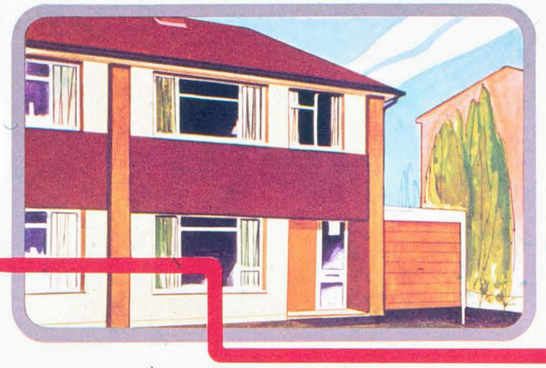
Susan Dials a Trunk Call

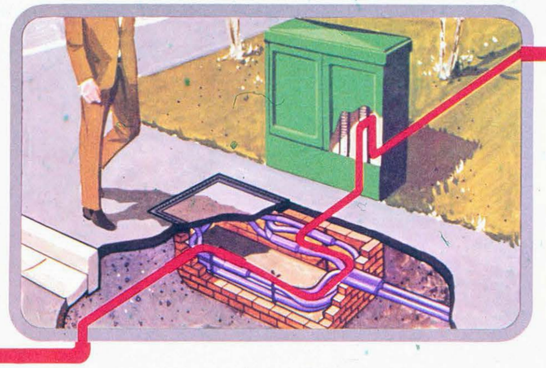
Susan dials her pen friend Janet's number.

UNDERGROUND DISTRIBUTION



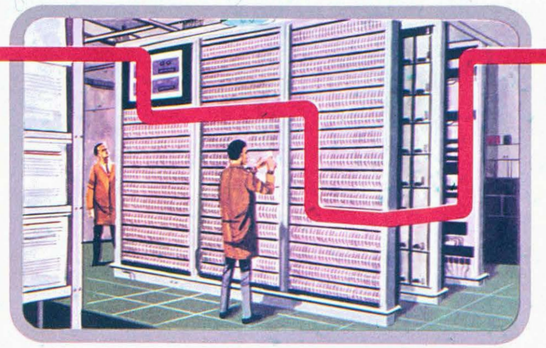
Her voice goes...

FOOTWAY BOX AND CABINET



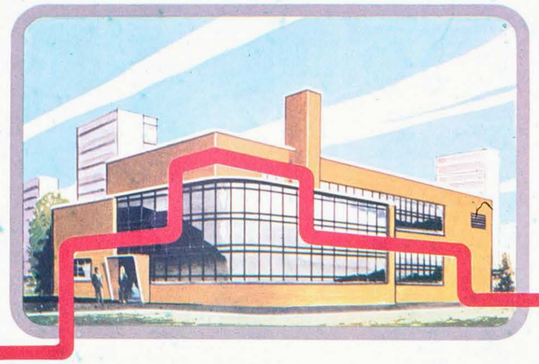
...along cables...

LOCAL AUTOMATIC EXCHANGE



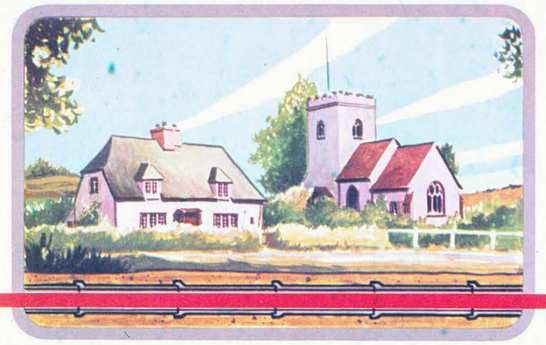
...to the local exchange.

TRUNK EXCHANGE



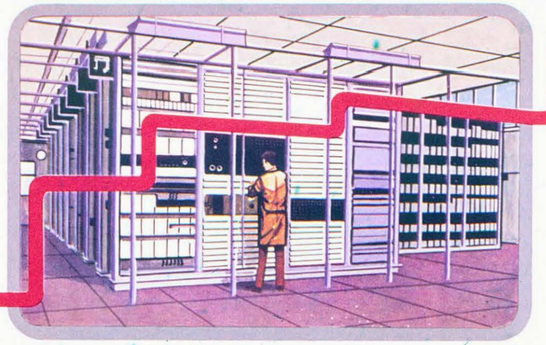
The trunk exchange...

UNDERGROUND CABLE IN DUCT



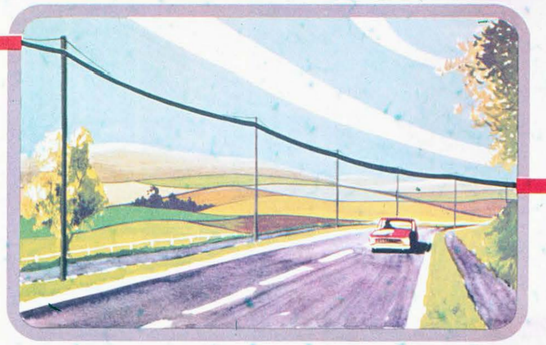
...connects the call...

EXCHANGE APPARATUS



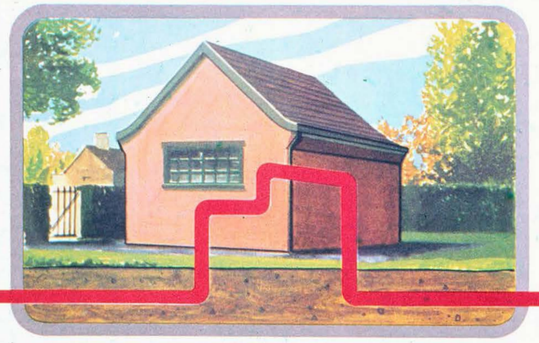
...through other large exchanges...

OVERHEAD POLE ROUTE



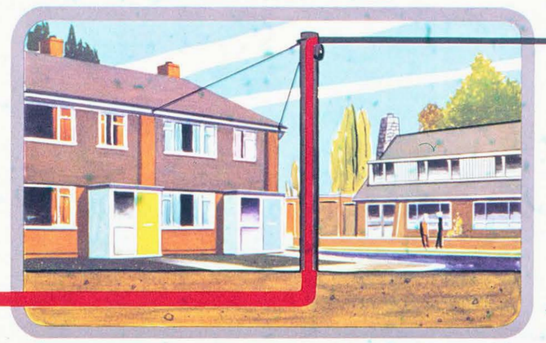
...through wires and perhaps...

UNATTENDED AUTOMATIC EXCHANGE



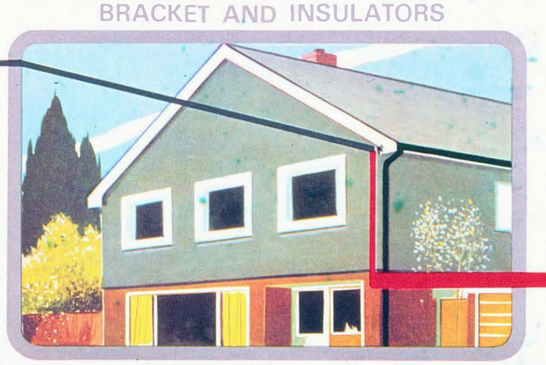
...a small country exchange...

DISTRIBUTION POLE

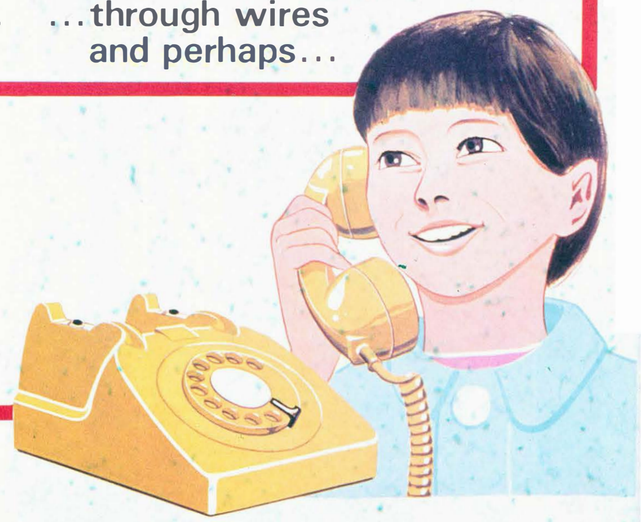


...more wires, and finally...

BRACKET AND INSULATORS



...to Janet's house...



...and Susan talks to Janet who is three hundred miles away.

Post Office
Telecommunications

Tele Ed 1

Make these your telephone companions

1 Current telephone directories and dialling instructions

2 A telephone number index

3 A telephone message pad

4 A pen or pencil

You don't HAVE to be tone-deaf about our telephone tones!

Here's how to recognise them:

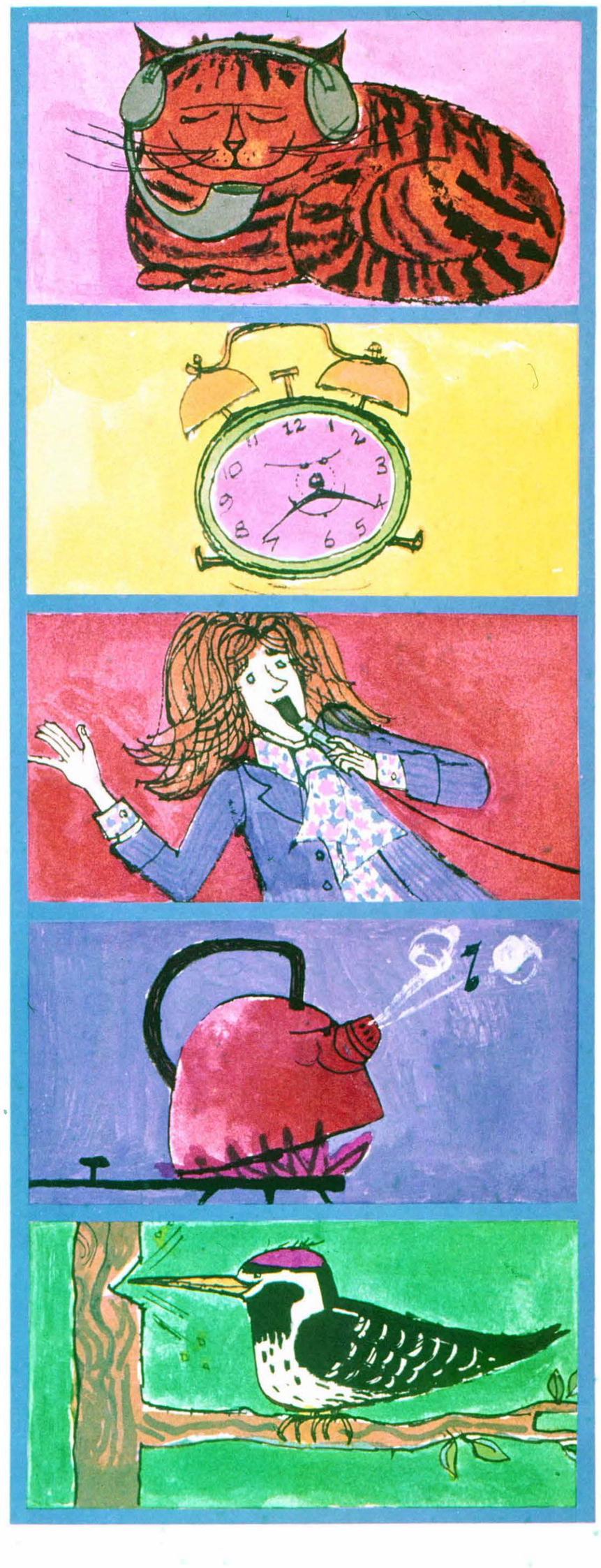
Dialling tone
– a continuous purring – tells you that the exchange equipment is ready for you to start dialling

Ringing tone
– a repeated double beat – tells you that the called number is being rung

Engaged tone
– a repeated single note – usually means the number you are calling is in use, but it can also mean that the exchange equipment is busy

Number unobtainable tone
– a continuous high-pitched note – tells you that the number is either out of service or has not been allocated to anyone

Pay tone
– high-pitched rapid pips – means you are being called from a 'Pay-on-answer' coin box

