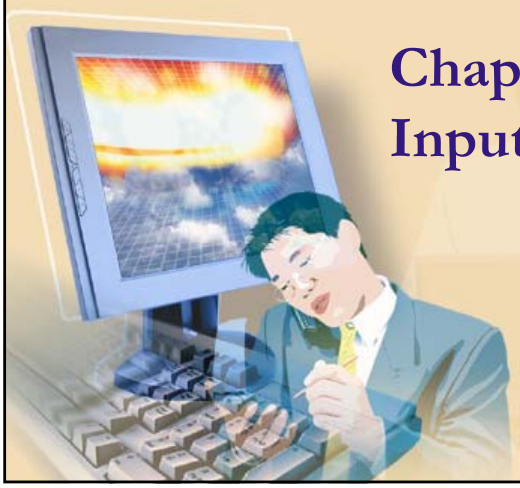
Discovering Computers 2005
A Gateway to Information



Chapter 5
Input

Chapter 5 Objectives

- Define input
- List characteristics of a keyboard
- Describe different mouse types and how they work
- Summarize how pointing devices work
- Explain how voice recognition works
- Describe various input devices for PDAs, Tablet PCs, and smart phones
- Explain how a digital camera works
- Describe uses of PC video cameras, Web cams, and video conferencing
- Discuss various scanners and reading devices and how they work
- Explain the types of terminal
- Summarize the various biometric devices
- Identify alternative input devices for physically challenged users

Next

What Is Input?

What is input?

- **Data or instructions entered into memory of computer**
- **Input device is any hardware component used to enter data or instructions**

p. 230 and 232 Fig. 5-1

Next

What Is Input?

What are the two types of input?

- **Data**
  - Unprocessed text, numbers, images, audio, and video
- **Instructions**
  - Programs
  - Commands
  - User responses

p. 230 Fig. 5-2

Next

The Keyboard

How is the keyboard divided?

- **Typing area**
- **Numeric keypad**
- **Function keys, special keys that issue commands**

p. 232 Fig. 5-3

Next

The Keyboard

What are alternative forms for commands?

- **Many programs allow you to use key combination, menu, or button to obtain same result**

MICROSOFT WORD KEY COMBINATION EQUIVALENTS

Command	Key Combination	Menu | Command	Button
Copy	Shift+F2 or Ctrl+C	Edit | Copy	
Open	Ctrl+F12	File | Open	
Paste	Ctrl+V	Edit | Paste	

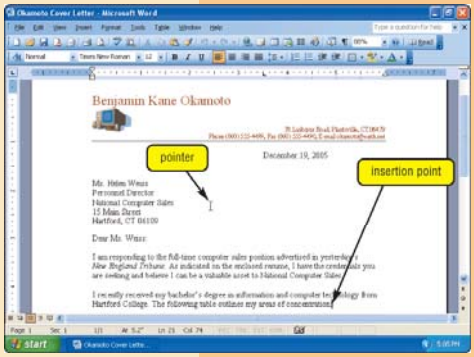
p. 233 Fig. 5-4

Next

The Keyboard

What is the insertion point?

- **Blinking vertical bar that indicates where next character you type will display**
- **Pointer changes location and shape as you move mouse or other pointing device**



p. 233 Fig. 5-5

Next

The Keyboard

What is a cordless keyboard?

- **Communicate with a receiver attached to a port on the system unit**

p. 234 Fig. 5-6

Next

The Keyboard

What are other types of keyboards?

- **Notebook and many handheld computers have built-in keyboards**

p. 234 Fig. 5-7

Next

Pointing Devices

What is a mouse?

- **Pointing device that fits under palm of hand**
  - **Pointing device** controls movement of pointer, also called mouse pointer
- Mechanical mouse **has rubber or metal ball on underside**

Click to view Web Link, click Chapter 5, Click Web Link from left navigation, then click Mouse below Chapter 5

p. 235 Fig. 5-8

Next

Pointing Devices

What is an optical mouse?

