Nov. 7th

Diode Vacuum Tube Patent

Nov. 7, 1905

English electrical engineer, John Ambrose Fleming was granted a US patent (803684) for his "oscillation valve", the first diode vacuum tube. It found almost immediate use as a switch because of its much greater speeds than mechanical relays.

Many people had experimented with tubes in the 19th century, including Thomas Edison [Feb 11] and Nikola Tesla [July 10]. However, the technology only became practical with Lee de Forest's 1906 three-terminal "audion" tube, which later evolved into the triode [Oct 20]. At the time, Fleming accused de Forest of copying his ideas. Even worse, Fleming's patent was later invalidated by the US supreme court, but that didn't prevent him from being knighted in 1929.

Paul M. Foster

Born: Nov. 7, 1934;

Robinson, Illinois
Died: June 23, 2003

Paul Foster was a Merry Prankster [Dec 14], an illustrator for Ken Kesey's [May 13]1973 "Garage Sale" book, a founding member of Wavy Gravy's Hog Farm commune [Jan 21], and also a programmer during the 1950's, "in the days of wooden transistors" as he would say.

He was drawn to the Hippie scene through his ownership of "The Offstage", a coffeehouse in San Jose in the 1960's, where he hired various musicians who later became founding members of the Grateful Dead and Jefferson Airplane. Through them, he met Kesey, and gave up computing to join the Pranksters. He went on to draw the Acid Test [Jan 12] Posters, as well as the Acid Test 'diploma', one of which sold for $24,000 in 2012 at a sale of Rock and Roll memorabilia.

Foster moved to San Francisco in 1983 and resumed his programming career, working for NASA and at Apple.

In the 1969 *Life* magazine special on Woodstock, Foster appears in a full page picture wearing a top hat and a multi-colored checked overalls. He can also be glimpsed in the *Woodstock* documentary by Michael Wadleigh.

His and Laura Foster's wedding at Aspen Meadows in New Mexico during the summer solstice celebration in 1968 was the subject of a series of pictures by Lisa Law, known for her photographic history of the 1960's.

Barbara Jane Liskov (nee Huberman)

Born: Nov. 7, 1939;

Los Angeles, California

Liskov has made numerous contributions to the foundations of programming languages and system design. Her research projects have included the Venus OS, a small, low-cost, interactive time-sharing system; the design and implementation of CLU, an early object-based language; Argus, the first high-level language to support distributed programs; and Thor, an object-oriented database system.

Liskov''s and Jeannette Wing's definition of subtyping, commonly known as the Liskov substitution principle, specifies how objects of a given type can be safely replaced by objects of a subtype.

Her 1968 Ph.D. thesis at Stanford was about chess endgames, and was supervised by John McCarthy [Sept 4]. In 1961, she had applied to study at Princeton, but received a form letter explaining that it didn't accept female students.

Barbara Liskov (2010). Photo by Kenneth C. Zirkel. CC BY-SA 3.0.

Although she was one of the earliest female Ph.Ds in computer science, she wasn't the first; see [June 7].

Gordon Eubanks Jr.

Born: Nov. 7, 1946;

Oklahoma

Eubanks worked with Gary Kildall [May 19] during the early days of his Digital Research company; Kildall had formerly been his graduate advisor at the Naval Postgraduate School in Monterey. Eubanks' thesis was concerned with a compiler for a version of BASIC for Kildall's CP/M OS [June 22].

While still a naval officer, Eubanks wrote the popular CBASIC compiler for the IMSAI 8080 [Dec 16]. Some friends said he called it "CBASIC" because he wrote it while serving on a submarine (at sea).

Eubanks left Digital Research after two years because: "It became clear to me that Digital Research did not have the will to win and they were losing opportunities. So I went off and did my own thing."

Eubanks spent 15 years as CEO of Symantec Corp [April 24], turning it into a profitable software utility and anti-virus business.

Eubanks is a stamp collector, specializing in items issued in

the US between 1847 and 1861. He has won the American Philatelic Society's "Champion of Champions" award twice.

