

Intel® Desktop Board D865PERL

Quick Reference

This guide is written for technically qualified personnel with experience installing and configuring desktop boards.

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Items on the Intel® Express Installer CD-ROM

- Product warranty
- Intel Express Installer
- *Intel® Desktop Board D865PERL Product Guide*
- Software utilities and drivers
- Software license agreement
- Readme file

Part Number: C24492-002

C24492-002



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Contact your local Intel sales office or your distributor to obtain the latest specifications and before placing your product order.

Copies of documents which have an ordering number and are referenced in this document, or other Intel literature, may be obtained from Intel Corporation by going to the World Wide Web site at: <http://www.intel.com> or by calling 1-800-548-4725.

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Before You Begin

Warning and Cautions



WARNING

Disconnect the desktop board's power supply from its AC power source before you connect or disconnect cables, or install or remove any board components. Failure to do this can result in personal injury or equipment damage. Some circuitry on the desktop board can continue to operate even though the front panel power switch is off.



CAUTION

Electrostatic discharge (ESD) can damage desktop board components. Install the board at an ESD-controlled workstation. If such a workstation is not available, wear an antistatic wrist strap or touch the surface of the antistatic package before handling the board.



CAUTION

Many of the midboard and front panel connectors provide operating voltage (+5 V DC and +12 V DC, for example) to devices inside the computer chassis, such as fans and internal peripherals. These connectors are not overcurrent protected. Do not use these connectors for powering devices external to the computer chassis. A fault in the load presented by the external devices could cause damage to the computer, the interconnecting cables, and the external devices themselves.

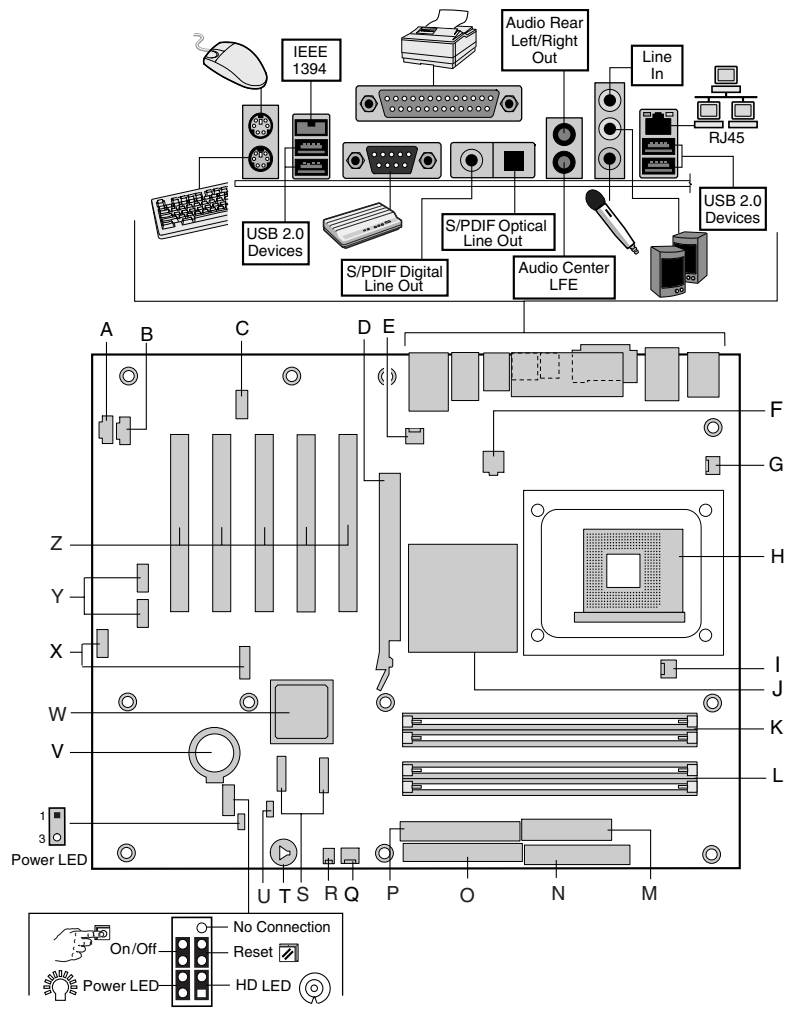
Safety and Regulatory Notice

See the *Intel® Desktop Board D865PERL Product Guide* for all applicable regulatory compliance statements, product certification markings, and safety and electromagnetic compatibility (EMC) standards and regulations the desktop board is compliant with.

Replacement battery warning label provided: Place the label inside the chassis in an easy-to-see location near the battery but not on the board itself.

Intended uses: This product was evaluated as information technology equipment (ITE) for home or office use when installed into an appropriate computer chassis. Other end uses or locations may require further evaluation.

