

How Magneto-Optical and Floptical Drives Work

Magneto-Optical Drives

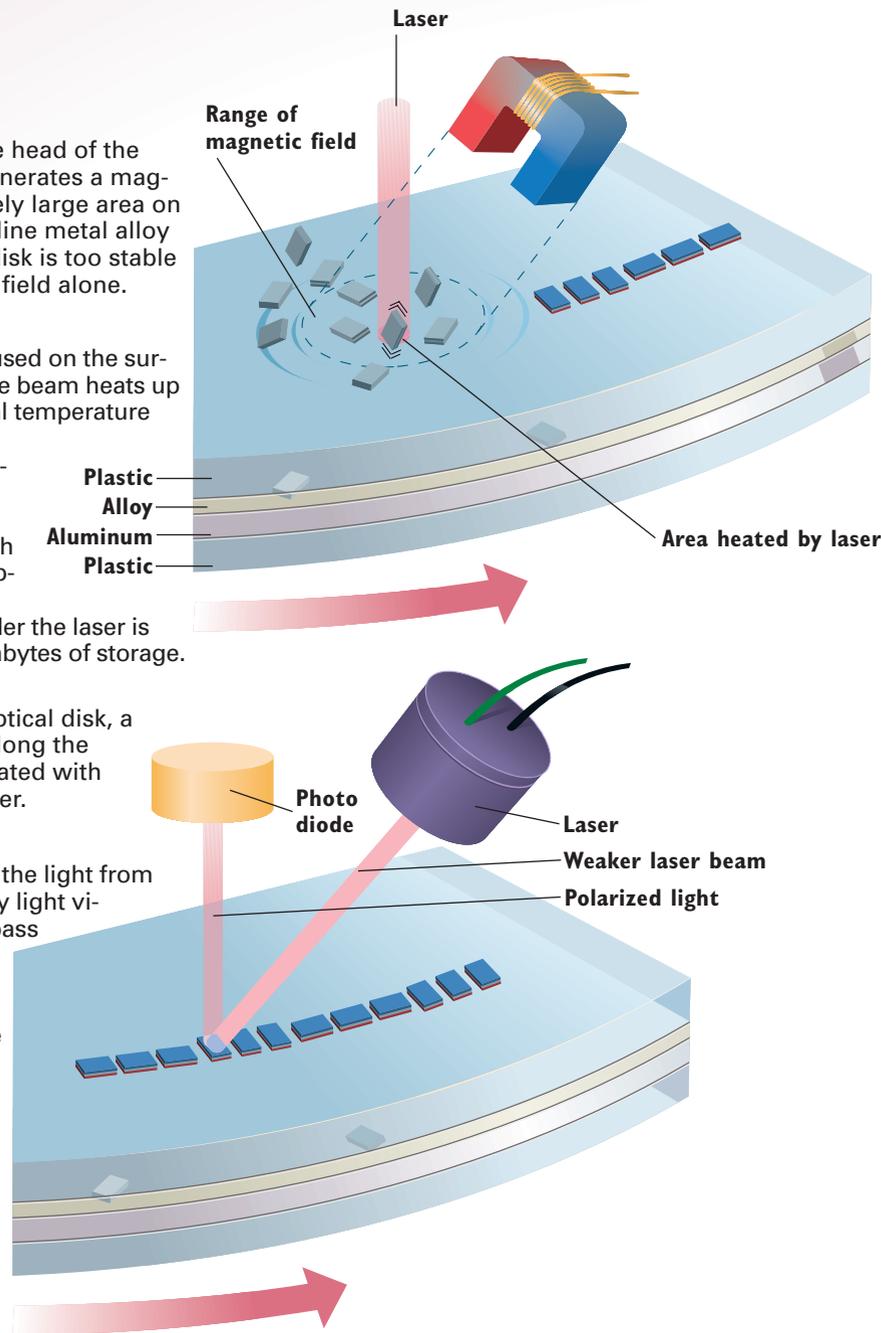
1 The electromagnetic read/write head of the *magneto-optical (MO)* drive generates a magnetic field that covers a relatively large area on the drive's disk. But the crystalline metal alloy that covers the surface of the disk is too stable to be affected by the magnetic field alone.

2 A thin, precise laser beam is focused on the surface of the disk. The energy in the beam heats up a tiny spot in the alloy to a critical temperature known as its *Curie point*. At this point, the heat loosens the metallic crystals in the alloy enough that they can be moved by the write head's magnetic field, which aligns the crystals one way to represent a 0 bit and a different way to represent a 1 bit. The area under the laser is small enough to provide 3-5 gigabytes of storage.

3 To read data from a magneto-optical disk, a weaker laser beam is focused along the tracks of data that had been created with the help of the more intense laser.

