July

Short Code Proposed

July 1949

Short Code was the first relatively high-level computer language in the sense that its statements were mathematic expressions rather than machine instructions. It also supported branching and calls to library functions.

The language was first proposed by John Mauchly [August 30] at the end of July 1949, originally as "Brief Code", and the first prototype, by William Schmitt, was running later that year on the BINAC [April 4] . He ported it to the UNIVAC [March 31] in 1950, and it also popped up on the UNIVAC II in 1952, implemented by A. B. Tonik and J. R Logan. Its programs ran almost 50 times slower than the equivalent machine code, which 'proved' to many people that high-level languages were never going to be a viable coding tool.

The BINAC was also home to the C-10 machine code by Mauchly and Betty Holberton [March 7], developed in 1947, the first language to use mnemonic names for operations (e.g. “a” for add and “b” for bring).

ETL Mark III

July 1956

When the Mark III came into operation at Japan’s Electrotechnical Laboratory (ETL) in July, it became the first stored-program transistor computer, and was amazingly also only the second electronic computer completed in Japan, after the vacuum tube-based FUJIC [Nov 16].

The Mark III's development was conducted by Takahashi Shigeru, Nishino Hiroji, Matsuzaki Isokazu and Kondo Kaoru of the Electronics Research Division at ETL. It employed 130 transistors, 1,800 germanium diodes, and its 128-word memory unit employed ultrasonic delay elements that used glass as a medium.

IBM and the Summa Theologica

July 1957

The *Summa Theologica* is considered the greatest work of medieval philosophy. It was written by St. Thomas Aquinas between 1265 and 1272, and spans some sixty volumes.

In 1957, IBM was asked by the Pontifical faculty of Philosophy

A page from Thomas Aquinas' Summa theologiae, 1482.

in Milan to create an index and concordance of the Summa, and Pope John XXIII was so delighted with the results that he conferred the Knights Grand Cross of the Order of St. Sylvester upon Thomas Watson, Jr. [Jan 14], and his brother Arthur. Other notable members of the Order include Bob Hope and Oscar Schindler.

In adition, the experience gained during the project contributed towards the development of the KWIC Index by Hans Peter Luhn [July 1], who worked for IBM at the time.

This was not IBM's first foray into religious indexing, which had begun in 1949 due to the efforts of the Jesuit priest, Roberto Busa [Nov 28].

Spreadsheet Programming

July 1961

Richard Mattessich published the article "Budgeting Models and System Simulation" in the July 1961 issue of *The Accounting Review* in which he discussed (in very general terms) how conventional accounting spreadsheets might be modeled in FORTRAN IV. The software would calculate the results of formulae expressed as the addition or subtraction of subscripted input data. There was no notion of an interactive GUI as typified by VisiCalc [May 11].

This was followed by several programming languages which made it easier to write the formulae, including BCL (Business Computer Language) by R. Brian Walsh in 1962, AutoPlan/AutoTab by A. Leroy Ellison, Harry N. Cantrell, and Russell E. Edwards in 1968, and LANPAR (LANguage for Programming Arrays at Random) by Rene K. Pardo and Remy Landau in 1969.

APL's [Dec 17] core use of multidimensional arrays made it a good choice for building spreadsheet languages, resulting in the IBM Financial Planning and Control System by Brian Ingham, and APLDOT designed by the US Railway association, both in 1976.

None of these offered an interactive grid-based user interface like that of VisiCalc.

First Computer Graphics Cover
July 1965

The July 1965 issue of *Fortune* sported the first magazine cover drawn using computer graphics.

It illustrated a story entitled "The 500 Biggest Industrials", and so featured a large "500" in the foreground, colored red, white, and blue, surrounded by numerous red and blue arrows pointing optimistically upwards.

The image had been generated in black and white on a PDP-1 [Nov 00] borrowed from Bolt, Beranek & Newman [Oct 15], and the colors added later by applying filters to different photographs taken of the image displayed on the PDP-1's screen.

Macsyma Begins
July 1968

Macsyma (Project MAC's SYmbolic MAnipulator) became one of the first computer algebra systems, and inspired many later systems, such as Maple, and Mathematica [June 23]. It was developed at MIT's Project MAC [July 1] by Carl Engelman, William A. Martin, and Joel Moses, and coded in Maclisp, making it the largest LISP program of the time. Its development also helped improved LISP's support for numerical computing and efficient compilation.