Desktop Board Components



OM15632

Figure 1. Desktop Board Components

continued

Desktop Board Components (continued)

Label	Description
A	Auxiliary line-in connector (ATAPI)
B	CD-ROM connector (ATAPI)
C	Front panel audio header
D	AGP connector
E	Rear chassis fan header (fan speed control)
F	12 V processor core voltage connector
G	VREG fan header
H	Processor socket
I	Processor fan header
J	Intel® 82865PE (MCH)
K	Channel A DIMM socket
L	Channel B DIMM socket
M	Main power connector
N	Diskette drive connector
O	Primary IDE connector
P	Secondary IDE connector
Q	Front chassis fan header (fan speed control)
R	Chassis intrusion header
S	Serial ATA connectors
T	Speaker
U	BIOS configuration jumper
V	Battery
W	Intel® 82801EB (ICH5) / 82801ER (ICH5R)
X	USB 2.0 headers
Y	IEEE 1394a headers (optional)
Z	PCI bus add-in card connectors

Supported Components

Processors

The board supports a single processor with the following features:

Type	Designation (GHz)	FSB ¹ Frequency (MHz)	L2 Cache (KB)
Intel® Pentium® 4 processor featuring Hyper-Threading Technology	3, 2.80C, 2.60C, and 2.40C	800	512
	3.06	533	512
Intel Pentium 4 processor based on 0.13 micron process	2.8, 2.66, 2.53, 2.4B, and 2.26	533	512
	2.6, 2.5, 2.4, 2.2, 2A, 1.80A, and 1.60A	400	512
Intel® Celeron® processor based on 0.13 micron process	2.2, 2.1, and 2.0	400	128

¹ Front side bus

For the latest information on processors supported by Desktop Board D865PERL, refer to the Intel World Wide Web site at:

<http://support.intel.com/support/motherboards/desktop>

Memory Module Requirements

The desktop board supports system memory as defined below:

Memory Speed	Processor	Front Side Bus Frequency	Memory Speed Outcome
DDR400	Pentium 4 processor	800 MHz	400 MHz
DDR333	Pentium 4 processor	800 MHz	320 MHz
	Pentium 4 processor	533 MHz	333 MHz
	Pentium 4 processor or Celeron processor	400 MHz	266 MHz
DDR266	Pentium 4 processor	533 MHz or 400 MHz	266 MHz
	Celeron processor	400 MHz	266 MHz

- Up to four 184-pin Double Data Rate (DDR) SDRAM Dual Inline Memory Module (DIMM) connectors with gold-plated contacts.
- Support for:
 - Unbuffered, non-registered single or double-sided DIMMs
 - Serial Presence Detect (SPD) memory only
 - Support for Suspend to RAM (STR), S3 ACPI state
 - Non-ECC RAM
 - 2.5 V memory



NOTES

System resources (such as PCI and AGP) require physical memory address locations that reduce available memory addresses above 3 GB. This may result in less than 4 GB of memory being available to the operating system and applications.

All memory components and DIMMs used with the desktop board must comply with the PC SDRAM specifications. These include the PC SDRAM Specification (memory component specific), the PC Unbuffered DIMM Specification. To view or download these specifications, refer to this Intel World Wide Web site at:

<http://developer.intel.com/technology/memory/pcsdram/spec/>

For information about vendors that support these memory requirements, refer to the Desktop Board D865PERL link on this Intel World Wide Web site at:

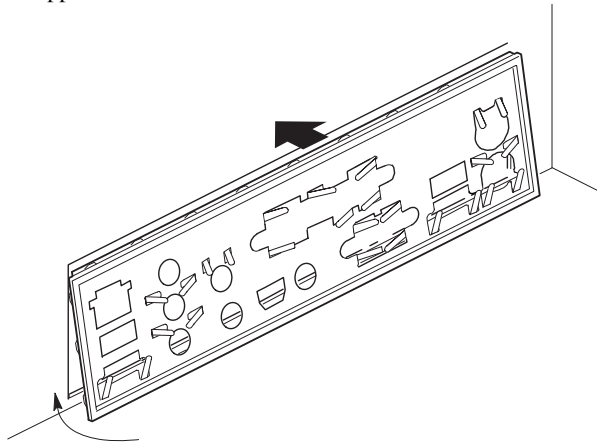
<http://support.intel.com/support/motherboards/desktop/>

Installation Steps

1. Installing the I/O Shield

The board comes with an I/O shield that is used to block radio frequency transmissions, necessary to pass emissions (EMI) certification testing, protect internal components from dust and foreign objects, and promote correct airflow within the chassis.

Install the I/O shield before installing the board in the chassis. Place the shield inside the chassis as shown in Figure 2. Press the shield into place so that it fits tightly and securely. If the shield doesn't fit, obtain a properly sized shield from the chassis supplier.



