CHAPTER 3

Computer Assembly—Step by Step

Objectives

Upon completion of this chapter, you should be able to answer the following questions:

- How do I open the case?

- What is the process to install the power supply?

- How do I attach the components to the motherboard and install the motherboard?

- How do I install internal drives?

- How do I install drives in external bays?

- How do I install adapter cards?

- What is the process to connect all internal cables?

- How do I reattach the side panels and connect external cables to the computer?

- What happens when I boot the computer for the first time?

Key Terms

This chapter uses the following key terms. You can find the definitions in the Glossary.

Assembling computers is a large part of a technician's job. As a technician, you will need to work in a logical, methodical manner when working with computer components. As with any learned trade, your computer assembly skills will improve dramatically with practice.

Open the Case

Computer cases are produced in a variety of form factors. Form factors refer to the size and shape of the case.

Prepare the workspace before opening the computer case. There should be adequate lighting, good ventilation, and a comfortable room temperature. The workbench or table should be accessible from all sides. Avoid cluttering the surface of the workbench or table with tools and computer components. An antistatic mat on the table will help prevent physical and *electrostatic discharge (ESD)* damage to equipment. Small containers can be used to hold small screws and other parts as they are being removed.

There are different methods for opening cases. To learn how to open a particular computer case, consult the user manual or the manufacturer's website. Most computer cases are opened in one of the following ways:

- The computer case cover can be removed as one piece.

- The top and side panels of the case can be removed.

- The top of the case may need to be removed before the side panels can be removed.

- Tool-less entries allow technicians to enter a case without the use of tools.

Install the Power Supply

A technician may be required to replace or install a power supply, as shown in Figure 3-1. Most *power supplies* can fit into the computer case in only one way. There are usually three or four screws that attach the power supply to the case. Power supplies have fans that can vibrate and loosen screws that are not secured. When installing a power supply, make sure that all of the screws are used and that they are properly tightened.

These are the power supply installation steps:

How To ⌕

Step 1.   Insert the power supply into the case.

Step 2.   Align the holes in the power supply with the holes in the case.

Step 3.   Secure the power supply to the case using the proper screws.
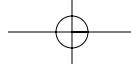
Figure 3-1   Power Supply

Virtual Desktop Activity: Power Supply

Complete the power supply layer in the Virtual Desktop. Refer to the Virtual Desktop software on the CD that comes with this book.

Virtual Desktop Activity: Motherboard

System requirements for the Virtual Desktop include a minimum of 512 MB RAM and Windows 2000 or Windows XP operating system.

Lab 3.2.0: Install the Power Supply
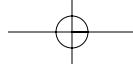
In this lab, you install the power supply in the computer. Refer to the lab in *IT Essentials: PC Hardware and Software Lab Manual, Fourth Edition*. You may perform this lab now or wait until the end of the chapter.

Attach the Components to the Motherboard and Install the Motherboard

This section details the steps to install components on the *motherboard* and then install the motherboard into the computer case.

After completing this section, you will meet these objectives:

- Install a CPU and a heat sink/fan assembly.
- Install the RAM.
- Install the motherboard.

Install a CPU and a Heat Sink/Fan Assembly
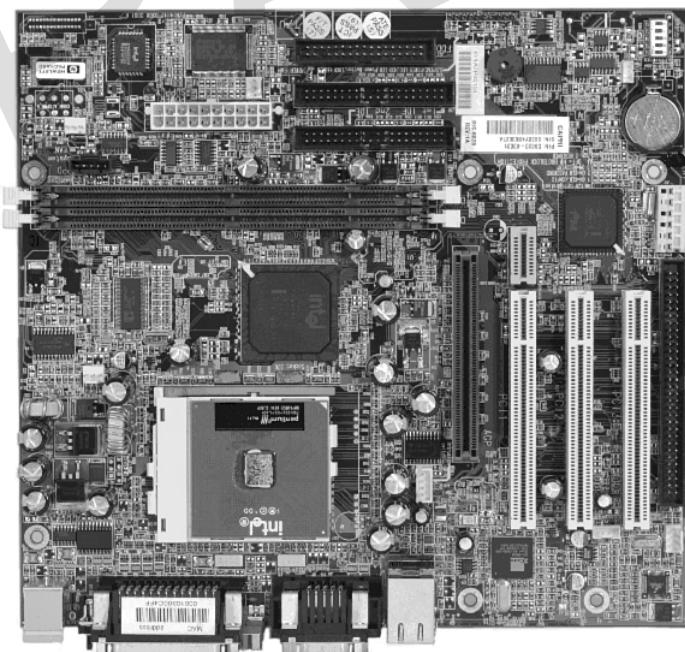
The *central processing unit (CPU)* and the heat sink/fan assembly may be installed on the motherboard before the motherboard is placed in the computer case.
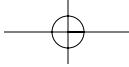
CPU