John M. Cioffi

Born: Nov. 7, 1956;

Illinois

Cioffi is called "the father of the Digital Subscriber Line" (DSL). In particular, his team at Amati Communications came up with a DSL modulation approach called discrete multitone (DMT).

DMT makes one phone line look like hundreds of subchannels, and improves transmission using what Cioffi calls an inverse Robin Hood strategy: "Bits are robbed from the poorest channels and given to the wealthiest channels."

He also designed the world's first Asymmetric Digital Subscriber Line (ADSL) and Very-high-speed Digital Subscriber Line (VDSL) modems, which account for around 98% of the world's more than 500 million DSL connections.

The amazing utility of ADSL was demonstrated in a research project conducted by Andrews & Arnold (a UK network provider) entitled "ADSL Works Over Wet String" in Dec. 2017. As long as the string was soaked with brackish water, data could be successfully sent and received, albeit at low speeds.

As "DSL's father", lawyers often ask Cioffi to be an "expert witness" in lawsuits. At one time, he estimated that he was receiving five such phone calls a day.

The Kansas City Standard

Nov. 7-8, 1975

Jerry Ogdin and Les Solomon, editors of *Popular Electronics* magazine [Dec 19], wrote an article in the Sept. 1975 issue setting out how to record computer data as audio tones on a cassette. Their HITS (Hobbyists' Interchange Tape System) used two tones to represent 1s and 0s.

It was a good idea, and a number of manufacturers started using similar, but incompatible, approaches. Wayne Green [Sept 3], of BYTE magazine, wanted these manufacturers to produce a single standard. A two-day meeting to hammer out the details was arranged in Kansas City, and attended by 18 people.

The resulting system was mostly based on Don Lancaster's [Sept 00] design which had been published in BYTE's first issue in September. The March 1976 magazine went on to feature two hardware implementations by Lancaster and Harold Mauch, but they only ran at 300 baud.

This meant that a typical 8KB BASIC program would take five minutes to load, which was woefully slow. Most audio cassette circuits could easily support higher speeds (e.g. as shown by the Tarbell Cassette Interface [Dec 00]). Solomon duly noted: "Unfortunately, it didn't last long; before the month ended, everyone went back to his own tape standard and the recording confusion got worse."

First Internet Radio

Nov. 7, 1994

The University of North Carolina's student radio station, WXYC (89.3 FM), became the first traditional radio station to broadcast regularly on the Internet, by connecting to a system at SunSite (later called Ibiblio), that was running Cornell's CU-SeeMe software [April 26].

Atlanta's WREK (91.1 FM) also started streaming on the same day, but using custom software called CyberRadio1. However, this was a beta launch and the stream wasn't publically advertised until later.

The first Internet-only radio network, NetRadio.com, started a year later, on [Nov 10] 1995.

Pets.com Closes

Nov. 7, 2000

After just two years of business, Pets.com, an icon of the dot-com bubble [Aug 9; March 10], closed, laying off 80% of its employees. In fact, measured from its IPO to liquidation, it had lasted just 268 days.

The remaining staff began selling selling sock puppets of the company's mascot, which had been prominently featured in its extensive and expensive marketing campaigns.

The sock puppet had become quite famous – it had appeared on ABC's "Good Morning America", and had a balloon made in its image for the 1999 Macy's Thanksgiving Day Parade. A story was circulated claiming that it was planning to enroll at the Wharton School of Business.

The Pets.com sock puppet. Photo by Jacob Bøtter. CC BY 2.0.

In Jan. 2000, the company made its most famous 'investment', spending more than $3 million for 30 seconds of advertising during the Super Bowl.

In retrospect, Pets.com's demise seemed inevitable – it lacked a workable business plan and lost money on nearly every sale because it was selling merchandise for approximately one-third the price it had paid

for it. All told, it burned its way through around $300 million of investment capital.

Other companies that suffered a similar fate from the same period include Webvan (for online grocery shopping) and Boo.com [May 18] (for branded fashion apparel).