS mode. This LVDS panel connector (J40) should be accompanied with LVDS Panel Control Connector (J14) and its jumper setting (JP9).

Chapter 3

System Installation

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Overview

This chapter provides instructions to install and configure the SBC-845D-VEA single board computer. Additional information is enclosed to help you install M-systems Flash disk, set up the onboard PCI device and handle WDT operation in software programming.

Pentium 4 Processor

Installing 478-pin CPU

1) Lift the CPU socket lever outwards and upwards to the other end.

2) Align the processor pins with pinholes on the socket. Make sure that the notched corner (pin 1) of the CPU corresponds to the socket's bevel end. Then press the CPU gently until it fits into place. If this operation is not easy or smooth, don't do it forcibly. Check the alignment and try again.

3) Push down the lever to lock the processor into the socket once the it is in position.

4) Follow the installation guide that came with your cooling fan or heat sink to mount it on CPU surface and lock it on the socket 478.

Removing CPU

1) Unlock the cooling fan first.

2) Lift the lever of CPU socket outwards and upwards to the other end.

3) Carefully lift up the existing CPU to remove it from the socket.

4) Push down the lever of the CPU socket to close the opened socket.

Configuring System Bus

The SBC-845D-VEA will automatically detect the speed of the Intel P4 processor.

Main Memory

The SBC-845D-VEA provides two DDR-SDRAM DIMM slots to support 2.5V DDR-SDRAM modules. The maximum memory size can be up to 2GB. The system will auto detect the memory clock according to BIOS CMOS settings.

For system compatibility and stability, don't use generic memory modules.

You can only use one double-sided DIMM in either one DIMM slot or two single-sided DIMM in both slots. If double-sided DIMM is being used, only one slot can be populated. If single-sided DIMM is used both slots may be used.

Make sure the modules are securely positioned in the socket. Follow normal procedures to install your DRAM module into the socket. Before locking, make sure that all modules have been fully inserted into the slots.



Note: To maintain system stability, don't change any of DRAM parameters in BIOS setup to upgrade your system performance without acquiring technical information.

M-systems Flash Disk

The SBC-845D-VEA reserves one 32-pin DIP socket for installing an M-systems Flash disk from 2MB to 512MB. The M-systems Flash disk is configured as an ISA device without PnP support. Before installing, make sure that the I/O address jumper is properly configured to a free I/O range. Failure to do so could cause an I/O resource conflict that may prevent peroper system operation. Follow the DiskOnChip (DOC) installation procedure to prevent a Flash chip burnout, due to incorrect installation.

Installing DOC

1) Align the DOC with the pinholes on the socket. Make sure that the notched corner or dot mark (pin 1) of DOC corresponds to notched corner of the socket.

2) Then press the DOC gently until it fits into place. If installation is correct, the system will view the Flash disk as a normal hard disk to access read/write data..



WARNING)

Please ensure that your DOC is properly inserted. Placing the DOC in reverse will cause severe damage. Remember, a new DOC chip is always a formatted disk. You may simply plug the chip on the DOC socket and read/write through it. If you would like to boot from this Flash disk, it is necessary to refer to the application note from M-systems. You can get related information from M-systems shipping package (such as product manual) or Web-site http://www.m-sys.com.



Installing the Single Board Computer

To install your SBC-845D-VEA into a standard chassis or proprietary environment, you need to perform the following steps:

1) Make sure that all jumper settings are in their proper positions.

2) Follow the instructions for installing and configuring the CPU and memory modules.

3) Slide the SBC-845D-VEA into the PICMG slot on the backplane in your system.

4) Attach cables to existing peripheral devices and secure.



WARNING

Please ensure that your SBC is correctly positioned in the backplane. Otherwise, the system might become unstable or fail to work due to poor golden finger contact between the board and the PICMG slot.



Driver Installation

After installing the hardware, locate the Kontron CPU Board Driver CD that was provided with the ship kit for the board. Insert this CD into your CD-ROM drive and follow the on-screen instructions to install the necessary device drivers for the SBC-845D-VEA single board computer.

Chipset Component Driver

The chipset on the SBC-845D-VEA is a new chipset that a few old operating systems might not be able to recognize. **To overcome this compatibility issue, for Windows Operating Systems such as Windows-95/98/98SE/2000, please install its INF before any of other Drivers are installed**. Refer to the Kontron CPU Board Driver CD that came with the SBC-845D-VEA.

ATI Mobility Radeon Graphic Integrated Chipset

Using ATI Mobility Radeon High performance graphic integrated chipset is aimed to gain an outstanding graphic performance at a cost effective price. It is accompanied by a 16MB DDR-SDRAM. This combination makes SBC-845D-VEA VLA an excellent piece of multimedia hardware.

With no additional video adaptor, this onboard video will usually default as the system display output. By adjusting the JP6 jumper to disable onboard VGA, an add-on PCI or ISA VGA daughterboard can take over the system display.

Drivers Support

Drivers support Windows 98/98SE/ME, Windows NT 4.0, Windows 2000, OS2, and Linux.

1) Windows 98/98SE/ME: Please execute the .exe file to begin the installation, or bring up the Display Control Panel to update the graphics driver.

2) Windows NT 4.0: Please install Windows NT 4.0 Service Pack 4 or above first, then execute the .exe file, or simply bring up the Display Control Panel to update graphics driver.

3) Windows 2000: Please bring up the Device Manager to update graphics drivers.

4) Redhat Linux V6.2/OS2: Please refer to the related documentation in for graphic drivers installation.

On-board Fast Ethernet Controller

Drivers Support

The drivers support Windows NT 4.0, Windows 98/98SE/ME, Windows 2000, Windows XP, and Linux.

On-board LED Indicator (for LAN status)

The SBC-845D-VEA provides three LED indicators to report the status of 82801BA MAC Fast Ethernet interfaces. Please refer to the table below as a quick reference guide.

82801BA	Name of LED	Operation of Ethernet Port	
		On	Off
LED 1	LAN Link Integrity LED	Good link in 10 or 100 Mbps	Bad Link
LED 2	LAN Active LED	Active	Not Active
LED 3	LAN Speed LED	100 Mbps	10 Mbps

Onboard AC97 Audio Device

The onboard AC97 audio device provides general audio display. It is capable for many general purposes.

Onboard 68-pin PCI connector

The SBC-845D-VEA provides one onboard 68-pin PCI connector that allows you to apply additional PCI devices, such as SCSI or Ethernet. If you have a compatible PCI device, simply plug it into the connector and secure it with two retention bars.

Clear CMOS Operation

The following table indicates how to enable/disable the CMOS Clear Function hardware circuit by setting jumpers at their proper positions.

JP1	FUNCTION
1-2 Short	Clear CMOS Disable _
2-3 Short	Clear CMOS Enable

To correctly operatethe CMOS Clear function, users must turn off the system, move JP1 jumper to short pins 2 and 3. To clear CMOS, please turn the power back on and turn it off again for AT systems, or press the toggle switch a few times for ATX systems. Move the JP1 back to 1-2 position (Normal Operation) and start the system. The system will then produce a “CMOS Check Sum Error” message. Users may then follow the displayed message to load the BIOS default settings.

WDT Function

The working algorithm of the WDT function can be simply described as a counting process. The Time-Out Interval can be set through software programming. The availability of the time-out interval settings by software or hardware between boards. The SBC-845D-VEA allows users to control the WDT through dynamic software programming. The WDT starts counting when it is activated. It sends out a signal to system reset or to non-maskable interrupt (NMI), when the time-out interval ends. To prevent the time-out interval from running out, a re-trigger signal will need to be sent before the counting reaches its end. This action will restart the counting process. A well-written WDT program should keep the counting process running under normal condition. WDT should never generate a system reset or NMI signal unless the system runs into trouble.

The related Control Registers of WDT are all included in the following sample program that is written in the "C" language. A user can fill a non-zero value into the Time-out Value Register to enable/refresh the WDT. The system will be reset after the Time-out Value has counted down to zero. Or the user can directly fill a zero value into the Time-out Value Register to disable the WDT immediately. To successfully access the content of the desired Control Register, the sequence of the following program codes should be run again step-by-step when each register is accessed.