Figure 3-2 shows a close-up view of the CPU and the motherboard. The CPU and motherboard are sensitive to electrostatic discharge. When handling a CPU and motherboard, make sure that you place them on a grounded antistatic mat. You should wear an antistatic wrist strap while working with these components. Key electrostatic-sensitive components include the following:

- CPUs
- Motherboards
- RAM
- Expansion cards
- Hard disk drive electronics

Figure 3-2 CPU and Motherboard
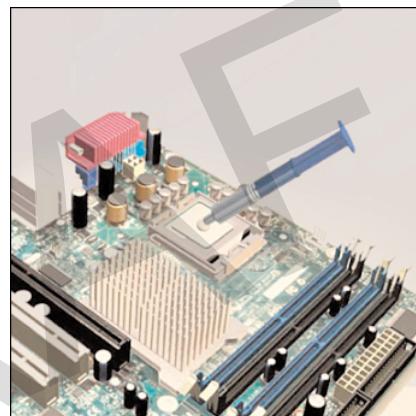
Caution

When handling a CPU, do not touch the CPU contacts at any time.

The CPU is secured to the socket on the motherboard with a locking assembly. The CPU sockets today are *zero insertion force (ZIF) sockets*. You should be familiar with the locking assembly before attempting to install a CPU into the socket on the motherboard. Orient the missing pin in the corner of the CPU to the missing hole on the socket.

Thermal compound helps to conduct heat away from the CPU. Figure 3-3 shows thermal compound being applied to the CPU.

Figure 3-3   Thermal Compound on the CPU
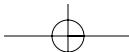
Caution

Silver-oxide thermal compound is toxic. Use rubber gloves and wash your hands thoroughly afterward. It does not take very much compound to fill the space between the CPU and heat sink. If you use too much it will leak onto the motherboard.

When you are installing a used CPU, clean the CPU and the base of the heat sink with *isopropyl alcohol*. Doing this removes all traces of old thermal compound. The surfaces are now ready for a new layer of thermal compound. Follow all manufacturer recommendations about applying the thermal compound.

Heat Sink/Fan Assembly

Figure 3-4 shows the connector and the motherboard header for the *heat sink/fan assembly*. It is a two-part cooling device. The heat sink draws heat away from the CPU. The fan moves the heat away from the heat sink. The heat sink/fan assembly usually has a 3-pin power connector.
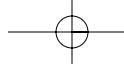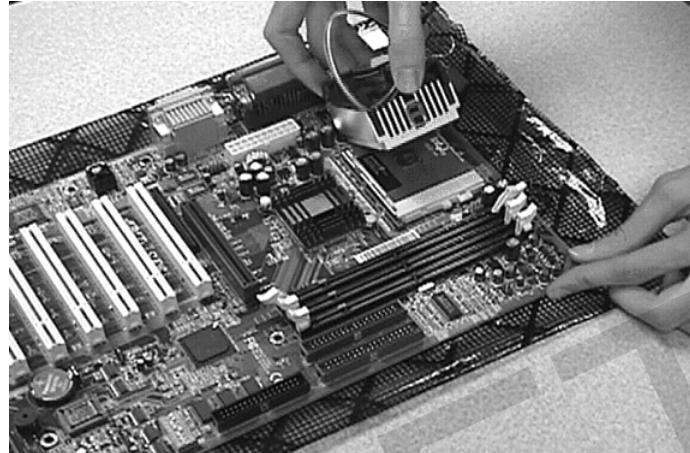
Figure 3-4   Heat Sink/Fan Assembly on the Motherboard
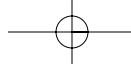
Follow these instructions for CPU and heat sink/fan assembly installation:

How To

Step 1.   Align the CPU so that the Connection 1 indicator is lined up with Pin 1 on the CPU socket. Doing this ensures that the orientation notches on the CPU are aligned with the orientation keys on the CPU socket.

Step 2.   Place the CPU gently into the socket.

