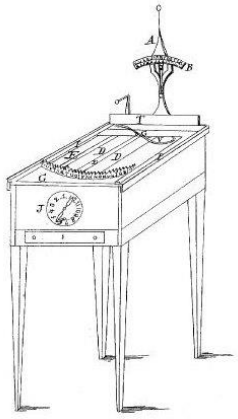
July 23rd

The Typographer
July 23, 1829

William Austin Burt (1792 – 1858) patented an awkward but workable typewriter, called the typographer, making it the first writing machine developed in the US. However, Pellegrino Turri had built an earlier typewriter prototype in Italy back in 1808.

The typographer was a rectangular wooden box, 12 inches wide, 12 inches high, and 18 inches long, with a rotatable lever on the front. The typeface letters were mounted on a short rod attached to the end of the lever, and pressing down imprinted a selected letter onto the paper. When a page was finished it was torn off a long roll.



Burt's "typographer" (1829). US Patent 5581X.

Burt's typographer generated a lot of interest, but didn't become a commercial success probably because it was slower to operate than writing by hand.

Christopher Latham Sholes is usually given credit for inventing the first "practical" typewriter in 1868.

Daniel D. McCracken
Born: July 23, 1930;

Hughesville, Montana
Died: July 30, 2011

McCracken wrote many respected programming textbooks, most notably the first one on FORTRAN, "A Guide to FORTRAN Programming" (1961), which sold over a million copies, in various editions.

He has been called the "Stephen King" of how-to programming books. (Not because of their spine-tingling, horrifying contents, but because of their sales.)

He first encountered FORTRAN in 1958 at New York University, and believed his first FORTRAN program was for calculating heat flows in liquids. However, his FORTRAN text wasn't his first – he'd written "Digital Computer Programming," in 1957.

In 1970, he earned a master of divinity degree, but didn't join the clergy. In 1972 he was one of the four editors of "To Love or to Perish: The Technological Crisis and the Churches."

Differential Analysers
July 23, 1947

The first practical general purpose differential analyser was designed by Vannevar Bush [March 11] and constructed by Harold Locke Hazen at MIT, from 1928-1931. It was used to solve differential equations using a wheel and disk mechanism, and could be "programmed" by changing its gear ratios with a screwdriver and wrench. Today it would be called an analog computer.

Bush initially called the machine a "continuous integraph", but introduced the "differential analyser" name in an article in October 1931 . It was also often described as "an oversized erector set," since it filled a good sized room. When Douglas Hartree [March 27] brought Bush's design back to England [Jan 24], the erector set pieces were replaced by proud British Meccano [Nov 30].

Although Bush's analyser became very influential, it wasn't the first machine to implement the mechanical integration of differential equations. That was due to William Thomson (Lord Kelvin) in 1872-3 with his tide-predicting machine [July 20].

Bush's second analyser, unveiled in 1935, utilized around 2,000 valves, as many relays, 150 electric motors, and weighed close to 100 tons. Its calculations were controlled by instructions fed to it on paper tape. The successful use of these technologies influenced the design of later digital machines.

In 1936 Claude Shannon [April 30] was hired to manage the analyser, and this prompted him to see the utility of using Boole's logic [Nov 2] to explain the circuitry.

After WWII, General Electric constructed a differential analyser for UCLA's College of Engineering, which became operational on this day. The close proximity of Hollywood, meant that this analyser appeared in many 1950's sci-fi movies, including "Destination Moon" (1950), "When Worlds Collide" (1951), and "Earth vs. the Flying Saucers (1956)". In that movie it operated a (fictitious) handwriting device.

First Live Trans-Atlantic TV
July 23, 1962

The first live trans-Atlantic television broadcast was made via the Telstar 1 satellite. It featured CBS's Walter Cronkite and NBC's Chet Huntley in New York, and the BBC's Richard Dimbleby in Brussels. The first segment included a major league baseball game between the

Philadelphia Phillies and the Chicago Cubs at Wrigley Field.

Telstar was part of a multi-national agreement between AT&T, Bell Labs, NASA, the British Post Office, and the French National PTT (Post, Telegraph & Telecom Office) to develop satellite communications across the Atlantic. It had been launched by Delta rocket from Cape Canaveral 13 days earlier on July 10.

The satellite was roughly spherical, measured 34.5 inches in length, and weighed about 170 pounds. Its outer surface was covered with solar cells to generate power.

Telstar also relayed the first telephone call through space later the same day, but enthusiasm waned after users realized that there was a half-second delay due to the 25,000-mile transmission path.

A song commemorating the launch entitled "Telstar", by the English surf-rock group *The Tornados*, was released on August 17, 1962, and topped the charts for three weeks.

Although no longer functional, Telstar remains in orbit today.

Jeffrey Adgate (Jeff) Dean

Born: July 23rd, 1968;

Honolulu, Hawaii

Dean designed large portions of Google's advertising, crawling, indexing and query serving systems, along with various pieces of its distributed computing infrastructure.

