Unit 2 Hardware Basics

Text A: Components of Computer Hardware

A personal computer is made up of multiple physical components of computer hardware, upon which can be installed an operating system and a multitude of software to perform the operator's desired functions. ①

Not everybody has exactly the same hardware. But those of you who have a desktop system, like the example shown in Figure 2-1, probably have most of the components shown in that same figure. Those of you with notebook computers probably have most of the same components. Only in your case the components are all integrated into a single book-sized portable unit.

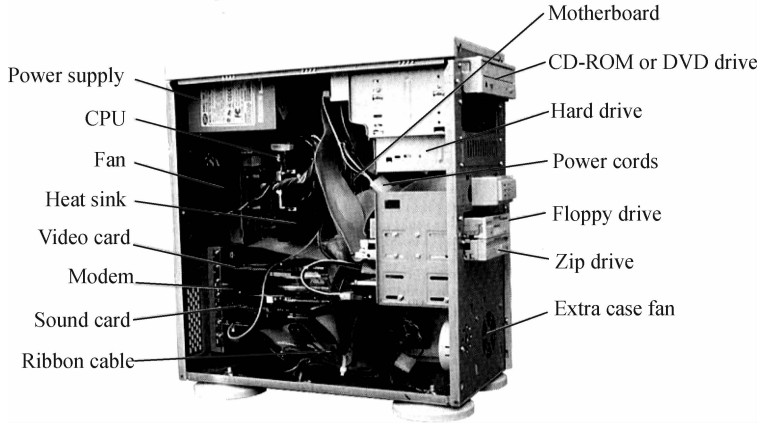


Figure 2-1 Hardware

Generally, computer hardware consists of the following components.

1. Motherboard

The motherboard is the main component inside the case with slots for expansion cards and holding parts.

Components directly attached to the motherboard include:

- central processing unit (CPU).
- computer fan—used to cool down the CPU.
- RAM (Random Access Memory)—stores all running processes (applications) and the current running OS(see Figure 2-2).
- firmware—usually Basic Input-Output System (BIOS) based or in newer systems Extensive Firmware Interface (EFI) compliant.
- Internal Buses connect the CPU to various internal components and to expansion cards for graphics and sound.

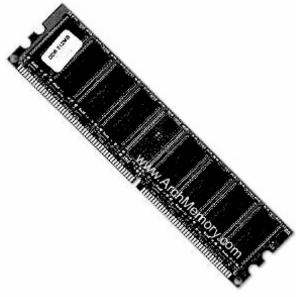


Figure 2-2 RAM

◇Northbridge memory controller, for RAM and PCI Express.

◇PCI, for other expansion cards.

◇SATA, for disk drives.

◇ISA, expansion card slot format obsolete in PCs, but still used in industrial computers.

- External Bus Controllers support ports for external peripherals. These ports may be controlled directly by the southbridge I/O controller or based on expansion cards attached to the motherboard through the PCI bus(see Figure 2-3).

◇USB.

◇FireWire.

◇eSATA.

◇SCSI.

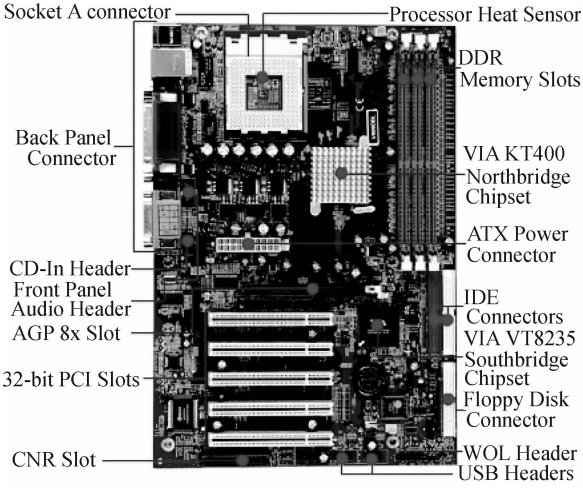


Figure 2-3 Motherboard

2. Power Supply

A power supply unit (PSU) is a case that holds a transformer, voltage control, and (usually) a cooling fan.