Step 3.   Close the CPU load plate and secure it in place by closing the load lever and moving it under the load lever retention tab.

Step 4.   Apply a small amount of thermal compound to the CPU and spread it evenly. Follow the application instructions provided by the manufacturer.

Step 5.   Align the heat sink/fan assembly retainers with the holes on the motherboard.

Step 6.   Place the heat sink/fan assembly onto the CPU socket, being careful not to pinch the CPU fan wires.

Step 7.   Tighten the heat sink/fan assembly retainers to secure the assembly in place.

Step 8.   Connect the heat sink/fan assembly power cable to the header on the motherboard.

Install the RAM

Like the CPU and the heat sink/fan assembly, *random-access memory (RAM)* is installed in the motherboard before the motherboard is secured in the computer case. Before you install a memory module, consult the motherboard documentation or website of the manufacturer to ensure that the RAM is compatible with the motherboard.

RAM provides temporary data storage for the CPU while the computer is operating. RAM is *volatile memory*, which means that its contents are lost when the computer is shut down. Typically, more RAM will enhance the performance of your computer.

Follow these steps for RAM installation:

How To

Step 1.   Align the notches on the RAM module with the keys in the slot and press down until the side tabs click into place.

Step 2.   Make sure that the side tabs have locked the RAM module. Visually check for exposed contacts.

Repeat these steps for additional RAM modules.

Install the Motherboard

The motherboard is now ready to install in the computer case. Plastic and metal standoffs are used to mount the motherboard and to prevent it from touching the metal portions of the case. You should install only the standoffs that align with the holes in the motherboard. Installing any additional standoffs may prevent the motherboard from being seated properly in the computer case.

Follow these steps for motherboard installation:

How To

Step 1.   Install standoffs in the computer case.

Step 2.   Align the I/O connectors on the back of the motherboard with the openings in the back of the case.

Step 3.   Align the screw holes of the motherboard with the standoffs.

Step 4.   Insert all of the motherboard screws.

Step 5.   Tighten all of the motherboard screws.

Virtual Desktop Activity: Motherboard
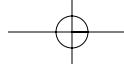
System requirements for the Virtual Desktop include a minimum of 512 MB RAM and Windows 2000 or Windows XP operating system.

Complete the motherboard assembly in the Virtual Desktop motherboard layer. Refer to the Virtual Desktop software on the CD that comes with this book.

Lab 3.3.3: Install the Motherboard

In this lab, you install the CPU, heat sink/fan assembly, RAM, and motherboard. Refer to the lab in *IT Essentials: PC Hardware and Software Lab Manual, Fourth Edition*. You may perform this lab now or wait until the end of the chapter.

Install Internal Drives

Drives that are installed in internal bays are called internal drives. A *hard disk drive (HDD)* is an example of an internal drive.

Follow these steps for HDD installation:

How To

Step 1.   Position the HDD so that it aligns with the 3.5-inch drive bay.

Step 2.   Insert the HDD into the drive bay so that the screw holes in the drive line up with the screw holes in the case.

Step 3.   Secure the HDD to the case using the proper screws.

Virtual Desktop Activity: Internal Drives

System requirements for the Virtual Desktop include a minimum of 512 MB RAM and Windows 2000 or Windows XP operating system.

Complete the hard drive installation in the Virtual Desktop internal drive layer. Refer to the Virtual Desktop software on the CD that comes with this book.

Install Drives in External Bays

Drives, such as *optical drives* and *floppy disk drives (FDD)*, are installed in drive bays that are accessed from the front of the case. Optical drives and FDD store data on removable media. Drives in external bays allow access to the media without opening the case.

After completing this section, you will meet these objectives:

■ Install the optical drive.

■ Install the floppy drive.
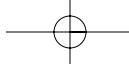
Install the Optical Drive

An optical drive is a storage device that reads and writes information to CDs and DVDs. A *Molex power connector* provides the optical drive with power from the power supply. A PATA cable connects the optical drive to the motherboard. If you use a PATA data connector you might need a berg connector. To provides power to the (FDD), you will need the smaller berg power connector.

Follow these steps for optical drive installation:

How To

Step 1.   Position the optical drive so that it aligns with the 5.25-inch drive bay.

Step 2.   Insert the optical drive into the drive bay so that the optical drive screw holes align with the screw holes in the case.

Step 3.   Secure the optical drive to the case using the proper screws.