In 1982, Macsyma was licensed to Symbolics [March 15].

ITS Described
July 1969

The Incompatible Timesharing System (ITS) was an influential OS developed mainly by Richard Greenblatt [Dec 25] and Stewart Nelson in the MIT AI lab, initially as a deliberate move away from the complexity of Project MAC's Multics project [Nov 30], but it eventually became better known as one of the catalysts for the burgeoning hacker culture in the lab during the 1960s and 1970s. The ITS 1.5 Reference Manual, by Donald Eastlake, was issued some time during this month.

In keeping with the hacker ethos, there were no passwords, every file was editable, and it was easy to watch and kill any user processes. Notable software written on the ITS included Emacs [Oct 2], MacLisp [Dec 25], Macsyma [previous entry], and SHRDLU [Feb 24].

The ITS name was chosen by Tom Knight as a humorous callback to the earliest time-sharing OS from MIT, the Compatible Time-Sharing System (CTSS [May 3]).

ITS's host PDP-10 is also remembered for its "More Magic" switch, a little home-made switch glued to the frame of one of its cabinet. The switch had two positions, labeled 'magic' and 'more magic'. Close examination by curious hackers revealed that the switch had only one wire running to it, and the other end, though connected to the wiring, was ultimately connected to a ground pin. Clearly the switch was useless: not only was it electrically non-operative, but it was connected to a place that couldn't affect anything anyway. So one of the hacker flipped the switch.

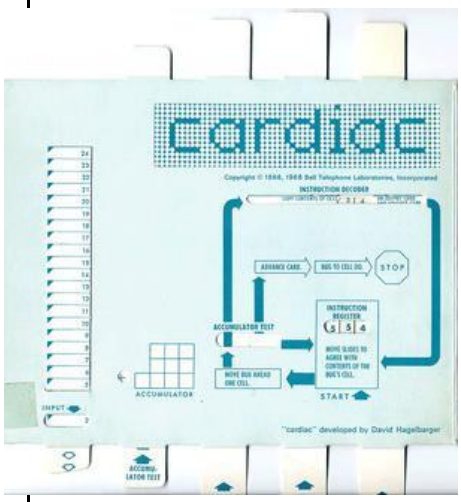
The PDP-10 promptly crashed.

This time Richard Greenblatt was called upon. He inspected it, concluded it was indeed useless, and utilized some diagonal cutters to remove it. The PDP-10 was rebooted, and ran without any problems.

CARDIAC: Very Arresting
July 1969

The CARDIAC (CARDboard Illustrative Aid to Computation) was a learning aid for teaching high school students how computers worked. It was developed by David Hagelbarger and Saul Fingerman at Bell Labs in 1968, but the "Bell Laboratories Record" (BLR) magazine printed an article about the system and its teaching materials during this month.

The computer operated by means of pencil and sliding tabs, with any arithmetic out-sourced to the user. The machine supported a generous 100 memory cells which could hold integers from 0 to ±999. A rich ten operation instruction set allowed the CARDIAC to add, subtract, test, shift, input, output, and jump.



The front of the CARDIAC. (c) Bell Telephone Labs 1968.

Programs were run by moving three tabs (in the shapes of beetles) so that the number in the instruction register equaled the number in the memory cell. When a beetle moved to the next memory cell, the user was directed by an arrow to what operation to perform next.

The manual and kit can be found online at https://www.cs.drexel.edu/~bls96/museum/cardiac.html

The CARDIAC wasn't the first paper-based digital computer; that was probably the PAPAC-00 a two-register, one-bit device, created by Rollin P. Mayer, and printed in the *Communications of the ACM* [Sept 15], Sept. 1959.

For more educational computer kits, see [Feb 22], [April 30], [Sept 30].

The NRI 832

July/August 1971

The National Radio Institute (NRI) Journal (Vol. 28, No. 4) announced its new home-study computer electronics course, which included (probably) the very first computer kit, the NRI 832.

The 832 used around 50 TTL chips, a 16-byte diode switch matrix memory, and an additional 16 bytes of TTL SRAM. Its operator's panel held 128 switches, and offered light bulb outputs.

The kit was designed by Lou Frenzel, a long-time electronic hobbyist/maker, who later became Vice President of Heath Company, where he started Heathkit's [July 00] personal computer and education/publishing businesses.

