March 14th

First Network Hackers

March 14, 1837

The Chappe telegraph [Dec 25] was the first telecommunications network to span all of France, although it was reserved for government use. In 1834, two bankers, François and Joseph Blanc, found a way to hack the system to their advantage.

The brothers traded government bonds at an exchange in Bordeaux where information about market movements back in Paris took several days to arrive by mail coach.

They bribed a telegraph operator in the city of Tours to add extra characters to messages sent over the network to indicate changes in the previous day's market. These were hidden by the use of the network's "backspace" symbol. When a backspace followed a "market movement" character, that symbol wouldn't be printed, and so effectively disappear.

But the extra character was present during a message's transmission between telegraph towers in the network. The brothers hired a former telegraph operator called Pierre Renaud to observe the tower outside Bordeaux with a telescope; he noted down the movement characters and passed them on to the Blancs.

The brothers were tried in 1836; but acquitted on this day. Their attorneys successfully argued that their actions had not violated any law. As a consequence, a new law was hurriedly drafted that forbade personal use of the telegraph without government approval.

Thereafter, the broadcasting of information remained a state monopoly in France until 1998.

William Alan Fetter

Born: March 14, 1928; Independence, Missouri

Died: June 23, 2002

Fetter is credited with coining the phrase "computer graphics" in 1960, although he disputed this, saying that his team leader at Boeing, Verne L Hudson, used the words first. In any case, they were invented to describe the use of a plotter to draw aircraft pilot and cockpit configurations.

Bill Fetter. Photo by Brant fetter. CC BY-SA 3.0.

In 1964 Fetter and Walter Bernhardt created the first 3D wireframe model of a human figure (a pilot) on an IBM 7094 [Nov 30]. It was quickly nicknamed "The First Man", "The Boeing Man", and even "Boeman", although Fetter preferred the more prosaic "Human Figure".

Fetter employed the model to make animated films of pilot and cockpit configurations. One eight-minute example from 1966 bore the catchy title, "SST Cockpit Visibility Simulation".

During a meeting at Bell Labs in 1965, Fetter heard about the "Experiments in Art and Technology" (E.A.T. [March 15]) movement, and soon became an active member. Prints of his wireframe model were shown in the "Cybernetic Serendipity" [Aug 1] and "New Tendencies" [Aug 3] exhibitions, and he helped found the Seattle chapter of E.A.T. in 1968. The film, "9 Evenings: Theatre & Engineering" [Oct 13] was shown during the first meeting, and Fetter and Hans Graf presented their computer animated short, "Sorcerer's Apprentice". It utilized colorized 2D geometric shapes and the wireframe model, set to music.

Fetter created the first computer-generated images for a TV commercial in 1969. Boeing allowed him to modify the wireframe model to animate its lips, allowing it to 'speak' for the first time.

David Neil Laurence Levy

Born: March 14, 1945; London, UK

Levy is a British International Chess Master with a long involvement in computer chess and AI. He was the founder of the "Computer Olympiads" and the "Mind Sports Olympiads", and a former President of the International Computer Games Association.

In 1968, after hearing John McCarthy [Sept 4] and Donald Michie [Nov 11] predict that a computer would defeat a world chess champion within ten years, Levy made a £1,250 bet that no program could even win a match against him within that time.

Ten years later, after dispatching a host of computerized opponents, Levy faced off against Chess 4.7 running on a CDC Cyber 176 [June 00]. Levy won his bet, defeating the software in a six-game match by 4.5–1.5, but afterwards he wrote, "I had proved that my 1968 assessment had been correct, but on the other hand my opponent in this match was very, very much stronger than I had thought possible when I started the bet." Inevitably, Levy lost a $5000 bet in 1989 when he played "Deep Thought" (the predecessor of "Deep Blue" [Dec 5]).