If you use screws that are too long, you may damage the drive you are mounting.

Install the Floppy Drive

A floppy disk drive (FDD) is a storage device that reads and writes information to a floppy disk. A *Berg power connector* provides the FDD with power from the power supply. A floppy drive data cable connects the FDD to the motherboard.

A floppy disk drive fits into the 3.5-inch bay on the front of the computer case, as shown in Figure 3-5.

Follow these steps for FDD installation:

How To

Step 1.   Position the FDD so that it aligns with the 3.5-inch drive bay.

Step 2.   Insert the FDD into the drive bay so that the FDD screw holes align with the screw holes in the case.

Step 3.   Secure the FDD to the case using the proper screws.
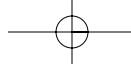
Figure 3-5   Floppy Disk Drive Installed

Virtual Desktop Activity: Drives in External Bays

System requirements for the Virtual Desktop include a minimum of 512 MB RAM and Windows 2000 or Windows XP operating system.

Complete the optical and floppy drive installation in the Virtual Desktop drives in the external bays layer. Refer to the Virtual Desktop software on the CD that comes with this book.

Lab 3.5.2: Install the Drives

In this lab, you install the hard drive, optical drive, and floppy drive. Refer to the lab in *IT Essentials: PC Hardware and Software Lab Manual, Fourth Edition*. You may perform this lab now or wait until the end of the chapter.

Install Adapter Cards

Adapter cards are installed to add functionality to a computer. Adapter cards must be compatible with the expansion slot. This section focuses on the installation of three types of adapter cards:

- PCIe x1 NIC
- PCI wireless NIC
- PCIe x16 video adapter card
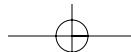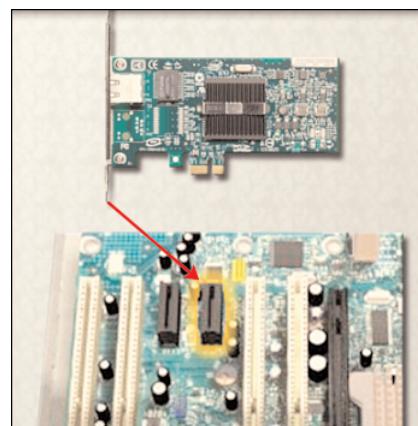
After completing this section, you will meet these objectives:
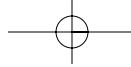
- Install the NIC.
- Install the wireless NIC.
- Install the video adapter card.

Install the NIC

A *network interface card (NIC)* enables a computer to connect to a network. NICs use peripheral component interface (PCI) and PCIe expansion slots on the motherboard, as shown in Figure 3-6.

Figure 3-6   PCIe Network Interface Card

Follow these steps for NIC installation:

How To

Step 1. Remove the blank from the case where the new card will be installed so that the port can be accessed.

Step 2. Align the NIC with the appropriate expansion slot on the motherboard.

Step 3. Press down gently on the NIC until the card is fully seated.

Step 4. Secure the NIC PC mounting bracket to the case with the appropriate screw.

Install the Wireless NIC
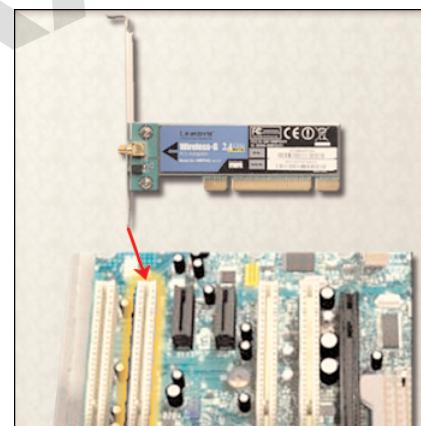
A wireless NIC, as shown in Figure 3-7, enables a computer to connect to a wireless network. Wireless NICs use PCI and PCIe expansion slots on the motherboard. Some wireless NICs are installed externally with a USB connector.

Follow these steps for wireless NIC installation:

How To
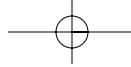
Step 1. Align the wireless NIC with the appropriate expansion slot on the motherboard.

Step 2. Press down gently on the wireless NIC until the card is fully seated.

Step 3. Secure the wireless NIC PC mounting bracket to the case with the appropriate screw.