Additionally, there is a maximum counting tolerance of 2 seconds that should be considered into user' application program. For more information about the WDT, please refer to the Winbond W83627HF data sheet that is attached in CD accessory.

```
// Enter Extended Function Mode
outp(0x002E, 0x87);
outp(0x002E, 0x87);

// Assign Pin 89 to be a WDTO
outp(0x002E, 0x2B);
outp(0x002F, inp(0x002F) & 0xEF);

// Select Logic Device 8
outp(0x002E, 0x07);
outp(0x002F, 0x08);

// Active Logic Device 8
outp(0x002E, 0x30);
outp(0x002F, 0x01);
```

```
// Select Count Mode
outp(0x002E, 0xF5);
outp(0x002F, (inp(0x002F) & 0xF7) | ( Count-mode Register  & 0xF0));

// Specify Time-out Value
outp(0x002E, 0xF6);
outp(0x002F,  Time-out Value Register );

// Disable WDT reset by keyboard/mouse interrupts
outp(0x002E, 0xF7);
outp(0x002F, 0x00);

// Exit Extended Function Mode
outp(0x002E, 0xAA);
```

Definitions of Variables:

Value of Count-mode Register :

1) 0x00 -- Count down in seconds (Bit3=0)

2) 0x08 -- Count down in minutes (Bit3=1)

Value of Time-out Value Register :

1) 0x00 -- Time-out Disable

2) 0x01~0xFF -- Value for counting down

SMBUS

The System Management Bus (SMBus) is a two-wire interface through which simple power-related chips can communicate with rest of the system. It uses I2C as its backbone.

A system using the SMBus passes messages to and from devices instead of tripping individual control lines.

With the SMBus, a device can provide manufacturer information, tell the system what its model/part number is, save its state for a suspend event, report different types of errors, accept control parameters, and return its status.

The SMBus may share the same host device and physical bus as ACCESS bus components provided that an appropriate electrical bridge is provided between the internal SMB devices and external ACCESS bus devices.

Display Output

LCD

There are two LCD panel interfaces provided on the SBC-845D-VEA: TMDS and LVDS.

TV

Composite Video, S-video and Scart R/G/B interfaces are 3 kinds of TV outputs provided by this system. Please refer to connector J30 for more details. Each time the system is on, the system auto-detects one interface for outputting display information. A connection to different interfaces will result in a particular impedance combination of signal lines. The selection will be made based on the different impedances of each signal line.

GPIO

The SBC-845D-VEA provides 4 input/output ports that can be individually configured to perform a simple basic I/O function or a pre-defined alternated function. Users can configure each individual port to become an input or output port by programming the register bit of the I/O Selection. To invert the port value, the "Inversion Register" setting has to be set. Port values can be set to read or write through the Data Register. All of these 4 ports are designed to be functional even in power loss conditions (VCC or VSB is off). That means, these ports will always keep their previous settings until the battery runs low.

Additionally, four extra Digital Output ports inversely amplify signals from GPIO ports. There are open-drain buffers, which can offer greater driving capacity up to 100mA.

There are two PNP I/O port addresses that can be used to configure GPIO ports:

1) 0x2E - EFER (Extended Function Enable Register, for entering Extended Function Mode)

- EFIR (Extended Function Index Register, for identifying CR index number)

2) 0x2F - EFDR (Extended Function Data Register, for accessing desired CR)

Below are some example codes, which demonstrate the use of GPIO.

```
// Enter Extended Function Mode
outp(0x002E, 0x87);
outp(0x002E, 0x87);

// Assign Pin121-128 to be GPIO port 1
outp(0x002E, 0x2A);
outp(0x002F, inp(0x002F) | 0x84);

// Select Logic Device 7
outp(0x002E, 0x07);
outp(0x002F, 0x07);

// Active Logic Device 7
outp(0x002E, 0x30);
outp(0x002F, 0x01);
```

```
// Select Inversion Mode
outp(0x002E, 0xF2);
outp(0x002F, (inp(0x002F) & 0x0F) | ( Inversion Register  & 0xF0));

// Select I/O Mode
outp(0x002E, 0xF0);
outp(0x002F, (inp(0x002F) & 0x0F) | ( I/O Selection Register  & 0xF0));

// Access GPIO ports
outp(0x002E, 0xF1);
outp(0x002F, (inp(0x002F) & 0x0F) | ( Output Data  & 0xF0)); or Input Data  = inp(0x002F);

// Exit Extended Function Mode
outp(0x002E, 0xAA);
```

Definitions of Variables:

Each bit in the high nibble of each Register represents the setting of a GPIO port.

Bit4 vs. GPIO port 1

Bit5 vs. GPIO port 2

Bit6 vs. GPIO port 3

Bit7 vs. GPIO port 4

Value of Inversion Register :
Only high nibble is available.
When set to a '1', the incoming/outgoing port value is inverted.
When set to a '0', the incoming/outgoing port value is the same as in Data Register.

Value of I/O Selection Register :
Only high nibble is available.
When set to a '1', respective GPIO port is programmed as an input port.
When set to a '0', respective GPIO port is programmed as an output port.

Value of Output Data / Input Data :
Only high nibble is available.

If a port is programmed to be an output port, then its respective bit can be read/write.

If a port is programmed to be an input port, then its respective bit can be read only.



Note: 1) All the Buffered Digital Outputs are open-drain amplified form respected GPIO ports. 2) Some other functions may occupy the lower nibble of the registers. Do not alter any content in the lower nibbles of the registers.

Chapter 4

BIOS Setup Information

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Overview

SBC-845D-VEA is equipped with the AWARD BIOS stored in Flash ROM. This BIOS has a built-in Setup program that allows users to easily modify the basic system configuration. This type of information is stored in CMOS RAM so that it is retained during power-off periods. When the system is turned on, the SBC-845D-VEA communicates with peripheral devices and check its hardware resources against the configuration information stored in the CMOS memory. If any error is detected, or the CMOS parameters need to be initially defined, the diagnostic program will prompt the user to enter the SETUP program. Some errors are significant enough to abort the start-up.

Entering Setup

1) Turn on or reboot the computer. When the message “Hit <DEL> if you want to run SETUP” appears, press the <Del> key immediately to enter the BIOS setup program.

2) If the message disappears before you respond, but you still wish to enter Setup, please restart the system again by turning it OFF and then ON, or touch the "RESET" button (“COLD START”). You may also restart from a “WARM START” by pressing the <Ctrl>, <Alt>, and <Delete> keys simultaneously. If you do not press the keys at the right time and the system will not boot, an error message will be displayed and you will again be asked to:

   - Press <F1> to Run SETUP or Resume

   - In HIFLEX BIOS setup, you can use the keyboard to choose among options or modify the system parameters to match the options with your system. The table below will show you all of keystroke functions in BIOS setup.

BIOS Setup Navigation Keys

Key	Functions
Up Arrow	Move to the previous item
Down Arrow	Move to the next item
Left Arrow	Move to the item on the left (menu bar)
Right Arrow	Move to the item on the right (menu bar)
Move Enter	Move to the item you desired
PgUp key	Increase the numeric value or make changes
PgDn key	Decrease the numeric value or make changes
+ key	Increase the numeric value or make changes
- key	Decrease the numeric value or make changes
Esc key	Main Menu -- Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
F1 key	General help on Setup navigation keys
F5 key	Load previous values from CMOS
F6 key	Load the fail-safe defaults from BIOS default table
F7 key	Load the optimized defaults
F10 key	Save all the CMOS changes and exit

Main Menu

Once you enter SBC-845D-VEA AWARD BIOS CMOS Setup Utility, you should start with the Main Menu. The Main Menu allows you to select from eleven setup functions and two exit choices. Use arrow keys to switch among items and press <Enter> key to accept or bring up the sub-menu.

Phoenix-AwardBIOS CMOS Setup Utility	
Standard CMOS Features Advanced BIOS Features Advanced Chipset Features Integrated Peripherals Power Management Setup PnP/PCI Configurations PC Health Status	Frequency/Voltage Control Load Fail-Safe Defaults Load Optimized Defaults Set Supervisor Password Set User Password Save & Exit Setup Exit Without Saving
Esc : Quit ↑ ↓ ← → : Select Item F10 : Save & Exit Setup	
Time, Date, Hard Disk Type….	

