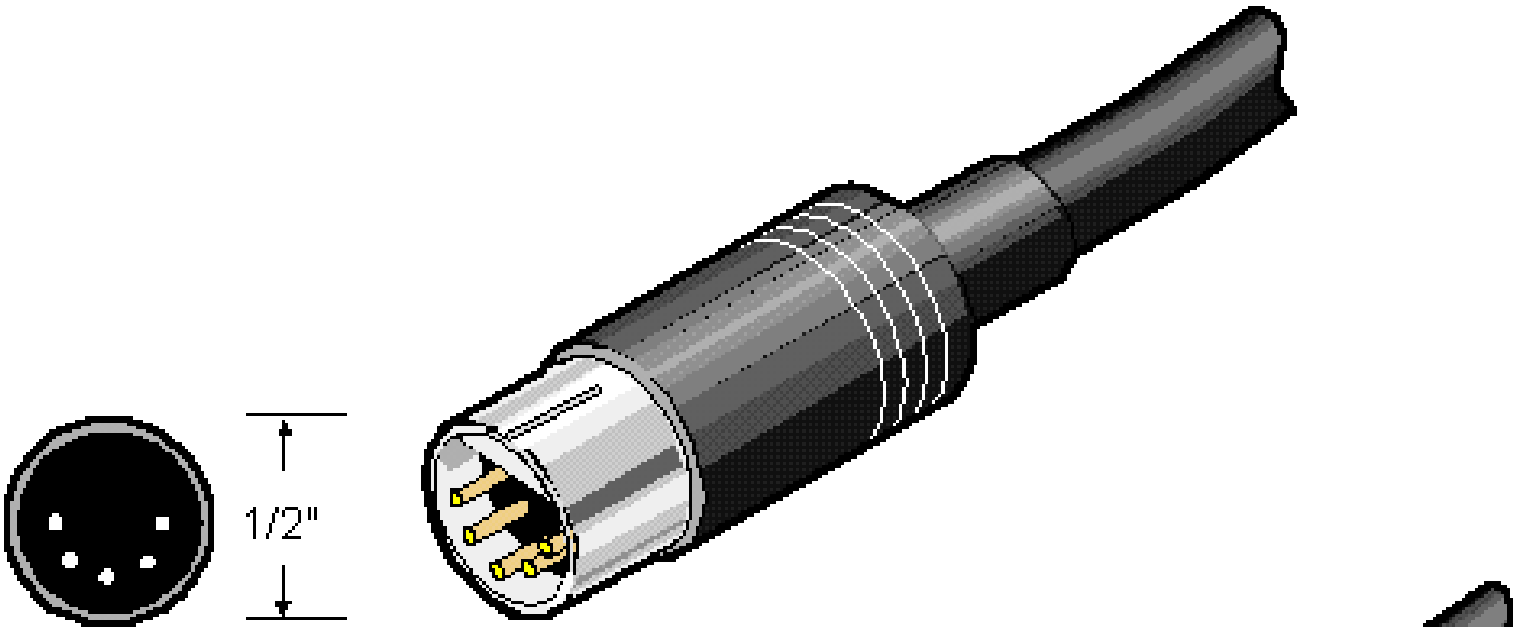
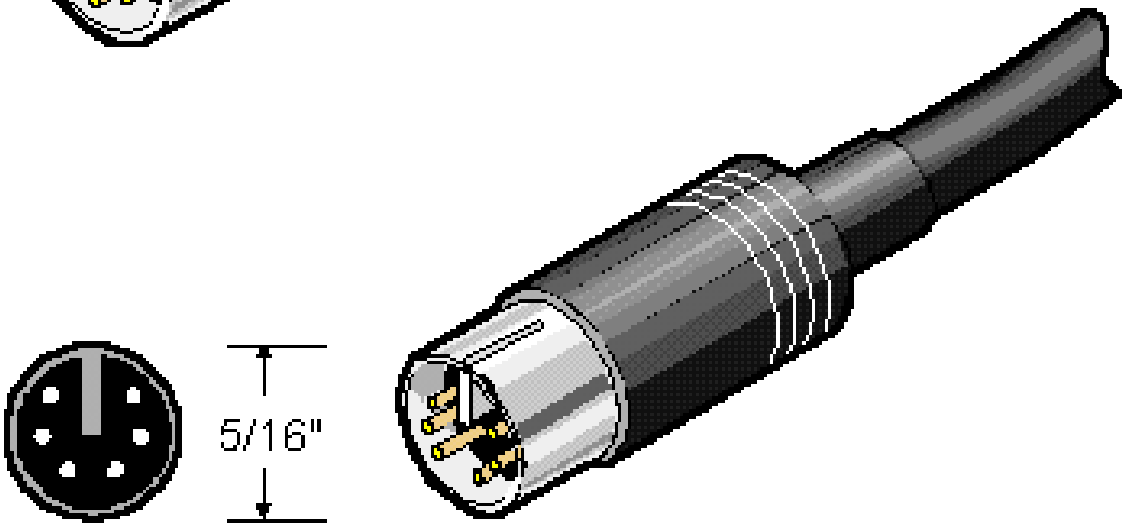
I/O Ports

Keyboard & Mouse

AT-style keyboard

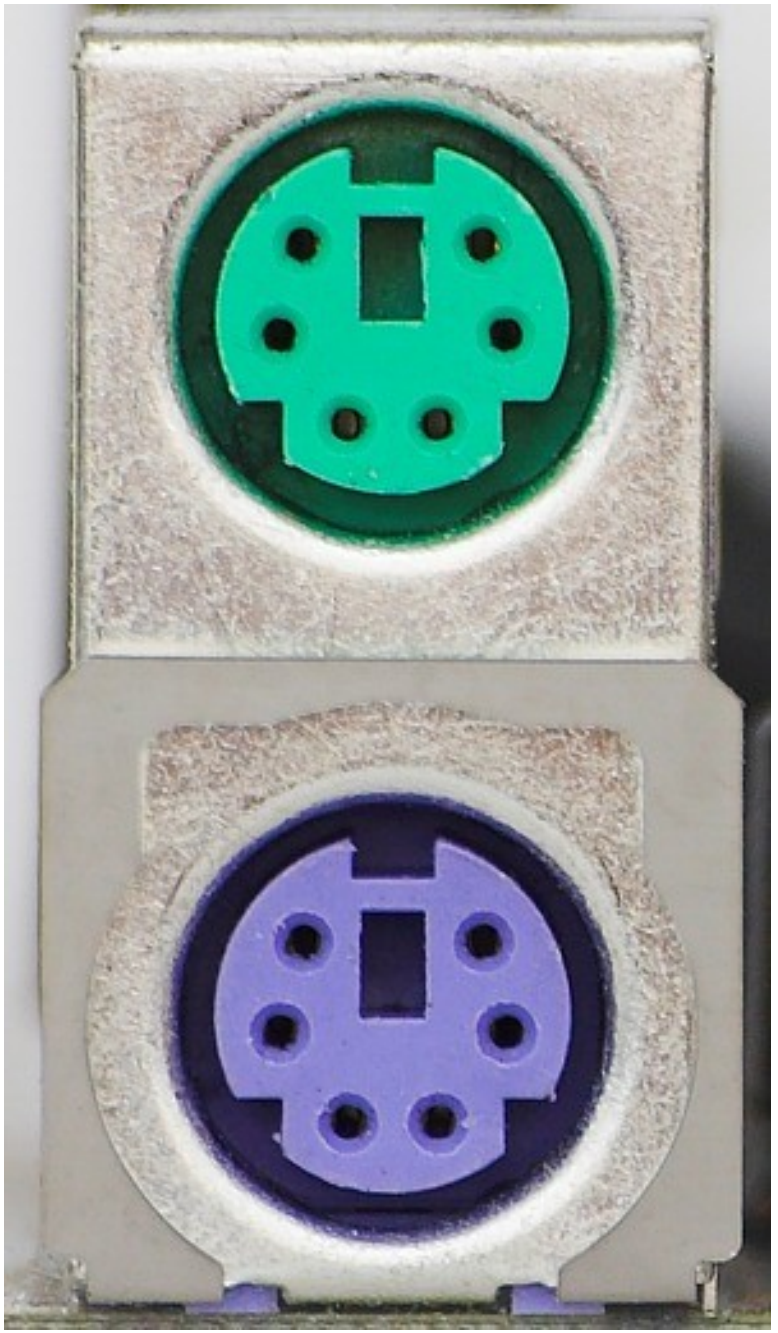


PC Keyboard



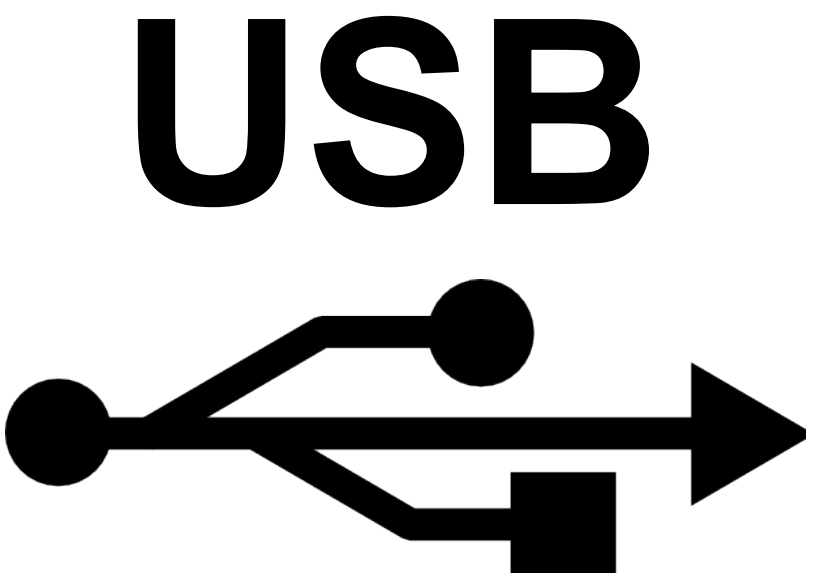
PS/2 (mouse, keyboard)

PC99 – Color Coding!