3. Video Display Controller

Video display controller produces the output for the computer display. This will either be built into the motherboard or attached in its own separate slot (PCI, or AGP), requiring a graphics card.

A modern video card consists of a printed circuit board on which the components are mounted. ② These include:

◇Graphics processing unit (GPU).

◇Video BIOS.

◇Video memory.

◇RAMDAC.

4. Removable Media Devices

◇CD (compact disc)—the most common type of removable media, suitable for music and data.

◇CD-ROM Drive—a device used for reading data from a CD.

◇CD Writer—a device used for both reading and writing data to and from a CD.

◇DVD (digital versatile disc)—a popular type of removable media that is the same dimensions as a CD but stores up to 12 times as much information as a CD.

◇DVD-ROM Drive—a device used for reading data from a DVD.

◇DVD Writer—a device used for both reading and writing data to and from a DVD.

◇DVD-RAM Drive—a device used for rapid writing and reading data from a special type of DVD.

◇Blu-ray Disc—a high-density optical disc format for data and high-definition video. Can store 70 times as much information as a CD.

◇BD-ROM Drive—a device used for reading data from a Blu-ray disc.

◇BD Writer—a device used for both reading and writing data to and from a Blu-ray disc.

◇HD DVD—a discontinued competitor to the Blu-ray format.

◇Floppy disk—an outdated storage device consisting of a thin disk of a flexible magnetic storage medium. Used today mainly for loading RAID drivers.

◇USB flash drive.

◇Tape drive—a device that reads and writes data on a magnetic tape, used for long-term storage and backups.

5. Secondary Storage

Secondary storage is a kind of hardware that keeps data inside the computer for later use and remains persistent even when the computer has no power.

◇Hard disk—for medium-term storage of data.

◇Solid-state drive—a device similar to hard disk, but containing no moving parts and storing data in a digital format.

6. Sound Card

Sound card enables the computer to output sound to audio devices, as well as accept input from a microphone. Most modern computers have sound cards built-in to the motherboard, though it is common for a user to install a separate sound card as an upgrade. Most sound cards, either built-in or added, have surround sound capabilities.

7. Other Peripherals

In addition, hardware devices can include external components of a computer system. The following are either standard or very common, include various input and output devices, usually external to the computer system(see Figure 2-4).

(1) Input Devices

• Text Input Devices

◇Keyboard—a device to input text and characters by depressing buttons (referred to as keys), similar to a typewriter.

• Pointing Devices

◇Mouse—a pointing device that detects two dimensional motions relative to its supporting surface.

◇Optical mouse—a newer technology that uses light to track the surface under the mouse to determine the motion to be translated into cursor movements on the screen.

◇Trackball—a pointing device consisting of an exposed protruding ball housed in a socket that detects rotation about two axes.

◇Touch screen.

• Gaming Devices

◇Joystick—a general control device that consists of a handheld stick that pivots around one end, to detect angles in two or three dimensions.

◇Gamepad—a general handheld game controller that relies on the digits (especially thumbs) to provide input.

◇Game controller—a specific type of controller specialized for certain gaming purposes.

• Image, Video Input Devices

◇Image scanner—a device that provides input by analyzing images, printed text,

handwriting, or an object.

◇Webcam—a low resolution video camera used to provide visual input that can be easily transferred over the Internet.

• Audio Input Devices

◇Microphone—an acoustic sensor that provides input by converting sound into electrical signals.

(2) Output Devices

An output device is any piece of computer hardware equipment used to communicate the results of data processing carried out by an information processing system (such as a computer) to the outside world.

Examples of output devices:

◇Speaker.

◇Headphones.

◇Screen (Monitor).

◇Printer.