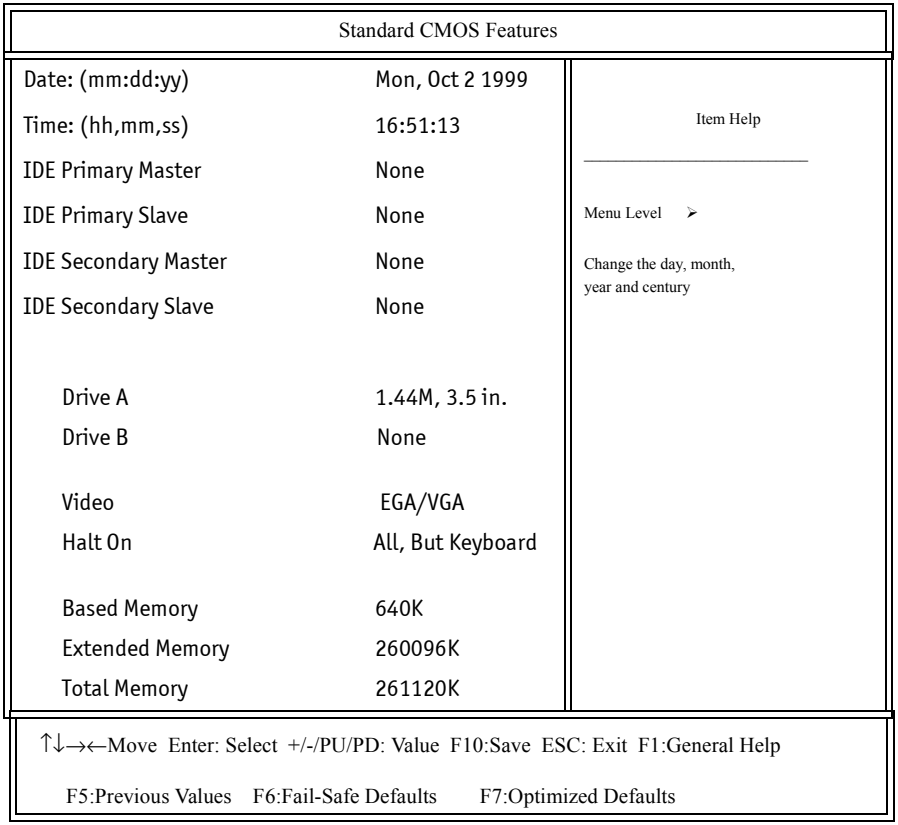
Note: It is strongly recommended to reload Optimal Setting if CMOS is lost or BIOS is updated.

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 <Enter> key to certify it.

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

Screen shot



Menu Selections

Item	Options	Description
Date	Mm:dd:yy	Set the system date. Note that the 'Day' automatically changes when you set the date
Time	Hh:mm:ss	Set the system time
IDE Primary Master	Options are in its sub menu (described in 4.4 Table)	Press <Enter> to enter the sub menu of detailed options
IDE Primary Slave	Options are in its sub menu (described in 4.4 Table)	Press <Enter> to enter the sub menu of detailed options
IDE Secondary Master	Options are in its sub menu (described in 4.4 Table)	Press <Enter> to enter the sub menu of detailed options
IDE Secondary Slave	Options are in its sub menu (described in 4.4 Table)	Press <Enter> to enter the sub menu of detailed options
Drive A Drive B	None 360K, 5.25 in 1.2M, 5.25 in 720K, 3.5 in 1.44M, 3.5 in 2.88M, 3.5 in	Select the type of floppy disk drive installed in your system
Video	EGA/VGA CGA 40 CGA 80 MONO	Select the default video device

Halt On	All Errors No Errors All, but Keyboard All, but Diskette All, but Disk/Key	Select the situation in which you want the BIOS to stop the POST process and notify you
Base Memory	N/A	Displays the amount of conventional memory detected during boot up
Extended Memory	N/A	Displays the amount of extended memory detected during boot up
Total Memory	N/A	Displays the total memory available in the system

IDE Adaptors Setup Menu

The IDE adapters control the IDE devices, such as hard disk drive or cdrom drive. It uses a separate sub menu to configure each hard disk drive.

Phoenix- AwardBIOS CMOS Setup Utility

IDE Primary Master

IDE HDD Auto-Detection	Press Enter	
IDE Primary Master	Auto	Item Help
Access Mode	Auto	
Capacity	20491 MB	Menu Level ➤➤
Cylinder	39703	
Head	16	
Precomp	0	To auto-detect the HDD's size, head... on this channel
Landing Zone	39702	
Sector	63	

↑↓→←Move Enter: Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help

F5:Previous Values F6:Fail-Safe Defaults F7:Optimized Defaults

Figure 4-1. Standard CMOS Setup – Screen Shot

Menu seletions

Item	Options	Description
IDE HDD Auto-detection	Press Enter	Press Enter to auto-detect the HDD on this channel. If detection is successful, it fills the remaining fields on this menu.
IDE Primary Master	None Auto Manual	Selecting 'manual' lets you set the remaining fields on this screen. Selects the type of fixed disk. "User Type" will let you select the number of cylinders, heads, etc. Note: PRECOMP=65535 means NONE !
Access Mode	CHS LBA Large Auto	Choose the access mode for this hard disk
Capacity	Auto Display your disk drive size	Disk drive capacity (Approximated). Note that this size is usually slightly greater than the size of a formatted disk given by a disk checking program.

The following options are selectable only if the 'IDE Primary Master' item is set to 'Manual

Cylinder	Min = 0 Max = 65535	Set the number of cylinders for this hard disk.
Head	Min = 0 Max = 255	Set the number of read/write heads
Precomp	Min = 0 Max = 65535	**** **Warning:** Setting a value of 65535 means no hard disk
Landing zone	Min = 0 Max = 65535	****
Sector	Min = 0 Max = 255	Number of sectors per track

Advanced BIOS Features

This section allows you to configure your system for basic operation. You have the opportunity to select the system's default speed, boot-up sequence, keyboard operation, shadowing and security.

Phoenix – AwardBIOS CMOS Setup Utility

Advanced BIOS Features

Virus Warning	Disabled	Item Help
CPU L1 & L2 Cache	Enabled	
Quick Power On Self Test	Enabled	
First Boot Device	Floppy	Menu Level ➢
Second Boot Device	HDD-0	
Third Boot Device	LS120	
Boot Other Device	Enabled	
Swap Floppy Drive	Disabled	
Boot Up Floppy Seek	Enabled	
Boot Up NumLock Status	On	
Get A20 Option	Fast	
Typematic Rate Setting	Disabled	
Typematic Rate (Chars/sec)	6	
Typematic delay (Msec)	250	
Security Option	Setup	
OS Select For DRAM > 64MB	Non-OS2	
Report no FDD for Win 95	No	
Small logo(EPA)show	Disabled	

↑↓←→Move Enter: Select +/-/PU/PD: Value F10:Save ESC: Exit F1:General Help

F5:Previous Values F6:Fail-safe defaults F7:Optimized Defaults

Figure 4-2. Advanced BIOS Features – Screen Shot

Virus Warning

Enabling the virus warning allows it to activate automatically when the system boots up, causing a warning message to appear when anything attempts to access the boot sector or hard disk partition table. When virus warning is disabled, no warning message will appear when anything attempts to access the boot sector or hard disk partition table.

Options: Enabled/Disabled.

L1 Cache

Enabling the CPU on-die L1 cache is necessary for full CPU performance.

Options: Enable/Disable.

L2 Cache

Enabling the CPU on-die L2 cache will speed up memory access and performance.

Options: Enabled/Disabled.

Quick Power On Self Test

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

Options: Enabled/Disabled.

First/Second/Third/Other Boot Device

The BIOS attempts to load the operating system from the devices in the sequence selected in these items.

The Choice: Floppy, LS120, ZIP100, HDD, SCSI, CDROM, HDD-1, HDD-2 HDD3, LAN and Disabled.

Swap Floppy Drive

If the system has two floppy drives, choose enable to assign physical driver B to logical drive A and Vice-Versa.

The choice: Enabled/Disabled.