Figure 3-7 Wireless NIC
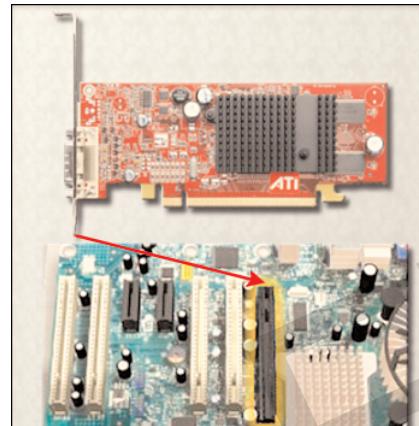

Install the Video Adapter Card

A *video adapter card*, as shown in Figure 3-8, is the interface between a computer and a display monitor. An upgraded video adapter card can provide better graphic capabilities for games and graphic programs. Video adapter cards use PCI, advance graphics port (AGP), and PCIe expansion slots on the motherboard. If the BIOS does not automatically sense the

new video card and disable the integrated one, you may need to do that manually through BIOS settings.

Figure 3-8   Video Adapter Card

Follow these steps for video adapter card installation:

How To

Step 1.   Remove the expansion slot case blank.

Step 2.   Align the video adapter card with the appropriate expansion slot on the mother-board.

Step 3.   Press down gently on the video adapter card until the card is fully seated.

Step 4.   Secure the video adapter card PC mounting bracket to the case with the appro-priate screw.

Virtual Desktop Activity: Adapter Cards
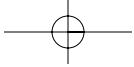
System requirements for the Virtual Desktop include a minimum of 512 MB RAM and Windows 2000 or Windows XP operating system.

Complete the NIC, wireless NIC, and video adapter card installation in the Virtual Desktop adapter card layer. Refer to the Virtual Desktop software on the CD that comes with this book.

Lab 3.6.3: Install Adapter Cards

In this lab, you install the NIC, wireless NIC, and video adapter card. Refer to the lab in *IT Essentials: PC Hardware and Software Lab Manual, Fourth Edition*. You may perform this lab now or wait until the end of the chapter.

Connect All Internal Cables

Power cables are used to distribute electricity from the power supply to the motherboard and other components. Data cables transmit data between the motherboard and storage devices, such as hard drives. Additional cables connect the buttons and link lights on the front of the computer case to the motherboard.

After completing this section, you will meet these objectives:

- Connect the power cables.
- Connect the data cables.

Connect the Power Cables

Power cables are brightly colored bundles of wires that branch out from the power supply. As the name suggests, they provide internal devices with electricity. There are several kinds of power connectors.

Motherboard Power Connections

Just like other components, motherboards require power to operate. The *Advanced Technology Extended (ATX)* main power connector will have either 20 or 24 pins. The power supply may also have a 4-pin or 6-pin Auxiliary (AUX) power connector that connects to the motherboard. A 20-pin connector will work in a motherboard with a 24-pin socket.

Follow these steps for motherboard power cable installation:

How To
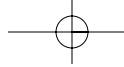
Step 1. Align the 20-pin ATX power connector with the socket on the motherboard.

Step 2. Gently press down on the connector until the clip clicks into place.

Step 3. Align the 4-pin AUX power connector with the socket on the motherboard.

Step 4. Gently press down on the connector until the clip clicks into place.

SATA Power Connectors

SATA power connectors use a 15-pin connector. *Serial advanced technology attachment (SATA) power connectors* are used to connect to hard disk drives, optical drives, or any devices that have a SATA power socket.

Molex Power Connectors

Hard disk drives and optical drives that do not have SATA power sockets use a Molex power connector.

Caution

Do not use a Molex connector and a SATA power connector on the same drive at the same time. It will prevent the drive from working properly.

Berg Power Connectors

The 4-pin Berg power connector supplies power to a floppy drive.

Follow these steps for Berg power connector installation:

How To

Step 1.   Plug the SATA power connector into the HDD.

Step 2.   Plug the Molex power connector into the optical drive.

Step 3.   Plug the 4-pin Berg power connector into the FDD.

Step 4.   Connect the 3-pin fan power connector into the appropriate fan header on the motherboard, according to the motherboard manual.

Step 5.   Plug the additional cables from the case into the appropriate connectors according to the motherboard manual.