- No moving mechanical parts inside
- Senses light to detect mouse's movement
- More precise than mechanical mouse
- Connects using a cable, or wireless

p. 235 Fig. 5-9

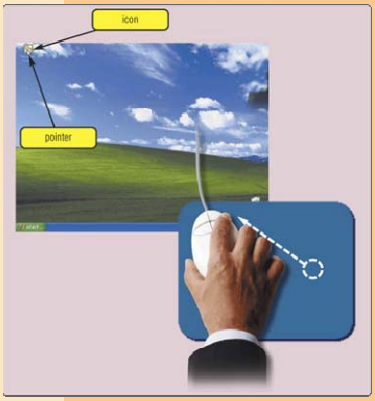
Next

Pointing Devices

How do you use a mouse?

- As you move mouse, pointer on screen moves

Step 1. Place the mouse toward the right of the mouse pad.



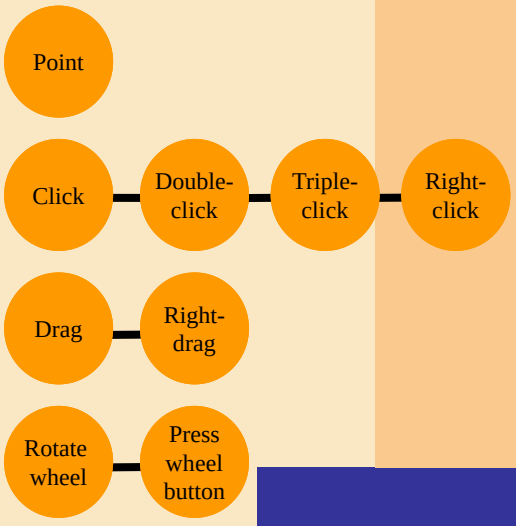
Step 2. Move the mouse diagonally toward the left until the pointer is positioned on the Microsoft Outlook icon.

p. 236 Fig. 5-10

Next

Pointing Devices

What are common mouse operations?



p. 237

Next

Other Pointing Devices

What is a trackball?

- **Stationary pointing device with a ball on its top**
- **To move pointer, rotate ball with thumb, fingers, or palm of hand**

p. 238 Fig. 5-12

Next

Other Pointing Devices

What are a touchpad and a pointing stick?

- **Touchpad is small, flat, rectangular pointing device sensitive to pressure and motion**
- **Pointing stick is pointing device shaped like pencil eraser positioned between keys on keyboard**

Click to view Web Link, click Chapter 5, Click Web Link from left navigation, then click Touchpad and Pointing Stick below Chapter 5

p. 238 Figs. 5-13—5-14

Next

Other Pointing Devices

What are a joystick and a wheel?

- **Joystick is vertical lever mounted on a base**
- **Wheel is steering-wheel-type input device**
  - Pedal simulates car brakes and accelerator

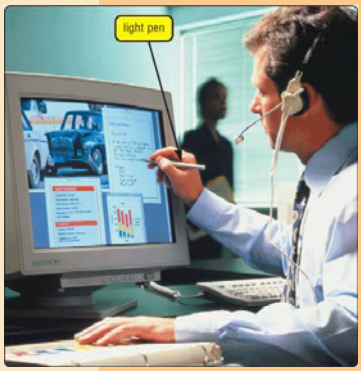
p. 239 Fig. 5-15

Next

Other Pointing Devices

What is a light pen?

- **Handheld input device that can detect light**
  - Press light pen against screen surface and then press button on pen



p. 239 Fig. 5-16

Next

Other Pointing Devices

What is a touch screen?

- **Touch areas of screen with finger**
- **Often used with kiosks**

Click to view Web Link, click Chapter 5, Click Web Link from left navigation, then click Touch Screen below Chapter 5

p. 240 Fig. 5-17

Next

Other Pointing Devices

What is a stylus?