Mouse (green)

Keyboard (purple)


USB

USB Versions

USB 1.0 / 1.1

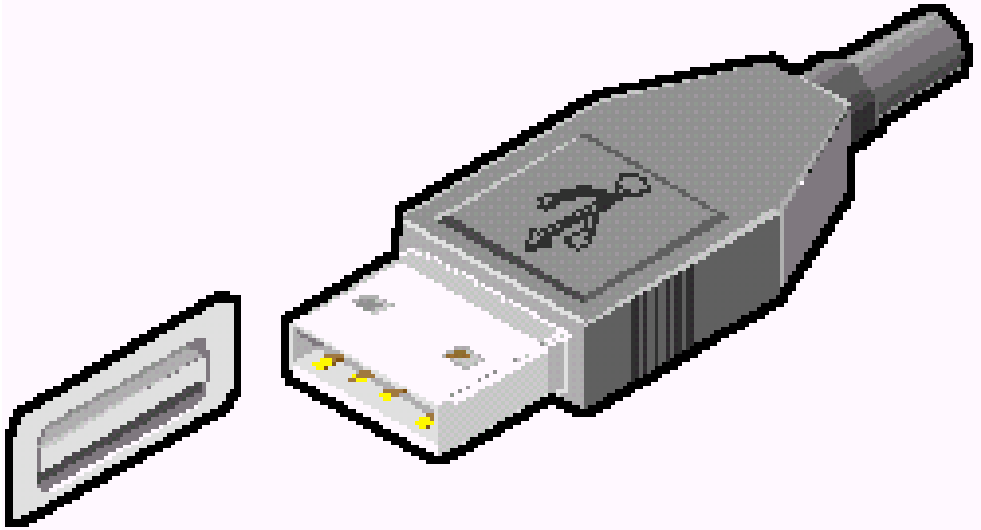
- “Low Speed” at 1.5 Mbits/sec
- “Full Speed” at 12 Mbits/sec
- Real-time (“isochronous”) is available when using “Full Speed”

USB 2.0 / 2.1

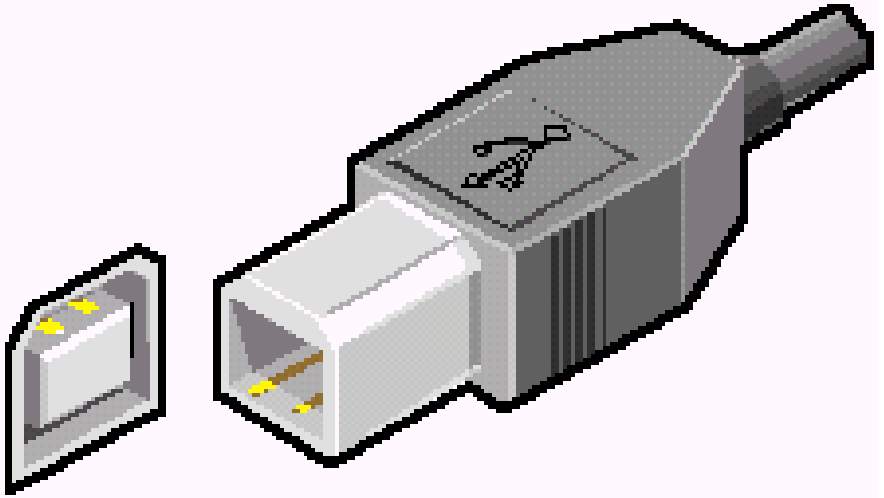
- Supports “Original USB” (aka 1.0/1.1) speeds
- All devices must be backwards-compatible to 12Mbps
- Adds “High Speed” at 480 Mbits/sec

USB 1.1

From Computer Desktop Encyclopedia

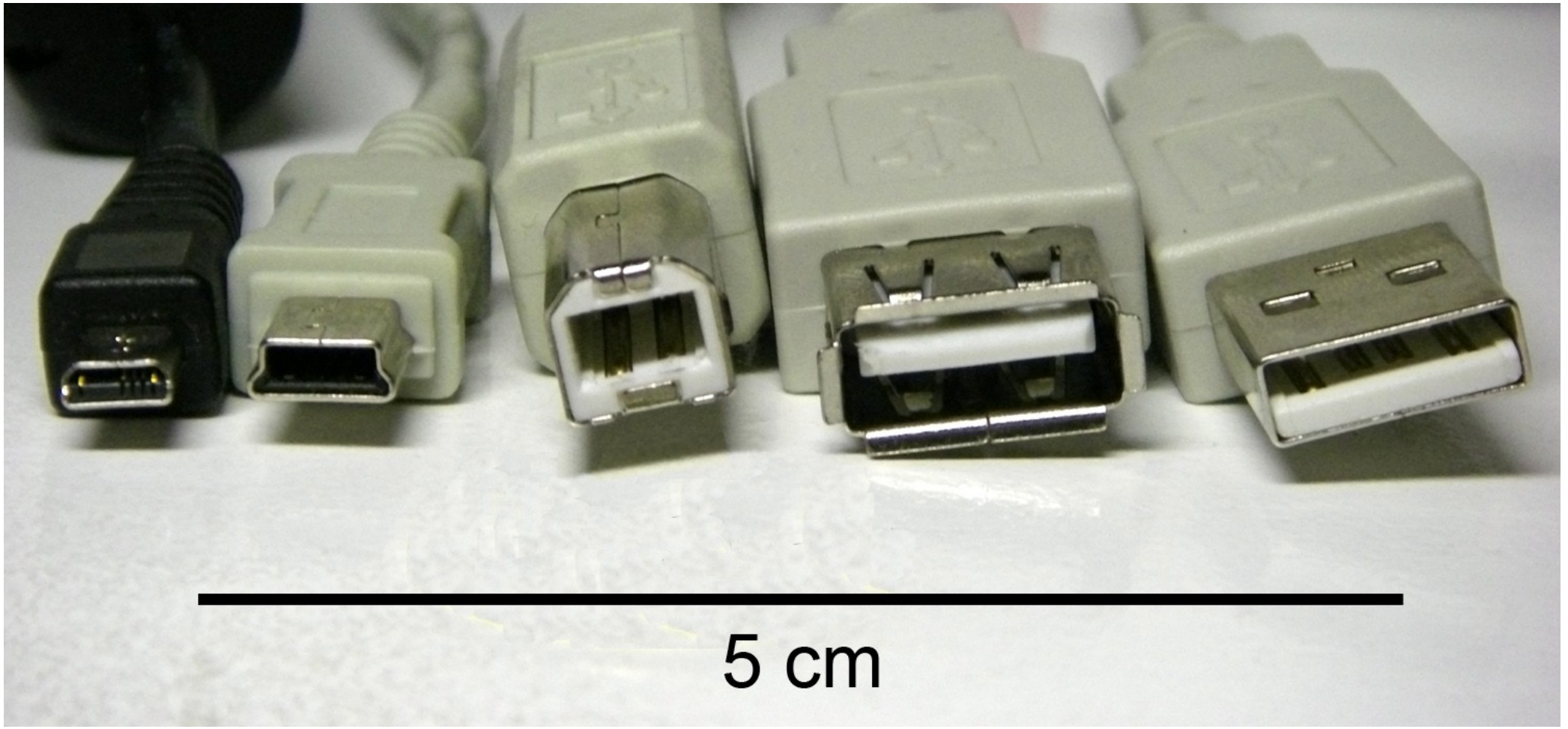


Type A (host or hub)

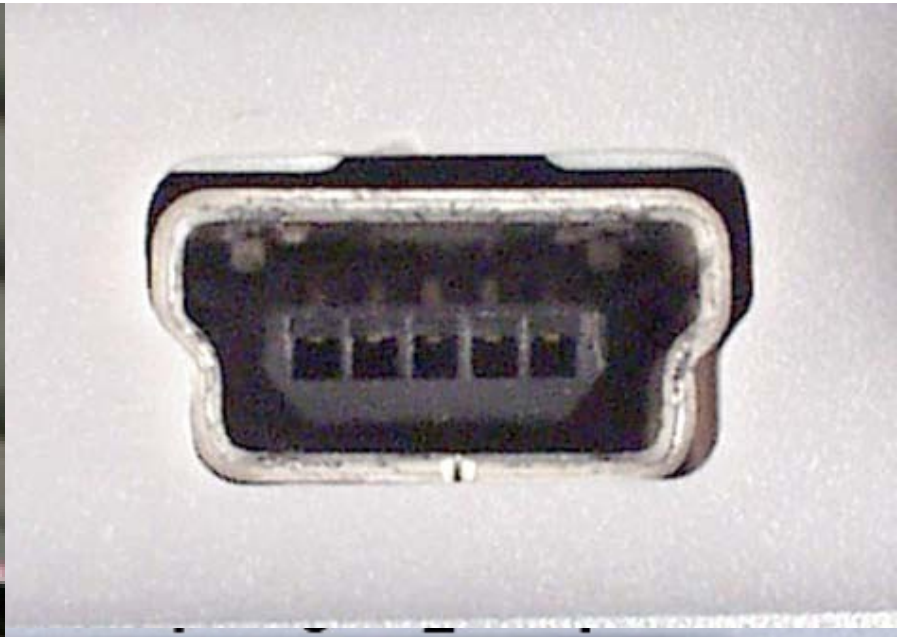


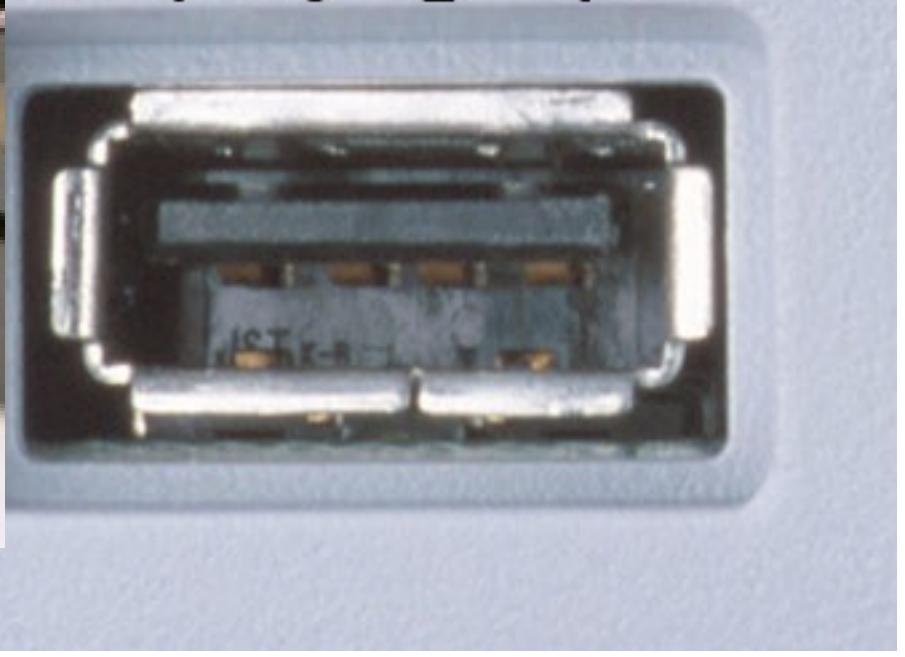
Type B (peripheral)

