

Early Telecommunication Devices

Although it is hardly used anymore, the telegraph is familiar to most people. This early telecommunication device is credited, as any school student knows, to Samuel Morse, who, in 1844 made the first long-distance electronic communication via his invention, the Morse's telegraph. What is not so commonly known is that Morse's was not the only telegraph nor he the only such inventor at this time. A rival system, developed by William Cook and Charles Wheatstone, was patented in England in 1845 and was subsequently adopted for use by British rail companies to enable speedy communication between rail stations.

However, the Cooke-Wheatstone telegraph, which used six wires and a fragile receiver requiring five magnetic needles, proved to be awkward to use, difficult to transport and expensive to build. Morse's version used one wire and a receiver of a simpler and stronger design. This is, no doubt, why it became the favored telegraph in many parts of the world, especially the United States, which built a telegraph line along railway tracks crossing the North American continent, linking eastern cities with western frontiers.

Morse chose the Magnetic Telegraph Company to handle the patents for his telegraph technology, and within seven years of the appearance of his invention, the company had licensed use of the telegraph to more than 50 companies across the US. In 1851, twelve of these companies came together to form the

Western Union Company. By 1866, Western Union had grown to include more than 4000 telegraph offices, almost all in rail stations.

Another early telecommunications device is still very much with us the telephone. Although the telephone is popularly thought to be the brainchild of one man, Alexander Graham Bell, this is not the whole truth. Phillip Reis, a schoolteacher in Germany, invented a device in 1861 that he labelled a telephone. Reis's invention was limited to transmitting musical tones, however, and could not send the sound of the human voice across the wire.

While Reis was working on his invention, Bell and another man, Elisha Gray, were also working toward the invention of the telephone, though by an indirect route. Both were, in fact, seeking ways of allowing multiple telegraph signals to travel along the same telegraph line - a system known as a harmonic telegraph. Bell worked in Boston while Gray was based in Chicago, and the two were rivals in their area of research. For both inventors, the perfection of the harmonic telegraph proved too difficult and both, separately but at around the same time, changed plans and started on the development of a telephone. Most interesting of all is the fact that both men applied for a patent to the US patent office for their respective telephones on the same day, 14 February 1876. Bell was lucky enough to have arrived a few hours earlier than Gray and so it was Bell whose name was to be forever associated with the telephone. The harmonic telegraph, incidentally, was perfected by Thomas Edison, best known as the inventor of the light bulb, in 1881.

Rights to Bell's patent (now recognized as the most valuable patent in history of technology) were offered to Western Union for \$100000, with the assumption that the giant telegraph company would be enthusiastic about the new technology. But Western Union disliked Bell's design and instead asked Elisha Gray to make refinements to his original telephone design. Bell's company began to set up its own business and sell telephones, while Western Union, with its somewhat different design, was its competitor.

Competition between the two continued for about two years, but all the while, the Bell company was mounting a legal challenge to Western Union, claiming it held the only true basic patents for the telephone. It based its claim on the fact that Bell had beaten Gray to the patent office and so should be the sole recognized inventor of the telephone. Eventually, Western Union had to agree with Bell and gave up its telephone rights and patents to the Bell company. The telephone company's entire network of telephones was handed over to the Bell company. As compensation, Western Union was given 20 per cent of revenue from rental of its former equipment, this arrangement was to last until Bell's patents expired. In an effort to fight the power the Bell company enjoyed from exclusive rights to Bell's patents, a small telephone company, Pacific Union, established telephone services in the 1920s and 1930s that it claimed were based on the telephone design of Phillips Reis. They maintained that because Reis's invention pre-dated Bell's, the Bell design was not the first of its kind and, therefore, Bell's patents were not valid. Although the court accepted that the company may have been using Reis's technology, it nonetheless held that only Bell's patents could legally be used.

The Bell company, eventually named American Telephone & Telegraph, thus formed an effective monopoly on telephone services in the United States. The company subsequently grew to such an extent that, a century later, it was the largest privately held enterprise in the world, with more than a million employees controlling communication between more than 100 million telephones. In 1984, American Telephone & Telegraph was found by a US court to be too monopolistic and was ordered to be broken up into several smaller companies.

* patent: an official recognition of a person as the inventor of a device

* monopoly: exclusive control of a market

Question 1-6:

Complete the table below. Use no more than three words from the reading passage for each answer.

Write your answers in boxes 1-5 on your answer sheet.

Year	Event	Inventor (s) (by surname)
1845	Patent of telegraph(1).....
1851	Establishment of(2).....	

1861	Invention of telephone(3).....
1876	Application for patent of(4).....	Gray
1881	Successful development of(5).....	Edison

Question 6-10:

Look at the following lists of inventors and companies. Match each inventor to one of the companies that used his/their technology. Choose E if there is no information in the reading passage.

Write the appropriate letters A-E in boxes 6-10 on your answer sheet.

NB: you may use any letter more than once.

Inventors

Morse

Example*

Example answer: D

(6) Bell

(7) Cooke and Wheatstone

(8) Edison

(9) Gray

(10) Reis

Companies

A British rail companies

B Pacific Union

C American telephone & telegraph

D Western Union

E no information in reading passage

Question 11-14:

Using no more than three words, answer the following questions. Write your answers in boxes 11-14 on your answer sheet.

11) Name one reason why Cooke and Wheatstone's invention was not as successful as Morse's.

12) In what type of location did Western Union typically offer its telegraph services?

13) What sort of information was Reis's original invention able to send?

14) What device did Alexander Graham Bell try but fail to invent?

ANSWER

- 1. Cooke and Wheatstone**
- 2. Western Union Company**
- 3. Reis**
- 4. Telephones**
- 5. (The) harmonic telegraph**
- 6. C**
- 7. A**
- 8. E**
- 9. D**
- 10. B**
- 11. Awkward to use/ Difficult to transport/ Expensive(to built)**
- 12. Rail stations**
- 13. Musical tones**
- 14. Harmonic telegraph**