In 1996, Levy made a prediction about Garry Kasparov's impending match against "Deep Blue": "Kasparov can take the match 6 to 0 if he wants to. I'm positive, I'd stake my life on it." Kasparov went on to lose the first game, although he won the match 4–2 [Feb 10]. Fortunately, no one collected on Levy's new 'bet'. The following year, Kasparov lost the rematch 2.5–3.5 [May 11], and Levy again survived

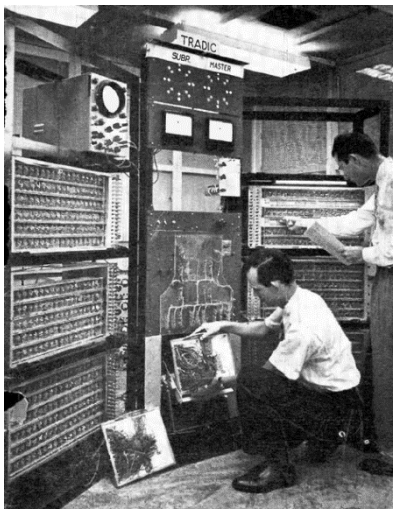
Levy published "Love and Sex with Robots" in 2008, based on his PhD research painstakingly carried out at Maastricht University in the Netherlands.

TRADIC

March 14, 1955

Bell Labs announced the first fully transistorized computer, the TRADIC (TRAnsistor DIgital Computer). It contained nearly 800 transistors and 10,000 diodes, and operated on fewer than 100 watts, one-twentieth the power required by a comparable vacuum tube machine. During the next two years only 17 components failed. a vastly lower rate than for vacuum tube devices.

The computer was designed by Jean Howard Felker, with lead engineer L.C. Brown (nicknamed "Charlie Brown"). The aim of their project, which had begun in 1951, was to construct a computer suitable to be taken airborne by the US Air Force.



Prototype of the TRADIC (1955). Jean Felker is on the left. Photo from *Radio-Electronic Engineering* magazine, Vol. 24, No. 5, May.

TRADIC 's success led to Bell releasing several other models, including the Leprechaun, so named because it was about the "size of a television set", albeit one of those very large 1950's designs. There was also a "Flyable TRADIC", which included partially transistorized navigation equipment. It did not have wings.

There are other contenders for "first fully transistorized computer", including the Austrian Mailüfterl [Jan 1], and the British Harwell CADET [Feb 00]. Manchester University's Transistor Computer was completed earlier [Nov 16], but wasn't fully transistorized.

Same Time, Next Year

March 14, 1975

The romantic comedy "Same Time, Next Year" opened at the Brooks Atkinson Theatre in NYC. It was written by Bernard Slade, and the cast included Ellen Burstyn and Charles Grodin.

The plot focuses on two people, George and Doris, married to other people, who meet for a romantic tryst once a year from 1951 to 1977. The years depicted are 1951, 1956, 1961, 1965, 1970, and 1975. The piece of dialogue most relevant for us occurs in the 1975 scene:

George: Did you know we've made love 113 times?
Doris: What?
George: I figured that out on my Bowmar calculator.

The Bowmar "Brain" (aka the 901B) was the first American-made pocket-sized calculator, and a massive hit when it was released in Christmas 1971 at the low-low-low price of $240.

It measured 5.2" x 3.0" x 1.5", could add, subtract, multiply, and divide, and sported an eight-digit red LED display. The Brain utilized Texas Instrument's TMS0103, a "calculator-on-a-chip" which had been announced just before the Brain went on sale. The chip contained a 3520 bit ROM, a 182 bit RAM, and a decimal ALU.

The TMS0103 wasn't the first calculator chip; that honor goes to the Mostek 6010 [Nov 15] which came to market in Jan. 1971, utlized inside the Japanese Busicom LE-120A "HANDY" calculator.

George could also have calculated their love-making average, which was 4.3461546 (on its eight-digit display). Since he was an accountant, this seems a strange omission.