Figure 2-4 Periherals

Words and Expressions

physical components: 物理组件

operating system (OS):操作系统

a multitude of:大量的,众多的

motherboard:*n*. 主板

case:*n*. 机箱

slot:*n*. 插槽

CPU:中央处理器

RAM:随机存取存储器
firmware:*n.* 固件;韧件
Extensive Firmware Interface (EFI):可扩展固件接口
BIOS:基本输入输出系统(Basic Input / Output System)
northbridge:*n.* 北桥(芯片)
southbridge:*n.* 南桥(芯片)
PCI express:串行总线
SATA:串行 ATA 接口
ISA:工业标准结构(Industry Standard Architecture)
external bus:外部总线
port:*n.* 端口
firewire:*n.* 火线
eSATA:外部 SATA 接口
SCSI:小型计算机系统接口
power supply unit:电源
voltage:*n.* 电压
video display:视频显示
graphics card:显示卡
printed circuit board:印刷电路板
graphics processing unit (GPU):图形处理器
video BIOS:视频输入输出系统
video memory:图像存储器
RAMDAC:数模转换器
Video Graphics Array (VGA):视频图形阵列
Digital Visual Interface (DVI):交互式数字影像系统
High-Definition Multimedia Interface (HDMI):高清晰度多媒体接口
Displayport:*n.* 显示端口;显示接口;传输界面
writer:*n.* 刻录机
blu-ray disc:蓝光光碟
hard disk:硬盘
sound card:声卡
peripherals device:外围设备
optical mouse:光电鼠标
trackball:*n.* 轨迹球;追踪球
touch screen:触摸屏
joystick:*n.* 操纵杆,控制杆

gamepad:*n*. 手柄;游戏控制器
image scanner:图像扫描器
webcam:*n*. 网络摄像头

Notes

①A personal computer is made up of multiple physical components of computer hardware, upon which can be installed an operating system and a multitude of software to perform the operator's desired functions.

个人电脑的硬件由许多物理部件组成。操作系统及众多软件都安装在硬件上,以方便使用者实现其操作功能。

②A modern video card consists of a printed circuit board on which the components are mounted.

最新的视频卡由一个印刷电路板组成,上面已安装好了各种组件。

mount 的意思是"安装"。

Exercises

Ⅰ. Decide whether the following statements are true (T) or false (F) in relation to the information in the text:

1. A personal computer is made up of multiple physical components of computer hardware, upon which system software and application software can be installed.

2. The motherboard is the main component outside the case with slots for expansion cards and holding parts.

3. ROM stores all running processes (applications) and the current running OS.

4. Internal Buses support ports for external peripherals.

5. Video display controller, being built into the motherboard only, produces the output for the computer display.

6. DVD Writer is a device used for both reading and writing data to and from a DVD.

7. Secondary storage is a kind of hardware that keeps data persistently inside the computer for later use.

8. Sound card enables the computer to output sound to audio devices, as well as accept input from a mouse.

Ⅱ. Translate the following terms or phrases from English into Chinese and vice versa.

sound card　　hard disk

secondary storage　　output devices
video display　　固件
显卡　　输出设备
个人电脑　　操作系统

Ⅲ. Complete each of the following statements with one of the four choices given below:

1. A personal computer is _____ multiple physical components of computer hardware.

A. consist of　　B. made up of　　C. contain　　D. get up of

2. Only in the case the components are all _____ into a single book-sized portable unit.

A. expressed　　B. included　　C. integrated　　D. held

3. Gamepad is a general handheld game controller that _____ on the digits to provide input.

A. lies　　B. holds　　C. gets　　D. relies

4. A power supply unit (PSU) is a case that holds a transformer, voltage control, and (usually) a _____ fan.

A. heating　　B. cold　　C. cooling　　D. cool

5. Secondary storage is a kind of _____ that keeps data inside the computer.

A. hardware　　B. software　　C. fireware　　D. firmware

Ⅳ. Translate the following sentences into Chinese:

1. Success covers a multitude of blunders.
2. Portable computers sell very well nowadays.
3. There is only outdated news, no outdated methods.
4. She did not carry out her promise to us.
5. Now you should be ready to install a window manager and some programs.

