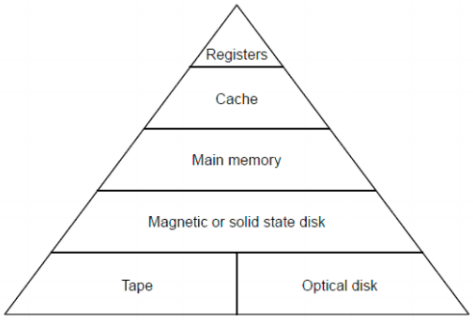
Ch 2.3 Secondary memory, 2.4 I/O

Ch 2.3 Secondary memory

The memory pyramid is cool. From the top down, memory gets 1) cheaper, 2) bigger, 3) slower.



Magnetic disks: track, sector, preamble, Error-Correcting Codes (ECC), intersector gap, Winchester disks, cylinder, seek time, rotational latency, disk controller

IDE disks: PC based, Integrated Drive Electronics (IDE), Basic Input-Output System (BIOS)

SCSI disks: Small Computer System Interface (SCSI, “scuzzy”), faster than IDE, Unix standard

RAID: Redundant Array of Inexpensive Disks (RAID), appears as single disk to users, striping
See RAID levels 0-5 on page 96

Solid-state disks: non-volatile flash memory, flash memory cell (below) is a transistor++
Reminder: volatile v. non-volatile, static v. dynamic

CD-ROM: pit, land, pit->land transition = 1, no transition = 0, CD-R, CD-RW
Interesting CD-ROM data layout (below):

DVD: Digital Versatile Disk (DVD), 4.7-17GB capacity (single/double sided and layered)
Improvement over CD - smaller pits, tighter spiral, red laser, Blu-ray is 25-50GB

Fig 2-24: Flash memory cell

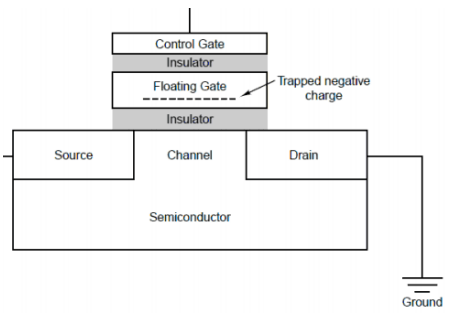
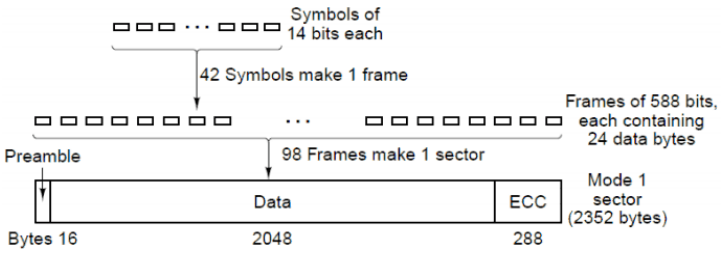


Fig 2-26: CD-ROM data layout



Ch 2.4 Input/Output

Buses: Direct Memory Access (DMA), interrupt, interrupt handler, bus arbiter,
Flavors: Industry Standard Architecture (ISA), Extended ISA (EISA), Peripheral Component Interconnect (PCI)

Terminals: cathode ray tube (CRT), liquid crystal display (LCD),
Details - video RAM, color palette, indexed color, example: 24 bit RGB value

Mice: 3 flavors: mechanical, optical (LED), opto-mechanical (combo)
mickey - min distance a mouse travels before communicating with computer (excellent!)

Game controllers: Wiimote, Kinect

Printers: laser printer, inkjet printer, halftoning

Telecommunications equipment: modem, baud rate, Digital Subscriber Line (DSL),
Modem transmission modes: full-duplex v. half-duplex v. simplex
See Figure 2-38 on page 128 for how binary signals are transmitted

Digital cameras: Charge-coupled devices (CCD's)

Character codes: ASCII, Unicode (2 bytes, international), UTF-8

Figure 2-33: LCD screen

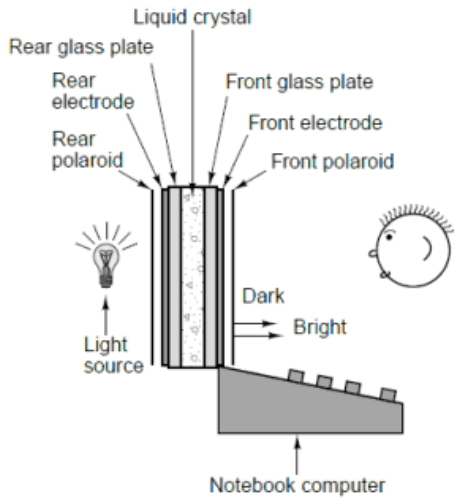


Figure 2-36: Laser printer