- **Looks like a ballpoint pen, but uses pressure to write text and draw lines**
- **Used with graphics tablets, flat electronic boards**

Click to view Web Link, click Chapter 5, Click Web Link from left navigation, then click Stylus and Pen below Chapter 5

p. 240 Fig. 5-18

Next

Other Pointing Devices

Where is a stylus used?

- **Some desktop computers**
- **Many mobile computers and devices**
  - Handwriting recognition software translates handwriting into characters that computer can process

p. 240 Fig. 5-19

Next

Voice Input

How does voice recognition work?

Step 1. A user dictates text into a microphone.

Step 2. An analog-to-digital converter (ADC) translates sound waves into digital measurements computer can process. Measurements include pitch, volume, silences, and phonemes. Phonemes are sound units such as *aw* and *guh*.

ADC

10010111010110101100001101

Step 3. Software compares spoken measurements with those in its database to find a match or list of possible matches.

Matches

your, you're

right, write

Step 4. To narrow a list down, software presents user with a list of choices or uses a natural language component to predict most likely match. User may correct any selection made by software.

Natural Language Engine

Click to view Web Link, click Chapter 5, Click Web Link from left navigation, then click Voice Input below Chapter 5

p. 242 Fig. 5-20

Next

Voice Input

What is a MIDI (musical instrument digital interface)?

- **External device, such as electronic piano keyboard, to input music and sound effects**

p. 243 Fig. 5-21

Next

PDAs, Tablet PCs, and Smart Phones

How is a data entered into a PDA?

p. 244 Fig. 5-22

Next

PDAs, Tablet PCs, and Smart Phones

What is a portable keyboard?

- **Full-sized keyboard you conveniently attach to and remove from PDA**

p. 245 Fig. 5-23

Next

PDAs, Tablet PCs, and Smart Phones

What is a docking station?

- **External device that holds mobile computer**
- **Provides connections to peripherals**

p. 245 Fig. 5-24

Next

PDAs, Tablet PCs, and Smart Phones

What is a smart phone?

- **Users can input and send text messages, graphics, pictures, video clips, and sound files**
- **Many have a built-in or attachable camera**

p. 246 Fig. 5-25

Next

Digital Cameras

What is a digital camera?

- **Allows you to take digital pictures**
- **Images viewable immediately on camera**
  - Download to computer
  - Post pictures to Web

p. 247 Fig. 5-26

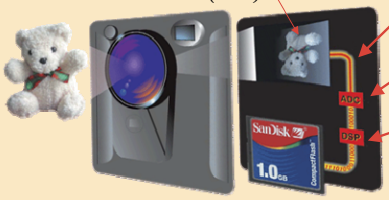
Next

Digital Cameras

How does a digital camera work?

Step 1. Point to the image to photograph and take picture. Light passes into the lens of the camera.

Step 2. Image is focused on a chip called a *charge-coupled device (CCD)*.



Step 3. CCD generates an analog signal that represents the image.

Step 4. Analog signal is converted to digital signal by analog-to-digital converter (ADC).

Step 5. Digital signal processor (DSP) adjusts quality of image and usually stores digital image on miniature mobile storage media in the camera.

Step 6. Images are transferred to a computer's hard disk by plugging one end of the cable into a camera and the other end into a computer; or images are copied to hard disk from storage media used in the camera.

Step 7. Using software supplied with the camera, images are viewed on screen, incorporated into documents, edited, and printed.

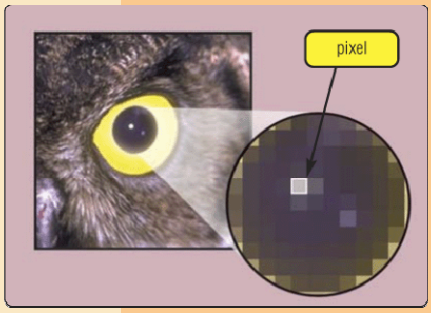
p. 248 Fig. 5-27

Next

Digital Cameras

What is resolution?

