



Calculator History Timeline

By Rick Bensene
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This page of the Old Calculator Museum is a timeline of known historical points, people, milestones, and other time-related material relating to calculating machine technology. Also included are some benchmark historical points relating to the early development of "individual computing", with listings of small computers of the late 1950's into the late 1960's, as well as some early timeshared computer systems debuting in the 1960s. These early computer systems that providing the ability of a person to be "one-on-one" with the computer provided some of the earliest opportunities for individual students, scientists, engineers, and business people to have direct access to sophisticated computing resources for the first time.

At nearly the same time (early 1960's) the the arrival of single-user *electronic* calculating machines provided access to fast, easy-to-use personal calculating capabilities that sat on their desktop. These early calculators were first used engineering, science, and accounting firms, but as the technology improved, reducing the cost of the devices, it was not much later that electronic calculators appeared in small business and educational environments, and even in the home office.

Listings for watershed events in the world of electronics technology are also included as context for the development of electronic calculators, small computers and timesharing systems.

Notable events in the development of what became the microprocessor and later, microcomputer systems are presented because the development of electronic calculator technology was the driving force behind the incremental improvements in electronic technology that first resulted in integrated circuits taking the place of transistors in electronic calculators, and eventually leading to the development of the central processing unit (CPU) of a computer on a single integrated circuit chip, which, in an interesting twist, was first commercially used in a consumer device to create an electronic calculator whose "brains" consisted of a simple computer (CPU) on a chip.

It is worthy to note that most of these "personal" computing developments were made long before the the "PC"s that we know today as the IBM PC (incorrectly called the first "Personal Computer" despite its name) and Apple Macintosh came to market. these computers were the beginnings of the true utility of a personal computer, which, over time, have evolved into the personal computing platforms of choice for people and business all over the world today.

This document was created from a huge number of sources that are too vast and gathered over such a long period of time to begin to account for. Some of the information here was gleaned from various online resources such as [Wikipedia](#) and [BitSavers](#). A large amount of information was also gathered from vintage periodicals and newspapers, as well as product flyers, product manuals, marketing materials, and documentation from calculator manufacturers(such as annual reports and internal/external publications) that the museum has accumulated over the years.

Some information is also gathered through interviews with the people involved in the projects to develop various calculating and computing devices at the time. The museum curator has had the incredible luck and privilege of meeting (in person, over the phone, or through digital media) with some of the players in the electronic calculator industry during the formative period of the device. Through these contacts, a tremendous wealth of information was gathered over the course of many years.

Some content in this document is not guaranteed to be 100% accurate in all aspects, as some of the information is based on the memories of people "who were there", whose memories have inevitably faded over the years. Best effort has been made to obtain alternate sources of information to corroborate such memories before they are published in this document. Despite best efforts the foggy memories of times long past can misplace events and developments in time.

There are cases where the definition of terms can be interpreted in different ways, such as when a product is "introduced" versus when it is actually available for sale. In the electronics and computing industry, a product introduction does not necessarily mean that the product can be purchased and delivered at the time of introduction. Effort is made in this document to provide introduction dates, as well as dates when a product was actually available for purchase. Some companies at the time (and is still a common practice today) made a point of introducing a product as much as 18 months before the product was actually available for purchase, with interested potential customers having to wait for a calculator that they may have already ordered based on marketing information, and perhaps even paid some money down toward the purchase, before the machine was delivered.

All efforts are made to assure this document is as accurate as possible. Updates are promptly made when sources of information converge to provide a more accurate dating of a given event.

If the reader identifies factual, spelling, punctuation, duplication, ordering, or formatting errors, please let the curator know by clicking the Email button at the top of this page. Reported errors will promptly be investigated and corrected. Likewise, if you are aware of calculating machine-related historical events, especially events that have specific dates associated with them, please let us know so we can research and authenticate the information and publish it here. Credit can be given for any contributions of information that is published if desired. All input is appreciated.

> 1646

Jul Birth of polymath [Gottfried Wilhelm von Leibniz](#) in Leipzig, Germany. Devised first practical four-function calculating machine called the [Ste](#)

> 1716

Nov [Gottfried Wilhelm von Leibniz](#) passes away at age 70 [14-Nov]

> 1799

Oct Birth of [Tanaka Hisashige](#), founder of precursor to Toshiba [18-Oct]

> 1811

Oct Birth of Isaac Merritt Singer, future founder of I.M. Singer & Co. (later, Singer Co.)

> 1822

Kienzle Apparate, GmbH founded in Germany, manufacturing clocks and time recorders

> 1838

Apr Birth of Frank S. Baldwin, prolific and revolutionary mechanical calculating machine designer [10-Apr]

> 1845

Aug Birth of Willgodt T. Odhner in St. Petersburg, Russia, creator of the first mass-marketed European calculating machine
>>> using the [Pinwheel mechanism](#) [10-Aug]

> 1851

Isaac Merritt Singer forms I.M. Singer & Company, manufacturing sewing machines
Daikichi Tanaka, apprentice of Hisashige Tanaka, establishes Tanaka Engineering Works (Toshiba precursor)

> 1857

Jan Birth of William S. Burroughs I, founder of American Arithmometer Co. (Precursor to Burroughs Corp.) [28-Jan]

> 1860

Feb Birth of Herman Hollerith, founder of Tabulating Machine Co.; the genesis of International Business Machines (IBM) [29-Feb]

> 1863

Sep Singer Manufacturing Co. (formerly I.M. Singer & Co.) formally incorporated [1-Sep]

> 1871

Grimme, Natalis & Co. founded in Braunschweig, Germany, manufacturing home appliances (later creates calculating machine brand "Brur

> 1872

Apr Passing of Frank S. Baldwin, prolific mechanical calculating machine designer [8-Apr]

> 1873

[Odhner Arithmometer](#) invented in Russia by W.T. Odhner, using Odhner's pinwheel mechanism

> 1875

Hisashige Tanaka establishes Shibaura Seisakusho, manufacturing telegraph equipment (Precursor to Toshiba)

Jul Isaac Merritt Singer, founder of what became Singer Co., passes away [23-Jul]

Ichisuke Fujioka (Son-in-Law of Hisashige Tanaka) & Shoichi Miyoshi form Tokyo Denki (Tokyo Electric Co.)

> 1878

Jul Bell Punch Co., Ltd. Incorporated in UK

Aug Birth of Heinrich Diehl, co-founder of Diehl Corp. [3-Aug]

> 1880

Aug Birth of Margarete Schmidt (Diehl), co-founder of Diehl Corp. [25-Aug]

> 1881

Sep Founder of precursor to Toshiba, Hisashige Tanaka, passes away [17-Sep]

Dec Kintarō Hattori opens K. Hattori & Co, a clock & jewelry shop in Tokyo, Japan (Precursor to Seiko) [26-Dec]

> 1884

Sep National Cash Register Co. (NCR) founded in Dayton, Ohio by John H. Patterson [1-Sep]

> 1886

Jan American Arithmometer Co. (Precursor to Burroughs Corp.) founded by William S. Burroughs in St. Louis, Missouri [21-Jan]

Smith Premier Typewriter Company established by Lyman C. Smith and three of his brothers, Wilbert, Monroe, and Hurlbut (Precursor to S
Carl Walther Company founded, producing firearms

> 1887

Dorr E. Felt patents his Comptometer, a mechanical adding/subtracting machine that dramatically improved accuracy over earlier machines

> 1888

Mar Birth of Willard Rockwell, founder of what became Rockwell International [31-Mar]

> 1889

Dorr E. Felt and Robert Tarrant form partnership manufacturing Felt's Comptometer calculating machines as Felt & Tarrant Mfg. Co.

> 1890

AB Åtvidabergs Industrier founded in Sweden (becomes Facit AB)

> 1891

Apr Carl Friden born in Alvesta, Sweden, founder of what became Friden Calculating Machine Co. [11-Apr]

May Gerard Philips and his father, Frederik Philips, found the Philips Co. in Eindhoven, Holland,

>>> manufacturing light bulbs (Precursor to Philips Gloeilampfabrieken N.V.) [15-May]

May Japan's Ministry of Communications establishes Electrotechnical Laboratory (ETL) [24-May]

> 1892

The Spencer Co. (later Philco) founded producing carbon arc lamps

Grimme, Natalis & Co. AG acquires rights to manufacture calculating machines based on Odhner's [Pinwheel mechanism](#)

> 1893

Smith Premier Typewriter Co. joins with Union Typewriter Co., a corporate trust including Remington, Caligraph, Densmore and Yost

Nov Birth of Tokuji Hayakawa, founder of what became Hayakawa Electric (later, Sharp Corporation) [3-Nov]

> 1894

Bell Punch Co., Ltd. suffers massive fire, destroying a newly-built manufacturing plant

> 1896

Winkelhofer & Jaenicke (later, Wanderer Büromaschinenwerke GmbH) founded in Chemnitz, Germany manufacturing motorcycles

Herman Hollerith founds Tabulating Machine Co. (Precursor to IBM)

Lagomarsino established in Milan, Italy as a distributor of European-made calculating machines

> 1898

Aug Nippon Electric Co., Ltd. (Nippon Denki Kabushiki-gaishe) established by Kunihiko Iwadare and Takeshiro Maeda (Precursor to NEC) [31-Aug]
 Sep William S. Burroughs I, founder of Burroughs Corp., passes away [14-Sep]

> 1899

Jul Nippon Electric Co., Ltd. Incorporated (Precursor to NEC) [17-Jul]

> 1900

Mar Birth of Howard Aiken, physicist and computer technology pioneer [8-Mar]
 Apr Birth of Kiyoshi Ichimura in Saga Prefecture, Japan. Future founder of Ricoh, Co., Ltd. [4-Apr]
 Sep Birth of [Kazuma Tateisi](#), future founder of Omron Tateisi Electronics [20-Sep]

> 1902

Jan [Curt Herzstark](#), inventor of the [Curta](#) calculator, Born in Vienna, Austria [26-Jan]
 Sep Heinrich & Margarete Diehl start business as a metal artwork foundry (Beginnings of Diehl Corp.)
 Dec Birth of Toshio Iue, founder of Sanyo Electric Co. Ltd. [28-Dec]

> 1903

Founders of Smith Premier Typewriter Co. quit due to conflicts with Union Typewriter Co., and form L. C. Smith & Bros. Typewriter Co.
 Dec [John von Neumann](#), physicist, mathematician, computing pioneer, engineer, born in Budapest, Hungary [28-Dec]
 Union Schreibmaschinen GmbH (Union Typewriter Co.) established in Berlin (Beginnings of Olympia International)

> 1904

Jan Royal Typewriter Company founded by Edward B. Hess & Lewis C. Meyers, headquartered in Brooklyn, NY
 Apr Birth of [George Robert Stibitz](#), future Bell Laboratories Computer Researcher & Designer [30-Apr]
 American Arithmometer Co. moves from St. Louis to Detroit

> 1905

Jan American Arithmometer Co. changes name to Burroughs Adding Machine Company [14-Jan]
 Sep Willgodt T. Odhner passes away, inventor of [Odhner Arithmometer](#) [15-Sep]
 Mercedes Büro-Maschinen Werke AG established in Thuringia, Germany

> 1906

Mar Royal Typewriter Co. introduces its first typewriter, the Royal Standard

> 1907

May Birth of Karl Diehl, son of Diehl Corp. founders [4-May]
 Aug Birth of [John W. Mauchly](#), future co-designer of ENIAC and many other important early computers [30-Aug]

> 1908

Universal Adding Machine Co. acquired by Burroughs Corp.
 Apr Birth of Masaru Ibuka, co-founder of Tokyo Tsushin Kogyo Kabushiki Kaisha Co. Ltd. (later, Sony) [11-Apr]
 Kanekichi Yasui establish Yasui Sewing Machine Co. (Precursor to Brother)
 Oct Camillo Olivetti founds Ing. C. Olivetti & Co., S.p.A., in Ivrea, Italy, manufacturing typewriters

> 1909

Burroughs Corp. acquires Pike Adding Machine Co.
 Bryant Chucking Grinder Co. founded by William L. Bryant

> 1910

Nippon Chikuonki Shokai (Japan Recorders Corp.) founded by Frederick Whitney Horne (later, Nippon Columbia Co., Ltd./Denon)
 Feb Birth of William B. Shockley, co-inventor of the transistor [13-Feb]
 Feb Uchida Denshi Kogyo Co., Ltd (a.k.a. Uchida Yoko Co., Ltd.) founded
 Jun Konrad Zuse, Computing Pioneer, born in Berlin, Germany [22-Jun]
 Electrical Engineer Namihei Odaira forms Hitachi, produces first product, a 5HP induction motor
 Sperry Gyroscope Co. founded by US inventor Elmer A. Sperry
 Brothers Rodney and Alfred Marchant begin manufacturing calculating machines in Oakland, CA [\[First US Calculator Company\]](#)

> 1911

Tabulating Machine Co. changes name to Computing, Tabulating and Recording Co. (CTR), later becomes IBM
 Aug Marchant Calculating Machine Co. formally incorporated [15-Aug]

> 1912

Muldivo Calculating Machine Co., Ltd. founded in London by Henri Ebstein as a distributor of office machines
 Philips Gloeilampfabrieken N.V. incorporated (Philips)
 Apr Jay R. Monroe and Frank Baldwin establish the Monroe Calculator Co. [25-Apr]

Sep David Packard, co-founder of Hewlett Packard, born in Pueblo, Colorado [7-Sep]

Sep Tokuji Hayakawa founds metal-working shop in Tokyo, Japan, Hayakawa Brothers Co. (precursor to Hayakawa Electric) [15-Sep]

> 1913

May Birth of William R. Hewlett, future co-founder of Hewlett Packard [20-May]

Jun Birth of computing visionary and pioneer Maurice Vincent Wilkes, Dudley, Worchestershire, UK (Created concept of microprogramming) [26-Jun]

> 1915

James Picker Co. founded by James Picker in New York City (later, Picker X-Ray, Picker Corp./Picker Nuclear Division)

May Tadashi Sasaki born in Taiwan (future calculator mover & shaker at Hayakawa Electric (Sharp) [12-May]

> 1916

National Association of Office Appliance Manufacturers founded in Chicago, Illinois (later BEMA)

Apr Claude Elwood Shannon, later to become known as "the father of information theory", born in Gaylord, MI [30-Apr]

May Birth of Bernard (Barney) Oliver, radar pioneer and later, founding director of Hewlett Packard Laboratories, responsible for overseeing development of [HP 9100](#) and HP-35 calculators [27-May]

> 1917

Nov Tadao Kashio born, Nangoku City, Japan, future co-founder of Casio [26-Nov]

> 1918

AB Addo founded in Malmo, Sweden by Hugo Agrell

Matsushita Electric Housewares Mfg. Works (later Panasonic) founded by Kōnosuke Matsushita

Mar Victor Adding Machine Co. founded in Chicago, IL, by Carl Buehler

May Birth of Ge Yao (G.Y.) Chu (Employee #1 and Co-Founder of Wang Laboratories) [3-May]

May Birth of Richard Phillips Feynman, future Theoretical Physicist, key member of Manhattan Project, intuitive mechanical calculator repairman, 1965 Nobel Prize winner, quantum physics theorist [15-May]

Jul Birth of Jay Wright Forrester, future co-inventor of magnetic core memory [14-Jul]

Aug Birth of [Katherine Johnson](#), who became one of NASA's

leading "human computers" (with the help of a Monroe electromechanical calculator) [26-Aug]

Oct Oi Electric Co. Ltd., founded, Tokyo, Japan [3-Oct]

> 1919

Apr Birth of [John Adam Presper Eckert Jr.](#), co-designer of ENIAC and other early computers with [John Mauchly](#) [9-Apr]

Jun Birth of [Stanley Frankel](#), Manhattan Project Nuclear Physicist, and later gifted computer & calculator designer.

>>> See Old Calculator Museum exhibit on the [SCM Cogito 240SR](#) for more information. [6-Jun]

Jul Birth of Frank S. Wyle, founder of Wyle Laboratories [23-Jul]

Radio Corporation of America (RCA) established as public company with majority ownership by General Electric

Willard Rockwell forms a company in Wisconsin making truck axle bearings forming the foundation of what becomes Rockwell International

The first adding machine from Victor Comptometer, the Model 110, is introduced

> 1920

Feb An Wang born in Shanghai, China, future founder of Wang Laboratories [7-Feb]

> 1921

Jan Birth of Akio Morita, co-founder of Sony [26-Jan]

Grimme, Natalis & Co. is incorporated as Grimme, Natalis & Co. AG (Brunsviga brand calculating machines)

Moon-Hopkins Billing Machine Co. purchased by Burroughs Corp.

> 1922

Laurence Marshall and Vannevar Bush are founders of American Appliance Co. (becomes Raytheon)

Oct Birth of Donald C. Hoeffler, future journalist who coins term "Silicon Valley" [3-Oct]

> 1923

Mar William Henry Burkhardt born, future prolific electronic calculating machine inventor at Monroe [4-Mar]

Dictaphone Corp. formed out of Columbia Gramophone Co.

General Instrument founded in New York, NY, manufacturing electronic equipment

Dictaphone Corp. formed out of Columbia Gramophone Co.

Sep Hayakawa Brothers Co. facilities destroyed by the [Great Kantō Earthquake](#) and subsequent fires [1-Sep]

Nov Birth of [Jack St. Clair Kilby](#), inventor of early experimental Integrated Circuit [8-Nov]

Dec Birth of Árpád Klatsmányi in Budapest, Hungary, future father of digital computing in Hungary

>>> and designer of Hungary's first electronic calculator, the [Hunor 131](#) [20-Dec]

> 1924

Birth of Yoshio Kojima (Future president of Nippon Calculating Machine Co.)

K. Hattori & Co. begins selling clocks under the Seiko brand name

Carl Walther Company begins manufacture and sale of mechanical calculating machines

Sep Tokuji Hayakawa opens rebuilt(after earthquake) metal-working business in Osaka, Japan, as Hayakawa Metal Laboratories [1-Sep]

Burroughs Adding Machine Co. listed on New York Stock Exchange

Computing, Tabulating, and Recording Co. changes name to International Business Machines (IBM)

> 1925

- Jan Toshio Kashio born (future calculating machine inventor at Casio Computer Co., Ltd.)
Due to a name clash, American Appliance Co. changes name to Raytheon Co.
- Apr Frank S. Baldwin, prolific calculator designer at Monroe, passes away [8-Apr]
Matsushita Communication Industrial Co., Ltd. (later, Panasonic) registers "National" brand name for consumer products marketed in Japan
- Apr Heinz Nixdorf, Computing Pioneer and Businessman(Nixdorf Computer), born in Paderborn, Germany [9-Apr]

> 1926

- L.C. Smith & Bros. and Corona Typewriter merge to become Smith-Corona Corp.
- Oct Royal Typewriter Co. produces its one millionth typewriter
- Nov Kanekichi Yasui, founder of Yasui Sewing Machine Co. passes away
- Nov Masayoshi Yasui, son of founder Yasui Sewing Machine Co. succeeds his father as CEO of the company
Yasui Sewing Machine Co. renamed Yasui Brothers Sewing Machine Co.

> 1927

- Remington Typewriter Co. and Rand Kardex merge to form Remington Rand
- Mar Birth of William B. Hugle, future co-founder of Hugle International, Siliconix, and others [30-Mar]
- Mar Birth of Robert H. Norman, electronics engineer & businessman (General Micro-electronics, Nortec Electronics) [24-Mar]
Grimme, Natalis & Co. AG renamed Brunsviga Maschinenwerk Grimme, Natalis & Co. AG, recognizing
>>> the Brunsviga brand name of calculating machines in its title
Matsushita begins marketing bicycle lamps in Japan under the "National" brand
- Aug Birth of Frances B. Sarnat, prolific inventor of semiconductor-related developments. The only woman scientist involved
>>> in such work in the early days of integrated circuit technology [13-Aug]
Remington Rand purchases Powers Accounting Machine Co.
- Dec Birth of [Robert Norton Noyce](#), inventor of the first practical Integrated Circuit, and co-founder of Integrated Electronics (Intel) [12-Dec]

> 1928

- Nippon Calculator Co. Ltd. incorporated in Osaka, Japan
- Feb Birth of Thomas E. Kurtz, future co-inventor/programmer of the BASIC computer language [22-Feb]
Brand name "Brother" registered by Yasui Brothers Sewing Machine Co.
- Jul Birth of [Robert A. Ragen](#), architect and project leader of the legendary [Friden EC-130](#) solid-state electronic calculator [23-Jul]
- Sep Paul Galvin founds Galvin Manufacturing Corp., in Chicago, Illinois (Precursor to Motorola)

> 1929

- Jan Birth of Gordon E. Moore, co-founder of Fairchild Semiconductor and Intel, and creator of [Moore's Law](#) [3-Jan]
- Jan Birth of Kazuo Kashio, co-founder with brother Tadao, of Kashio Seisakujo (future Casio Computer Co., Ltd) [9-Jan]
- Feb Birth of Massimo Rinaldi, founder of Industrie Macchine Elettroniche (IME) and designer/patent holder of early IME Calculators [21-Feb]
- Apr Birth of Dale Perry Masher, co-designer at SRI of display subsystem for [Friden 130](#) [14-Apr]
Harold T. Avery joins Marchant Calculating Machine Co.
Carl Friden leaves as head of design department at Marchant Calculating Machine Co.
National Association of Office Appliance Manufacturers renamed to
>>> Office Equipment Manufacturers Institute (later BEMA)
- Nov Herman Hollerith, noted inventor of punched card tabulating equipment and founder of what later became IBM, passes away [17-Nov]
- Dec IBM's electromechanical Statistical Calculator presented to Columbia University
- Dec Idek Tramielski (Jack Tramiel) Born in Lodz, Poland (founder of Commodore) [13-Dec]

> 1930

- Union Schreibmaschinen GmbH moves from Berlin to Erfurt, Germany
Union Schreibmaschinen GmbH renamed to "Europa Schreibmaschinen AG", creates the brand name "Olympia" for their typewriters
Tiger Calculating Machine Co., Ltd. founded
- May Citizen Watch Co., Ltd. established in Japan
- May Geophysical Service founded by John C. Karcher and Eugene McDermott. (Precursor to Texas Instruments) [16-May]
Dorr Eugene Felt, co-founder of Felt & Tarrant, passes away
- Nov Birth of James (Phil) Ferguson, co-founder of General Micro-electronics [18-Nov]
- Dec Birth of Eiichi Goto, inventor of Parametron logic circuitry [22-Jan]
- Mar Julius J. Muray, (VP of Cintra, Inc.) Born in Hungary [22-Mar]
- Apr Irwin Wunderman (founder of Cintra, Inc.) born [24-Apr]
- Jun Birth of Don E. Farina, MOS IC Pioneer [3-Jun]

> 1932

- Ing. C. Olivetti & Co., S.p.A makes first public stock offering
- May Birth of Jay Glenn Miner, future guru-level MOS LSI circuit designer in early days of American Micro-systems (AMI)
>>> involved in development of CADC LSI computer chip-set for the F-14 Tom Cat fighter. Creator of
>>> innovative LSI IC's for Atari's home game consoles, Commodore 64 & AMIGA personal computers [31-May]

> **Links to Interesting Calculator-Related Sites**

Here is a list of some sites that specialize in old calculators and related technology. Please visit these pages to learn more about the world of calculating machines.

Jun Birth of Don E. Farina, MOS IC Pioneer [3-Jun]

> 1932

>>>

Ing. C. Olivetti & Co., S.p.A makes first public stock offering

>>>

>>> involved in development of CADC LSI computer chip-set for the F-14 Tom Cat fighter. Creator of

>>> innovative LSI IC's for Atari's home game consoles, Commodore 64 & AMIGA personal computers [31-May]

Carl Buehler, founder of Victor Adding Machine Co., passes away

Litton Engineering Laboratories, making vacuum-tube manufacturing equipment, founded by Charles Litton, Sr. [3/13/1904-11/1972]

Sep Birth of Howard Rathbun, co-inventor of [Monroe EPIC 2000](#) and [EPIC 3000](#) calculators with Mark Pivovonsky. US Patent [3,328,763](#) [24-Sep]

> 1933

Seiki Kogaku Kenkyusho (Precision Optical Industry) established (Precursor to Canon Camera Co.)

Mar Birth of Atsushi Asada, visionary engineer behind development of Electronic Calculators at Hayakawa Electric (Sharp)

Birth of William Kahn, visionary designer of [Mathatronics Mathatron](#) calculator and founder of Mathatronics

May Friden Calculating Machine, Co. founded by Carl Friden with \$52,000 in capital

May Future inventor of CMOS IC technology, Frank Wanlass, born in Thatcher, Arizona [17-May]

May Tateisi Electric Mfg. Co. founded by Kazuma Tateisi, Osaka Japan (becomes OMRON Corp.) [10-May]

> 1934

Edgar Jessup brought in by Board of Directors of Marchant Calculators, Inc. as President

Aug Birth of Chester Gordon Bell, later architect and project manager for many computer development projects at Digital Equipment Corp. [19-Aug]

Yasui Brothers Sewing Machine Co. renamed Nippon Sewing Machine Mfg. Co.