OM14811

Figure 2. I/O Shield

2. Installing the Desktop Board

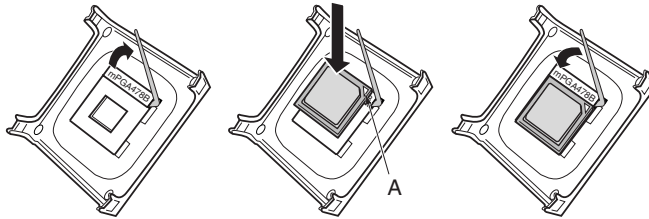
Refer to your chassis manual for specific instructions on installing and removing the desktop board.

Secure Desktop Board D865PERL to the chassis using 11 screws. Refer to the board illustration on page 4 for the location of the screw mounting holes.

3. Installing the Processor

To install the processor, follow these steps, see Figure 3:

1. Observe the precautions in “Before You Begin” on page 3.
2. Lift the processor socket lever.
3. Install the processor so that the corner with the triangle marking (A) is aligned with the corner where the lever is attached to the socket.
4. Lower the lever back to its original position.



OM12078

Figure 3. Installing the Processor

5. The desktop board has an integrated processor fan heat sink retention mechanism (RM). For instructions on how to install the processor fan heat sink, refer to the boxed processor manual or the Intel World Wide Web site at:

<http://support.intel.com/support/processors/pentium4/intnotes478.htm>

4. Installing Memory Modules



CAUTION

Install memory in the DIMM sockets prior to installing the AGP video card to avoid interference with the memory retention mechanism.

Desktop Board D865PERL's four DIMM sockets are arranged as DIMM 0 and DIMM 1 in both Channel A and Channel B, as shown Figure 4.

Dual Channel Configuration

Install a matched pair of DIMMs (equal in speed: DDR266, DDR333, or DDR400; density: 64 MB, 128 MB, 256 MB, 512 MB, or 1 GB; and technology: 128 Mb, 256 Mb, or 512 Mb) in DIMM 0 in both Channels A and B. If additional memory is to be used, install another matched pair of DIMMs in DIMM 1 in both Channels A and B.



NOTE

All other memory configurations will result in single channel memory operation.

To install DIMMs, follow these steps:

1. Observe the precautions in “Before You Begin” on page 3.
2. Remove the AGP video card if it interferes with the DIMM clips from being easily opened and closed.
3. Align the small notch at the bottom edge of the DIMM with the key in the socket.
4. Insert the bottom edge of the DIMM into the socket.
5. Push down on the top edge of the DIMM until the retaining clips snap into place. Make sure the clips are firmly in place.

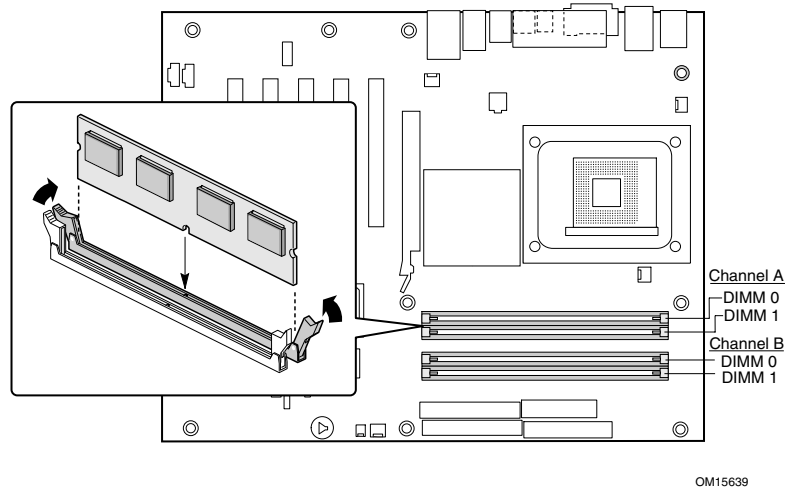


Figure 4. Installing DIMMs

5. Installing an AGP Card



CAUTION

Care must be taken when installing an AGP card into an AGP connector. When installing any AGP card in the desktop board, ensure that it is fully seated in the AGP connector before you power on the system. If the card is not fully seated in the AGP connector, an electrical short may result across the AGP slot pins. Depending on the over-current protection of the power supply, certain board components and/or traces may be damaged.

