

the Courier

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- REVAMPING ASIA'S SCHOOLS
- HUMANITARIAN INTERVENTION
- WAR COMICS: THE NEW REALISM

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MORSE THE END OF AN ERA?

♦ *Tony Smith*

A world information highway built as a result of the 19th-century communications revolution came to the end of the road at the beginning of this year. Or did it?

From midnight, January 31, 1999, international regulations no longer require ships at sea to be equipped to call for help in an emergency using Morse code and the well-known SOS signal. On February 1, the Global Maritime Distress and Safety System (GMDSS), using satellite and other high-tech communication techniques, replaced a system which since the early part of this century has saved countless ships and thousands of lives.

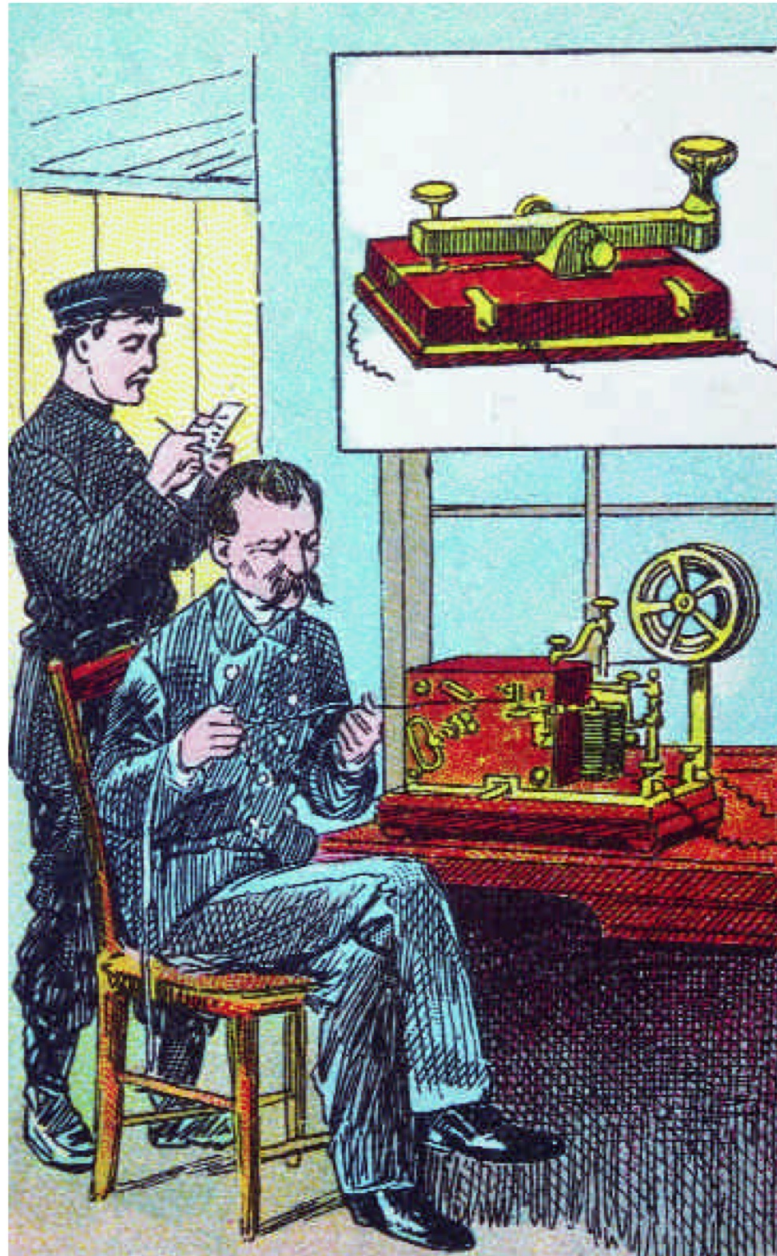
GMDSS has been developed and progressively implemented since 1979. As more and more ships adopted the new system, coastal radio stations around the world have been closing down their wireless telegraphy (W/T) services as demand has decreased.

As midnight approached on January 31, many of the remaining stations sent their final Morse signals in a profusion of emotional messages, typical of which was this from a group of Danish stations: "Concluding an era of more than 90 years of W/T service from Danish coast stations, starting in 1909. . . This is the last transmission for ever."

