

Advances in communications technology

Advances in the way people communicate between countries range from the satellite network that now covers the entire globe to the fibre optic cable network that links continents under the sea. These networks provide fast, reliable and cheap communications between countries.

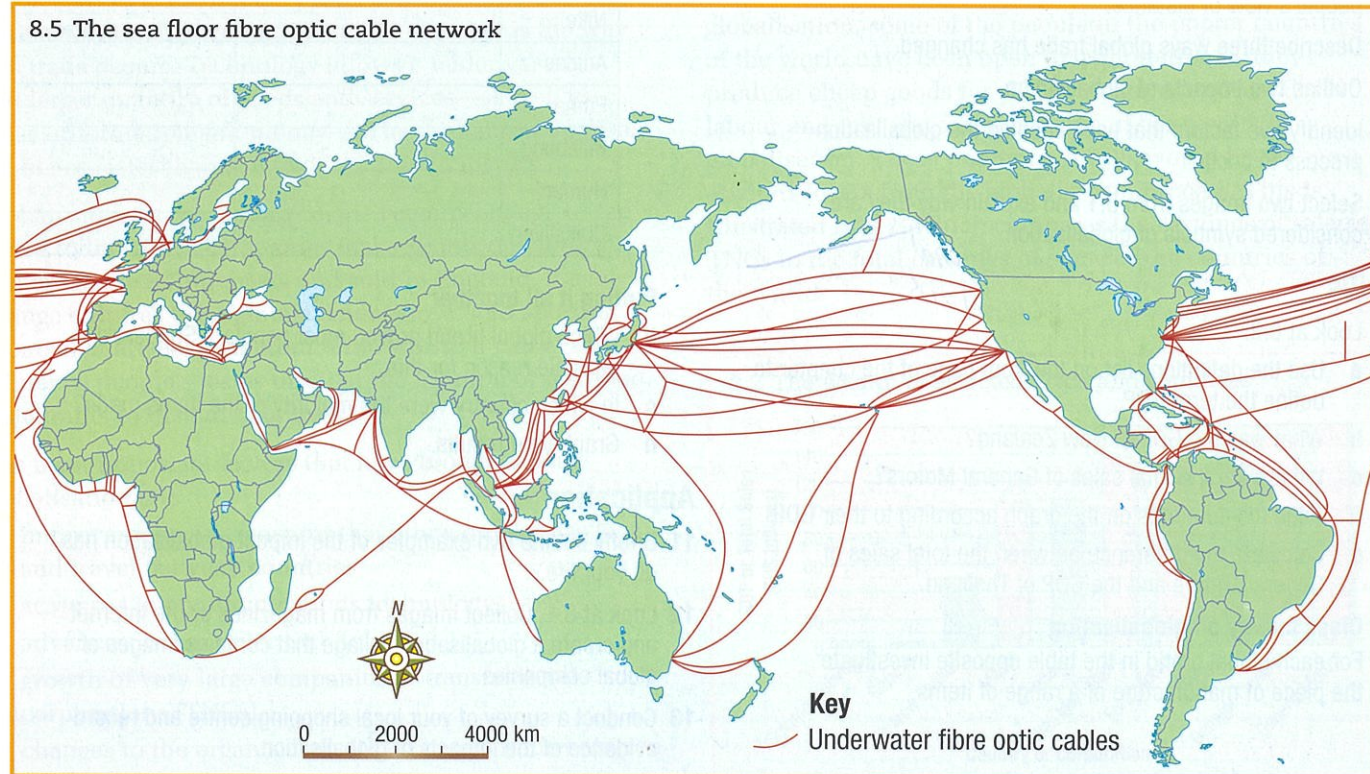
THE FIBRE OPTIC CABLE NETWORK

One fibre optic cable is as thin as a human hair and is able to carry large amounts of digital information over very long distances. Fibre optic cables are the best method of handling the high volume of phone calls and information flows between different places all over the globe.

The fibre optic cables that are laid around the world are made up of thousands of individual cables. A huge network of these cables connects the world's major cities. They have enabled the development of the telephone, cable television and Internet network that we have today.

The network is laid on land and on the sea floor across most of the world's oceans, as shown in 8.5. The only continent not connected by fibre optic cable is Antarctica.

8.5 The sea floor fibre optic cable network



8.4 Individual fibre optic cables are put together to form cables capable of carrying large amounts of information over very long distances.

A recent advance in communication technology is the growth in broadband technology. Digital files are sent through telephone lines, fibre optic cables, wireless networks and satellites. The future challenge for the optical fibre cable network will be to increase the amount of data that can be transmitted through the cables as the size of the files increases and more of the world's population use the network. Broadband has all but replaced dial-up Internet accounts because it is faster and can handle large amounts of information.