Barry Wright Corp. founded (later purchased Mathatronics, Inc.)

> 1935

IBM announces the 601 Multiplying Punch (electro-mechanical punched-card calculator)

Mar Birth of Norman J. Grannis, future co-founder of Computer Design Corporation [23-Mar]

May Hayakawa Metal Industry Institute Co., Ltd. incorporated from Hayakawa Metal Laboratories, Tokuji Hayakawa Founder & President (Future Sharp Corp.)

May Birth of Howard Zabriskie Bogert, calculator designer & LSI engineer [5-May]

National Technical Laboratories founded by Caltech professor Dr. Arnold Beckman in Pasadena, CA.,

>>> manufacturing precision Ph measurement equipment (Later, Beckman Instruments)

Precisa Co. founded in Zurich, Switzerland to manufacture printing adding/calculating machines

Jun Fujitsu Limited established as manufacturing arm of Fuji Electric Ltd., manufacturing telephone exchange-related equipment [20-Jun]

> 1936

Feb Riken Kankoshi Co., Ltd. founded by Kiyoshi Ichimura as spinoff of Rikagaku Kogyo (Precursor to Ricoh Co., Ltd.) [6-Feb]

May General Precision Equipment Corp. founded in New York, NY [30-May]

Hayakawa Metal Industry Institute Co., Ltd. changes name to Hayakawa Industrial Co., Ltd. (Future Sharp Corp.)

Union Schreibmaschinen AG renamed Olympia Büromaschinen Werke AG (Olympia Office Machine Works)

Friden Calculating Machine, Co., moves to San Leandro, California

> 1937

Librascope Inc., Glendale, CA, founded by Mr. Lewie Imm, developing & operating theater equipment

Aug Seiki Kogaku Kenkyusho (Precision Optical Industry) Co., Ltd. Incorporated (Precursor to Canon Camera Co.)

Japanese government bans import of business machines

Claude Shannon [4/30/1916-2/24/2001] submits Masters Degree thesis entitled "A Symbolic Analysis of Relay and Switching Circuits" which is later published as a paper that outlines the application of Boolean Algebra to electrical circuitry

Oct Marcian (Ted) Hoff, architect of the first commercial single-chip microprocessor at Intel, born in Rochester, New York

Nov Proposal for conceptual computing machine that became [Harvard Mark I](#) (aka ASCC) presented to IBM by Dr. Howard Aiken

> 1938

Konrad Zuse [6/22/1910-12/18/1995] completes the mostly mechanical V1 (later known as Z1), prototype of a programmable calculating machine

Mar Riken Kankoshi Co. Ltd. changes name to Riken Optical Co. Ltd. (Later Ricoh Co., Ltd.)

Jun Passing of [John A. Presper Eckert Jr.](#), noted co-designer of ENIAC and other significant early electronic computers [3-Jun]

Sep Project to develop Bell Labs' (George Stibitz-designed) relay-based Complex Number Calculator approved

Nov Heinrich Diehl (founder of Diehl Corp.) passes, son Karl assumes presidency of company [7-Nov]

Nov Hewlett Packard luminary Physicist & Engineer Barney Oliver passes away [23-Nov]

Dec Incorporation of Geophysical Service, Inc. (Precursor to Texas Instruments) [6-Dec]

Dec Lee Loren (Buff) Boysel born in Detroit, MI [31-Dec] [[Fairchild MOS LSI disruptive force, developed First Single Chip Microprocessor Core](#)]

> 1939

Jan Hewlett Packard founded by Bill Hewlett & David Packard in Palo Alto, California, with

>>> management mentorship from Bill Hewlett's close friend, Charles Litton, Sr. (Litton Engineering, Inc.)

Feb Funding for what becomes the IBM [Harvard Mark I](#) (aka ASCC) electromechanical computer project approved

Tokyo Denki (Tokyo Electric Co.) and Shibaura Seisakusho merge to form Tokyo Shibaura Electric Co., Ltd. (Later, Toshiba)

Apr Construction of the Bell Labs Model I Relay Complex Number Calculator begins

Clary Corp. founded by Hugh L. Clary

Geophysical Service Inc.(GSI) changes name to Coronado Corp., GSI spun off as subsidiary

- Oct Bell Laboratories' relay-based (~425 relays and eight crossbar switches) [Model I Complex Number Calculator](#)
 >>> completed and operational. Cost: ~\$20,000, roughly \$429,000 in 2022 dollars [\[First known relay-based calculating machine\]](#)

➤ 1940

- Jan Bell Laboratories' relay-based [Model I Complex Number Calculator](#) begins production operation [8-Jan]
 The Spencer Co. changes its name to Philco Corp., using the Philco brand name it had been marketing radios under since the 1930's
 May Directors of Philips Gloeilampfabrieken (Philips) learn of Germany's impending invasion of the Netherlands. To continue
 >>> members of the Philips family and other senior management flee to US to eventually start-up North American Philips Co.
 Toshio Kashio begins work at Japan's Ministry of Communications after graduating from School of Electrical Engineering in Tokyo
 Jul Clive Marles Sinclair born in Ealing, England (Future founder of Sinclair Radionics Ltd.) [30-Jul]
 Bell Punch Co., Ltd. introduces a Comptometer and markets it under the Sumlock Comptometer brand
 Tiger Calculating Machine Co., Ltd. splits its sales organization into separate company, Tiger Calculating Sales Co., Ltd
 Sep Konrad Zuse[6/22/1910-12/18/1995] demonstrates his Z2 telephone relay-based calculating machine built in his parents' home
 Sep Public demonstration of Bell Laboratories' relay-based [Complex Number Calculator](#) being remotely operated via
 >>> Teletype terminal at Dartmouth College [11-Sep] [\[First example of remote computing\]](#)
 Nov Birth of Harold Koplow (Future senior calculator engineer at Wang Labs), in Lynn, MA [21-Nov]

➤ 1941

- Jan Passing of Edward B. Hess, co-founder of Royal Typewriter Co. and one of its principal typewriter designers
 Konrad Zuse[6/22/1910-12/18/1995] founds Zuse Apparatebau to manufacture relay-based calculating machines
 May Konrad Zuse[6/22/1910-12/18/1995] publicly demonstrates his [V3 \(later known as Z3\)](#) relay-based floating-point
 >>> programmable calculator [12-May] [\[World's first fully electric programmable calculating machine\]](#)
 Librascope Inc. purchased by General Precision Equipment Corp.
 May Uchida Denshi Kogyo Co., Ltd. (Uchida Yoko) incorporated
 May Michael James Cochran (Chief Calculator Architect, Texas Instruments) born in Daytona Beach, Florida [21-May]
 Sep Birth of H. Edward Roberts, future founder of MITS [13-Sep]
 Four-function relay calculator developed by Fuji Electric Works, Japan
 Dec Birth of Federico Faggin, leader of the team that developed what is considered the first
 >>> commercial CPU on a chip, the Intel 4004, first used in Nippon Calculating Machines' [Busicom 141-PF](#) electronic calculator [1-Dec]
 Dec Geophysical Service Inc.(GSI) subsidiary of Coronado Corp. purchased by Eugene McDermott, Cecil Green,
 >>> Erik Jonsson, and H.B. Peacock to form foundation of what would later become Texas Instruments [6-Dec]

➤ 1942

- Fuji Star Calculator Mfg. established (Precursor to Nippon Calculating Machine Co.)
 Oct As part of war effort, Smith-Corona begins production of the M1903A3 Springfield bolt-action rifle at Syracuse, NY calculator factory
 Hayakawa Industrial Co., Ltd. changes business name to Hayakawa Electric Co., Ltd. (Hayakawa Denki Kogyo Kabushiki Kaisha)

➤ 1943

- Mar Stanley Frankel and Eldred Nelson among first to arrive at secret Los Alamos site to begin calculations on effectiveness
 >>> of gun-type design for atomic (nuclear fission) bomb
 Stanley Frankel & Eldred Nelson order assortment of Friden, Monroe, and Marchant rotary electromechanical calculators
 >>> for use by scientists and a group of so-called "hand computers" (human operators of calculators) at Los Alamos
 T-5 Computing Group at Los Alamos formed, with Mary Frankel (Stanley's Frankel's wife) appointed as the informal group supervisor
[Curt Herzstark](#)[1/26/1902-10/27/1988], under Nazi orders, draws up plans for what becomes the [Curta](#)
 >>> mechanical calculator while imprisoned in infamous Nazi Buchenwald concentration camp
 Jul Bell Labs completes Model II "Relay Interpolator" relay-based (440 relays) special purpose computer, used
 >>> for calculations relating to the development of the US Army's M9 (anti-aircraft) Gun Director system
 Aug Masatoshi Shima born in Shizouka, Japan. Later while at Nippon Calculating Machine Co., Ltd.(NCM)
 >>> becomes heavily involved in the development of simple computer CPU on a chip (Intel 4004) used in NCM's [Busicom 141-PF](#) calculator [1-Dec]
 Los Alamos' T-Division leader Hans Bethe recruits mathematician Don Flanders to become the formal head of the T-5 Computing group.
 >>> Immediately Flanders standardizes the calculators to be used at T-5 as the [Marchant Silent Speed 10ACT](#)
 >>> All of the Monroe calculators and all but two Friden calculators were eliminated, with the two Friden calculators that
 >>> remained used by Mary Frankel(Stanley Frankel's wife) and Betty Inglis, which they insisted on keeping believing
 >>> they were superior to the Marchant calculators
 Dec Z-3 relay computer built by Konrad Zuse[6/22/1910-12/18/1995] destroyed by allied bombardment of Berlin [21-Dec]

➤ 1944

- Jan Construction of IBM's electromechanical computing machine, [ASCC](#) (Automatic Sequence Controlled
 >>> Calculator), also known as the Harvard Mark I, completed at IBM's Endicott, NY plant
 Feb IBM's [ASCC](#) (Automatic Sequence Controlled Calculator) electromechanical computing machine
 >>> shipped to Harvard University on loan from IBM, becoming known as the Harvard Mark I
 Mar Dr. [John von Neumann](#) runs one of the earliest programs on IBM's [Harvard Mark I](#) (ASCC) electromechanical computing machine,
 >>> a classified simulation of an implosion-type atomic bomb design
 Three specially-modified IBM Model 601 Multiplying Punch calculators and associated punched card equipment arrive at
 >>> Los Alamos to aid in/speed up Manhattan Project theoretical atomic bomb calculations
 Stan Frankel, Eldred Nelson, and Richard Feynman go about installing IBM's punched card calculating equipment at

>>> Los Alamos due to Manhattan Project secrecy precluding IBM field personnel from performing the installation
 May IBM's [Harvard Mark I](#) (ASCC) electromechanical computing
 >>> machine begins classified ballistics calculations for US Navy Bureau of Ships
 Aug IBM's [Harvard Mark I](#) (ASCC) electromechanical computing machine formally turned over
 >>> to Harvard University by IBM after completing secret weapons calculations [7-Aug]

➤ 1945

Mar Bell Labs completes Model IV relay calculator using ~1400 relays. Shipped to Naval Research
 >>> Laboratory in Washington, DC for solving complex naval gun fire-control calculations as follow on to earlier IBM ASCC computations
 Apr Carl Friden, founder of Friden Calculating Machine Co., [passes away](#) [29-Apr]
 Nippon Calculator Co., Ltd. re-founded after WW-II manufacturing mechanical calculators (precursor to Nippon Calculating Machine Co.)
 Autonetics formed out of North American Aviation's Technical Research Laboratory
 Walter S. Johnson assumes role as President of Friden Calculating Machine Co. after founder and president Carl Friden passes away
 Jun Bell Labs Completes Model III Relay-Based "Ballistic Computer", capable of trigonometric operations using approx. 1,400 relays
 Aug First atomic bomb used in warfare dropped by US B-29 bomber over Hiroshima, Japan,
 >>> killing an estimated 80,000 people and causing massive devastation [6-Aug. 8:15 AM local time]
 Aug A second US atomic bomb detonated over Nagasaki, Japan, killing an estimated 40,000 people [9-Aug, 11:02 AM local time]
 Aug Japanese Emperor Hirohito issues unconditional surrender declaration in radio broadcast [15-Aug]
 Sep Japan officially surrenders due to overwhelming force of two US atomic bomb attacks, thus marking the end of World War II [2-Sep]
 Sep Royal Typewriter Co. resumes typewriter production after converting
 >>> to production of munitions, weapons, and aircraft parts for World War II
 Dec Howard Vollum, Jack Murdock, Miles Tippery and Glen McDowell found Tekrad in Portland, OR (Future Tektronix, Inc.)

➤ 1946

Jan Tekrad changes name to Tektronix, Inc. due to similarity of Tekrad with Techrad in California
 Apr Tadao Kashio and brother Kazuo co-found Kashio Seisakujo (Kashio Manufacturing), later becomes Casio Computer Co., Ltd.
 May Tokyo Tsushin Kogyo Kabushiki Kaisha Co., Ltd. (Tokyo Telecommunications Engineering Co.) re-established
 >>> after World War II by Masaru Ibuka and Akio Morita (later becomes Sony Corp.) [7-May]
 Toshio Kashio joins brothers Tadao and Kazuo at newly founded Kashio Seisakujo (later becomes Casio)
 >>> Director of Research & Development and Engineering Manager
 Smith & Corona Co. renamed Smith-Corona
 Aug Charles Litton, Sr. forms Litton Industries, Inc. to produce advanced vacuum tubes. Litton's original
 >>> Litton Engineering Laboratories remains a separate private entity, focusing purely on producing specialized equipment
 >>> used in the manufacturing of vacuum tubes
 Nippon Calculating Machine Co., Ltd incorporated in Tokyo, Japan; changed name from Nippon Calculator Co.
 Sankyo Seiki Mfg. founded, development of mechanical music box movements begins
 First of two Bell Labs' Model V Relay calculators completed. Programmable via punched tape,
 >>> using over 9,000 relays. Installed at National Advisory Committee for Aeronautics, Langley Field, VA
 Nippon Chikuonki Shokai (Japan Records Corp.) renamed Nippon Columbia Co.
 Litton Engineering Laboratories formally incorporated
 Tadashi Sasaki visits transistor technology researchers at Bell Labs
 Nov Calculating race in Tokyo between desktop electromechanical calculator and abacus - Abacus Won! [12-Nov]

➤ 1947

Galvin Manufacturing Corp. changes name to Motorola, Inc.
 Denon brand-name established for Nippon Columbia Co., Ltd. audio products
 Mar Sanyo Denki Seisakusho (Sanyo Electric Co., Ltd.) co-founded by Toshio Iue and brother Goro Iue
 >>> as spin-off of Matsushita due to US-mandated post-war break-up of largest Japanese corporations [21-Mar]
 Second of two Bell Labs' Model V Relay calculators completed
 >>> and installed at the US Army's Ballistic Research Laboratory (BRL) in Aberdeen, MD
 Curta calculator (Type I) begins production
 Jun William Hugle and Frances Sarnat are married
 Burroughs adopts the capital "B" trademark
 National Electronics, Inc. (not to be confused with National Semiconductor) established
 >>> in Geneva, IL, manufacturing vacuum tubes
 Aug Hewlett Packard Co. Incorporated [18-Aug]
 Sep Seiki Kogako Kenkyusho (Precision Optical Industry) Co., Ltd. changes name to Canon Camera Co., Inc.
 Dec The first working point-contact transistor is created at Bell Laboratories [16-Dec]
 Dec Construction of Small-Scale Experimental Machine (SSEM), aka "Manchester Baby" begins at Manchester
 >>> University, UK [\[Technically the first working all-electronic stored-program computing machine\]](#)
 Dec The Williams-Kilburn electrostatic cathode ray tube (CRT) used in "Manchester Baby" computer [\[First practical electronic Random Access Memory \(RAM\)\]](#)
 Dec First use of the new point-contact transistor as an audio amplifier demonstrated internally at Bell Labs [23-Dec]

➤ 1948

Jan IBM's electromechanical Stored Sequence Electronic Calculator (SSEC) dedicated and begins operations at IBM headquarters
 Jan The concept of a transistor made by growing semiconductor crystals in layers (epitaxy) conceived by Dr. William Shockley [23-Jan]
 May Tateisi Electric Mfg. changes name to Tateisi Electronics Co.
 Jun First program runs on Small-Scale Experimental Machine (SSEM), aka "Manchester Baby" electronic computer at Manchester University, L

Jun Dr. William Shockley files for patent on his concept of a grown-junction(epitaxial) transistor, becomes

>>> [US Patent #2569347](#) [26-Jun]

Jun Bell Labs' point-contact Transistor first publicly [demonstrated](#) [30-Jun]

Futaba Denshi founded in Mobara, Japan, manufacturing radio vacuum tubes

Raytheon introduces the CK703 Germanium point-contact transistor [[First commercially-produced Transistor](#)]

> 1949

Jan Japanese government establishes the Ministry of International Trade and Industry (MITI) to coordinate financial and business aspects of Japanese economy to strengthen the country's recovery from World War II [11-Jan]

May IBM introduces its electronic Card-Programmed Calculator(CPC), based on the Model 604 Electronic Calculating Punch

First Japanese Business Machine Exposition held in Tokyo, Japan

Kashio brothers visit Japan Business Machine Expo seeking ideas for new products,

>>> and witness various electromechanical calculating machines

Toshio Kashio proposes that Kashio Seisakujo design & manufacture an electric (as opposed to electromechanical) calculator

>>> and immediately begins design of a solenoid(electro-magnet)-based automatic four-function calculator

Wyle Laboratories founded by Frank S. Wyle with \$5,000 loan from his father

Nippon Electric Co. (NEC) and Western Electric (Bell Labs) establish joint-venture with funding from Western Electric to develop transistor

May The Cambridge University (UK) EDSAC stored program computer executes its first program [6-May]

Aug Marchant Calculating Machine Co. re-incorporated as Marchant Calculators Inc. [3-Aug]

Aug Kobe Kogyo Corp. established [5-Aug]

Introduction of the [Friden STW-10](#) electromechanical calculator at the fall New York Business Show

Bell Labs' relay-based Complex Number Calculator decommissioned and dismantled

> 1950

Jan Tokyo Tsushin Kogyo Kabushiki Kaisha Co., Ltd. (later, Sony) completes its first commercial tape recorder

Feb Royal Typewriter Co. introduces its first electric typewriter

Walter M. A. Andersen founds Andersen Laboratories, Inc., a pioneering company in development of low-cost magnetostrictive delay line te

Nippon Electric Co. (NEC) begins first Japanese transistor R&D effort as a result of joint-venture with Western Electric

Apr Sanyo Electric Co., Ltd., formally incorporated [1-Apr]

Apr First Swedish-built computer, [BARK](#) (Binary Automatic Relay Calculator), introduced.

>>> 5,000 telephone relays, plug-board programmable, 50 memory registers, 100 number constant table. [28-Apr]

National Technical Laboratories changes its name to Beckman Instruments, Inc.

Kazuo Kashio joins brothers Tadao and Toshio at Kashio Seisakujo (Casio Computer Co., Ltd.)

Canon Camera Co., Inc. opens branch office in New York City

Diehl Corp. begins development of mechanical calculating machines

Nov Broughton & Co. (Bristol) Ltd. (a.k.a. Broughtons of Bristol) incorporated, providing sales & support of imported office equipment in UK [17-

> 1951

Jan Geophysical Service Inc.(GSI) changes name to General Instrument Inc., but due to a name clash

>>> with General Instrument, Inc., again renamed as Texas Instruments

Feb First commercially-available electronic computer, the UK's Ferranti Mark I, delivered to first customer

Jun Dr. An Wang co-founds Wang Laboratories with Dr. Ge Yao Chu, with \$600 of self-funding [22-Jun]

Concept of microprogramming conceived by Maurice Wilkes[6/26/1913-11/29/2010] at Cambridge University

Jul Bell Labs features Dr. William Shockley during its announcement of the development of the first grown-junction transistor [4-Jul]

Bell Labs begins selling licensing rights to transistor technology for \$25,000 (roughly \$536,000 in 2022 dollars)

Sep Bowmar Instrument Corp. founded in Fort Wayne, Indiana, by Edward White

Sep Bell Labs hosts first technology forum for potential licensees of transistor technology

Physical Research Laboratories of Pasadena, CA, formed by George B. Greene and Donald White

Physical Research Laboratories announces intent to market a small, high- performance scientific computer

> 1952

Mar Takachiho Koheki Co. Ltd. founded [13-Mar]

Apr Bell Laboratories hosts nine-day Transistor Technology Symposium for licensees of transistor technology

Benson-Lehner introduces the Computyper (later sold to Friden)

Yukio Kashio joins his three brothers at Kashio Seisakujo (later, Casio Computer Co., Ltd.)

Japan's Electrotechnical Laboratory (ETL) develops prototype relay calculator, the ETL Mark 1

Texas Instruments purchases license for transistor technology from Bell Labs

First demonstration of magnetic core memory

Friden SRW electromechanical calculator introduced [[First Desktop Electromechanical Calculator with Automatic Square Root](#)]

Founding of early semiconductor manufacturer Transitron Electronic Corp. by brothers David & Leo Bakalar.

Jul Heinz Nixdorf founds Labor für Impulstechnik, in Essen, West Germany (later, Nixdorf Computer AG) [1-Jul]

Aug Marchant Calculators, Inc. acquires 70% ownership of computer manufacturer Physical

>>> Research Laboratories (PRL) of Pasadena, CA to develop a computer business. Marchant renames PRL to Marchant Research, Inc.

>>> George Greene remains President [6-Aug]

Wang Labs (Dr. An Wang) contracted by Laboratory for Electronics, Inc., a small Massachusetts

>>> company that developed electronics for military applications, to assist in development of a magnetic core-based

>>> character generator (Read-Only Memory, a.k.a. ROM) for use in displaying characters on a CRT (later becomes [US Patent #2,920,312](#)).