Thus signed off with dots and dashes the era of Morse telegraphy, a medium which in the 19th century had created a revolution in world communications, serving virtually every aspect of human activity: government, diplomacy, business, industry, railways, newspapers, military, and more, plus the needs of ordinary people who wished to send telegrams.

'What Hath God Wrought!'

Following the Italian physicist Alessandro Volta's invention of the voltaic pile in 1800, the first means of storing electricity, there was an upsurge of electrical experimentation, including many attempts to achieve communication between distant points using electricity and metal wires. In 1832, Samuel F.B. Morse, a well-known American artist, conceived the idea of an electromagnetic



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♦ *Consultant Editor of Morsum Magnificat, an international magazine devoted to Morse telegraphy.*

By the end of the 19th century, Morse telegraphy was in widespread use.



This Morse receiver dating from 1889 is displayed in the telecommunications museum at Fleurance-Bodou, in France.

► instrument to achieve this by means of interrupted electrical currents corresponding to a prearranged code (see box).

In 1843, Congress allocated \$30,000 to test his invention on a 40-mile (65-km) line along the railroad from Washington to Baltimore. This opened on May 24, 1844, with the sending of the apposite phrase "What Hath God Wrought!", and within a year private companies came into being with plans to run Morse lines to all parts of America.

In 1866, after several earlier attempts, a submarine cable linked Britain and America. By 1871 a cable had reached Australia, and well before the turn of the century most of the world was covered by a vast network of Morse lines.

A new industry

The Morse telegraph created an entirely new industry which, amongst other things, offered women for the first time an opportunity to take up a respectable career, that of a telegrapher, outside their own homes. Telegrams became a way of life for business and for individuals, and many large organizations had their own telegraph offices.

In 1848, six New York newspapers formed the Associated Press, sharing news-gathering and telegraphic services. They hired their own lines and operating staff, and by 1923 AP landlines across North America

totalled 92,000 miles (148,000 km) serving the interests of 1,207 member newspapers.

Many famous people started their careers in the telegraph industry. Thomas Edison, the famous inventor, was an itinerant Morse telegrapher at the age of 17,

travelling thousands of miles throughout the United States and Canada, taking job after job as his fancy, or circumstances, dictated.

Andrew Carnegie, the industrialist and philanthropist, began as a messenger boy and was a telegraphist for twelve years.

HOW IT WORKED

In its simplest form, each of two telegraph stations has a Morse key, in effect a simple electrical switch; a battery; and an electromagnet receiving instrument called a "sounder". The two stations, which could be a few or many miles apart, are linked by a single wire strung on telegraph poles. A second wire is connected to the ground at each station and the earth completes the electrical circuit.

When the key in one station is held down, electricity passes along the line to activate the magnets in the sounder in the other station. A hinged bar in the sounder is pulled down towards the magnets making a loud click as it comes to the end of its movement. Releasing the key switches off the magnets and the sounder's bar is pulled up by a spring to make yet another click.

Depressing the key for a brief moment (a dot) results in two clicks close together. Holding the key down for a longer period (a dash) creates two clicks further apart. A telegraph operator learned to

distinguish between the dots and dashes sent in this way and thus read the Morse code.

The code received was transcribed manually with pen and paper. Subsequent improvements in speed and capacity were achieved by the invention of the typewriter, which dramatically increased receiving capability; and a semi-automatic Morse key which greatly increased the sending speed of manual Morse.

The greatest capital expense was the cost of erecting poles and wires hundreds of miles across country to carry telegraphic traffic. In 1876 Thomas Edison invented a "quadruplex" system enabling a single wire to carry up to two messages in one direction and another two in the opposite direction simultaneously. This created extra "lines" which did not have to be physically built. Automatic high-speed sending and receiving machines further increased the carrying capacity of existing lines. ■

Gene Autry, “the singing cowboy”, who died in 1998 aged 91, was a railroad telegrapher in his youth before he became a Hollywood star.

In the early days of broadcasting, a telegrapher accompanied American commentators to sporting events, and special lines were installed to connect the stadium to the radio station. The telegrapher sent short reports to the station describing the progress of the match, and a “sportscaster” used them to provide a “live” commentary on the game as if he were there personally. One broadcaster who worked in this way in the 1930s was Ronald Reagan, later President of the United States.