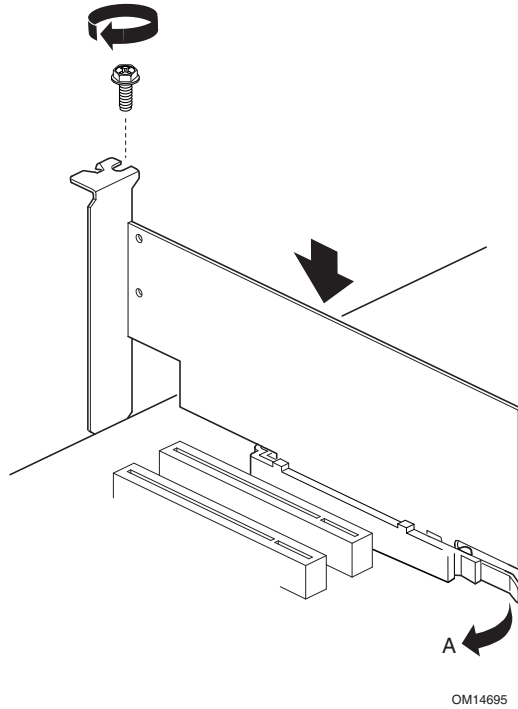


NOTE

The AGP connector is keyed for 1.5 V and 0.8 V AGP cards only. Do not attempt to install a legacy 3.3 V AGP card. The AGP connector is not mechanically compatible with legacy 3.3 V AGP cards.

Desktop Board D865PERL has an integrated AGP card retention mechanism (RM). Follow these instructions to install an AGP card, see Figure 5:

1. Observe the precautions in “Before You Begin” on page 3.
2. Place the AGP card in the AGP connector.
3. Press down on the card until it is completely seated in the connector and the card retention notch snaps into place below the RM.
4. Secure the card’s metal bracket to the chassis back panel with a screw.



OM14695

Figure 5. Installing an AGP card

To remove the AGP card, reverse steps taken when installing an AGP card. Before removing the card, make sure to push back on the RM lever (A) until the retention pin completely clears the notch in the card.

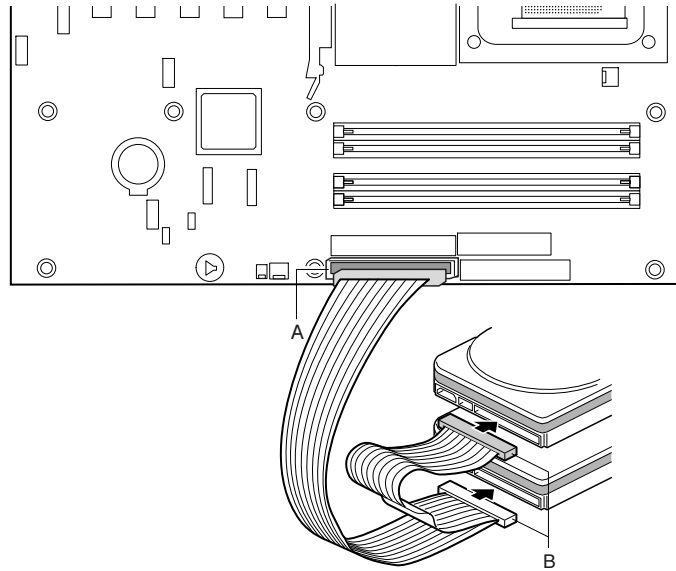
6. Attaching IDE Drives

The Intel® boxed desktop board package includes an ATA-66/100 cable.

The cable supports the ATA-66/100 (40-contact, 80-conductor) transfer protocol and is backward compatible with drives using slower IDE transfer protocols. The cable can connect two drives to the desktop board.

The cable will work correctly only when oriented as shown in Figure 6. For correct cable function:

1. Observe the precautions in “Before You Begin” on page 3.
2. Attach the cable end with the single connector (A) to the board.
3. Attach the cable end with the two closely spaced connectors (B) to the drives.



OM15643

Figure 6. Attaching IDE Cables

7. Attaching Serial ATA (SATA) Drives

The boxed desktop board package includes one or two (optional) Serial ATA (SATA) cable(s).

The cable (4-conductor) supports the Serial ATA protocol and connects a single drive to the desktop board. Either end of the cable can be connected to the SATA drive or the connector on the board, see Figure 7.

For correct cable function:

1. Observe the precautions in “Before You Begin” on page 3.
2. Attach either cable end to the connector (A) on the board.
3. Attach the other cable end (B) to the drive.

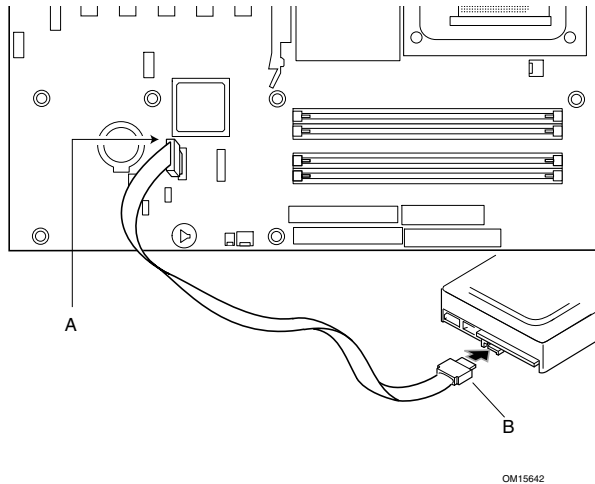


Figure 7. Attaching an SATA Cable



NOTE

Some SATA drives may require a power adapter cable. Contact the manufacturer of the SATA drive to determine the best method for powering the SATA drive.

