

1 **Chapter 6**
Output

2 Chapter 6 Objectives

3 What is Output?

1 **What Is output?**

2 ❖ **Data that has been processed into a useful form, called information**

4 What Are Output Devices?

1 **What is an output device?**

2 ❖ **Any hardware component that can convey information to a user**

5 Display Devices

1 **What is a display device?**

2 ❖ **Television-like**

❖ **Information on a display device sometimes is called soft copy**

6 Display Devices

1 **What is a CRT monitor?**

2 ❖ **Large sealed, glass screen**

❖ **Screen coated with tiny dots of phosphor material**

❖ **Pixel, or picture element, is single point in electronic image**

❖ **Three dots (red, blue, and green) combine to make up each pixel**

7 Display Devices

1 **What are typical sizes for CRT monitors?**

2 ❖ **15, 17, 19, 21, and 22 inch screen size**

❖ **Viewable size is diagonal measurement of actual viewing area provided by the monitor**

8 Display Devices

1 **What is a liquid crystal display (LCD) monitor?**

2 ❖ **Type of flat-panel display**

❖ **Uses liquid crystals between two sheets of material to present information on screen**

❖ **Electric current passes through crystals, which creates images on the screen**

9 Display Devices

1 **Where are some features of LCD screens?**

2 ❖ **Lightweight and compact**

❖ **Consumes less than one-third of the power than does a CRT monitor**

❖ **Ideal for notebook and handheld computers**

10 Display Devices

1 **What is a Web-enabled device?**

2 ❖ **Allows access to the Web or e-mail**

• **Cellular telephones**

• **Pagers**

- ❖ Many use monochrome LCD displays to save battery power

11 Display Devices

1 **What is an electronic book (e-book) ?**

- 2
- ❖ Small, book-sized computer that uses an LCD screen
 - ❖ Allows users to read, save, highlight, bookmark, and add notes to online text
 - ❖ Download new book content from Web

12 Display Devices

What are the two technologies used for LCD monitors?

13 Display Devices

1 **What is a gas plasma monitor?**

- 2
- ❖ Flat-panel display uses layer of gas plasma between two sheets of material

14 Display Devices

1 **What is display resolution ?**

- 2
- ❖ Describes the sharpness and clarity of image
 - ❖ The higher the resolution, the sharper the image and the more that can display on the monitor

15 Display Devices

1 **What is dot pitch ?**

- 2
- ❖ Measure of the distance between pixels
 - ❖ Sometimes called pixel pitch
 - ❖ Smaller the distance between the pixels, the sharper the image

16 Display Devices

1 **What is refresh rate?**

- 2
- ❖ Speed at which monitor redraws images on the screen

17 Display Devices

1 **What is a video card ?**

- 2
- ❖ Converts digital output from computer into analog video signal
 - ❖ Controls how display device produces picture
 - ❖ Also called graphics card or video adapter

18 Display Devices

How does video travel from the processor to a CRT monitor?

19 Display Devices

1 **What is bit depth ?**

- 2
- ❖ Number of bits a video card uses to store information about each pixel
 - ❖ Also called color depth
 - ❖ Determines number of colors a video card can display
 - ❖ Greater the number of bits, better the resulting image

20 Display Devices

1 **What are video standards?**

- 2
- ❖ Video Electronics Standards Association (VESA) develops video standards

- 21 Display Devices
What are various video card configurations?
- 22 Display Devices
1 **What is electromagnetic radiation (EMR)?**
2
 - ❖ Magnetic field that travels at speed of light
 - ❖ Small amount produced by all CRT monitors
- 23 Display Devices
1 **What is the ENERGY STAR® program?**
2
 - ❖ Program to encourage manufacturers to create energy-efficient devices that require little power when not in use
 - ❖ Monitors and devices meeting guidelines display ENERGY STAR® label
- 24 Display Devices
1 **What is Interactive TV?**
2
 - ❖ Two-way communications technology in which users interact with television programming
 - ❖ HDTV works directly with interactive TV
- 25 Printers
1 **What is a printer?**
2
 - ❖ Output device that produces text and graphics on paper
 - ❖ Result is hard copy, or printout
 - ❖ Two orientations
- 26 Printers
1 **What is an impact printer?**
2
 - ❖ Forms characters by striking a mechanism against ink ribbon that physically contacts paper
 - ❖ Ideal for printing multipart forms
 - ❖ Can withstand dusty environments, vibrations, and extreme temperatures
- 27 Printers
1 **What is a dot-matrix printer?**
2
 - ❖ Impact printer that produces printed images when tiny wire pins on print head mechanism strike inked ribbon
 - ❖ Most use continuous-form paper
- 28 Printers
1 **How does a dot-matrix printer work?**
2
 - ❖ When ribbon presses against paper, it creates dots that form characters and graphics
 - ❖ A higher number of pins (9 to 24) means printer prints more dots per character, which results in higher print quality
- 29 Printers
1 **What is a line printer?**
2
 - ❖ High-speed impact printer that prints entire line at a time
 - ❖ Speed measured by number of lines per minute (lpm) it can print

