

SAMUEL MORSE'S TELEGRAPH

(The Start of the Communications Revolution)

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We live in the information age where more and more information is required at all times. There never seems to be a time when information is so readily available, but this has not always been the case. The today's communications revolution includes radio, telephones, television computers, fax machines and satellites. So fast is the change in communications that we sometimes forget the machine that started it all.

The Telegraph

The telegraph was born at a time when few grasped even remotely what electric current was, let alone what it might do. The telegraph was a landmark in human development from which there could be no retreat. For the first time messages could routinely travel great distances faster than man or beast could carry them.

Samuel Morse

In October 1832 Samuel Morse, an early pioneer of the telegraph, on his way home from Europe met Dr. Charles Jackson who asked whether electricity took much time to travel over a long wire. The idea began to obsess Morse and before reaching shore, he had sketched the basic elements of a telegraph instrument and a crude version of a code based on dots and dashes.

News from Europe in early 1837 told of the great strides being made in telegraphy; Morse realized that if he did not finish the invention soon, his efforts might be wasted. Finally, in February 1837 Congress directed the Secretary of the Treasury to ask for proposals for a telegraph.

Morse's Telegraph

Morse thought that if he could perfect the electromagnetic telegraph that he had designed, in 1836, it would answer the government's needs. Morse was able to refine and adapt elements created by others into a marvelously simple and rugged system. His had a quality none of them had and came up with an excellent design capability based upon a mind practiced in forming and re-forming multiple elements.

The key to Morse's system was his ability to solve a problem that had stumped other inventors: a form of encoding messages suited to the limitations of the telegraph. In early 1838 he switched to the dot-dash system, the final version of which did not emerge until 1844. In this version the most frequently used letters were assigned the shortest codes. The instrument Morse

exhibited to friends in September 1837 contained the basic elements of what later became the standard telegraph.

Power Problem

Morse still had a power problem, how to transmit over long distances without a loss of current, that had been the downfall of all earlier telegraph inventors. Prof. Leonard Gale improved Morse's design in the spring of 1837 by using superior batteries and electromagnets that had been suggested by Joseph Henry six years earlier.

Gale realized that Morse's battery of one large cell generated ample electric current but not nearly enough intensity (voltage). Since the latter was what the telegraph needed to send current over long distances, Gale helped Morse construct a battery of twenty cells connected in series. He also improved the electromagnet by increasing the loops of wire around it from tens to hundreds. Once Morse adopted Gale's modifications, the results were astonishing. In November 1837 his improved device sent a signal over ten miles of wire set on reels in Gale's lecture room. This test made clear that by combining the new apparatus with the relay principle it would be possible to send messages over any distance.

Washington Presentation

With his improved telegraph in hand, Morse journeyed to Washington and repeated his demonstration in December 1842. Morse spent several anxious months attending congressional debates and waiting. Then in early March, Congress approved a \$30,000 for a trial line over the forty miles between Washington and Baltimore. By May 24 it connected the railroad depot on Pratt Street in Baltimore with the Supreme Court chamber in Washington, where the telegraph had been set up for its official demonstration.

What should the first message ever sent over an American intercity telegraph line be? Morse gave the question some thought, then let his friend Annie Ellsworth make the choice, Morse liked the selection. On Friday, May 24, 1844, he sat down at his instrument and tapped out the letters. It took him one minute to complete the message: WHAT HATH GOD WROUGHT?

Telegraph Use

By the end of the Civil War, the telegraph was used extensively by railroads, businessmen, speculators, and the press. Bankers, brokers, and shippers quickly grasped the advantage of instant communication, as did wholesale and retail merchants. Fast access to

information led to the rise of Wall Street as the center of financial markets and commodities exchanges in Chicago. Merchants using the telegraph found that "Operations are made in *one day* with its aid, by repeated communications," marveled one observer in 1847, "which could not be done in from two to four weeks by mail."

A vast, sprawling nation that had been tied together by a network of local newspapers quickly relied on the telegraph for information that usually took days or weeks to arrive.

Today's Communication Systems

The Internet (World Wide Web) is a network of interconnected computers that is used to send documents and information to anyone connected to the network. It is used daily by millions of people, business, and governments in the world to quickly transfer information to anyone in the world.