

Input

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



What Is Input?

What are the two types of input?

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



The Keyboard

How is the keyboard divided?

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



The Keyboard

What are alternative forms for commands?

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

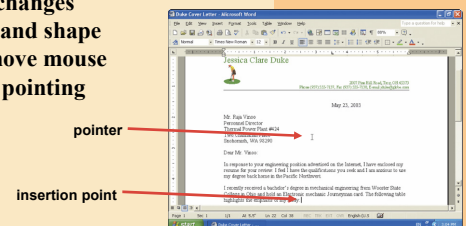
MICROSOFT WORD KEY COMBINATION EQUIVALENTS

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

The Keyboard

What is the **insertion point**?

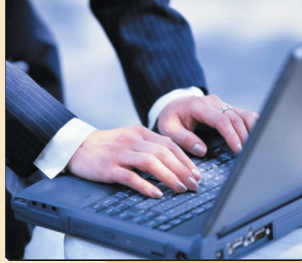
- Blinking vertical bar that indicates where next character you type will display
- **Pointer** changes location and shape as you move mouse or other pointing device



The Keyboard

What are other types of keyboards?

- **Cordless keyboard** is battery-powered and transmits data using wireless technology
- Notebook and many handheld computers have built-in keyboards



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The Keyboard

What is an ergonomic keyboard?

- Designed to minimize strain on hands and wrists
 - **Ergonomics** incorporates comfort, efficiency, and safety into design of items in workplace

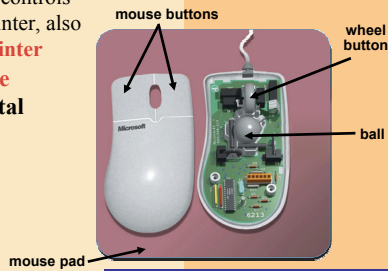


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Mouse

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



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Mouse

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

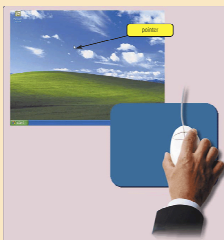


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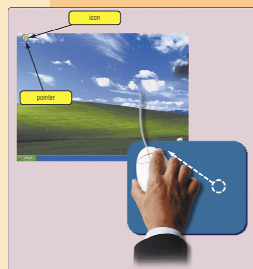
Mouse

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.

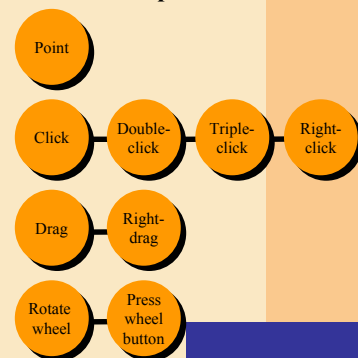


Step 2. Move the mouse diagonally toward the left until the pointer is positioned on the Microsoft Outlook icon.

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Other Pointing Devices

What are common mouse operations?



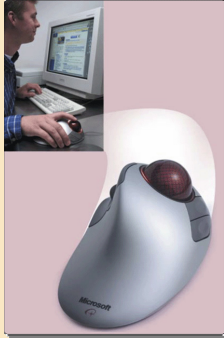
p. 5.09

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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. 5.10 Fig. 5-12

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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



p. 5.10 Figs. 5-13–5-14

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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



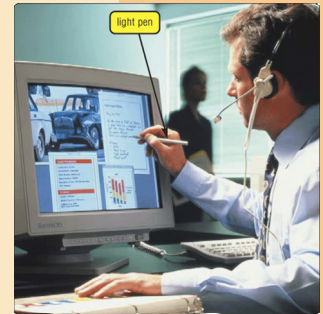
p. 5.11 Fig. 5-15

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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



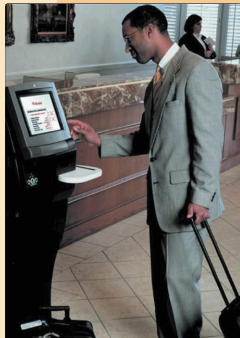
p. 5.15 Fig. 5-16

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Other Pointing Devices

What is a **touch screen**?