Boot Up Floppy Seek

Enabled tests floppy drives to determine whether they have 40 or 80 tracks

The choice: Enabled/Disabled.

Boot Up NumLock Status

Select power on state for NumLock.

The choice: Off/On.

Get A20 Option

Fast-lets chipsets control Gate A20 and normal – a pin in the keyboard controller controls Gate A20.

The choice: Normal/Fast

Typematic Rate Setting

Keystrokes repeat at a rate determined by the keyboard controller – When enabled, the typematic rate and typematic delay can be select.

The choice: Enabled/Disabled.

Typematic Rate (Chars/sec)

This option will only available when Typematic Rate Setting is set to enable. The unit is character per second.

Typematic delay (Msec)

This option is only available when the Typematic Rate Setting is set to enable. The delay is in Msec.

Security Option

Select whether the password is required every time the system boots or only when you enter setup.

System	The system will not boot and access to Setup will be denied if the correct password is not entered at the prompt.
Setup	The system will boot, but access to Setup will be denied if the correct password is not entered at the prompt.



Note: To disable security, select PASSWORD SETTING at Main Menu and then you will be asked to enter password. Do not type anything and just press <Enter>, it will disable security. Once the security is disabled, the system will boot and you can enter Setup freely.

OS Select For DRAM > 64MB

Select the operating system that is running with greater than 64MB of RAM on the system.

The choice: Non-OS2, OS2.

Advanced Chipset Features

This section allows you to configure the system based on the specific features of the Intel 82815 GMCH chipset. This chipset manages bus speeds and access to system memory resources, such as DRAM (SDRAM) and the external cache. It also coordinates communication between the conventional ISA bus and the PCI bus. It must be stated that these items never need to be altered. The default settings have been chosen because they provide the best operating conditions for your system. The only time you might consider making any changes would be if you discovered that data was being lost while using your system.

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Advanced Chipset Features

DRAM Timing Selectable	By SPD	Item Help
CAS Latency Time	1.5	
Active to Precharge Delay	7	Menu Level ➢
DRAM RAS#-to-CAS# Delay	3	
DRAM RAS# Precharge	3	
DRAM Data Integrity Mode	Non-ECC	
Memory Frequency For	Auto	
Dram Read Thermal Mgmt	Disabled	
System BIOS Cacheable	Enabled	
Video BIOS Cacheable	Disabled	
Memory Hole AT 15-16M	Disabled	
Delayed Transaction	Enabled	
Delay Prior to Thermal	16 Min	
AGP Aperture Size(MB)	64	

↑↓←→Move Enter: Select +/-/PU/PD: Value F10:Save ESC: Exit F1:General Help
F5:Previous Values F6:Fail-Safe Defaults F7:Optimized Defaults

Figure 4-3. Advanced Chipset Features – Screen Shot

This chipset settings deal with CPU access to dynamic random access memory (DRAM). The default timings have been carefully chosen and should only be altered if data is being lost. Such a scenario might well occur if your system had mixed speed DRAM chips installed so that greater delays may be required to preserve the integrity of the data held in the slower memory chips.

DRAM Time Selectable

This option provides DIMM Plug-andplay support by serial presence detect(SPD) mechanism via the SMBUus interface.

The choice: Manual/ By SPD

Masked: CAS Latency Time

This option controls the number of SCLKs between the time a read command is sampled by the SDRAMs and the time the GMCH samples correspondent data from the SDRAMs.

The Choice: 1.5, 2, 2.5, 3 SCLKs.

Masked: Active to Precharge Delay

This is to DDR standard accordingly.

The choice: 7, 6, 5

Masked: DRAM RAS-to-CAS Delay

This option controls the number of SCLKs (SDRAM Clock) from a row activate command to a read or write command. If your system installs good quality of SDRAM, you can set this option to "3 SCLKs" to obtain better memory performance. Normally, the option will be set to Auto.

The Choice: 2 or 3

Masked: DRAM RAS Precharge

This option controls the number of SCLKs for RAS# precharge. If your system installs good quality of SDRAM, you can set this option to "3 SCLKs" to obtain better memory performance. It is set to auto normally.

The Choice: 2 or 3

DRAM Data Integraty Mode

There are two options available. The DRAM integrity mode will be implemented by the parity algorithm when this option is set to "Non-ECC".

The choice: Non ECC/ ECC.

Memory Frequency For

Users are recommnaded to use Auto for memory frequency selection.

The choice: DDR200/DDR266/Auto

DRAM Read Thermal Mgmt

The choice: Enabled/Disabled.

System BIOS Cacheable

Selecting Enabled allows caching of the system BIOS ROM at F0000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result.

The choice: Enabled/Disabled.

Video BIOS Cacheable

Select "Enabled" to enable caching VGA BIOS into L2 cache to get higher display performance. "Disabled" will ignore this BIOS caching function.

The choice : Enabled/Disabled

Memory Hole At 15-16M

In order to improve performance, certain space in memory is reserved for ISA cards. This memory must be mapped into the memory space below 16MB.

The Choice: Enabled/Disabled.

Delayed Transaction

Select "Enabled" to enable delay transaction.This will enhance performance for data transmission between different PCI bus.

The Choice: Enabled/Disabled.

AGP Aperture Size<MB>

The selected size will ocuppy system memory.

The choice: 4/8/16/32/64/128/256.

Integrated Peripherals

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Integrated Peripherals

On-Chip Primary PCI IDE	Enabled	Item Help
On-Chip Secondary PCI IDE	Enabled	Menu Level ➢
IDE Primary Master PIO	Auto	
IDE Primary Slave PIO	Auto	
IDE Secondary Master PIO	Auto	
IDE Secondary Slave PIO	Auto	
IDE Primary Master UDMA	Auto	
IDE Primary Slave UDMA	Auto	
IDE Secondary Master UDMA	Auto	
IDE Secondary Slave UDMA	Auto	
USB Controller	Enabled	
USB Keyboard Support	Enabled	
Init Display First	PCI Slot	
IDE HDD Block Mode	Enabled	
POWER ON Function	BUTTON ONLY	
KB Power On Password	Enter	
Hot Key Power On	Ctrl-F1	
Onboard FDC Controller	Enabled	
Onboard Serial Port 1	Auto	
Onboard Serial Port 2	Auto	
UART Mode Select	Normal	
RxD , TxD Active	Hi,Lo	
IR Transmission Delay '	Enabled	
UR2 Duplex Mode	Half	
Onboard Parallel Port	378/IRQ7	
Parallel Port Mode	ECP	
EPP Mode Select	EPP1.7	
ECP Mode Use DMA	3	
PWRON After PWR-Fail	Off	

↑↓←→ Move Enter: Select +/-/PU/PD: Value F10:Save ESC: Exit F1:General Help

F5:Previous Values F6:Fail-Safe Defaults F7:Optimized Defaults

OnChip Primary/Secondary PCI IDE

The chipset contains a PCI IDE interface with support for two IDE channels. Select Enabled to activate the primary IDE interface. Select Disabled to deactivate this interface

The choice: Enabled/Disabled.

IDE Primary/Secondary Master/Slave PIO

The four IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device.

The choice: Auto, Mode 0, Mode 1, Mode 2, Mode 3, Mode 4.

IDE Primary/Secondary Master/Slave UDMA

Ultra DMA/33/66/100 implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver (Windows 95 OSR2 or a third-party IDE bus master driver). If your hard drive and your system software both support Ultra DMA/33/66/100, select Auto to enable BIOS support.

The Choice: Auto, Disabled.

USB Controller

This item allows you to enable/disable USB (Universal Serial Bus) function.

The choice: Enabled/Disabled

USB Keyboard Support

This item allows you to enable USB keyboard function under POST, BIOS setup menu, DOS, or Windows-NT with no USB driver loaded.

The choice: Enabled/Disabled

USB Mouse Support

To enable or disable the USB mouse control.

The choice: Enabled/Disabled.

Init Display First

This item allows you to select the first display port to be initialized.

The choice: PCI Slot (off-board video adaptor), AGP

IDE HDD Block Mode

This item allows you to enable/disable IDE HDD Block Mode. The function is to collect the data that is nearby the one being read and leave them in the system buffer. Buffered data can be used with faster transmission rate so as to enhance system performance.