Typical USB cables

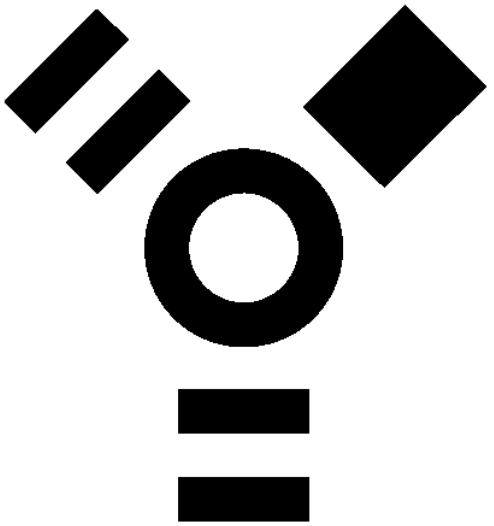


USB Ports





Firewire



FireWire™ Versions

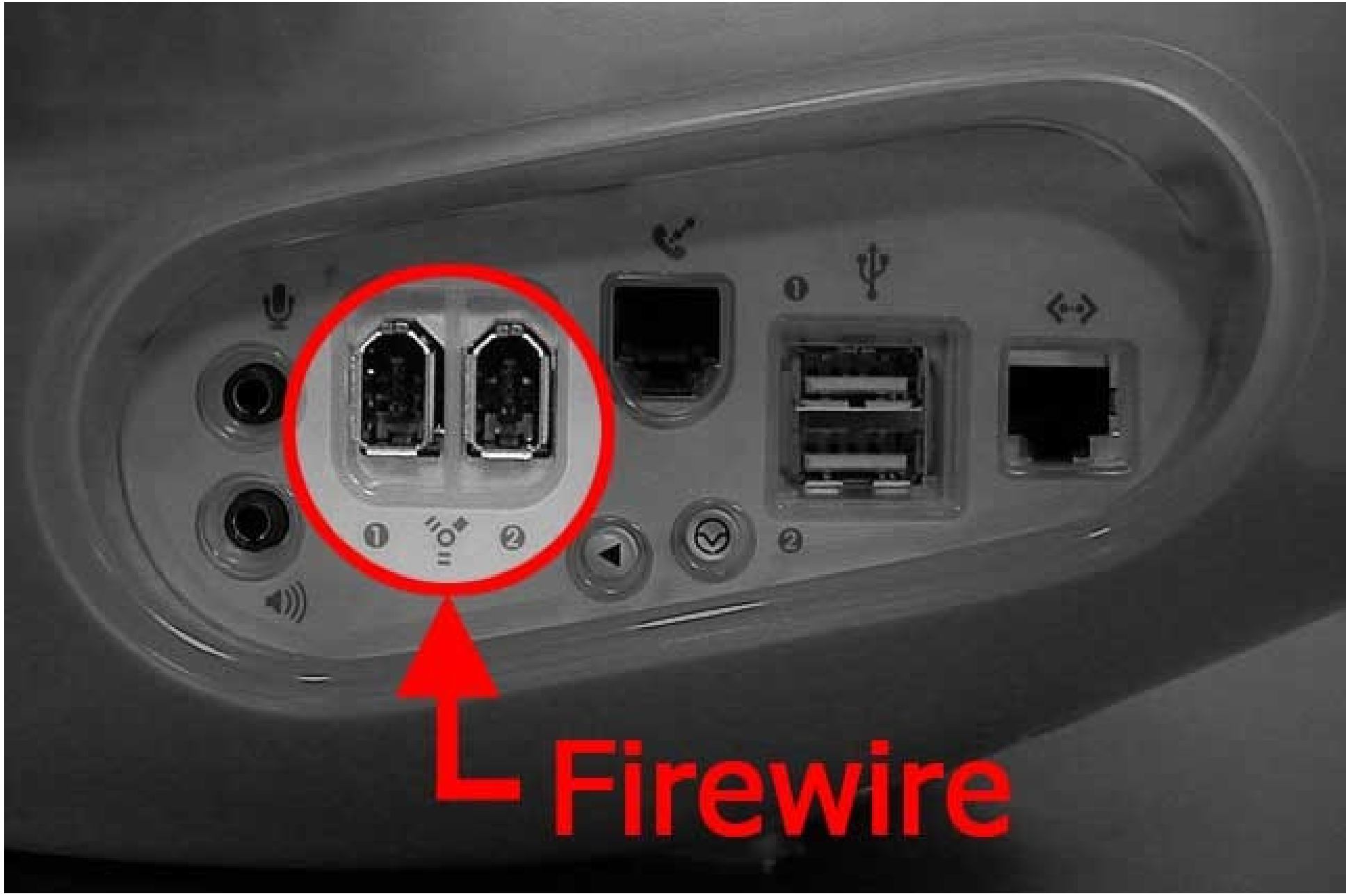
IEEE 1394a

- A.K.A. Sony **i.Link**
- 400 Mbit/sec
- “FireWire” is an Apple trademark equivalent to IEEE 1394a

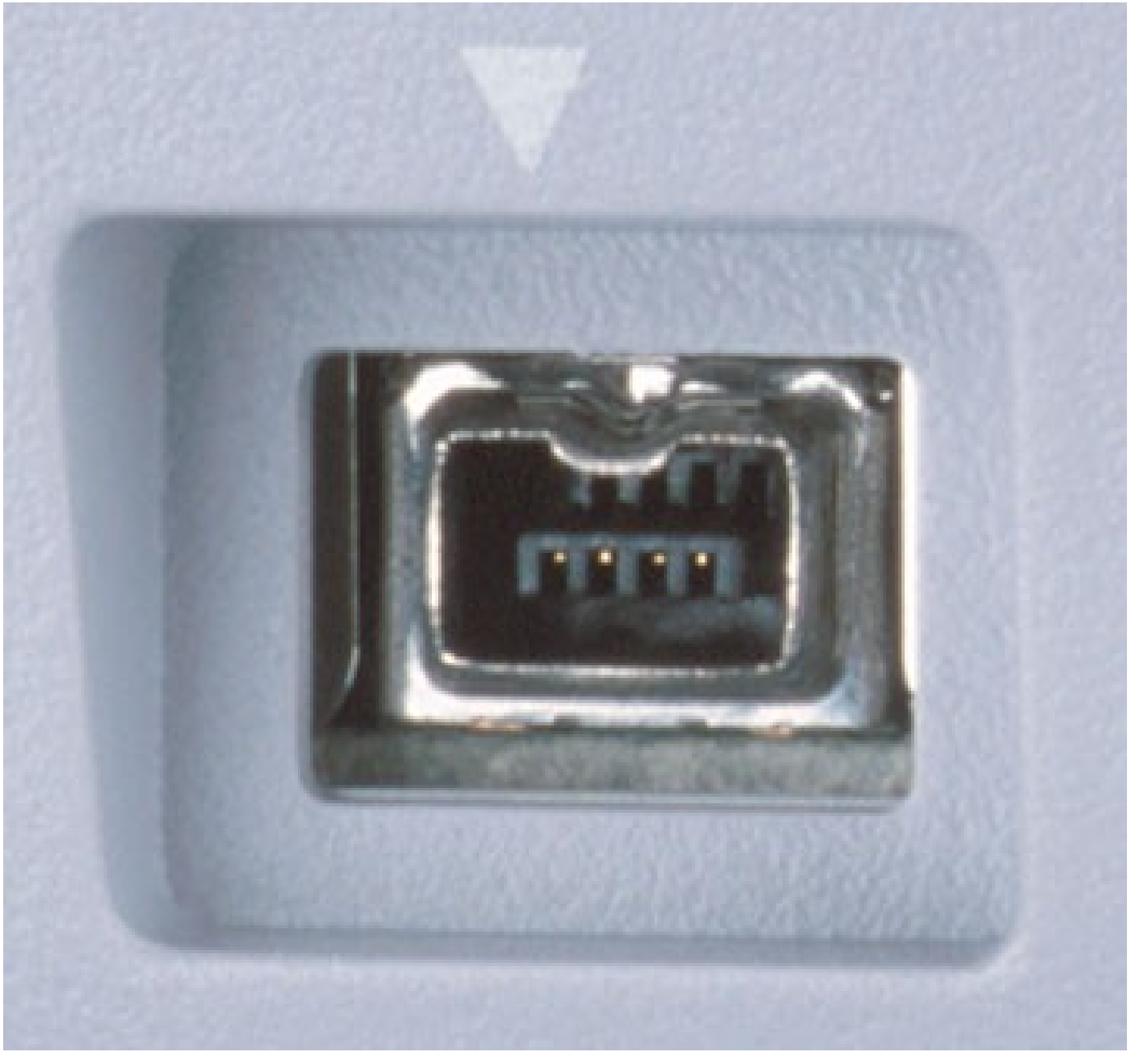
IEEE 1394b

- 800 Mbit/sec
- All 1394b devices (host and peripheral) are backwards compatible with 1394a

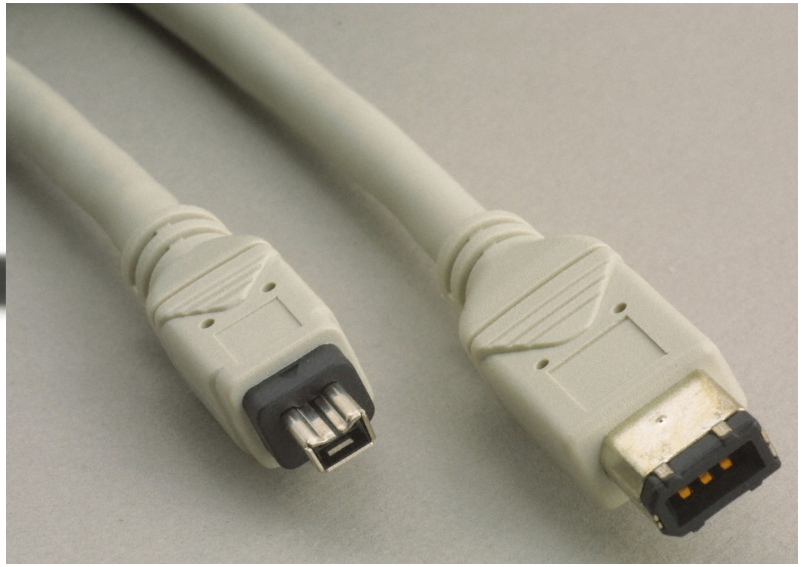
FireWire 400 / IEEE 1394a ports



FireWire 800 / IEEE 1394b port



Typical FireWire cables



Video

13W3 Video

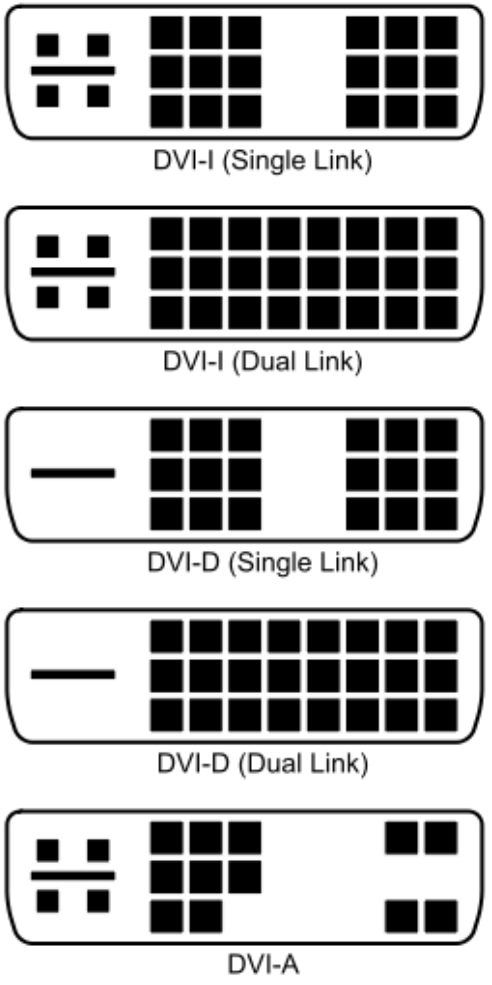
- Found in early workstations (Sun, Apollo, HP, etc.) until late 1990's
- Separate R, G, B coax lines ensured high signal quality

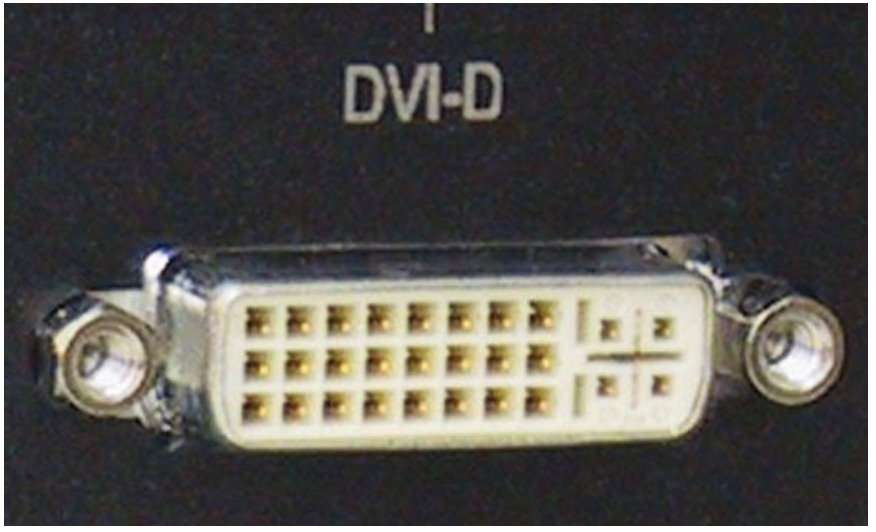
DB-15 / VGA

- Standard IBM PC VGA connector
- Requires heavy shielding for high resolutions
- Analog signals susceptible to interference

DVI (Digital Video Interface)

- Successor to VGA DB15 connector
- Can be analog or digital
- Approx 9 different types of DVI connector are NOT ALWAYS INTERCHANGEABLE!



