

Chapter 7

Making Multimedia

Memory and Storage Devices

Estimating the memory requirements of a multimedia project—the space required on a hard disk, thumb drive, CD-ROM, or DVD, not the random access memory (RAM) used while your computer is running—you must have a sense of the project's content and scope. Color images, text, sound bites, video clips, and the programming code that glues it all together require memory; if there are many of these elements, you will need even more. If you are *making* multimedia, you will also need to allocate memory for storing and archiving working files used during production, original audio and video clips, edited pieces and final mixed pieces.

Random Access Memory (RAM)

When you are faced with budget constraints, you can certainly produce a multimedia project on a slower or limited-memory computer. On the other hand, it is highly disappointing to face memory (RAM) shortages time after time, when one is attempting to keep multiple applications and files open simultaneously. Further disappointing situation arises when one has to wait the extra seconds required of each editing step when working with multimedia material on a slow processor. No matter how fast processor one has in the machine, speed becomes ineffective if not accompanied by sufficient RAM. A fast processor without enough RAM may waste processor cycles while it swaps needed portions of program code into and out of memory. In some cases, increasing available RAM may show more performance improvement on your system than upgrading the processor chip.

Read-Only Memory (ROM)

Unlike RAM, read-only memory (ROM) is not *volatile*. When you turn off the power to a ROM chip, it will not forget, or lose its memory. ROM is typically used in computers to hold the small BIOS program that initially boots up the computer, and it is used in printers to hold built-in fonts. Programmable ROMs (called EPROMs) allow changes to be made that are not forgotten when power is turned off.

Hard Disks

Adequate storage space for your production environment can be provided by large-capacity hard disks, server-mounted on a network. As multimedia has reached consumer desktops, makers of hard disks have built smaller-profile, larger-capacity, faster, and less-expensive hard disks. As network and Internet servers drive the demand for centralized data storage requiring **terabytes** (one trillion bytes), hard disks are often configured into fail-proof redundant arrays offering built-in protection against crashes.

Flash Memory or Thumb Drives

These flash memory data storage devices are about the size of a thin cigarette lighter and can be integrated with USB or FireWire interfaces to store from eight megabytes to several GB of data. They are available in every color of the rainbow, are extremely portable, and, because they have fewer moving parts, are more reliable than disk drives. Consisting of a small printed circuit board encased in a sturdy metal or plastic casing with a USB connector covered with a cap, the

flash drive is trendy as a status symbol, and convenient to use. This same solid-state storage is used in digital cameras, cell phones, and audio recording devices, and for solid state hard drives (no spinning platters or moving parts) that are found in some netbooks and other handheld devices.

CD-ROM Discs

Compact disc read-only memory (CD-ROM) players have become an integral part of the multimedia development workstation and are an important delivery vehicle for mass-produced projects. A wide variety of developer utilities, graphic backgrounds, stock photography and sounds, applications, games, reference texts, and educational software are available on this medium. CD-ROM players have typically been very slow to access and transmit data (150 KBps, which is the speed required of consumer Audio CDs), but developments have led to double-, triple-, quadruple speed, 24x, 48x, and 56x drives designed specifically for computer (not Red Book Audio) use. With a compact disc recorder, one can make their own CDs, using CD-recordable (CD-R) blank discs to create a CD in most formats of CD-ROM and CD-Audio. Software, such as Roxio's Toast and Easy CD Creator, helps in organizing files present on hard disk(s) into a "virtual" structure, and then writes them to the CD in that order. CD-R discs are manufactured differently than normal CDs but can play in any CD-Audio or CD-ROM player. These write once, enhanced CDs make excellent high-capacity file archives and are used extensively by multimedia developers for pre-mastering and testing CD-ROM projects and titles. Because they have become very inexpensive, they are also used for short-run distribution of finished multimedia projects and data backup. A CD-RW (read and write) recorder can rewrite 700MB of data to a CD-RW disc about 1,000 times.

NOTE: The study material (as per the guideline) is compiled from your prescribed textbook *Multimedia: Making it Work* (ninth edition) by Tay Vaughan.