The NRI course was based around 100 experiments that demonstrated various electrical principles, computer operation, and programming. Frenzel remarked, "We are just tickled to death about our computer course and we think that our students will be, too." It sold for just over $500, and became very popular.

The NRI 832 wasn't the first computer kit to appear in an advert. That honor belongs to an ad by Dave Digby which appeared in the October 1967 issue of CQ magazine (a publication aimed at amateur radio operators). The $1000 kit used RTL logic, four registers, and a 512- to 1024- byte delay line memory. However, there's some debate over whether any of those kits were actually manufactured.

Traf-O-Data Begins

Summer 1972

Bill Gates [Oct 28] and Paul Allen [Jan 21] set up their Traf-O-Data business with the idea of automating the processing of traffic paper tapes for Seattle's road department. They had been inspired by observing another group of students at Lakeside School who were currently doing this job manually. Incidentally, Traf-O-Data wasn't the pair's first business venture – see [Nov 18].

The project required special hardware to read the tapes, but neither Gates nor Allen had any hardware design experience. So they headed over to the University of Washington's (UW) Physics building (now known as Mary Gates Hall) where they eventually found Paul Gilbert, an EE student, worked in the high-energy tracking lab. He became a partner in the business, and in return built a microcomputer using the newly released Intel 8008 [April 00] while Gates and Allen wrote its software.

To test their code while the microcomputer was being built, Allen wrote an 8008 emulator that ran on UWs IBM 360. (Although Allen wasn't a student there, his father was a UW librarian.)

Unfortunately, the Traf-O-Data project came to nothing when Washington state began offering free traffic processing services to its cities, ending the need for private contractors.

But Traf-O-Data didn't die; indeed it was formally created in Jan 1975, with Gates, Allen, and Paul Gilbert as partners. This allowed Gates and Allen to use Traf-O-Data's 8008 emulator to develop their BASIC for the Altair [Dec 19].

Allen later said: "Traf-O-Data remains my favorite mistake because it confirmed to me that every failure contains the seeds of your next success."

PLATO IV

Summer 1972

Donald Bitzer [Jan 1] and Daniel Alpert's PLATO (Programmed Logic for Automatic Teaching Operations) [Aug 22] was the first general-purpose computer-assisted instruction system.

When PLATO IV became operational at the University of Illinois during the summer of 1972, it offered several major innovations: Bitzer's orange plasma screen with bitmapped graphics, a microfiche selector that permitted colored images to be projected on the back of the screen under program control, and a 16×16 grid infrared touch panel [Nov 27].

A PLATO V Terminal from 1981. Photo by Mtnman79. CC BY 3.0.

Several novel peripherals were designed for PLATO, including the Gooch Synthetic Woodwind (named after inventor Sherwin Gooch) which offered four voice music synthesis., and the Votrax speech synthesizer [Dec 4] which led to a "say" instruction being added to PLATO's Tutor programming language.

PLATO IV included shared-memory that allowed programs to send data between its users. This was used to build chat-type programs and multiplayer networked games, such as spasim (a 3D space game [March 1]), Empire (a shooter [May 00]), and Dungeon [Dec 22].

By 1976, PLATO had sprouted a variety of novel tools for online communication, including Personal Notes (e-mail), Talkomatic (chat rooms), Term-Talk (instant messaging), monitor mode (remote screen sharing), and emoticons.

Early in 1972, Xerox PARC researchers were given a tour of Illinois' PLATO system, and many of the technologies found

their way back to PARC. For example, PLATO's application for drawing pictures influenced the drawing program on the Xerox Star [April 27]. PLATO's Charset Editor for painting new characters became PARC's Doodle program.

Some authors have drawn similarities between this visit and the much more famous one by the Apple team to PARC in [Dec 00] 1979.

There's an even earlier connection between PLATO and PARC in the impressive shape of Alan Kay [May 17] who first visited in the summer of 1968, and saw a prototype of the plasma display.

The Mark-8
July 1974

The Mark-8 was a 'build it yourself' microcomputer first described in *Radio-Electronics*' July 1974 issue. For only $5, a budding computer engineer could purchase a booklet containing circuit board layouts based around an Intel 8008 [April 00] and construction details. A couple of thousand were sold, according to the designer Jonathan Titus, then a student at Virginia Tech.