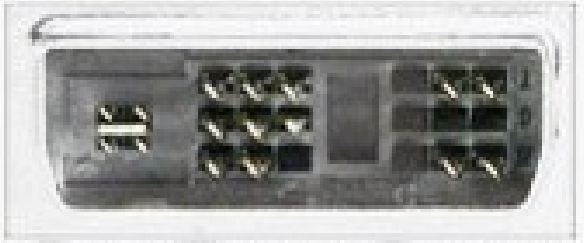


DVI Connector Guide

DVI-I Single Link (analog and digital)

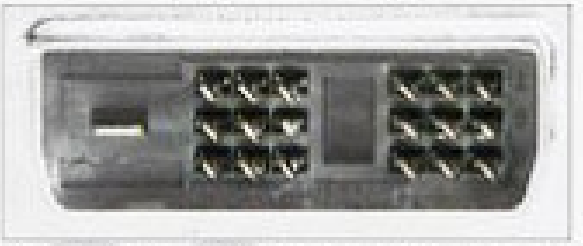
Three rows of 6 pins and two contacts above and below the flat blade

DVI-A (analog only)



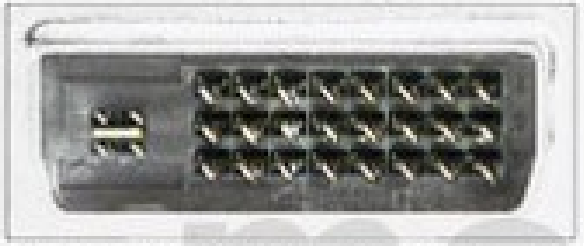
One row of 5 pins, one row of 3 pins and one row of 4 pins with two contacts above and below the flat blade

DVI-D Single Link (digital only)



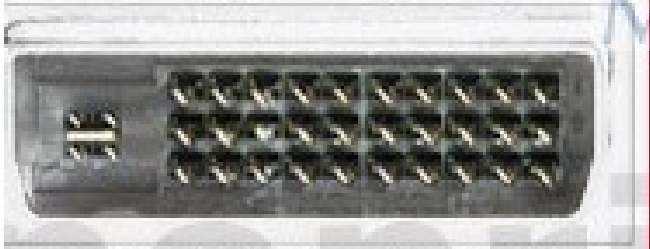
Three rows of 6 pins and no contacts above or below the flat blade

DVI-I Dual Link (analog and digital)



Three rows of 8 pins and two contacts above and below the flat blade

P & D (analog and digital)



Three rows of 10 pins and two contacts above and below the flat blade

DVI-D Dual Link (digital only)

Three rows of 8 pins and no contacts above or below the flat blade

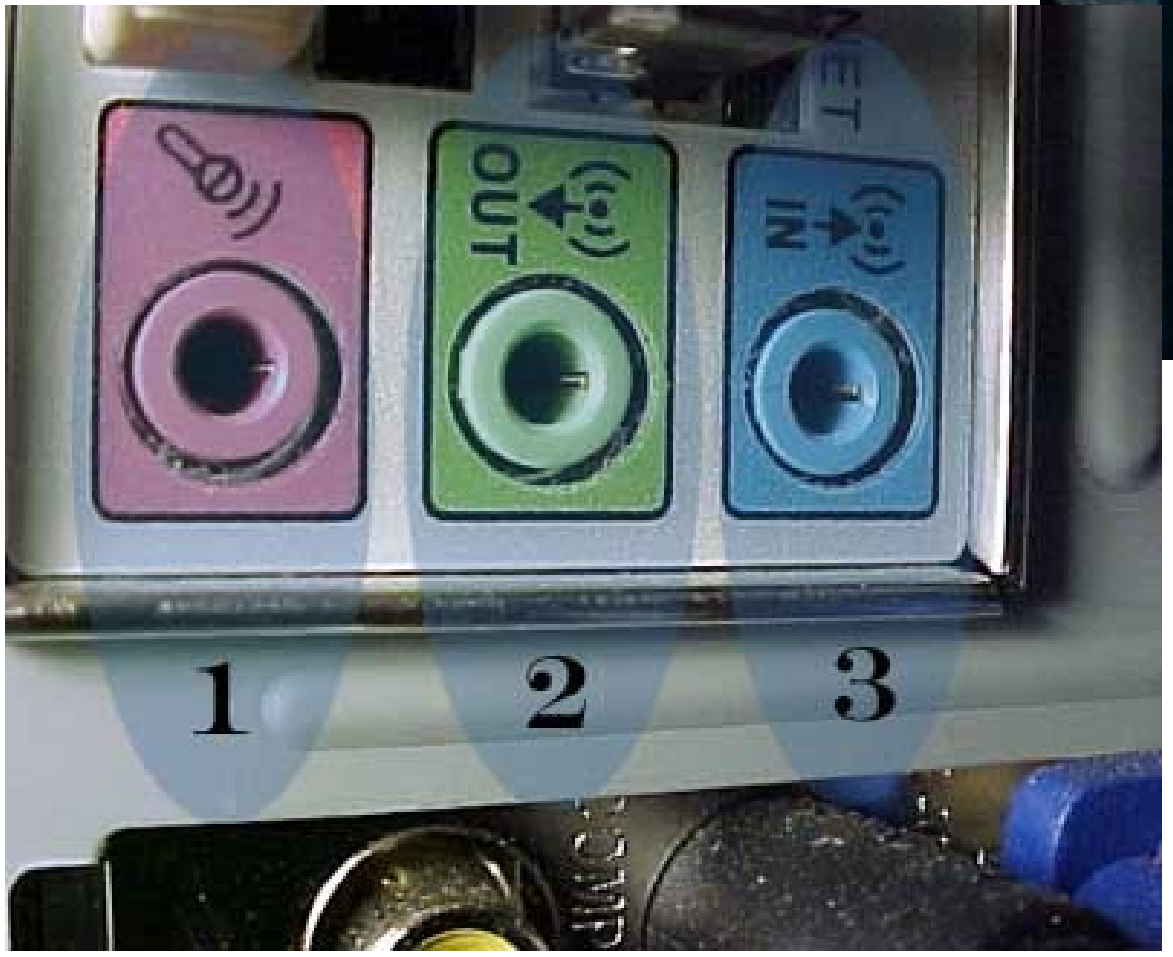
The cable is this DVI-D Dual Link type.

HDMI

- Successor to DVI
- Can handle audio as well as video
- 100% digital interface

Audio

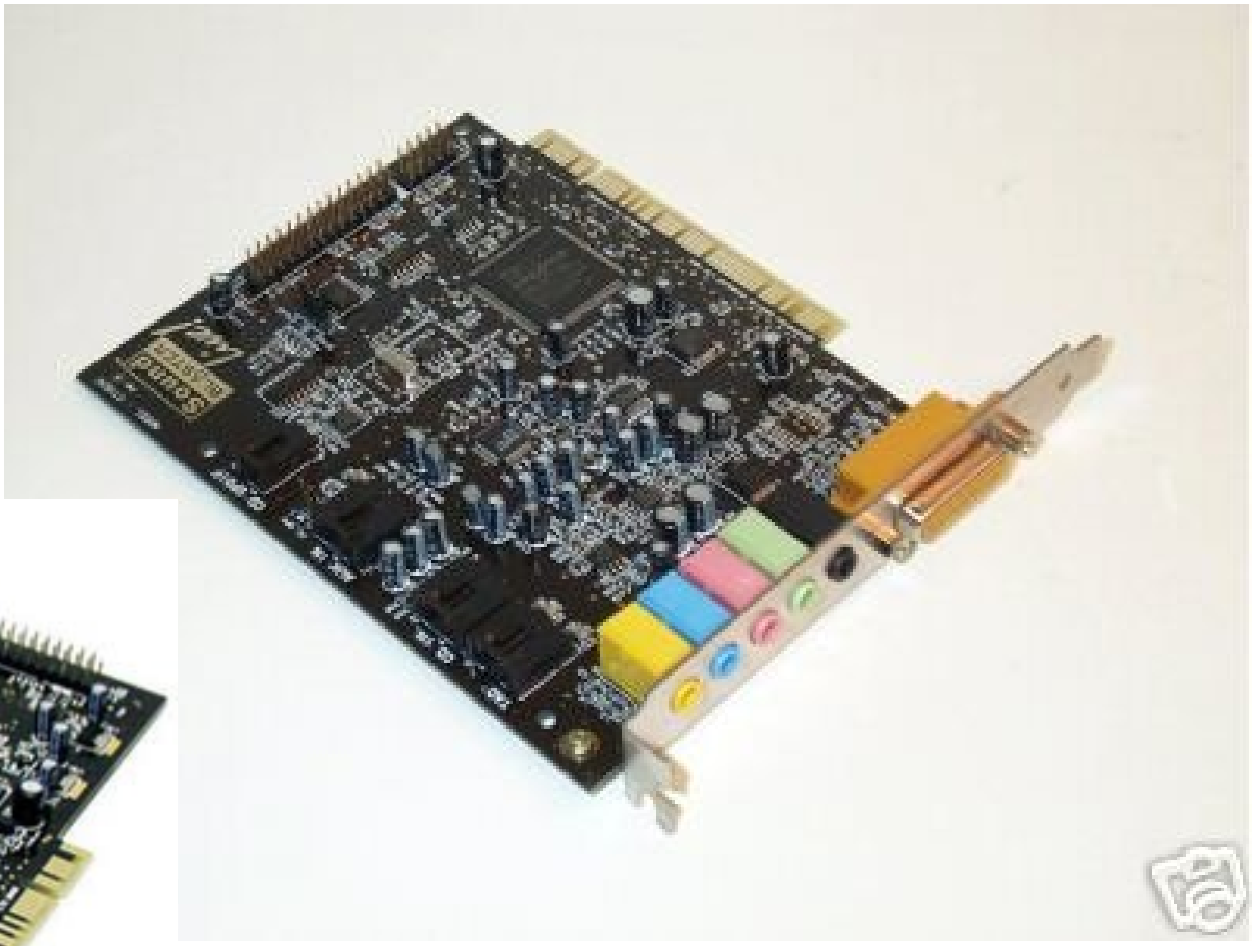
PC99 – color coding!