Connect the Data Cables

Drives connect to the motherboard using data cables. The drive being connected determines the type of data cable used. The types of data cables are PATA, SATA, and floppy disk.
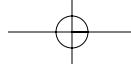
PATA Data Cables

The *parallel advanced technology attachment (PATA) data cable* is sometimes called a ribbon cable because it is wide and flat. The PATA cable can have either 40 or 80 conductors. A PATA cable usually has three 40-pin connectors. One connector at the end of the cable connects to the motherboard. The other two connectors connect to drives. If multiple hard drives are installed, the master drive connects to the end connector. The slave drive connects to the middle connector.

A stripe on the data cable denotes the location of Pin 1. Plug the PATA cable into the drive with the Pin 1 indicator on the cable aligned with the Pin 1 indicator on the drive connector. The Pin 1 indicator on the drive connector is usually closest to the power connector on the drive. Many motherboards have two PATA drive controllers, providing support for a maximum of four PATA drives.

SATA Data Cables

The *SATA data cable* has a 7-pin connector. One end of the cable is connected to the motherboard. The other end is connected to any drive that has a SATA data connector.

Reattach the Side Panels and Connect External Cables to the Computer

Now that all the internal components have been installed and connected to the motherboard and power supply, you need to reattach the side panels to the computer case. The next step is to connect the cables for all computer peripherals and the power cable.

After completing this section, you will meet these objectives:

- Reattach the side panels to the case.
- Connect external cables to the computer.

Reattach the Side Panels to the Case

Most computer cases have two panels, one on each side. Some computer cases have one three-sided cover that slides down over the case frame.

When the cover is in place, make sure that it is secured at all screw locations. Some computer cases use screws that are inserted with a screwdriver. Other cases have knob-type screws that can be tightened by hand. Tool-less cases simply "click" closed.

If you are unsure about how to remove or replace the computer case, refer to the documentation or website of the manufacturer for more information.

Caution
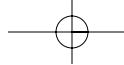
Handle case parts with care. Some computer case covers have sharp or jagged edges.

Connect External Cables to the Computer

After the case panels have been reattached, connect the cables to the back of the computer. Here are some common external cable connections:

- Monitor
- Keyboard
- Mouse
- USB
- Ethernet
- Power

When attaching cables, ensure that they are connected to the correct locations on the computer. For example, some mouse and keyboard cables use the same type of PS/2 connector.

Floppy Drive Data Cables

The floppy drive data cable has a 34-pin connector. Like the PATA data cable, the floppy drive data cable has a stripe to denote the location of Pin 1. A floppy drive cable usually has three 34-pin connectors. One connector at the end of the cable connects to the motherboard. The other two connectors connect to drives. If multiple floppy drives are installed, the A: drive connects to the end connector. The B: drive connects to the middle connector.

Plug the floppy drive data cable into the drive with the Pin 1 indicator on the cable aligned with the Pin 1 indicator on the drive connector. Motherboards have one floppy drive controller, providing support for a maximum of two floppy drives.

Note

If Pin 1 on the floppy drive data cable is not aligned with Pin 1 on the drive connector, the floppy drive does not function. This misalignment does not damage the drive, but the drive activity light displays continuously. To fix this problem, turn off the computer and reconnect the data cable so that Pin 1 on the cable and Pin 1 on the connector are aligned. Reboot the computer.

Follow these steps for data cable installation:

How To

Step 1.   Plug the motherboard end of the PATA cable into the motherboard socket.

Step 2.   Plug the connector at the far end of the PATA cable into the optical drive.

Step 3.   Plug one end of the SATA cable into the motherboard socket.

Step 4.   Plug the other end of the SATA cable into the HDD.

Step 5.   Plug the motherboard end of the FDD cable into the motherboard socket.

Step 6.   Plug the connector at the far end of the FDD cable into the floppy drive.

Step 7.   Double check to make sure all cables are securely connected to the devices and to the motherboard.

Virtual Desktop Activity: Internal Cables
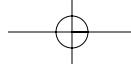
System requirements for the Virtual Desktop include a minimum of 512 MB RAM and Windows 2000 or Windows XP operating system.

Complete the internal cable installation in the Virtual Desktop internal cable layer. Refer to the Virtual Desktop software on the CD that comes with this book.

Lab 3.7.2: Install Internal Cables

In this lab, you install internal power and data cables in the computer. Refer to the lab in *IT Essentials: PC Hardware and Software Lab Manual, Fourth Edition*. You may perform this lab now or wait until the end of the chapter.

Caution

When attaching cables, never force a connection.

Note

Plug in the power cable after you have connected all other cables.

