THE COMPUTER CORNER

No. 265: USB AGAIN

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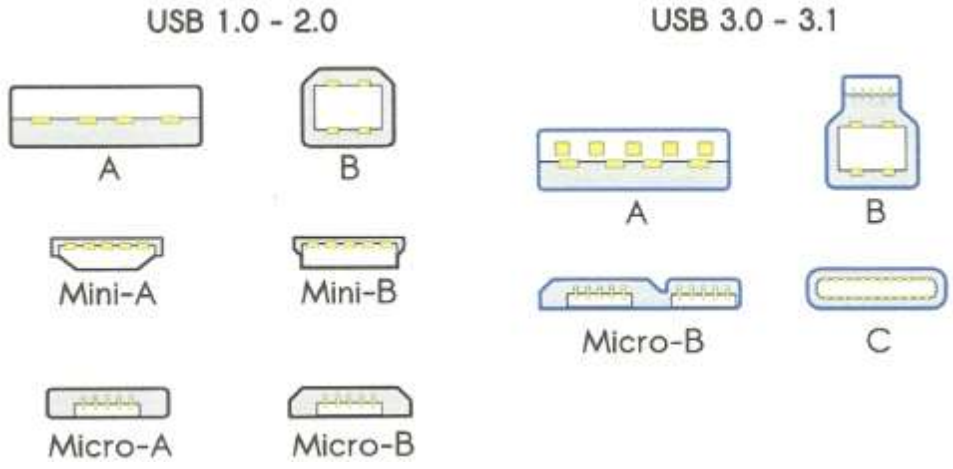
I have written about **U**niversal **S**erial **B**us three times in this column in the past, and have the feeling that I am not done yet even after this time! USB has become so valuable to most users that it is natural for it to expand, improve, and evolve. The past articles were:

#131 USB	Aug 2006	What is it for?
#184 USB	July 2013	What is it and how does it work?
#210 USB HUBS	Aug 2015	What are hubs and which ones to purchase.

USB was developed first in the early 1990's to replace the parallel (printer) and serial ports. Old computers had one PAR and one or two SER ports built in, and if you needed more than that, you were out of luck unless you added more cards to supply more ports. With USB, you could have theoretically up to 127 devices on a single USB bus. Now it is common to have several or even many physical USB ports on a new machine.

Early USB connectors had only 4 contacts, a lot better than 9 needed for serial connectors or the 25 used for parallel (typically printer) connectors. When more contacts than 4 were needed as the usefulness of USB expanded (as in USB-3, where 9 or more contacts were used, study the diagrams below), clever engineers set it up so that when an old 4-contact device was plugged into a socket, it would not make contact with the additional USB-3 only contacts buried deeper in the socket, so it became backward compatible. All kinds of devices began to use the USB ports. Today they connect with keyboards, pointing devices such as mice and other gadgets, digital video and still cameras, printers, portable media players, disk drives, network adapters, and they even serve as battery chargers for cell phones and other devices that like to suck electrons from the computer to fill their own reservoirs. USB ports have become plentiful, but we always seem to need more as our uses increase. And, their configuration has changed.

USB 1 through 2 come in an A configuration, a B configuration, a mini-A, a mini-B and a micro-A and micro-B, as shown by these six cable images on the left from Wikimedia.



In all the cable images, yellow bars or boxes represent copper contacts. USB 3, shown in the four cable images on the right, are always highlighted by a bright blue plastic insulator (rather than black or neutral colored), just as shown. First released in late 2008, USB uses a SuperSpeed transfer mode which boils down to as much as about 3.2 gigabits per second delivered to the application. That is pretty darn fast, and is facilitated by multi-lane operation over existing wires that were intended for flip-flop capabilities in the type C connector (although hard to see and count in the diagram shown in this article, the type C connector has 24 copper contacts).

But, we are not done! The USB 4 specification was released 29 Aug 2019 and it supports 40 gigabit per second throughput! That probably means a future desktop you purchase will connect to its monitor via a USB port rather than a thick, heavy video cable or even an HDMI port. The saga never ends. Until the next update on USB ...

Want to look at the old USB articles? Did you know you can download an Index, and all the Computer Corner files from our website? Yep. Give it a try. Happy Computing!