Diehl Corp. (W. Germany) begins production of semi-automatic mechanical calculators

Introduction of the first commercial US product to utilize the transistor, the Sonotone 1010 Hearing Aid,

- >>> uses two subminiature vacuum tubes and a single transistor manufactured by Germanium Products, Inc. [29-Dec]
- Dec Raytheon is producing thousands per week of the first commercial transistor, the Germanium PNP junction
- >>> device designated CK718, sold only to hearing aid manufacturers

➤ 1953

- Jan Introduction of the world's first *all-transistor* device, the Model O "Transit-Ear" hearing aid, manufactured by Maico
- >>> Electronics, Inc. of Minneapolis, MN, utilizing three commercially-produced Raytheon CK718 Germanium PNP junction transistors
- Jan Paul Gardner Allen[1/21/1953-10/15/2018], future co-founder of Microsoft, co-author of the first BASIC language processor
- >>> for a microprocessor(Intel 8080), and Philanthropist, Born in Seattle, Washington [21-Jan]
- Raytheon announces the first generally-available commercial transistor, the Germanium junction PNP CK722
- Cherry Electrical Products Corp. founded by Walter Lorain Cherry out of the basement of a restaurant in Highland Park, IL
- National Cash Register Co. (NCR), acquires Computer Research Corp., forming NCR Electronics Division
- May RCA introduces its first commercial transistors, the 2N34 Germanium junction PNP and the 2N35 Germanium junction NPN devices
- Massimo Rinaldi graduates with Electrical Engineering degree from La Sapienza University of Rome
- Burroughs Adding Machine Co. renamed to Burroughs Corp.
- Burroughs Corp. delivers its first electronic computer, UDEC I, to Wayne State University
- Jul IBM announces it is developing what will become the first mass-produced electronic computer,
- >>> featuring a high-speed magnetic drum as its main memory. The computer is first delivered in late 1954 as the
- >>> [IBM 650 Magnetic Drum Data Processing Machine](#) [First Commercial Computer To Use Magnetic Drum as Main Memory] [14-Jan]
- Smith-Corona renamed Smith-Corona, Inc.
- Tokyo Tsushin Kogyo Kabushiki Kaisha Co., Ltd. (later, Sony) purchases first Japanese license for transistor technology from Bell Laboratory
- Philco Corp. develops the surface barrier transistor, a Germanium transistor developed expressly for high-speed computers
- Charles Thornton, noted businessman, forms Electro Dynamics, Corp., with partners Roy Ash and Hugh Jamieson,
- >>> in Beverly Hills, CA (Precursor to Litton Industries)
- Marchant Research Inc. delivers its first computer, magnetic drum-based MINIAC to Atlantic Refining
- >>> at contract price of ~\$50,000
- Robert Ragen joins Friden Calculating Machine Co.
- Nov University of Manchester's Experimental Transistor Computer operational [First Transistor-based(Logic) general purpose computer]
- Nov Charles Thorton's Electro Dynamics Corp. purchases Litton Industries from Charles Litton, Sr. for \$1.25M
- >>> Charles Litton retains Litton Research Laboratories
- First practical use of magnetic core memory in a computer; 32x32x16 (1024 16-bit words) array in [Whirlwind I](#),
- >>> using vacuum tube-based row & column drivers and sense amplifiers

➤ 1954

- Jan Bell Labs' transistorized [TRADIC](#) computer becomes operational [First Transistor-based(logic) computer in US]
- Büromaschinen Werke AG renamed to Olympia Werke AG
- Mar [Parametron](#) ferro-electronic device invented in Japan by Eiichi Goto[1/26/1931-6/12/2005],
- >>> a graduate student at Tokyo University. Parametron-based logic was first used in Ricoh/Oi Electric
- >>> [Aleph Zero](#) electronic calculator
- Japan's Electrotechnical Laboratory creates Electronics Department specifically tasked with
- >>> solid-state electronic technology research & development
- Brother International Corp. established as US presence by Nippon Sewing Machine Mfg. Co.
- Apr Texas Instruments R&D department develops first functional Silicon junction transistor [4-Apr]
- Apr Royal Typewriter Co. announces intent to merge with McBee Co.
- Burroughs purchases Haydu Brothers vacuum-tube manufacturing firm to become manufacturer of Burroughs' newly-invented
- >>> [Nixie](#) display tube
- May Texas Instruments announces it has begun initial volume production of Silicon-based transistors [10-May] [First mass production of Silicon-based t
- May Texas Instruments seeks radio manufacturer to produce a fully-transistorized radio that they designed using hand-picked
- >>> sets of four TI-made Germanium junction NPN transistors. Large vacuum-tube radio manufacturers Philco and RCA were
- >>> not interested. Industrial Development Engineering Associates(IDEA) of Indianapolis, IN, marketing products under the
- >>> Regency brand, signs up to manufacture and market the radio
- Jul Tokyo Tsushin Kogyo Kabushiki Kaisha Ltd. (Sony) announces availability of the first transistor produced in Japan,
- >>> a PNP Germanium-alloy junction device
- Jul Eiichi Goto[1/26/1931-6/12/2005] presents research paper on Parametron logic at Japan's Electronic Computer Research
- Group of the Institute of Telecommunications Engineers
- Charles Thornton drops his company name of Electro Dynamics, renaming it to its largest subsidiary, Litton Industries, Inc.
- >>> Litton Industries' Magnetron tube manufacturing division split out to become Litton Industries of California.
- Jul Merger of Royal Typewriter Co. and McBee Co. completed, forming Royal McBee Corp.
- Sep Toyo Electronics Industry established in Kyoto Japan, known as R.ohm (Future ROHM Semiconductor)
- Charles Thornton's Electro Dynamics Corp. purchases vacuum tube manufacturing equipment maker Litton Engineering, Inc., forms
- >>> Litton Industries for \$1.5M with financing from Lehman Brothers, assumes Litton Industries name
- Oct The Regency TR-1, the first transistor radio, designed by Texas Instruments, using four TI transistors, and produced by the
- >>> Regency division of Industrial Development Engineering Associates (IDEA) is announced at a target retail price of \$49.95 [18-Oct]
- Oct Fuji Telecommunications Mfg. (later Fujitsu) introduces [FACOM 100](#) programmable relay calculator (~4,500 relays)
- Friden Calculating Machine Co. opens production facility in Wageningen, Holland
- Nov The Regency TR-1 transistor radio, the first such device in the world, begins retail sale
- Production of the [Curta Type II](#) mechanical calculator begins

- Dec The first IBM 650 Magnetic Drum Data Processing Machine is delivered to John Hancock Mutual Life Insurance Co.
- Dec Kashio Seisakujo (Casio) completes prototype of solenoid(electromagnet)-based fully-automatic four-function electric calculator

➤ 1955

- Kazuo and Yukio Kashio of Kashio Seisakujo(Casio) visit office equipment retailer Uchida Yoko
- >>> to show their prototype solenoid-based calculating machine. After demonstrating the
- >>> calculator, they are told it is not marketable due to lack of chain multiplication, stating the machine is "outdated"
- On the heels of the rejection by Uchida Yoko, Toshio Kashio begins intensive re-work of solenoid-based calculator
- >>> to successfully add chain multiplication and various other improvements
- Feb Monroe Calculator Co. introduces the [Monrobot III](#) vacuum tube, magnetic drum-based programmable desk-sized electronic calculator
- Aug Tokyo Tsushin Kogyo Kabushiki Kaisha (later, Sony) introduces Japan's first transistor radio for sale in the US, the Sony-Radio TR-55, utilizing Germanium junction transistors developed under license from Bell Laboratories
- Canon opens US Branch office in New York City, establishing Canon USA
- Ricoh Co., Ltd. enters business machine marketplace with its Ricopy 101 Copying Machine
- Texas Instruments introduces the first commercial Silicon-junction transistors, the 900-Series
- Typewriter marketing firm, Commodore International Ltd., founded by Jack Tramiel in Toronto, Canada
- May Dr. An Wang granted US Patent [2,708,722](#) for principles of principles of magnetic core memory
- Remington Rand merges with Sperry Gyroscope Corp., forming Sperry Rand
- Matsushita begins use of "PanaSonic" as brand name for products sold outside native Japanese market
- Jun Wang Laboratories incorporated with Dr. An Wang as President/CEO, and Ge Yao Chu as Vice President
- Motorola opens new production facility in Phoenix, AZ to produce transistors
- Aug Tokyo Tsushin Kogyo Kabushiki Kaisha (later, Sony) listed as over-the-counter stock on Tokyo Stock Exchange
- Olivetti establishes a new Laboratory of Electronic Research in Piza, Italy
- Oct ENIAC, generally considered the world's first general-purpose fully electronic computer, decommissioned [2-Oct, 11:45 PM EST]
- Oct [WEIZAC](#) electronic computer becomes fully operational [[First Electronic Digital Computer in the Middle East \(Israel\)](#)]
- Oct George Greene resigns as president of Marchant Research, Inc.
- Oct Birth of William Henry Gates, Seattle, WA (Future Co-Founder of Microsoft) [28-Oct]
- Nov [Introduction](#) of [Stanley Frankel](#) -designed [Librascope LGP-30](#) small computer
- Nov Autonetics established as an independent division of North American Aviation specializing in advanced military electronics
- Nov Japan's Electrotechnical Laboratory completes large-scale relay-based [ETL Mark II Computer](#), over 20,000 relays

➤ 1956

- Project behind development of Bell Punch electronic calculator begins
- Feb [Jay W. Forrester](#)[7/14/1918-11/16/2016] granted [US Patent #2,736,880](#) for three-dimensional coincident current magnetic core memory [28
- Mar Japan's Fuji Photographic Film Co. completes Japan's first electronic computer, FUJIC, 1700 vacuum tubes, delay line memory
- Mar Dr. An Wang sells rights to patent for core memory principles to IBM for \$500,000 to provide capital for Wang Laboratories [4-Mar]
- Kashio Seisakujo (Casio) completes engineering prototype of four function solenoid-based electromechanical calculator
- >>> and begins preparing it for production
- Mar Friden Calculating Machine Co. [acquires](#) Commercial Controls Corp. (Originator of Flexowriter/Justowriter) [12-Mar]
- Litton Industries, Inc. begins trading shares on the American Stock Exchange (AMEX)
- After years of working on development of an automatic solenoid-based electromechanical calculator at Kashio Seisakujo(Casio),
- >>> it's inventor, Toshio Kashio, declares it to be a dead-end and immediately begins design of a telephone relay-based calculator
- Kashio Seisakujo(Casio) abandons plans to manufacture refined solenoid-based electric calculator
- Realtone Electronics Corp.(US) founded in New York by Saul Ashkenazi to market transistor radios in the US imported
- >>> from Japan's Kobe Kogyo Corp. under the TEN brand
- Facit (Sweden) creates new subsidiary, Facit Electronics, to build and sell electronic computers
- Litton Industries introduces the transistorized [Litton 20](#) computer, designed for solving differential equations
- Jul Japan's Electrotechnical Laboratory(ETL) completes Japan's first transistorized computer, the [ETL Mark III](#),
- >>> using optical glass ultrasonic delay lines for main memory
- Burroughs Corp. acquires computer manufacturer ElectroData Corporation
- The Massachusetts Institute of Technology (MIT) completes the [TX-0](#) fully transistorized computer
- With investment capital from Beckman Instruments, Inc., Dr. William Shockley[2/13/1910-8/12/1989] founds Shockley Semiconductor
- >>> Laboratory in Mountain View, California to develop and market Silicon-based (as opposed to Germanium) semiconductor devices
- Aug Smith-Corona acquires Kleinschmidt Laboratories of Deerfield, IL for telecommunications products and engineering/technical talent
- Kashio Seisakujo (later, Casio Computer Co., Ltd.) shows prototype relay-based automatic four-function electric calculator,
- a vast improvement in both speed and usability over earlier solenoid-based electric calculator
- Dec Dr. William Shockley[2/13/1910-8/12/1989], Walter Brattain[2/10/1902-10/13/1987], and
- >>> John Bardeen[5/23/1908-1/30/1991] jointly awarded Nobel Prize in Physics for discovery of the transistor effect [10-Dec]
- US Government action mandates Bell Laboratories make transistor design information available for licensing

➤ 1957

- Sherman Fairchild, founder of Fairchild Camera and Instrument, funds startup of Fairchild Semiconductor
- >>> to develop and market Silicon transistors
- Felt and Tarrant Mfg. Co. becomes Comptometer Corp.
- Litton Industries, Inc. begins publicly trading on the New York Stock Exchange (NYSE)
- RCA introduces the 2N404 PNP alloy-junction Germanium transistor which became heavily used in early US
- >>> US-made electronic calculator designs. Examples: [Friden 130](#), [Wyle Laboratories WS-01/WS-02](#), [Wang LOC1](#)
- Clary Corp. introduces a plug-board-programmable electronic calculator built into a desk, the Clary [DE-60](#)

- Feb Passing of Dr. [John von Neumann](#), Manhattan Project luminary and computing legend [8-Feb]
 Brunsviga Maschinenwerke AG enters into partnership arrangement with Olympia Werke AG
 Elmer R. Easton joins Wyle Laboratories as part of its management team after five years at Lear Inc. (Aircraft)
 Digital Equipment Corporation (a.k.a. DEC) founded in Maynard, Massachusetts to manufacture digital logic modules
 Hitachi completes its first electronic computing machine, the [HIPAC MK-1](#), based on Parametron logic circuitry developed by Eiichi Goto[1/2]
 >>> The HIPAC KM-1 was used to calculate sag of electrical power lines between power poles
 The Nixie Tube gas-discharge numeric display tube goes into volume production at Haydu Brothers division of Burroughs
 Jun Kashio Seisakujo formally re-incorporated as Casio Computer Co., Ltd. [1-Jun]
 Jun Uchida Yoko Co., Ltd. forges agreement with Casio Computer Co., Ltd. as exclusive domestic (Japan) distributor of Casio 14-A and future calculators
 Jun New Casio Computer Co., Ltd. 14-A Relay Calculator begins production. 342 Relays, Bi-Quinary Logic,
 >>> four function with ten-key keyboard[Casio's First Commercial Relay-based Calculator]
 The "Traitorous Eight" senior engineers resign from Shockley Semiconductor to join fledgling Fairchild Semiconductor
 IBM introduces the [610 "Auto-Point"](#) programmable calculator (floating point, programmable w/magnetic drum, vacuum-tube logic) Video on YouTube
 Royal Typewriter division of Royal McBee produces its ten-millionth typewriter
 Dec Casio delivers first 14-A Relay Calculator to exclusive distributor, Uchida Yoko Co., Ltd.

> 1958

- Jan Bell Punch shows prototype of electronic calculator using cold-cathode tube technology
 Jan Marchant shuts down Marchant Research Inc. subsidiary due to high R&D costs of computer business
 Jan Tokyo Tsushin Kogyo Kabushiki Kaisha renamed Sony Corporation [1-Jan]
 Matsushita Communication Industrial Co., Ltd. established as spin off from Matsushita Electric Industrial Co., Ltd.
 Nippon Electric Co., Ltd. introduces the NEAC-1101 and NEAC-1102 computers based on Parametron technology
 James Picker Co. acquired by CIT Financial, but Picker family still manages operations
 Marchant Calculators, Inc. acquires Johnson Adding Machine Co.
 Mar Institute of Radio Engineers (IRE) National Convention, Waldorf-Astoria Hotel, New York City, NY [24-27 Mar]
 Apr Smith-Corona, Inc. and Marchant Calculators, Inc. float [proposal](#) for the companies to merge [7-Apr]
 May Smith-Corona, Inc. and Marchant Calculators, Inc. formally agree to merger terms. Merger subject to shareholder vote and holders of financial interest
 Sep Merger of Smith-Corona, Inc. and Marchant Calculators, Inc. completed, forming Smith-Corona Marchant (SCM)
 Sep Jack Kilby demonstrates his prototype Integrated Circuit to his boss at Texas Instruments [12-Sep]
 Oct Monroe Calculating Machine Co. merges with Litton Industries, becomes Monroe division of Litton Industries
 Prof. László Kozma completes Hungary's first relay-based computer (Approx. 2000 relays), the [MESZ-1](#), at Budapest University of Technology and Economics
 Smith-Corona Marchant (SCM) acquires British Typewriters, Ltd.
 Dec Sony Corporation listed on Tokyo Stock Exchange

> 1959

- Hitachi establishes business presence in the US; Hitachi New York, Ltd.
 Friden SBT-10 electromechanical calculator introduced offering "Back Transfer" from carriage to keyboard
 Apr Tsugio Makimoto hires on at Hitachi, working to improve Germanium transistor operating speed
 Apr Hitachi Ltd. completes its first transistorized computer, the binary-coded decimal [HITAC 301](#)
 Apr Olivetti introduces Italy's first commercially sold computer, the transistorized ELEA 9003, at the Milan Fair
 Apr Varadyne Industries, Inc. incorporated in Santa Monica, CA
 Brunsviga Maschinenwerke AG becomes Brunsviga Division of Olympia Werke AG, Wilhelmshaven, Germany
 Bryant Chucking Grinder Co. begins design work on a magnetic disk drive
 Robert Noyce of Fairchild Semiconductor develops first monolithic Integrated Circuit
 Massimo Rinaldi founds Transimatic S.p.A. in Rome, manufacturing mechanical calculators and accounting machines (later, IME)
 May Casio Computer Co., Ltd. introduces 14-B Relay calculator, adding automatic Square Root
 Árpád Klatzmányi joins Elektronikus Mérőkészülékek Gyára(EMG),
 >>> (Electronics Measurement Equipment Works) founded in Hungary, performing research on
 >>> the use of transistors for digital logic
 LGP-30 computer installed at Dartmouth University, beginning Dartmouth's legacy in computer history
 The incredible electromechanical computer, [Harvard Mark I](#) decommissioned and disassembled
 Solitron Devices, Inc., solid-state electronic component manufacturer, founded by Benjamin Friedman, in West Palm Beach, FL
 May Nippon Electric Co., Ltd. (later, NEC) delivers first commercial Japanese-made fully transistorized computer, the [NEAC 2203](#)
 May National Semiconductor founded in Danbury, Connecticut
 Nov Design team formed at Packard Bell to develop what becomes the [PB-250](#) computer
 Dec NYSE IPO of Massachusetts-based semiconductor designer/manufacture Transitron Electronic Corp.
 >>> consisting of 1,000,000 shares at \$36/share. All shares sold within 30 minutes.
 Japan displaces the United States as the world's largest producer of transistors, producing 86 million transistors in 1959

> 1960

- Feb NEC prototypes first Japanese-made mesa-type Germanium transistor [19-Feb]
 Feb Sony establishes Sony Corporation of America in US
 Feb First customer shipment of Clary DE 60 desk-sized programmable electronic calculator
 Mar Texas Instruments announces the SN502 "Solid Circuit" Silicon Monolithic IC Flip Flop (\$450 Retail per Flip Flop!) [TI's First Commercially Sold IC]
 Japan's Unoke Denshi Kogyo formed by partnership of seven individuals (precursor to USAC Electronic Industrial Co., Ltd.) [1-Nov]
 Federico Faggin begins computer design career at Olivetti in Italy
 Nippon Electric Co. (NEC) begins R&D effort in Integrated Circuit technology
 Comptometer Corp. sells right use trademark "Comptometer" to Control Systems Ltd., the owner of Bell Punch Co. Ltd., and Sumlock, Ltd.

Mar Casio 301 Scientific relay calculator introduced
Philco Corp. files for bankruptcy protection, seeks buyer for distressed business

Apr Clevite Transistor Products acquires Shockley Transistor Corp., William Shockley joins Clevite's transistor division

Apr Engineers from Hayakawa Electric (Sharp) visit Prof. Hiroshi Ozaki at Osaka University to study transistorized digital logic design principles

May Packard Bell introduces the [PB-250 Computer](#) at the Western Joint
>>> Computer Conference although the computer itself was not shown

Jun Smith-Corona Marchant (SCM) announces a line of photocopy machines

Jul James (Phil) Ferguson begins new role in Sustaining Engineering at Fairchild Semiconductor [10-Jul]

Aug Prototype [Packard Bell PB-250](#) computer operational. [Stanley Frankel](#) is a consulting engineer on logic design of the computer
Smith-Corona Marchant (SCM) enters accounting/bookkeeping machine market with machines manufactured for them by West-German firm

Sep Hayakawa Electric (Sharp) formally creates high technology product research department

Sep Fairchild Semiconductor produces first functional planar monolithic integrated circuit

Oct First production [Packard Bell PB-250](#) computer delivered to customer
Research into development of fully electronic calculator begins at Hayakawa Electric(Sharp) within newly formed R&D department under su

> 1961

Jan Japan's government-backed Electro-Technical Laboratory produces a simple integrated circuit as proof-of-concept [\[Japan's First Integrated Circu](#)
William Kahn begins design specification for [Mathatron](#) calculator

Feb Fuji Tsushinki Manufacturing Corp. (now Fujitsu) completes prototype of its first transistorized computer, the [FACOM 222](#) general purpose c

Feb Casio announces the ["TUC Compuwriter"](#) (with TUC standing for Toshiba, Uchida Yoko, **Casio**),

Feb Casio announces the a relay-based business-oriented calculating machine that utilized a Toshiba-made output typewriter
Sony R&D Engineer Saburu Uemura creates a "homebrew" transistorized electronic abacus using over 1,000 rejected radio transistors

Mar Clary introduces DAC-2500 electronic calculating unit as OEM product (derived from DE 60 programmable calculator)
Autonetics division of North American Aviation introduces its RECOMP-II engineering-oriented
>>> transistorized fixed-head disk-based computer w/native floating point math capability
Bryant Chucking Grinder Co. acquired by Ex-Cell-O Corp., becomes Bryant Computer Products
Zuse KG, a computer company founded by Konrad Zuse[6/22/1910-12/18/1995], builds working replica
>>> of Zuse's original [Z-3 relay computer](#) that was destroyed in bombing of Berlin in December, 1943
Realtone Electronics Corp. goes public on American Stock Exchange(AMEX) with symbol RTE
VEB Mechanik Büromaschinenwerk Rheinmetall (East Germany) introduces line of
>>> rotary electromechanical calculators under the Supermetall brand

Mar Fairchild Semiconductor announces its μ Logic family of RTL(Resistor-Transistor Logic) bipolar integrated circuits

Mar IRE International Convention and Show, Waldorf Astoria Hotel / Coliseum, New York [20-23 Mar]

Apr Office Equipment Manufacturers Institute (becomes BEMA) Exposition, New York Coliseum [17-21 Apr]

Apr [Logicon Inc.](#) founded by eight engineers in Redondo Beach, CA, focusing on defense-oriented computing systems
Kōnosuke Matsushita of Matsushita Electric Housewares Mfg. Works travels to US and
>>> and cements deals to produce television sets under the Panasonic brand for sale in US markets

May Friden Calculating Machine Co. contacts Stanford Research Institute (SRI) for proposal to develop a
>>> Cathode Ray Tube(CRT)-based display subsystem for an electronic calculator under development at Friden
Mitsubishi Electric produces Japan's first commercial integrated circuit under trade name
>>> of Moletron (**Molecular Electronics**) using Westinghouse IC samples as a reference
TTL (Transistor-Transistor Logic) IC technology invented at Thompson Ramo Wooldridge (TRW) by James Buie
Wyle Laboratories goes public
Sumlock Comptometer Ltd. founded, primary distributor for Bell Punch calculators
Unoke Denshi Kogyo(USAC Electronic Industrial, Co., Ltd.) produces prototype Parametron-based office-oriented
>>> small computer system designated USAC 5010 (Never marketed)
Nippon Sewing Machine Mfg. Co. (later, Brother) begins manufacturing office products

Aug Japan Electronic Computer Co. (JECC) formed, a computing equipment rental agency formed by collaboration of the Japanese governmen
>>> manufacturers; Tokyo Shibaura Denki(Toshiba), Fuji Tsushinki Mfg. Co. (Fujitsu), Nippon Electric Co. (NEC), Hitachi,
>>> Oki Electric Industry, Matsushita Electric Industrial, and Mitsubishi Electric
Tadashi Sasaki earns PhD in Electrical Engineering from Kyoto University

Sep Wyle Laboratories [acquires](#) Ransom Research Inc., of San Pedro, CA. Ransom Research develops and markets
>>> standardized [solid-state logic modules and chassis](#) for digital electronic systems prototyping or production use.
>>> Ransom Research also has a side-project using their logic modules designs to prototype a solid-state electronic calculator that
>>> later becomes the [Wyle Laboratories WS-01](#)
BEMA (Business Equipment Manufacturers Association) formed from reorganization of Office Equipment Manufacturers Institute

Sep Stanford Research Institute delivers contracted prototype CRT Display System to Friden, one month ahead of Schedule

Sep Signetics (contraction of **Signal Network Electronics**) Corp. founded by four ex-Fairchild
>>> semiconductor engineers with \$1M funding from Lehman Brothers and others [12-Sep]

Oct Texas Instruments completes prototype "SOLID CIRCUIT" computer programmed to operate as a simple desk calculator under contract
>>> to Aeronautical Systems Division of the US Air Force to demonstrate viability of monolithic integrated circuit technology

Oct Sumlock Comptometer/Bell Punch formally introduces its Anita C/VII (Mark 7) and the [C/VIII](#) (Mark 8) electronic calculators at the Hamburg

Oct Victor Adding Machine Co. and Comptometer Corp. merge to form Victor Comptometer Corp.

Oct First open public exhibition of the [Anita C/VIII](#) (Mk 8) at the Business Efficiency Exhibition, London

Nov Friden begins project EDTC-1 to create a prototype electronic calculator utilizing a magnetic drum memory and CRT display

Dec Diehl Corp. (West Germany) and SCM forge [agreement](#) for SCM to gain exclusive rights to market Diehl calculators in North America [9-Dec
Friden selects Bryant Computer Products C-105 Magnetic Drum system for use in EDTC-1
>>> proof-of-concept prototype electronic calculator

Dec Ford Motor Company purchases Philco, creating Philco-Ford division, marketing electronic semiconductor components, consumer products, computer systems, and space & defense industry equipment [11-Dec]
 Dec Wyle Laboratories and Liberty Electronics Corp. sign agreement stating that Wyle Laboratories
 >>> will assume ownership of Liberty Electronics Corp., an electronic components distributor [21-Dec]

➤ 1962

Jan Sumlock Comptometer begins accepting orders for the Anita Mk7 and [Anita Mk8](#) calculators [First commercial fully-electronic desktop calculators]
 Jan Casio Computer Co., Ltd. introduces the AL-1 scientific relay calculator with up to 360 steps of user-programmable electromechanical read
 Jan Wyle Laboratories completes acquisition of electronics distributor Liberty Electronics Corp. through 100% share purchase
 Jan Sumlock Comptometer begins mass manufacturing of the Anita Mk7 and [Anita Mk8](#)
 Feb Mathatronics Inc., founded in Waltham, Massachusetts, by William Kahn, Roy Reach, and David Shapiro.
 Feb Business machine equipment retailer Rapid Data Systems & Equipment, Ltd. incorporated [6-Feb]
 Feb Formal design of Mathatronics' future [Mathatron](#) advanced electronic calculator begins
 Mar Signetics announces the SE-100 series of small-scale DTL (Diode-Transistor Logic) Integrated Circuits at IEEE show [First Commercial DTL IC]
 Mar Semiconductor manufacturer Siliconix co-founded by husband and wife team of William and Frances Hugle in Santa Clara, CA
 Japanese government creates government-owned "Research & Development Corp." to provide funding to help Japanese companies reach
 Business machine distributor Remex Corp. begins business in Palm Beach, FL
 IBM ceases production of the model 650 Magnetic Drum Data Processing Machine
 >>> after selling nearly 2,000 of the computers world-wide since its introduction in 1954
 Facit AB shuts down Facit Electronics subsidiary due to extreme competition in the computer marketplace
 Philips (Netherlands) demonstrates prototype transistorized electronic adding machine and three-function (+, -, X) 10-key calculating device
 Ahead of schedule, Stanford Research Institute(SRI) delivers Friden its' prototype CRT Display hardware and design data for use in Friden
 General Electric produces the first practical Light Emitting Diode (LED)
 Thomas Osborne begins thought process for design of future "[Green Machine](#)" electronic calculator utilizing Finite State Machine(FSM) co
 >>> while Electronics Engineering student at UC Berkeley ^[2]
 May Friden's EDTC-1 magnetic drum-based electronic calculator proof-of-concept operational, though only as a display system not capable of c
 May Addmaster Corp. incorporated to manufacture low-cost adding machines utilizing DuPont DELRIN™ plastic components
 Commodore International, Ltd. goes public, changes name to Commodore Business Machines
 Jun SRI issues refund of \$4,444.62 to Friden due to Display Project cost under-run
 Jun Friden initiates design project EDTC-3 to replace magnetic drum storage element in EDTC-1 proof-of-concept electronic calculator display sy
 Unoke Denshi Kogyo(USAC Electronic Industrial, Co., Ltd.) signs business collaboration agreement with Uchida Yoko Co., Ltd.
[Wanderer Büromaschinewerke GmbH](#) formally begins internal project to develop a four-function printing electronic desktop calculator
 Hayakawa Electric Co., Ltd. establishes US sales presence as Sharp Electronics Corp.
 Aug Japan's first microprogrammed computer, KT-Pilot, announced as joint collaboration of Kyoto University and Tokyo Shibaura Electric Co. (n
 Nippon Sewing Machine Co. changes name to Brother Industries, Ltd.
 Saburo Uemura, researcher at Sony, demonstrates third prototype (MD-3) hand-built electronic calculator with typewriter
 >>> output, designated MD-3, to skeptical Sony management
 Thomas Osborne begins employment at Smith-Corona Marchant (SCM) as part of engineering team developing an electronic calculator ^[2]
 Olivetti begins design of [Programma 101](#) electronic calculator under direction of Pier Giorgio Perotto[12/24/1930-1/22/2002]
 Nov Signetics receives \$1.7M investment from Corning Glass in exchange for 51% ownership
 Nov Smith-Corona Marchant changes company name to SCM Corp.
 Nov Soviet Union demonstrates operational prototype of an all-electronic calculator, precursor to production VEGA electronic calculator
 Oi Electric Co., Ltd. (Japan) initiates an electronic calculator development project in collaboration with Ricoh
 Friden SRQ electromechanical calculator introduced, offering automatic square root [First Electromechanical Rotary Calculator with Square Root]
 Dec Working prototype of [Mathatron](#) calculator formally demonstrated to investors of Mathatronics Inc.
 Dec Ferranti Atlas computer at Manchester University provides first virtual memory management capabilities (Address-Translation, Memory Pag
 Dec US Subsidiary of Ricoh Co., Ltd. founded as Ricoh Industries, U.S.A. Inc.