The Mark-8 was actually the second microprocessor kit, the first being the Scelbi-8H [March 00], but the Mark-8 became better known since *Radio-Electronics* was a widely read magazine, and the Mark-8 was pictured on the cover.

The interest in the Mark-8 prompted the editors of *Popular Electronics* to publish a similar but easier microcomputer project, its famous Altair 8800 [Dec 19] article, in January 1975. *Popular Electronics* had been offered the Mark-8 piece, but had turned it down.

Apple I Released
July 1976

Prev: [April 1] Next: [Jan 3]

The Apple I went on sale at the "sinister" price of $666.66, chosen because Steve Wozniak [Aug 11] "liked repeating digits" and "the phone number for my dial-a-joke service was 255-6666," and because it represented a one-third markup on the $500 wholesale price. He had no idea about its satanic meaning as the "Number of the Beast".

The Circuit Board of a Fully Assembled Apple I. Photo by geni. CC BY-SA 4.0.

Unlike other hobbyist computers of the day which were sold as kits, the Apple I was beautifully presented as a fully assembled circuit board, containing about 60 chips. However, to turn it into a working computer, users still had to add a case, a power supply, ASCII keyboard, and a display. However, the Apple I's support for keyboard input and TV output was a radical step forward – machines of the time, such as the Altair [Dec 19], relied on the user toggling switches, and looking at flashing bulbs.

About 200 boards were sold before Apple announced the Apple II a year later [June 5]. According to an online registry, there are still 79 around, an impressive survival rate.

On August 26, 2016, an Apple I prototype built by Steve Jobs [Feb 24] (according to Apple I expert Corey Cohen), was sold for $815,000. It was duly dubbed the 'Holy Grail' of computers.

On Nov 9, 2021, one of the first 50 models sold to the Byte Shop in Mountain View [Dec 8] was auctioned off for $400,000. It's known as the "Chaffey College" Apple I because its original owner was a professor at the college in Rancho Cucamonga. He sold the computer to a student in 1977 who had kept the computer until now.

The machine had undergone an "extensive authentication, restoration, and evaluation process", according to the auction house. It's one of just 20 Apple I's still functioning. In addition, the case is made of koa wood, one of only six known koa wood cases in existence.

BLAS Reported
July 1977

C.L. Lawson, R.J. Hanson, D.R. Kincaid, and F.T. Krogh submitted their paper, "Basic Linear Algebra Subprograms for Fortran Usage" to the *ACM Transactions on Mathematical Software*.

This paper described the BLAS package (Basic Linear Algebra Subprograms) consisting of 38 FORTRAN-callable subprograms for basic numerical linear algebra, such as vector addition, scalar multiplication, dot products, linear combinations, and matrix multiplication.

BLAS was developed by the ACM-SIGNUM committee on basic linear algebra subprograms between 1973-1977, and quickly became the de facto standard for low-level routines used in linear algebra libraries, such as LINPACK [Dec 1] and LAPACK.

The original BLAS focussed on densely stored vectors and matrices, but extensions were added later for sparse matrices and the utilization of cache memory.

Starship 1's Easter Egg

July 1977

Starship 1 was a first-person shooter space combat game developed and manufactured for arcades by Atari [June 27]. The objective was to destroy alien spacecraft while maneuvering "Starship Atari" through asteroid fields.

It (probably) contained the first Easter egg in any arcade game, added by its designer Ron Milner, who worked at Atari from 1972 to 1985. If a player followed a certain sequence of controls, the message “Hi Ron” would flash on the screen and the player would be awarded ten free games.

The trick was to insert a coin while holding both the phasor and start buttons down. Then, very quickly, release those buttons and hit the slow control.

Besides coin-op work, Milner was the co-inventor of the Atari 2600 video game system [Oct 14] and helped prototype the animatronics at Chuck E. Cheese [May 2].

Other early video game Easter eggs can be found in “Adventure” for the Atari 2600 from 1979, and “Video Whizball” released in 1978 for the Fairchild Channel F game console [Dec 1].

Heath Kit H8 Announced

July 1977

Heathkit was a long-established player (since 1926) in the electronics market, offering a range of DIY kits, some of them scarely complex, such as a color television and a light airplane. Through the 1950s and 1960s it also sold a range of splendid analogue computers, including the extremely popular (and cheap) EC-1 [Dec 25].

