

Milestones in Telegraphic History

Based on a chronology developed by

Robert Jones, W5TU

Richardson, TX

And

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1753

Charles Morrison, in Europe, proposes an electrostatic telegraph system in which the use of 26 insulated wires conducting charges from a Leyden jar cause movements in small pieces of paper on which each letter of the alphabet is written.

1763

Bosolus describes a system similar to Morrison's except he uses only two wires, and a letter code.

1791

Apr. 27 – Samuel Finley Breese Morse born in Charlestown, Mass.

1797–1838

Many advances are made in the theory of telegraphy. Contributors include Lomond, Reiser, Salva, Cavallo, Ronalds, Sommering, Schweigger, Coxe, LaPlace, Triboaillet, Schilling, Henry, Gauss, Weber, Steinheil, Clarke, Masson, Breguet, Davy, Deval, Billon, Soudalot, Vorrsselman and many others.

1797

Lomond, in Europe, proposes a system similar to Morrison's except it uses a single wire and alphabet in motion.

1799

Volta, in Italy, develops the "Voltaic Pile," or battery.

1810–1815

Morse, 19 years old, has become a painter and graduates from Yale College. He studies in England and has works exhibited at the Royal Academy. At 24 he returns to America and takes up portraiture as a profession.

1816

Ronalds, in England, demonstrates his electrostatic telegraph which is similar to Morrison's proposal, except pith balls are deflected by the charges. The system uses only

two wires. A pair of synchronous clockwork dials, one on each end, are used to identify letters.

1820

Oersted discovers that electric current along a wire causes a compass needle to turn.

Sept. 18 – Schweigger invents his "multiplier," the electromagnetic coil.

Sept. 20 – Ampere publishes a paper on electric current flow.

1825

Sturgeon perfects the electromagnet.

1827

Savary, in England, moves a steel needle using the charge stored in a Leyden jar.

Ohm publishes "Ohm's Law," which relates electric current, voltage and resistance to each other.

1831

Faraday discovers the properties of induction between parallel conductors.

1832

Nicholas demonstrates a 5-needle electric telegraph in Berlin. Schilling, a Russian diplomat, demonstrates his electric telegraph in Germany. The system uses five numerical indicator needles which are used to identify a specific 5-digit code. A code dictionary relates these codes to words. After studying and painting in France and Italy, Morse travels from Europe to America on the packet ship "Sully." Part of Morse's interest in improved communications traced to the death of his first wife, at the age of 25. Away from home at the time, it took two weeks for the news to reach him. Following a dinner table conversation with Dr. Charles Jackson regarding recent European discoveries on electromagnetic properties, he makes his first notes regarding his "Recording Electric Magnetic Telegraph" and a dot - dash alphabet code. Later, Jackson claims credit for Morse's invention, saying he had supplied key information.

1833

Gauss and Weber apply the idea of Schweigger's multiplier to telegraphy.

1835

Morse is appointed "Professor of the Literature of the Arts of Design" in the University of the City of New York. Morse (44 years old) develops the concept of the "Morse Register" and a numbered-word code.

1836

Morse builds his first functional telegraph instrument (now located in the National Museum in Washington). It consists of an old picture frame fastened to a table. The wheels of an old wooden clock, which are moved by a weight, carry a thin strip of paper forward. Morse demonstrates the instrument to several friends, including Leonard D. Gale.

Schilling simplifies his electric telegraph to use a single needle and a more precise code. Morse invents the "relay" to solve the problem of current loss on long lines.

1837

June 10 – The Cooke and Wheatstone electric "Five Needle Telegraph" is patented (#7390) in London. The instrument requires six wires between each of its stations. This European telegraph had no means of recording messages; Morse felt this to be a great disadvantage.

Edward Davy, a dentist, shows his electric telegraph in London.

April–Sept. – Morse and Gale experiment at the University.