➤ 1963

Jan Richard (Dick) Ahrens begins work at Friden in Calculator Engineering Department working on what becomes the [Friden EC-130](#) electronic
 Mar First order for two Mathatronics [Mathatron](#) calculators placed by Woods Hole Oceanographic Institute
 Realtone Electronics Corp. begins marketing consumer electronics products under the Soundesign brand name
 General Arthur Lowell retires from the US Marine Corps
 Apr Riken Optical Co., Ltd. changes name to Ricoh Co., Ltd.
 Long-term merger negotiations between Kienzle Apparate, GmbH and Labor für Impulstechnik (later, Nixdorf) begin
 Apr Ricoh Europe S.A. established in Switzerland as subsidiary of Ricoh Co., Ltd.
 Philips introduces the "Compact Cassette" audio tape (later used by Wang, HP, and others for program/data storage for calculators)
 Jun Friden exhibits prototype [Friden EC-130](#) electronic calculator to limited audiences under non-disclosure
 Kobe Kogyo Corp. merges with Fujitsu Ltd.
 Jun General Micro-electronics(GM-e), spinoff of Fairchild Semiconductor, founded by Col. Arthur Lowell(retired, US Marine Corps) along with
 >>> Robert Norman[3/24/1927-1/21/2017], Howard Bobb, and James (Phil) Ferguson[11/18/1930-1/15/2016] (All from Fairchild Semiconducto
 Jun Hayakawa Electric Co., Ltd. (Sharp) and Olms Consolidated Ltd. (Australia) establish joint venture
 >>> (Olms-Hayakawa Electronics Pty Ltd.) manufacturing and selling Hayakawa-designed radios and TVs under the Sharp brand name in Au
 Jun Friden [introduces](#) its [6010 "Computyper"](#) transistorized computer system
 Sanyo introduces the revolutionary "Cadnica" line of Nickel-Cadmium rechargeable batteries
 Singer Manufacturing Co. changes named to Singer Corp.
 Jun SCM Corp. announces plan to move manufacturing of calculators from Oakland, CA, to Orangeburg, SC
 Jul Announcement of intent for Singer Corp. to acquire Friden Calculating Machine Co. [16-Jul]

Jul Mathatronics Inc., successfully completes first customer shipment of [Mathatron](#) Model 8-48 calculator to Woods Hole Oceanographic Institute

Jul Canon Camera Co., Inc. completes prototype 10-key electronic calculator

Wanderer Bümaschinewerke initiates contract with Heinz Nixdorf's Labor Für Impulsetechnik for design and development of electronics or 1

Aug Formal agreement approved by boards of directors [announced](#) for Singer Corporation's acquisition of Friden Calculating Machine Co. [16-/

Aug Western Electronics Show & Convention (WESCON), Cow Palace, San Francisco, CA [20-23 Aug]

Diehl Corp. introduces the "Transmatic", a sophisticated four-function electromechanical automatic printing calculator

Aug Oi Electric exhibits trial production prototype of its [Aleph Zero](#) calculator

Wanderer Bümaschinewerke begins production of non-electronic portions (keyboard/printer/cabinet) for its future

>>> printing desktop electronic calculator

Fairchild Semiconductor introduces the first RTL (Resistor-Transistor Logic) Flip Flop IC, the 907

Sep Tektronix, Inc. goes public, with over-the-counter trading beginning on September 11, 1963 [11-Sep]

Wanderer Büomaschinewerke places pilot production order with Labor Für Impulsetechnik electronics and power supply for Wanderer's el

Sep Project to develop timesharing computing system (later named DTSS) begins at Dartmouth College directed by John G. Kemeny and Thon

Thomas Osborne leaves Smith-Corona Marchant(SCM) over his concerns that the electronic calculator SCM was developing (which

>>> became the [SCM Cogito 240](#)) would be a market failure (later proven true) ^[2]

Oct Japanese Electronics Show, Minato Fairgrounds, Osaka Japan [2-8 Oct]

Oct Sale of Friden Calculating Machine Co. to Singer Corp. completed [14-Oct]

Oct Philip R. Samwell succeeds Walter S. Johnson as President of Friden Division of Singer Corp.

Oct Friden Division of Singer Corp. acquires Physical Sciences Corp. of Arcadia, CA

Oct Pyle National announces majority funding of General Micro-electronics [23-Oct]

Oct General Micro-electronics announces production of its first MOS IC family, dubbed Picologic

Nov 17th Annual NEREM (National Electronics Research & Engineering Meeting), Boston, MA [4-6 Nov]

Nov [Mathatronics Mathatron](#) formally introduced @ NEREM show, Boston.

>>> [Many Firsts: First All-Transistor w/Magnetic Core Memory, "Learn Mode" Stored

>>> Program, Floating Decimal, Scientific Notation, Fully Algebraic Logic w/PEMDAS,

>>> Automatic Square Root]

Massimo Rinaldi sells majority control of his company Transimatic Italiana to Edison, S.p.A., and assumes Director

>>> of Research & Development role. Company changes name to Industrie Macchine Elettroniche, S.p.A. (IME)

Dec MOS IC guru Frank Wanlass[5/17/1933-9/9/2010] leaves Fairchild Semiconductor to join

>>> General Micro-electronics to advance MOS LSI development

Exports compose 22% of Japanese electronics output, worth \$364M. Japan's imports of electronics from US: \$63M

Bill & Frances Hogle leave Siliconix, the company they founded in March, 1962

➤ 1964

Jan Tektronix, Inc. begins trading on the New York Stock Exchange with ticker symbol TEK at \$23/share [11-Jan]

Jan Thomas Osborne begins development of his electronic calculator design called the ["Green Machine"](#) (progenitor of HP 9100A)

Jan Dartmouth College Receives National Science Foundation Grant for development of timeshared computing system

Precisa Co. merges with Hermes Typewriter Co. becoming Hermes-Precisa International

Feb K&M Electronics founded, developing electronic inventory systems

Stewart-Warner Microcircuits, an IC manufacturing subsidiary of Stewart-Warner, founded by William and Frances Hogle in Sunnyvale, CA

The Dual In-Line Package (DIP) for ICs invented at Fairchild Semiconductor R&D Lab

David Takagishi (later of Cintra, Inc.) begins work at Fairchild Semiconductor

Signetics opens large IC fabrication facility in Sunnyvale CA

Union Carbide Electronics created as part of Union Carbide conglomerate, with Jean Hoerni as President

Dr. Tadashi Sasaki leaves Fujitsu for senior management position at Hayakawa Electric (Sharp)

Casio has operational prototype of a transistorized desktop calculator

Wang Laboratories begins development of [LOCI-1](#) Calculator

Feb Dartmouth College receives two computers manufactured by General Electric for implementation

>>> of timeshared computing system, GE-235(Back-end CPU) and GE Datanet-30(Front-end CPU)

Mar Hayakawa Electric (Sharp) shows prototype [Compet 10 \(Model CS-10A\)](#), transistorized electronic calculator and announces production [18-

Mar IEEE International Convention, New York Hilton Hotel & Coliseum [23-26 Mar]

Mar Sony shows prototype MD-5 electronic calculator at IEEE International Convention, New York ^{[Sony's First Publicly Shown Desktop Electronic Calcul}

Mar General Electric computers installed in 1700 Sq.Ft. space in basement of old building at Dartmouth University for implementation of timesh

Mar Ricoh, in collaboration with Oi Electric Co., Ltd. shows prototype version of [Aleph Zero 101](#) electronic calculator ^[Parametron logic]

Apr IBM announces the System/360 line of compatible computers (includes Models 30, 40, 50, 60, 62, and 70) [7-Apr]

Apr Italy's IME (Industria Macchine Elettroniche) introduces the [IME 84](#) electronic calculator [10-Apr] ^[IME's First Four-Function Electronic Calculator]

Apr Opening of 1964-1965 World's Fair & Exposition held in New York, USA [22-Apr]

Apr Sony shows prototype electronic calculator (MD-6?) in Japanese Pavilion at opening of New York World's Fair & Exposition [22-Apr]

Apr Italy's IME formally announces its [IME 84](#) electronic calculator at the Milan,

>>> Italy International Trade Fair (Fiera di Milano) [12 to 25-Apr]

Apr Wyle Laboratories demonstrates pre-production [Wyle WS-01 Scientific](#) rotating magnetic memory-based

>>> electronic calculator at Spring Joint Computer Conference, Washington D.C. [21 to 23-Apr]

Apr Friden announces the [EC-130](#) to its sales force at annual "Fiesta de los Conquistadores" sales convention in Boca Raton, FL. [28-Apr]

May Wyle Laboratories announces its [WS-01 Scientific](#) electronic calculator

May The Dartmouth Time Shared System (DTSS) runs its first BASIC (Beginner's All-Purpose

>>> Symbolic Instruction Code) program: "PRINT 2+2" [1-May, 4:00 AM]

May Hayakawa Electric (Sharp) formally announces plan to soon introduce a fully electronic desk calculator, the [Compet CS-10A](#) [14-May] ^{[Haya}

May Sony announces intent to enter the electronic calculator marketplace [14-May]

May Friden formally introduces the [EC-130](#) electronic calculator in public event held at the Waldorf-Astoria
>>> Hotel in New York City, with retail price of \$2,150 [20-May] [[Friden's First Electronic Calculator](#)]

May George E. Comstock (Future founder of Diablo Systems) hired at Friden as R&D Director

May Canon publicly exhibits prototype of its [Canola 130](#) at Tokyo Business Machine Show [[Canon's First Electronic Calculator](#)]

Jun Friden begins national advertising campaign for the [EC-130](#) electronic calculator [6-Jun]

Jun Fairchild Semiconductor introduces the 930-Series DTL IC Logic family of four different IC's

Jun Casio 401 Advanced Relay calculator introduced

Citizen Business Machines Co., Ltd. established as subsidiary of Citizen Watch Co., Ltd.

Jun US Patent Office grants Texas Instruments two patents on IC technology

Autonetics division of North American Aviation, Inc. sets up pilot microelectronics fabrication line

Jul Friden begins internal project E-585, development of the [Friden 1150](#) IC-based printing electronic calculator [2-Jul]

Jul Hayakawa Electric (Sharp) commences delivery of [Compet 10](#) (Model CS-10A) electronic
>>> calculator in Japan [[Hayakawa Electric's and Japan's first production electronic calculator](#)]

Soviet "VEGA" electronic calculator begins production [[Soviet Union's First Electronic Calculator](#)]

Tokyo Shibaura Electric Co., Ltd. (Toshiba) forms small engineering team focusing on development of a desktop electronic calculator
>>> as a result of Hayakawa Electric's introduction of Japan's first electronic calculator, the [Sharp Compet 10](#)

Aug Western Electronic Show and Convention (WESCON), Los Angeles Sports Arena [25-28 Aug]

Aug General Micro-electronics (GM-e) Publicly [introduces](#) the first commercial "large-scale" MOS IC, the pL20 20-Bit MOS shift register, at WE

Aug The [Friden EC-130](#) electronic calculator wins Industrial Design award at WESCON Show

Aug Hayakawa Electric Co., Ltd. (Sharp) forms Industrial Instrument Division to focus on electronic calculator business

Aug Olivetti's Computer Division sold to General Electric. Electronic calculator team saved from sale at last minute
>>> by quietly changing classification of the [Programma 101](#) project from "computer" to "calculator". [31-Aug]

Sumlock Comptometer Anita C/IX (Mark 9) debuts

Sep Wang Laboratories introduces the [LOCI-1](#) calculator priced at US\$2,500 [[Wang Laboratories' First Electronic Calculator](#)]

Oct In-depth article on Sharp's [Compet 10](#) calculator written up in Japan's *Semiconductor Technique* Magazine

Oct Victor and General Micro-electronics(GM-e) sign contract for GM-e to develop and produce the [Victor 3900](#) MOS IC calculator

Oct Los Angeles BEMA (Business Equipment Manufacturers Association) show [19-23 Oct]

Oct Canon begins sale of the [Canola 130](#) electronic calculator in Japan

Oct Texas Instruments begins sale of military-spec SN5400-Series TTL Integrated Circuits in flat-pack packages

British electronic component manufacturer Mullard Ltd. demonstrates a prototype 12-digit
>>> electronic calculator using combination of cold-cathode tubes and transistors

Dec Wanderer-Werke AG publicly shows pre-production prototype of its microcoded *Conti* electronic printing calculator
>>> Electronic logic and power supply developed by Labor Für Impulstechnik
>>> (later Nixdorf) under contract to Wanderer Werke. Electronics and power supply hidden under
>>> presentation table, with keyboard and printer mechanisms housed in cabinet on table top [7-Dec]

Dec British electronic component manufacturer Mullard shows prototype electronic
>>> calculator utilizing a mix of thyratrons and transistors

Dec [Monroe EPIC 2000](#) calculator [introduced](#) [1-Dec]

Dec MOS IC innovator Frank Wanlass[5/17/1933-9/9/2010] leaves General Micro-electronics after only one year, moving to General Instrument

Dec Arthur Lowell resigns (under pressure) as President of General Micro-electronics

Dec James (Phil) Ferguson assumes Presidency of General Micro-electronics

Dec Thomas Osborne's "[Green Machine](#)" calculator prototype becomes fully operational [24-Dec] ^[2]

Dec Litton Industries announces intent to acquire Royal McBee Corp.
[Wyle Laboratories WS-02 Scientific](#) magnetostrictive delay line-based update of the WS-01 calculator debuts

> 1965

Jan General Micro-electronics [announces](#) general availability of its pL5000 20-bit MOS Shift Register [[First commercial publicly available MOS Integrat](#)
Thomas Osborne begins showing his "[Green Machine](#)" electronic calculator to
>>> numerous calculator manufacturers in hopes of finding a buyer for his design

Jan Wang Laboratories' [LOCI-2](#) electronic calculator debuts [[Wang Laboratories' First Programmable Calculator](#)]

Feb IBM Introduces the famous [IBM 1130](#) "Personal" minicomputer system [11-Feb]

General Micro-electronics (GM-e) completes breadboard prototype design for
>>> the [Victor 3900](#) using its Milliwatt Logic family of bipolar integrated circuits

Mar Litton Industries acquisition of Royal McBee complete. Royal McBee split into five divisions,
>>> with Royal McBee name changed back to Royal Typewriter Division. Other divisions
>>> were Roytype Consumer Products, Rotype Supplies, McBee Systems, and RMB.

Mar The Dartmouth University "Dartmouth Time-Sharing System" (DTSS) begins regular operations

Mar IEEE Annual International Convention, New York, NY [22-26 Mar]

Mar Digital Equipment Corp. (DEC) introduces its new low-cost transistorized 12-bit minicomputer system, the [PDP-8](#) ("Straight 8"), \$18,500

Apr Hannover Fair (Hannover Messe) held in Hannover, West Germany [19-27 Apr]

Apr Wanderer-Werke AG formally introduces the Labor für Impulstechnik(LFI),
>>> later Nixdorf Computer)-designed Wanderer Conti printing desktop electronic
>>> calculator at Hannover Messe(Fair), Hannover, West Germany [19-Apr]

Apr Bulgarian electronics firm Elektronika, introduces its first transistorized [Elka 6521](#) electronic calculator [17-Apr]
>>> Note: Likely a reverse-engineered version of the Italian [IME-84](#), though not confirmed

Apr Through merger of parent company Eitel-McCollough, Inc., National Electronics, Inc., becomes a subsidiary of Varian Associates

Apr Gordon E. Moore(1/3/2029-3/24/2023) of Fairchild Semiconductor has watershed article published in *Electronics* Magazine
>>> that later becomes known as the foundation of [Moore's Law](#) predicting the future incredible growth rate of integrated circuit technology

- Apr [Friden EC-132](#) introduced to Friden sales force at annual sales convention [8-Apr]
 Thomas Osborne joins electronic calculator project at Hewlett Packard as consultant after demonstrating his
 >>> self-designed & built "[Green Machine](#)" transistorized electronic calculator (project becomes HP 9100A)
 Fairchild Semiconductor introduces first commercial line of Integrated Circuits using Dual-Inline Package (DIP) format that the company inv
 Solitron Devices, Inc. purchases Honeywell Semiconductor Products Division
 The transistor-based [Hunor 131](#), introduced. Designed by electronics genius Árpád Klatsmányi of Elektronikus Mérőkészülékek Gyára(EMC)
- Apr General Micro-electronics delivers first 25 production [Victor 3900](#) calculators to Victor Comptometer
 Bowmar Instrument Corp. purchases Acton Laboratories, Inc (ALI), forming Bowmar/ALI Inc. as
 >>> wholly-owned subsidiary (Future electronic calculator design/manufacturing arm of Bowmar Instrument Corp.)
 Olympia Werke AG introduces the [RAE 4/15](#) [[Olympia's First Electronic Calculator](#)]
- May Nippon Calculating Machine Co. shows prototype "Unicon 160" electronic calculator (precursor to the production Busicom 161)
- May Former General Micro-electronics co-founder Col. Arthur Lowell [assumes role](#)
 >>> of Executive Director of R&D at North American Aviation's Autonetics division
- May Casio 402 financial math-oriented relay calculator debuts [[Casio's last relay-based calculator](#)]
 AB Åtvidabergs Industrier changes its corporate name to Facit AB
 Clevite Transistor Products sold to ITT Industries
 First operational prototype of Data Acquisition Corporation's technologically advanced [DAC-512](#) programmable desktop calculator
- Jun First customer deliveries of [Monroe EPIC 2000](#) calculators begin
- Jun Smith-Corona Marchant (SCM) announces the [Stanley Frankel](#)-designed [SCM Cogito 240](#) electronic calculator
- Jun Malcolm McMillan(Physicist) and Jack Volder(CORDIC Algorithm Developer) demo their "Athena" prototype electronic
 >>> calculator to Hewlett Packard executives. Athena uses McMillan's electronic implementation of Volder's
 >>> CORDIC algorithms to perform fast fixed point trigonometric functions
- Jun Inventor/electronics engineer Thomas Osborne demos his personally designed & built "[Green Machine](#)" floating point
 >>> electronic calculator prototype at Hewlett Packard with disappointingly little interest
- Jun Casio Computer Co., Inc. ends nearly eight-year exclusive distribution agreement with Uchida Yoko Co., Ltd.
 Royal McBee acquired by Litton Industries
- Aug General Electric debuts first commercial timesharing service based on Dartmouth University's DTSS timeshared environment
 Wanderer-Werke AG introduces the transistorized Wanderer Logatronic desk-sized office computer developed by Labor für Impulstechnik
 Industria Macchine Elettroniche (IME) begins sales of its electronic calculators in the UK via office equipment distributor Muldivo
 Tokyo Shibaura Electric Co., Ltd. (Toshiba) establishes U.S. business presence
- Sep Caltype Corporation incorporated, subsidiary of Transistron Electronic Corp. [15-Sep]
- Sep Casio announces the transistorized [Casio 001](#) electronic calculator (Sold only in Japan) [[Casio's first production all-electronic transistorized calculator](#)]
- Sep Texas Instruments' secret "[Cal-Tech](#)" skunk-works battery-powered printing handheld electronic calculator project begins
- Sep Sharp introduces the [Compet 20 \(CS-20A\)](#) [[Sharp's First Use of Silicon Transistors](#)]
- Oct [Sharp Compet 20](#) shown at Japan's 31st Annual Business Machine Show in Osaka, Japan
- Oct Seven new desktop electronic calculators shown at BEMA show, New York World's Fair Complex [25-29 Oct]
- Oct [Olivetti Programma 101](#) introduced and demonstrated in a small area away from
 >>> Olivetti's main exhibition at BEMA show held at the World's Fair Complex in New York. Olivetti's highly-refined electromechanical
 >>> Logos 27 calculator was the primary exhibit. Despite this, the Programma 101 steals the show. [25-Oct]
- Oct Dero Research & Development introduces the Fairchild RTL IC-based [Sage 1](#) calculator at BEMA show [[First and Only Electronic Calculator by De](#)]
- Oct Victor Comptometer [introduces](#) the revolutionary [Victor 3900](#) at annual
 >>> Business Equipment Manufacturer's Association (BEMA) show [[First MOS "LSI" IC-Based Electronic Calculator](#)]
- Oct Wang Laboratories' first public demonstration of new [300-Series](#) Calculator
- Nov Sharp introduces the Compet 21 (CS-21A), adds square root to the [Compet 20](#)
 Hewlett Packard places order for 100 [Olivetti Programma 101](#) calculators ostensibly as "tools for engineers"
 Facit AB cements two year exclusive OEM agreement with Hayakawa Electric (Sharp) to resell electronic calculators under Facit and Addo
 After showing his "[Green Machine](#)" prototype electronic calculator to nearly 30 calculator companies with no interest by any of them,
 >>> Thomas Osborne is invited to Hewlett Packard to show his machine a second time through an engineering contact he worked with at SCI
 Thomas Osborne gives demo of his "[Green Machine](#)" electronic calculator to Barney Oliver[5/27/1916-11/23-1995], leader of HP's
 >>> secret calculator development project. Demo goes well. Osborne is invited by Oliver
 >>> to demo his calculator the following day to "Bill and Dave" (not knowing who they are)
 Thomas Osborne demonstrates his prototype calculator to "Bill and Dave", whom Osborne discovers
 >>> are the founders of Hewlett Packard, Bill Hewlett and David Packard.
 >>> Bill and Dave are impressed, and contract Osborne to participate in a paid six-week evaluation of his design methods
 >>> and logic design of his "[Green Machine](#)" calculator by the HP calculator engineering team
- Nov Canon introduces the [Canon 161](#) transistorized electronic calculator
- Dec Toshiba introduces its BC-1001 transistorized electronic calculator utilizing unique
 >>> capacitive working register storage system [[Toshiba's first production electronic calculator](#)]
 Combined output of Japanese electronic calculator manufacturers for 1965 is 4,355 machines

➤ 1966

- Jan Hitachi produces its first Integrated Circuits, Emitter Coupled Logic (ECL) bipolar devices, HD101 - HD106
 Six week evaluation of Thomas Osborne's "[Green Machine](#)" calculator by Hewlett Packard's calculator development team
 >>> results in his design being enthusiastically embraced. Project is given a green light with Osborne serving as senior
 >>> design engineer, operating as a consultant to HP
- Jan Casio 001 calculator introduced [[Casio's First Electronic Calculator with Automatic Square Root](#)]
- Jan Alan W. Drew appointed President/CEO of Friden Div. of Singer Corp., succeeding Philip R. Samwell [20-Jan]
- Jan Startup founder William B. Hugle displaced as Executive VP at Stewart-Warner Micro-circuits in management shuffle