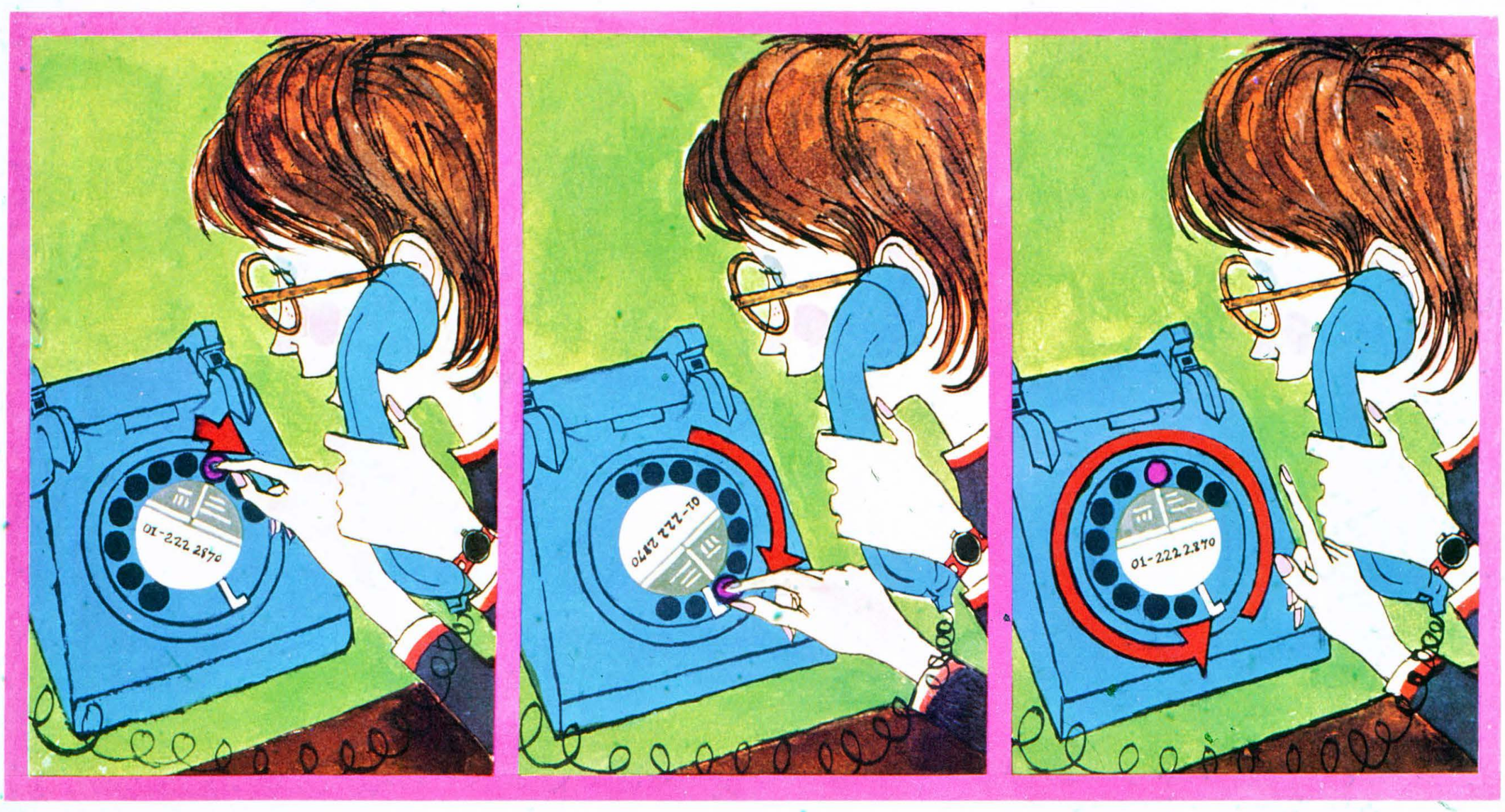


Tune in to the Post Office exchange operator if you don't know these tones. She will be pleased to play them for you free of charge

'Do-it-yourself' diallers

do it the professional way

Wait until you hear dialling tone then:



1

Dial the number carefully

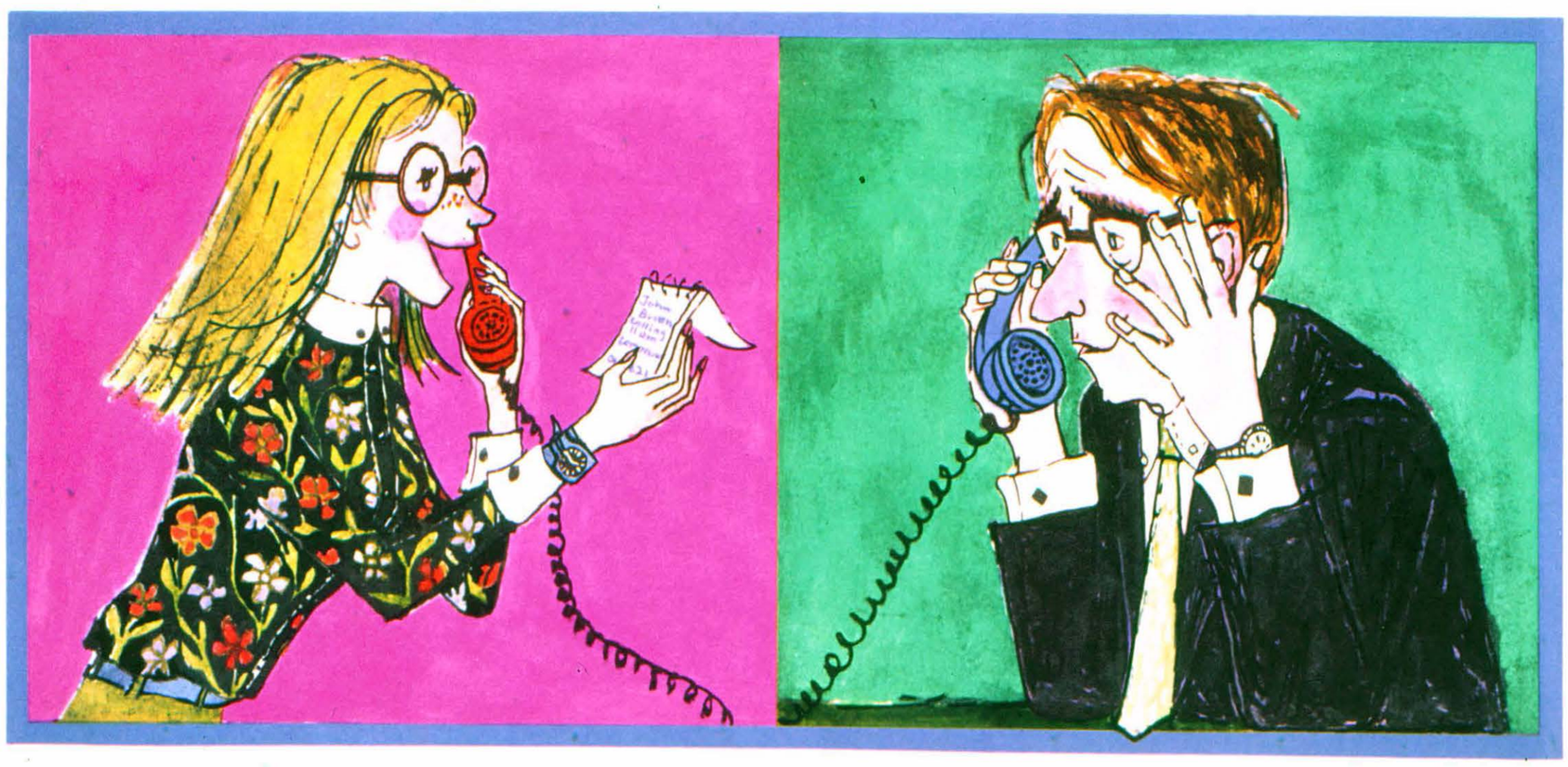
2

Dial right round to the finger stop

3

Lift your finger and let the dial return freely after each digit

Does he understand you ?



Yes, he will if you don't shout
but speak clearly and directly into the
mouthpiece of your telephone.
Spell out words if necessary,
using our telephone alphabet.

A	Alfred	**J**	Jack	**R**	Robert
B	Benjamin	**K**	King	**S**	Samuel
C	Charlie	**L**	London	**T**	Tommy
D	David	**M**	Mary	**U**	Uncle
E	Edward	**N**	Nellie	**V**	Victor
F	Frederick	**O**	Oliver	**W**	William
G	George	**P**	Peter	**X**	X-Ray
H	Harry	**Q**	Queen	**Y**	Yellow
I	Isaac			**Z**	Zebra

Are you figure conscious ?

1 yes, if you list all the numbers you use frequently and keep the list near your telephone

2 you always give your own telephone number clearly and correctly

3 you say ‘fife’ for ‘five’ (so that five is not confused with nine) and ‘oh’ not ‘nought’ (which can be confused with eight)

Then you’ve obviously got the vital statistics

Does he get the message?

Telephone message for:

Time: Date:

Caller's name:
Address:

Telephone number:

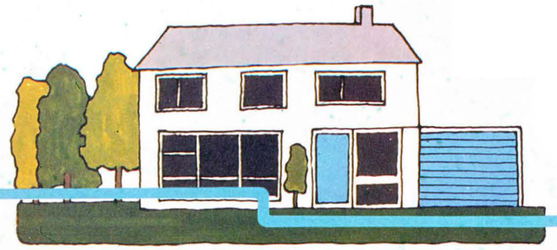
Message:

Message taken by:

Yes, if you write it down and pass it to him immediately

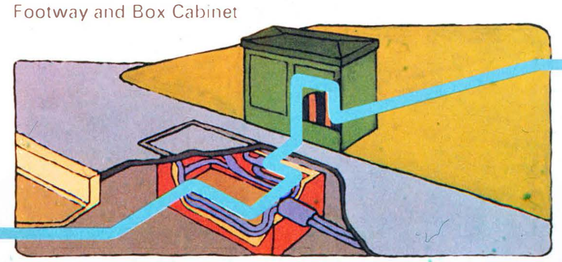
The Routing of a Trunk Call

When you dial a Trunk call . . .



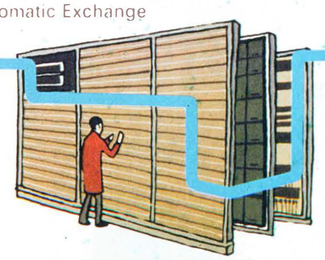
. . . your voice goes . . .

Footway and Box Cabinet



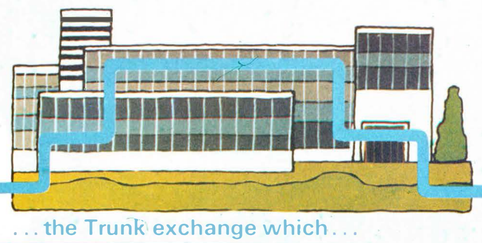
. . . along cables . . .

Local Automatic Exchange



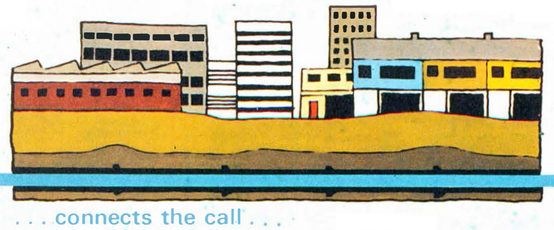
. . . to the local exchange and on to . . .

Trunk Exchange



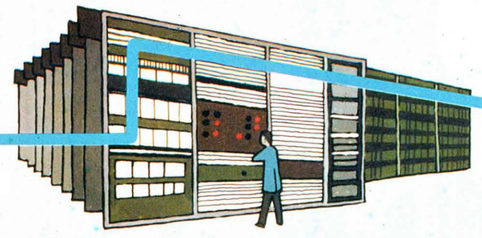
. . . the Trunk exchange which . . .

Underground Cable in Duct



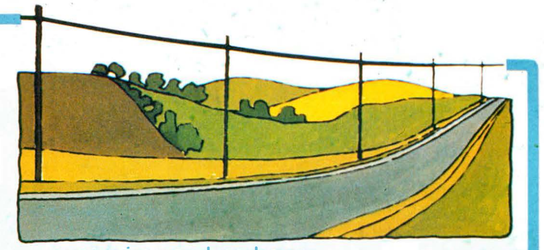
. . . connects the call . . .

Exchange Apparatus



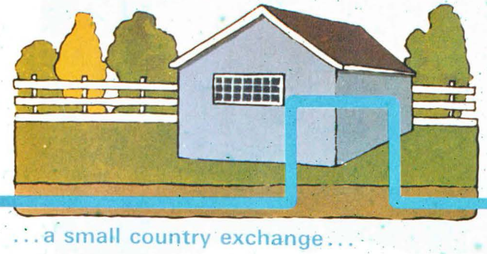
. . . through other large exchanges . . .