Text B: Optical Readers

An optical reader is a device that uses a light source to read characters, marks and codes and then converts them into digital data that can be processed by a computer.[①] The following sections discuss three types of optical readers: optical character recognition, optical mark recognition, and bar code scanner.

(1) Optical Character Recognition (OCR)

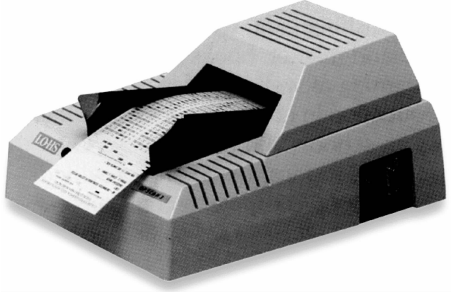
Optical Character Recognition is a technology that involves reading typewritten,

computer-printed, or handwritten characters from ordinary documents and translating the images into a form that the computer can understand. Most OCR devices include a small optical scanner for reading characters and sophisticated software for analyzing what is read. OCR devices range from large machines that can read thousands of documents per minute to handled wands that read one document at a time. ②

OCR software is also used with optical scanners such as flatbed, sheet-fed, and pen scanners. For example, suppose you need to modify a business report, but do not have the original word processing file. You could use a flatbed scanner to scan the document, but you still would not be able to edit the report. The scanner, which does not differentiate between text and graphics, will save the report as a bitmap image, which cannot be edited directly in a word processing program. To convert it into an editable text file that can be edited, you must have optical character recognition (OCR) software that works with the scanner. The resulting output can be stored in a variety of file formats, including those recognized by word processing software.

(2) Optical Mark Recognition (OMR)

Optical Mark Recognition devices read hand-drawn marks such as small circles or rectangles. A person places these marks on a form, such as text, survey, or questionnaire answer sheet. The OMR device first reads a master document, such as an answer key sheet for a test, to record correct answers based on patterns of light; the remaining documents then are passed through the OMR device and patterns of light are matched against the master document.



(3) Bar Code Scanner

Bar code uses laser beams to read bar codes. A bar code scanner is an identification code that consists of a set of vertical lines and spaces of different widths. The bar code, which represents some data that identifies the item, is printed on a product's package or on a label that is affixed to a product so it can be read by a bar code scanner. The bar code scanner uses light patterns from the bar code lines to identify the item.

Words and Expressions

optical reader: 光学阅读器
Optical Character Recognition: 光学字符识别仪
Optical Mark Recognition:光学标记识别仪
Bar Code Scanner:条码扫描仪
form:n. 形式
handled wand:手持条码读入器
flatbed, sheet-fed, and pen scanners:平板扫描仪、输纸扫描仪和笔式扫描仪
bitmap:n. 位图
convert:*vt.* 转换
file format:文件格式
questionnaire: n. 问卷;调查表
master document: 主控文档
vertical line: 垂直线
package: n. 包装
label:n. 标签;商标;签条

Notes

①An optical reader is a device that uses a light source to read characters, marks and codes and then converts them into digital data that can be processed by a computer.

光学阅读器是一种设备,它使用一个光源读入字符标记和代码,然后将其转换为能被计算机处理的数字数据。

这一句话比较复杂。that uses a light...引导一个定语从句,修饰 device,第二个 that 从句"that can be..."也是一个定语从句修饰 data。

②OCR devices range from large machines that can read thousands of documents per minute to handled wands that read one document at a time.

OCR 设备大到每分钟能读入数千个文档的大机器,小到一次只能读入一个文档的手持条码读入器。

range:*vi.* (在……范围内)变动;变化

The prices of leather shoes range from 100 to 250 dollars.