- Mar [sale](#) of General Micro-electronics to Philco-Ford completed
- Mar Dr. Gordon Moore(1/3/2029-3/24/2023) of Fairchild Semiconductor predicts Large Scale Integration will "change the world", adding it will cost ~\$30,000,000 per acre for a single chip!
- >>>
- Mar Friden begins engineering development program designated E-630 for a new IC-based CRT display calculator
- >>> initially given the model number 1130, in deference to its predecessor, the [Friden EC-130](#). It was subsequently renamed the [Friden 1160](#)
- >>> after legal concerns over trademark rights relating to IBM's [1130](#) computer.
- Mar Hitachi completes prototype Metal-Oxide Semiconductor (MOS) IC-based desktop electronic calculator using ICs it manufactured
- Mar Wang Laboratories begins production of transistorized [300-Series](#) calculators
- Sumlock Anita Electronics Ltd. formed out of Bell Punch Co., Ltd. to design and build electronic calculators
- Industria Macchine Elettroniche (IME) introduces the transistorized [IME 86/IME 86-S](#) calculators
- Due to cash problems, Commodore's founder & CEO, Jack Tramiel, sells 17% of the company to Canadian investor Irving Gould
- Unoke Denshi Kogyo(USAC Electronic Industrial Co., Ltd.) produces its first
- >>> electronic billing machine, sold through marketing agreement with Uchida Yoko Co., Ltd.
- Radio and TV manufacturing joint venture between Hayakawa Electric Co., Ltd. (Sharp) and
- >>> Olims Electronics (Australia) begins licensed manufacture and sale of Sharp-designed electronic calculators
- >>> under the Sharp brand name in Australia, beginning with the [Sharp Compet 20](#)
- Data Acquisition Corp. [introduces](#) the technologically advanced [DAC-512](#) programmable desktop calculator
- May Hayakawa Electric(Sharp) announces availability of its new [Sharp Compet 30](#) (Model CS-30A) transistorized electronic calculator
- May Casio 164 transistorized electronic calculator introduced [\[Casio's first calculator to utilize magnetic core memory\]](#)
- May Diehl introduces the [Combitron](#) transistorized electronic programmable printing desktop calculator
- >>> with extremely elegant electronic design by [Stanley Frankel](#) [\[Diehl's first electronic calculator\]](#)
- Hayakawa Electric(Sharp) announces an update to the [Compet 30](#) (CS-30A) designated Model CS-30B, providing support
- >>> for negative numbers, and adding error and memory register status indicators to the left of the display panel
- Jun Introduction of the Stanley Frankel-designed SCM (Smith-Corona Marchant) [Cogito 240](#) and [Cogito 240SR](#)
- >>> transistorized electronic calculators [\[SCM's first electronic calculators\]](#)
- Jun Toshiba introduces BCT-1211 8-Terminal transistorized timeshared calculator system [\[World's first timeshared multi-console calculator system\]](#)
- Jun Wyle Laboratories [purchases](#) 36,500 shares of its own common stock
- >>> to end long-standing litigation with prior ownership of Liberty Electronics, purchased by Wyle Labs in January, 1962
- Jun Wanderer Werke AG begins full-scale production of its Wanderer *Conti printing electronic calculator*
- Jun Friden partners with Texas Instruments for development & manufacture of [custom TTL Ring-Counter IC's](#)
- >>> for use in next generation of IC-based calculators
- Jul Transistorized [Casio 101](#) introduced in Japan [\[Casio's first export-ready electronic calculator\]](#)
- Jul Friden introduces the 1217 printing electromechanical calculator to limited regional markets [\[Friden's Last Electromechanical Printing Calculator\]](#)
- Jul Chip maker American Micro-systems Inc. (AMI) founded in Santa Clara, California, led by ex-General Micro-electronics
- >>> co-founder Howard Bobb, and Warren Wheeler
- Jul Nippon Calculating Machine Co., Ltd. (NCM) introduces the transistorized Basicom 161 electronic calculator
- >>> produced by its ElectroTechnical Industries division [\[NCM's first production electronic calculator\]](#)
- Jul Mathatronics, Inc., purchased by Barry Wright Corp., becomes Mathatronics division of Barry Wright Corp.
- Canon U.S.A., Inc. Incorporated
- Hugle Industries, Inc. founded by William and Frances Hugle to manufacture IC fabrication equipment
- Facit AB acquires AB Addo, a competing Swedish mechanical calculating machine company
- Aug Western Electronics Show and Convention (WESCON), Sports Arena & Hollywood Park, Los Angeles, CA USA [23-26 Aug]
- Sumlock Comptometer introduces the Anita C/XII (Mark 12) [\[Sumlock's first all-transistor calculator\]](#)
- Sep ISE Electronics Corp. (Iseden) founded, inventor of Vacuum Fluorescent Display(VFD) indicator devices
- Sep Casio make first export shipment of its [Casio 101](#) electronic calculators to Australia where they
- >>> are sold under the Remington brand name [\[First Casio electronic calculator sold outside Japan\]](#)
- Sep Japan Electronics Show, Tokyo, Japan [20-29 Sep]
- SCM (Smith-Corona Marchant) begins fulfilling orders for the [Cogito 240](#) and [Cogito 240SR](#) electronic calculators
- Sep Casio introduces the [Casio 101E](#) (Marketed by Commodore as the Commodore 500E)
- Oct Japanese Business Machines Exhibition, Toronto, Canada
- Oct Nortec Electronics Corp. incorporated, founded by Robert Norman[3/24/1927-1/21/2017] [13-Oct]
- Oct Sanyo exhibits prototype version of its upcoming DK-141 transistorized electronic calculator
- Industria Macchine Elettroniche (IME) begins sales of its electronic calculators in the US
- Oct Hayakawa Electric(Sharp) announces the Japan-only [Sharp Compet 31](#) (CS-31A), an update to the Compet 30 Model CS-30B using Mitsu
- >>> small-scale bipolar TTL ICs to replace transistorized memory register logic of the CS-30B. [\[Hayakawa Electric's first calculator to utilize ICs\]](#)
- Oct Brother International (Japan) introduces its first mass-market electronic calculator, the transistorized [Calther 130](#)
- Oct Litton Industries Royal Typewriter division announces plans to acquire UK typewriter manufacturer Imperial
- Oct 50th Anniversary BEMA Exposition, McCormick Place, Chicago [18-20 Oct]
- Texas Instruments Begins Sale of 7400-Series TTL ICs in plastic Dual-Inline (DIP) packages
- Nov Wang announces availability of the model 320SE 4-user Simultaneous "Time Shared" calculator system
- Nov Sharp introduces the [Compet 15](#) "budget-friendly" electronic calculator
- Nov Toshiba introduces the [BC-1411](#) electronic calculator
- Dec Rough prototype of Texas Instruments "[Cal-Tech](#)" electronic calculator is operational
- Facit AB begins marketing Sharp-manufactured electronic calculators through OEM agreement with Hayakawa Electric (Sharp)
- Dec [Rumors](#) surface that Hewlett Packard is developing a sophisticated desktop electronic calculator
- >>> (that becomes the HP 9100A, [announced](#) on 3/11/1968)
- Combined output of Japanese electronic desktop calculator manufacturers for 1966 is 25,532 machines

> 1967

- Jan Hitachi introduces KK-12 (ELCA-12) transistorized electronic calculator in Japan. Imported by Friden to become the [Friden 1112](#) [Hitachi's Fir
- Feb Canon announces it will begin sale of its new [Canola 167](#) magnetic-drum-based calculator in Japan.
- Feb Sharp begins Japan-only sales of the [Compet 31](#) (CS-31A) using Mitsubishi small-scale bipolar IC-based memory register
- Feb Victor Comptometer and General Micro-electronics explain lack of deliveries of [Victor 3900](#) introduced in October, 1965
- Mar International IEEE Convention Exhibition, New York Coliseum/Hilton Hotel [20-23 Mar]
- Mar Hayakawa Electric (Sharp) shows prototype 12-digit calculator using small-scale Metal Oxide Semiconductor (MOS) Integrated Circuits
>>> manufactured by Nippon Electric Co., Ltd. (NEC)
Picker X-Ray Changes Name to Picker Corp.
- Mar Wang Laboratories introduces its new modular 4000 Computer System based on 300-Series calculator logic
- Mar Canon introduces its transistorized Canola 151 (reduced capacity version of the [Canon 161](#)
The Floppy Disk (8-inch) invented at IBM by Alan Shugart
Commodore Business Machines enters OEM agreement with Casio for sales of Casio calculators under the Commodore brand in US & Ca
- Mar Texas Instruments completes first operational "[Cal-Tech](#)" proof-of-concept bipolar LSI IC-based printing electronic calculator [29-Mar]
>>> [World's First LSI Bipolar IC-Based Handheld Battery-Powered Printing Electronic Calculator (Not marketed)]
- Mar Texas Instruments' first showing of "[Cal-Tech](#)" proof-of-concept electronic calculator
Sharp introduces a new version of the Compet 30, the Model CS-30B, with some improvements over the early Model CS-30A
>>> including true negative number handling and a memory active indicator.
- Apr Uchida Yoko [introduces](#) the [USAC 10B](#) small-scale IC-based electronic desk calculator utilizing Fairchild Semiconductor's "μLogic" RTL (R
Sony applies with Japan's Ministry of International Trade and Industry (MITI) for grant funding relating
>>> to development of electronic calculator utilizing Large Scale Integration(LSI) Integrated Circuits
- Apr Masatoshi Shima joins Computer Division of Nippon Calculating Machine Co. as Computer Programmer
- May Sony Corp. issues Press Release Announcing the [ICC-500W](#) Electronic Calculator. [15-May]
Hayakawa Electric (Sharp) applies to Japan's MITI (Ministry of International Trade and Industry) for grant to fund development of Large Sc
Facit renews its agreement with Sharp for marketing of Sharp-made calculators under the Facit brand after previous two-year agreement e
Federico Faggin joins SGS-Fairchild in Italy
North American Aviation and Rockwell-Standard Merge to form North American Rockwell Corp.
Data Acquisition Corp. acquired by Picker Corp., placed in company's Picker Nuclear Division
Data Acquisition Corp's [DAC-512](#) calculator re-badged and marketed as a Picker Nuclear product
Chip maker Intersil founded by Jean Hoerni to develop ICs for electronic watches
Chip maker Electronic Arrays, Mountain View, California, founded, formerly McMullen Associates
- Jun Tateisi Electronics Co., (Omron) begins secret development project to create an electronic calculator within its
>>> R&D Department at direction of President of Omron, Mr. Tateisi
- Jun First ever Consumer Electronics Show(CES), New York
- Jun Toshiba introduces its [BC-1201](#) transistorized electronic calculator
- Jun Sony Corp. formally [introduces](#) the [SOBAX ICC-500](#) hybrid circuit electronic calculator [1-Jun] [Sony's First Production Electronic Calculator]
- Jun Sony introduces the [SOBAX ICC-400](#), identical to the [ICC-500](#), omitting Sum-of-Products function key
- Jul Wang Laboratories begins publishing "[The Wang Laboratories Programmer](#)" periodical
David Shapiro leaves Mathatronics
- Jul Autonetics division of North American Rockwell announces intention to enter custom MOS and SOS(Silicon-on-Sapphire) IC design & prod
Casio opens first European sales office in Switzerland, begins exporting electronic calculators into Europe
- Jul Wang Labs announces the transistorized [Model 370](#) programmer for the [300-Series](#) calculators
- Aug Hayakawa Electric (Sharp) introduces the mostly transistorized (with a few Mitsubishi-made small-scale bipolar ICs) Compet 32 (CS-32A) [
>>> [Sharp's first production use of Magnetic Core Memory, Bit-Serial Architecture, Multiplexed Display]
- Aug Western Electronic Show and Convention (WESCON), Cow Palace & Hilton Hotel, San Francisco, California [22-25 Aug]
- Aug SCM [introduces](#) the [Cogito 566 PR](#), a re-badged OEM version of the [Diehl Combitron](#) [24-Aug]
- Aug Wang Laboratories first publicly demonstrates the [370 Programmer](#) at WESCON show in San Francisco, CA
- Aug Wang Laboratories listed publicly on the New York Stock Exchange, [Announces](#) issue of 240,000 shares of Common Stock at \$12.50/share
- Sep Initial shipment of Hayakawa Electric Sharp Compet 32 calculators to US market halted at request of
>>> Mitsubishi over fears of Texas Instruments patent infringement litigation over bipolar IC technology used in the calculator
- Sep Lee Boysel of Fairchild Semiconductor writes proposal for MOS IC-based computer chip-set
- Sep Sperry-Remington forms OEM relationship Casio Calculating Machine, Co.
- Sep Nippon Electric Co. (NEC) produces 250,000 Integrated Circuits in month of September, 1967
- Sep Japan Electronics Show, Osaka Japan [28-Sep - 4-Oct]
- Oct Japanese Business Machines Show at Japanese Trade Center, Chicago, IL [9-13 Oct]
- Oct 9th Annual [BEMA \(Business Equipment Manufacturers Assoc.\) Show](#), New York [23-27 Oct]
- Oct Friden introduces the 1217 electromechanical printing calculator to the US market
- Oct 7th Annual Japan Business Machine Show, Tokyo, Japan [25-28 Oct]
Sumlock Comptometer adds Wanderer-Werke Conti printing electronic calculator to its line of calculating machines
- Oct Masatoshi Shima transfers to calculator design division of Nippon Calculating Machine Co.
- Oct [Casio AL-1000](#) transistorized programmable calculator [debuts](#) [Casio's First Programmable Electronic Calculator]
- Nov 21st Annual NEREM show, Boston War Memorial Auditorium [1-3 Nov]
- Nov James (Phil) Ferguson leaves position as General Manager of Philco-Ford Microelectronics ostensibly to spend more time with family
- Nov Cintra, Inc. founded by Irwin Wunderman in his garage, manufacturing digital photonic measurement instruments
- Nov Japan's Nippon Columbia Co., Ltd. registers trade name "Denon"
- Nov Nippon Calculating Machine Co. introduces the [Busicom 141](#) transistorized calculator, a 14-digit version of its original 16-digit Busicom 161
- Nov Nippon Calculating Machine Co. (NCM) announces the Wyle Laboratories-designed [Busicom 162](#), eventually sold through OEM agreemen
>>> National Cash Register (NCR) who repackaged and sold it as the Model [18-2](#), [NCM's First IC-Based Electronic Calculator]

- Nov Nippon Calculating Machine Co.(NCM) introduces the small-scale DTL IC-based [Busicom 202](#) CRT-display calculator, designed by Wyle L. Toshio Iue, Founder/CEO of Sanyo Electric Co., Ltd, steps down, relinquishes CEO role to his brother, Yuro
- Nov Monroe Calculator Co. holds sales convention at Diplomat Hotel, Hollywood, Florida [26-Nov to 1-Dec]
- Dec Hayakawa Electric (Sharp) introduces [Compet 16](#) (CS-16A) [\[Sharp's First use of Japanese-made MOS Integrated Circuits in Production Electronic Calculator\]](#)

> 1968

>

- Jan Sanyo announces entry into electronic calculator marketplace with three machines to debut in early spring, 1968
Hayakawa Electric's (Later, Sharp) Tadashi Sasaki arranges \$40M Yen (Approx. \$110,000 US) "under-the-table" funding to Nippon Calculating Machine Co. (NCM)
- Feb Federico Faggin moves from Italy to California to work at Fairchild Semiconductor on development of Silicon-Gate MOS integrated circuit technology
- Feb Singer/Friden internally announces the small/medium-scale DTL/TTL IC-based [1150](#) printing calculator at MSRP of \$1,495 [8-Feb]
- Mar The American Calculator Corp. of Dallas, TX incorporated [6-Mar]
- Mar Dr. An Wang, CEO of Wang Laboratories, given sneak preview of Hewlett Packard 9100A electronic calculator at
>>> calculator at the IEEE Conference in New York, NY by Hewlett Packard founder, Bill Hewlett[5/20/1913-1/12/2001]
- Mar Hewlett Packard (HP) formally announces the amazing 9100A electronic calculator [\[HP's First Electronic Calculator, Revolutionary Capabilities\]](#) [11-Mar]
- Mar Early Production Hewlett Packard 9100A first shown to limited audience at IEEE Conference in New York [March 18-21]
- Mar Singer and General Precision Equipment Corp. (GPE) agree in principal for Singer to acquire GPE [26-Mar]
- Mar Singer/Friden internally announces the [1151](#) programmable printing desktop calculator at MSRP of \$1,795
- Mar Canon [introduces](#) the [Canola 130S](#) transistorized electronic calculator
- Mar Wang Laboratories introduces [Model 380](#) programmer console for [300-Series](#) calculators at New York IEEE Conference [20-Mar]
Japanese domestic integrated circuit production surpasses number of imported ICs
- Apr ElectroTechnical Industries (ETI) (not to be confused with Japan's Electrotechnical
>>> Laboratory) established for Electronic Calculator development & manufacturing, associated with Nippon Calculating Machine Co. (Busicom)
- Apr Canon 161S and [Canola 163](#) calculators announced in Japan [1-Apr]
- Apr Burroughs signs [agreement](#) with Hayakawa Electric (Sharp) for Sharp to design & manufacture calculators for Burroughs
- Apr Harold Koplow[11/21/1940-11/4/2004] begins employment at Wang Laboratories
>>> as calculator application programmer for [Wang 300-Series](#) calculators
- Apr Agreement reached for Labor für Impulstechnik (LFI) (later Nixdorf) to purchase business machines division of Wanderer-Werke AG for 17.5%
- Apr Tokyo Shibaura Mfg. Co. (Toshiba) introduces its stylish [BC-1412](#) transistorized electronic calculator
- Apr Tokyo Shibaura Mfg. Co. (Toshiba) introduces its high-end transistorized desktop electronic calculator, the [BC-1621](#) transistorized electronic calculator
- Apr Sanyo introduces [ICC-141](#) and ICC-161 calculators using MOS shift register IC made by Philco-Ford Microelectronics(formerly General Microelectronics)
- Apr Sanyo introduces its ICC-121 and [ICC-141](#) calculators utilizing incandescent-lit mosaic display
- Apr Wang Laboratories announces the 379-5 Output Writer, a modified IBM Selectric typewriter used for programmed output from the [370](#) and [370/ST](#)
Realtime Electronics Corp. formally changes company name to Soundesign Corp., AMEX stock symbol SON
- May Canon begins sales of the Small-Scale bipolar IC-based [Canon 163](#)(US \$958) and Canon 161S(US \$764) in Japan [1-May]
- May [Wang 362E](#) introduced
- May General Precision Equipment Co. and Singer Co. announce merger [10-May]
- May Casio introduces the [Casio 152](#) calculator
- May Tadashi Sasaki (Sharp) travels to US seeking IC manufacturer to layout and fabricate LSI ICs for miniaturized electronic calculator
- Tyco Laboratories, Inc. acquires magnetostrictive delay line manufacturer Digital Devices
- Tektronix, Inc. introduces its first Direct-View Storage Tube (DVST) Graphics Computer Terminal, the T4002.
- Tokyo Electronic Applications Laboratory (TEAL), Tokyo, Japan, established by Hayakawa Electric's Tadashi Sasaki
>>> to manufacture electronic calculators as an OEM producer
- Wang Laboratories acquires substantial share of disk drive manufacturer Digital Information Storage Corp.
- Uchida Yoko acquires Japanese distribution rights for the Seiko S-300 Programmable Electronic Printing calculator
- David Takagishi joins Cintra, Inc. as electronics engineer on design team for the [Cintra 909](#) calculator
- [Computer Design Corp.](#) founded, spin-off of Wyle Laboratories Calculator Products Division
- Broughton & Co. (Bristol) Ltd. and Nippon Calculating Machine Co.(NCM) joint venture formed to market NCM electronic calculators under NCM name
- Futaba Denshi begins manufacture of gas-discharge display devices
- Facit AB builds a large new calculator factory in Sweden
- Wang Laboratories rattled by rumor that Digital Equipment Corp.(DEC) is working on developing a "Desk Calculator". The rumored calculator would be a desktop model with a keyboard and a small screen.
- May Japanese Business Machine Show, Harumi Fairground, Tokyo (14 Manufacturers, 34 Models of electronic calculators)
- May Hayakawa Electric (Sharp) introduces the [Compet 50](#), [Model CS-50A](#) Printing Electronic Calculator [\[Sharp's first Printing Electronic Calculator\]](#)
- Jun Ray Holt & Steve Geller of Garrett AiResearch begin work on Top-Secret US Government project to develop what becomes a very sophisticated
>>> Integration(LSI) microprocessor chip set for the flight control system in the Navy F-14A Tom Cat jet fighter
- Jun Philco-Ford Corp. [shuts down production](#) of the history-making [Victor 3900](#), the world's first MOS Large-Scale Integration(LSI) electronic calculator
- Jun Wang Laboratories closes purchase of Philip Hankins, Inc. (PHI). Dave Moros from PHI instrumental in development of future Wang Calculators
- Sharp introduces its [Compet 22](#) (Model CS-22A) electronic calculator
- Hayakawa Electric (Sharp) selects Autonetics division of North American Rockwell for development of an advanced LSI calculator chip set
- Jul Tateisi Electronics Co., R&D department completes secret development project producing a prototype electronic calculator designated as OI-1
- Jul [Compucorp](#) incorporated as business unit of Computer Design Corporation, with Elmer Easton(President), Norman J. Grannis(VP)[3/23/1968]
- Jul Roger Keenan(Finance), Kasper Terhorst(Director) and Cynthia Wells(Secretary) as principals [5-Jul]
- Jul Singer Corp. acquires General Precision Equipment Corp.
- Jul Bob Noyce and Dr. Gordon Moore(1/3/2029-3/24/2023) found "N M Electronics", the genesis of Intel Corp. [18-Jul]
- Jul Sony introduces the [SOBAX ICC-600](#) calculator
- Jul Canon [introduces](#) the Canola 161S and [Canola 163](#) calculators for sale in USA
- Jul Singer Corp. completes acquisition of General Precision Equipment Corp. (including Librascope, Inc., The Kearfott Co., Inc., and Link Flight Systems, Inc.)
- Jul Computer Terminals Corp. (Later Datapoint Corp.) founded by Phil Ray and Austin("Gus") Roche in San Antonio, TX USA,

>>> to develop low-cost CRT-display electronic data terminals to replace the noisy electro-mechanical
 >>> Teletype Model 33-ASR commonly used as data terminals for computer systems
 Jul Hitachi introduces the KK-22 (ELCA-22) calculator in Japan. Imported and sold by Friden as the [Friden EC-1113](#)
 Jul National Cash Register (NCR) signs [agreement](#) with Nippon Calculating Machine Co. for sale of NCM manufactured calculators under NCF
 Brother Industries acquires UK-based Jones Sewing Machine Co.
 Nippon Calculating Machine Co. forms Business Computer Corp., a.k.a. Busicom USA, for US market expansion
 Aug NM Electronics renamed Intel [6-Aug]
 Aug Western Electronic Show and Convention (WESCON), Los Angeles, CA [20-23 Aug]
 Okaya Electric Industries Co., Tokyo Japan, introduces a new cold-cathode segmented display tube it calls
 >>> "Elfin", challenging Burroughs' ubiquitous Nixie tube for calculator displays
 Aug Nippon Calculating Machine Co./Busicom introduces follow-on machine, the Busicom 162C electronic calculator, removing the square root
 >>> the earlier [Busicom 162](#), by simply omitting the key on the keyboard
 Sep Denon announces the [DEC-61A4](#) electronic calculator [[Denon's First Electronic Calculator](#)]
 Sep Japanese Electronics Show, Tokyo, Japan [17-23 Sep]
 Sep Hayakawa Electric Co., Ltd. (later Sharp Corp.) announces "Memorizer 30" and "Memorizer 60"
 >>> auxiliary programmers for its [and Compet 32 calculators](#)
 Sep Shinshu Seiki Co., Ltd. (later Epson) announces the historic [EP-101](#) digital printer, providing a simple, compact,
 >>> reliable and easily-interfaced printing solution for electronic calculators and any other device that required (mostly numeric) printing capab
 Sep Hewlett Packard 9100A documented in HP's corporate technology publication, the [Hewlett Packard Journal](#) September, 1968
 Sep Wang Laboratories stock begins trading on the American Stock Exchange [10-Sep]
 Sep Dr. An Wang granted US Patent [3,402,285](#) for principles of [Wang LOC](#) calculator,
 >>> including novel logarithm/anti-logarithm generation logic [17-Sep] [[Wang Labs' First Calculator Patent](#)]
 Oct Labor für Impulstechnik (LFI) formally closes purchase of business machines division of Wanderer-Werke AG [1-Oct]
 Oct Wang Laboratories introduces [360SE](#) four-user simultaneous electronics package extension of the earlier 320SE [[Last Wang Labs 300-Series C](#)]
 Oct Lee Boysel and two other MOS engineers leave Fairchild Semiconductor to form Four-Phase Systems to develop
 >>> computer systems based on VLSI (Very Large Scale Integration) building block ICs
 Oct Computer Design Corp. [CDC](spun off from Wyle Laboratories) and Nippon Calculating Machine Co. [NCM] forge [agreement](#) for CDC to c
 Oct Labor für Impulstechnik (LFI) renamed Nixdorf Computer AG
 Tadashi Sasaki (Hayakawa Electric/Sharp) meets with Robert Noyce and Bob Graham (Intel) and Yoshio Kojima
 >>> (Nippon Calculating Machine Co./Busicom) concerning use of large-scale MOS ICs in electronic calculators
 Japanese government-owned Research & Development Corp. grants Toshiba and Hitachi Ltd. \$900,000 each to develop Ion-Implantation :
 Victor Comptometer acquires exclusive distribution rights from Nixdorf Computer AG for sale of the Wanderer Conti printing electronic calcu
 Nov Tateisi Electronics Co. establishes trade name of Omron Tateisi Electronics Co.
 Dec Toshiba introduces its BC-1401 calculator [[Toshiba's First MOS IC-Based Calculator](#)][1-Dec]
 Dec Tektronix introduces the T4002 Graphics Terminal, their first Direct View Storage Tube (DVST) Graphics Terminal
 Dec Uchida Yoko, Co., Ltd. introduces the USAC-22B electronic calculator
 Dec Passing of Kiyoshi Ichimura, Founder of Riken Kankoshi Co., Ltd. (later Ricoh Co., Ltd.) [16-Dec]
 Total value of electronic calculators produced in Japan for 1968: \$71M