Overhead Pole Route



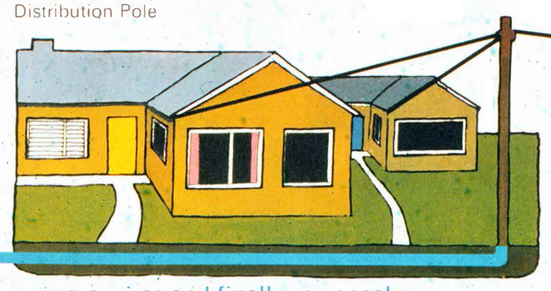
. . . over wires and perhaps . . .

Unattended Automatic Exchange

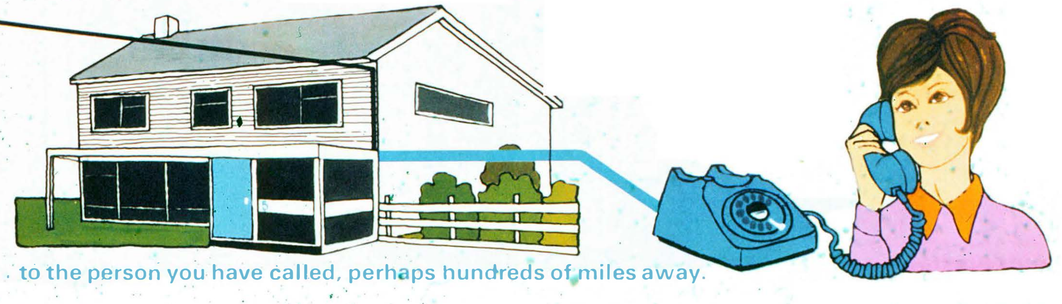


. . . a small country exchange . . .

Distribution Pole

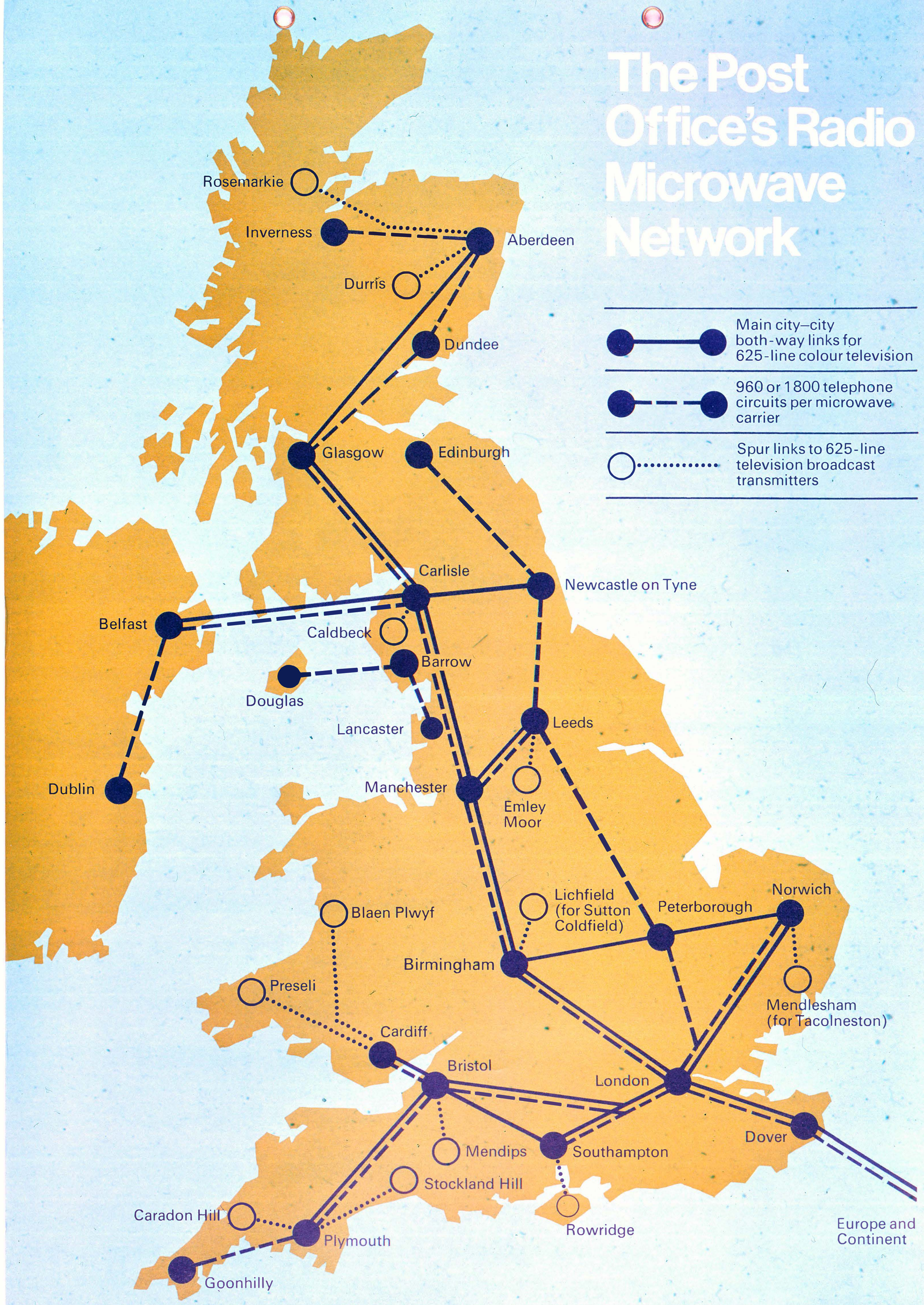


. . . more wires and finally you speak . . .



. . . to the person you have called, perhaps hundreds of miles away.

The Post Office's Radio Microwave Network



Main city–city both-way links for 625-line colour television

960 or 1800 telephone circuits per microwave carrier

Spur links to 625-line television broadcast transmitters

Post Office
Telecommunications

Post Office Tower

Standing stark above London's skyline is an impressive landmark, the Post Office Tower. The Tower is the tallest building in Britain. Situated near Tottenham Court Road, the Tower is no 'head-in-the-clouds' venture for it plays an important part in London's communications system.

Telephone conversations, besides being carried by wire are nowadays transmitted by micro-wave radio beams, each beam being capable of carrying over a thousand individual telephone calls at once. These beams are rather like searchlight beams, and are transmitted from aerials which are situated high enough to give the beams an obstacle-free path. Hence the reason for the Post Office Tower – to carry aerials high enough to transmit and receive beams far above the roof-top level of the highest of London's buildings. (See diagram below.)

From the Tower, telephone calls are transmitted as far afield as Manchester, Norwich, Bristol and Southampton – but not direct, however, as the beams are limited to a range of some 30 miles and must be relayed to their destination in a series of hops by relay stations which receive and re-transmit the beams. Television programmes are also relayed from studio to transmitter via the Tower's aerials.

The Tower is 620 feet high, and weighs 13,000 tons. It is constructed of concrete reinforced with high tensile and mild steel and has no less than 50,000 square feet of glass on its outside covering. It will withstand high winds with the minimum of deflection – so as not to upset the alignment of the radio beams. Gusts of 90 mph are estimated to induce a deflection of only 15 inches at the very top of the Tower!

Storm warning radar scanner (189m) 620 feet

Forty foot steel mast capable of carrying aerials (177m) 580 feet

Room containing high-speed lift motors, water tanks and ventilating equipment

Lift pulley compartments

Kitchen

Cocktail bar

The unique revolving restaurant with an all-round view of London, completing one revolution in approximately half-an-hour

Observation platforms (145·5m) 477 feet

Horn and dish aerials

Aerial inspection galleries (108·2m) 355 feet

Apparatus rooms containing telephone and television equipment extend for 13 further floors

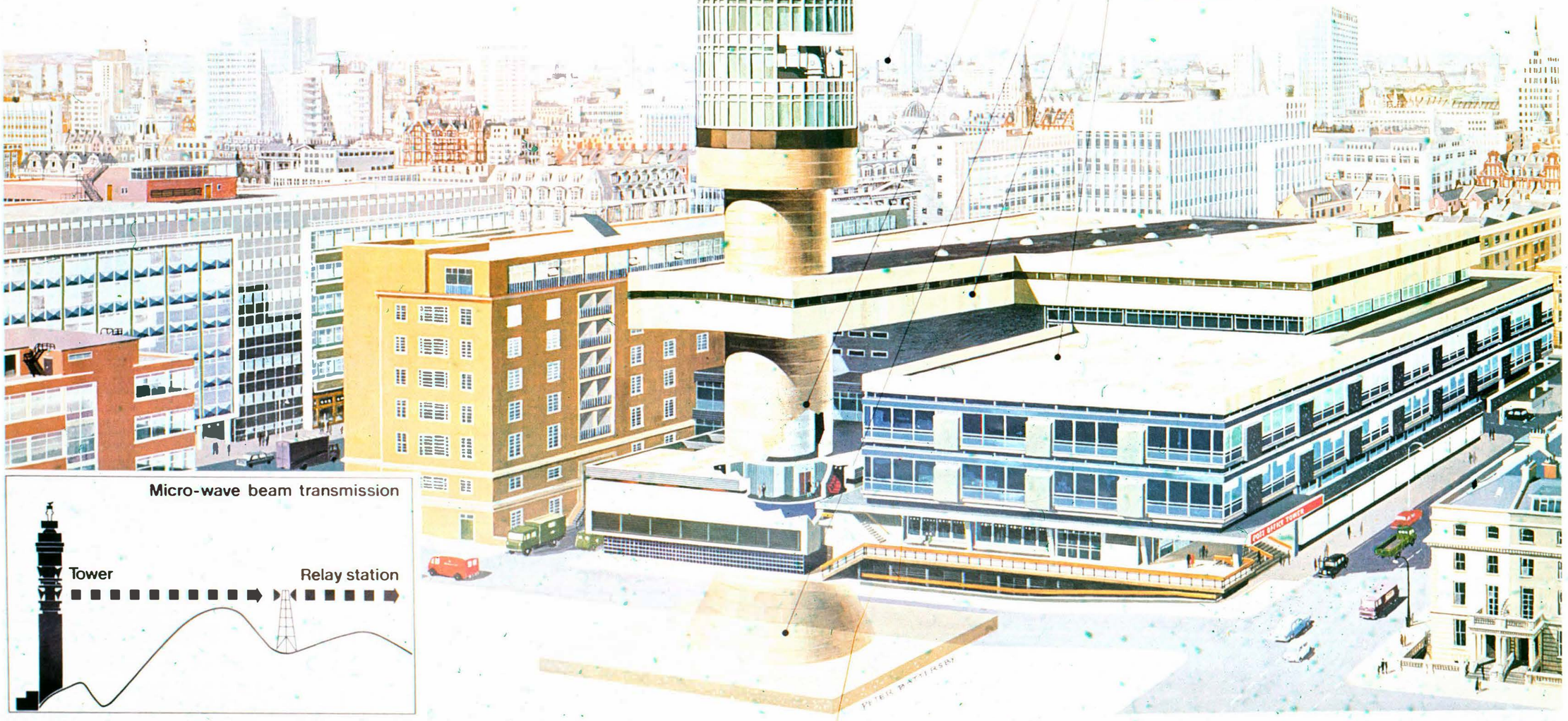
Ventilating equipment rooms

Reinforced concrete shaft. This extends the full height of the Tower and forms the backbone around which the Tower is built, and contains the lift shaft, emergency stairs, ventilating ducts and cables for radio equipment, etc.