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



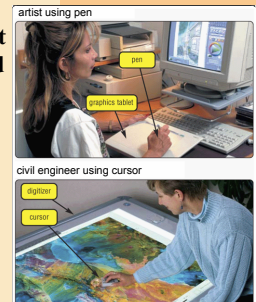
p. 5.12 Fig. 5-17

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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
 - **Electronic signature**—legal signature created using special software, stylus, and graphics tablet



p. 5.12 Fig. 5-18

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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

Pen for computer monitor



Digital pen for Tablet PC



Stylus for PDA

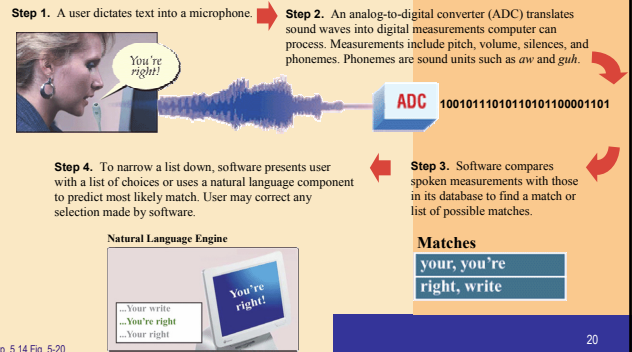


p. 5.12 Fig. 5-19

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Voice Input

How does voice recognition work?



p. 5.14 Fig. 5-20

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Voice Input

What is a **MIDI** (musical instrument digital interface)?

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



p. 5.15 Fig. 5-21

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Input Devices for Mobile Users

How is a data entered into a PDA?



p. 5.16 Fig. 5-22

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Input Devices for Mobile Users

What is a **portable keyboard**?

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



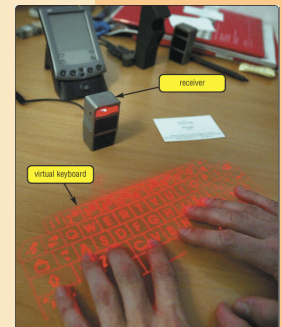
p. 5.17 Fig. 5-23

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Input Devices for Mobile Users

What is a **virtual keyboard**?

- Projects infrared image of keyboard onto any flat surface



p. 5.17 Fig. 5-24

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Input Devices for Mobile Users

What is a **docking station**?

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



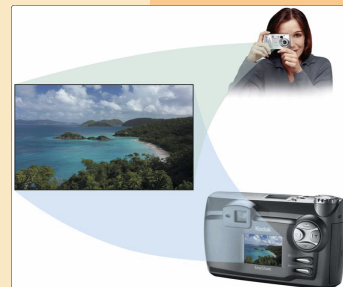
p. 5.18 Fig. 5-25

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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. 5.19 Fig. 5-26

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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)**.

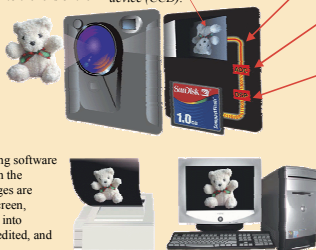
Step 3. CCD generates an analog signal that represents the image.

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.



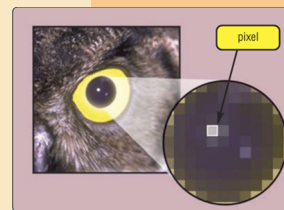
p. 5.20 Fig. 5-27

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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. 5.21 Fig. 5-28

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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



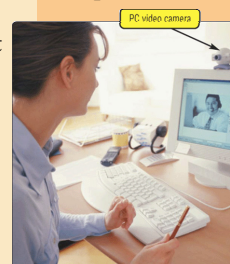
p. 5.22 Fig. 5-29

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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



p. 5.22 Fig. 5-30

30

Video Input

What is **videoconferencing**?