皮鞋的价格从 100 美元到 250 美元不等。

Grammar Focus

一、形容词

形容词修饰名词,说明事物或人的性质或特征。通常,可将形容词分成性质形容词和叙述形容词两类,其位置不一定都放在名词前面。

(1)直接说明事物的性质或特征的形容词是性质形容词,它有级的变化,可以用程度副词修饰,在句中可作定语、表语和补语。例如:hot 热的。

(2)叙述形容词只能作表语,所以又称为表语形容词。这类形容词没有级的变化,也不可用程度副词修饰。大多数以 a 开头的形容词都属于这一类。例如:afraid 害怕的。

(错) He is an ill man.

(对) The man is ill.

(错) She is an afraid girl.

(对) The girl is afraid.

这类词还有: well, unwell, ill, faint, alike, alive, alone, asleep, awake 等。

(3)形容词作定语修饰名词时,要放在名词的前边。但是如果形容词修饰以 -thing 为字尾的词语时,要放在这些词之后,例如: something nice。

(4)大部分形容词加 -ly 可构成副词。但 friendly, deadly, lovely, lonely, likely, lively, ugly, brotherly 仍为形容词。

(5)多个形容词修饰名词时,其顺序为:限定词—数词—描绘词—(大小,长短,形状,新旧,颜色)—出处—材料性质,类别—名词。

a small round table

a tall gray building

a dirty old brown shirt

a famous German medical school

an expensive Japanese sports car

典型例题:

(1) Tony is going camping with _____ boys.

A. little two other　　B. two little other

C. two other little　　D. little other two

答案:C。由“限定词—数词—描绘词—(大小,长短,形状,新旧,颜色)—性质—名词”的公式可知按数词、描绘词、性质依次顺序,只有 C 符合答案。

(2) One day they crossed the _____ bridge behind the palace.

A. old Chinese stone　　B. Chinese old stone

C. old stone Chinese　　D. Chinese stone old

答案:A. 几个形容词修饰一个名词,它们的排列顺序是:年龄,形状,大小 + 颜色 + 来源 + 质地 + 用途 + 国家 + 名词。

(3) ——How was your recent visit to Qingdao?

——It was great. We visited some friends, and spent the _____ days at the seaside.

A. few last sunny　　B. last few sunny

C. last sunny few　　D. few sunny last

答案:B。本题考查多个形容词的排序问题。一般与被修饰形容词关系密切的形容词靠近名词;如果几个形容词的重要性差不多,音节少的形容词在前,音节多的放在后,在不能确定时,可参照下式:

①限定词 + 数量词(序数词在前,基数词在后) + 性状形容词 + 大小、长短、高低等形体。

those + three + beautiful + large + square

②新旧 + 颜色 + 国籍 + 材料 + 名词。

old + brown + wood + table

二、副词

副词主要用来修饰动词、形容词、副词或其他结构。

1. 副词的位置

(1)在动词之前。

(2)在 be 动词、助动词之后。

(3) 多个助动词时,副词一般放在第一个助动词后。

注意:

①大多数方式副词位于句尾,但宾语过长,副词可以提前,以使句子平衡。

We could see very clearly a strange light ahead of us.

②方式副词 well, badly(糟、坏), hard 等只放在句尾。

He speaks English well.

2. 副词的排列顺序

(1)时间,地点副词,小单位在前,大单位在后。

(2)方式副词,短的在前,长的在后,并用 and 或 but 等连词连接。

Please write slowly and carefully.

(3)多个不同副词排列:程度 + 地点 + 方式 + 时间副词。

注意:副词 very 可以修饰形容词,但不能修饰动词。

改错:(错) I very like English.

(对) I like English very much.

注意:副词 enough 要放在形容词的后面,形容词 enough 放在名词前后都可。

I don't know him well enough.

There is enough food for everyone to eat.

There is food enough for everyone to eat.