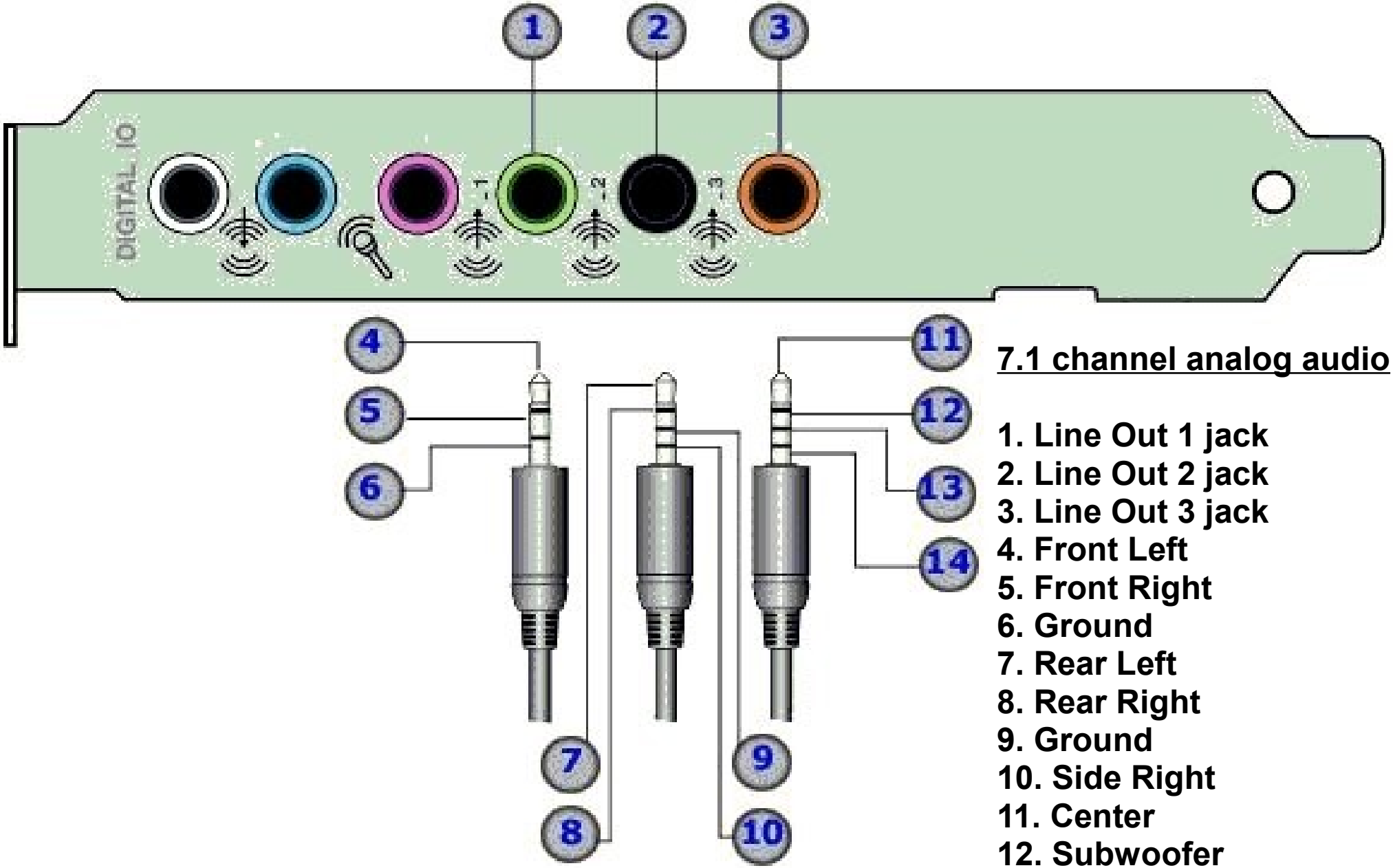


Pink = microphone
Green = audio out (line-level)
Blue = audio in (line-level)

Audio-out jack *may* also produce speaker-level voltage but if so, *must* be auto-detecting based on impedance. Unfortunately, auto-detection doesn't always work!

http://support.creative.com/kb/ShowArticle.aspx?sid=3069

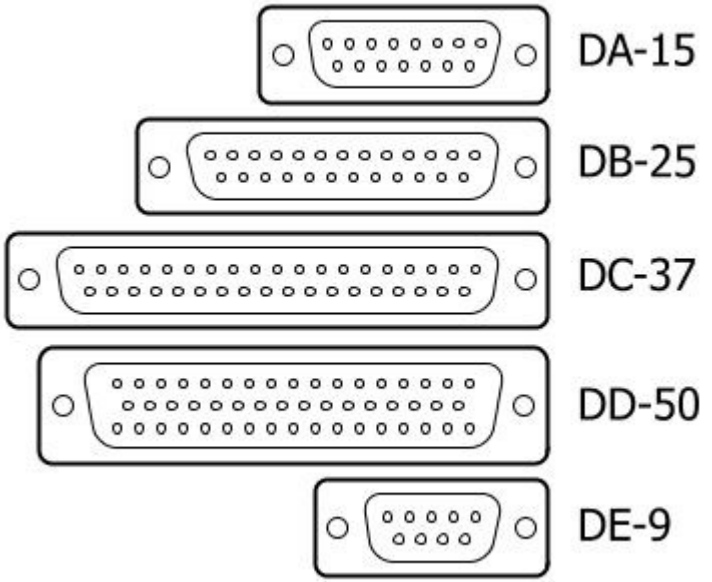




7.1 channel analog audio

1. Line Out 1 jack
2. Line Out 2 jack
3. Line Out 3 jack
4. Front Left
5. Front Right
6. Ground
7. Rear Left
8. Rear Right
9. Ground
10. Side Right
11. Center
12. Subwoofer
13. Ground
14. Side Left

Serial, Parallel, etc.



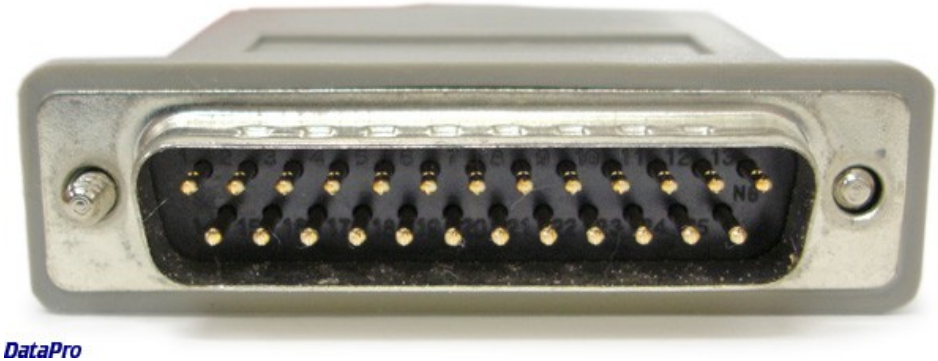
“DB”-style jacks

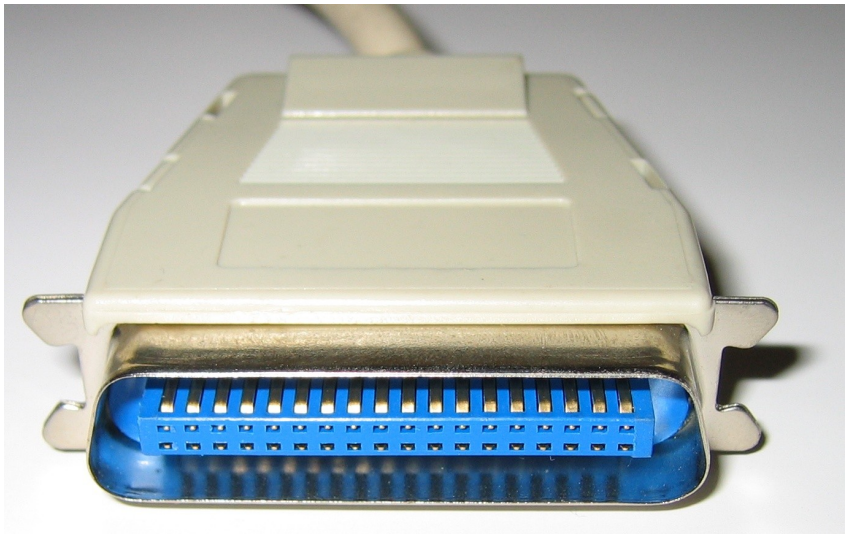
DB9

- Used for RS-232 (modems, mice)
- Monochrome video (IBM PC standard)
- Partial DB-9 (4 pins) sometimes used for FC-AL

DB25

- RS-232 Serial ports (modems, terminals)
- Centronics (printers)
- SCSI-1 (early Apple, Atari, Amiga, etc.)
  - Only usable at asynchronous speeds (5 MBytes/sec)





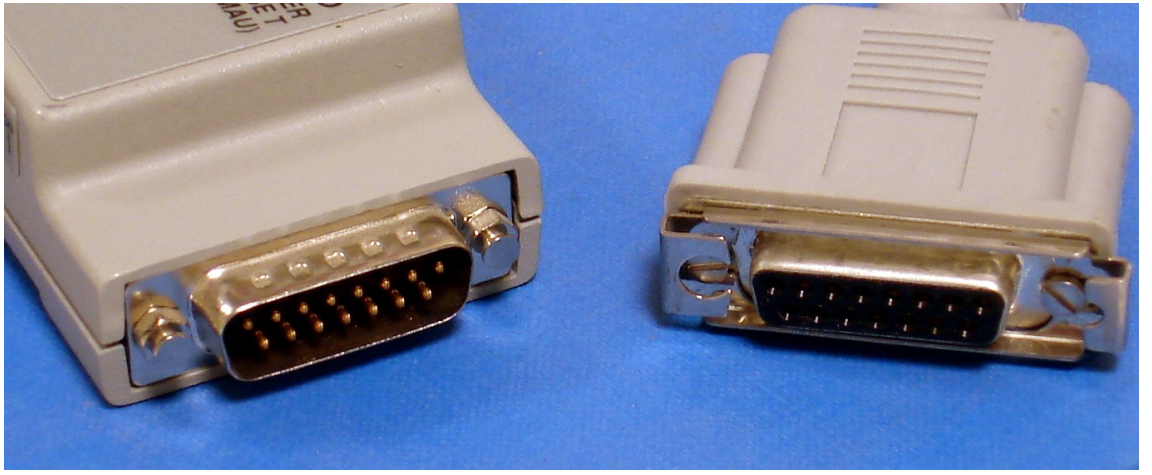
DB15

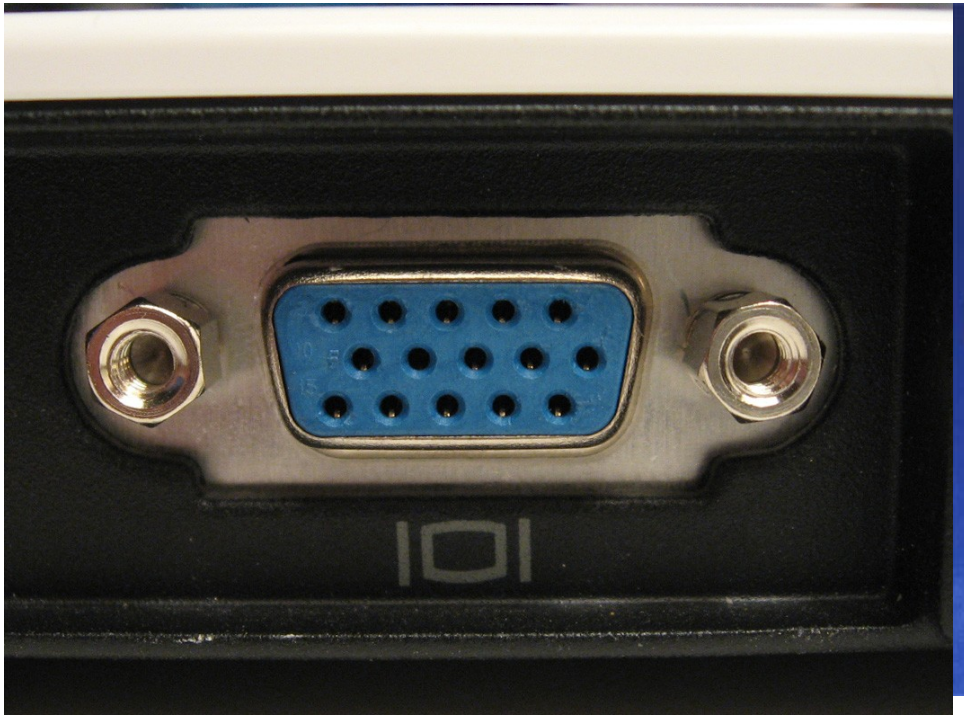
Two-row type

AUI (ethernet)

Three-row type

VGA (video)