➤ 1969

Jan Litton Industries acquires German typewriter manufacturer Triumph Adler
 Jan Singer Co. board of directors changes status of Friden, Inc. from fully-owned subsidiary to the Friden Division of Singer Co. [1-Jan]
 Jan MOS Technology, Inc. incorporated, founded by three former General Instrument executives [16-Jan]
 Jan Wang Laboratories introduces 200-Series "business" calculators based on 300-Series calculators
 Jan Sony introduces the ICC-500A, a cost-reduced version of the [ICC-500](#)
 Jan Wang Laboratories announces [CP-2 Card Programmer](#) for 200/300-Series calculators
 Feb Hugle Industries, Inc. establishes Japanese subsidiary Hugle Electronics, Inc. in Tokyo, Japan
 Feb U.S. Patent [3,430,095](#) granted to to Jack J. Bialik[7/20/1924-1/4/2010], Dale P. Masher[4/14/1929-3/30/2014],
 >>> and Bill W. Stevens, all of Stanford Research Institute, who developed the display subsystem developed for Friden's [Friden EC-130](#) unc
 Hitachi New York, Ltd. renamed Hitachi America, Ltd.
 Feb The Singer Co. formally adopts a new logo for Friden, with a larger SINGER with "FRIDEN DIVISION" in smaller letters beneath
 Feb Friden [announces](#) market availability of the Hitachi-manufactured [Friden 1113](#)
 Feb [Wang 700](#) calculator [announced](#), not actually available until nearly a year later
 Feb Four Phase Systems, Inc. incorporated, founded by Lee Boysel and associates
 Massimo Rinaldi leaves IME to form new company building computer systems, Industria Sistemi Elettronici (INSEL), SpA, in Rome.
 Feb Busicom (ElectroTechnical Industries) introduces the Wyle Laboratories-designed [Busicom 207](#) and [2017](#) punched-card programmable e
 Feb Hitachi introduces the first Japanese-made minicomputer, the transistorized [HITAC 10](#)
 Feb Japan's Ministry of International Trade and Industry (MITI) approves Hayakawa Electric's (Sharp) request for government funding
 >>> assistance to develop a Large Scale Integration (LSI)-based miniature electronic calculator
 Feb Japan's MITI approves Hayakawa Electric's request to engage Autonetics division of North American Rockwell
 >>> to develop custom MOS large-scale ICs for a new miniature calculator
 Mar Arthur Lowell resigns as Director of Microelectronics Applications and Advanced Products at Autonetics
 Mar 1969 IEEE International Convention and Exhibition, New York, NY [24-27 Mar]
 Mar Autonetics Division of North American Rockwell receives \$30M from Hayakawa Electric Co., Ltd. (Sharp) for
 >>> LSI Calculator integrated circuit development, some of which comes from Japanese Government (MITI) grant to Hayakawa Electric
 Mar Hayakawa Electric (Sharp) exhibits prototype "miniature desk calculator" using eleven Hitachi-made MOS highly-integrated ICs at IEEE E
 Mar Hayakawa Electric (Sharp) [announces](#) (though it is far from production) its historical "micro-Compet" [Sharp QT-8D](#) in the US at New York
 >>> trade show, sales in Japan tentatively estimated to begin in August [27-Mar]

Mar Fujitsu introduces its entry into the Japanese minicomputer market, the [FACOM R](#), utilizing
>>> domestically-produced small-scale bipolar TTL integrated circuits, first of its kind for Japan

Mar Wang Laboratories, Inc., acquires Medical Systems and Data Corp. of Boston, MA
Bob Cole(Fairchild) and Don Borrer(GM-e/Philco Microelectronics) start up IC mask making & foundry Cartesian, Inc.
Union Carbide Electronics' MOS Devices Division(San Diego, CA) sold to Solitron Devices, Inc.
Amidst rabid competition in the calculator market, Italy's IME begins phasing out production of its electronic calculators
R.ohm (Toyo Electronics Industry, Japan) begins development of Integrated Circuit technology
North American Philips Corp. formed as merger of Consolidated Electric Co., and North American Philips Co., Inc.
ISE Electronics licenses Vacuum Fluorescent Display technology to Futaba Denshi

Mar Omron Tateisi Electronics Co. shows prototype of the [Omron 1210](#) electronic calculator

Mar Nippon Calculating Machine Co. (NCM) forges secret contract with Wyle Laboratories of El Segundo, California for realization of NCM's
>>> block-level design of a complex configurable Large Scale Integration calculator chip set estimated by NCM to require twelve chips (befo

Apr All of Autonetics' microelectronics activities rolled into a completely new Microelectronics Products Division with
>>> Sam Carlson named as GM. Autonetics' aviation, navigation, and space systems remain under the Autonetics umbrella.

Apr VEB Kombinat Robotron formed as a large conglomerate of German Office & Data Processing Companies [1-Apr]

Apr Intel introduces its first generally-available product, the [Intel 3101](#) bipolar 64-bit Random Access Memory (RAM) chip

Apr First operating prototype of Top Secret state-of-the-art American Micro-systems(AMI)-fabricated MOS/LSI microprocessor chip set for
>>> the US Navy F-14A Tom Cat air superiority fighter flight control system, the ([MP-944 CADC](#)) [One of a number of early multi-chip micropr

Apr M. Shima, H. Masuda, and S. Takayama from Nippon Calculating Machine Co.(NCM), Japan, visit Intel
>>> concerning development of proposed seven-chip MOS LSI calculator chipset designed by NCM calculator architecture design team

Apr Provisional agreement forged between Intel and Nippon Calculating Machine Co. (NCM) signed for Intel to develop and fabricate a comp
>>> MOS/LSI calculator chip set based on architecture developed by NCM

Apr [SCM Cogito 414](#) electronic calculator [introduced](#) [23-Apr] [Very early LSI chipset on eight chips fabricated by AMI]

May Sharp announces the [Compet 361, Model CS-361](#)), first of a series of Compet 361 electronic calculators [16-May]

May Friden announces the CRT-display [Friden 1160](#) electronic calculator to its sales force [20-May]

May Wang Laboratories introduces model [301 Column Printer](#) for Wang 200/300-Series calculators
Casio announces the programmable [AL-2000](#) electronic calculator

May Uchida Yoko exits calculator market after just two years

May Shinshu Seiki Co., Ltd. (later Epson) shows revolutionary [EP-101](#) printer at 38th Business Show in Tokyo

May Casio introduces the [Casio 121-A/AS-A](#) calculator
Citizen Business Machines Co., Ltd. establishes US sales company CBM America Corp.
Universal Electronic Industry Co., Ltd., a.k.a. Unitron founded in Taiwan ^[1]
Unoke Denshi Kogyo changes name to USAC Electronic Industrial Co., Ltd.

May Advanced Micro Devices (AMD) founded in Sunnyvale, CA

Jun Mostek founded in Worcester, Massachusetts by ex-Texas Instruments employees with significant funding from Sprague Electric Co.

Jun Barry Wright Corp. announces negotiations to sell Mathatronics calculator division to a small private investment group

Jun Completion of Top Secret project to develop what is one of the first MOS/LSI microprocessors, the [MP944 CADC \(Central Air Data Comp](#)
>>> developed by Garrett AiResearch and fabricated by American Micro-systems, Inc.(AMI), used in flight control system of the new US Nav

Jun SCM Introduces the 1016PR Programmable Calculator utilizing mostly small-scale DTL IC logic, \$2,495 [18-Jun]

Jun Sony introduces the ICC-510 Electronic Calculator

Jun The Friden division of Singer Co. announces it will build a new plant for electronic calculators in Albuquerque, NM

Jun Annual Consumer Electronics Show, New York Hilton Hotel [28 Jun-1 Jul]

Jul Matsushita begins first shipments of an electronic calculator it manufactures for Olympia, to be sold by Olympia in its markets as the Olyr

Jul Toshio Iue, founder of Sanyo, passes away at age 66 [16-Jul]

Jul Casio's [AL-2000](#) Programmable Calculator available for sale
Chipmaker Microsystems International Ltd.(MIL) founded in Ottawa, Canada, a spinoff of Northern Electric Co. Ltd., part of Bell Canada

Jul Dictaphone Corp. announces entry into the electronic calculator business, marketing two calculators manufactured by Sanyo under Dicta

Jul-Aug Hayakawa Electric rejects all MOS LSI chips produced by Autonetics in July & August for its upcoming [QT-8D "Micro-Compet"](#) calculator
>>> forcing Hayakawa Electric to delay introduction of the calculator from August to October (actually December)

Aug Sanyo reaches licensing agreement with chipmaker General Instrument to import, and later to locally manufacture, MOS LSI calculator ci

Aug Founding of Micro Instrumentation and Telemetry Systems (MITS) by Ed Roberts and three other partners

Aug Hitachi introduces the KK-24 (ELKA-24) in Japan. Sold by Friden as the [Friden 1114](#) under OEM contract with Hitachi
Sales of Casio electronic calculators passes 100,000 unit mark
Victor Comptometer sells its electronics division to Nixdorf Computer AG

Aug Western Electronics Show and Convention (WESCON), Cow Palace & Hilton Hotel, San Francisco [19-22 Aug]

Aug [Introduction](#) of the [Monroe 820](#) CRT-display electronic calculator [[Monroe's First IC-Based Calculator](#)]

Aug Shinshu Seiki Co., Ltd. (later Epson) shows [EP-101](#) drum printer at WESCON show
Canon Camera Co., Inc. changes name to Canon, Inc.

Sep Schneider Radio-Télévision Electronique, Ivry-sur-Seine, France, introduces the EXA(Exactronique) 210
>>> electronic calclator at the International Office Equipment and Computer show in Paris

Sep M. Shima of Nippon Calculating Machine Co.(NCM) returns to US to check on Intel's progress of calculator chipset development and find
>>> not meeting expectations. He is told Intel does not have the capability to make the chipset proposed by NCM

Sep Intel engineer assigned to "Busicom Project" proposes an alternative to NCM's chip set design involving the development of a simple sing
>>> and support chips that could be programmed to operate as various different types of calculators

Sep Intel introduces its first static 256-bit MOS Random Access Memory IC, the 1101

Sep Omron Tateisi Electronics Co. introduces production version of the [Omron 1210](#) [[Omron's First Electronic Calculator](#)]
William Kahn, Roy Reach (both founders) leave Mathatronics

Oct Hitachi Begins Sale of its First Minicomputer, the HITAC-10, using small-scale TTL ICs

Oct Japan Electronics Show, Osaka [1-7 Oct]

Oct Sony publishes news release stating it will demonstrate its first programmable electronic calculator, the SOBAX ICC-2500, at BEMA show

Oct 11th Annual BEMA (Business Equipment Manufacturers Assoc.) show, New York Coliseum [26-30 Oct]

Oct Sony introduces the ICC-610 calculator at BEMA show [26-Oct]

Oct Sony formally introduces its first programmable calculator, the [ICC-2500](#), at BEMA show [26-Oct]

Oct Prototype [Wang 700](#) Advanced Programming Calculator shown at BEMA show

Oct Nippon Columbia (Denon) and Hitachi form strategic business alliance

Oct Brother Procal 514 electronic calculator introduced

Oct [Hewlett Packard 9100B](#) introduced

Oct Barry Wright Corp. announces failure of deal to sell Mathatronics division to private investment group

Oct Canon and Texas Instruments enter into agreement involving development of "Miniature Electronic Calculators"

Computer Terminals Corp. approaches Intel and Texas Instruments concerning design of a single-chip eight-bit CPU to

>>> replace the large board full of TTL small & medium-scale ICs that implemented the CPU in their Datapoint 2200 "smart terminal"

Fairchild Semiconductor introduces the first static RAM IC, the 4100, storing 256 bits

Nov 23rd Annual Northeast Electronics Research and Engineering Meeting (NEREM), Boston, MA [5-7 Nov]

Nov Texas Instruments sets up its first complete production MOS LSI fabrication line at its new Houston, TX facility

Nov Sony introduces the SOBAX ICC-520 calculator

Nov Matsushita Communication Industrial Co., Ltd. (later, Panasonic) introduces the National PANAC-12W electronic calculator [[Matsushita's F](#)]

Nov Friden introduces the Hitachi-manufactured [Friden EC-1114](#) electronic calculator [5-Nov]

Nov Hitachi introduces the KK-32 (ELKA-32) Electronic Calculator in Japan. OEM'd by Friden to become the [Friden 1115](#)

Nov Hayakawa Electric (Sharp) establishes Sharp Electronics U.K. Ltd. in Manchester, U.K.

Nov Sophisticated [909 Scientist](#) electronic calculator announced by Cintra, Inc. [[Cintra's First Electronic Calculator](#)]

Commodore Business Machines moves corporate headquarters to Santa Clara, CA, from Toronto, Canada

Wander Werke AG ceases distribution of Wanderer *Conti* calculators, now only sold as Victor 1500-series

Dec Hayakawa Electric [Sharp QT-8D](#) calculator debuts in Japan utilizing Autonetics-made four chip LSI chipset [[World's Second Electronic Calculat](#)]

Dec Barry Wright Corp. shuts Mathatronics division, marking end of Mathatron calculator production/sales [30-Dec]

Estimated world total sales Value of electronic calculators for 1969: \$US46.8B

Casio's total calculator sales reach 100,000 units world-wide

Japanese electronic calculator firms export 112,000 calculators to US in 1969, selling for a total of \$US35.65M

Japanese electronic calculator firms Ship 441,000 calculators in 1969, selling for a total of \$US146.4M world-wide

US domestic sales of electronic calculators for 1969 is \$US46.8M

> 1970

Jan Hayakawa Electric Co., Ltd., changes name to Sharp Corporation [1-Jan]

Jan Digital Equipment Corp. (DEC) introduces its new 16-bit minicomputer, the [PDP-11](#) (PDP 11/20)

Jan MITS (Micro Instrumentation and Telemetry Systems) incorporated

Jan Omron Tateisi Electronics Co. introduces the [Omron 1200](#) electronic calculator [21-Jan]

Jan Nippon Columbia (Denon) introduces the [DEC-411](#) electronic calculator

Jan Ricoh Co., Ltd. founds Ricoh of America, Inc., a wholly-owned US subsidiary, located in New Jersey,

>>> combining its New York business office with Ricoh Industries USA, Inc.

Jan Production of the Wanderer Werke *Conti* and (licensed) Victor Comptometer 1500-series ends

Jan Wang Laboratories claims it has begun customer deliveries of its long-delayed [Wang 700-Series](#) calculators

Futaba Denshi begins manufacture of Vacuum Fluorescent Display Devices after licensing technology from Iseden(ISE)

Oi Electric Co., Ltd. ceases manufacture of electronic calculators

Feb Japanese telephone equipment manufacturer Nitsuko, Ltd. introduces its 1213 electronic calculator under the Tiger brand name

Feb Mois Gerson, formerly of McDonnell Douglas' Space & Missile group, joins Electronic Arrays, Inc. as

>>> Director of Corporate Operations

Feb Sony introduces its ICC-1600 electronic calculator

Feb Friden introduces the Hitachi-made [Friden EC-1115](#) electronic calculator [4-Feb]

Feb Formal agreement signed between Nippon Calculating Machine Co.(NCM) (a.k.a. Busicom) and Intel,

>>> for development of a set of LSI integrated circuits exclusively for NCM to use for electronic calculator applications [6-Feb]

Feb Wang Laboratories *announces* the Wang 3300 Timeshared Computer System

Digital Equipment Corp. (DEC) introduces its new [PDP 8/e](#) 12-bit minicomputer utilizing

small and medium-scale bipolar DTL and TTL logic chips and a universal backplane bus called Omnibus, \$6,500

Mar Sony announces its ICC-1500 electronic calculator

Mar Autonetics division of North American Rockwell gains standards approval of 42-pin "Zig Zag" IC package

APF Electronics Inc. founded by brothers **Allen** and **Philip** Friedman in New York to market & distribute Japanese-made electronics in the U

Mar Nippon Calculating Machine Co. (Busicom) approves specs for Intel's proposed chip set to

>>> serve as adaptable controller for electronic calculators

Mar Wang Laboratories formally introduces the [Wang 720A/B](#) with additional memory capacity

Mar Sharp [QT-8D](#) begins sales in US

Apr Japanese Electronics Show, Tokyo

Apr Federico Faggin leaves Fairchild Semiconductor, hired by Intel to work on "Busicom Project"

Apr Federico Faggin put in charge of chip set design for "Busicom Project"

Apr M. Shima of Busicom travels to Intel to help with chip set development,

>>> joins Intel development team and immediately begins contributing to design [7-Apr]

Apr Light Emitting Diode (LED), and later, calculator manufacturer Litronix founded by George E. Smith and six associates

Apr Friden begins customer deliveries of the [Friden EC-1115](#) electronic calculator

Apr Canon announces the [Canon Pocketronic](#) "handheld" printing calculator using Texas Instruments LSI chips

Apr Bill Hewlett[5/20/1913-1/12/2001] (HP co-founder) and Barney Oliver[5/27/1916-11/23-1995] (9100 calculator project manager) gift a
>>> [HP 9100B](#) calculator to noted Science and Science Fiction author Arthur C. Clarke

Apr Founding of General Digital by Alvin Philips, formerly of Motorola (beginning of Western Digital) [23-Apr]

May Nippon Calculating Machine Co. (later Busicom) introduces the Wyle Laboratories-designed 207P and [2017P](#) versions of the [207](#)/2017 cal

May Casio establishes its own US sales company, Casio, Inc., in New York

May Sanyo announces the ICC-0082D "mini-calculator" with rechargeable Sanyo-developed Nickel-
>>> Cadmium rechargeable battery pack and Nixie tube display.
>>> Uses four-chip MOS/LSI chipset developed and fabricated by General Instrument in US

May Mostek's VP of Marketing (Harvey "Berry" Cash) visits Nippon Calculating Machine Co. (NCM) in Japan
>>> concerning NCM's request for Mostek to develop MOS Large Scale Integration (LSI) single
>>> chip basic calculator IC based on NCM's logic design (becomes the MK5010; First calculator-on-a-chip)
Hewlett Packard Corp. ordered to pay Olivetti \$900,000 in royalties for violation of Olivetti's [Programma 101](#)
>>> patents by HP's 9100A/[9100B](#) calculators

Burroughs introduces the "Panaplex" planar gas-discharge display panel innovation
>>> using clear electrodes desposited on glass

American Micro-systems, Inc. (AMI) moves IC manufacturing facilities to Pocatello, Idaho

Jun Nippon Columbia (Denon) introduces the [DEC-521](#) electronic calculator

Jun Computer Terminals Corp. announces its Datapoint 2200 "smart" data terminal with TTL SSI & MSI-based CPU and MOS memory

Jun Wang Laboratories [introduces](#) its [100-Series](#) calculators

Jun Japanese electronic calculator manufacturers produce 519,000 units worth \$142M US Dollars
>>> in first half of 1970, exceeding total 1969 production by 78,000 units and only
>>> \$US4.4M shy of total 1969 revenue.

Jun Nippon Calculating Machine Co.(NCM) (a.k.a Busicom) and Mostek ink contract for NCM to purchase 60,000 units of a Mostek-made
>>> calculator-on-a-chip for \$US30 per chip if the chip is ready for production by mid-November (\$US1.8M deal)

Jul North American Rockwell (NAR) creates NAR Microelectronics Inc. from its Autonetics division
Pico Electronics Ltd. founded in Glenrothes, Scotland, by skilled group of MOS IC design
>>> engineers from General Instrument intent on developing a single chip calculator IC

Aug Friden introduces the Hitachi-made [Friden EC-1116](#) electronic calculator [5-Aug]
Friden's new electronic calculator manufacturing plant in Albuquerque, NM up and running

Aug Logic simulation of Intel's simple CPU on a chip for Nippon Calculating Machine Co.(NCM) completed, only one logic error found

Aug Nippon Calculating Machine Co. shows prototype Busicom Model 141-DA using Japanese-produced
>>> Liquid Crystal Display (LCD) (Never went to production)

Aug Western Electronics Show and Convention (WESCON), Hollywood Park, Los Angeles, CA [25-28 Aug]
Monroe signs OEM agreement with [Computer Design Corp.](#) to market calculators designed and built by Computer Design Corporation

Sep Shares of Sony Corporation first listed on New York Stock Exchange

Sep Sanyo introduces the ICC-0082D "mini-calculator" in the US [7-Sep]

Sep Casio first publicly traded on secondary market of Tokyo Stock Exchange

Oct Japan Electronics Show, Osaka Japan [1-7-Oct]

Oct Intel announces the 1103 1024-bit dynamic RAM IC, first commercially used in the
>>> [Hewlett Packard 9810A](#) [[First Commercially-Available DRAM Chip](#)]

Oct Matsushita introduces the National (Matsushita's trade name for electronic products)
>>> PANAC-1202 (JE-202) electronic calculator for sale in Japan

Oct Canon's [Pocketronic](#) begins sales in Japan [[First MOS-LSI Handheld, Rechargeable Battery Powered, Printing Calculator](#)] [[Texas Instruments' Cal-Tech](#) was pro

Oct Nippon Calculating Machine Co. informally accepts Intel's single-chip CPU proposal for its new calculator concept,
>>> flatly rejecting successful competing chipset from Computer Design Corporation based on NCM's original concept

Nov Mostek engineer hand-delivers Rubylith layout for "calculator on a chip" to Californian
>>> IC photomask contractor for mask production

Nov Nippon Calculating Machine Co.'s Masatoshi Shima returns to Japan after working very closely with Intel
>>> design team focused on developing developing "CPU on a chip" as basis for calculator
>>> [became Intel 4004 microprocessor and later, Busicom 141-PF calculator]

Nov Electronic Arrays [announces](#) six-chip calculator (S-100) chipset for \$158.46 for all six chips [[First publicly-available commercial calculator chipset](#)]

Nov Team at Hewlett Packard begins design of HP-35 Handheld Scientific calculator

Nov Mostek team successfully tests "calculator on a chip" from first run of IC developed
>>> for Nippon Calculating Machine Co. (Busicom)

Nov Four-Phase Systems, Inc. debuts their MOS/VLSI IC-based IV/70 Computer System [[First Use of Microprocessor in a Commercial Product](#)]

Nov International Calculating Machines (ICM) created as subsidiary of Electronic Arrays

Nov Canon introduces the [Canon L-121](#) desktop calculator [[Canon's first calculator to utilize MOS/LSI ICs](#)]

Nov [Casio 121-B/AS-B](#) calculator introduced

Dec U.S. Patent [3,546,676](#) granted to Robert Ragen of Friden, for design of [Friden EC-130](#)

Dec Wang Laboratories common stock begins trading on the New York Stock Exchange [22-Dec]
Industrial Research Magazine names Cintra, Inc.'s [909 Scientist](#) calculators as one of its "IR 100" most innovative products of 1970
US sales of domestically-made electronic desk calculators for 1970: \$US37.8M
Total sales value of European-made electronic desk calculators in 1970: \$US134.3M
Total factory price of Japanese desktop electronic calculator production in 1970: \$166.7M
Japanese-made electronic calculators account for 70% of US calculator sales in 1970, amounting to ~\$US120M
Approximately 1/2 of 1970 world-wide MOS integrated circuit production end up in electronic calculators, a dollar volume of \$US60M-\$US8

