How CD Drives Work

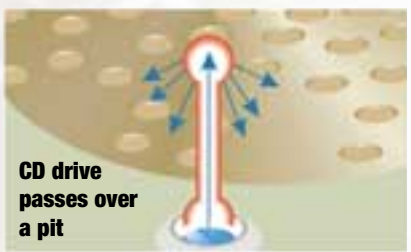
Compact disc media, whether it's an audio CD, CD-ROM, CD-R (CD-recordable), or CD-RW (CD-rewriteable), stores information in the form of pits and lands. **Pits** are raised bumps on the bottom of the disc, and **lands** are spaces between the pits. Pits and lands are equivalent to the 0s and 1s that make up the digital binary language of computers.

A CD drive reads the pits and lands by using a laser and a sensor. When the computer sends a command to find data on a CD, the drive's laser springs into action. The laser scans the underside of the disc, searching for the specific pits and lands that correspond to the command the drive has received. The laser bounces off the disc, and the sensor measures how much light is reflected back. If the laser passes over a pit, the light is diffused so less light is measured. A land will reflect back most of the light that strikes it.

A photo cell inside the CD drive's read head assembly measures the amount of light reflected from the CD-ROM, which is how it distinguishes between pits and lands. The CD drive interprets the pits and lands as 0s and 1s and passes that coded information to the computer.

How A CD Is Read

When the laser from a CD drive strikes a land on a disc, most of the light is reflected back to the drive's sensor. The drive knows the laser has passed over a land, due to the high percentage of light reflected back.

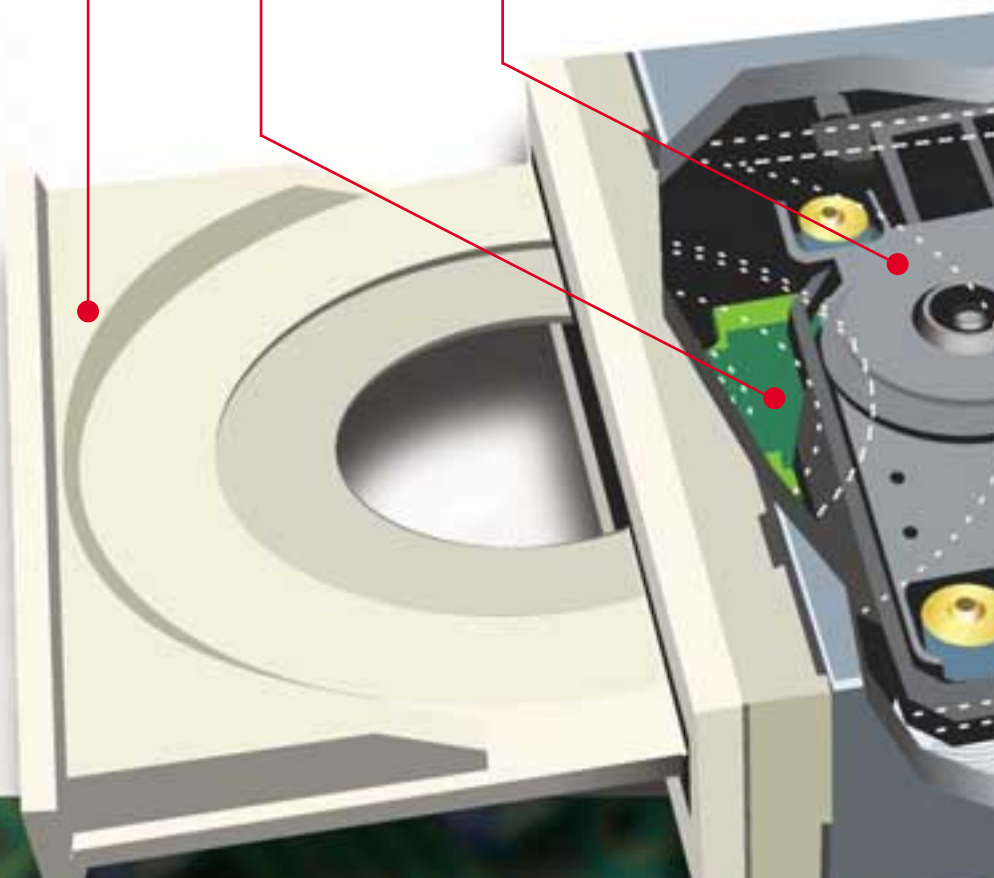


When the laser from a CD drive passes over a pit, the light is diffused. A smaller percentage of light is reflected back to the drive's sensor, so the drive knows the laser has hit a pit.

Spindle Motor
The spindle motor rotates the CD-ROM so that data can be read by the read head assembly. On newer drives, the speed at which the motor rotates is constant.

Circuit Board
The circuit board contains a variety of tiny electronic components.