三、形容词和副词的比较结构

大多数形容词(性质形容词)和副词有比较级和最高级的变化,即原级、比较级和最高级,用来表示事物的等级差别。原级即形容词的原形,比较级和最高级有规则变化和不规则变化两种。

1. 规则变化

单音节词和少数双音节词,加词尾 - er, - est 来构成比较级和最高级。

构 词 法	原级	比较级	最高级
一般单音节词末尾加 - er, - est	tall (高的)	taller	tallest
以不发音的 e 结尾的单音节词和少数以 - le 结尾的双音节词只加 - r, - st	nice	nicer	nicest
以一个辅音字母结尾的闭音节单音节词,双写结尾的辅音字母,再加 - er, - est	big	bigger	biggest
以辅音字母 + y 结尾的双音节词,改 y 为 i,再加 - er, - est	easy	easier	easiest
其他双音节词和多音节词,在前面加 more, most 来构成比较级和最高级	easily	more easily	most easily

2. 不规则变化

这一部分中有许多词,比如 good(好的)/better/best, bad (坏的)/worse/worst 等。请参照任何一部英汉词典后的附录部分,并详记。

3. as + 形容词或副词原级 + as

(1)在否定句或疑问句中可用 so…as。

He cannot run so/as fast as you.

(2)当 as…as 中间有名词时采用以下格式。

as + 形容词 + a + 单数名词

as + many/much +名词

This is as good an example as the other is.

I can carry as much paper as you can.

(3)用表示倍数的词或其他程度副词做修饰语时,放在 as 的前面。

This room is twice as big as that one.

Your room is the same size as mine.

4. 比较级形容词或副词 + than

You are taller than I.

The lights in your room are as bright as those in mine.

注意:

(1)要避免重复使用比较级。

(错) He is more cleverer than his brother.

(对) He is more clever than his brother.

(对) He is cleverer than his brother.

(2)要避免将主语含在比较对象中。

(错) China is larger that any country in Asia.

(对) China is larger than any other countries in Asia.

(3)要注意对应句型,遵循前后一致的原则。

The population of Shanghai is larger than that of Beijing.

It is easier to make a plan than to carry it out.

5. 可修饰比较级的词

a bit, a little, rather, much, far, by far, many, a lot, lots, a great deal, any, still, even 等都可以修饰比较级。以上词(除 by far 外),必须置于比较级形容词或副词的前面。

典型例题:

(1)——Are you feeling _____?

——Yes, I'm fine now.

A. any well　　B. any better

C. quite good　　D. quite better

答案:B. any 可修饰比较级,quite 修饰原级,well 的比较级为 better。

(2)The experiment was _____ easier than we had expected.

A. more　　B. much more

C. much　　D. more much

答案:C. much 可修饰比较级,因此 B,C 都说得通,但 easier 本身已是比较级,不需 more,因此 C 为正确答案。

(3)If there were no examinations, we should have _____ at school.

A. the happiest time　　B. a more happier time

C. much happiest time　　D. a much happier time

答案:D。

6. 和 more 有关的词组

(1) the more…the more…　越……就越……

The harder you work, the greater progress you'll make.

(2) more B than A/less A than B　与其说 A 不如说 B。

He is more lazy than slow at his work.

= He is less slow than lazy at his work.

(3) no more…than…　与……一样……,不比……多。

The officials could see no more than the Emperor.

no less…than…　与……一样……

He is no less diligent than you.

(4) more than　不只是,非常。

She is more than kind to us all.

典型例题:

(1) The weather in China is different from _____.

A. in America　　B. one in America

C. America　　D. that in America

答案:D. 本题意为"中国的天气比美国热"。比较的是天气而不是国家,C 不能选。A 没有名词,后句成分不全,排除。B 和 D 中,B 中的 one 常用来代替可数名词,而 that 可以代替不可数或抽象名词,所以选 D。

(2) After the new technique was introduced, the factory produced _____ tractors in 1988 as the year before.

A. as twice many　　B. as many twice

C. twice as many　　D. twice many as

答案:C. 此句意为"这个厂 1988 能生产的拖拉机是往年的两倍"。表示倍数用"倍数 + as + 形容词原形 + as + 比较对象"的句型。所以此句答案为 C。

This ruler is three times as long as that one.