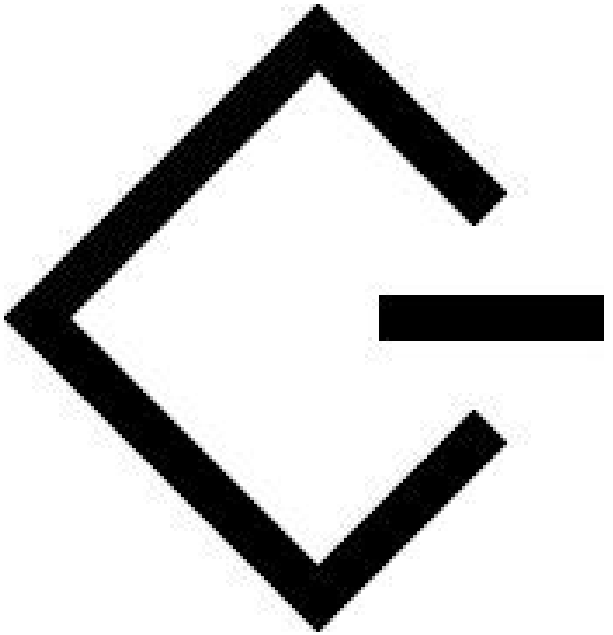




DB50

Used for SCSI-1
applications,
synchronous protocol
up to 10 MBytes/sec

SCSI

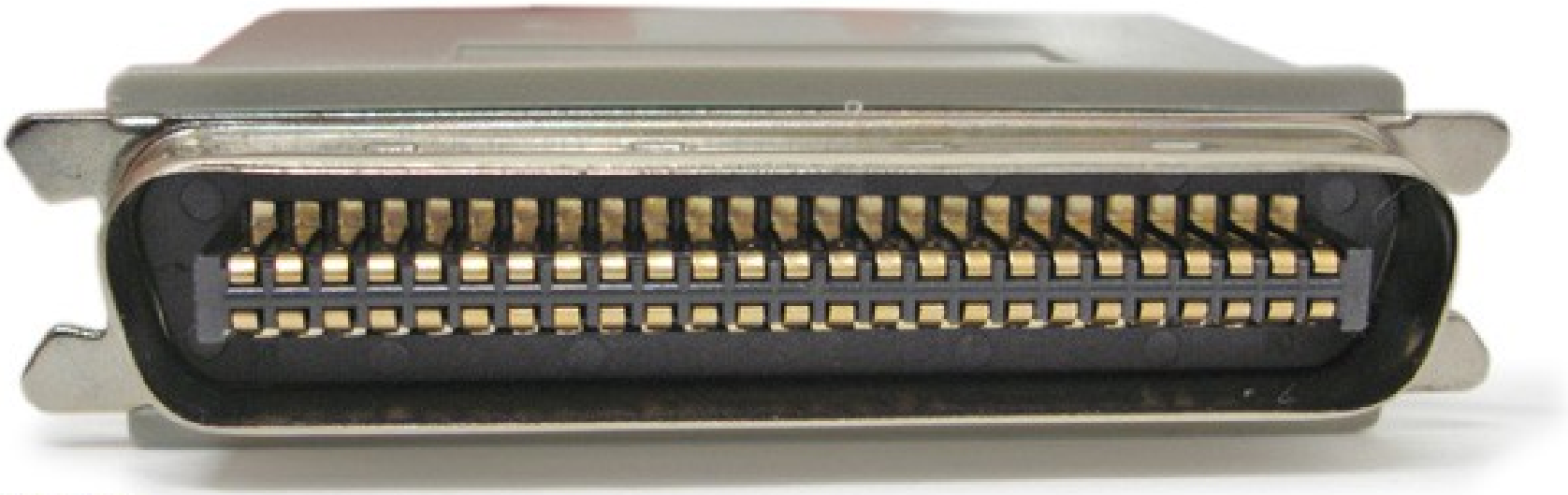


SCSI-1

Officially just “SCSI”

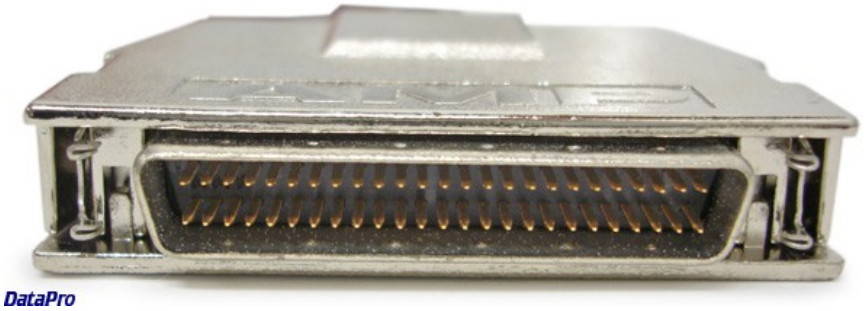
- DB25
- DB50
- Centronics-50

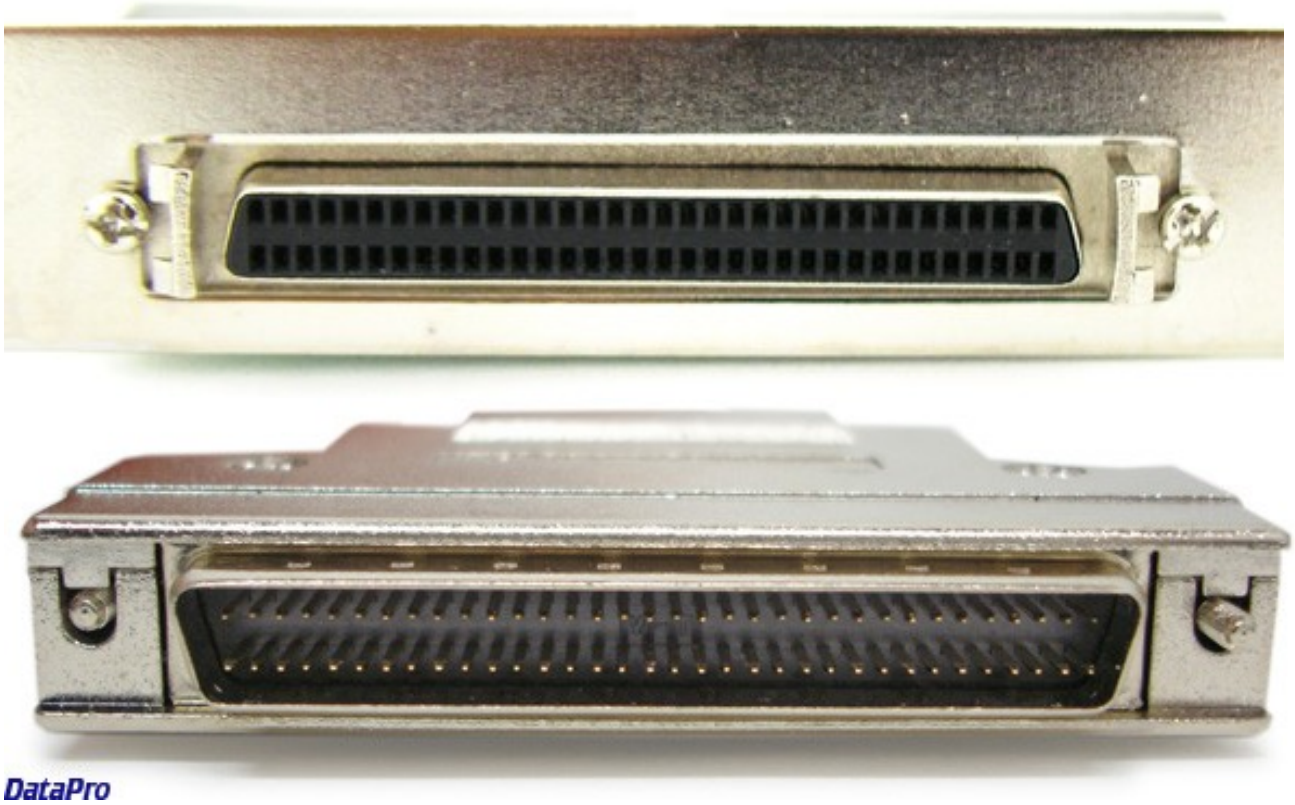
Up to 10MBytes/sec



SCSI-II

- Narrow (8-bit), up to 20 Mbytes/sec
- Wide (16-bit), up to 40 Mbytes/sec
- HD50 and HD68 connectors

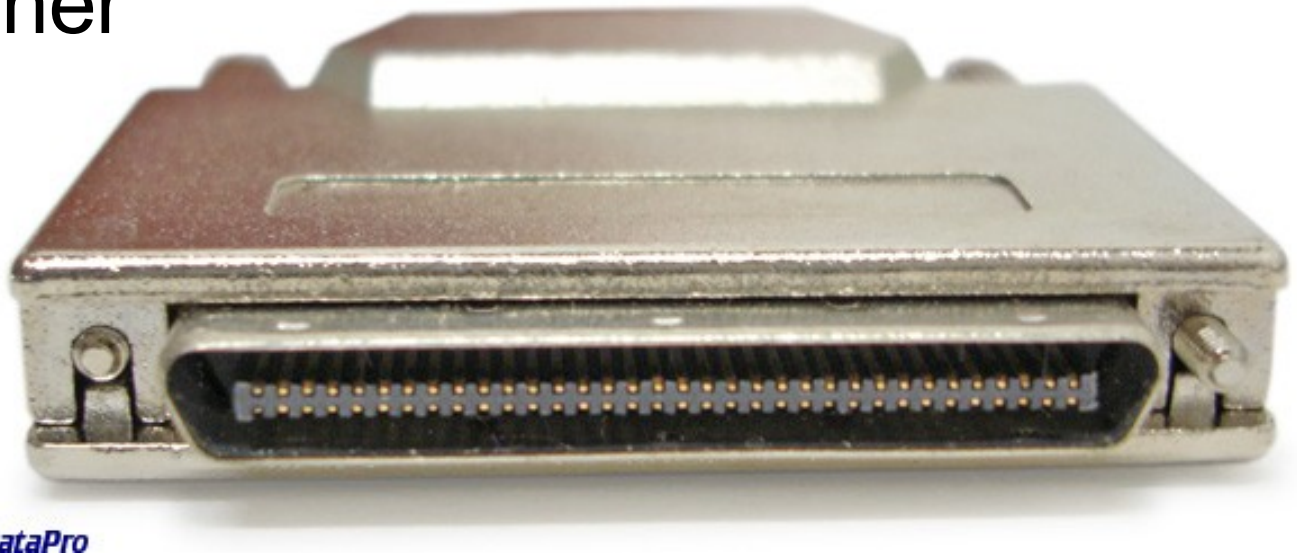




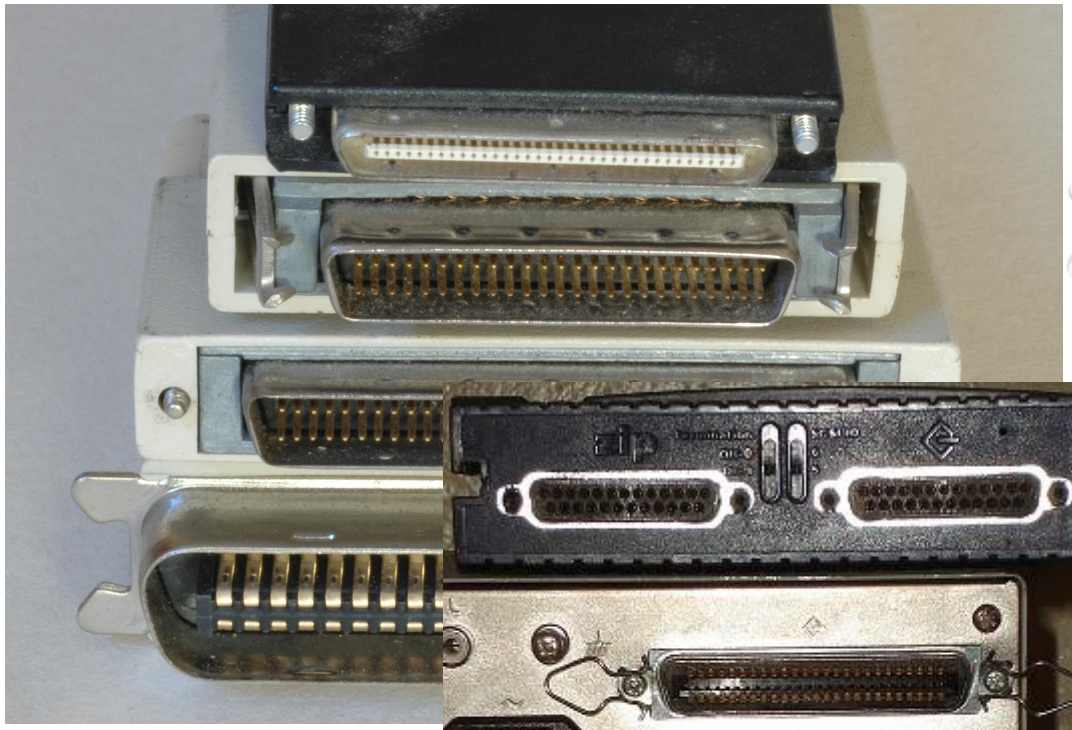
SCSI-III

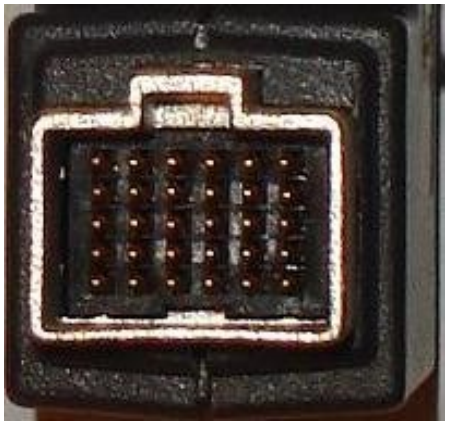
Vast confusion of standards, ranging from 40 MBytes/sec to 640 Mbytes/sec

