Dec. 19th

Adin D. Falkoff

Born: Dec. 19, 1921;

New Jersey
Died: Aug. 13, 2010

Falkoff helped Kenneth E. Iverson [Dec 17] develop "A Programming Language" (APL) at IBM, with Iverson explicitly crediting him with choosing the name, and of using an IBM Selectric typewriter [June 23] typeball to provide APL's extended character set. Falkoff also wrote the landmark article, "A Formal Description of System/360" [April 7], which defined that system using APL.

In an interview, Falkoff recalled one IBM manager remarking that APL couldn't be all that good because two of the smartest guys he knew, Iverson and Falkoff, couldn't make people believe in it.

Space Broadcast

Dec. 19, 1958

President Dwight D. Eisenhower's Christmas message became the first radio broadcast sent from space. It was transmitted from the US Army's Project SCORE (Signal Communications by Orbiting Relay Equipment) satellite, which had been launched from Cape Canaveral the day before.

The taped message was: "This is the President of the United States speaking. Through the marvels of scientific advance, my voice is coming to you from a satellite circling in outer space. Through this unique means I convey to you, and to all mankind, America's wish for peace on Earth and goodwill toward men everywhere."

The tape player failed to start during the satellite's first orbit, but on the second pass the message was communicated via the backup device. The signal was fairly weak, and very few radio receivers were able to pick it up. Most people heard the message when it was rebroadcast on conventional news programs.

After 12 days the satellite's batteries failed and it reentered the Earth's atmosphere on Jan. 21, 1959, and burnt up.

Project SCORE was the first endeavor of the new "Advanced Research Projects Agency" (ARPA [Feb 7]), which had been hurriedly created in response to the Soviet launch of Sputnik 1 on [Oct 4] 1957. Aside from proving that the communications hardware worked, SCORE also acted as a test run for the Atlas rocket.

Altair 8800 Kits

Dec. 19, 1974

The Altair 8800 microcomputer kit was released by Micro Instrumentation and Telemetry Systems (MITS). For $395 you got everything you needed to build a computer boasting an Intel 8080 processor [April 18] and 256 bytes of memory (expandable up to a staggering 64 KB).

An Altair 8800 with an added 8-inch floppy disk system. Photo by Michael Holley.

The Altair used toggle switches for input and sported LEDs for output. A 100-line bus allowed for the easy addition of hardware cards, and this later evolved into the S-100 bus standard [Aug 28].

The Altair wasn't the first microcomputer; arguably, it was the fourth, after the French Micral-N [Jan 15], the Scelbi-8H [March 00]), and the mildly successful Mark-8 [July 00]. But it was the Altair that spurred the industry into high gear.

Ed Roberts designed the circuitry, and Bill Yates the board layout. At the time, MITS was running short of cash, and a $65,000 bank loan financed the machine's design and initial production. Roberts' dream was to break even by selling perhaps 200 Altairs. In fact, within three months he was scrambling to keep up with demand, and had a backlog of over 4000 orders.

The first prototype was finished in Oct. and shipped to *Popular Electronics* magazine in NYC for the photo shoot that would become the famous cover of the Jan. 1975 issue. Disastrously, the machine was lost in transit, and so the Altair that actually appears in the picture was an empty case (note that none of the LEDs are lit).

At the time, the loss led to rumors that the machine was a sham. Also, the next completed Altair came with a different board layout than the one described in the magazine piece, including the replacement of the 100-wire ribbon cable by a bus.

One of the great myths concerning the machine is the origin of the "Altair" name. One popular story is that Les Solomon, the technical director at *Popular Electronics*, asked his daughter for a suggestion, and she came up with "Altair", because "that's where the Enterprise is going in this week's episode"; of course, she was referring to the "Star Trek" [Sept 8] TV show. However, Altair is only mentioned in one episode: "Amok Time", which first aired on Sept. 16, 1967, seven years before. But perhaps she caught it in reruns?

Alternately, Forrest M. Mims III [Jan 15] (co-founder of MITS) stated in the Nov. 1984 issue of *Creative Computing* that the Altair was originally going to be named the PE-8 (Popular Electronics 8-bit), but Solomon thought the name rather dull.