Follow these steps for external cable installation:

How To

Step 1.   Attach the monitor cable to the video port.

Step 2.   Secure the cable by tightening the screws on the connector.

Step 3.   Plug the keyboard cable into the PS/2 keyboard port.

Step 4.   Plug the mouse cable into the PS/2 mouse port.

Step 5.   Plug the USB cable into a USB port.

Step 6.   Plug the network cable into the network port.

Step 7.   Connect the wireless antenna to the antenna connector.

Step 8.   Plug the power cable into the power supply.
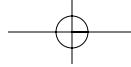
Figure 3-9 shows all of the external cables plugged into the back of the computer.

Figure 3-9   All External Cables Plugged into the Back

Virtual Desktop Activity: External Cables

System requirements for the Virtual Desktop include a minimum of 512 MB RAM and
Windows 2000 or Windows XP operating system.

Complete the external cable installation in the Virtual Desktop external cable layer. Refer to
the Virtual Desktop software on the CD that comes with this book.

Lab 3.8.2: Complete the Computer Assembly

In this lab, you reattach the case and connect the external cables to complete the computer assembly. Refer to the lab in *IT Essentials: PC Hardware and Software Lab Manual, Fourth Edition*. You may perform this lab now or wait until the end of the chapter.

Boot the Computer for the First Time

When the computer is booted, the *basic input/output system (BIOS)* performs a check on all of the internal components, as shown in Figure 3-10. This check is called a power-on self test (POST).

After completing this section, you will meet these objectives:
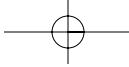
- Identify beep codes.

- Describe BIOS setup.

Figure 3-10   BIOS Setup Screenshot


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Copyright 1996-2002

SWV25.86B.0094.P01.0211111021
SWV2 Production BIOS Version 1.00
BIOS Build 0094

2 X Intel(R) Xeon(TM) CPU 2.00GHz
Testing system memory, memory size=1024MB
1024MB Extended Memory Passed
512K L2 Cache SRAM Passed


