

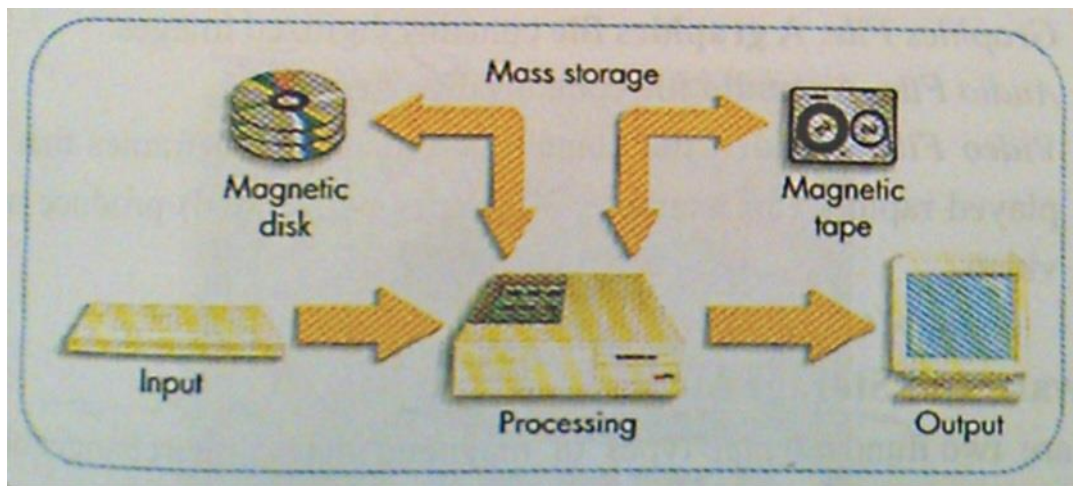
# Unit 5

## Section One: Reading Comprehension

### Mass Storage and Files

Within a computer system, programs and information in all forms (text, image, audio, video) are stored in both RAM and permanent **mass storage**, such as magnetic disk and tape. Programs and information are retrieved from mass storage and stored temporarily in high-speed RAM for processing.

Over the years, manufacturers have developed a variety of permanent mass storage devices and media. Today the various types of **magnetic disk drives** and their respective storage media are the state of the art for permanent storage. Magnetic tape drives complement magnetic disk storage by providing inexpensive *backup* capability and *archival* storage. Later in the Unit, **optical laser disk**, a rapidly emerging alternative to magnetic storage drives, is introduced. First, let's take a look at the files stored on these drives.



**Figure 5-1. Ram and Mass Storage.** Programs and data are stored permanently in mass storage and temporarily in RAM.

### The Many Faces of Files

The **file** is simply a recording of information. It is the foundation storage on a computer system. To a computer, a file is a string of 0s and 1s (digitized data) that are stored and retrieved as a single unit.

### Types of Files: ASCII to Video

There are many types of files, most of which are defined by the software that created them (for example, a word processing document or spreadsheet).

Popular files are:

- **ASCII File.** An **ASCII file** is a text-only file that can be read or created by any word processing program or text editor.
- **Data File.** A **data file** contains data organized into records.

- Document File. All word processing and desktop publishing **document files** contain text and, often, images.
- Spreadsheet File. A **spreadsheet file** contains rows and columns of data.
- Web Page File. A **Web page file** is compatible with the World Wide Web and Internet browsers.
- Source Program File. A **source program** file contains user-written instructions to the computer. These instructions must be translated to machine language prior to program execution.
- Executable Program File. An **executable program file** contains executable machine language code.
- Graphics File. A **graphics file** contains digitized images.
- Audio File. An **audio file** contains digitized sound.
- Video File. A **video file** contains digitized video frames that when played rapidly (for example, 30 frames per second) produce motion video.

## Hardware and Storage Media

There are two fundamental types of magnetic disks: interchangeable and fixed.

- **Interchangeable magnetic disks** can be stored offline and loaded to the magnetic disk drives as they are needed.
- **Fixed magnetic disks**, also called hard disks, are permanently installed, or fixed. All hard disks are rigid and are usually made of

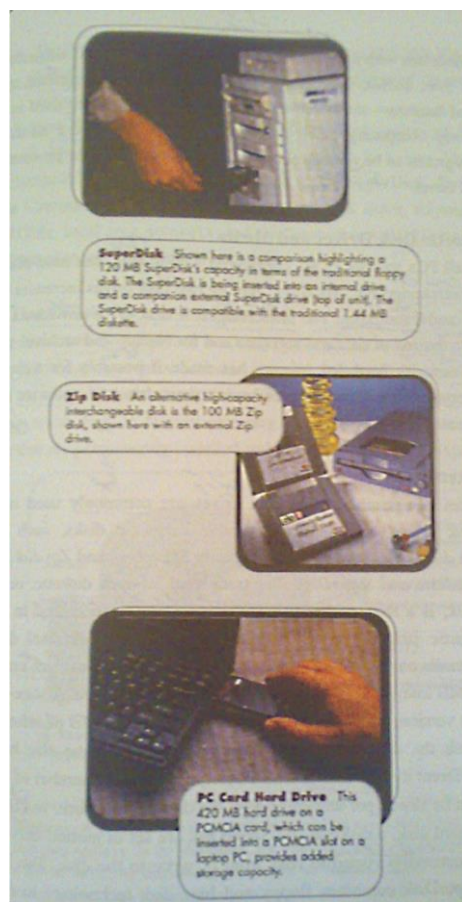


Figure 5-2. Magnetic Disk Drivers and Media

aluminum with a surface coating of easily magnetized elements, such as iron, cobalt, chromium, and nickel. Today's integrated systems and databases are stored on hard disk, especially those used in work group computing. Such systems and databases require all data and programs to be online (accessible to the computer for processing) at all times.