8. Configuring the System for Intel® RAID Technology for Serial ATA



NOTE

The Intel® RAID Technology for Serial ATA is supported with Microsoft Windows® XP only.

Configuring the BIOS for Intel RAID Technology for Serial ATA

The SoftRAID option must be enabled in BIOS before the system can load the option ROM code for Intel RAID.

1. Enter the BIOS Setup program by pressing the <F2> key after the Power-On-Self-Test (POST) memory test begins.
2. Select the Advanced menu and then the Drive Configuration menu.
3. Switch the ATA/IDE Configuration option from Legacy to Enhanced. Next, switch the SoftRAID option to Enabled.
4. Press <F10> to save the BIOS settings and exit the BIOS Setup program.

Creating, Deleting, and Resetting RAID Sets

The Serial ATA RAID set must be administered in the RAID Configuration utility. During POST, the following message will appear for a few seconds:

Press <Cntrl-I> to enter Raid Configuration utility

After the above message appears, press the <Ctrl> and <I> keys simultaneously.

Create RAID 0 Volume

1. Select option 1 Create RAID Volume and press the <Enter> key.
2. Select the stripe value for the RAID 0 array by scrolling through the available values by using the <↑> or <↓> keys and pressing the <Enter> key.
3. The available values range from 8 KB to 128 KB in 8 KB increments. The stripe value should be chosen based on the planned drive usage. Some suggested selections are listed below. The default selection is 64 KB.
 - 16 KB – low disk usage
 - 64 KB – typical disk usage
 - 128 KB – performance disk usage
4. Press the <Enter> key again to the Create Volume prompt to create the array. Confirm this selection by pressing the <Y> key after the prompt.
5. Scroll to option 4 Exit and press the <Enter> key to exit the RAID Configuration utility. Confirm the exit by pressing <Y> key.

Delete RAID Volume



CAUTION

All data on the RAID drives will be lost.

1. Select option 2 *Delete RAID Volume* and press the <Enter> key to delete the RAID set.
2. Press the <Delete> key to delete the RAID volume. Confirm the volume deletion by pressing the <Y> key.

Reset RAID Data



CAUTION

All data on the RAID drives and any RAID structures will be lost.

1. Select option 3 *Reset RAID Data* and press the <Enter> key to delete the RAID set and remove any RAID structures from the drives.
2. Confirm the selection by pressing the <Y> key.

Loading the Intel® Application Accelerator 3.0 RAID Edition Driver

For Microsoft Windows XP, follow these steps to install the RAID driver:

1. As Windows Setup begins, press <F6> to specify the RAID driver.
2. When queried by the installation screen, press <S> to specify an additional device.
3. Insert the floppy disk labeled Intel® Application Accelerator 3.0 RAID Edition Driver and press <Enter>.
4. Press <Enter> to select the Intel RAID controller.
5. Press <Enter> to continue with Windows Setup.

Configuring an Intel RAID Ready System

The Intel Application Accelerator 3.0 RAID Edition software offers the flexibility to upgrade from a single Serial ATA drive to a two drive RAID 0 configuration when an additional Serial ATA drive is added to the system. However, several important steps must be followed at the time the system is first configured in order to take advantage of RAID when upgrading to a second Serial ATA drive.

1. The BIOS must be configured for RAID before installing Windows XP on the single Serial ATA drive. Refer to section 'Configuring the BIOS for Intel RAID Technology for Serial ATA' on page 14 to properly configure the BIOS.
2. Install the Intel RAID driver during Window Setup. Refer to section "Loading the Intel Application Accelerator 3.0 RAID Edition Driver" to install the driver during Windows Setup.

3. Install the operating system and then the Intel Application Accelerator 3.0 RAID Edition software. The Intel Application Accelerator 3.0 RAID Edition software is included on the Intel® Express Installer CD that ships with the desktop board.

Upgrading to Serial ATA RAID 0 Configuration from a Single Drive Configuration

1. Install the second Serial ATA drive in the system. Refer to section “Attaching Serial ATA (SATA) Drives” on page 13.
2. Start the system and boot into Windows XP.
3. Launch the Intel Application Accelerator from the Start Menu (Start → All Programs → Intel Application Accelerator RAID Edition → Intel Application Accelerator).
4. From the Integrated RAID tab, right-click on “RAID Volume” and select “Create from Existing Disk.”