The choice: Enabled/Disabled

Power On Function

This item allows you to select different power on scheme using ATX power supply.

Password	Power on using customized password string
Hot Key	Power on using special customized key
Mouse Left	Power on using mouse left click
Mouse Right	Power on using mouse right click
Any Key	Power on using any keyboard key
Button Only	Power on by power Button
Keyboard 98	Power on by keyboard 98

Masked: Keyboard Power On Password

In the event of "Power On Function" being configured as "Password", this item will be enabled for tuning. Press "Enter" key to enter a customized password, and confirm again when being asked. In the case that the confirmed password does not match the configured one, the message of "Password Disabled – Press any key to continue..." will be prompted.

Masked: Hot Key Power On

In the event of "Power On Function" being configured as "Hot Key", this item will be enabled for tuning.

The choice: Ctrl-F1 to Ctrl-F12.

Onboard FDC Controller

This item allows you to enable/disable onboard Floppy disk controller.

The choice: Enabled/Disabled

Onboard Serial Port 1/Port 2

Select an address and corresponding interrupt for the first and second serial ports.

The choice: 3F8/IRQ4, 2E8/IRQ3, 3E8/IRQ4, 2F8/IRQ3, Disabled, Auto.

UART Mode Select

This item allows users to select Infrared transmission mode.

Normal	Disable Infrared function
IrDA	Select IrDA mode transmission
ASKIR	Select ASKIR mode transmission

As Infrared transmission function shares onboard serial port 2, COM2 needs to be enabled.

Masked : RxD, TxD Active

This item is to configure Infrared transmission rate. Four options are available :

Hi, Hi	High rate for receiving / High rate for transmitting
Hi, Lo	High rate for receiving / Low rate for transmitting
Lo, Hi	Low rate for receiving / High rate for transmitting
Lo, Lo	Low rate for receiving / Low rate for transmitting

Masked : IR Transmission Delay

This option will be available when IR is enabled.

The choice: Enabled/Disabled.

Masked: UR2 Duplex Mode

The available choices are full duplex mode and half duplex mode

The choice: Full/Half.

Masked: Use IR Pins

The available choices are IR-Rx2Tx2/ RxD2, TxD2.

The choice: IR-Rx2Tx2 / RxD2, TxD2.

Onboard Parallel Port

This item allows you to configure I/O address of the onboard parallel port.

The Choices : Disabled, 378/IRQ7, 278/IRQ5, 3BC/IRQ7

Parallel Port Mode

There are four different modes for the onboard parallel port :

SPP	Switch to SPP mode
EPP	Switch to EPP mode
ECP	Switch to ECP mode
ECP + EPP	Switch to ECP + EPP mode
Normal	Switch to Normal mode

Masked: EPP Mode Select

Select different version of EPP mode.

The choices : EPP1.7/EPP1.9

Masked: ECP Mode Use DMA

Select a proper DMA channel for ECP mode.

The choices: 3/1

PWRON After PWR-Fail

This item allows user to configure the power status of using ATX power supply after a serious power loss occurs.

On	System automatically restores power back
Off	System stays at power –off
Former-Sts	System restores back to previous status (On or Off)

Midi Port Address

There are 4 choices. There are disable, 330, 300 and 290.

The choice: Disabled/330/300/290.

Midi Port IRQ

To assign an IRQ number to Midi Port.

The choice: 5/10.

Watch Dog Timer Select

This BIOS testing option is able to reset the system according to the selected table.

The choice: Disabled/ 10 sec/ 20 sec/ 30 sec/ 40 sec/ 1Min/ 2 Min/ 4 Min

DOC Memory Address Range

There are 4 section option in the memory available to be selected. The choice: D8000-D9FFF, DA000-DBFFF, DC000-DDFFF and DE000-DFFFF.

Power Management Setup

The Power Management Setup allows you to configure you system to most effectively save energy while operating in a manner consistent with your own style of computer use.

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Power Management Setup

ACPI function	Enabled	Item Help
ACPI Suspend Type	S1(POS)	
Run VGABIOS if S3 Resume	Auto	Menu Level ➢
Power Management	User Define	
Video Off Method	DPMS	
Video Off In Suspend	Yes	
Suspend Type	Stop Grant	
MODEM	Use IRQ 3	
Suspend Mode	Disabled	
HDD Power Down	Disabled	
Soft-Off by PWR-BTTN	Instant-Off	
CPU THRM-Throttling	50.0%	
Wake-Up by PCI card	Enabled	
Power On by Ring	Enabled	
USB KB Wake-Up by PCI card	Enabled	
Resume by Alarm	Disabled	
Date(of Month) Alarm	0	
Time(hh:mm:ss) Alarm	0 0 0	
** Reload Global Timer Events **		
Primary IDE 0	Disabled	
Primary IDE 1	Disabled	
Secondary IDE 0	Disabled	
Secondary IDE 1	Disabled	
FDD,COM,LPT Port	Disabled	
PCI PIRQ[A-D]#	Disabled	

↑↓→←Move Enter: Select +/-/PU/PD: Value F10:Save ESC: Exit F1:General Help

F5:Previous Values F6:Fail-Safe Defaults F7:Optimized Defaults

ACPI Function

This item allows you to enable/disable the Advanced Configuration and Power Management (ACPI).

The choices : Enabled/Disabled.

ACPI Suspend Type

The choices : S1(POS)/S3(STR)/S1&S3

Power Management

This category allows you to select the type (or degree) of power saving and is directly related to "HDD Power Down", "Suspend Mode".

There are three selections for Power Management, three of which have fixed mode settings.

Min. Power Saving	Minimum power management. Suspend Mode = 1 hr., and HDD Power Down = 15 min.
Max. Power Saving	Maximum power management. Suspend Mode = 1 min., and HDD Power Down = 1 min.
User Defined	Allows you to set each mode individually. When not disabled, Suspend Mode ranges from 1 min. to 1 hr. and HDD Power Down ranges from 1 min. to 15 min.

Video Off Method

This determines the manner in which the monitor is blanked.

V/H SYNC+Blank	This selection will cause the system to turn off the vertical and horizontal synchronization ports and write blanks to the video buffer.
Blank Screen	This option only writes blanks to the video buffer.
DPMS	Initial display power management signaling.

Video Off In Suspend

This allows user to enable/disable video off in Suspend Mode.

The choices : Yes/No

Suspend Type

Two options are available : Stop Grant and Power On Suspend.

Suspend Mode

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

The choices : Disabled/1Min/2Min/4 Min /8 Min /12 Min /20 Min/40 Min/1 Hour.

HDD Power Down

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

The choices : Disabled/1Min/2Min/3 Min /4 Min /5 Min /6 Min /7 Min /8 Min /9 Min /10 Min /11 Min /12 Min /13 Min /14 Min /15 Min.

Soft-Off by PWR-BTTN

This item allows users to set the time to remove the power after the power button is pressed.

The choices : Instant-Off/Delay 4 Sec.

CPU THRM-Throttling

When the CPU temperature reaches the preset standard. The CPU usage will be reduced to a selected level to avoid overheating.

The choices : 87.5%/ 75.5%/ 62.5%/ 50.0%/ 37.5%/ 25.0%/ 12.5%

Wake-Up by PCI card

This option can be enabled to support Wake Up by on-board LAN.

The choices : Disabled/ Enabled

Power On by Ring

When select "Enabled", a system that is at soft-off mode will be alert to Wake-On-Modem signal.

The choices : Enabled/Disabled

Resume by Alarm

This item allows users to enable/disable the resume by alarm function. When "Enabled" is selected, system using ATX power supply could be powered on if a customized time and day is approached.

The choices : Enabled/Disabled

Masked : Date(of Month) Alarm

When "Resume by Alarm" is enabled, this item could allow users to configure the date parameter of the timing dateline on which to power on the systm.

The choices : 0 ~ 31

Masked : Time(hh:mm:ss) Alarm

When "Resume by Alarm" is enabled, this item could allow users to configure the time parameter of the timing dateline on which to power on the systm.

The choices : hh (0~23), mm (0~59), ss (0 ~59)

Primary/Secondary IDE 0/1

This item is to configure IDE devices being monitored by system so as to keep system out of suspend mode if the associated device is busy.