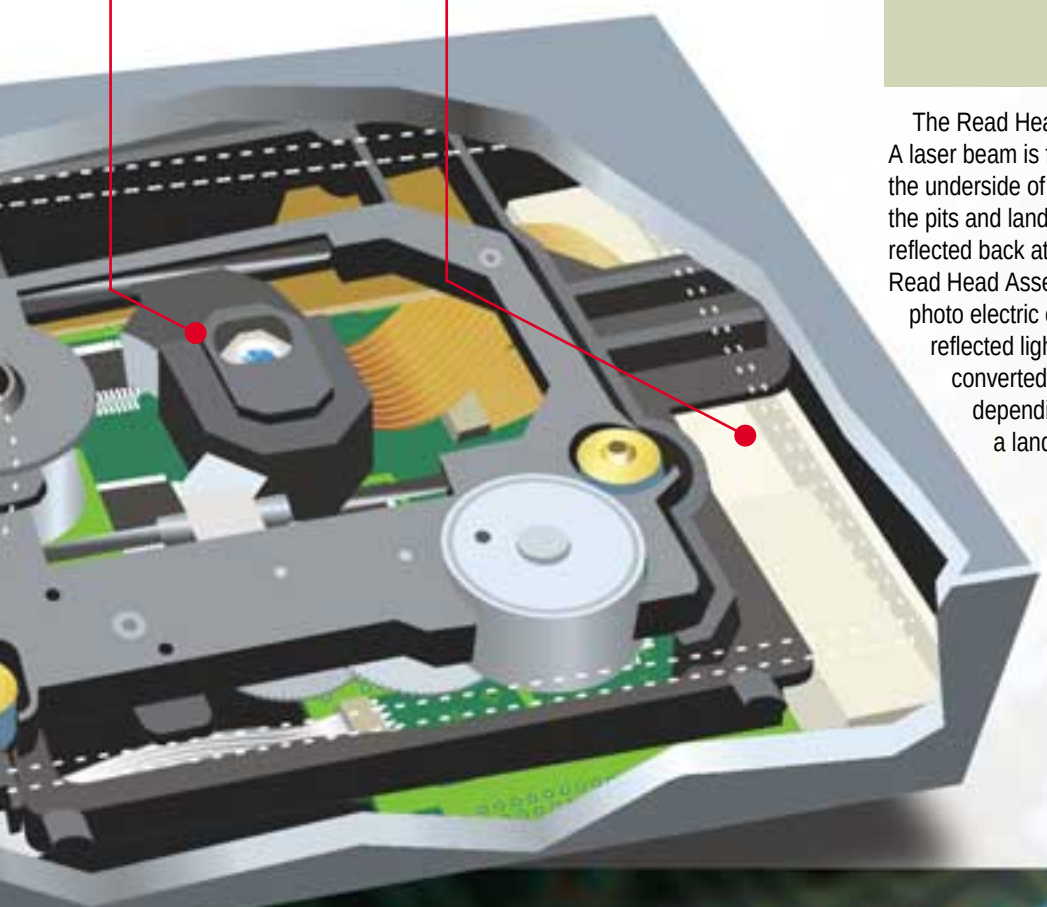
CD-ROM Tray



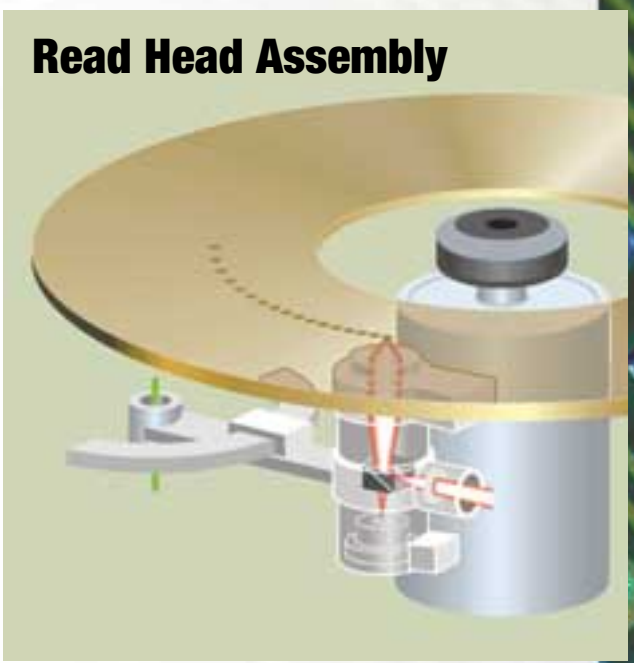
Back View Of A CD Drive

Read Head Assembly
The read head assembly contains the laser, lenses, and photo sensors that read the pits and lands on a CD-ROM. The read head assembly moves in and out across the CD-ROM drive on tracks while the spindle motor spins the CD-ROM.

Ports
There are several ports on the back of a CD drive. They provide the power for the CD drive and are the gateway for the flow of data to and from the CD drive.



Read Head Assembly



The Read Head Assembly consists of several parts. A laser beam is focused through two lenses and strikes the underside of the CD-ROM. The laser beam strikes the pits and lands. The light from the pits and lands is reflected back at different intensities. A prism inside the Read Head Assembly directs the reflected light to a photo electric cell, which notes the intensity of the reflected light. The intensity of the reflected light is converted to a digital signal: either a 0 or a 1, depending on whether the drive reads a pit or a land.

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