QR Code Patented

March 14, 1994

The QR (Quick Response) code was a 2D barcode invented by Masahiro Hara's team at Denso Wave. A patent application was filed on this day (JP 2938338).

The code could be quickly detected independent of its orientation, and could store up to 7,089 numeric characters or 2,953 alphanumerics, more data than normal barcodes [June 26]. It also incorporated Reed–Solomon [Jan 21] error correction which made it more likely that a poor quality image could still be understood.

It's original purpose was to track components during car manufacturing, but it soon started appearing on other items, greatly helped by Denso Wave making its specification publically available.

In 2008, Japanese gravestone maker Ishi no Koe (the "Voice of the Stone") began to sell tombstones with QR codes which contained a URL link to a virtual grave site for the deceased.

The QR Code wasn't the first 2D barcode – that was "Code 49" developed by David Allais in 1987, which later evolved into the PDF417 code.

Linux Kernel
March 14, 1994

The Linux kernel was conceived by Linus Torvalds [Dec 28] on [Aug 25] 1991 and version 0.01 was released on [Sept 17]. Version 1 debuted on this day, having grown to 176,250 lines of code. It quickly became the most prominent example of open source software, and the heart of many distributions of GNU/Linux [Sept 27], Android [Nov 5] and Chrome OS [Sept 2].

By 2006, only approximately 2% of the kernel was still written by Torvalds, although his work was one of the largest parts. Torvalds stated in 2012 that his main job nowadays was merging code written by others into the kernel.

Since version 3.18 (Dec. 2014), an average of about 1500 developers from 200-250 companies have contributed to each release. The top 30 developers are responsible for a little more than 16% of the code, with the top benefactors by company being Intel (12.9%) and Red Hat (8.0%).

Version 5.0 in 2019 was nearly 26 million lines of code. The next major numbered release, Linux 5.12, codenamed "Frozen Wasteland" was previewed at the end of March, 2021.

The burning quiestion of how to pronounce "Linux" led Torvalds to include an audio track with version 1's source code. It's still available today by typing:

```
play
http://ftp.funet.fi/pub/
Linux/PEOPLE/Linus/
SillySounds/english.ogg
```

This uses sox and wget, and you get the added bonus of hearing Torvalds pronounce his own name.

Power Macs
March 14, 1994

The Power Macintosh was a line of Apple workstations based on various PowerPC RISC processors [Oct 2]. It became the mainstay of Apple's top-end products for the next decade.

The first ones were the Power Mac 6100, 7100, and 8100. Their codenames, especially the 7100's, caused some legal troubles [Jan 10].

The 6100 was the earliest Mac able to run OS 9. This was something of a sad milestone since it 'refreshed' several beloved audio clips – the familiar start-up "bong" was replaced by a chord strummed by jazz guitarist Stanley Jordan. Instead of the "Chimes of Doom", there was the sound of a car crashing and glass breaking.

Shortly after Steve Jobs' return to Apple on [Sept 16] 1997, Jony Ive [Feb 27] and his team unveiled a new case design for the Power Mac G3, and the G4 Cube [July 19].

In Aug. 2006, the Power Mac made way for its Intel-based replacement [June 6], the Mac Pro.

Riding the Bullet
March 14, 2000

The 66-page novella "Riding the Bullet" by Stephen King [Nov 25] debuted on the Internet, available for download at $2.50. Its publisher, Simon & Schuster, claimed it as the world's first mass market e-book.

During the first 24 hours, over 400,000 copies were downloaded, jamming the publisher's server in the process. There were also reports that its encryption software caused some machines to crash, but hackers soon cracked it.

King returned to e-books on July 24, when he posted the first installment of his serial "The Plant", and this time the files were unencrypted. However, he stipulated that at least 75% of the downloads had to be backed by a $1 donation if fans wanted to continue seeing new installments.