The choices : Enabled/Disabled

FDD, COM, LPT Port

This item is to configure floppy device, COM ports, and parallel port being monitored by system so as to keep system out of suspend mode if the associated device is busy.

The choices: Enabled/Disabled

PCI PIRQ[A-D]#

This option can be used to detect PCI device activities. If there are activities, the system will go into sleep mode.

The choices : Enabled/Disabled

PnP/PCI Configuration Setup

This section describes configuring the PCI bus system. PCI, or **P**ersonal **C**omputer **I**nterconnect, is a system which allows I/O devices to operate at speeds nearing the speed the CPU itself uses when communicating with its own special components.

This section covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.

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PnP/PCI Configurations

Reset Configuration Data	Disabled	Item Help

Resources Controlled By	Auto(ESCD)	Menu Level ➢
IRQ Resources	Press Enter	BIOS can automatically configure all the boot and Plug and Play compatible devices. If you choose Auto, you cannot select IRQ DMA and memory base address fields, since BIOS automatically assigns them
PCI/VGA Palette Snoop	Disabled	
Assign IRQ For VGA	Enabled	
INT PIN 1 Assignment	Auto	
INT PIN 2 Assignment	Auto	
INT PIN 3 Assignment	Auto	
INT PIN 4 Assignment	Auto	
INT PIN 5 Assignment	Auto	
INT PIN 6 Assignment	Auto	
INT PIN 7 Assignment	Auto	
INT PIN 8 Assignment	Auto	

↑↓→←Move Enter: Select +/-/PU/PD: Value F10:Save ESC: Exit F1:General Help

F5:Previous Values F6:Fail-Safe Defaults F7:Optimized Defaults

Figure 4-4. PnP/PCI Configurations – Screen Shot

Reset Configuration Data

Normally, you leave this field Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on card and the system reconfiguration has caused such a serious conflict that the operating system can not boot.

The choice: Enabled, Disabled .

Resource controlled by

The Award Plug and Play BIOS has the capacity to automatically configure all of the boot and Plug and Play compatible devices. However, this capability means absolutely nothing unless you are using a Plug and Play operating system such as Windows®95. If you set this field to "manual" choose specific resources by going into each of the sub menu that follows this field (a sub menu is preceded by a "➢").

The choice: Auto (ESCD), Manual.

IRQ Resources

When resources are controlled manually, assign each system interrupt a type, depending on the type of device using the interrupt.

The choice: Enter for more options

PCI/VGA Palette Snoop

Leave this field at Disabled.

The choices : Enabled/Disabled.

Assign IRQ For VGA

To enable VGA IRQ assignation by selecting enabled.

The choices : Enabled/Disabled.

INT PIN 1/2/3/4/5/6/7/8 Assignment

This BIOS option can assist users to assign IRQ numbers to particular slots. The IRQ number availabled are 3, 4, 5, 7, 9, 10, 11, 12, 14 and 15. Auto is the default value for each slot.

PC Health Status

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PC Health Status

CPU Warning Temperature	Disabled	Item Help
Current System Temperature	38_/100_	----------
Current CPU1 Temperature	43_/109_	Menu Level ➢
Current CPU FAN Speed	43_/109_	
Current Power FAN Speed	43_/109_	
Current System FAN Speed	43_/109_	
IN0(V)		
IN1(V)		
IN2(V)		
+ 5 V		
+12 V		
-12 V		
- 5 V		
VBAT(V)		
5VSB(V)		
CPU Throttle Temperature	Disabled	

↑↓→← Move Enter: Select +/-/PU/PD: Value F10:Save ESC: Exit F1:General Help
F5:Previous Values F6:Fail-Safe Defaults F7:Optimized Defaults

Frequency/Voltage Control

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Frequency/Voltage Control

CPU Clock Ratio	12 x	Item Help
Auto Detect PCI CLK	Enabled	----------
System Spectrum	Disabled	Menu Level ➢

↑↓→← Move Enter: Select +/-/PU/PD: Value F10:Save ESC: Exit F1:General Help
F5:Previous Values F6:Fail-Safe Defaults F7:Optimized Defaults

Figure 4-5. Frequency/Voltage Control

Spread Spectrum

This item allows you to enable/disable the spread spectrum modulate

The choices : Enabled, Disabled

Default Menu

Selecting “Defaults” from the main menu shows you two options which are described below

Load Fail-Safe Defaults

When you press <Enter> on this item you get a confirmation dialog box with a message similar to:

```
Load Fail-Safe Defaults (Y/N) ? N
```

Pressing ‘Y’ loads the BIOS default values for the most stable, minimal-performance system operations.

Load Optimized Defaults

When you press <Enter> on this item you get a confirmation dialog box with a message similar to:

```
Load Optimized Defaults (Y/N) ? N
```

Pressing ‘Y’ loads the default values that are factory settings for optimal performance system operations.

Supervisor/User Password Setting

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

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

user password: just can only enter but do not have the right to change the options of the setup menus. When you select this function, the following message will appear at the center of the screen to assist you in creating a password.

ENTER PASSWORD

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

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

PASSWORD DISABLED

When a password has been enabled, you will be prompted to enter it every time you try to enter Setup. This prevents an unauthorized person from changing any part of your system configuration.

Additionally, when a password is enabled, you can also require the BIOS to request a password every time your system is rebooted. This would prevent unauthorized use of your computer.

You determine when the password is required within the BIOS Features Setup Menu and its Security option (see Section 3). If the Security option is set to “System”, the password will be required both at boot and at entry to Setup. If set to “Setup”, prompting only occurs when trying to enter Setup.

Exiting Selection

Save & Exit Setup

Pressing <Enter> on this item asks for confirmation:

Save to CMOS and EXIT (Y/N)? Y

Pressing "Y" stores the selections made in the menus in CMOS – a special section of memory that stays on after you turn your system off. The next time you boot your computer, the BIOS configures your system according to the Setup selections stored in CMOS. After saving the values the system is restarted again.

Exit Without Saving

Pressing <Enter> on this item asks for confirmation:

Quit without saving (Y/N)? Y

This allows you to exit Setup without storing in CMOS any change. The previous selections remain in effect. This exits the Setup utility and restarts your computer.

POST Messages

During the Power On Self-Test (POST), if the BIOS detects an error requiring you to do something to fix, it will either sound a beep code or display a message. If a message is displayed, it will be accompanied by:

PRESS F1 TO CONTINUE, CTRL-ALT-ESC OR DEL TO ENTER SETUP

POST Beep

Currently there are two kinds of beep codes in BIOS. This code indicates that a video error has occurred and the BIOS cannot initialize the video screen to display any additional information. This beep code consists of a single long beep followed by two short beeps. The other code indicates that your DRAM error has occurred. This beep code consists of a single long beep repeatedly.

Error Messages

One or more of the following messages may be displayed if the BIOS detects an error during the POST. This list includes messages for both the ISA and the EISA BIOS.

CMOS BATTERY HAS FAILED

CMOS battery is no longer functional. It should be replaced.

CMOS CHECKSUM ERROR

Checksum of CMOS is incorrect. This can indicate that CMOS has become corrupt. This error may have been caused by a weak battery. Check the battery and replace if necessary.

DISK BOOT FAILURE, INSERT SYSTEM DISK AND PRESS ENTER

No boot device was found. This could mean that either a boot drive was not detected or the drive does not contain proper system boot files. Insert a system disk into Drive A: and press <Enter>. If you assumed the system would boot from the hard drive, make sure the controller is inserted correctly and all cables are properly attached. Also be sure the disk is formatted as a boot device. Then reboot the system.

DISKETTE DRIVES OR TYPES MISMATCH ERROR - RUN SETUP

Type of diskette drive installed in the system is different from the CMOS definition. Run Setup to reconfigure the drive type correctly.

DISPLAY SWITCH IS SET INCORRECTLY

Display switch on the motherboard can be set to either monochrome or color. This indicates the switch is set to a different setting than indicated in Setup. Determine which setting is correct, and then either turn off the system and change the jumper, or enter Setup and change the VIDEO selection.