Sept. 2 – Professor Daubeny, Professor Torrey and Alfred Vail attend a demonstration of Morse's telegraph at New York University. Vail becomes very interested.

Sept. 23 – Morse enters into an agreement with Alfred Vail, whose father owns Speedwell Iron Works.

Morse develops his caveat showing the invention and alphabet code. It is sent to his old classmate and Commissioner of Patents, Henry L. Ellsworth, in Washington.

1838

Jan – Implementation of Morse's first letter code. The actual sending apparatus used a printer's "portrulle" with cast type. Each letter of type had saw teeth filed in the edge to activate the sending machine. A letter's code symbol length was based upon the various quantities of type found in the printer's office. The register (receiver) was an electromagnet-activated pen, drawing the saw tooth symbols on a thin strip of moving paper.

Jan 6 – Morse (46 years old) and Vail demonstrate the telegraph to Judge Vail, Alfred's father.

Jan 24 – Morse demonstrates his telegraph over a ten mile circuit at N.Y. University. Transmission speed was recorded at 10 w.p.m.

Feb 21 – Morse demonstrates the telegraph to President Martin Van Buren and his cabinet. Congressman Francis O.J. Smith recognizes the possibilities and becomes interested.

Feb – Morse enters a partnership: Morse 9/16; Smith 4/16; Vail 2/16 and Gale 1/16. Morse requests Congressional funding via his "Telegraph Bill."

Apr 6 – F.O.J. Smith delivers a Congressional report on Morse's Telegraph Bill.

Steinheil, in Germany, publishes improvements to the Gauss and Weber work. He also discovers "earth return" (ground).

1839

May 16 – Morse leaves the U.S. for London.

June 26 – Morse applies for an English patent on his Electric Telegraph, but is turned down because of the information already published by Cooke and Wheatstone (June 10, 1837) on their "Magnetic Needle Telegraph.

Aug 29 – Morse is granted a French patent in Paris.

Sept. 10 – Morse provides a telegraph demonstration at the Institute of France.

Cooke patents (#7614) his 4-needle, letter-showing telegraph and his portable 2-needle

number-showing telegraph in England. Cooke and Wheatstone patent (#8345) their electric "ABC" clockwork single-needle telegraph in England.

1840

Mar 23 – Morse leaves Europe for the U.S.

Apr 15 – Morse arrives in New York.

The Cooke & Wheatstone "Needle Telegraph" (also called the "Step-by-Step Letter-Showing" or "ABC Instrument") is in daily used on the London & Birmingham and Great Western Railroads in England. [Eventually Morse's approach won out; however, this system was used in England as late as 1870.]

Cooke & Wheatstone propose joining forces with Morse, but upon F.O.J. Smith's advice, Morse declines.

June 20 – Morse's (49 years old) "Recording Electric Telegraph" and "Telegraph Symbols" receive U.S. patents. These patents were based upon Morse's 1837 caveat. He had asked that any action be held until he returned from Europe. Vail's hand key designed. Henry produces high-frequency electric oscillations.

1842

Telegraph poles and ceramic insulators are in regular use in Europe.

Morse installs a submarine cable between Castle Garden and Governor's Island in New York.

Morse and Dr. J.F. Fisher of Philadelphia discover the principle of duplex telegraphy.

1843

Jan 13 – Things are not going well for Morse, now 52 years old. Dr. Gale has resigned due to ill health, and Smith has become an enemy. Only Vail remains at his side.

Feb 23 – Morse's "Telegraph Bill" passes the House.

Mar 3 – In the final session hours, the Senate passes Morse's bill.

Mar 4 – Annie Ellsworth informs Morse that his bill has passed. He is shocked because, feeling that there was not sufficient time left, he had left the session early. Morse promises his old class-mate's daughter that she will be the originator of the very first dispatch sent between Washington and Baltimore.

Mar 24 – Congress appropriates \$30,000 for Morse's telegraph.