Although donation rates were high initially, the number of paying customers soon declined, and only six parts of the story were posted. Nevertheless, King later reported having made nearly half a million dollars from the release.

Sewing Game Boy
March 14, 2001

"Mario Family" was a cartridge for the "Game Boy Color" [April 21] console that allowed the device to interface with the Jaguar JN-100 sewing machine via a cable.

The Game Boy Color and the Singer Izek. (c) technologizer.com.

The software offered 84 stitch patterns, including abstract designs, numbers, and animals such as dolphins, which the machine would sew onto material.

Editing tools on the cartridge allowed the user to create their own custom stitches, and favorite designs could be saved for later.

Should something jam on the sewing machine, a diagram would appear on the "Game Boy Color"s screen with the troubled area flashing.

This made the JN-100 the first computerized sewing machine available at a mass-market price (around $600). It was released in international markets rebranded as the "Singer Izek".

Pi Day

March 14 (every year)

3.141592653589793238...

"Pi Day" is an annual celebration of π that's observed today since 3/14 in month/day format are the constant's first three digits. Physicist Larry Shaw organized the first celebration in 1988, at the San Francisco Exploratorium.

Of course, people in countries that follow a day/month format prefer "Pi Approximation Day": July 22 or 22/7, which is accurate to two decimal places and was proposed by Archimedes [March 8] in “On the Measurement of a Circle” (ca. 250 BC).

March 14, 2015 was celebrated as “Super Pi Day” since 3/14/15, matched π's first five digits. At 9:26:53am, this extended to ten digits.

William Shanks spent over fifteen years calculating π to 707 decimal places by hand, averaging one decimal digit per week. He used the formula:

$$\frac{\pi}{4} = 4\tan^{-1}\left(\frac{1}{5}\right) - \tan^{-1}\left(\frac{1}{239}\right)$$

In 1944, D.F. Ferguson (using a calculator) discovered that Shanks had made an error in the 528th place, and the digits thereafter were incorrect.

The best result obtained by calculator appeared in 1949, when D. F. Ferguson (again) and John Wrench extended π to 1,120 decimal places after months of work. Wrench and Levi Smith may have beaten this record in1956, when they produced 1,160 places.

The first computer calculation was also made in 1949, using the ENIAC [Feb 15]. George Reitwiesner calculated π to 2,307 places in a little less than 70 hours.

It’s worth noting that even NASA only uses 16 digits of π in its interplanetary travel calculations. Indeed, James Grime has calculated that 39 digits is enough to calculate the circumference of the known universe to an accuracy within the width of a single hydrogen atom. Conversly, 1 Kings 7:23 in the Bible refers to a circular pool as being 30 cubits around and 10 cubits across, making π equal to 3 (i.e. 1 digit of accuracy).

The current record is 62.8 trillion digits held by Swiss researchers at the Graubuenden University of Applied Sciences, which they announced on Aug. 14, 2021. The last ten digits are: 7817924264

They utilized a system based on two 32-core AMD EPYC 7542 'Rome' processors [May 1] equipped with 1 TB of memory and Ubuntu Linux 20.04 [Oct 20]. This was coupled thirty-eight 16 TB HDDs, 34 of which were for swapping, and four for storing the result.

The team smashed the previous record of 50 trillion digits, set by Timothy Mullican in 2020, and completed the task in just over 108 days versus Mullican's 303.

To verify the correctness of the calculation, the researchers used the Bailey–Borwein–Plouffe (BBP) formula, which can compute any position in Pi without calculating all preceding digits. A simple version can be expressed in Python in a few lines:

```
from decimal import
Decimal, getcontext

getcontext().prec=100

print(
 sum(1/Decimal(16)**k *
  (Decimal(4)/(8*k+1) -
   Decimal(2)/(8*k+4) -
   Decimal(1)/(8*k+5) -
   Decimal(1)/(8*k+6))
    for k in range(100)) )
```

For more math constants, see [Jan 27], [May 5]