DISPLAY TYPE HAS CHANGED SINCE LAST BOOT

Since last powering off the system, the display adapter has been changed. You must configure the system for the new display type.

EISA Configuration Checksum Error

PLEASE RUN EISA CONFIGURATION UTILITY

The EISA non-volatile RAM checksum is incorrect or cannot correctly read the EISA slot. This can indicate either the EISA non-volatile memory has become corrupt or the slot has been configured incorrectly. Also be sure the card is installed firmly in the slot.

EISA Configuration Is Not Complete

PLEASE RUN EISA CONFIGURATION UTILITY

The slot configuration information stored in the EISA non-volatile memory is incomplete.



Note: When either of these errors appear, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

ERROR ENCOUNTERED INITIALIZING HARD DRIVE

Hard drive cannot be initialized. Be sure the adapter is installed correctly and all cables are correctly and firmly attached. Also be sure the correct hard drive type is selected in Setup.

ERROR INITIALIZING HARD DISK CONTROLLER

Cannot initialize controller. Make sure the cord is correctly and firmly installed in the bus. Be sure the correct hard drive type is selected in Setup. Also check to see if any jumper needs to be set correctly on the hard drive.

FLOPPY DISK CNTRLR ERROR OR NO CNTRLR PRESENT

Cannot find or initialize the floppy drive controller. make sure the controller is installed correctly and firmly. If there are no floppy drives installed, be sure the Diskette Drive selection in Setup is set to NONE.

Invalid EISA Configuration

PLEASE RUN EISA CONFIGURATION UTILITY

The non-volatile memory containing EISA configuration information was programmed incorrectly or has become corrupt. Re-run EISA configuration utility to correctly program the memory.

NOTE: When this error appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

KEYBOARD ERROR OR NO KEYBOARD PRESENT

Cannot initialize the keyboard. Make sure the keyboard is attached correctly and no keys are being pressed during the boot.

If you are purposely configuring the system without a keyboard, set the error halt condition in Setup to HALT ON ALL, BUT KEYBOARD. This will cause the BIOS to ignore the missing keyboard and continue the boot.

Memory Address Error at ...

Indicates a memory address error at a specific location. You can use this location along with the memory map for your system to find and replace the bad memory chips.

Memory parity Error at ...

Indicates a memory parity error at a specific location. You can use this location along with the memory map for your system to find and replace the bad memory chips.

MEMORY SIZE HAS CHANGED SINCE LAST BOOT

Memory has been added or removed since the last boot. In EISA mode use Configuration Utility to reconfigure the memory configuration. In ISA mode enter Setup and enter the new memory size in the memory fields.

Memory Verify Error at ...

Indicates an error verifying a value already written to memory. Use the location along with your system's memory map to locate the bad chip.

OFFENDING ADDRESS NOT FOUND

This message is used in conjunction with the I/O CHANNEL CHECK and RAM PARITY ERROR messages when the segment that has caused the problem cannot be isolated.

OFFENDING SEGMENT:

This message is used in conjunction with the I/O CHANNEL CHECK and RAM PARITY ERROR messages when the segment that has caused the problem has been isolated.

PRESS A KEY TO REBOOT

This will be displayed at the bottom screen when an error occurs that requires you to reboot. Press any key and the system will reboot.

PRESS F1 TO DISABLE NMI, F2 TO REBOOT

When BIOS detects a Non-maskable Interrupt condition during boot, this will allow you to disable the NMI and continue to boot, or you can reboot the system with the NMI enabled.

RAM PARITY ERROR - CHECKING FOR SEGMENT ...

Indicates a parity error in Random Access Memory.

Should Be Empty But EISA Board Found

PLEASE RUN EISA CONFIGURATION UTILITY

A valid board ID was found in a slot that was configured as having no board ID.



Note: When this error appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

Should Have EISA Board But Not Found

PLEASE RUN EISA CONFIGURATION UTILITY

The board installed is not responding to the ID request, or no board ID has been found in the indicated slot.



Note: When this error appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

Slot Not Empty

Indicates that a slot designated as empty by the EISA Configuration Utility actually contains a board.



Note: When this error appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

SYSTEM HALTED, (CTRL-ALT-DEL) TO REBOOT ...

Indicates the present boot attempt has been aborted and the system must be rebooted. Press and hold down the CTRL and ALT keys and press DEL.

Wrong Board In Slot

PLEASE RUN EISA CONFIGURATION UTILITY

The board ID does not match the ID stored in the EISA non-volatile memory.



Note: When this error appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

- **FLOPPY DISK(S) fail (80)**

  Unable to reset floppy subsystem.

- **FLOPPY DISK(S) fail (40)**

  Floppy Type dismatch.

- **Hard Disk(s) fail (80)**

  HDD reset failed

- **Hard Disk(s) fail (40)**

  HDD controller diagnostics failed.

- **Hard Disk(s) fail (20)**

  HDD initialization error.

- **Hard Disk(s) fail (10)**

  Unable to recalibrate fixed disk.

- **Hard Disk(s) fail (08)**

  Sector Verify failed.

- **Keyboard is locked out**

  Unlock the key

- **Keyboard error or no keyboard present**

  Cannot initialize the keyboard. Make sure the keyboard is attached correctly and no keys are being pressed during the boot.

BIOS ROM checksum error – System halted

The checksum of ROM address F0000H-FFFFFH is bad.

Memory test fails

BIOS reports the memory test fail if the onboard memory is tested error.

BIOS POST Check Point List

AWARDBIOS provides all IBM standard Power On Self Test (POST) routines as well as enhanced AWARDBIOS 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 describing the message and 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 how far the BIOS has executed through the power-on sequence and what test is currently being performed. This is done to help troubleshoot 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 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 AWARDBIOS products with a core BIOS date of 07/15/95 version 6.27 (Enhanced).

Code	Description
CFh	Test CMOS R/W functionality.
C0h	Early chipset initialization: -Disable shadow RAM -Disable L2 cache (socket 7 or below) -Program basic chipset registers
C1h	Detect memory -Auto-detection of DRAM size, type and ECC. -Auto-detection of L2 cache (socket 7 or below)
C3h	Expand compressed BIOS code to DRAM
C5h	Call chipset hook to copy BIOS back to E000 & F000 shadow RAM.
0h1	Expand the Xgroup codes locating in physical address 1000:0
02h	Reserved
03h	Initial Superio_Early_Init switch.
04h	Reserved
05h	1. Blank out screen 2. Clear CMOS error flag
06h	Reserved
07h	1. Clear 8042 interface 2. Initialize 8042 self-test

Code	Description
08h	Test special keyboard controller for Winbond 977 series Super I/O chips. Enable keyboard interface.
09h	Reserved
0Ah	Disable PS/2 mouse interface (optional). Auto detect ports for keyboard & mouse followed by a port & interface swap (optional). Reset keyboard for Winbond 977 series Super I/O chips.
0Bh	Reserved
0Ch	Reserved
0Dh	Reserved
0Eh	Test F000h segment shadow to see whether it is R/W-able or not. If test fails, keep beeping the speaker.
0Fh	Reserved
10h	Auto detect flash type to load appropriate flash R/W codes into the run time area in F000 for ESCD & DMI support.
11h	Reserved
12h	Use walking 1's algorithm to check out interface in CMOS circuitry. Also set real-time clock power status, and then check for override.
13h	Reserved
14h	Program chipset default values into chipset. Chipset default values are MODBINable by OEM customers.
15h	Reeserved
16h	Initial Early_Init_Onboard_Generator switch.
17h	Reserved
18h	Detect CPU information including brand, SMI type (Cyrix or Intel) and CPU level (586 or 686).
19h	Reserved
1Ah	Reserved

Code	Description
1Bh	Initial interrupts vector table. If no special specified, all H/W interrupts are directed to SPURIOUS_INT_HDLR & S/W interrupts to SPURIOUS_soft_HDLR.
1Ch	Reserved
1Dh	Initial EARLY_PM_INIT switch.
1Eh	Reserved
1Fh	Load keyboard matrix (notebook platform)
20h	Reserved
21h	HPM initialization (notebook platform)
22h	Reserved
23h	Check validity of RTC value: e.g. a value of 5Ah is an invalid value for RTC minute. Load CMOS settings into BIOS stack. If CMOS checksum fails, use default value instead. Prepare BIOS resource map for PCI & PnP use. If ESCD is valid, take into consideration of the ESCD's legacy information. Onboard clock generator initialization. Disable respective clock resource to empty PCI & DIMM slots. Early PCI initialization: -Enumerate PCI bus number -Assign memory & I/O resource -Search for a valid VGA device & VGA BIOS, and put it into C000:0.