Various high-density connectors, VHDCI is common for higher speeds

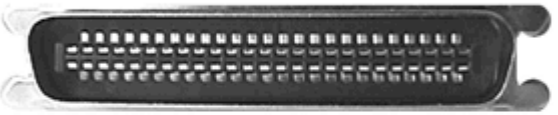


Other SCSI connectors...





DB25m (Mac-SCSI)
Aprox: 39mm

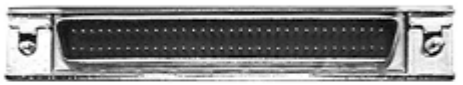


C50m (SCSI-1)
Aprox: 65mm

IDC50m (SCSI-1)
Aprox: 70mm

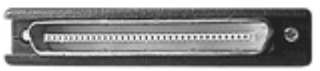
IDC50f (SCSI-1)
Aprox: 67mm

HD50m (SCSI-2)
Aprox: 35mm



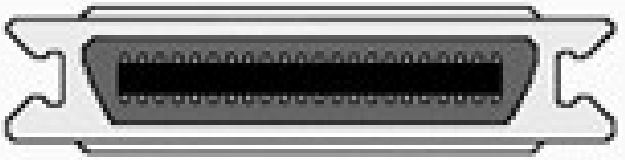
HD68m (SCSI-3)
Aprox: 47mm

HD68f (SCSI-3)
Aprox: 45mm

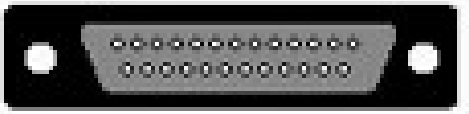


VHDC68m (SCSI-4)
Aprox: 32mm

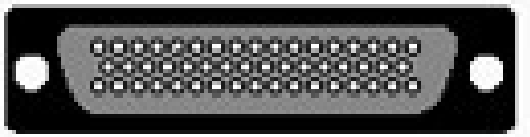
External SCSI Connectors



Centronics 50-Pin

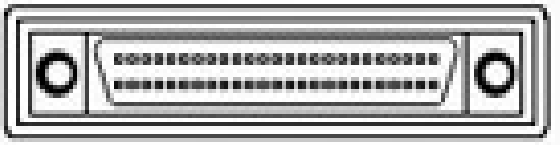


DB 25-Pin



DB 50-Pin

High Density DB 50-Pin (Clip Type)

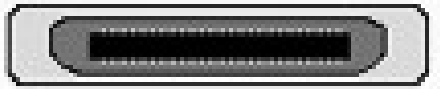


High Density DB 50-Pin (Screw Type)

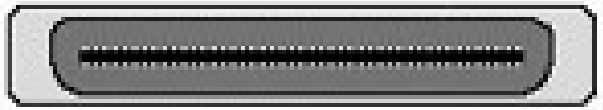
VHDCI 68-Pin

High Density DB 68-Pin (Clip Type)

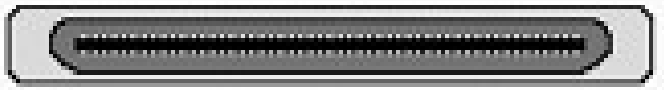
High Density DB 68-Pin (Screw Type)



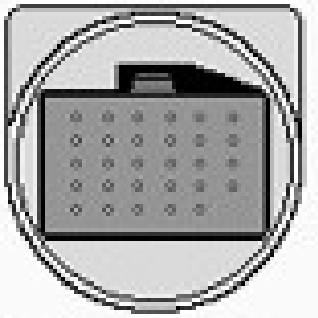
High Density Centronics 50-Pin



High Density Centronics 60-Pin



High Density Centronics 68-Pin

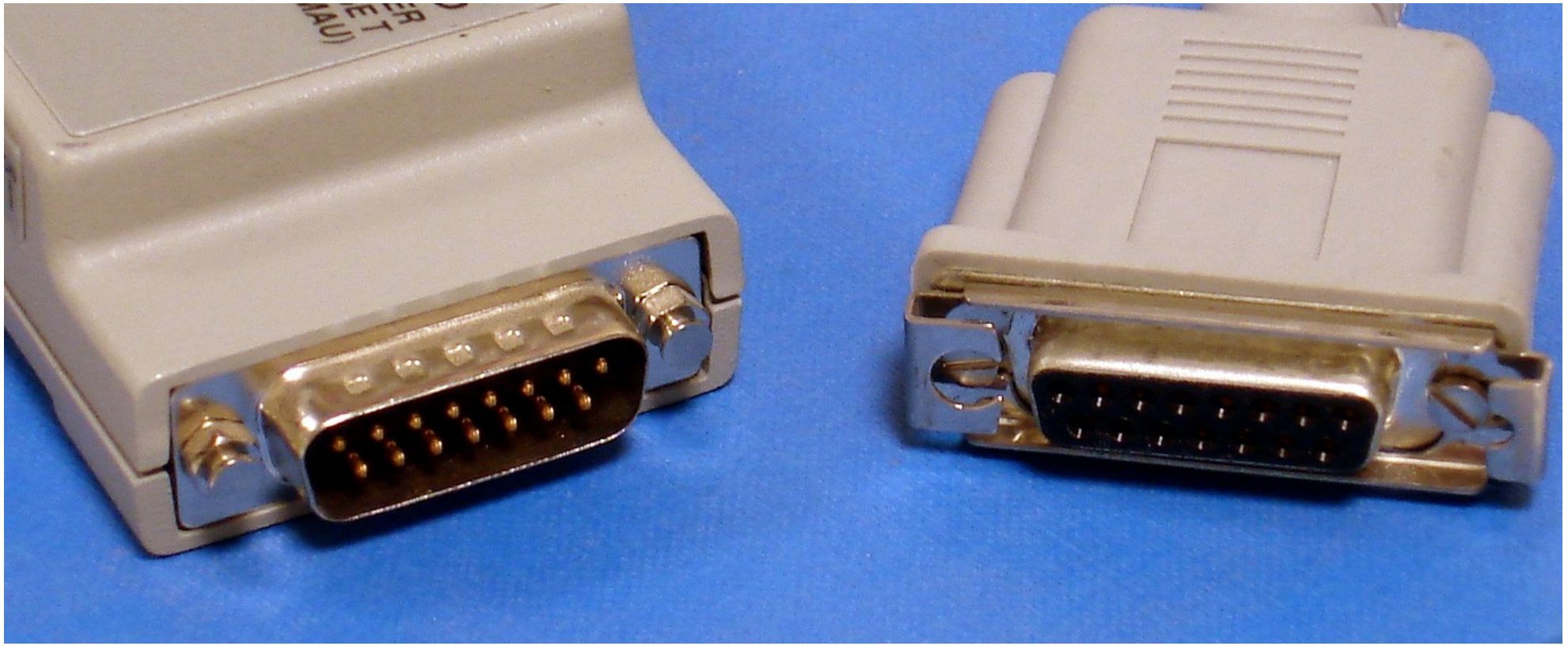


HDI30 (Apple/Mac)