SATELLITE COMMUNICATIONS

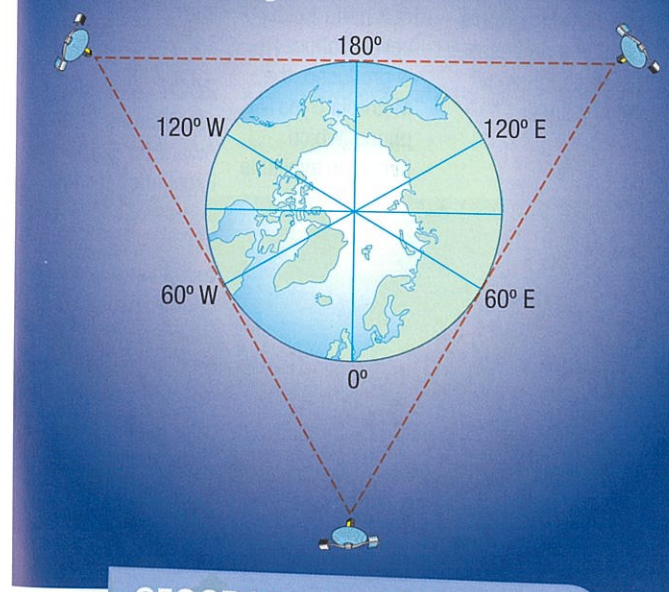
With the development of the first wireless technology at the end of the nineteenth century came the difficulty of sending these communication signals over long distances. As signals do not bend along the Earth's curved surface, satellites were developed to overcome this problem. They are able to record and send information as they orbit high above the earth.

Today, there are hundreds of satellites in operation around the world. These satellites are used for communications, weather forecasting, television broadcasting, radio communications, Internet access and defence, as well as other things, such as global positioning systems (GPS).

Most communication satellites in use today are in a geostationary orbit. This means that the satellite remains over the same position of the Earth's surface and stays fixed in the sky from any point on Earth. Geostationary satellites can be spaced at intervals of up to 120 degrees longitude. In this way as few as three satellites are able to link all the inhabited regions of the world, providing an effective global communications network, as shown in 8.6.

Satellites are the best method of mobile communications for ships and planes as well as for people who are in areas that lack good communication networks.

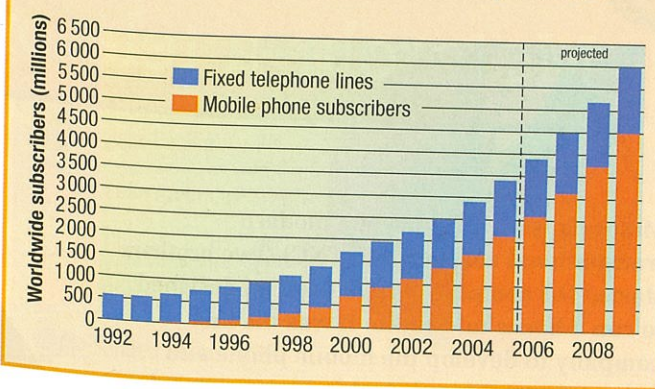
8.6 Geostationary satellites provide an important link as the signal is beamed to and from satellites in order to travel around the globe.



GEOGRAPHY FOCUS

A typical satellite is able to transmit 27 680 000 pages of typed text in just 90 seconds while the fibre optic cable that links the United States and Japan across the Pacific Ocean is capable of handling 320 000 telephone calls at any one time.

8.7 Global growth in mobile and fixed telephone use



Activities

Knowledge

- 1 What is a fibre optic cable and why are they used for communication between countries?
- 2 People talk of the 'fibre optic cable network'. Explain what this term means and describe the information that is sent over the network.
- 3 Explain the future challenge that exists for the global fibre optic cable network.
- 4 Why has broadband technology replaced dial-up Internet?
- 5 Explain the advantage that satellite communications have over wireless communication networks.
- 6 Name six different uses for satellites today.
- 7 Refer to 8.6 and explain how three satellites in a geostationary orbit can provide a global communications network.
- 8 List three situations where satellites are preferable as a means of communications over the fibre optic cable network.
- 9 Outline two types of communications technology that could be used by scientists living in Antarctica attempting to communicate with school students in the United States.

Skills

- 10 Look at 8.5:
 - a Identify the continents that have the most linkages to the global fibre optic cable network.
 - b Identify the continents that have the fewest linkages to the fibre optic cable network.
 - c Give one possible reason for Antarctica not being connected to the fibre optic cable network.
- 11 The graph in 8.7 shows the growth in mobile and fixed telephone use:
 - a What was the total projected number of phone subscribers for fixed and mobile phones in 2007?
 - b Estimate the number of mobile phone users in 2006.
 - c In what year did the number of mobile phone subscribers overtake fixed telephone line users?
 - d Identify one trend in phone use shown by the graph.