June 16th

Clock Patent

June 16, 1657

Christiaan Huygens' astronomy required accurate timekeeping, but clocks of the time were regulated by slowly falling weights whose speed of descent was irregular, making the clocks far from precise.

Huygens responded by studying the relationship between the length of a pendulum and its period of oscillation which led to his combining of a pendulum with a weight-driven clock at the end of 1656. He patented the design on this day.

Although the initial idea for a pendulum-based clock was due to Galileo, Huygens solved an essential problem – he made its period constant by adding a pivot that caused the bob to swing through the arc of a cycloid rather than a circle. This change increased the accuracy to better than one minute per day.

Huygens later went on to develop a spring-powered clock (in 1660), which was accurate to about fifteen *seconds* per day. This was at about the same time as similar, but independent, work by Robert Hooke. Of course, this led to heated debate over who has priority.

Sherlock and Babbage

June 16, 1892

'Holmes is as inhuman as a Babbage's [Dec 26] Calculating Machine, and just about as likely to fall in love', Arthur Conan Doyle wrote to his mentor, Dr. Joseph Bell, on this day.

Bell was a Scottish surgeon and lecturer at the University of Edinburgh's medical school . He was also a primary inspiration for Doyle's Sherlock Holmes.

C-T-R Incorporated

June 16 (or 15), 1911

The Computing–Tabulating–Recording company (C-T-R) was a consolidation of four firms: Hollerith's [Feb 29] Tabulating Machine Co., Computing Scale Co., Bundy Manufacturing, and the International Time Recording Co.

The result was a business of around 1,300 employees, with its main office in Endicott, New York. The company continued to produce all the goods its component enterprises had made, but eventually focused on Hollerith's record-keeping equipment. Hollerith also joined the board, and served as a consulting engineer until he retired some ten years later.

The merger was the work of New York financier Charles Ranlett Flint, known as the "Father of Trusts". He also helped negotiate the Wright Brothers' first sales of airplanes overseas.

A Jan. 1920 CTR sales catalog showing clocks, scales and tabulating equipment.

Thomas J. Watson Sr. [Feb 17] joined C-T-R in May 1914. In [Feb 14] 1924, C-T-R adopted the name International Business Machines (IBM).

John Wilder Tukey

Born: June 16, 1915;

New Bedford, Massachusetts
Died: July 26, 2000

Tukey and James Cooley [Sept 18] developed the fast Fourier transform which converts a signal from its original domain (often measured across time or space) into the frequency domain. This makes it easier to extract many kinds of useful data.

Tukey was also the inventor of the box plot, and many other discoveries that bear his name: the Tukey range test, the Tukey lambda distribution, the Tukey test of additivity, and the Teichmüller-Tukey lemma; many are related to his statistical interests.

While working with John von Neumann [Dec 28], Tukey coined the word "bit" as a contraction of "binary digit". "bit" first appeared in a puiblished article in 1948, written by Claude Shannon [April 30].

A Jan. 1958 feature by Tukey, "The Teaching of Concrete Mathematics," in the *American Mathematical Monthly*, may be the earliest use of the word "software" in a journal. However, Richard Carhart had employed it earlier, but only in a memo [Jan 9].

The relevant sentence from Tukey's article: "Today the 'software' comprising the carefully planned interpretive routines, compilers, and other aspects of automative programming are at least as important to the modern electronic calculator as its 'hardware' of tubes, transistors, wires, tapes and the like."

Another quote: "Far better an approximate answer to the right question, which is often vague, than an exact answer to the wrong question, which can always be made precise."

Manchester Mark 1 in its Prime

June 16-17, 1949

The Manchester Mark 1 was one of the earliest stored-program computers, and was developed after the success of the simpler Manchester "Baby" [June 21] which acted as a prototype for this machine's design. Work began in Aug. 1948, and the device was operational by April 1949. Rather confusingly, it was also known as the Manchester Automatic Digital Machine, or MADM.

Built by a team led by Frederick Williams [June 26] and Tom Kilburn [Aug 11], the Mark 1 used over 1,300 vacuum tubes and occupied a large room. Its Williams-Kilburn tube memory [Dec 11] proved so reliable that it was adopted by several other systems [June 10].

Aside from tube memory, the Mark 1 introduced several other innovations, including the B-line, later known as the index register. In early descriptions, it was termed a "B-line" to distinguish it from the "A" used for the accumulator, and "C" for "control." The device also introduced a basic form of memory pages (a term probably coined by Alan Turing [June 23]). A page could be backed up to a magnetic drum that was capable of storing 128 pages. Drum stores weren't unique to Manchester; in particular Andrew Booth was exploring their use [Feb 1], and he provided valuable input.