Solomon, Alexander Burawa (associate editor), and John McVeigh (technical editor) decided that "It's a stellar event, so let's name it after a star." Within minutes, John McVeigh had come up with "Altair".

Incidentally, "Altair IV" is the location for the classic 1950's sci-fi movie "Forbidden Planet" [March 23].

Verilog Design Begins

Dec. 19, 1983

Verilog is a hardware description language used to model electronic systems, typically at the register level. Before Verilog, engineers had usually simulated their designs at the schematic or gate level.

The first version was developed by Prabhu Goel, Phil Moorby, Chi-Lai Huang, and Douglas Warmke. Their company was acquired by Cadence Design in 1989 which released Verilog into the public domain the next year.

This precipitated a "languages war" in the electronics industry between VHDL [Aug 00] and Verilog because of their quite different coding styles: strong vs. weak typing, an Ada-like language vs. C-like, and deterministic execution vs. non-deterministic. Both languages survived the fight, and now coexist peacefully, often used together in the same design process.

Verilog is a portmanteau of the words "verification" and "logic".

AIDS Trojan

Dec. 19, 1989

"AIDS Trojan" carried out the first known ransomware attack after being sneaked onto PCs via 5.25 floppy disks labeled as an "AIDS Information Introductory Diskette". Around 20,000 copies were mailed to people, mostly at medical research institutions.

The software would record the number of times that the host computer had been booted, and when the count reached 90, it would attack, hiding directories and encrypting files. It then prompted the user to 'renew' its 'license' by sending $189 to a PO box in Panama.

Fortunately, it employed symmetric cryptography to lock the files, and this was fairly easily cracked. Of course, later ransomware 'fixed' this weakness by switching to public key encryption (e.g. see [Sept 5], [May 12]).

A Harvard-trained evolutionary biologist was eventually identified as the author of the software, and was extradited to Britain on ten counts of blackmail and criminal damage. He defended himself by saying that the money would go towards AIDS research. Meanwhile he exhibited increasingly strange behavior while he awaited trial. This included wearing condoms on his nose, a cardboard box on his head, and putting curlers in his beard to ward off the threat of radiation. In Nov. 1991, Judge Geoffrey Rivlin determined that the individual was unfit to stand trial, and he was deported to the US.

VGMusic.com

Dec. 19, 1996

The Videogame Music Archive was launched by Michael Newman, and has grown to include tens of thousands of pieces of music from numerous games.

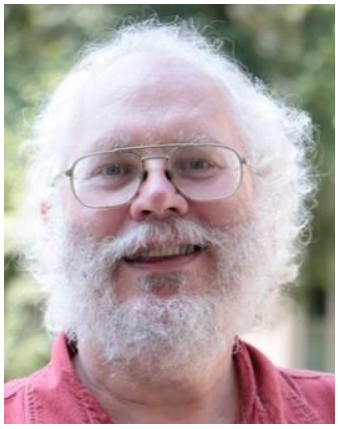
The site accepts remakes, covers and remixes, but rejects direct reproductions and rips. This has kept it from being attacked for copyright infringement.

Shor's Algorithm Demo

Dec. 19, 2001

In the journal *Nature*, a team from IBM and Stanford reported the first implementation of "Shor's Algorithm." The algorithm was proposed by Peter Shor back in 1994 as a way to factor a number using a quantum computer.

A fully general-purpose version of the algorithm would make many cryptosystems much easier to break, and so the proposal sparked a tremendous amount of interest in quantum computers, which has continued to this day.



Peter Shor (2018). Photo by Rosalee Zammuto. (c) MIT.

The team's implementation utilized 10^{18} molecules, each one made up of the nuclei of five fluorine and two carbon atoms. This sounds a lot, but amounted to about a thimbleful of liquid.

The molecules formed a seven-qubit (quantum bits) computer, and when it was pulsed with electromagnetic waves and monitored using NMR (Nuclear Magnetic Resonance), correctly performed a factorization. Perhaps a little disappointingly, it was only designed to factor 15 (i.e. into 3 and 5).

Nabil Amer, manager of IBM's Physics of Information Group, remarked: "Although the answer may appear to be trivial, the unprecedented control required over the seven spins during the calculation made this the most

complex quantum computation performed to date."

For a larger qubit quantum computer, see [Feb 13].