- ❖ **Band printer prints fully-formed characters using a hammer mechanism**
- ❖ **Shuttle-matrix printer is high-speed printer that works more like a dot-matrix printer**

30 Printers

1 **What is a non-impact printer?**

- 2 ❖ **Forms characters and graphics on piece of paper without actually striking paper**

31 Printers

1 **What is an ink-jet printer?**

- 2 ❖ **Nonimpact printer forms characters and graphics by spraying tiny drops of liquid ink onto piece of paper**
- ❖ **Most popular type of color printer for home use**

32 Printers

1 **What is the resolution of a printer?**

- 2 ❖ **Sharpness and clarity of characters**
- ❖ **Measured by number of dots per inch (dpi) printer can output**

33 Printers

How does an ink-jet printer work?

34 Printers

1 **What is a laser printer?**

- 2 ❖ **High-speed, high-quality nonimpact printer**
- ❖ **Prints text and graphics in very high-quality resolution, ranging from 600 to 1,200 dpi**
- ❖ **Typically costs more than ink-jet printer, but is much faster**

35 Printers

How does a laser printer work?

36 Printers

1 **What is a thermal printer?**

- 2 ❖ **Generates images by pushing electrically heated pins against heat-sensitive paper**
- ❖ **Ideal for small devices, such as adding machines**

37 Printers

1 **What is a photo printer?**

- 2 ❖ **Color printer that produces photo lab quality pictures and prints everyday documents**

38 Printers

1 **What is a label printer?**

- 2 ❖ **Small printer that prints on adhesive type material that can be placed on a variety of items**
- ❖ **Most also print bar codes and**

e-stamps

- 39 Printers
- 1 **What is a portable printer?**
 - 2 ❖ **Small, lightweight ink-jet or thermal printer that allows mobile user to print from notebook or handheld computer while traveling**
- 40 Printers
- 1 **What is a plotter?**
 - 2 ❖ **Sophisticated printer used to produce high-quality drawings**
❖ **Large-format printer similar to plotter and is used to print quality color prints**
- 41 Speakers and Headsets
- 1 **What is an audio output device?**
 - 2 ❖ **Computer component that produces music, speech, and other sounds**
❖ **Speakers and headsets are common devices**
- 42 Speakers and Headsets
- 1 **What is voice output?**
 - 2 ❖ **Computer talks to you through speakers on computer**
- 43 Speakers and Headsets
- 1 **What is Internet telephony?**
 - 2 ❖ **Allows you to have a conversation over the Web, just as if you were talking on the telephone**
- 44 Other Output Devices
- 1 **What is a data projector?**
 - 2 ❖ **Device that takes image from a computer screen and projects it onto a larger screen**
- 45 Other Output Devices
- 1 **What is a facsimile (fax) machine?**
 - 2 ❖ **Device that transmits and receives documents over telephone lines**
- 46 Other Output Devices
- 1 **What is a fax modem?**
 - 2 ❖ **Modem that allows you to send and receive electronic documents as faxes**
- 47 Other Output Devices
- 1 **What is a multifunction device (MFD) ?**
 - 2 ❖ **Provides the functionality of a printer, scanner, copy machine, and fax machine**
- 48 Terminals
- 1 **What is a terminal?**
 - 2 ❖ **Device that performs both input and output**
- 49 Terminals

- 1 **What is a dumb terminal?**
- 2

50 Terminals

- 1 **What is an intelligent terminal?**
- 2
 - ❖ Has monitor, keyboard, memory and processor
 - ❖ Similar to a PC in that it can perform tasks independent of host computer
 - ❖ Programmable

51 Terminals

- 1 **What is a point-of-sale (POS) terminal?**
- 2
 - ❖ Records purchases at point where purchase is made
 - ❖ Output from POS terminals serves as input to host computer

52 Terminals

- 1 **What is an automated teller machine (ATM)?**
- 2
 - ❖ Self-service banking machine that connects to host computer through telephone network

53 Output Devices for Physically Challenged Users

- 1 **What is the Magnifier command?**
- 2
 - ❖ Windows Magnifier command enlarges text and other items in window on screen

54 Output Devices for Physically Challenged Users

- 1 **What other output options are available for visually impaired users?**
- 2
 - ❖ Change Window's settings such as increasing size or changing color of text to make words easier to read
 - ❖ Blind users can work with voice output
 - ❖ Braille printer outputs information in Braille onto paper

55 Summary

What are suggested output devices for the Home user?

56 Putting It All Together

What are suggested output devices for the SOHO user?

57 Putting It All Together

What are suggested output devices for the Mobile user?

58 Putting It All Together

What are suggested output devices for the Large Business user?

59 Putting It All Together

What are suggested output devices for the Power user?

60 Summary of Output

❖ **What is output?**

- ❖ **What are output devices?**
- ❖ **Display devices**
- ❖ **Printers**
- ❖ **Speakers and headsets**
- ❖ **Other output devices**
- ❖ **Terminals**
- ❖ **Output devices for physically challenged users**