- **Sharpness and clarity of image**
- **The higher the resolution, the better the image quality, but the more expensive the camera**
- **Pixel (picture element) is single point in electronic image**
  - Greater the number of pixels, the better the image quality



p. 249 Fig. 5-28

Next

Video Input

What is video input?

- **Process of entering full-motion images into computer**
- **Video capture card is adapter card that converts analog video signal into digital signal that computer can use**
- **Digital video (DV) camera records video as digital signals**

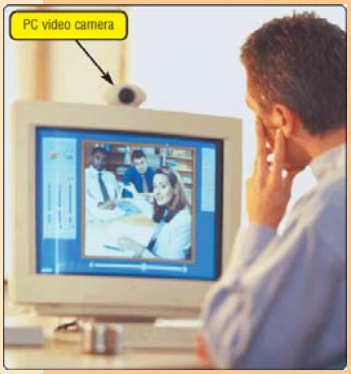
p. 250 Fig. 5-29

Next

Video Input

What are a PC video camera and a Web cam?

- **PC video camera—DV camera used to capture video and still images, and to make video telephone calls on Internet**
  - Also called PC camera
- **Web cam—video camera whose output displays on a Web page**



Click to view video

Click to view Web Link, click Chapter 5, Click Web Link from left navigation, then click PC Video Cameras below Chapter 5

p. 250 Fig. 5-30

Next

Video Input

What is video conferencing?

- **Two or more geographically separated people who use network on Internet to transmit audio and video data**
  - Whiteboard is another window on screen that can display notes and drawings simultaneously on all participants' screens

p. 251 Fig. 5-31

Next

Scanners and Reading Devices

What is a scanner?

- **Light-sensing device that reads printed text and graphics**
  - Used for image processing, converting paper documents into electronic images

Click to view animation

Click to view Web Link, click Chapter 5, Click Web Link from left navigation, then click Scanner below Chapter 5

p. 252 Fig. 5-32

Flatbed

Pen or Handheld

Sheet-fed

Drum

Next

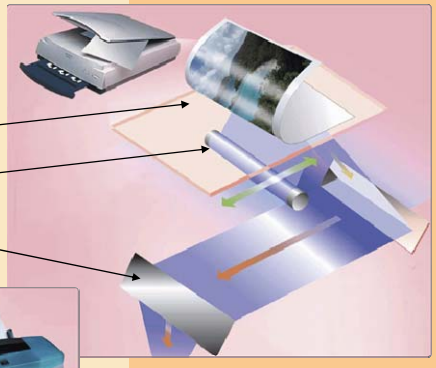
Scanners and Reading Devices

How does a flatbed scanner work?

Step 1. Document to be scanned is placed face down on the glass window.

Step 2. Bright light moves underneath scanned document.

Step 3. Image of the document is reflected into a series of mirrors.



Step 4. Light is converted to analog electrical current that is converted to digital signal by an analog-to-digital converter (ADC).

Step 5. Digital information is sent to memory in the computer to be used by illustration, desktop publishing, or other software; or it is stored on disk.

Step 6. Users can print image, e-mail it, include it in a document, or place it on a Web page.

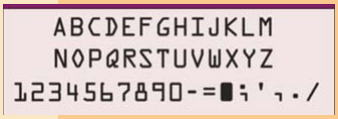
p. 253 Fig. 5-33

Next

Scanners and Reading Devices

What is an optical reader?

- **Device that uses light source to read characters, marks, and codes and then converts them into digital data**
  - **O**ptical **c**haracter **r**ecognition **(OCR)** reads characters in OCR font
  - **O**ptical **m**ark **r**ecognition **(OMR)** reads hand-drawn pencil marks, such as small circles
  - Bar code scanner



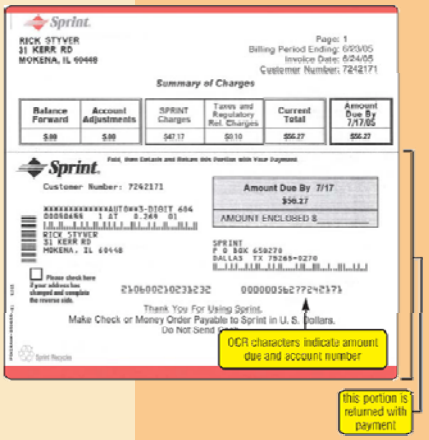
p. 254 Fig. 5-34

Next

Scanners and Reading Devices

What is a turnaround document?