He and Sanjay Ghemawat (his pair programming partner on many project) wrote an influential paper on MapReduce, a system for parallizing large-scale data processing applications. Google's crawling and indexing system is implemented as MapReduce tasks [July 13].

Dean, Ghemawat, Greg Corrado, and Andrew Ng [April 18] set up the "Google Brain" project in 2011 to build a deep learning system on top of Google's cloud computing infrastructure. In June 2012, it trained itself to recognize a cat based on watching YouTube videos.

Dean and Ghemawat are the only "Senior Google Fellows" -- those mortals having attained level 11, a measure of career development created specifically for them.

Within Google, there's a website dedicated to making Chuck Norris-like jokes about Dean. For example: "Jeff Dean writes directly in binary. He then writes the source code as documentation for other developers."

Before joining Google, Dean worked for the World Health Organization, developing software for the statistical modeling, forecasting, and analysis of HIV, and other epidemics.

Selectric Bug

July 23, 1984

The Selectric Bug was a sophisticated digital eavesdropping device, developed in the mid-1970s by the Soviets. It was designed to fit inside IBM Selectric II and III typewriters [July 31] and was virtually invisible and undetectable.

Following a tip off from the French, eleven tons of business equipment used at overseas embassies was shipped back to the US for analysis by the NSA. The leader of the team, Walter Deely, offered a $5,000 bonus for the first person to find a bugging device.

On this day, technician Michael Arneson noticed an anomaly in the power switch of a Selectric typewriter and decided to x-ray the machine. Eventually, implants were found in 16 Selectric typewriters used at the US Embassy in Moscow and the US Consulate in Leningrad.

The bugs were hidden inside a hollow support bracket at the bottom of the Selectric's keyboard, and could be remote controlled from outside the building. When a typewriter was turned on, it sent its data via short bursts of radio to a nearby listening post.

This type of eavesdropping is now called a *side-channel attack*; for another example, see [June 14].

Amiga 1000

July 23, 1985

Commodore [Oct 10] unveiled the Amiga 1000 (aka A1000), the first reasonably priced multimedia computer at a star-studded gala featuring Andy Warhol and Debbie Harry in NYC. Warhol used the new ProPaint software to create a portrait of Harry. He later made a series of digital drawings including a Campbell's soup can, Botticelli's The Birth of Venus, and flowers.

For only $1200, it supported graphics, sound, and video good enough for many broadcast professionals to adopt it for their special effects needs. Its multimedia hardware was designed by Jay Miner [May 31], the engineer behind the Atari 800 [Nov 00]. Three of the custom chips inside the A1000 were called Agnes, Paula (the name of Miner's then girlfriend), and Denise.

Jay Miner's and Mitchy's signatures from an A1000. Photo by Steve Heal. CC BY 2.5.

The A1000's OS by Carl Sassenrath [June 14] was also advanced for its time, offering both multitasking and a

windowing interface. It was one of the first systems to employ message passing, dynamically loaded libraries, and device drivers.

Unfortunately, poor marketing meant that the A1000 never became the standard for multimedia computers, but it did become a gaming giant, boasting titles like Lemmings [Feb 14], "Cannon Fodder", and "Monkey Island", and was a staple of the demoscene (programs showing off a machine's visual and audio capabilities).

The inside of the A1000 case was engraved with the signatures of the Amiga designers, including Jay Miner [May 23] and the paw print of his dog Mitchy. The other famous signed computer case of the time was the original Apple Mac [Feb 10]; Ronald H. Nicholson, Jr. is the only person to have signed both.

The Atari 520ST [Jan 10] was released shortly before the Amiga 1000, and a huge (but mostly friendly) rivalry grew up between the two groups of users.

Knight Lightning Trial

July 23, 1990

The trial of Craig Neidorf (aka "Knight Lightning"), one of PHRACK's editors [Nov 17], began in Chicago.

As part of Operation Sundevil [May 7] Neidorf was arrested on January 18 and charged with access device fraud and transportation of stolen property. The charges related to an article in the February 1989 issue of PHRACK about the workings of the Enhanced 911 emergency response system.

According to the indictment, the stolen documentation was worth nearly $80,000, but the government had to drop all its charges after four days of testimony when it was revealed that the public could freely purchase this document for around $20.

Nevertheless, the trial left Neidorf with $100,000 in legal bills.

No Hands Across America

July 23 - 31, 1995

"No Hands Across America" showed that it was possible for an autonomous vehicle to drive unaided across the US, from Pittsburgh to San Diego. The vehicle, a 1990 Pontiac Trans Sport minivan drove itself for all but 50 of the 2850 miles, averaging over 60 mph. The road trip's passengers were Dean Pomerleau and Todd Jochem, from Carnegie Mellon.

RALPH, a video-based system developed by Pomerleau and Jochem, used lane markings, road edges, ruts, lane discolorations and the position of the car ahead to identify the center of the lane. However, RALPH had to manage without computerized road maps, which didn't exist back then. Also, GPS was still limited for civilian uses [Feb 22], so was only employed to calculate speed.