Section Two: Further Reading

# Optical Laser Disks: High-Density Storage

Optical laser disk technology has already replaced magnetic disk and tape storage. With this technology, two lasers replace the read/write head used in magnetic storage. One laser beam writes to the recording surface by scoring microscopic *pits* in the disk, and another laser reads the data from the light sensitive recording surface. A light beam is easily deflected to the desired place on the optical disk, so a mechanical access arm is not needed.

Optical laser disks are a very inviting option for users. These disks are less sensitive to environmental fluctuations, and they provide more direct access storage at a much lower cost than does the magnetic disk alternative. Two technologies are introduced in this section: CD-ROM and DVD.

## CD-ROM and DVD: The Technology

CD-ROM, a spinoff of audio CD technology, stands for compact disk-read- only memory. The name implies its application. Once inserted into the CD- ROM drive, the text, video images, and so on can be read into RAM for processing or display. However, the data on the disk are fixed-they cannot be altered. This is contrast, of course, to the read/write capability of magnetic disks.

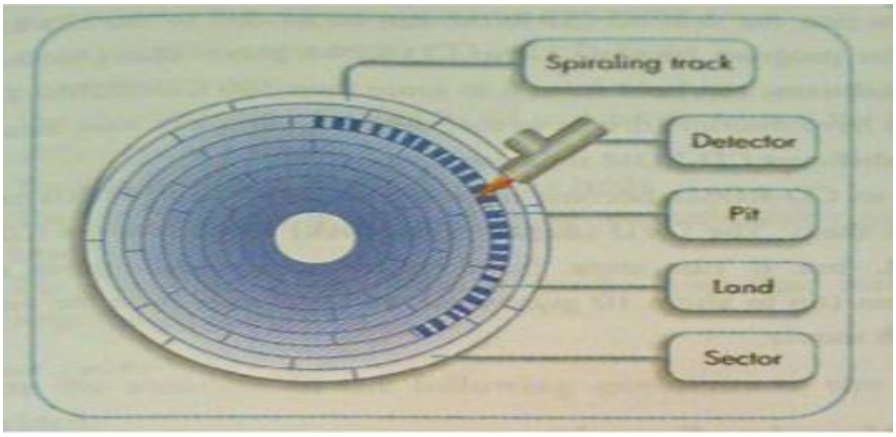


**Figure 5-4. CD-ROM Organization.** A laser beam detector interprets pits and lands, which represent bits (1 s and 0s), located within the sectors in the spiraling track on the CD-ROM reflective surface

Data are recorded on the CD-ROM's reflective surface in the form of pits and lands. The pits are tiny reflective bumps that have been burned in with a laser. The lands are flat areas separating the pits. Together they record read-only binary (1s and 0s) information that can be interpreted by the computer as text, audio, images, and so on.

Popular CD-ROM drives spin much faster than the original CD. The speed at which a given CD-ROM spins depends on the physical location of the data being read. The data pass over the movable laser detector at the same rate, no matter where the data are read. Therefore, the CD-ROM must spin more quickly when accessing data near the center.

The laser detector is analogous to the magnetic disk's read/write head. The relatively slow spin rates make the CD-ROM access time much slower than that of its magnetic cousins. A CD-ROM drive may take 10 to 50 times longer to ready itself to read the information. Once ready to read, the transfer rate also is much slower.

The introduction of multidisk CD-ROM player/changers enables ready access to vast amounts of online data. This device is like a CD audio player/changer in that the desired CD-ROM can be loaded to the CD-ROM disk drive under program control. These CD-ROM player/changers, sometimes called **jukeboxes**, can hold from 6 to more than 500 CD-ROMs. The larger jukeboxes have multiple drives so that network users can have simultaneous access to different CD-ROM resources.

Just as CD-ROMs become mainstream equipment, **DVDs** are poised to replace them. The DVD (**digital videodisk**) looks like the CD and the CD-ROM, but it can store from seven to fourteen times as much information (up to about 10 gigabytes). A DVD can store the video for a full-length movie.

(Winn L. Rosch: Internet)