USB Legacy ......... Enabled
```

Identify Beep Codes

POST checks to see that all of the hardware in the computer is operating correctly. If a device is malfunctioning, an error or a beep code alerts the technician that there is a problem. Typically, a single beep denotes that the computer is functioning properly. If there is a

hardware problem, the computer might emit a series of beeps. Each BIOS manufacturer uses different codes to indicate hardware problems. Table 3-1 shows a sample chart of *beep codes*. The beep codes for your computer might be different. Consult the motherboard documentation to view beep codes for your computer.

Table 3-1   Sample Beep Codes
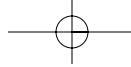
Beep Code	Meaning	Cause
1 beep	Passed POST	Successfully passed POST
2 beeps	Memory parity error	Bad memory
3 beeps	Base 64K memory failure	Bad memory
4 beeps	Timer not operational	Bad motherboard
5 beeps	Processor error	Bad processor
6 beeps	8042 gate A20 failure	Bad CPU or motherboard
7 beeps	Processor exception	Bad processor
8 beeps	Video memory error	Bad video card or memory
9 beeps	ROM checksum error	Bad BIOS
10 beeps	CMOS checksum error	Bad motherboard
11 beeps	Cache memory bad	Bad CPU or motherboard

Describe BIOS Setup

The BIOS contains a setup program used to configure settings for hardware devices. The configuration data is saved to a special memory chip called a *complementary metal-oxide semiconductor (CMOS)*. CMOS is maintained by the battery in the computer. If this battery dies, all BIOS setup configuration data will be lost. If this occurs, replace the battery and reconfigure the BIOS settings.

To enter the BIOS setup program, you must press the proper key or key sequence during POST. Most computers use the Delete key. Your computer might use another key or combination of keys.

Figure 3-11 shows an example of a BIOS setup program.

Figure 3-11   BIOS Setup Program

Here are some common BIOS setup menu options:

- **Main**: System time, date, HDD type, and so forth

- **Advanced**: Infrared port settings, parallel port settings, and so forth

- **Security**: Password settings to setup utility

- **Others**: Low battery alarm, system beep, and so on

- **Boot**: Boot order of the computer

- **Exit**: Setup utility exit

Lab 3.9.2: Boot the Computer

In this lab, you boot the computer and verify BIOS settings. Refer to the lab in *IT Essentials: PC Hardware and Software Lab Manual, Fourth Edition*. You may perform this lab now or wait until the end of the chapter.

Summary

This chapter detailed the steps used to assemble a computer and boot the system for the first time. These are some important points to remember:

- Computer cases come in a variety of sizes and configurations. Many of the computer's components must match the case's form factor.
- The CPU is installed on the motherboard with a heat sink/fan assembly.
- The power supply is installed in the PC.
- RAM is installed in RAM slots found on the motherboard.
- Adapter cards are installed in PCI and PCIe expansion slots found on the motherboard.
- Hard disk drives are installed in 3.5-inch drive bays located inside the case.
- Optical drives are installed in 5.25-inch drive bays that can be accessed from outside the case.
- Floppy drives are installed in 3.5-inch drive bays that can be accessed from outside the case.
- Power supply cables are connected to all drives and the motherboard.
- Internal data cables transfer data to all drives.
- External cables connect peripheral devices to the computer.
- Beep codes signify when hardware malfunctions.
- The BIOS setup program is used to display information about the computer components and allows the user to change system settings.

Summary of Exercises

This is a summary of the Labs, Worksheets, Remote Technician exercises, Class Discussions, Virtual Desktop activities, and Virtual Laptop activities associated with this chapter.

Labs

The following labs cover material from this chapter. Refer to the labs in *IT Essentials: PC Hardware and Software Lab Manual, Fourth Edition*.

Lab 3.2.0: Install the Power Supply

Lab 3.3.3: Install the Motherboard

Lab 3.5.2: Install the Drives

Lab 3.6.3: Install Adapter Cards

Lab 3.7.2: Install Internal Cables

Lab 3.8.2: Complete the Computer Assembly

Lab 3.9.2: Boot the Computer

Virtual Desktop Activities

The following Virtual Desktop activities cover material from this chapter. Refer to the Virtual Desktop software on the CD that comes with this book.

Virtual Desktop Activity: Power Supply

Virtual Desktop Activity: Motherboard

Virtual Desktop Activity: Internal Drives

Virtual Desktop Activity: Drives in External Bays

Virtual Desktop Activity: Adapter Cards

Virtual Desktop Activity: Internal Cables

Virtual Desktop Activity: External Cables

Check Your Understanding

You can find the answers to these questions in the appendix, "Answers to Check Your Understanding Questions."

1. A technician is installing a new power supply in a computer. Which type of power connector should be used to connect to a CD-ROM?

    A. Berg

    B. Mini-Molex

    C. Molex

    D. 20-pin ATX connector

2. A technician is installing a new power supply in a computer. Which type of power connector should be used to connect to an ATX motherboard?

    A. Berg

    B. Mini-Molex

    C. Molex

    D. 20-pin connector

3. When a technician installs a new CPU, what will help maintain even contact and heat distribution between the CPU and heat sink?

   A. Silicon spray

   B. Graphite paste

   C. Glue

   D. Thermal compound

4. When installing a CPU in a ZIF socket, how should the technician align the pins to avoid damage?

   A. Pin 1 is always aligned with the corner opposite the base of the lever.

   B. Pin 1 on the CPU is aligned with Pin 1 on the ZIF socket.

   C. Pin 1 is aligned with the corner closest to the memory.

   D. The removed corner of the CPU is always aligned with the corner opposite Pin 1.

5. A technician is installing additional memory in a computer. How can the technician guarantee that the memory is correctly aligned?

   A. The label on the memory module should always face the CPU.

   B. A notch in the memory module should be aligned with a notch in the slot on the motherboard.

   C. The arrows on the memory module should be aligned with the arrows on the motherboard slot.

   D. All memory and motherboard slots are color-coded, with one red end and one blue end.

6. When mounting a motherboard in a computer case, what does the technician use to prevent the motherboard from touching the bottom of the case?

   A. Standoffs

   B. Ground-fault isolators

   C. Silicon spray

   D. Grounding straps

7. When installing adapter cards in a computer, how should a technician properly secure the card?

   A. Install the card, and attach it to the expansion slot using thermal paste.

   B. Install the card, and attach it to the motherboard using thermal pads.

   C. Install the card, and secure it using metal retaining clips located on the expansion slot.

   D. Install the card, and secure it to the case with a screw. Or, if the case provides plastic or metal clips, use them.

8. Which two connectors are used to connect external peripherals?

  A. EIDE

  B. Molex

  C. PATA

  D. PS/2

  E. USB

DRAFT