Pre-stressed concrete foundations

Connecting bridge from base building to Tower, which also serves to brace the Tower

Trunk telephone and television switching equipment



Designed and illustrated by Peter Battersby Printed by W S Cowell Limited

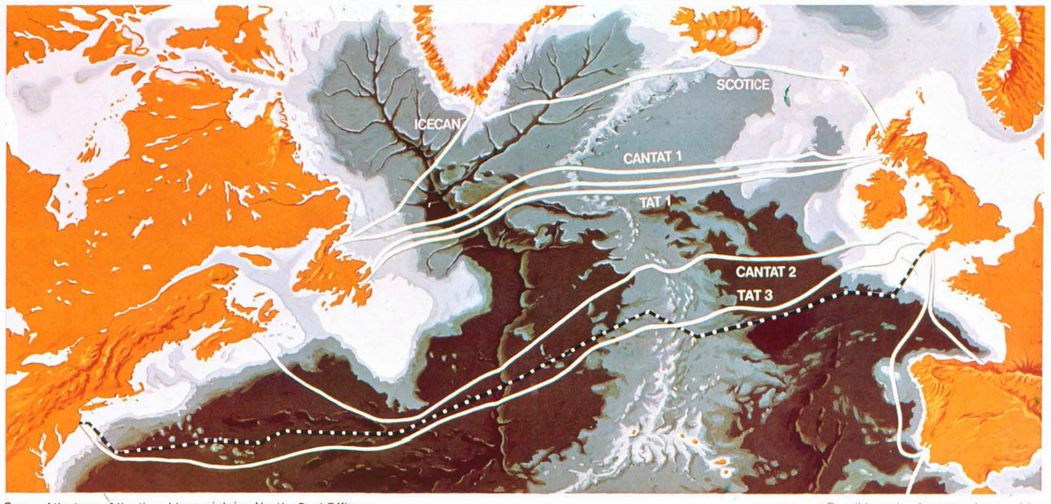
Issued by THQ Publicity Division Education Service Tele Ed 17(3)

Undersea Cables 1

Post Office
Telecommunications

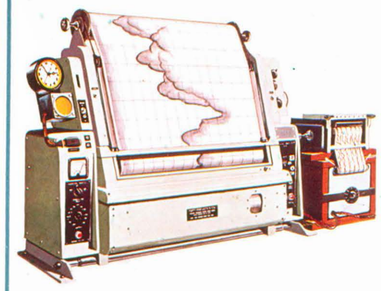
Britain laid the first undersea (submarine) telegraph cable in 1850 and throughout the years British inventors have pioneered the development of undersea cables and laying techniques. Today, undersea cables span the oceans and a single cable can carry thousands of simultaneous telephone conversations as well as telex, datel, etc.

Detailed planning and research precede the laying of a new cable. A survey ship, using sophisticated instruments, determines the depths, temperatures, currents and the nature of the sea bed. The route should avoid undersea mountain peaks, canyons, existing cables, submerged wrecks and other hazards.

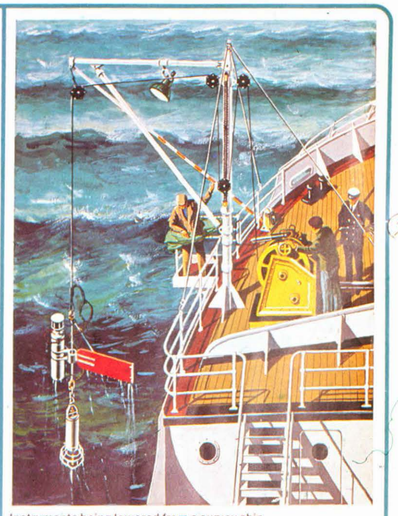


Some of the trans-Atlantic cables maintained by the Post Office.

---- Possible route of proposed new cable.



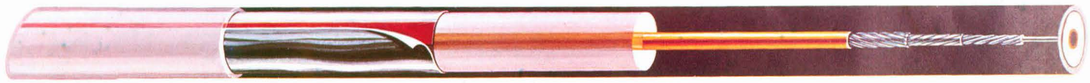
Echo sounder and sonar plot the depth of the sea.



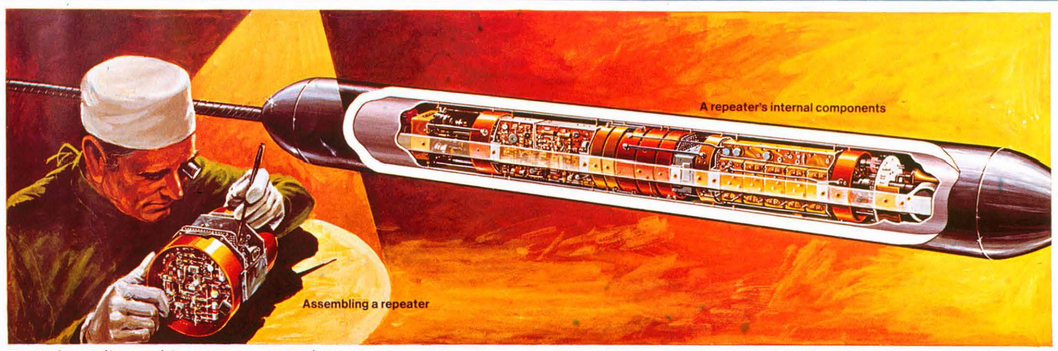
Instruments being lowered from a survey ship.

In shallow water, where cables may be damaged by fishing trawls, ships' anchors or by currents, a type of cable with steel wires on the outside is used. This is called 'armoured' cable.
The depths of the ocean are free from these hazards, so cables need not be armoured, but they must be strong enough to be laid and repaired without breaking. The type now used in deep water throughout the world has a specially designed steel core and was invented by the Post Office. It is very strong but also very light and is, therefore, called 'lightweight' cable.

Armoured cable

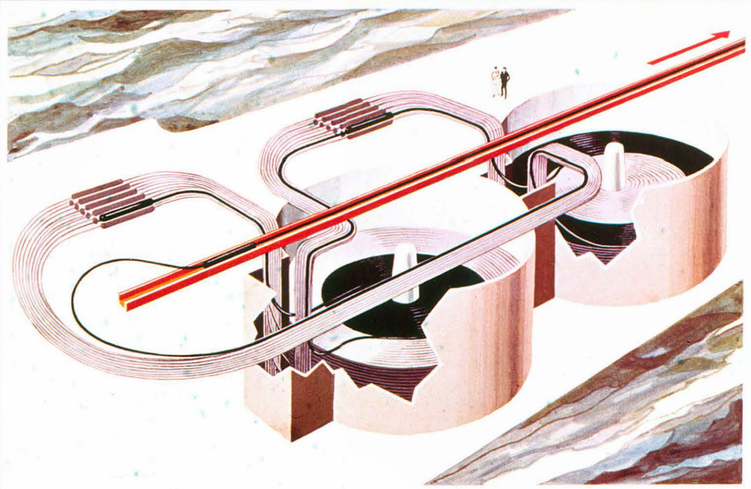


Lightweight cable

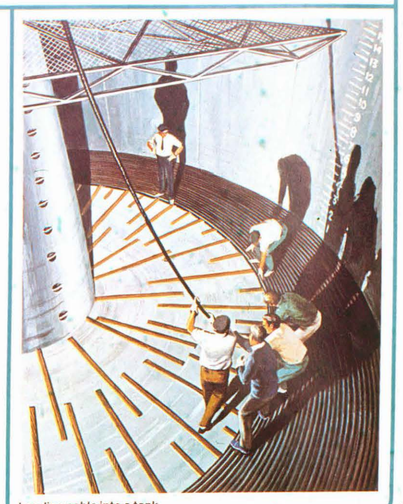


Assembling a repeater

Every few miles, cables are connected to amplifiers, or 'repeaters', as they are more commonly called. Without them, messages would become too weak to be heard. Repeaters also divide the cable into short lengths and, because more simultaneous messages can be passed through a short cable than an undivided long one, they increase the number of messages a cable can carry. Repeaters are encased in heavy steel tubes to withstand the enormous pressure on the sea bed. Changing a faulty repeater is difficult and expensive, so great care is taken to make them reliable. A speck of dust can cause a fault so repeaters are assembled in dust-free rooms by engineers wearing special clothes. The Post Office manufactures its own transistors for repeaters and has received the Queen's Award to Industry for this work.



A cableship may have to carry several hundred nautical miles of cable. This is stored in circular holds called 'tanks.' The repeaters which are spliced into a cable are stowed between decks.



Loading cable into a tank.

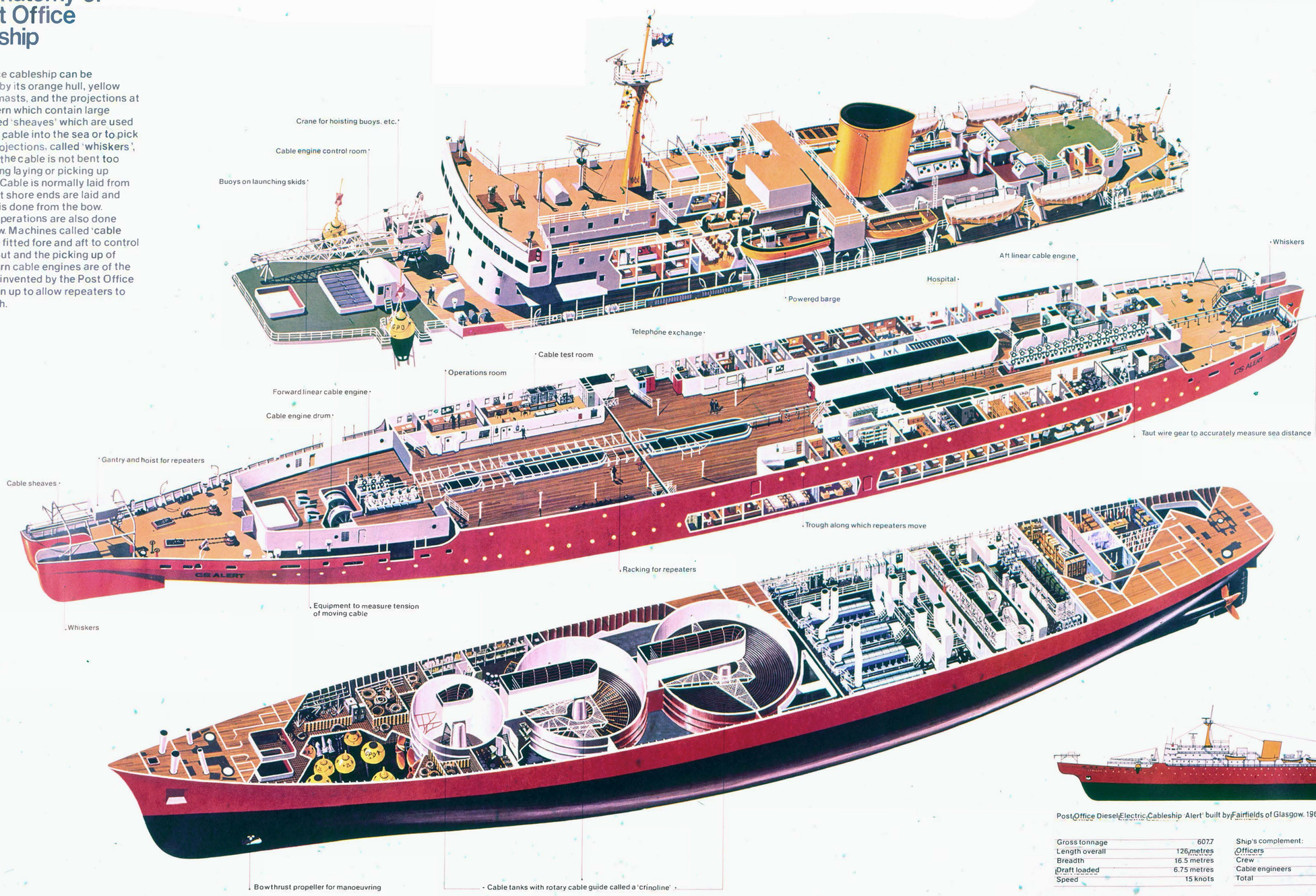
Illustrated by Peter Battersby Printed by W S Cowell Limited, The Butter Market, Ipswich. Issued by THO Publicity Division Education Service Tele Ed 26

Undersea Cables 2

Post Office Telecommunications

The anatomy of a Post Office cableship

A Post Office cableship can be recognised by its orange hull, yellow funnel and masts, and the projections at bow and stern which contain large wheels called 'sheaves' which are used to lower the cable into the sea or to pick it up. The projections, called 'whiskers', ensure that the cable is not bent too sharply during laying or picking up operations. Cable is normally laid from the stern but shore ends are laid and repair work is done from the bow. Picking up operations are also done from the bow. Machines called 'cable engines' are fitted fore and aft to control the paying out and the picking up of cable. Modern cable engines are of the 'linear' type invented by the Post Office and can open up to allow repeaters to pass through.