- **Document that you return to the company that sent it**
  - Portion you return has information printed in OCR characters



p. 255 Fig. 5-35

Next

Scanners and Reading Devices

What is a bar code reader?

- **Uses laser beams to read bar codes**

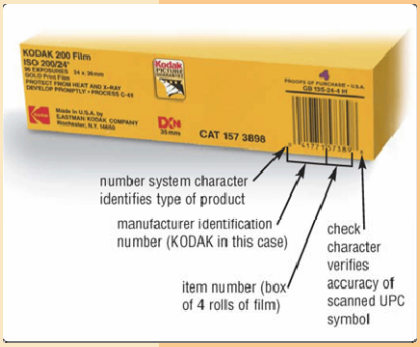
p. 255 Fig. 5-36

Next

Scanners and Reading Devices

What is a bar code?

- **Identification code that consists of a set of vertical lines and spaces of different widths**
- **Universal Product Code (UPC)**



p. 255 Fig. 5-37

Next

Scanners and Reading Devices

What are some widely used bar codes?

Bar Code Name/Sample	Primary Market	Bar Code Name/Sample	Primary Market
Codabar	Libraries, blood banks, and air parcel carriers	Interleaved 2 of 5	Nonretail applications, such as game tickets, requiring only numbers in the bar code
Code 39	Nonretail applications such as manufacturing, inventory, military, and health applications requiring numbers and letters in the bar code	POSTNET® – Postal Numeric Encoding Technique	United States Postal Service (USPS), used to represent a postal code or delivery point code
EAN – European Article Numbering	Similar to UPC, only used internationally except U.S. and Canada; variation of EAN is used for bar codes on books	UPC – Universal Product Code	Supermarkets, convenience, and specialty stores use to identify manufacturers and products

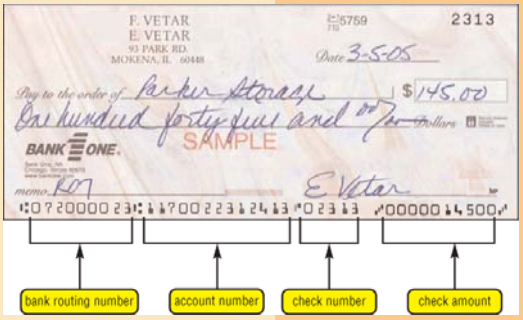
p. 256 Fig. 5-38

Next

Scanners and Reading Devices

What is a magnetic-ink character recognition (MICR) reader?

- Can read text printed with magnetized ink
- Banking industry almost exclusively uses MICR for check processing



p. 257 Fig. 5-39

Next

Scanners and Reading Devices

What is a data collection device?

- **Obtains data directly at location where transaction or event takes place**
- **Transmits data over network or Internet**

p. 257 Fig. 5-40

Next

Terminals

What is a point of sale (POS) terminal?

- **Records purchases, processes credit or debit cards, and updates inventory**
  - Swipe credit or debit card through **card reader**—reads customer's personal data from magnetic strip

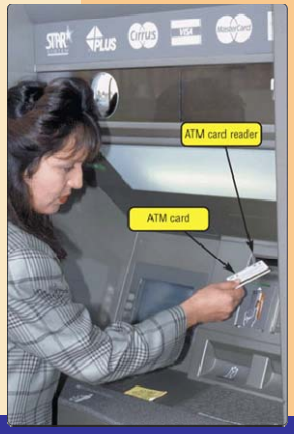
p. 258 Fig. 5-41

Next

Terminals

What is an automated teller machine (ATM)?

- **Self-service banking machine that connects to a host computer through a network**



p. 259 Fig. 5-42

Next

Terminals

What is a smart display?