## PC Magnetic Disk Drives and Media

Virtually all PCs sold today are configured with at least one hard-disk drive and one interchangeable disk drive. Having two disk drives increases system flexibility and throughput. The interchangeable disk drive provides a means for the distribution of data and software and for backup and archival storage. The high-capacity hard-disk storage has made it possible for today's PC users to enjoy the convenience of having their data and software readily accessible at all times.

## The Diskette

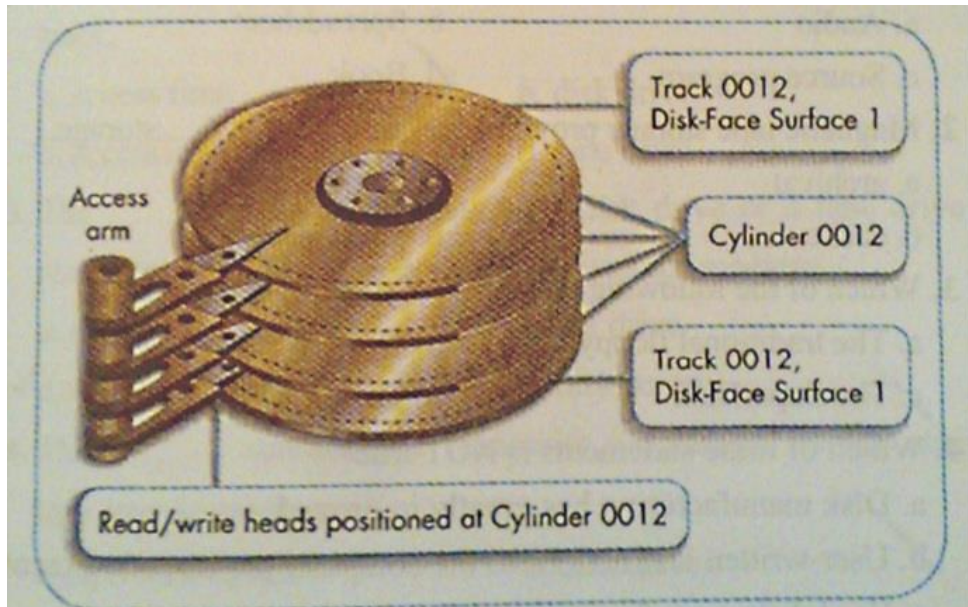
Three types of interchangeable disk drives are commonly used on PCs. These disk drives accept interchangeable magnetic disks, such as the (traditional *diskette* and the new high-capacity *SuperDisk* and Zip disk.

- Diskette and SuperDisk. The traditional 3.5-inch diskette, or *floppy* disk, is a thin, mylar disk that is permanently enclosed in a rigid plastic jacket. The widely used standard for traditional diskettes permits only 1.44 MB of storage, not much in the modern era where 4 MB images or 30 MB programs are common place. A state-of-the-art version, called the **SuperDisk**, can store 120 MB of information. Both the diskette and the SuperDisk are the same size but have different disk densities. **Disk density** refers to the number of bits that can be stored per unit of area on the disk-face surface. In contrast to a hard disk, a diskette and SuperDisk are set in motion only when a command is issued to read from or write to the disk. The 120 MB SuperDisk combines floppy and hard-disk technology to read and write to specially formatted floppy-size disks. The SuperDisk drive reads from and writes to the traditional diskette as well.
- Zip Disk. The **Zip drive** reads and writes to 100 MB **Zip disks**. The Zip disk and SuperDisk have storage capacities of 70 and 83 floppy diskettes, respectively.

The diskette-based floppy disk drive is still standard equipment on most PCs and will remain so during this transition period to a new higher-density interchangeable disk, such as the Zip disk or the SuperDisk. The iMac from Apple Computer doesn't come with a floppy disk drive, relying instead on CD-ROMs, local area networks, and the Internet as vehicles for the transfer of information and programs.

## The Hard Disk

Hard disk manufacturers are working continuously to achieve two objectives: (1) to put more information in less disk space and (2) to enable a more rapid transfer of that information to/from RAM. Consequently hard-disk storage technology is forever changing. There are two types of hard disk, those that are permanently installed and those that are interchangeable.



**Figure 5-3. Fixed Hard Disk With Four Platters and Eight Recording Surfaces.**

A cylinder refers to similarly numbered concentric tracks on the disk-face surfaces. In the illustration, the read/write heads are positioned over Cylinder 0012. At this position, the data on any one of the eight tracks numbered 0012 are accessible to the computer on each revolution of the disk. The read/write heads must be moved to access data on other tracks/cylinders.

(Winn L. Rosch: Internet)