A universal code

The code used on the American lines was “American Morse”, which is not the same as the international code we know today. The first Morse line in Europe was between Hamburg and Cuxhaven in 1847, but the American code was not entirely suitable for the German language with its diacritical letters. A new extended code was therefore devised, including some new characters and some retained

from the American code.

As the telegraph spread to other German states and to Austria, each state devised its own variation of the Morse code, necessitating telegraphic translation to a different code by an operator as messages crossed state boundaries.

In 1851 the Austro-Germanic Telegraph Union adopted a slightly amended version of the 1847 code for use in all states as part of a unified telegraph system effective from July 1, 1852. The new code spread to other European countries and was finally adopted for universal use in 1865 by the newly formed International Telegraph Union.

Later, some countries developed their own versions of the code for internal communications. Apart from the original American Morse, which remained in use within the United States, there are Arabic, Burmese, Chinese, Greek, Hebrew, Japanese, Korean, Russian, and Turkish Morse codes, and possibly more.

The European code, which finally became the international Morse code, was the chosen communication mode for the newly invented wireless at the end of the

19th century.

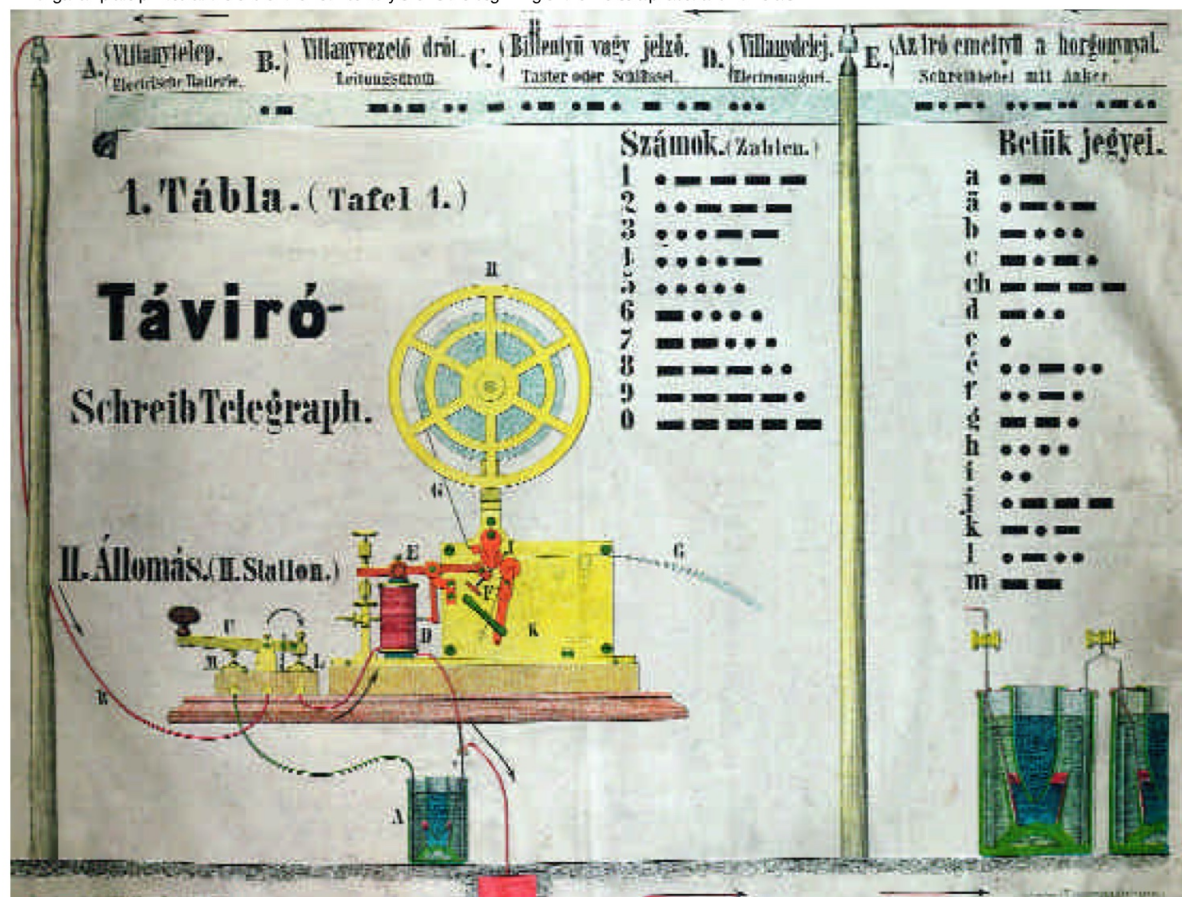
A good practical system of signalling already existed between stations using metal wires to carry their signals. The purpose of early wireless was simply to replicate and extend the scope of the Morse telegraph without the need for wires between stations. When wireless was found to be capable of sending messages over great distances it was adapted for use by ships at sea which previously had no means of communication with land, or each other, except by visual signalling when close-by.