Morse spends over \$20,000 of his \$30,000 Congressional grant on a 14 km underground line in lead pipes, similar to what was being tried in Europe. It fails, as did the one in Europe.

Dec 27 – The underground transmission line being a disaster, Morse discharges J.C. Fisher, hires Ezra Cornell, and orders the transmission wires to be run overhead.

1844

May 1 – First test of new overhead wire, quickly strung 35 km through treetops and on posts, from Annapolis Junction to Washington, D.C.

May 24 – Morse, now 53 years old, gives first official demonstration of his telegraph using over-head wire from the Supreme Court Chamber in the Capitol Building in Washington (his location) to Baltimore (Vail's location). Using his letter code, Annie

Ellsworth's selected biblical phrase "What Hath God Wrought," from Numbers 23:23, is sent from Washington to Baltimore.

1845

In Europe Cooke & Wheatstone patent a "Single Needle Telegraph" which requires only one overhead wire and earth return.

1846

Telegraph operators in the U.S. are beginning to "sound read" the code from Morse's register, much to the dismay of management, who want the letters decoded from the inked paper strip.

Sarah G. Bagley becomes the first female telegrapher, in the newly-opened office at Lowell, Massachusetts

Dec. 19 – The Toronto, Hamilton & Niagara Electric Telegraph Co., the first in Canada, opens for business.

1847

56 years old, Morse moves to his summer home, Locust Grove, in Poughkeepsie, N.Y. and resides there until 1871.

1849

First teleprinter circuit, New York to Philadelphia, uses Royal E. House teleprinter. The unit, which resembles a small piano, was the first telegraph instrument to print actual letters rather than code symbols.

1851

April 1 – Western Union is started, under the direction of Hiram Sibley, by parent company New York & Mississippi Valley Printing Telegraph Company (about 50 different telegraph companies are in existence, and none of their lines interconnect). The new company has U.S. rights to the House teleprinter.

Since the Morse code's space letters (C, O, R, Y and Z) and long L cause problems when used with submarine cables, the "International" or "Continental" Morse code is developed at the International Telegraphic Conference in Berlin. It combines portions of the Davy code (1838) and the Bain code (1846). Interestingly, Davy was a dentist and Bain was a clock maker.

Sept 22nd – At Turner, (now Harriman, N.Y.) Erie Railroad Superintendent Charles Minot uses telegraph to control train movements, thus introducing "train dispatching" to American railroading.

1852

The first "Channel Cable" is laid between London and Paris.

1854

Cyrus Field consults with Morse on an "Atlantic Cable."

1856

Apr 4 – New York & Mississippi Valley Printing Telegraph Company officially changes the name of its union of 13 different companies to "Western Union."
The sounder is invented.

1857

Morse, 66 years old, accepts a one-time payment of 400,000 gold francs for the right of Europeans to legally use his telegraphic techniques.

The "National Telegraphic Review and Operator's Guide" lists "73," which means my love to you.

Automatic sender, 70 w.p.m., is invented. Ink recorders and perforators are re-introduced.

1858

Trans-Atlantic cable is successfully laid by warships, but breaks limit its usefulness. In only 24 days, communication between the U.S. and Europe is lost.

1859

Western Union sets up the "92 Code" of numbered phrases. "73" is included and means "Accept my compliments. "30" is defined to mean "The end. No more."

1860

Apr 3 – The Pony Express, officially the Central Overland California and Pike's Peak Express Company, is initiated. A letter from St. Joseph, Missouri to Sacramento, California typically requires ten days transit time.

1861

Oct 21 – Western Union joins wires from the east with wires from the west at Salt Lake City, completing the first transcontinental telegraph.

Oct 24 – Pony Express ends, ruining many investors.

1867

U.S. buys Russian America (Alaska) from Russia. Purchase was initially urged by Western Union president Hiram Sibley, because W.U. needed that route, a 16,000 mile land wire through western Canada, Russian America, across the Bering Strait and through Siberia, to link America with Europe. This scheme was abandoned in 1868 when the Trans-Atlantic cable proved to be successful.