➤ 1971

- Jan Don Hoefler, journalist, first uses the term "Silicon Valley" in print in a number of articles he wrote that
>>> ran in *Electronic News*, with the title of "Silicon Valley, USA" [11-Jan]
- Jan Hewlett Packard introduces instrumentation system for 9100A and [9100B](#) calculators
- Jan Mostek begins volume production of "Calculator-on-a-chip", dubbed the MK5010, developed exclusively for Nippon Calculating
>>> Machine Co. (NCM), a.k.a. Busicom [[First Single-Chip Calculator IC](#)]
- Jan Sanyo introduces re-design of the ICC-0081D calculator using 7-Segment gas-discharge
>>> display tubes replacing Nixie tubes
- Jan Sanyo introduces the ICC-0082 calculator with built-in power supply/charger versus external power pack of ICC-0081/ICC-0081D
- Jan [Sharp EL-8](#), also known as the ELSI-8, introduced
- Jan Victor Comptometer internally obsoletes the [Victor 14-321](#) and [Victor 14-322](#) electronic calculators
- Jan Nippon Calculating Machine Co. completes breadboard prototype of printing calculator using small/medium scale
TTL ICs based on the design of Intel's proposed micro-CPU
- Jan Nippon Calculating Machine Co. introduces first "pocket" calculator, the "Handy" LE-120A, using
>>> Mostek MK6010 single-chip calculator IC [[First calculator to use calculator-on-a-chip](#)]
- Computer Terminals Corp. begins shipping its Datatpoint 2200 "smart" data terminal, considered by many to be the first "personal compute
- Intel begins pilot production of CPU on a chip and peripheral chips exclusively for Nippon Calculating Machine Co.
- Jan Wang Laboratories announces its [500-Series](#) calculators
- Feb Intel verifies first operating "CPU on a Chip" IC created for Nippon Calculating Machine Co.
- Feb Philco-Ford announces shutdown of its microelectronics division amidst extreme competition in the marketplace
- Eiko Business Machines engages NEC to design a printing calculator chipset
- International Calculating Machines introduces the [ICM 816](#) calculator using its parent company's
>>> (Electronic Arrays) [S-100](#) six-chip calculator chip set
- Feb Canon's unique [Pocketronic](#) calculator goes on sale in USA
- Feb [Sharp EL-8](#) begins sales in US
- Mar Michael Cochran leaves Cintra, Inc. to join Texas Instruments
- Mar Nippon Columbia (Denon) and Hitachi dissolve business partnership
- Mar IEEE '71 exposition, New York Coliseum/New York Hilton [23-25 Mar]
- Mar Wang Labs [delivers](#) first 3300 Time Shared Computer System to Weymouth South High School in Weymouth, MA
- Remains of Mathatronics liquidated, marking the end of the innovative calculator company
- [Victor 1800-Series](#) calculators introduced
- London-based calculating machine distributor Muldivo Calculating Machine Co., Ltd. goes out of business
- [Hewlett Packard 9810A](#) introduced as first member of new 9800-series of electronic calculating instruments
- Apr Sharp introduces the EL-8M, follow-on to the [EL-8](#), adding memory or double-precision multiply functions
- Apr Nippon Calculating Machine Co. receives first production "CPU on a Chip" and support
>>> chips from Intel used for building prototype printing business calculator
- Apr Casio introduces the Casio AL-3000 printing programmable electronic calculator
- Apr First operating prototype of printing office calculator using Intel "CPU on a chip" completed by
>>> Nippon Calculating Machine Co. [[Prototype for the Busicom 141-PF](#)]
- May Introduction of the [Omron 800](#) calculator [[New Low Price Benchmark for AC-Powered Desktop](#)]
- May Nippon Calculating Machine Co. begins volume production of the Intel 4004-based Busicom 141-PF calculator
- SCM introduces the [Marchant I](#) (also known as the F-80) battery-operated, portable, Nixie Tube
>>> display calculator utilizing AMI-manufactured two chip LSI chip set
- May Nippon Calculating Machine Co., under Busicom brand name, begins sale of its LE-120A calculator using Mostek's
>>> single-chip calculator IC [[First Handheld, single-chip, LED-Display calculator](#)]
- May Intel and Nippon Calculating Machine Co. renegotiate calculator chip-set contract,
>>> allowing Intel to sell "CPU on a chip" and support ICs to others, creating the MCS-4 family of chips
- May Casio introduces the [Casio AS-C](#)
- May Bowmar shows early prototype of pocket-sized battery-powered calculator using TI calculator-on-a-chip at industry trade show
- May Tektronix, Inc. announces purchase of Cintra, Inc. from Physics International [7-May]
- May Jack Murdock, co-founder of Tektronix, [dies](#) in mishap with his seaplane [16-May]
- Computer Design Corporation launches its own line higher-end calculators under the Compucorp brand name
- UniCom Systems, Inc. founded in Cupertino, California, as an electronic calculator distributor
- Jun Sharp begins sale of the EL-8M, follow-on to the [EL-8](#), adding memory/double-precision functions
- Jun Wang Laboratories announces the top-of-the-line 700C and [720C](#) models of
>>> its 700-series calculators
- Jun Wang Laboratories announces the 708 Memory Expansion Controller for its 700-Series calculators
- Jun Wang Laboratories announces 709 Dual Cassette Drive peripheral for the 700-Series calculators
- Sankyo Seiki Mfg. Co., Ltd. (Japan) begins production of compact SANAC-series magnetic card reader/writer device
- Jul Nippon Calculating Machine Co.(Busicom) and National Cash Register negotiate OEM sales agreement
>>> for NCR to sell the Busicom 141-PF calculator under the NCR badge in North America
- Jul General Digital renamed Western Digital
- Jul [Purchase](#) of Cintra, Inc. by Tektronix is completed
- Jul Michael Cochran validates functionality of what becomes the progenitor of Texas Instrument's [TMS1802](#)
>>> microcontroller-based calculator chip [4-Jul]
- Jul Tektronix announces the re-badged Cintra 909 and 911 calculators as the [Tektronix 909](#) and [Tektronix 911](#)
- Jul Hugle International incorporated, Mountain View, California [20-Jul]
- Jul Mois Gerson succeeds Samuel Nissim as President of Electronic Arrays, Inc. Nissim assumes Chairman of the Board role.

Aug Tektronix, Inc. announces price reduction and upgraded base memory in [Tektronix 909](#) and [Tektronix 911](#) calculators

Aug American Micro-systems, Inc. (AMI) announces agreement to acquire majority interest in desktop calculator distributor Unicom Systems, Inc. of Cupertino, CA

Aug Garrett Micro-Circuits sells company assets to Burroughs, but retains company name

Tektronix, Inc. introduces the T4010 Direct View Storage Tube Graphics Terminal

Sep Texas Instruments [announces](#) the TMS1802, TI's first calculator on a chip [later becomes TMS0100-series] [17-Sep]

Sep Masatoshi Shima leaves Nippon Calculating Machine Co.(Busicom) for new position at Ricoh

Sep Omron inks \$2M contract with Nortec Electronics Corp. for development of MOS/LSI chip set for low-cost calculators

Sep [Casio AS-8A](#) introduced

Sep Sony introduces the [Sobax ICC-88](#) rechargeable portable calculator using Electronic Arrays' six-chip calculator chip-set

Sep AMI completes acquisition of calculator distributor Unicom Systems, Inc.

Sep Bowmar/ALI, Inc. ships their first pocket-sized electronic calculator, the 901B with MSRP of \$249, >>> utilizing TI calculator-on-a-chip IC [\[First commercial truly pocket-sized calculator\]](#)

Oct Busicom introduces the Model 141-PF printing desktop calculator [\[First calculator to utilize single-chip microprocessor \(Intel 4004\)\]](#)

Nov Mitsubishi Electric introduces its first minicomputer, the MELCOM 70, using Small- & Medium-Scale TTL IC Logic with 0.8μS cycle time [\[Fast\]](#)

Nov Masatoshi Shima Leaves Ricoh to work for Intel at request of Intel CEO Bob Noyce

Nov Popular Electronics publishes article introducing MITS' \$179 calculator kit, the [MITS 816](#)

>>> based on Electronic Arrays' low-cost six-chip calculator chip set

Nov Intel announces general availability of MCS-4 microprocessor family [15-Nov] [\[Intel's first publicly-marketed microprocessor IC\]](#)

Dec Wang Laboratories announces [Wang 600-Series](#) calculators

Sales of electronic calculators in US during 1971 totals \$131-million

Estimated total factory price of Japanese desktop electronic calculator production in 1971: \$136.4M

Sales value of Japanese-made electronic calculators during 1971: approx. \$176M

Total number of electronic calculators in Soviet Union (USSR): ~45,000

Total value of calculators manufactured in Europe during 1971: ~\$174.1M

➤ 1972

Jan The Japanese Machinery Exporters Association reduces minimum FOB export price of electronic calculators >>> without memory capability to approx. US\$65.00/unit for first six months of 1972

Jan General Electric closes down its integrated circuit business

Jan Hewlett Packard introduces the revolutionary HP-35 handheld scientific calculator utilizing LSI ICs >>> fabricated by Mostek for HP [\[World's first handheld scientific calculator\]](#)

Feb Rapid Data Systems & Equipment, Ltd. introduces the Rapidman 800 pocket calculator

Feb Wang Labs announces SWAP calculator user group [operational in June '72]

Feb Wang Labs announces [Model 711](#) Input/Output Writer

Feb [Casio fx-1](#) introduced [\[Casio's first scientific electronic calculator\]](#)

May Sony introduces its ICC-700 electronic calculator

Apr Varadyne, Inc. spins off Varadyne Systems unit which manufactures electronic calculator equipment

Apr Texas Instruments opens calculator manufacturing plant in Fort Walton Beach, Florida

Apr Litronix opens electronics manufacturing facility in Malaysia

Apr Intel announces the 8008 microprocessor chip, based on 1201 microprocessor prototype developed for Computer Terminal Corp.

Apr Commodore Business Machines provides guarantee of bank loan for Varadyne Systems, Inc.

Apr Birmingham, UK-based business equipment firm Fonadeck International purchases assets of closed-down Muldivo >>> Calculating Machine Co., Ltd. for an undisclosed price

Apr Commodore Business Machines obtains option to acquire 75-90% of Varadyne Systems, Inc. from Varadyne, Inc.

Facit AB begins large scale layoffs as calculator business suffers major losses

Diehl Corp. ends production of electromechanical calculators

May The American Calculator Corp. dissolved [8-May]

May Casio AS-8D introduced

Jun Master Calculator Company, a division of 6/C Inc., registered as doing business in Grand Prairie, Texas [9-Jun]

Jun Wang Laboratories inaugurates "SWAP" (Society for Wang Applications and Programs) User Group

Jun [MITS Model 1440](#) calculator introduced in *Radio-Electronics* magazine

Jun Casio introduces its R-3 Printing Electronic Calculator

[Hewlett Packard 9820A](#) introduced, using HP-developed 5x7 dot-matrix alphanumeric LED display

[Hewlett Packard 9830A](#) introduced [\[First desktop calculator to have the BASIC programming language embedded in ROM\]](#)

Production of Curta mechanical calculators ends

Aug Casio's [Casio Mini](#) introduced [\[New low price benchmark for four-function handheld\]](#)

Aug Fujitsu introduces the FACOM U-200 Series of 16-bit Minicomputers [\[Intel's second microprocessor\]](#)

Aug Intel introduces the 8008 Microprocessor [24-Aug] [\[Intel's second microprocessor\]](#)

Aug Rockwell Microelectronics introduces the 4-bit PPS-4 microprocessor [\[Rockwell's first microprocessor\]](#)

Aug Sharp EL-801 "ELSI-MINI" handheld calculator introduced [\[First use of CMOS calculator chip-set \(T3103, T3104\) made by Toshiba\]](#)

Rockwell International acquires Sumlock Anita Electronics Ltd. and Sumlock Comptometer

Sep Rockwell International [acquires](#) Unicom Systems, Inc. from American Micro-systems, Inc. [18-Sep]

Sep Texas Instruments announces its TMS0100 family of mask-programmable calculator ICs that can be configured for >>> different features by simple mask changes [20-Sep]

Sep Texas Instruments announces entry into the electronic calculator marketplace with the TI-2500 handheld, and the desktop [TI 3000](#), >>> and [TI 3500](#) calculators, utilizing their new TMS0100-series calculator on a chip ICs [20-Sep]

Oct First all Taiwanese-designed & manufactured Unitron DC-12 electronic calculator goes to market [\[1\]](#)

- Facit AB and subsidiary Addo AB acquired by consumer and industrial products conglomerate Electrolux
- Nov Litronix purchases CMOS integrated circuit manufacturer Advanced LSI Technology, Inc.
- Nov Nixdorf acquires Victor Comptometer, establishes Nixdorf Computer, Inc. in Chicago, IL
- Nov Microsystems International(MIL) licences Nortec Electronics' single chip
- >>> calculator IC design to manufacture calculators for Rapid Data Systems & Equipment Ltd.
- Wang [400-Series](#) calculators introduced
- Dec Micro Instrumentation & Telemetry Systems (MITS) introduces its most advanced desktop electronic calculator, the [MITS 7400](#)
- Estimated total factory price of Japanese desktop electronic calculator production in 1972: \$142.4M

➤ 1973

- Feb Hewlett Packard HP-80 introduced [[First Financial Handheld](#)]
- Feb Casio introduces the Casio "Mini", Model CM-601
- Mar US Federal Trade Commission, under anti-trust concerns, rules that Litton Industries to divest itself of Triumph Adler
- Mar [MITS 7440](#) calculator introduced in *Radio Electronics magazine*
- Hewlett Packard opens retail sales showrooms in San Francisco, New York, and Chicago to market its line of
- >>> advanced desktop and pocket electronic calculators
- Cherry Electrical Products Corp. begins manufacture of electronic calculators purely as OEM producer, initial customers
- >>> are Unicom Systems (Rockwell International), SCM, and Olympia. Later, Sumlock Anita and NCR
- Business Equipment Manufacturers Association (BEMA) becomes CBEMA, adding computer manufacturers to the mix
- Apr Hewlett Packard introduces the 9805A printing (with optional LED display) statistical desktop electronic calculator
- Apr First public demonstration of cellular phone technology by Marty Cooper of Motorola,
- >>> leader of team that developed the technology, uses a prototype wireless portable
- >>> cellular phone to place a call to counterpart at Bell Laboratories [3-Apr]
- North American Rockwell and Rockwell Manufacturing merge to form Rockwell International
- May Hewlett Packard, through Japanese subsidiary Yokogawa Hewlett-Packard, markets a plug-in ROM block for the [HP 9810](#) calculator that p
- May Sharp introduces the ELSI Mate EL-805 [15-May] [[First Battery-Powered "Pocket" Liquid Crystal Display \(LCD\) Calculator](#)]
- May Sony [announces](#) it will end production of electronic calculators [31-May]
- May Hewlett Packard [HP-46](#) printing desktop electronic calculator introduced
- May Wang Laboratories begins shipping the [2200](#) "personal computer"
- May Computer Design Corp. (Compucorp) Introduces the 324 *Scientist* and 344 *Statistician* "portable microcomputers" (Compucorp's term)
- May Hewlett Packard HP-45 handheld calculator introduced
- Jul Panafacom, Ltd. established in Japan by consortium of Fujitsu, Fuji Electric, and Matsushita(Panasonic) to develop a 16-bit microprocesso
- Jul Sony terminates manufacture of electronic calculators [31-Jul]
- Aug Japan's Ministry of Finance reports that exports of Japanese-made electronic calculators through
- >>> the end of July, 1973 exceeded the total exports for all of 1972.
- Aug Tektronix [Model 21](#) and [31](#) calculators introduced. Model 21 priced at \$1,850, and Model 31 at \$2,850 [2-Aug]
- Sep Master Calculator Co. purchased by American Metrics
- Sep Western Electronics Show & Convention (WESCON) trade show, San Francisco, CA [11-14 Sep]
- Nov Signetics goes public with 1.3M shares at \$17 each
- Dec Beckman Instruments assumes ownership of Sperry's Planar Gas Discharge Display group
- Dec Hewlett Packard [announces](#) its 9821A calculator for \$4,975 in base form
- \$399.5M Japan's combined output of electronic calculators exceeds ten million units for the year 1973
- Research firm Creative Strategies study reveals that retail sales of electronic calculators in 1973 reached \$1-billion mark
- Factory-cost of electronic calculators produced in the US in 1973 amounts to \$530M

➤ 1974

- Jan Hewlett Packard HP-65 handheld programmable calculator introduced [[World's first programmable handheld electronic calculator](#)]
- Jan Intel introduces its 8080 8-bit microprocessor, follow-on to the earlier 8008
- Feb Singer/Friden announces the Friden 1202 and [Friden 1203](#) calculators utilizing Rockwell single chip calculator IC
- Feb Nippon Calculating Machine Co. (Busicom) files for bankruptcy
- Feb Tektronix Model 21 and [Model 31](#) calculators launched in UK
- Motorola announces its 6800 8-bit microprocessor based loosely on Digital Equipment (DEC) [PDP-11](#) minicomputer architecture
- Mar Japan's Business Machine Makers Association announce desktop calculator quality standards that certify a calculator as having
- >>> met specific quality measurements to assure quality consistency in Japan's highly competitive calculator market
- Mar NEC announces its first single-chip eight digit calculator LSI that provides memory functions, the μ PD277
- Mar Tektronix announces the [31/53 Instrumentation System](#) based on its [Model 31 Calculator](#)
- Apr Unexpected market-wide drop in sales of electronic calculators marks beginning of shakeout in industry
- Jun U.S. Patent [3,819,921](#) granted to Texas Instruments' Jack Kilby & team for TI's prototype [Cal-Tech](#) calculator
- Cal-Tex Semiconductor, Inc. leaves the electronic calculator marketplace to focus on electronic watches
- [Computer Design Corp. \(Compucorp\)](#) sells 24% share of voting stock to Litton Industries (Monroe)
- A general economic recession hits the semiconductor market resulting in large layoffs at chip makers
- Jul Litton Industries loans [Computer Design Corp. \(Compucorp\)](#) \$1M
- Aug Tektronix announces Model 152 BCD Interface for its [Model 31](#) calculator
- Aug Monroe division of Litton Industries assumes sole distributorship of electronic calculators and peripheral equipment
- >>> manufactured by Computer Design Corporation under the Compucorp brand. The [agreement](#) states that the Compucorp division of Comp
- >>> cease all marketing, sales and service of Compucorp-branded calculators, with all personnel involved with Compucorp becoming Monroe
- Smith-Corona Marchant(SCM) files complaint with US Federal Trade Commission against Brother Industries, Ltd.
- >>> of Japan for dumping inexpensive portable typewriters into the US Market

- Sep NEC announces what it claims is the world's smallest full function 8-digit calculator on a single chip, the μ PD940
Broughton & Co. (Bristol) Ltd., UK, purchases rights to the "Busicom" brand name from bankrupt Nippon Calculating Machine Co.
Nippon Calculating Machine Co.(Japan) and Busicom Corp. cease operations after bankruptcy
National Cash Register Co. changes name to NCR Corp.
- Nov Sam Carlson released as director of Rockwell International's Microelectronics Products division, replaced by Don Mitchell.
>>> Carlson named VP & Assistant to Donn L. Williams, Rockwell's President of Electronics Operations
[Computer Design Corp. \(Compucorp\)](#) shuts down its dealer/distributor network and OEM agreements per
>>> [August agreement](#) with Monroe division of Litton Industries
Microsystems International Ltd.(MIL) acquired by Northern Electric Co. Ltd. from which it was originally a spin-off
Estimated world-wide production of electronic calculators in 1974: 34-Million units
US production value of calculator ICs in 1974: Basic Single-Chip, \$18.6M; Scientific Single-Chip, \$10.6M;
>>> Special Function Single Chip, \$3.5M; Chip sets, \$2.7M
Estimated 1974 sales value of electronic calculators in Europe: \$399.5M
- Dec MOS Technology, Inc. revitalized with arrival of four ex-Motorola senior engineers (including
>>> Chuck Peddle), as well as investment from Prentice-Hall Corp. [11-Dec]
US sales of desktop calculators in 1974: Programmable: \$170M; Non-Programmable: \$375M; Total: \$545M
Estimated manufacturing cost of 12.2 million electronic calculators produced in the US in 1974: \$580M (35M net loss?)
Casio's total global sales of calculators tops 10,000,000 (10 million) units, only ~2.2 million units shy of total US electronic calculator produc

> 1975

- Jan Microsoft announces BASIC for the Altair 8800 microcomputer [2-Jan] *[First microcomputer BASIC interpreter and Microsoft's first product]*
- Jan Texas Instruments shutters Fort Walton Beach, Florida calculator plant, citing economic conditions [10-Jan]
- Jan MOS Technology, Inc. renamed to CDS Technology, Inc. [31-Jan]
- Feb Rockwell International [announces](#) intention to shut down calculator division Unicom Systems [1-Feb]
- Feb New York Life Insurance Co. files \$16-million suit against Bowmar Instrument Corp. due to default on a loan [7-Feb]
- Feb Bowmar Instrument Corp. files for Federal Chapter XI bankruptcy [10-Feb]
- Mar Plan for acquisition of chip maker Signetics by Philips announced
- Apr On appeal, the US Federal Trade Commissions reverses its ruling that Litton Industries divest itself of Triumph Adler
- Apr Panafacom Ltd. introduces its MN1610 16-bit Microprocessor IC based on its U-200 minicomputer architecture
- Apr Bill Gates & Paul Allen found Micro Soft (later, Microsoft) [4-Apr]
National Semiconductor reveals that one of its proprietary scientific calculator chip designs
>>> had been stolen, copied, and is being sold at lower cost than National's chip
Hugle International declared bankrupt
Remains of [Computer Design Corp.](#) absorbed into Monroe International division of Litton Industries
- May Tektronix announces the Model E-31 Calculator (reduced cost version of the Tektronix [Model 31](#))
- Jun Acquisition of Signetics by Philips, via US Philips Trust Corp., is completed, combined becomes Philips Semiconductors
- Jun Bowmar Instrument Corp. terminates production of calculators
- Jun Shinshu Seiki Co., Ltd. launches the Epson brand name
- Jun Canon introduces its SX-310 advanced programmable desktop calculator
[Hewlett Packard 9830](#) calculator selects passwords for the very popular ABC TV Game Show *Password*
- Jul CDS Technology, Inc dissolved as a corporate entity, reverting back to MOS Technology Inc. [9-Jul]
Facit AB subsidiary of Electrolux writes off inventory stocks of calculators at factories
>>> in Sweden and sales subsidiaries outside Sweden as non-salable merchandise
Singer Business Machines division closed down
- Oct IMS Associates publishes advertisement for IMSAI 8080 Microcomputer in *Popular Electronics* magazine
Beginning of project at Hewlett Packard to develop what became the [HP 85A](#)
Western Digital becomes the largest independent producer (by sales volume) of calculator ICs in the world
- Nov Tektronix introduces the revolutionary [4051](#) desktop "Graphics Computer System", \$7,995
Tektronix closes down calculator business unit, exits the calculator business
- Dec One of Texas Instruments' [Cal-Tech](#) calculators accepted for exhibit by the Smithsonian Institution
- Dec IMS Associates ships the first batch of IMSAI 8080 microcomputer kits to customers [16-Dec]
American Microsystems, Inc. (AMI) ships over 15M MOS/LSI integrated circuits in 1975
1975 sales of calculator chip sets produced in Japan & Europe: \$115.6M
1975 sales of electronic calculators in the US: \$268M
1975 sales of electronic calculators in Japan & Europe: Basic pocket calculators: \$117.6M;
>>> Office calculators: \$100.1M; Scientific calculators: \$42M
US production value of calculator ICs in 1975: Basic Single-Chip: \$21.6M; Scientific Single-Chip: \$16.1M
>>> Special Function Single Chip: \$2.4M; Chip sets: \$2.4M

> 1976

- Jan Victor Comptometer introduces the [Victor 4900](#) Advanced Programmable Calculator
- Jan Rockwell International begins phase-out of Sumlock Anita division in UK
Texas Instruments [announces](#) the [SR-60](#) advanced programmable desktop calculator
- Feb Hewlett Packard announces the [HP 9825A](#) programmable calculator with HP-IB instrument control capability
- Feb Rockwell International's Microelectronics Device Division reports that it produced over
>>> two-million LSI semiconductor devices during February, 1976
- Mar Federico Faggin(formerly Intel), Ralph Ungermann(Intel), and Masatoshi Shima(formerly Nippon Calculating Machine Co./Intel)
>>> create first working prototype of Zilog Z-80 microprocessor

Friden closes down electronic calculator plant opened in fall of 1970 in Albuquerque, NM

Facit AB begins phase-out of direct sales force for office products

Facit AB closes office product production factory in Gothenburg, Sweden

Monroe Division of Litton Industries ends business relationship with Computer Design Corp.(Compucorp)

Oct Computer Design Corp. announces bankruptcy filing [22-Oct]

Oct Western Digital Corp. announces voluntary filing for Chapter XI bankruptcy protection during attempted reorganization

>>> after it is unable to meet financial obligations to United California Bank and Emerson Electric Co.