Inspiration for wireless

The most famous early use of Morse at sea was when the Titanic struck an iceberg and sank on the night of April 14, 1912. Her two Radio Officers, Jack Phillips and Harold Bride, stayed by their radio until the last moment, sending out CQD SOS messages in Morse code calling other ships to their rescue. “CQD” was a recognized maritime distress signal, and “SOS” was a new international signal due to replace it shortly.

Their calls were heard 58 miles (93 km) away by the Carpathia, which arrived on the ▶

A Hungarian plate printed at the end of the 19th century shows the beginning of the Morse alphabet and numerals.



► scene an hour and twenty minutes after the Titanic sank and rescued some 700 survivors. Over 1,500 people died in the tragedy, including Jack Phillips. Bride survived and although unable to walk or stand, spent much of the time over the next four days heroically helping the radio officer of the Carpathia send a continuous stream of messages from the surviving passengers to their next of kin.

Military use

Morse telegraphy was used by military forces in the Crimean War, and in the American Civil War. In the First World War, it was widely employed in trench warfare with buzzers replacing sounders. At the same time early wireless telegraphy sets were coming into use.

By the time of the Second World War, although wired telegraphy was still used, wireless had become the preferred form of military communication. It was also an essential part of clandestine/intelligence operations, particularly in occupied Europe where Allied agents risked detection, and their lives, every time they transmitted a message to London. Morse by radio also served as a vital communications link for the greatly increased use of aircraft in wartime operations.

In most armed forces today Morse is no longer taught as a standard form of communication, although some operators still learn it as a special skill. In a recent unusual application, Sudan People's Liberation Army rebels fighting the government of Sudan have been heard on shortwave radio, without Morse keys, vocalizing the code as

IDENTIFYING OPERATORS BY THEIR 'FINGERPRINTS'

When Morse is sent by hand, every operator has his or her own characteristics in the shape of slight variations in the lengths of dots and dashes and spacing between letters and words. Slight as they are, when a Morse operator regularly "works" another operator, it becomes quite easy to recognize the style or "fist" of the other.

In the Second World War, the differences in the sending styles of secret agents were noted by their home stations so that if they were captured false messages emanating from the enemy could easily be detected. The styles of operators on enemy submarines, ships or military units were also identified to help track their movements on a day-to-day basis ■

"dits" and "dahs" into microphones.

Not quite the end

The invention of radio signalled the beginning of the end for landline Morse, but it took a long time to happen. While long-distance radio services challenged the cable companies, the advent of the teleprinter took a more immediate effect. Britain's Post Office officially abandoned Morse in 1932, although its use continued in the United States and Australia until the 1960s.

The same process took place in other

countries although from time to time unconfirmed reports indicate that landline Morse still survives in Mexico and India.

Morse at sea has officially ceased, but it has not yet disappeared. Some stations and ships are still actively carrying Morse traffic, mostly in the developing world, but some European stations can also be heard. The high cost of installing new equipment in the ships is the main reason for the delay in changing to GMDSS, but also training facilities have not been able to keep up with demand.

There is still one major user of Morse code. Radio amateurs worldwide use it to communicate with each other because of two advantages. It has an internationally understood system of abbreviations which aids communication between people who are unfamiliar with each other's language; and Morse radio transmission is a particularly effective means of getting signals to distant places compared with other radio modes—the same advantages that made it so valuable for maritime use.

Landline Morse is also kept alive by hobbyists. In America, Canada and Australia, enthusiasts mount historical displays and communicate with each other using original keys and sounders via the public telephone system, dial-up units, and modems. ■



• The Internet contains a vast amount of information about Morse telegraphy. A useful start can be made at <http://www.morsum.demon.co.uk/links.html>

The first attempt to lay a transatlantic submarine telegraph cable. Valencia island (Ireland), 1857. (Contemporary engraving).