NOTE

The RAID volume name must be in English alphanumeric ASCII characters and no more than 16 characters.

5. Select the source disk to create the RAID Volume and then press the “Next” button.
6. Enter the name of the RAID volume (default is RAID_Volume1).
7. Select the stripe value for the RAID 0 array. The available values range from 8 KB to 128 KB in 8 KB increments. The stripe value should be chosen based on the planned drive usage. Some suggested selections are listed below. The default selection is 64 KB.
 - 16 KB – low disk usage
 - 64 KB – typical disk usage
 - 128 KB – performance disk usage
8. Press the “Next” button to continue.
9. Confirm creation of the RAID volume by pressing the “Yes” button.
10. Reconfirm creation of the RAID volume by pressing the “Yes” button.
11. Press the “Migrate” button to begin the data migration.



NOTE

Data migration will take a considerable amount of time. Do not power down or reset the system during migration.

12. Reboot the system after migration completes by selecting “Yes” when prompted to do so.



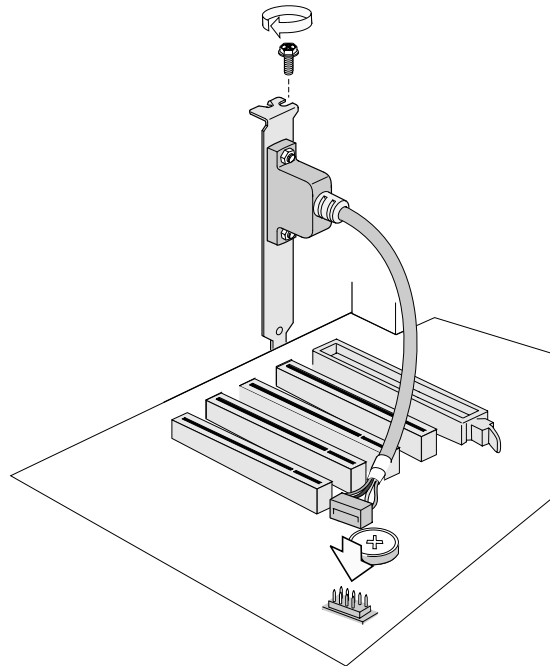
NOTE

If an IDE hard drive is also attached to the system, the RAID volume will need to be moved up in priority in order to boot from it. After the system reboots, press the <F2> key to enter BIOS Setup. Then, navigate to the BOOT menu and select the Hard Disk Drives option. Move the RAID volume to the 1st Drive position. Press <F10> to save the BIOS settings and exit the BIOS Setup program.

9. Installing the Rear Panel USB 2.0 Adapter

Follow these instructions to install the rear panel USB 2.0 adapter, see Figure 8:

1. Observe the precautions in “Before You Begin” on page 3.
2. Attach the cable end with the connector to the USB 2.0 header on the desktop board.
3. Secure the cable’s metal bracket to the chassis back panel with a screw.