Post Office Diesel Electric Cableship 'Alert' built by Fairfields of Glasgow, 1961

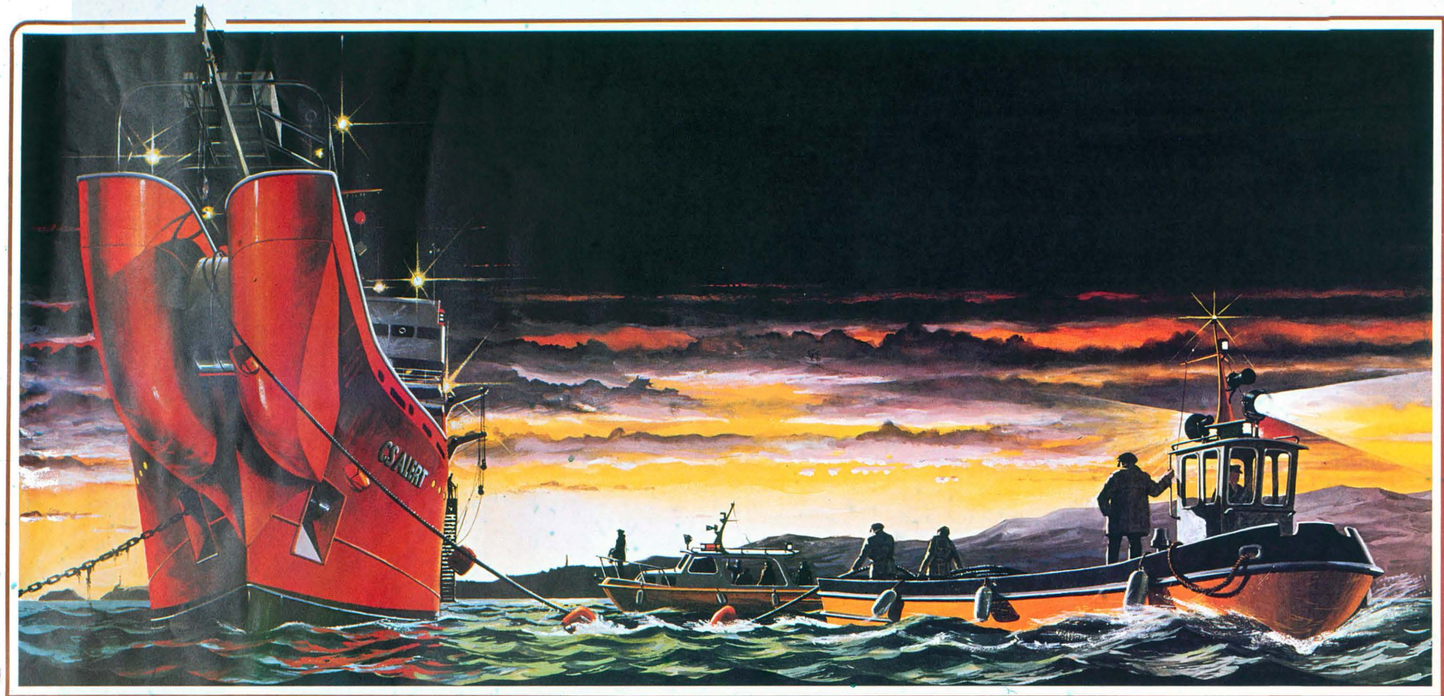
Gross tonnage	6077
Length overall	126 metres
Breadth	16.5 metres
Draft loaded	6.75 metres
Speed	15 knots

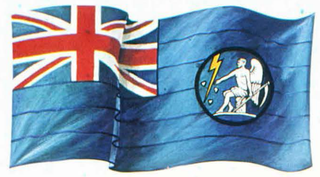
Ship's complement:	
Officers	26
Crew	83
Cable engineers	17
Total	126

Illustrated by Peter Battersby. Printed by W S Cowell Limited, The Butter Market, Ipswich. Issued by THQ Publicity Division Education Service. Tele Ed 27

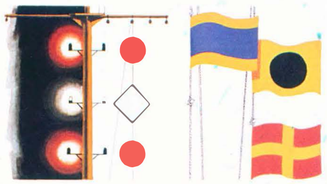
Undersea Cables 3

Post Office
Telecommunications

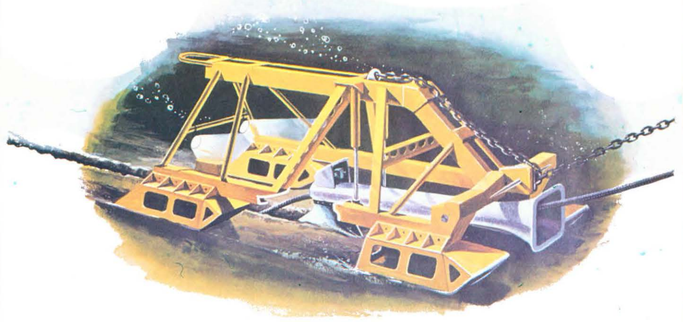




The ships of the Post Office cable fleet fly the Blue Ensign on which is imposed the crest of its Marine Division. This symbolises Time annihilated by telecommunications and shows Father Time with his hour glass shattered by an electric spark.



At night, masthead lights warn ships to keep clear when cable is being laid. During daylight, masthead signals and flags convey the same warning.



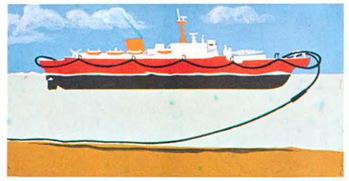
Where fishing trawls or ships' anchors might damage a cable, it is sometimes buried beneath the sea bed. This is generally done with a special plough towed by the cableship. Television cameras on the plough enable the operation to be watched and remotely controlled from the ship. Cables can also be buried by miniature submarine.

Cable laying

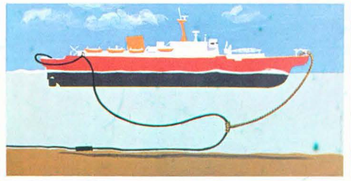
As a result of variations in the sea bed, the ship that is used, the type of cable, and the weather, no two cable lays are the same. The cableship is commencing a typical cable laying operation. It has approached the shore as closely as the depth of water will allow. A length of armoured cable has been led over the bow sheaves and is being loaded into a shallow draught powered barge which will convey the cable to the shore, paying out as it goes. Temporary floats will keep the cable from sinking and allow it to be accurately positioned.

After bringing the cable ashore, it has been laid in a prepared trench across the beach. The temporary floats are being removed, allowing the cable to sink.

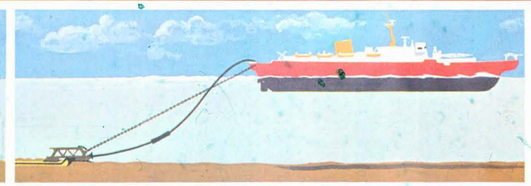
The cableship is commencing the cable lay from the bow sheaves.



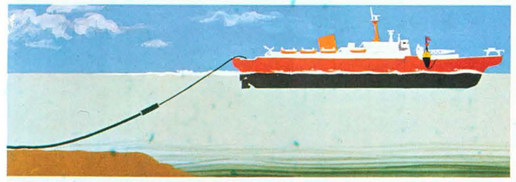
Now in deeper water, the cable is secured at the bow while a fresh end is fed over the stern sheaves and along the ship's side to the bow where the ends are joined.



The joined cable is lowered to the sea bed.



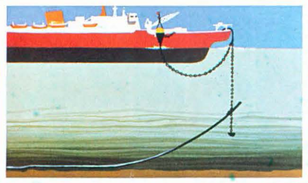
Having reached an area where trawlers fish and ships anchor, the cable is being ploughed into the sea bed.



The ship is now clear of the Continental Shelf and is starting to lay lightweight cable.

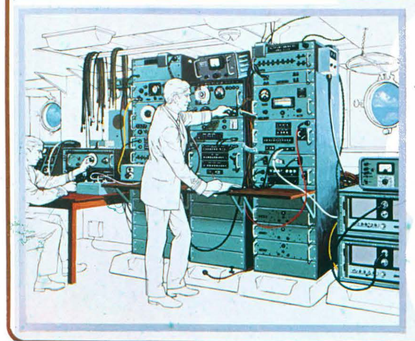
Having laid its first load of cable, a buoy has been attached to the end and the ship returns to port for more.

The ship, which can carry several hundred nautical miles of cable, is reloaded back in port.

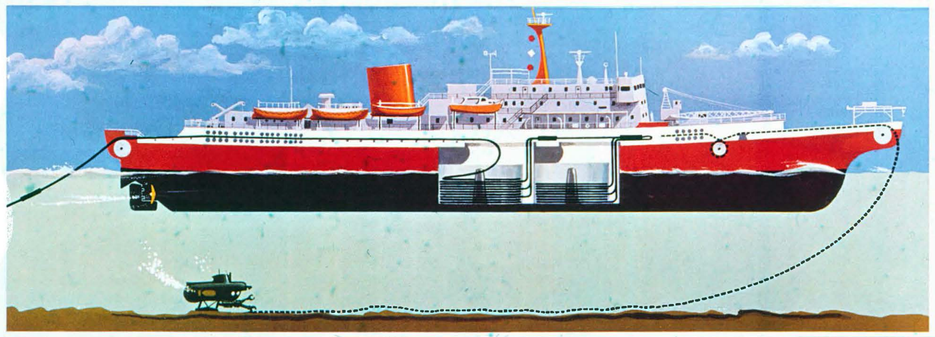


Returning to the buoy, the cable end is recovered and joined to the new cable before continuing the lay.

The lay completed, the cable end is taken ashore by barge as before. The new link will become part of the international network carrying communications between the peoples of the world.



A Test Room.
A ship's electrical testing room where delicate instruments prove that the cable is sound or locate the position of faults.



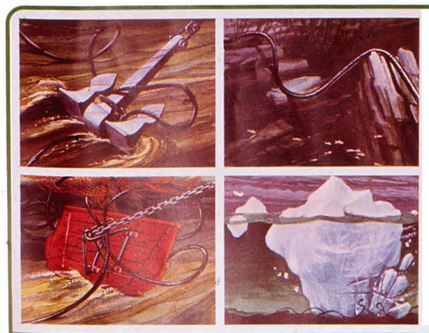
Cable from the tanks can be payed out either from bow (dotted) or stern. Cables can be buried by plough or miniature submarine.

A Linear Cable Engine.
Because it can handle both cable and repeaters, a linear cable engine speeds cable laying.

Illustrated by Peter Battersby Printed by W S Cowell Limited, The Butter Market, Ipswich. Issued by THQ Publicity Division Education Service Tele Ed 28

Undersea Cables 4

Post Office Telecommunications



Cable repair

Study of annual weather patterns and meteorological forecasts allow new cables to be laid when fine weather is expected. But faults can occur at any time and, because they disrupt important international communications, they must be cleared quickly even when conditions are difficult and hazardous. Cables can be damaged by ships' anchors, fishing gear, sharp rocks, icebergs bumping along the sea bed, and in many other ways. A faulty cable must be raised for repair.

The cableship is fishing for a faulty cable with a grapnel.

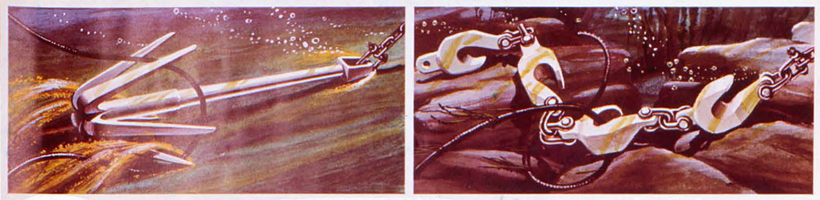
The faulty cable has been found and is being raised.

The cable has been cut and tested and the good end has been dropped and buoyed.

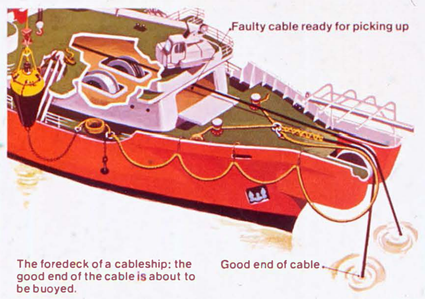
The faulty end has been retained and the cableship will pick up the cable until the fault is on deck.

The fault has been cut out and a new cable joined. The ship is now paying out cable on its way back to the buoy. The buoy is about to be picked up and the other cable end recovered.

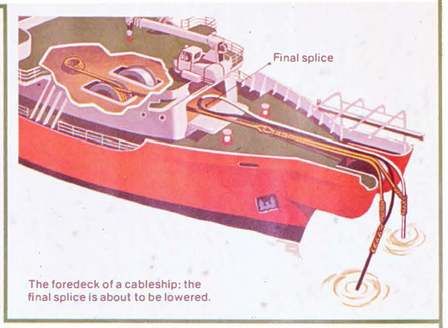
The two cables have been joined and are being lowered to the sea bed.