- 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. 5.23 Fig. 5-31

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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



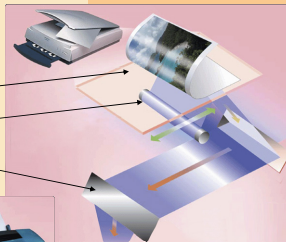
p. 5.24 Fig. 5-32

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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 in 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. 5.25 Fig. 5-33

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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
 - **Optical character recognition (OCR)** reads characters in OCR font
 - **Optical mark recognition (OMR)** reads hand-drawn pencil marks, such as small circles
 - Bar code scanner

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ABCDEFGHIJKLM
NOPQRSTUVWXYZ
1234567890- = ! ; ' , . /
    
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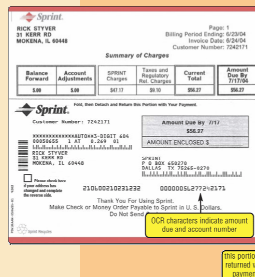
p. 5.26 Fig. 5-34

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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. 5.27 Fig. 5-35

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Scanners and Reading Devices

What is a **bar code scanner**?

- Uses laser beams to read bar codes



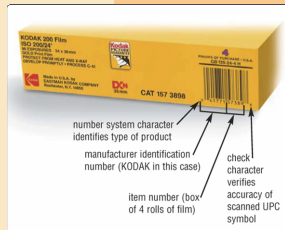
p. 5.27 Fig. 5-36

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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. 5.27 Fig. 5-37

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Scanners and Reading Devices

What are some widely used bar codes?

Bar Code Name/Sample	Primary Market	Bar Code Name/Sample	Primary Market
Codabar  A 1 2 3 4 5 6 7 8 9 0 1 2 A	Libraries, blood banks, and air parcel carriers	Interleaved 2 of 5  1 2 3 4 5 6 7 8 9 0 1 2	Nonretail applications, such as game tickets, requiring only numbers in the bar code
Code 39  C 0 0 0 E 3 0	Nonretail applications such as manufacturing, inventory, military, and health applications requiring numbers and letters in the bar code	POSTNET™ – Postal Numeric Encoding Technique  H J J J J J J J J J J J J J J J	United States Postal Service (USPS), used to represent a postal code or delivery point code
EAN – European Article Numbering  1 2 3 4 5 6 7 8 9 0 1 2 0	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  0 1 2 3 4 5 6 7 8 9 0 1 2 0	Supermarkets, convenience, and specialty stores use to identify manufacturers and products

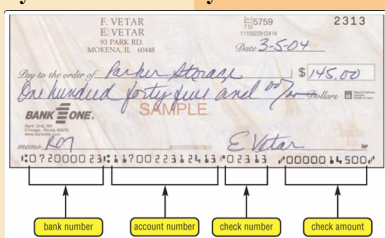
p. 5.28 Fig. 5-38

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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



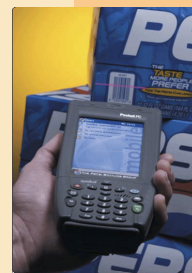
p. 5.29 Fig. 5-39

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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. 5.29 Fig. 5-40

40

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. 5.30 Fig. 5-41

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Terminals

What is an **automatic teller machine (ATM)**?

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



p. 5.31 Fig. 5-42

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Terminals

What is a **smart display**?

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



p. 5.31 Fig. 5-43

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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

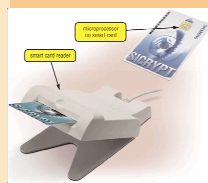


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Biometric Input

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



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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 x 1200 ppi color scanner
- 1- or 2-megapixel digital camera
- Headset that includes a microphone
- PC video camera
- Smart display

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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 x 1200 ppi color scanner
- 1- or 2-megapixel digital camera
- Headset that includes a microphone
- PC video camera

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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

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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

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Putting It All Together

What are recommended input devices for power users?



Power

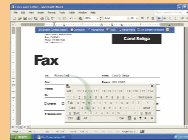
- Enhanced keyboard or ergonomic keyboard
- Mouse
- Stylus and portable keyboard for PDA
- Pen for graphics tablet
- 48-bit 1200 × 1200 ppi color scanner
- 5- or 6-megapixel digital camera
- Headset that includes a microphone
- PC video camera

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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**



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