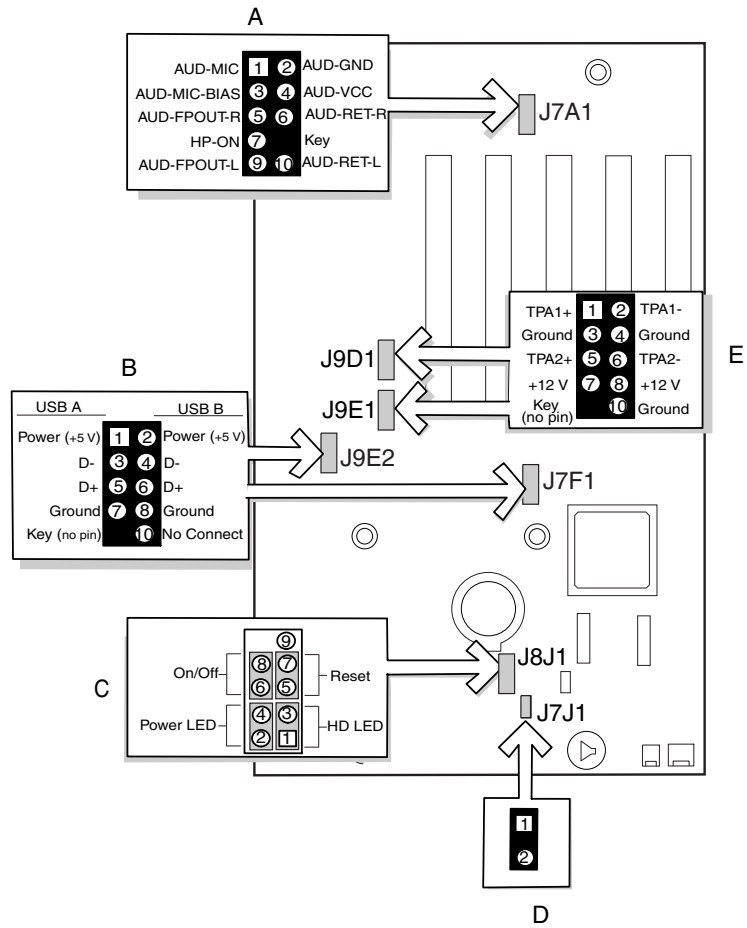


OM15690

Figure 8. Installing the Rear Panel USB 2.0 Adapter

10. Connecting Internal Headers

Figure 9 shows the location of internal headers.



OM15689

Item	Description
A	Front panel audio
B	USB 2.0
C	Front panel
D	Power LED
E	IEEE 1394a (optional)

Figure 9. Internal Headers

Installing a Front Panel Audio Solution

To install the cable that connects the front panel audio solution to the front panel audio header, follow these steps:

1. Observe the precautions in “Before You Begin” on page 3.
2. Turn off all peripheral devices connected to the computer. Turn off the computer and disconnect the AC power cord.
3. Remove the cover.
4. Locate the front panel audio header. Remove the two jumpers from the header to disable the back panel audio connectors.
5. Install a correctly keyed and shielded front panel audio cable.
6. Connect the audio cable to the front panel audio solution.
7. Replace the cover.

To restore back panel operations, follow these steps:

1. Observe the precautions in “Before You Begin” on page 3.
2. Turn off all peripheral devices connected to the computer. Turn off the computer and disconnect the AC power cord.
3. Remove the cover.
4. Remove the front panel audio cable.
5. Install a jumper on pins 5-6 (rear R channel).
6. Install a jumper on pins 9-10 (rear L channel).
7. Replace the cover.

11. Connecting Hardware Control and Power Connectors

Figure 10 shows the location of the hardware control (chassis intrusion and fan) headers and power connectors.

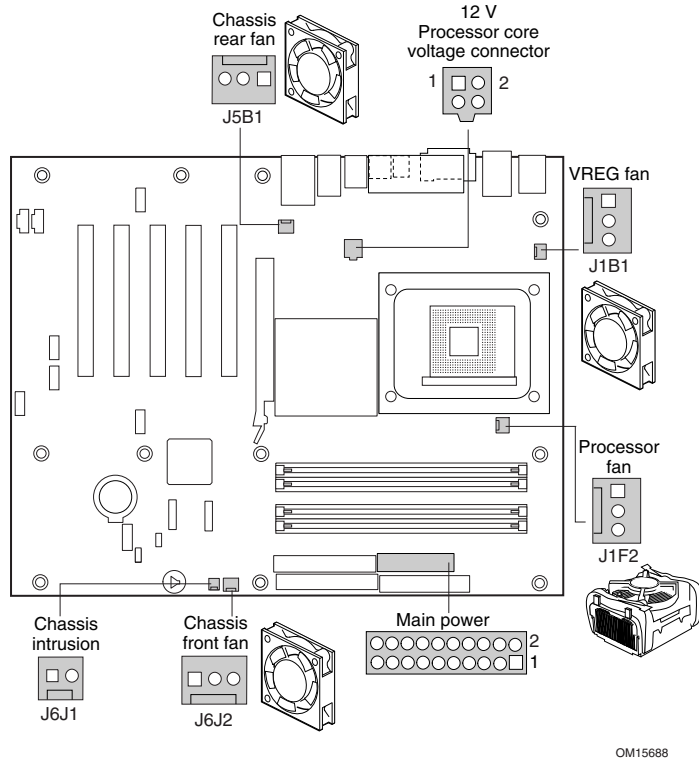


Figure 10. Location of Hardware Control and Power Connectors

Connecting the Chassis Intrusion and Fan Headers

Observe the precautions in “Before You Begin” on page 3. Connect the chassis intrusion, processor’s fan heat sink, and chassis fan cables to their respective headers on the board (see Figure 10).

Connecting Power Cables



CAUTION

Failure to use an ATX12V power supply, or not connecting the 12 V processor core voltage power supply connector to Desktop Board D865PERL may result in damage to the desktop board and/or power supply.

For more information on the ATX12V power supply, refer to the Intel Desktop Board D865PERL Product Guide on the Intel Express Installer CD-ROM.

See Figure 10 for the location of the power connectors.

1. Observe the precautions in “Before You Begin” on page 3.
2. Connect the 12 V processor core voltage power supply cable to the 2x2 connector.
3. Connect the main power cable to the 2x10 connector.