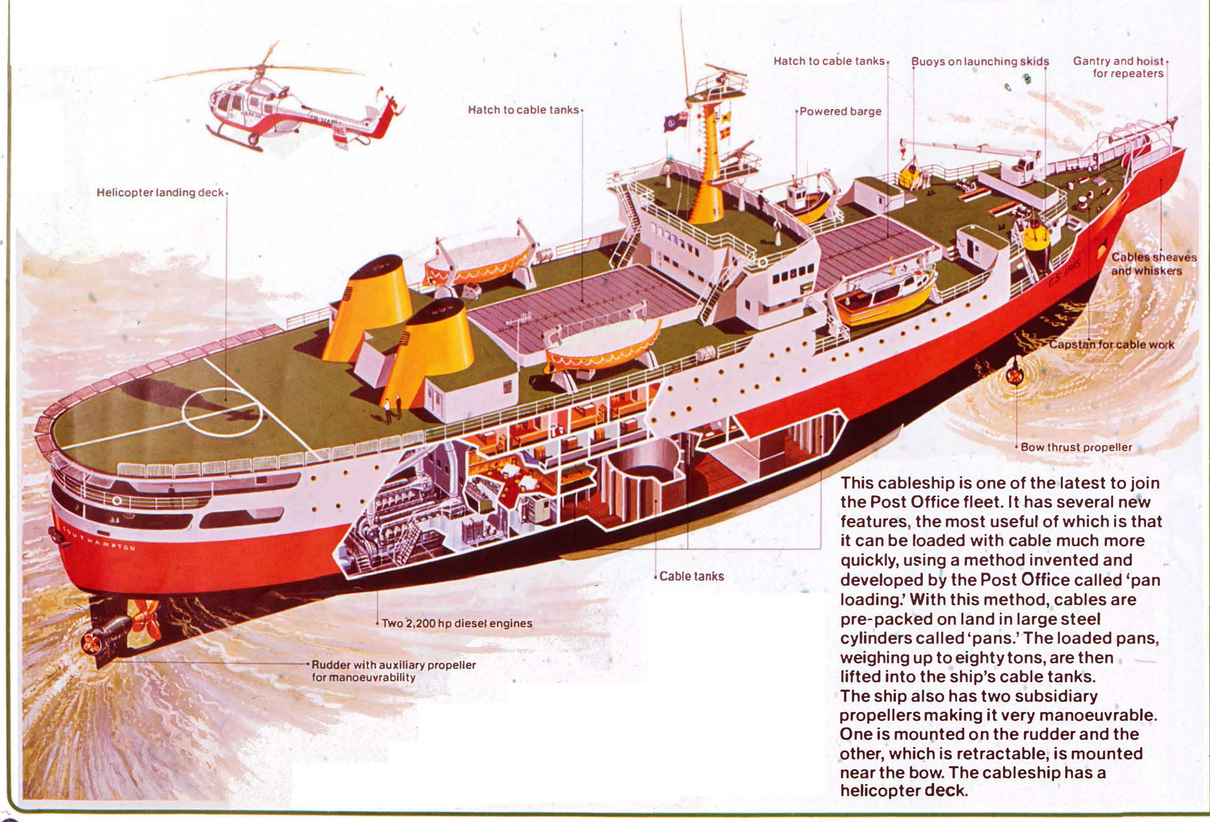
A cableship does this by fishing for it with special hooks called grapnels. Different types of grapnel are used according to the nature of the sea bed.



The foredeck of a cableship: the good end of the cable is about to be buoyed.



The foredeck of a cableship: the final splice is about to be lowered.



This cableship is one of the latest to join the Post Office fleet. It has several new features, the most useful of which is that it can be loaded with cable much more quickly, using a method invented and developed by the Post Office called 'pan loading.' With this method, cables are pre-packed on land in large steel cylinders called 'pans.' The loaded pans, weighing up to eighty tons, are then lifted into the ship's cable tanks.
The ship also has two subsidiary propellers making it very manoeuvrable. One is mounted on the rudder and the other, which is retractable, is mounted near the bow. The cableship has a helicopter deck.

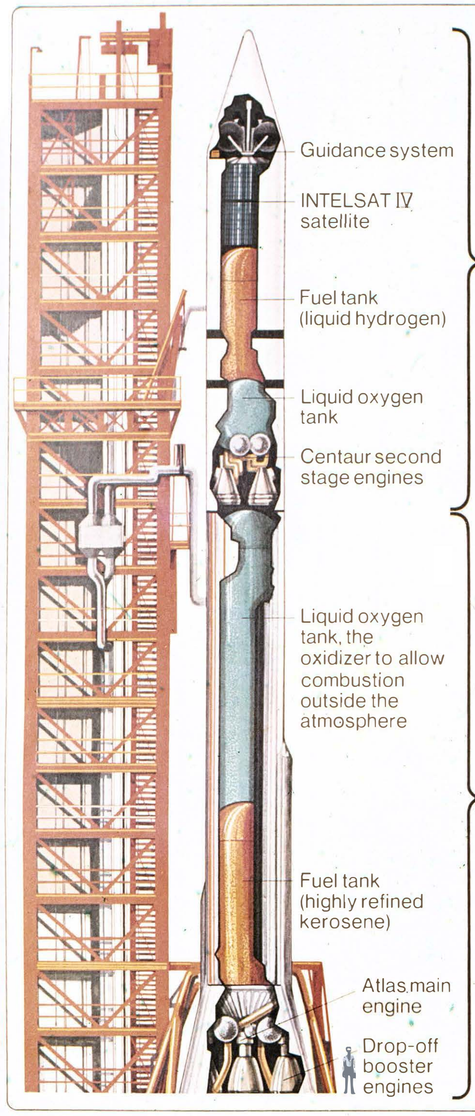
During cable laying and repair operations, cable ends are marked with buoys. A rope, supported by small floats, is attached to the top of the buoy. This can be hooked from the deck of a ship and enables the buoy to be picked up without lowering a boat. A radar reflector on the buoy makes its position visible on the ship's radar screen and it can be found more easily. This is particularly important when visibility is poor.

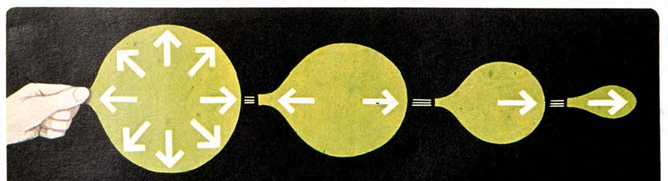
Until recently, cables have always been laid and repaired from the deck of a cableship. The development of the miniature submarine has meant that cables in shallow water can be inspected, and some work can be done, on the sea bed. So far, miniature submarines have been used mainly to bury cable and repeaters. This is done by dislodging the silt beneath the repeater with a water jet. This produces a hollow into which the repeater sinks.

Illustrated by Peter Battersby. Printed by W S Cowell Limited, The Butter Market, Ipswich. Issued by THO Publicity Division Education Service Tele Ed 29

Satellite Communications a Satellite Launch

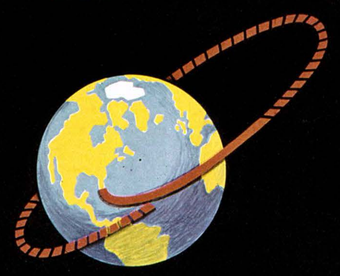
Post Office Telecommunications





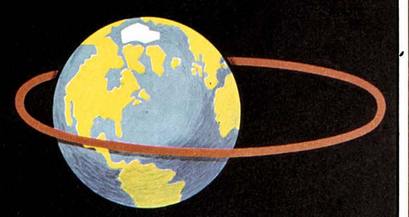
You can see from this diagram how a balloon is propelled by a similar force that launches a rocket into space.
The air exerts a uniform outward pressure but, when released, the imbalance sets up an equal force on the opposite side, driving the balloon forward.

1 Launch Trajectory



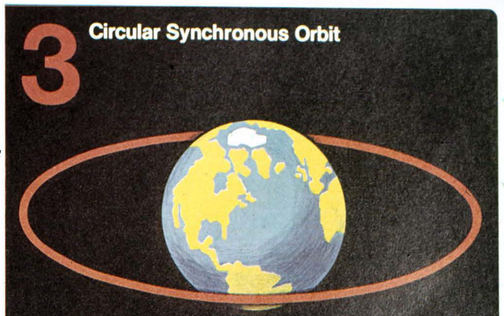
The INTELSAT IV satellites are launched by Atlas/Centaur rockets from Cape Canaveral, U.S.A.

2 Elliptical Transfer Orbit

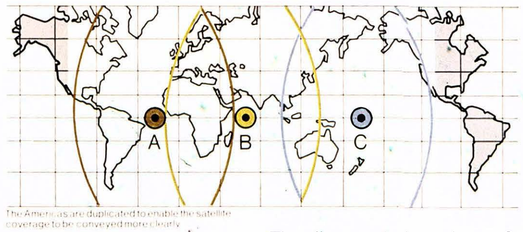


After separation from the Atlas and then Centaur rockets, the satellite is placed into the highly elliptical transfer orbit. It is spun at 50 rpm to stabilise it.

3 Circular Synchronous Orbit



After travelling round the transfer orbit 2 or 3 times, for checking and testing, the satellite is placed in its final synchronous orbit 35,800 km out in space.



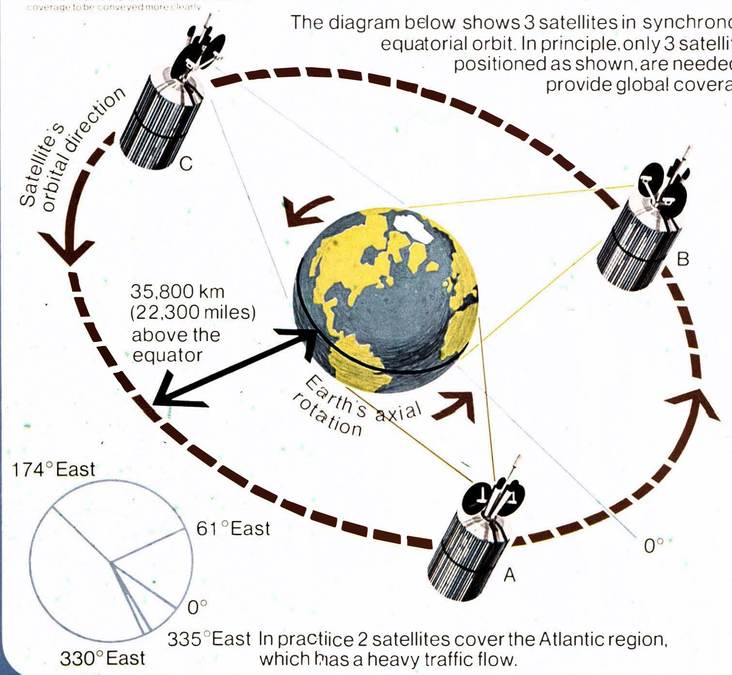
The Americas are duplicated to enable the satellite coverage to be conveyed more clearly

A. Position 335°E and 330°E over Atlantic Ocean

B. Position 61°E over Indian Ocean

C. Position 174°E over Pacific Ocean

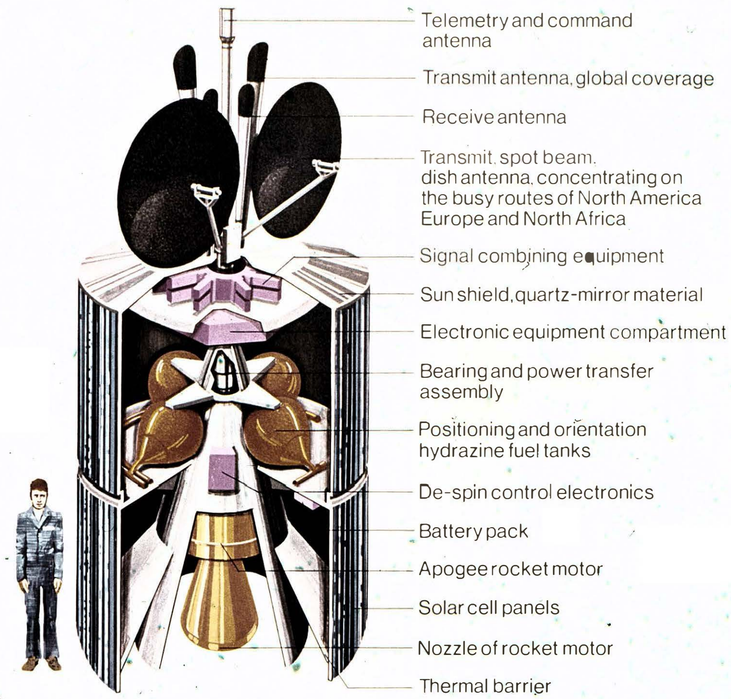
The diagram below shows 3 satellites in synchronous equatorial orbit. In principle, only 3 satellites, positioned as shown, are needed to provide global coverage.