1868

July 28 – A truly successful Trans-Atlantic cable is finally laid by the vessel "Great Eastern."

1869

May 10 – Union Pacific and Central Pacific rails meet at Promontory, Utah to complete a transcontinental rail link. News is flashed by telegraph to a waiting nation.

1870

The Post Office takes over several failing telegraph companies.

1872

Apr 2 – Morse, almost 82 years old, dies in New York.

Western Electric Manufacturing Co. makes its own telegraph instruments.

1875

Feb – J.H. Bunnell's sounder design receives a patent.

1876

Mar 10 – Bell invents the telephone.

1879

Oct 21 – Thomas A. Edison, who began electrical experiments while working as a telegrapher, develops the first successful electric lamp.

1881

Feb 16 – Bunnell patents his steel-lever key, a design so good it has never been supplanted.

1883

Western Union and the U.S. Naval Observatory inaugurate nationwide "Correct Time Service."

Edison demonstrates his "Edison Effect" (current flow from filament to plate) and patents a device later known as the "thermionic diode."

1886

June 9 – The Order of Railroad Telegraphers is founded as a result of a meeting called by Ambrose D. Thurston, Agent for Burlington, Cedar Rapids & Northern Railway at La Porte City, Iowa. One of the union's first successful actions was to win a concession from management limiting telegraph operators to 17 hours continuous service.

1888

Hertz, in Germany, discovers radio waves.

1894

May 10 – Marconi sends a radio wave 3/4 mile. "Wireless" is born.

1896

Foote, Pierson & Co., New York, makes and sells telegraph instruments.

June 2 – Marconi receives a British patent for his wireless apparatus.

1897

July 7 – The Marconi Company successfully communicates "ship to shore" over a distance of 12 miles.

1899

Mar 3 – First rescue using wireless. The lightship East Goodwin sent the word "help" while sinking.

1900

December – Fessenden develops radio telephony.

1901

Dec 12 – Marconi's letter "S" is heard across the Atlantic, from St. Johns, Newfoundland to Poldhu, England – 1800 miles.

1903

Jan 18 – Marconi has a two-way contact with England.

Horace Martin invents the "Autoplex" sending key. This design used a pair of sounder magnets and a battery to hold the pendulum when dashes were made.

1904

Martin invents the "Vibroplex" Original model. It is still being manufactured today. The likeness of a lightning bug is used in advertising it and the devices are quickly nicknamed "bugs."

Marconi Company is using CQD (General call–Distress) as a distress signal for its ships at sea.

Nov 16 – Fleming (England) patents his "Fleming Valve," a two-element vacuum tube, by applying the principles of the "Edison Effect" to detection of radio signals.

1906

First International Wireless Conference discusses a universal distress signal. The German SOE is suggested, but because the letter E is so short, another S is used in its place.

Lee de Forest, "Father of Radio," invents the first amplifying vacuum tube, the Audion, by adding a third element (a grid) to the Fleming Valve.

1910

"International Ship Act" requires a wireless set on all ships.

A number of railroads have adopted the telephone for dispatching trains.

1911

Vibroplex introduces a dual-lever "bug" with independent levers for dots and dashes, but only a single pendulum.

1912

Apr 15 – The Titanic sinks, killing 1517. Its radio operator, Jack Phillips, sends both CQD and the new SOS distress signals in International Morse.

Aug 9 – The Radio Act of 1912 officially adopts: International Morse; the "Q" code (QRM, QRN, QSO etc.); CQ (from English landline) as general call or "attention."

Vibroplex introduces the "X" model. It has only one contact, with a strip to hold the pendulum when dashes are made.

1913

Vibroplex buys out the Mecograph Company, of Cleveland, Ohio.

1914

Vibroplex introduces the "Blue Racer," half the size of the "Original."
R.L. Boulter Company, Los Angeles, is issued a patent for their bug design.