Using the BIOS Setup Program

The BIOS Setup program can be used to view and change the BIOS settings for the computer. The BIOS Setup program is accessed by pressing the <F2> key after the Power-On Self-Test (POST) memory test begins and before the operating system boot begins.

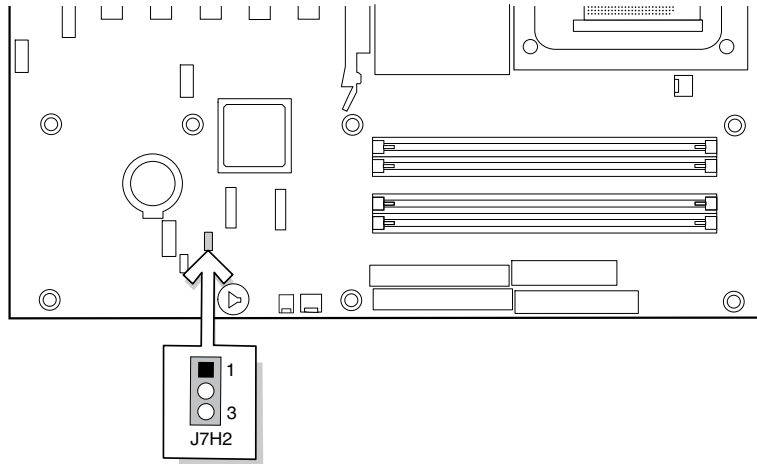
Setting the BIOS Configuration Jumper Block



CAUTION

Always turn off the power and unplug the power cord from the computer before changing the jumper block settings. Moving the jumper with the power on may result in unreliable computer operation.

The BIOS configuration jumper block (see Figure 11) determines the operating mode of the BIOS Setup Program and enables BIOS recovery in the event of a failed BIOS update.






OM15644

Figure 11. Location of the BIOS Configuration Jumper

The following table describes the jumper block settings for the BIOS Setup configuration jumper.

BIOS Setup Configuration Jumper Block Settings

Jumper Setting	Mode	Description
	Normal (default) (1-2)	The BIOS uses the current configuration and passwords for booting.
	Configure (2-3)	After the Power-On Self-Test (POST) runs, the BIOS displays the Maintenance Menu. Use this menu to clear passwords.
	Recovery (None)	The BIOS recovers data from a recovery diskette in the event of a failed BIOS update.*

* To update or recover the BIOS, see the instructions in the Intel Desktop Board D865PERL Product Guide on the Intel Express Installer CD-ROM.

For a complete list of BIOS Setup settings, see:

- The *Intel Desktop Board D865PERL Product Guide* on the Intel Express Installer CD-ROM
- The Intel World Wide Web Site at <http://support.intel.com/support/motherboards/desktop/>

Troubleshooting

Desktop Board D865PERL system fails to boot.

- Ensure that the power supply cable with the 4-pin connector is plugged into the 12 V processor core voltage connector located near the processor socket on the desktop board.
- Remove and re-insert the Intel Pentium 4 processor, memory, and any add-in cards to make sure they are fully seated. Remove any non-essential hardware components and boot the system.
- Disconnect all power and remove the CMOS battery. Wait 10 minutes, then re-install the battery, reconnect power, and boot the system.

A repeating beep error code is heard and the desktop board does not boot or show any video.

This beep code may indicate a problem during detection of the DDR SDRAM memory device. Check to ensure that system memory is properly installed and that the DIMMs meet the Memory Module Requirements listed in the Supported Components section of this document.

Resolving slow boot times with IDE hard drives.

Extended boot time can be the result of IDE drive jumper configuration. For additional information visit

<http://support.intel.com/support/motherboards/desktop/slowboot.htm>

Only 1.5 V or 0.8 V AGP 1X/4X/8X graphics cards are supported.

The AGP connector on this desktop board is keyed for 1.5 V or 0.8 V AGP cards only. The AGP connector is not mechanically compatible with 3.3 V AGP cards. To some, the 1.5 V or 0.8 V AGP connector may appear backwards because the connector key is exactly the opposite of the 3.3 V AGP connector.

Customer Support Links

View or download product support information from Intel's World Wide Web site:

<http://support.intel.com/support/motherboards/desktop/>

Follow the link to your Intel Desktop Board for the following information:

- Known Issues and Solutions
- Software and Drivers (latest BIOS and driver updates)
- Compatibility (supported Intel[®] processors and memory information)
- Product Documentation
 - Technical Product Specification
 - Specification Update
 - Quick Reference Guide

The Intel World Wide Web site also includes telephone numbers for Intel customer support:

- Intel Customer Support World Wide Phone Numbers:
<http://support.intel.com/support/9089.htm>
- Intel Desktop Board Email Support Form:
<http://supportmail.intel.com/scripts-emf/welcome.asp?id=36>

If you can't find the information you need on the Web, contact your point of purchase.