- **Thin monitor that detaches from computer to function as portable wireless touch screen**

p. 259 Fig. 5-43

Next

Biometric Input

What is biometrics?

- **Authenticates person's identity by verifying personal characteristic**
  - **Fingerprint scanner** captures curves and indentations of fingerprint
  - Hand geometry system measures shape and size of person's hand

Click to view video

Click to view Web Link, click Chapter 5, Click Web Link from left navigation, then click Biometric Input below Chapter 5

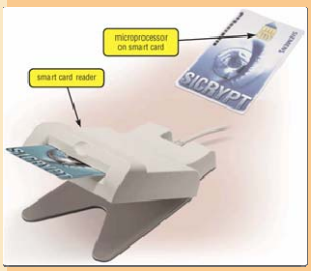
p. 260 Fig. 5-45

Next

Biometric Input

What are examples of biometric technology?

- **Voice verification system compares live speech with stored voice pattern**
- **Signature verification system recognizes shape of signature**
- **Iris recognition system reads patterns in blood vessels in back of eye**
  - Biometric data is sometimes stored on **smart card**, which stores personal data on microprocessor embedded in card



p. 261 Figs. 5-46—5-47

Next

Putting It All Together

What are recommended input devices for home users?

Home

- Enhanced keyboard or ergonomic keyboard
- Mouse
- Stylus for PDA
- Joystick or wheel
- 30-bit 600 × 1200 ppi color scanner
- 1- or 2-megapixel digital camera
- Headset that includes a microphone
- PC video camera
- Smart display

p. 262 Fig. 5-48

Next

Putting It All Together

What are recommended input devices for small office/home office users (SOHO)?

Small Office/ Home Office (SOHO)

- Enhanced keyboard or ergonomic keyboard
- Mouse
- Stylus and portable keyboard for PDA or **digital pen** for Tablet PC
- 36-bit 600 × 1200 ppi color scanner
- 1- or 2-megapixel digital camera
- Headset that includes a microphone
- PC video camera

p. 262 Fig. 5-48

Next

Putting It All Together

What are recommended input devices for mobile users?

Mobile

- Wireless mouse for notebook computer
- Trackball, touchpad, or pointing stick on notebook computer
- Stylus and portable keyboard for PDA or digital pen for Tablet PC
- 2- or 3-megapixel digital camera
- Headset that includes a microphone
- Fingerprint scanner for notebook computer

p. 262 Fig. 5-48

Next

Putting It All Together

What are recommended input devices for large business users?

Large Business

- Enhanced keyboard or ergonomic keyboard
- Mouse
- Stylus and portable keyboard for PDA or digital pen for Tablet PC
- Touch screen
- Light pen
- 42-bit 1200 × 1200 ppi color scanner
- OCR/OMR readers, bar code scanners, MICR reader, or data collection devices
- Microphone
- Video camera for video conferences
- Fingerprint scanner or other biometric device

p. 262 Fig. 5-48

Next

Putting It All Together

What are recommended input devices for power users?

Power

- Enhanced keyboard or ergonomic keyboard
- Mouse
- Stylus and portable keyboard for PDA
- Pen for graphics tablet
- 48-bit 1200 × 1200 ppi color scanner
- 5- or 6-megapixel digital camera
- Headset that includes a microphone
- PC video camera

p. 262 Fig. 5-48

Next

Input Devices for Physically Challenged Users

What input devices are available for those with physical limitations?

- Keyguard allows users to rest hands on keyboard without accidentally pressing keys
- Head-mounted pointer controls pointer on screen
- New developments include gesture recognition and computerized implant devices

p. 263 Figs. 5-49—5-50

Next

Summary of Input

- Keyboard, mouse, and other pointing devices
- Voice input
- Input devices for PDAs, Tablet PCs, and smart phones
- Digital cameras
- Video Input
- Scanners and reading devices
- Terminals
- Biometric input
- Input devices for physically challenged users

Chapter 5 Complete