1915

Associated Press begins switch from Morse telegraphy to teleprinter.
Maj. Edwin Armstrong's "regenerative detector" improves radio receiver design.

1917

Vibroplex introduces the "Wire Chief." Designed for use in limited space, it has an upright pendulum.

1920

WWJ Detroit and KDKA Pittsburgh start regular radio broadcasts.

1923

Vibroplex patent expires.

1925

The Ultimate Transmitter Company, Los Angeles, manufactures the "73" bug. The mechanism of this pocket-sized, locable bug wraps around itself for compactness. "Teletype" is trademarked.

1926

Vibroplex introduces the "Lightning Bug" with a flat pendulum and a triangular bridge. Its features are very similar to Boulter's design.

1930

Vibroplex introduces the "Martin Junior" for radio operators.

1934

The Communications Act of 1934 establishes the Federal Communications Commission.

1937

Pennsylvania Railroad inaugurates two-way train-telephone communication system in main line operation, between Albion, Pa. and North Bessemer Yard in Pittsburgh.

1939

Hanson introduces the Melehan Valiant bug with two different-speed pendulums, one for dots and one for dashes.
Ted R. McElroy sets a world code-copying record of 75.2 w.p.m. in International code.

1940

Vibroplex introduces the "Champion," which is similar to the earlier "Lightning Bug."

1942

April – The Morse Telegraph Club, Inc. is founded in Los Angeles, California to perpetuate knowledge and traditions of telegraphy and American Morse code, to foster and maintain friendship among telegraphers and to honor Samuel Finley Breese Morse for his invaluable contribution to society.

1949

Western Union terminates its agreement with individual railroads in the U.S., effectively relinquishing all property and claim of ownership of poles, wires, instruments and other equipment.

This marked the beginning of the end of the telegraph as a means of communication.

1950

B.H. Breedlove, Atlanta, Ga. manufactures the "Codetrol" bug with a fully-enclosed right-angle mechanism.

The Dow Key bug, with a rotating mechanism for right-or-left handed operation, is introduced.

1967

Canadian Pacific Telegraphs and Canadian National Telegraphs combine as CN/CP Telecommunications.

1972

May 30 – Last commercial telegraph message in Canada, sent from Batiscan, Que. In both French and English, it was received in Montreal by CNCP Telecommunications operators Roland Poliquin and Germaine Routhier.

1982

May 6 – Burlington Northern Railroad Dispatcher Fred Putnam issues and Operator Harry Drogitis (at Whitehall, Mont.) copies train order No. 117, ENG 1995 RUN EXTRA WHITEHALL TO LOGAN. This is believed to be last Morse-wire train order in the U.S. or Canada.

1985

Last remaining telegraph circuit on the Milwaukee Railroad, between Milwaukee, Wis. and the Twin Cities, closed down. This may have been the last Morse circuit in use by any U.S. or Canadian railroad.

"Dial-Up Morse" (an adaptation of commercial carrier telegraphy technique, for point-to-point use over public telephone circuits) developed by John H. Holman, Jr. Apparatus consists of a 300-baud computer modem, a home-made terminal unit and a Morse set.

1989

Feb. 10 – First intercity "Dial-Up Morse" network circuit (5 offices), using a hub developed by Holman.

April 29th – Last annual Western Union Morse telegraph circuit linking chapters of the Morse Telegraph Club at their yearly observance of Morse's birthday, ending a 40-plus year tradition.

1991

Morse telegraph still in use on some Mexican and Central American railroads, and by the post office system of at least one Central American country.

1992

Use of Morse telegraphy is discontinued by Mexican government communication agency.

With commercial telegraph now only a memory, Morse Telegraph Club members in the U.S. and Canada continue to demonstrate landline telegraphy at rail museums, historical societies, fairs, festivals etc.

1999

Commercial cw retired 1 February 1999. Replaced by satellite communications.

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