

A Short History of Submarine Cables



The story really began in 1795 when a Spaniard named Salva suggested the idea of underwater telegraphic communication. But nothing significant happened until 1850 when a single wire cable manufactured by the Gutta Percha Company was laid between England and France. International telecommunications had started.

Unfortunately, the first cable did not last very long - on the night after it was connected a French fisherman caught the cable and cut a length out of it. A heavier armoured cable with four conductors was successfully laid the following year. For the first time two countries separated by sea were able to communicate by means of the electric telegraph.

A boom in the laying of submarine cables followed. Many cables were placed in service across the Irish Sea, the North Sea, the Mediterranean and even the Black Sea.

Then came the greatest challenge - the laying of the first trans-Atlantic cable. It is hard now to realise just what an enormous task this was. The 2,500 miles (4025km) of cable took a total of 20,500 miles (33,000km) of copper wire for the conductor, and the outer sheathing took 367,000 miles (590,500km) of iron wire. The total length of wire used was enough to go round the world thirteen times.

The cable was loaded into two specially converted warships, one British and one American. Laying from the USS *Niagara*, steaming west from Ireland lasted only a few days. After 300 miles (482km) the cable snapped.

A second attempt with laying commencing in mid-Atlantic suffered the same fate. But on the third attempt, despite some very rough weather, luck - and the cable - held, and in August, 1858 the Old World and the New were joined telegraphically if only for a short time. The cable failed on September 1, and it was not until July, 1866, that the first really successful Atlantic cable was laid by the S.S. *Great Eastern*.

Cables multiplied. News which had previously taken up to six months to reach distant parts of the world could now be relayed in a matter of hours. In 1902 the "All Red" route was completed.

This consisted of a series of cable links across the Pacific Ocean, connecting New Zealand and Australia with Vancouver and through the Trans-Canada and Atlantic lines to Europe.

Charges for messages sent over the cable were high. An ordinary message from Australia or New Zealand to England cost 15 shillings a word; newspaper messages three shillings and eleven pence a word. As a result the cable news section of newspapers seldom reached half a column and in some cases was so scanty as to be barely intelligible.

Submarine telegraph cables remained the only fast means of international communication for 75 years. Then, in the 1920s came the dramatic impact of radio. Shortwave, high frequency radio could transmit voices or pictures. International telex was also made possible by radio. For 30 years radio carried all the world's conversations and most of its messages. But the weaknesses of radio soon became apparent. Its capacity was too limited, conversations were often difficult, and certain atmospheric conditions could disrupt radio communications for days at a time.

Some alternative communication system had to be found, combining the dependability of submarine cable and the diversity of radio. The break-through came with two new technical developments. First, in the 1940s, came the submersible repeater which made trans-oceanic speech transmission possible. Until its development engineers did not have any means of overcoming the loss of signal strength over long cables.

In 1956 the first submarine cable incorporating repeaters came into operation across the Atlantic. With a capacity of 36 two-way voice channels, each capable of subdivision into a number of telegraph channels, TAT-1 as it was called, demonstrated the great potential of this new form of telecommunications and triggered an explosion in public demand for international telecommunications facilities.

Next, research teams working for the British Post Office in the 1950s developed the modern lightweight coaxial cable which had a high-tensile steel core and a Polythene outer skin and did not need to be armoured in deep water. This cable, instead of using a number of wires grouped together consisted basically of an inner and an outer concentric conductor which carried the electrical speech signals.

Then came a vast new concept - a high quality global submarine cable network linking the nations of the Commonwealth. By December 1961, the first link, CANTAT-1 providing 80 two-way voice circuits had been opened between Britain and Canada, and by July 1 1962 Australia and New Zealand were in communication through the first stage of the second link, COMPAC. In December of the same year the second stage from Auckland to Fiji was opened. The laying of the final stages, Fiji to Hawaii and Hawaii to Canada soon followed and the completed COMPAC cable was opened on December 3, 1963.

Although these new telecommunications systems were created to satisfy a demand, they in turn created heavier demands and a vast network of cables has been laid beneath the seas of the world.

In 1975 the 480 circuit TASMAN Cable was completed to Australia. ANZCAN Cable, which replaced COMPAC Cable, was the last of the Pacific Ocean analogue cables to be installed to Australia. A-I-S Cable which lands at Perth, WA is of the same design as ANZCAN Cable and

was the last of Telstra's analogue cables to be installed. All cables installed since A-I-S have been of fibre optic design.

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Last modified: 28th September, 1998