In practice 2 satellites cover the Atlantic region, which has a heavy traffic flow.

An INTELSAT IV Satellite

Each INTELSAT IV satellite has a capacity of about 5,000 simultaneous telephone conversations, or 12 TV channels, or any combination of these. At launch, it weighs, 1,415 kg (3,120 lbs.) is 5.28 metres (17 ft. approx.) tall and 2.38 metres (8 ft. approx.) in diameter.



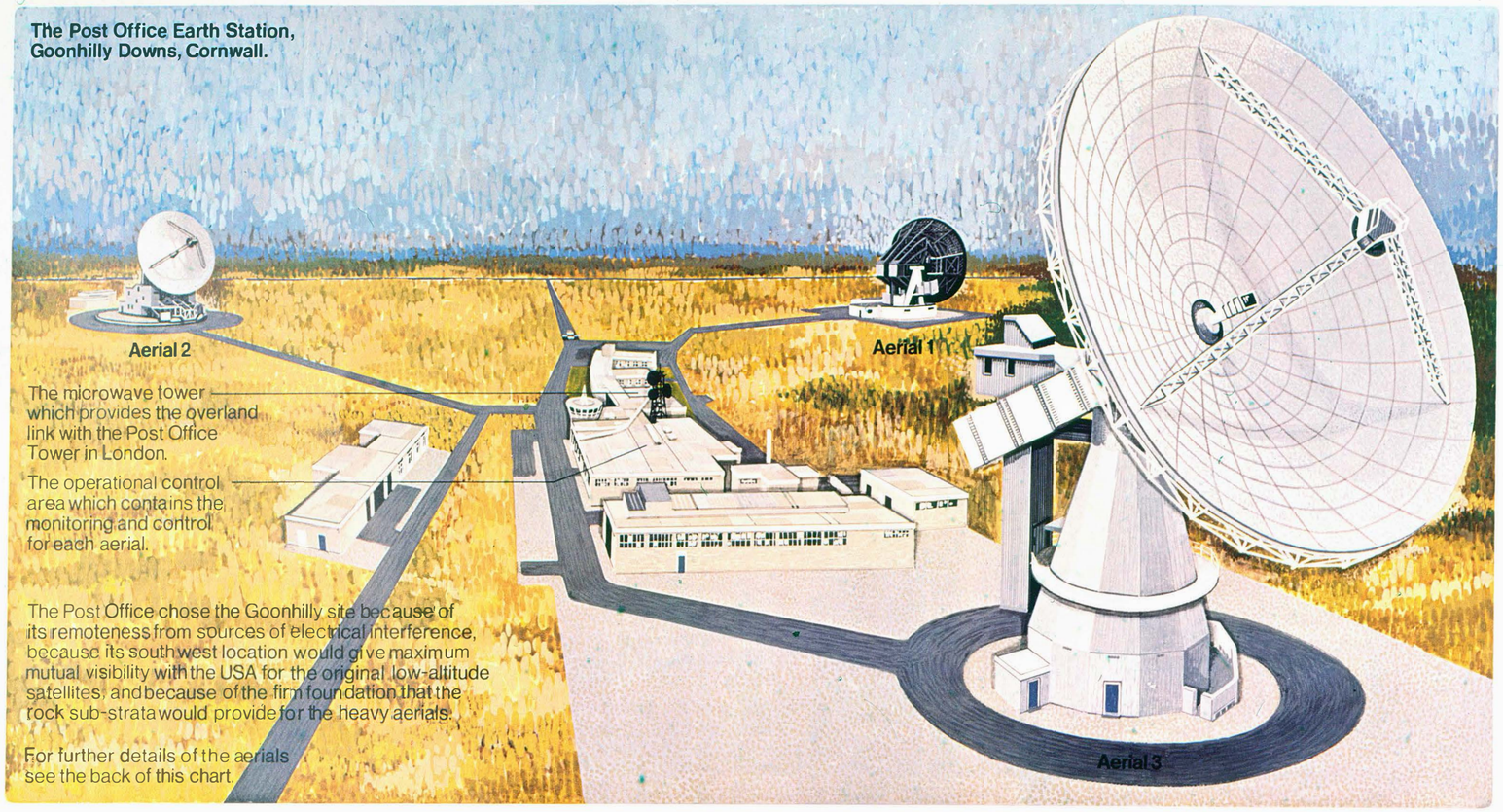
Designed and illustrated by John Hutchinson ARCA Printed by W S Cowell Limited

Issued by THQ Publicity Division Education Service Tele Ed 30

Satellite Communications

Goonhilly Earth Station

Post Office Telecommunications



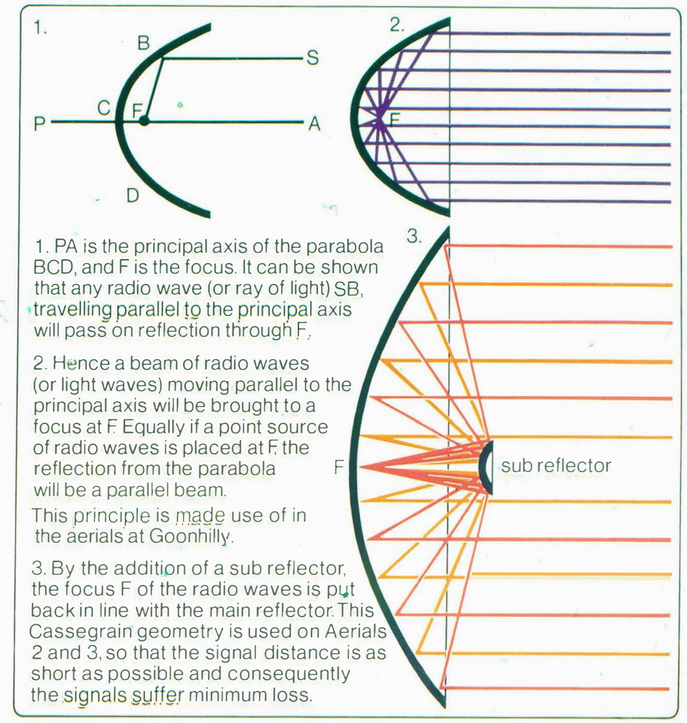
The Post Office Earth Station, Goonhilly Downs, Cornwall.

The microwave tower which provides the overland link with the Post Office Tower in London.

The operational control area which contains the monitoring and control for each aerial.

The Post Office chose the Goonhilly site because of its remoteness from sources of electrical interference, because its south west location would give maximum mutual visibility with the USA for the original low-altitude satellites, and because of the firm foundation that the rock sub-strata would provide for the heavy aerials.

For further details of the aerials see the back of this chart.

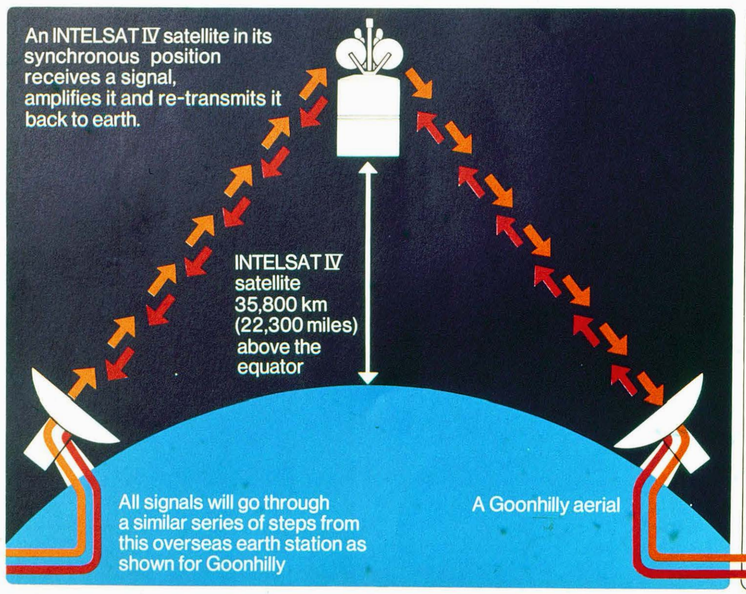


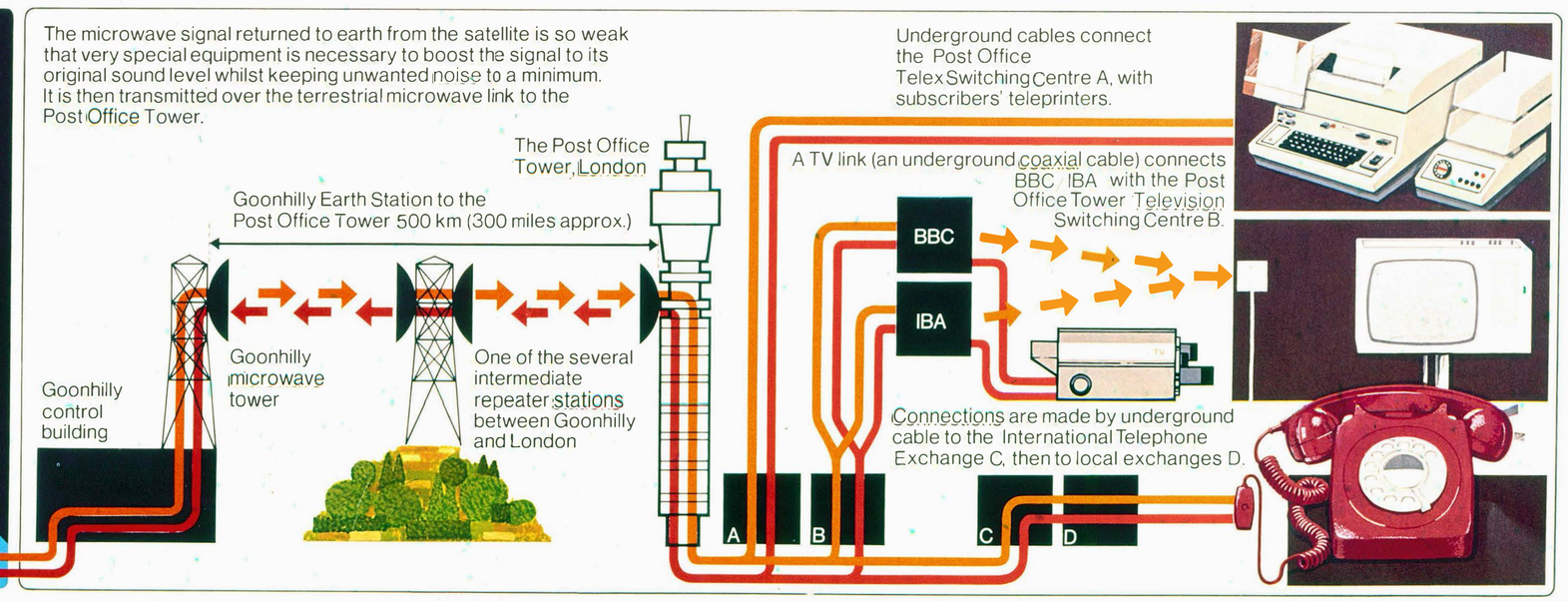
1. PA is the principal axis of the parabola BCD, and F is the focus. It can be shown that any radio wave (or ray of light) SB, travelling parallel to the principal axis will pass on reflection through F.

2. Hence a beam of radio waves (or light waves) moving parallel to the principal axis will be brought to a focus at F. Equally if a point source of radio waves is placed at F, the reflection from the parabola will be a parallel beam.

This principle is made use of in the aerials at Goonhilly.

3. By the addition of a sub reflector, the focus F of the radio waves is put back in line with the main reflector. This Cassegrain geometry is used on Aerials 2 and 3, so that the signal distance is as short as possible and consequently the signals suffer minimum loss.





Designed and illustrated by John Hutchinson ARCA Printed by W S Cowell Limited

Issued by THQ Publicity Division Education Service Tele Ed 31

Satellite Communications a Telephone Call

Post Office Telecommunications

Goonhilly Aerial 3

Sub reflector

Feed horn

A

Elevation drive

Elevation bearing

Upper azimuth bearing

Lower azimuth bearing

If the aerial is not pointing directly at the satellite, an error signal is derived which is used to control the movement of the aerial, returning it to its correct position.

Transmitter hall with four transmitters. Signals from the Post Office Tower are re-grouped in the Goonhilly control building according to destination and are here amplified and transmitted to the satellite.

