

Early Logic:

Perhaps the earliest form of "Electromechanical Logic" was with complex relay wiring and solenoids. A system called "Ladder Logic" was developed to deal with this technology. Perhaps some of you have had some experience with "Ladder-Logic", because it's still in use today in many Industrial Controllers.

In these early days, Magnetic Cores were developed as "Gate" Components, and they had some interesting properties, one of which was the ability to electrically alter a single gate to be either a AND Gate or a OR Gate, or even a "Majority" Gate. This obviously could cause some confusion as to final output, because of this flexibility.

The first high speed logic in electrical form was by using vacuum tubes as Gates, known as the 1st Generation "Electrical" Computers. Understand that there were various forms of "Mechanical" Computers in use also. Systems like "Linear-Analog", and "3-Dimensional Cams".

As Transistors matured, they became useful as low voltage and compact logic systems. Few people today are aware that these transistors were primarily "PNP", and used negative voltage, typically -6V. These were incorporated in not only the new "2nd Generation Computers, but even in much of the peripherals of the the newer "3rd Generation" Systems. These were identified as either "Negative-True" or "Negative-False" Logic Systems. Transistors that became available for hobbyists at that time were ones like Ratheon's CK-722.

As the newer technology of Transistor development came along, "NPN" Transistors became available, and used +6V to +18V began to appear. This event caused an interesting problem of dealing with "Negative-True", "Negative-False", and "Positive-True" devices in the same circuit area.

"Interface-Technology" became a serious subject and requirement to teach in those early days.

A new method of incorporating this technology began to appear that carried on for many years. Certain standard "Transistorized Logic" was incorporated on individual circuit boards that were wired together on a "Backplane" by a method called "Wirewrap". Early circuit boards utilized hand wiring that passed through holes in the board. Later these holes were replaced by small rivets, that were soldered to traces that were on both sides of the board. Transistor legs were soldered into the circuit this way. It was a while before new technology of "Plate-Through-Holes" came about.

In terms of "Solid-State-Devices", it has been real interesting to have seen the development with transistor circuits composing gates, F-F's, and timers on circuit boards as "RTL" and even "DTL" to the earliest form of miniaturized devices. These were most often only one or two per package, which as more were incorporated into that one package became known as SSI (Small Scale Integrated) circuits.