Dec Texas Instruments introduces the PC-100 Thermal Printer Dock for the SR-52 Magnetic

>>> Card programmable pocket calculator at Consumer Electronics Show

Dec Singer sells Friden division to British computer manufacturer International Computers Limited (ICL)

> 1977

Mar Agreement reached between Victor Comptometer Corp. and Walter Kidde Co. for Kidde to acquire Victor

Apr Ricoh introduces the acronym "OA" for Office Automation at Hanover Fairground CEBIT show in Germany

Hewlett Packard introduces the revolutionary [HP-01](#) Wrist Instrument [[First wrist-worn watch/calculator/calendar/stopwatch](#)]

Jun Rockwell International exits calculator business

Facit(Electrolux) exits calculator business

First availability of the new Apple II microcomputer

Jul Heathkit announces its first computer kit, the [Heathkit H-8](#) based on the Intel 8080 CPU and a proprietary bus structure, \$379

Litronix exits the electronic calculator market

Micro Instrumentation and Telemetry Systems (MITS) sold to Pertec Computer Corp.

Oct Texas Instruments [introduces](#) the [SR-60A](#) update of the SR-60 programmable calculator

Victor United spins off business machines division as Victor Business Products

> 1978

Jan Tokyo Electronic Application Laboratory (TEAL) closes, claiming bankruptcy, a victim of the calculator price wars

Commodore exits electronic calculator business in favor of personal computers

Dr. Ge Yao Chu, Senior VP and Board Member and employee #1, retires from Wang Laboratories

Jun Nippon Electric Co., Ltd. (NEC) announces intent to acquire California-based chip-maker

>>> Electronic Arrays, Inc. for approx. \$8.6M [16-Jun]

Oct Willard Rockwell, founder of what became Rockwell International, passes away [16-Oct]

Dec Sale of Chip Maker Electronic Arrays to NEC completed

> 1979

Mostek purchased by United Technologies Corp.

Mar Volkswagenwerk AG (Volkswagen) announces intent to acquire majority ownership of Royal Typewriter/Triumph-Adler in 55% stock purcha

R.ohm (Toyo Electronics Industry) changes name to ROHM

Fairchild Camera & Instrument purchased by French company, Schlumberger Limited, for \$425M

Dec Hewlett Packard announces the [HP-85A](#) desktop computer

Tokyo Shibaura Electric Co., Ltd. formally changes name to Toshiba

> 1980

Jan [John W. Mauchly](#), physicist, noted designer of ENIAC and other important early electronic

>>> computers, passes away at age 72 [8-Jan]

Bankrupt Computer Design Corp./Compucorp rejects paltry \$1/share bid by Savin Corp. to acquire the company

Jun Tokuji Hayakawa, brilliant inventor, Head of R&D and Engineering Manager at

>>> Hayakawa Electric Co., Ltd. (later, Sharp Corp.) passes away [24-Jun]

Monroe International changes name to Monroe Systems for Business

Oct Compucorp introduces "Correct'n'Spell" Word processing System, \$13,000

Dec Rapid Data Systems & Equipment dissolved [16-Dec]

Dec MOS Technology, Inc. merged into Commodore Business Machines, Inc. [23-Dec]

Total global sales of Casio electronic calculators reaches 100,000,000 (100 Million) units

> 1981

Jan Commodore Business Machines acquires MOS Technology, Inc. [1-Jan]

Financier Bernard Katz acquires majority ownership of Compucorp

May [Dr. Stanley P. Frankel](#), Manhattan Project physicist, and later designer of the [SCM/Marchant Cogito 240SR](#)

>>> and the prototype of the [Diehl Combitron](#), passes away [2-May]

> 1982

Mar Motorola, Inc. completes purchase of Four-Phase Systems, Inc. in \$253M Stock Exchange [2-Mar]

Jul Harold Koplow[11/21/1940-11/4/2004] leaves Wang Laboratories over disagreements with Fred Wang(Dr. An Wang's son), Wang Labs' Dir

Soundesign Corp. returns to being a privately-held company

Victor United & Victor Business Products rejoined, now called "Victor Technologies"

Dr. An Wang retires from active management of Wang Laboratories

> 1983

Harold Koplow[11/21/1940-11/4/2004] joins computer manufacturer Modular Computer

>>> Systems, Inc. (MODCOMP) as VP of Research & Development

Nippon Electric Co., Ltd. officially renamed "NEC Corporation"

Texas Instruments files complaint with US Intl. Trade Commission concerning importation of inexpensive off-shore calculators as violation c

Sep Compucorp [announces](#) plan to purchase 80% stake in Monroe division of Litton Business Systems

➤ 1984

- Jan Jack Tramiel leaves Commodore, citing "personal reasons" for his departure, though indications were that it was really due
>>> wrangling within the company concerning its future direction
- Jan Compucorp announces abandonment of plan to purchase majority ownership of Monroe division of Litton Industries
- Apr Toshio Kashio awarded Japanese Medal of Honor with Blue Ribbon by Emperor Hirohito(Shōwa) due to his contributions in
>>> the development of electronic technology (most specifically electronic calculators) in Japan
- Frank S. Wyle retires from role as CEO of Wyle Laboratories
- Jul Atari Corp. purchased from Time Warner Communications by exiled Commodore founder Jack Tramiel [2-Jul]
- Jul US Intl. Trade Commission initiates investigation of TI claim of import tariff/patent violation by off-shore (Japan) calculator manufacturers
- Aug Hewlett Packard begins shipping the HP-25 handheld programmable calculator
- Aug Compucorp announces promotion of Norman Grannis[3/23/1935-2/19/2001] to Executive VP and Chief Operations Officer
- Litton Industries sells Monroe Systems for Business division to [Jeffrey Picower](#), a major beneficiary of the Bernie Madoff investment scandal
- Dec Elmer R. Easton steps down as President and CEO of Compucorp
- Dec William M. Duke succeeds Elmer Easton as President and CEO of Compucorp

➤ 1985

- Jan Bernard B. Katz invests \$1M in Compucorp, assumes board Vice Chairman of the Board title
- Olympia Werke AG is renamed Olympia Aktiengesellschaft
- Mar Elmer R. Easton resigns as Chairman of the Board of Compucorp to pursue other business interests
- Dr. An Wang (Founder/CEO of Wang Laboratories) holds secret discussions with ITT regarding possible merger
- Jun US Intl. Trade Commission rules no violation of tariff or patent law relating to Texas Instruments' complaint filed in late 1983
- Jun Bernard B. Katz resigns from board of directors of Compucorp citing potential conflict of interest
- Jul John F. Cunningham resigns as President of Wang Laboratories, sells all of his stock holdings in the company [19-Jul]
- Harold Koplow[11/21/1940-11-4-2004], leaves Modular Computer (Modcomp), and Dave Moros, both
formerly from Wang Laboratories, recruited to Computer Consoles, Inc.
- Sep Bernard B. Katz elected Chairman of the Board of Compucorp (only months after having resigned as a director)
- Sep Norman Grannis[3/23/1935-2/19/2001] promoted to President and CEO of Compucorp, replacing William Duke
- Oct United Technologies announces intent to close down Mostek Corp. subsidiary [17-Oct]

➤ 1986

- Mar Passing of Heinz Nixdorf due to heart attack suffered at the CeBit Trade Show [17-Mar]
- Apr Passing of Don Hoefler, journalist who first used the term "Silicon Valley" in print [15-Apr]
- Apr Olivetti S.p.A purchases Volkswagen's controlling interest in Royal Typewriter/Triumph-Adler
- Fairchild Semiconductor purchased from Schlumberger by National Semiconductor
- Jun Transatron Electronics Corp. announces it is going out of business [29-Jun]
- SCM purchased by UK firm Hanson pLC, which promptly shuts down much of SCM's business units
- Elmer R. Easton, former President of Computer Design Corp., forms [Three D Graphics Inc.](#)
- Sep Burroughs Corp. and Sperry Corp. merge to form Unisys Corp.
- Nov Dr. An Wang steps down as President of Wang Laboratories
- Nov Dr. An Wang's son, Fred (Director of R&D), named President of Wang Laboratories [19-Nov]
- Bell Punch Co., Ltd. ceases business

➤ 1987

- Morris Chang founds Taiwan Semiconductor Manufacturing Co., Ltd. (TSMC) and begins operations as world's first dedicated
>>> Silicon IC foundry. Philips Gloeilampfabrieken N.V. largest corporate source of start-up funding and intellectual property
- SGS Thomson purchases chipmaker Mostek

➤ 1988

- Feb Noted Manhattan Project physicist Richard Feynman passes away [15-Feb]
- Tadao Kashio steps down as President of Casio Computer Co., Ltd.
- Toshio Kashio assumes role as Chairman of the Board of Casio Computer Co., Ltd.
- Oct [Curt Herzstark](#), inventor of Curta calculator, passes away [27-Oct]

➤ 1989

- Apr Kōnosuke Matsushita, founder of Matsushita/Panasonic, passes away at age 94 [27-Apr]
- Aug Frederick Wang, son of founder of Wang Laboratories, Dr. An Wang, resigns as President [8-Aug]
- Aug Dr. William B. Shockley, co-inventor of transistor, passes away at age 79 [12-Aug]
- Dr. An Wang, founder of Wang Laboratories, diagnosed with high mortality rate esophageal cancer

➤ 1990

- Jan Dr. An Wang loses ability to speak due to esophageal cancer
- K. Hattori & Co. formally renamed Seiko Corporation
- Mar Dr. An Wang, founder of Wang Laboratories, passes away at age 70 due to complications from esophageal cancer [24-Mar]
- Jun Robert Noyce, semiconductor technology luminary, passes away at age 62 [3-Jun]
- Omron Tateisi

Oct Siemens AG acquires majority equity in Nixdorf Computer AG, to form Siemens Nixdorf Informationsystems AG [1-Oct]

> 1991

Jan Founder of Omron Tateisi Electronics, Kazuma Tateisi, passes Away at 90 Years of Age [12-Jan]
 Pier Giorgio Perotto awarded prestigious Leonardo Da Vinci award for development of the groundbreaking [Olivetti Programma 101](#) program
 National Cash Register Corp. (NCR) acquired by American Telephone & Telegraph (AT&T)
 Mar Dr. Julius J. Muray, Vice President of Cintra, Inc., passes away [28-Mar]

> 1992

Aug Wang Laboratories files for Chapter XI bankruptcy protection, 5,000 jobs to be eliminated [18-Aug]

> 1993

Mar Tadao Kashio, co-founder of Casio, passes away at age 75 [4-Mar]
 Sep Wang Laboratories emerges from August, 1992 Chapter XI Bankruptcy reorganization [20-Sep]

> 1994

Mar Commodore's stock falls to \$0.75/share, NYSE halts trading of the company's shares
 Apr Commodore Business Machines announces closure and liquidation of the company [29-Apr]
 Soundesign Corp. changes company name to [SDI Technologies](#)
 Apr Commodore Semiconductor Group survives closure of parent company through purchase by its management
 Jun Jay Glenn Miner[R.I.P.], early MOS LSI chip design guru at General Micro-electronics (GM-e) and
 >>> American Micro-systems (AMI), architect and chip developer for Atari and Commodore
 >>> microcomputers, passes away at age 62 [20-Jun]

> 1995

Jan George Robert Stibitz, famed Bell Labs Computer Researcher & Designer, passes away [31-Jan]
 Apr Remains of Commodore Business Machines sold to ESCOM, a German computer manufacturer
 Jul Smith-Corona Corp. files for Chapter XI bankruptcy protection [5-Jul]
 Nov Passing of Bernard (Barney) Oliver, founding director of HP Laboratories, and project leader for HP's first calculators, the [HP 9100s](#) and HF
 Dec Konrad Zuse, electronic computing pioneer, passes away [18-Dec]

> 1996

Mar David Packard, co-founder of Hewlett Packard, passes away [26-Mar]
 Federico Faggin donates the original prototype for the Basicom 141-PF calculator, the first to use a single-chip microprocessor, to the
 >>> [Computer History Museum](#) in Mountain View, California

> 1997

The Old Calculator Museum first appears on the World Wide Web as a Geocities site
 Fairchild Semiconductor, an independent venture, founded in Portland, Maine
 Mar National Semiconductor sells its Standard Products Group (created from parts of the "old" Fairchild Camera & Instrument) to newly-formed
 May Logicon, Inc. acquired by Northrup Grumman for \$750M [5-May]
 Aug William S. Burroughs passes away [2-Aug]
 Dec Masaru Ibuka, co-founder of Sony, passes away at age 89 [19-Dec]

> 1998

Wang Laboratories acquires Olivetti's Computer Services Division, Olsy, SpA, for \$391M; Wang Labs now "Wang Global"
 Mar Facit AB, after numerous breakups and ownership changes, ceases to exist
 Sep Public disclosure (after 30 years) of formerly top secret [MP944 CAD/C](#) microprocessor chip set used in US Navy's F-14 Tom Cat Jet Fighter
 Monroe Systems for Business sells off copier, fax, and shredder businesses to Savin, to focus business purely on calculators

> 1999

Wang Global (formerly Wang Laboratories) acquired by Dutch company Getronics
 Tsugio Makimoto, GM of Hitachi's Semiconductor Division, leaves Hitachi to join Sony Corp.
 Oct Akio Morita, co-founder of Sony, passes away at age 78 [3-Oct]

> 2000

Mar William H. Burkhardt, prolific calculating machine designer at Monroe Calculating Machine Co., passes away at age 77
 Atsushi Asada, key calculator engineer in the early days of Hayakawa Electric (Sharp) electronic calculators, joins board of directors of Nini
 Sep David Moros, [Wang 700](#) hardware architect and co-inventor of Wang Labs' first Word Processor, passes away from cancer at age 64 [27-Sep]
 Dec Litton Industries and Northrop Grumman announce buyout of Litton for ~\$5.1 billion

> 2001

Jan American Micro-systems, Inc. (AMI) changes name to AMI Semiconductor
 Jan Bill Hewlett, co-founder of Hewlett Packard, passes away [12-Jan]
 Feb Co-founder of Computer Design Corporation, and later President of Compucorp, Norman J. Grannis, passes away at age 65 [19-Feb]
 Feb Claude E. Shannon, declared the "father of information theory", passes away at age 84 [24-Feb]
 Apr Northrop Grumman announces completion of purchase of Litton Industries [3-Apr]
 Monroe Systems for Business becomes privately-owned, with HQ in Bristol, PA

Sep John P. Stedman, once VP and Director of Operations at Mathatronics, passes away at age 83 [26-Sep]

➤ 2002

Jan Pier Giorgio Perotto, project leader and architect of the historical [Olivetti Programma 101](#), passes away at age of 71 [22-Jan]

➤ 2003

May Matsushita announces it will globally unify its consumer products under the Panasonic brand name

Oct William B. Hogle, founder of Hogle Industries, Hogle International, Siliconix and Stewart-Warner Micro-circuits, among others, passes away

Dec Howard Z. Bogert, calculator designer and MOS LSI IC designer, passes away at age 68 [28-Dec]

➤ 2004

Sep Royal goes private, becoming Royal Consumer Information Products, Inc. located in Bridgewater, NJ USA

Nov Harold Koplow, winner of contest with Dr. An Wang to write the most efficient

>>> microcode, developer of microcode for the [Wang 700-Series](#) calculators, and later, development of

>>> Wang's breakthrough word processing and small office computing systems, passes away at age 64 [4-Nov]

➤ 2005

Jun Eiichi Goto, developer of the Parametron, passes away [12-Jun]

Atsushi Asada(Sharp) retires, leaves position as Chairman of the Board of Directors of Nintendo

Jun Jack Kilby, inventor of the first Integrated Circuit, and leader in the design of the "[Cal-Tech](#)" calculator at Texas Instruments, passes away a

Jul Dr. Irwin Wunderman, founder of Cintra, Inc., visionary behind development of the Cintra [909 Scientist](#) and 911 *Statistician* calculators, and

Jul Hiro Moriyasu, deeply involved in the formation of the Tektronix calculator division with the acquisition of Cintra, Inc.,

>>> as well as managing the development of the revolutionary Tektronix 4051 Desktop Graphics Computer, passes away at age 70. [July 31]

Dec Sales of Casio electronic calculators passes one-billion unit mark

Dec Sharp Corporation presented with prestigious "IEEE Milestone in Engineering and Computing"

➤ 2006

May Benjamin Friedman, founder of Solitron Devices, Inc. passes away at age 84 [10-May]

➤ 2007

Jul Árpád Klatsmányi, a pioneer in development of transistorized digital electronics in Hungary, passes away at 83 years of age [1-Jul]

Wyle Laboratories, Inc. changes its name to Wyle, Inc.

Nov Acquisition of Tektronix, Inc. by Daniher Corp., making Tektronix an indirect, wholly-owned subsidiary of Daniher Corp. [21-Nov]

Dec Deal inked for AMI Semiconductor to be acquired by ON Semiconductor (omsemi) for approximately \$915M in stock

➤ 2008

Jan Karl Diehl, son of Diehl Group founders, passes away at age of 100. [19-Jan]

Mar ON semiconductor's purchase of AMI Semiconductor finalized

Nov Panasonic and Sanyo announce agreement in principle for Panasonic to acquire majority stake in Sanyo [2-Nov]

➤ 2009

Apr Hewlett Packard awarded the "IEEE Milestone in Engineering and Computing" award for the company's development of the

>>> HP-35 calculator, the first handheld scientific electronic calculator

Jun Don Farina, MOS IC pioneer at Fairchild, General Micro-electronics and others, passes away at age 78 [11-Jun]

Aug Massimo Rinaldi, calculator designer and founder of IME, passes away [16-Aug]

Nov Matsushita and Sanyo begin talks relating to Matsushita acquiring Sanyo [3-Nov]

Dec Panasonic acquires majority (50.2%) stake in Sanyo with \$4.5 billion investment [21-Dec]

➤ 2010

Mar Passing of Jack J. Bialik, project leader at Stanford Research Institute for development of CRT display system for Friden calculator [1-Mar]

Apr Dr. H. Edward Roberts, founder of MITS, passes away at age 68 [1-Apr]

Aug A [monument](#) honoring the legacy of Autonetics opens to the public in Anaheim, CA [3-Aug]

Jul Panasonic announces that it will acquire all remaining shares of Sanyo, making it a wholly-owned subsidiary of Panasonic

Sep Frank Wanlass, CMOS IC Inventor, passes away at 77 years of age

Nov UK Computer Pioneer Sir Maurice Wilkes, inventor of microprogramming concept, passes away at age 97 [29-Nov]

➤ 2011

Apr Sanyo Electric Co. becomes wholly-owned subsidiary of Panasonic [1-Apr]

Jul Saul Ashkenazi, founder of Realtone Electronics (later, Soundesign; now SDI Technologies) passes away at age 90

Aug Dr. Ge Yao (G.Y.) Chu, co-founder with Dr. An Wang of Wang Laboratories, passes away at age 93 [4-Aug]

➤ 2012

Mar Passing of Mark Pivovonski, age 88, co-inventor of the Monroe [EPIC 2000/ EPIC 3000](#) calculators, as well as one of the engineers involve

➤ 2014

Oct Howard Rathbun, co-inventor of the Monroe [EPIC 2000/ EPIC 3000](#) calculators, [passes away](#) at age 82 [23-Oct]

➤ 2016

Jan James (Phil) Ferguson, integrated circuit technology luminary, passes away at age 85 [16-Jan]

- Mar Broughton & Co. (Bristol) Ltd. principals file Striking Off (Dissolution) Application for the Company [11-Mar]
The Casio AL-1 Relay Calculator listed in Japan's National Museum of Nature & Science registry as important achievement in Japanese technology
- Jul Wyle, Inc. (formerly Wyle Laboratories, Inc.) [purchased](#) by KBR, Inc. for \$570M, forming KBRwyle [5-Jul]
- Aug Broughton & Co. (Bristol) Ltd. ceases operations, ending legacy of Busicom brand name [16-Aug]
- Aug Frank S. Wyle, founder of Wyle Laboratories, passes away at age 97 [29-Aug]
- Sep Fairchild Semiconductor acquired by ON Semiconductor [19-Sep]
- Oct Paul G. Allen, co-founder of Microsoft, passes Away at Age 65 [15-Oct]

> 2017

- Jan Robert H. Norman, Fairchild Gang-of-Eight Member, GM-e co-founder, Nortec Electronics founder, MOS IC Design Pioneer, passes away at age 87 [1-Jan]
- Apr Jack Tramiel, founder of Commodore, passes away at age 83 [8-Apr]
- Jun Kevan Heydon, fellow calculator collector and preservationist living in the UK, passes away due to sudden cardiac arrest at age 50. Rest in peace [1-Jun]

> 2018

- Jan Tadashi Sasaki, undisputed leader in Japanese electronic calculator technology development and key player in development of the Intel 4004 [1-Jan]
- Sep Untimely passing of Emil Dudek, fellow calculator preservationist, at age 57 [30-Sep]
- Dec Passing of Michael J. Cochran, extraordinary calculator engineer at Hewlett Packard, Cintra, Tektronix, and Texas Instruments [2-Dec]

> 2019

- Feb Jerry Merryman, one of Texas Instruments' key engineers involved in development of TI's revolutionary skunk-works bipolar LSI [Cal-Tech](#) calculator [1-Feb]
- Mar The Old Calculator Museum's exhibit of Wang Laboratories' line of electronic calculators presented at the 2nd annual Vintage Computer Festival [1-Mar]
>>> held at the now defunct Living Computer Museum+Labs in Seattle, WA wins the "Most Interesting Presentation" award. [24-Mar]
- Dec Charles (Chuck) Peddle, primary designer of the MOS Technology 6502 microprocessor, passes away at age 82 [15-Dec]

> 2020

- Feb [Katherine Johnson](#), noted NASA computer(mathematician), passes away at age 101. [24-Feb]
- Mar Paul Allen's [Living Computer Museum+Labs](#) in Seattle, WA, closed due to COVID-19 pandemic. Museum liquidated in summer of 2024. A 100% success story [1-Mar]
- Jun [Passing](#) of Charles "Chuck" Near, designer of thought-to-be-impossible 16-layer printed circuit board [1-Jun]
>>> microcode ROM used in the revolutionary HP 9100A and [HP 9100B](#) electronic calculators. Near was 85 years of age
- Nov The [Texas Instruments Cal-Tech](#) prototype electronic calculator from the estate of Jerry Merryman[6/17/1932-2/27/2019], one of its designs [1-Nov]

> 2021

- Apr [Lee Boysel](#) passes away at age 82 [25-Apr] [[Fairchild MOS LSI Disruptive Force](#), Developed [First Single Chip Microprocessor Core](#), the AL1] [1-Apr]
- Sep Sir Clive Sinclair, founder of Sinclair Radionics and producer of novel calculators and low-cost microcomputers, passes away at age 81 [16-Sep]
- Nov Royal Consumer Information Products becomes officially licensed partner of Hewlett Packard to produce, distribute, market, and support HP-branded electronic calculators [1-Nov]

> 2022

- Oct Dave Cochran, arithmetic microcode engineer for Hewlett Packard's first electronic calculator, the HP-9100A, as well as for the HP-35 [1-Oct]
>>> groundbreaking HP-35 handheld scientific calculator, [passes away](#) [7-Oct]

> 2023

- Mar Gordon E. Moore, Electronics Technology Visionary, Co-Founder of Fairchild Semiconductor and Intel, and creator of [Moore's Law](#), passes away [1-Mar]

> 2024

- May Passing of [C. Gordon Bell](#), computer pioneer, museum founder, historian, influencer, and architect/project leader of a great many of Digital Equipment Corp.'s[DEC] computers. He was 89 [17-May]
>>> architect/project leader of a great many of Digital Equipment Corp.'s[DEC] computers. He was 89 [17-May]
- Sep Edson De Castro(9/14/1938-9/6/2024) prolific computer design engineer and entrepreneur passes away at age 86 De Castro was the project manager for development of Digital Equipment Corp.'s[DEC] famous [PDP-8](#) mini-computer After leaving DEC, De Castro was the project manager for development of Data General Corp., famous for its [Nova](#) line of 16-bit minicomputers and later 32-bit computers that were serious competitors of DEC's PDP-11 and VAX computers. [6-Sep]
>>> of DEC-competitor, Data General Corp., famous for its [Nova](#) line of 16-bit minicomputers and later 32-bit computers that were serious competitors of DEC's PDP-11 and VAX computers. [6-Sep]
- Oct Ward Christensen(10/23/1946-10/11/2024), co-builder/author of the first public computer bulletin board system in Chicago(CBBS, 1978) as well as programmer of the XMODEM(1977) serial data protocol for up/download of files (both text and binary) between serially-connected personal computers, providing file transfers with error-detection/retry, allowing files to be exchanged over noisy phone lines with acoustic couplers or early direct-connect modems. [11-Oct]
>>> and programmer of the XMODEM(1977) serial data protocol for up/download of files (both text and binary) between serially-connected personal computers, providing file transfers with error-detection/retry, allowing files to be exchanged over noisy phone lines with acoustic couplers or early direct-connect modems. [11-Oct]
- Nov [Passing of Thomas E. Kurtz](#)(2/22/1928-11/12/2024), educator, computer scientist, and co-inventor of the BASIC computer language, at age 96 [1-Nov]

References:

- [1] [Taiwan 1: The Unitron DC-12 Launches an Industry](#), Will & Dave Davis, November, 2023
 [2] [Thomas Osborne's Story in His Own Words](#), Steve Leibson, 2004

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