Code	Description
24h	Reserved
25h	Reserved
26h	Reserved
27h	Initialize INT 09 buffer
28h	Reserved
29h	Program CPU internal MTRR (P6 & PII) for 0-640K memory address. Initialize the APIC for Pentium class CPU. Program early chipset according to CMOS setup. Example: onboard IDE controller. Measure CPU speed. Invoke video BIOS.
2Ah	Reserved
2Bh	Reserved
2Ch	Reserved
2Dh	Initialize multi-language. Put information on screen display, including Award title, CPU type, CPU speed ....
2Eh	Reserved
2Fh	Reserved
30h	Reserved
31h	Reserved
32h	Reserved
33h	Reset keyboard except Winbond 977 series Super I/O chips.
34h	Reserved
35h	Reserved
36h	Reserved
37h	Reserved
38h	Reserved
39h	Reserved

Code	Description
3Ah	Reserved
3Bh	Reserved
3Ch	Test 8254
3Dh	Reserved
3Eh	Test 8259 interrupt mask bits for channel 1
3Fh	Reserved
40h	Test 8259 interrupt mask bits for channel 2
41h	Reserved
42h	Reserved
43h	Test 8259 functionality
44h	Reserved
45h	Reserved
46h	Reserved
47h	Initialize EISA slot
48h	Reserved
49h	Calculate total memory by testing the last double word of each 64K page. Program writes allocation for AMD K5 CPU.
4Ah	Reserved
4Bh	Reserved
4Ch	Reserved
4Dh	Reserved

Code	Description
4Eh	Program MTRR of M1 CPU Initialize L2 cache for P6 class CPU & program CPU with proper cacheable range. Initialize the APIC for P6 class CPU. On MP platform, adjust the cacheable range to smaller one in case the cacheable ranges between each CPU are not identical.
4Fh	Reserved
50h	Initialize USB
51h	Reserved
52h	Test all memory (clear all extended memory to 0)
53h	Reserved
54h	Reserved
55h	Display number of processors (multi-processor platform)
56h	Reserved
57h	Display PnP logo Early ISA PnP initialization -Assign CSN to every ISA PnP device.
58h	Reserved
59h	Initialize the combined Trend Anti-Virus code.
5Ah	Reserved
5Bh	(Optional Feature) Show message for entering AWDFLASH.EXE from FDD (optional)
5Ch	Reserved
5Dh	Initialize Init_Onboard_Super_IO switch. Initialize Init_Onbaord_AUDIO switch.
5Eh	Reserved

Code	Description
5Fh	Reserved
60h	Okay to enter Setup utility; i.e. not until this POST stage can users enter the CMOS setup utility.
61h	Reserved
62h	Reserved
63h	Reserved
64h	Reserved
65h	Initialize PS/2 Mouse
66h	Reserved
67h	Prepare memory size information for function call: INT 15h ax=E820h
68h	Reserved
69h	Turn on L2 cache
6Ah	Reserved
6Bh	Program chipset registers according to items described in Setup & Auto-configuration table.
6Ch	Reserved
6Dh	Assign resources to all ISA PnP devices. Auto assign ports to onboard COM ports if the corresponding item in Setup is set to "AUTO".
6Eh	Reserved
6Fh	Initialize floppy controller Set up floppy related fields in 40:hardware.
70h	Reserved
71h	Reserved
72h	Reserved

Code	Description
73h	(Optional Feature) Enter AWDFLASH.EXE if : -AWDFLASH is found in floppy drive. -ALT+F2 is pressed
74h	Reserved
75h	Detect & install all IDE devices: HDD, LS120, ZIP, CDROM.....
76h	Reserved
77h	Detect serial ports & parallel ports.
78h	Reserved
79h	Reserved
7Ah	Detect & install co-processor
7Bh	Reserved
7Ch	Reserved
7Dh	Reserved
7Eh	Reserved
7Fh	Switch back to text mode if full screen logo is supported. -If errors occur, report errors & wait for keys -If no errors occur or F1 key is pressed to continue: ◆Clear EPA or customization logo.
80h	Reserved
81h	Reserved
82h	Call chipset power management hook. Recover the text fond used by EPA logo (not for full screen logo) If password is set, ask for password.
83h	Save all data in stack back to CMOS
84h	Initialize ISA PnP boot devices

Code	Description
85h	1) USB final Initialization 2) NET PC: Build SYSID structure 3) Switch screen back to text mode 4) Set up ACPI table at top of memory. 5) Invoke ISA adapter ROMs 6) Assign IRQs to PCI devices 7) Initialize APM 8) Clear noise of IRQs.
86h	Reserved
87h	Reserved
88h	Reserved
89h	Reserved
90h	Reserved
91h	Reserved
92h	Reserved
93h	Read HDD boot sector information for Trend Anti-Virus code

Code	Description
94h	1) Enable L2 cache 2) Program boot up speed 3) Chipset final initialization. 4) Power management final initialization 5) Clear screen & display summary table 6) Program K6 write allocation 7) Program P6 class write combining
95h	1) Program daylight saving 1) Update keyboard LED & typematic rate
96h	1) Build MP table 2) Build & update ESCD 3) Set CMOS century to 20h or 19h 4) Load CMOS time into DOS timer tick 5) Build MSIRQ routing table.
FFh	Boot attempt (INT 19h

BIOS Flash Utility

Utilize AWARD Flash BIOS programming utility to update on-board BIOS for the future new BIOS version. Please contact your technical window to get this utility if necessary.



Note: Remark or delete any installed Memory Management Utility (such as HIMEM.SYS, EMM386.EXE, QEMM.EXE, ..., etc.) in the CONFIG.SYS files before running Flash programming utility.

Chapter 5

ATX Power Settings

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Overview

This section of the User's Guide provides few useful tips to get your SBC-845D-VEA running without failure. As jumper configuration has been addressed in previous chapters, this section will focus on ATX power settings.

Backplane

The SBC-845D-VEA is a full-sized SBC, and therefore is able to run on any PICMG backplane, active or passive.

P4 Power connector

This SBC requires power to draw from at least two connectors. The CPU supplementary power connector (J5) should be connected at all times for the system to run properly. During standalone mode, the single board computer will not utilize peripheral device cards. A 4-pin supplementary connector for CPU the (J5) and the 4-pin connector (J13) must be connected in order for peripheral devices to run. If the system's main power comes from a backplane, the CPU supplementary power connector (J5) should still be connected.

ATX power

The SBC-845D-VEA is designed to support both AT and ATX power. The following instruction demonstrates how the ATX function can be applied.

The SBC-845D-VEA adapts its ATX power through its ATX power control connector (J11). This ATX power interface can be connected to a supported backplane. Such a backplane is required to have a 4-pin connector for feeding the ATX power to the SBC-845D-VEA. Refer to the following example:

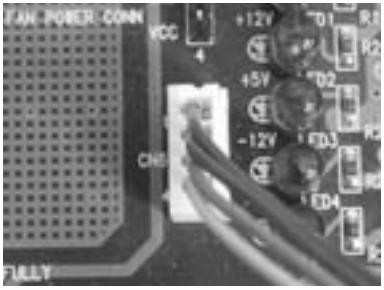


Figure 5-1. ATX power control connection on backplane

Short both pins 3-5 and 4-6 of JP4 to enable the ATX function. In addition to connecting the 4-pin ATX power control cable to J11, a toggle switch should be used to switch the board's ATX power on/off. The toggle switch is usually located on the chassis front panel. Pressing the switch once will turn the power on, and pressing it again will turn it off. The toggle switch should be connected to J16.

The last thing to do before your SBC-845D-VEA system can be turned on is to connect the 20-pin ATX power cable to the backplane. By switching your ATX power on, the system goes into power standby. Pressing the SBC-845D-VEA ATX power button should successfully turn on the system.

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