In 1977 Heathkit decided to enter the microcomputer market, under the guidance of electronic hobbyist/maker, Lou Frenzel [two pages ago]. The H8, an Intel 8080-based microcomputer [April 00], was announced in July 1977 and started selling in kit form that fall at a shockingly reasonable price of $379.

The Heathkit H-8. Photo by Arthur G Korwin Piotrowski. CC BY-SA 4.0.

It came with a pre-built CPU board, and a front panel with a 9-digit 7-segment octal display and a 16-key octal keypad. A speaker provided audio feedback on whether an operation had finished correctly (short bleep) or not (long bleep).

On the downside, for it to be a useful programming tool, you really needed to purchase a few extras – RAM and a cassette drive were considered de rigueur.

After Zenith Corp. bought HeathKit’s computer division, it released a pre-assembled version called the Zenith Data Systems Z-100 which became more popular. Jerry Pournelle [Aug 7] praised its keyboard, and wrote that it “had the best color graphics I’ve seen on a small machine”.

"The Soul of a New Machine" Published

July 1981

The Soul of a New Machine by Tracy Kidder recounts the development of a new Data General [April 15] workstation, with the engineering team forced to work at a blistering pace under tremendous pressure. The book won the 1982 National Book Award for Nonfiction and a Pulitzer Prize for General Non-Fiction.

The machine was launched on April 29, 1980 as the Data General Eclipse MV/8000. It was the first in a family of 32-bit minicomputers

Tom West was assigned the responsibility of building it, a task that usually took about three years, but he was given a year, a seemingly impossible task. He assembled a team of about thirty engineers. The hardware designers came to be known as the Hardy Boys, and the microcode developers were the Microkids.

Real Programmers Don’t Use Pascal

July 1983

“Real Programmers Don’t Use Pascal” (a title rifting upon the 1982 bestseller “Real Men Don’t Eat Quiche”) was published by Ed Post as a letter in the July edition of *Datamation* [Oct 00].

Real Programmers only use punch cards and write programs in FORTRAN [Dec 00] or assembly language, while “quiche eaters” delude themselves with languages such as Pascal [Nov 20] which support superfluous structured syntax and impose irritating restrictions to prevent bugs (i.e. limit our god-given freedoms).

Seymour Cray [Sept 28] was lionized as an icon of Real Programming. It was said that he input the first OS for the CDC 7600 [Dec 3] by toggling switches on its front panel by hand (and without needing to refer to notes).

The Sun SPARC

July 1987

The Scalable Processor Architecture (SPARC) was a reduced instruction set computing (RISC [May 30]) chip

developed by Sun Microsystems [Feb 24]. SPARC's commercial success finally overcame the industry's dyed-in-the-wool skepticism about RISC (i.e. they finally decided to take a few risks).

The original 32-bit SPARC (SPARC V7) was used in the Sun-4 workstation, which replaced the Sun-3 built around the Motorola 68000 [Sept 26].

Sun cannily made SPARC an open architecture, available for licensing by any manufacturer. The combination of just a license to copy the SPARC processor, plus Berkeley UNIX [March 9], made it almost as easy to enter the workstation market as it was to make an IBM compatible PC.

One of the best kept secrets of the Sun marketing team was that SPARC spelt backwards was CRAPS. Team members had to swear they would never utter that word to anyone.

Intel Inside is Out

July 1991

In the late 1980s, Intel's market share was being eroded by upstart, sprightly competitors such as AMD [May 1] and Zilog [March 9]. An innovative advertising strategy was needed urgently, and one was born in 1989, when Intel's Dennis Carter visited MicroAge's headquarters to meet with its VP of Marketing, Ron Mion.

Mion felt that the public didn't really need to fully understand why Intel chips were better, they just needed to *feel* that they were better, and to prove this assertion he proposed a market test. Intel would pay for a MicroAge billboard saying, "If you're buying a personal computer, make sure it has Intel inside." In turn, MicroAge would put "Intel Inside" stickers on the cases of their Intel-based computers.

Mion decided to do the test in Boulder, Colorado, where MicroAge had a single store. Virtually overnight, the sales of Intel-based PCs shot up. Intel soon after adopted "Intel Inside" worldwide.

The five-note D♭ D♭ G♭ D♭ A♭ xylophone/xylomarimba jingle used in TV adverts was introduced in 1994. It was written by Walter Werzowa, once a member of the Austrian 1980s sampling band, *Edelweiss*.