On this day, a program that searched for Mersenne primes ran error-free for nine hours. Primes-finding was a popular task at the time [June 7]. The first new Mersenne primes were found by the SWAC [Jan 30].

The Mark 1 was widely reported on in the British press, frequently by invoking the phrase "electronic brain". That provoked a somewhat negative reaction from the head of Manchester's Department of Neurosurgery, Sir Geoffrey Jefferson [June 9], which perhaps marks the start of the long-running debate about whether a computer can be creative.

Turing produced a programmer's handbook for the machine that was praised for its scope and criticized for its opacity. The manual was given a major rewrite by Turing's successor as head of software development, Tony Brooker [Dec 14].

The Mark 1 was superceded by the Ferranti Mark 1 on [Feb 12]. 1951, making it the world's first commercial computer to be delivered to a customer.

HEC 2 on Display

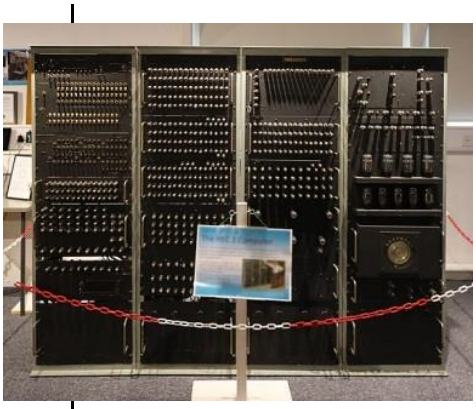
June 16-26, 1953

The Hollerith Electronic Computer (HEC) was produced by the British Tabulating Machine Company (BTM [Feb 18]), based on a design by Andrew Booth [Feb 1], becoming Britain's first mass-produced business computer (depending on how you define "mass"). A pre-production version was put on display at the Business Efficiency Exhibition in Olympia, London.

A prototype built by Raymond 'Dickie' Bird first worked in Dec. 1951 at the BTM premises in Letchworth. The HEC 1 was 1.5 meters high by 3 meters wide by 0.5 meters deep and used approximately 1,000 ex-Government vacuum tubes. A more unusual feature was Booth's magnetic drum memory, which offered around 2 KB of storage.

In 1955, the first production machine, the HEC 2M, went into production. Seven or eight found buyers, including at GE Research Labs, Thorn, Esso, and the UK Ministry of Defense.

The HEC design proved to have a long life, evolving into the HEC 4, and later the 1201. Around 125 1200s were sold, more than any other British computer of the time.



The HEC 1 at the UK National Museum of Computing. Photo by geni. CC BY-SA 4.0.

MSX Standard Announced

June 16, 1983

MSX was a home computer architecture proposed by Microsoft Japan's Kazuhiko Nishi. He was inspired by the success of VHS as a standard for video cassette recorders (ignoring the battles with Betamax).

The MSX specifications included a Zilog Z80 [March 9], 64 KB of RAM, a TMS9918A video processor, a sound chip, a NEC cassette interface chip, an Atari joystick interface [Nov 00], and Microsoft 32 KB extended BASIC in ROM [Nov 18].

The major benefit of the standard was that any piece of hardware or software with the MSX logo was compatible with the MSX products of all the manufacturers. In particular, any MSX game cartridge would work in any MSX computer.

MSX became quite popular in Japan, and eventually 5 million units were sold. However, the Japanese manufacturers stayed away from the competitive US market, which was in the middle of a Commodore-led price war [Jan 7].

NC vs. NetPC

June 16, 1997

The Network Computer (or NC) was a diskless desktop computer produced by Oracle [Aug 17] between 1996 and 2000 in a loose alliance including Sun Microsystems [Feb 24], IBM, Apple, and Netscape [March 25]. Among the software requirements was support for IP-based protocols (TCP/IP [Jan 1], FTP [April 16], etc.), and Web standards (HTTP [Dec 1], HTML, Java [Feb 23]).

Naturally, Microsoft and Intel [Aug 26] responded by developed a competing standard called NetPC. Other alternatives were WeBRef (from Motorola [Sept 25] and HDS Network Systems) and Odin (from National Semiconductor [April 11]). Microsoft and Intel unveiled NetPC at the PC Expo trade show on this day. Within two years they announced its phase-out.

The failure of the NC/Net PC concept was caused by a number of factors. Firstly, prices of full-featured PCs quickly fell below $1,000, making it hard for diskless devices to compete on price. Secondly, their software was quite immature (i.e. buggy), and thirdly the idea arguably debuted too soon. At the time, the typical home Internet connection was a 28.8 kbit/s dialup modem, which was too slow for most diskless applications. Also, the Web hadn't hit the mainstream yet.