Ethernet

AUI

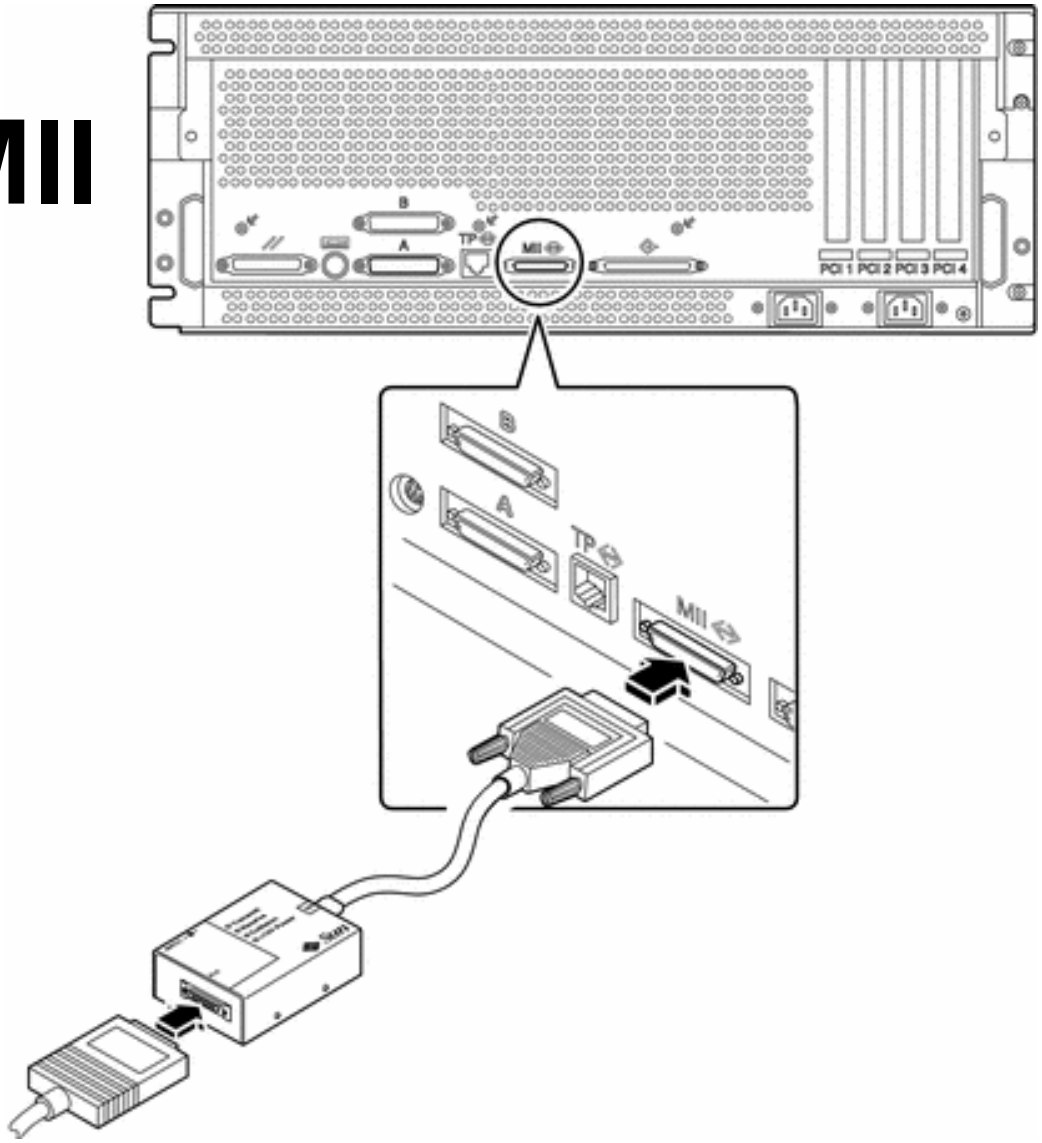
Original 10Mbit/sec
ethernet connection



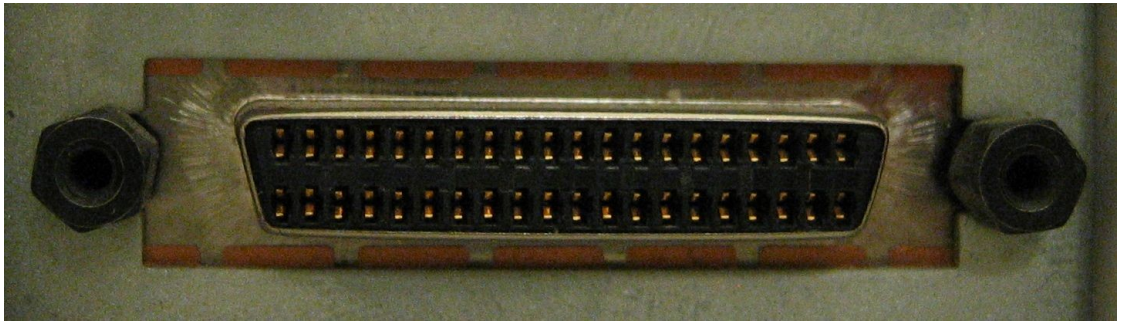
AAUI (Apple AUI)

Remember the *original* embrace-and-extend people?

MII

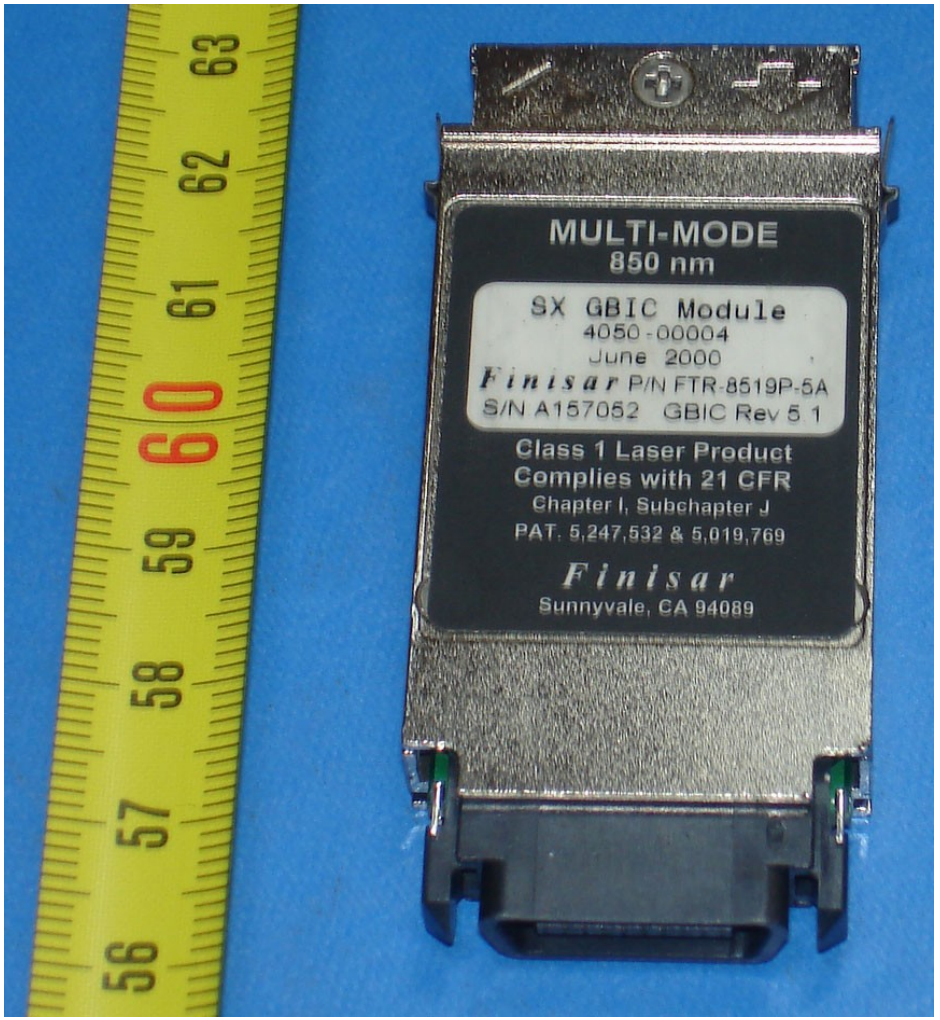


- 100Mbit/sec version of AUI
- Found only on workstations from Sun, HP, etc. and certain routers (typically Cisco)
- Looks like SCSI-2 but isn't



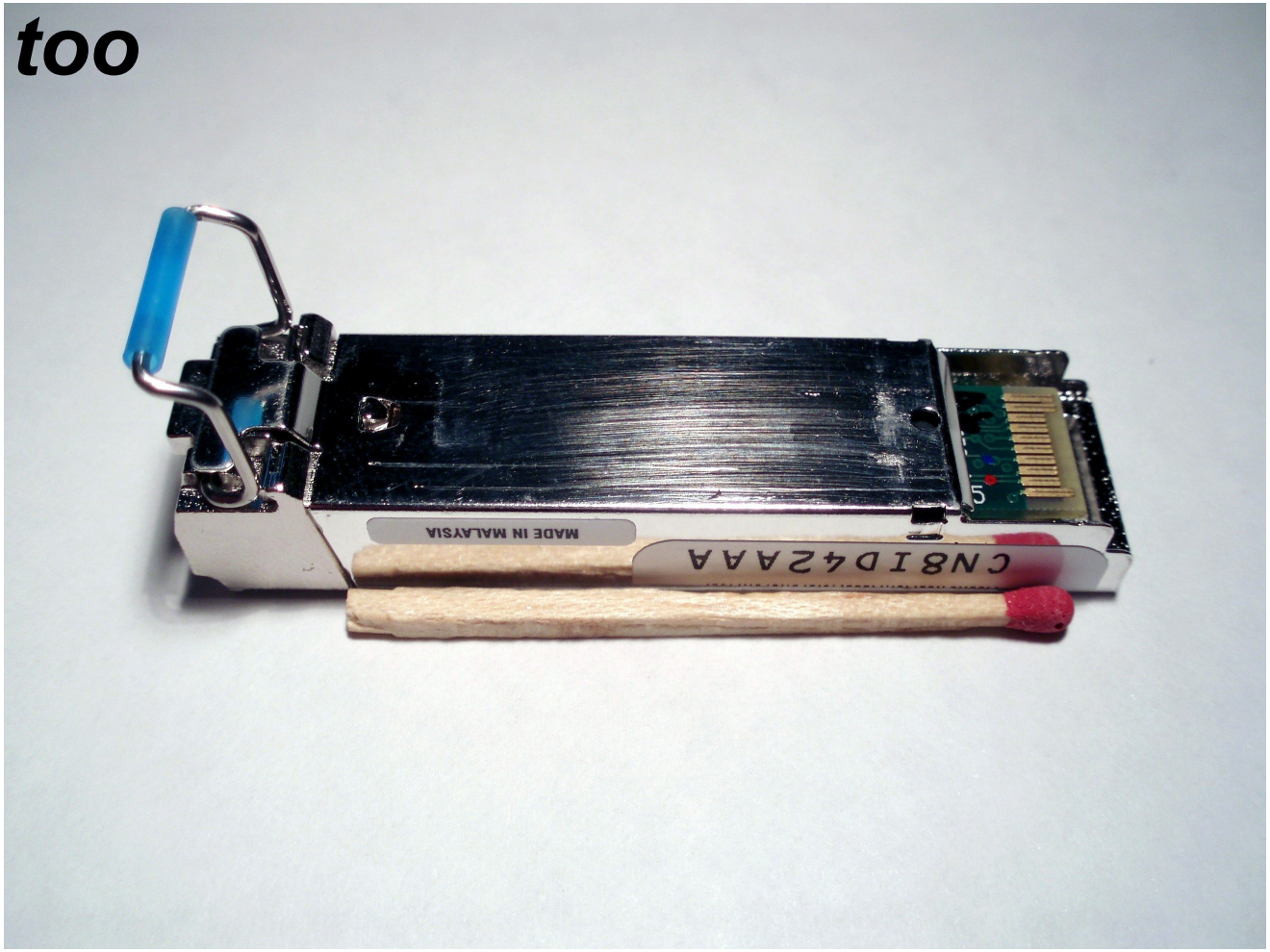
GBIC

Successor to MII, for Gigabit networks



SFP

Small Form-factor
Pluggable... for when GBICs are just ***too darn big***.



XFP

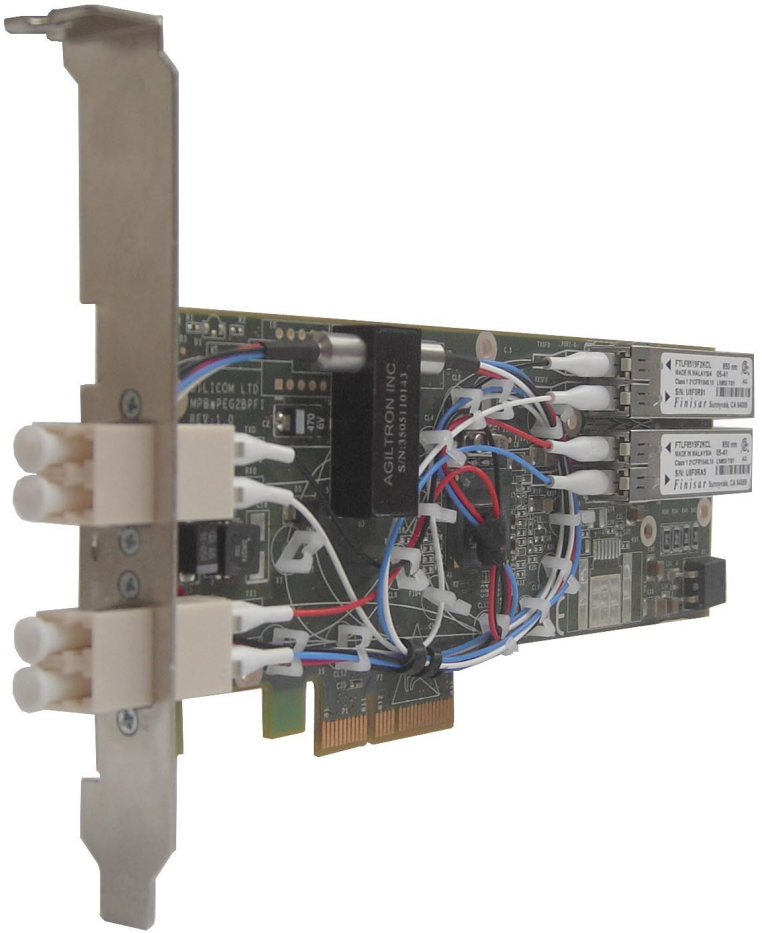
or, 10-gigabit SFP

WTF?

Yup, it's still ethernet.

See the two SFP GBICs at the ***back*** of the card?

Turns out PCI slots are *almost* wide enough to fit a SFP GBIC, but not quite.



Typical ethernet connectors