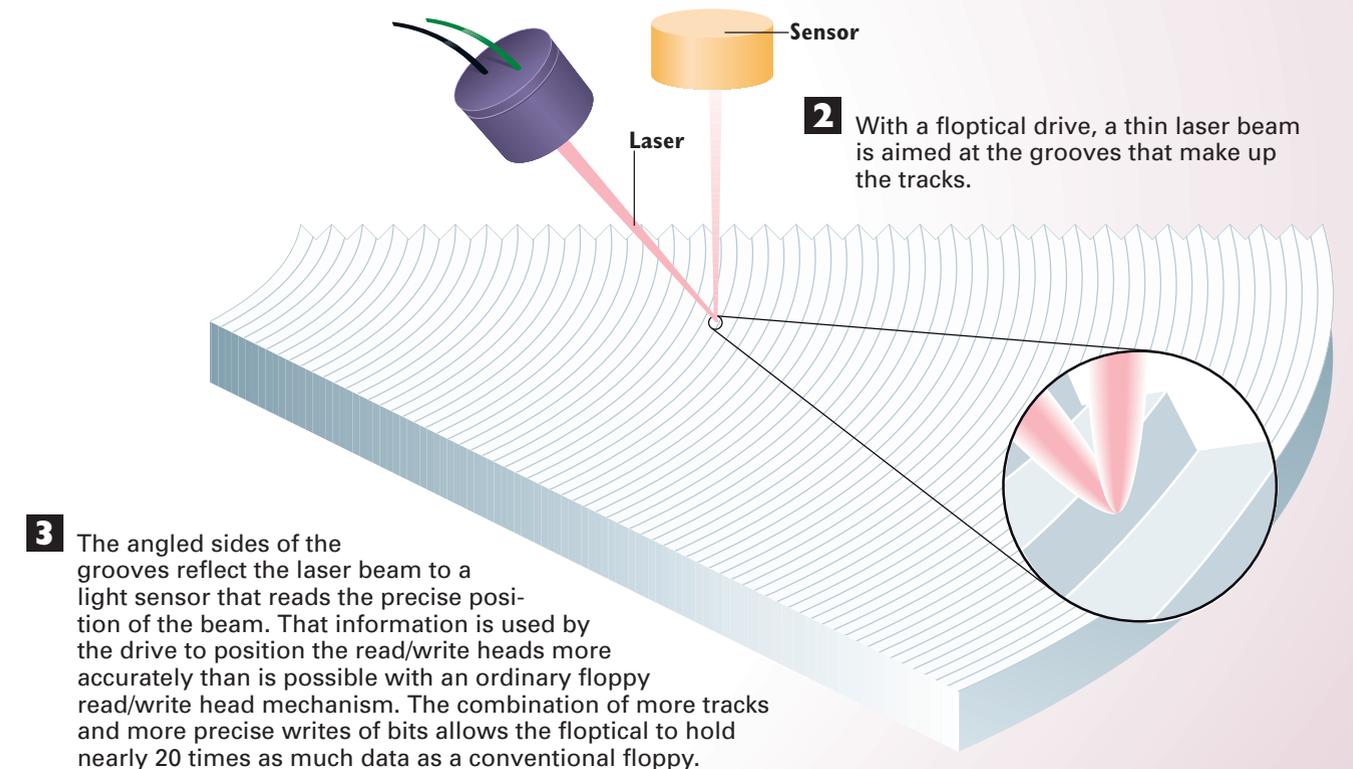
4 The crystals in the alloy *polarize* the light from the laser. Polarization allows only light vibrating in a certain direction to pass through the crystals. The alignment of crystals in 0 bits polarizes the light in one direction, and the crystals in 1 bits polarize light in a different direction.

5 The polarized light is reflected from the aluminum layer of the disk to a *photo diode*, which senses the direction in which the light is polarized and translates that information into a stream of 0s and 1s.



Floptical Drives

1 A 120MB floptical disk is created with a series of small, precise concentric tracks stamped in its barium-ferrite surface coating. The tracks, where data is written, are thinner and more numerous than those created by ordinary floppy disk formatting. On conventional floppies, the operating system formats the disk by recording magnetic markers on the surface of the disk to create a road map of tracks and sectors. The markers are used to find areas where files exist or where new files can be written. But this method of formatting has wide tolerances for error to allow for the imprecision with which the drive head reads those markers. Those wide margins limit how much can be stored on a regular floppy.



3 The angled sides of the grooves reflect the laser beam to a light sensor that reads the precise position of the beam. That information is used by the drive to position the read/write heads more accurately than is possible with an ordinary floppy read/write head mechanism. The combination of more tracks and more precise writes of bits allows the floptical to hold nearly 20 times as much data as a conventional floppy.