Power supply and air conditioning

B

External lift

Internal lift

Reinforced concrete tower

Low noise amplifiers, cooled to 15°K (−258°C) which amplify the extremely weak signals received, are mounted in the cabin behind the reflector in line with the elevation axis A.
The low temperature is necessary to minimise the thermal noise in the system itself.

Receiving equipment in the control building further amplifies the signals in a series of steps and re-groups them before they are transmitted to the Post Office Tower.

C

The operational control area (OCA) contains the consoles showing the operational state of the aerials, receiving equipment, transmitting equipment and tracking systems. It also contains manual steering controls.

D

The signals are transmitted over the terrestrial microwave link from one repeater station to another to cover the 500 km (300 miles approx.) between Goonhilly and the Post Office Tower in London.

Goonhilly

Repeater station

Repeater station

Post Office Tower

E International Telephone Exchange

Local telephone exchange. From here calls are routed to subscribers.

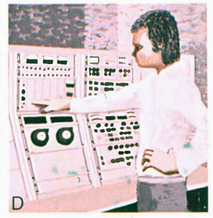
Key

- Receive path
- Transmit path
- Control and monitor system

High up in the cabin behind the reflector an engineer makes a test.

B Operating one of the four transmitters.

C The Controller checks an aerial's condition on his desk console.



D Part of the control panel for Aerial 3.

E International Telephone Exchange operators connect calls to subscribers.

Designed and illustrated by John Hutchinson ARCA Printed by W S Cowell Limited

Issued by THQ Publicity Division Education Service Tele Ed 32

Satellite Communications the World Receives

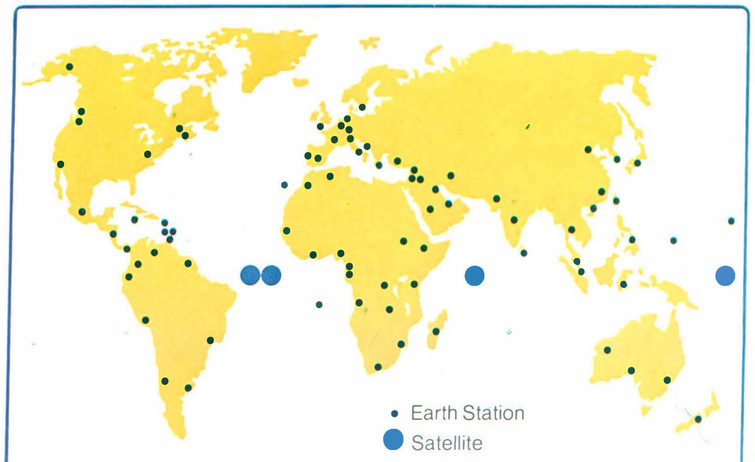
Post Office Telecommunications

INTELSAT

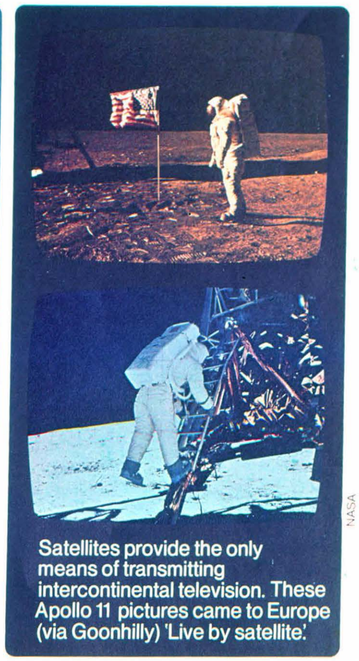
The global satellite system is run by INTELSAT the International Telecommunications Satellite Organization, a group now made up of over 80 nations – an outstanding example of international co-operation. The United Kingdom is represented on the INTELSAT Board of Governors by members of the Post Office. INTELSAT satellites have given us a reliable means of communication with the rest of the world.

Other Satellite Systems

In addition to the INTELSAT system, there exist, or are planned, other satellite systems, some aspects of which are depicted below.

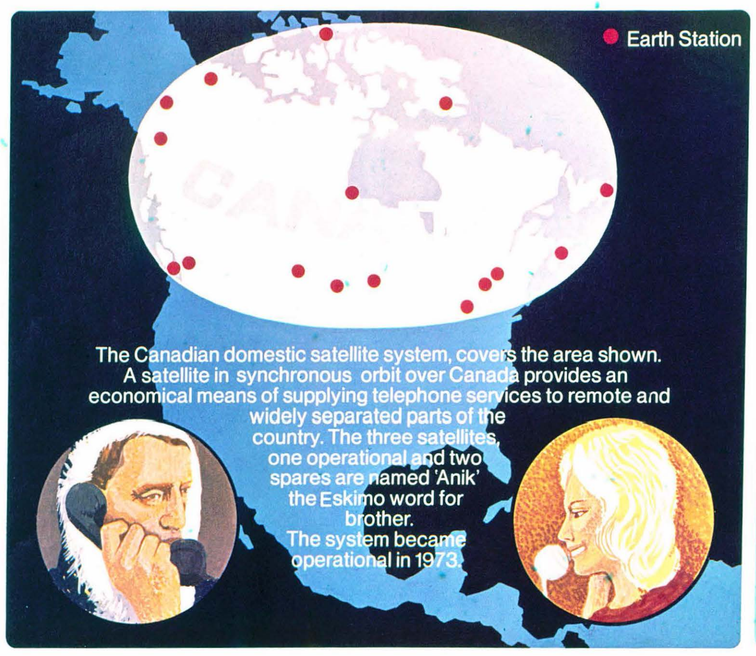


INTELSAT's first satellite Early Bird was launched in 1965 and provided telephone and television communications between North America and Western Europe. The present system of four INTELSAT IV satellites, has expanded considerably on this and can provide communication links between any pair of countries with their own earth stations. By 1974 the UK had some 700 satellite telephone circuits to various parts of the world, this figure is increasing by some 20% each year.

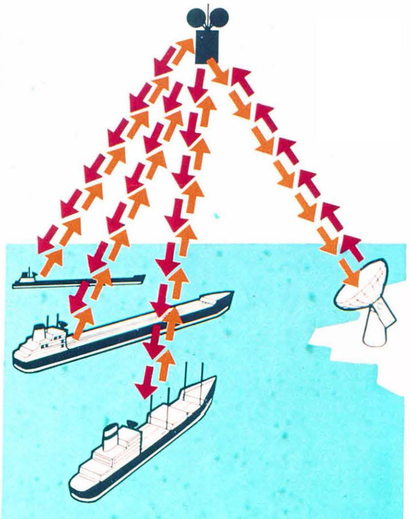


Satellites provide the only means of transmitting intercontinental television. These Apollo 11 pictures came to Europe (via Goonhilly) 'Live by satellite.'

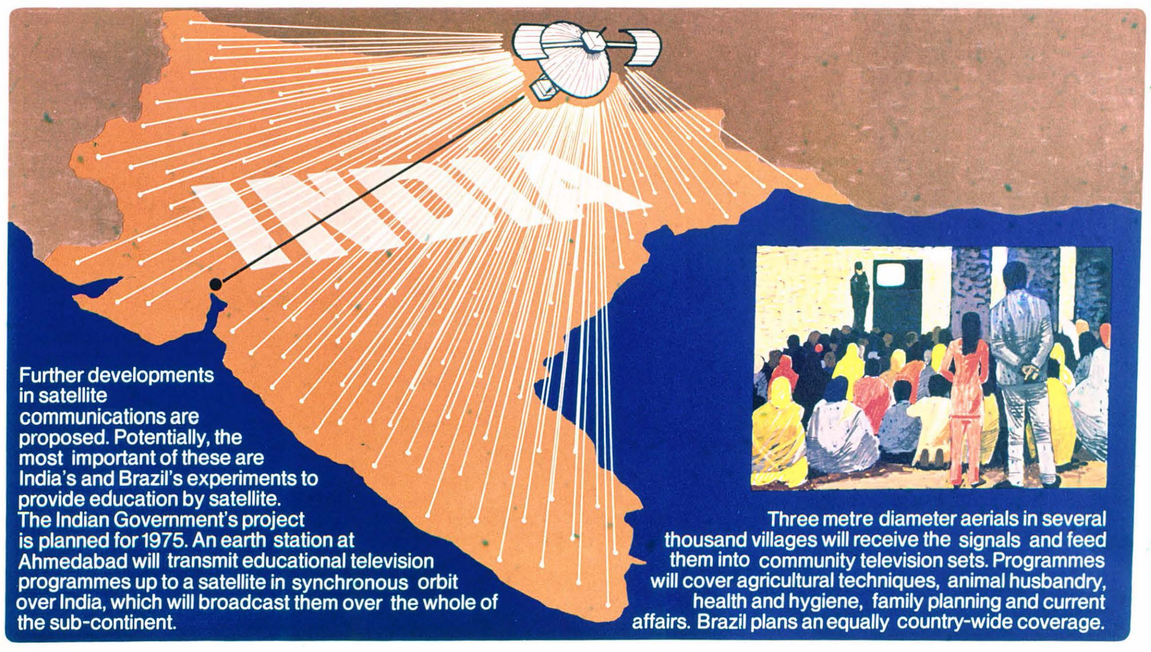
NASA



The Canadian domestic satellite system, covers the area shown. A satellite in synchronous orbit over Canada provides an economical means of supplying telephone services to remote and widely separated parts of the country. The three satellites, one operational and two spares are named 'Anik' the Eskimo word for brother. The system became operational in 1973.



A future maritime satellite system will provide ship-to-ship and ship-to-shore telephone links to replace the present HF radio system.



Further developments in satellite communications are proposed. Potentially, the most important of these are India's and Brazil's experiments to provide education by satellite. The Indian Government's project is planned for 1975. An earth station at Ahmedabad will transmit educational television programmes up to a satellite in synchronous orbit over India, which will broadcast them over the whole of the sub-continent.

Three metre diameter aerials in several thousand villages will receive the signals and feed them into community television sets. Programmes will cover agricultural techniques, animal husbandry, health and hygiene, family planning and current affairs. Brazil plans an equally country-wide coverage.

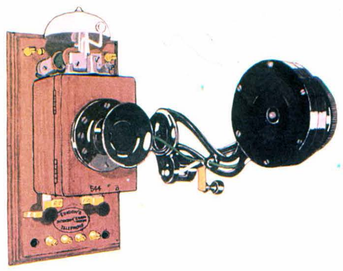
Designed and illustrated by John Hutchinson ARCA Printed by W S Cowell Limited

Issued by THQ Publicity Division Education Service Tele Ed 33

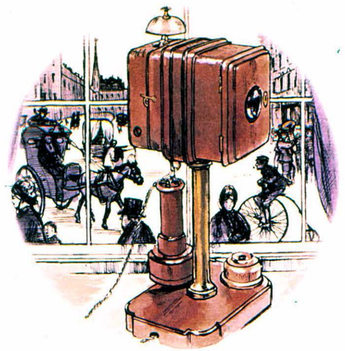
HISTORY OF THE TELEPHONE INSTRUMENT

The first person to transmit speech by electricity was Alexander Graham Bell. Born in Scotland, he made his discoveries in Canada and the USA. Telephones are designed firstly to be functional, but they can be artistic too and reflect current artistic trends.

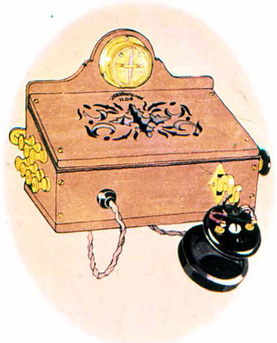
Bell's telephone was used as both a transmitter and a receiver. 1877.



Edison's telephone had a carbon transmitter and a chalk receiver. 1878.



The telephone of 1879 combining Edison's carbon transmitter with Bell's receiver.

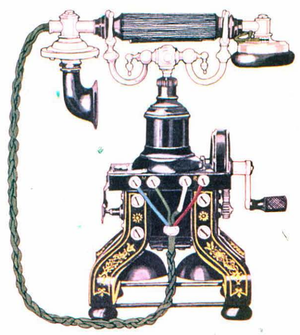


Callers spoke into the fret-work front of this telephone. 1880.

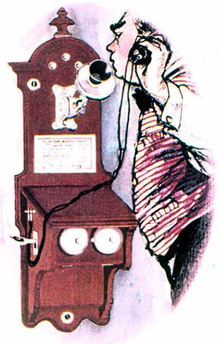
Successful in business, the telephone proved equally useful in homes. 1880.

Before 1900 the only public telephones were installed in shops.

In late Victorian days, the 'Electrophone' relayed music over the telephone wires.

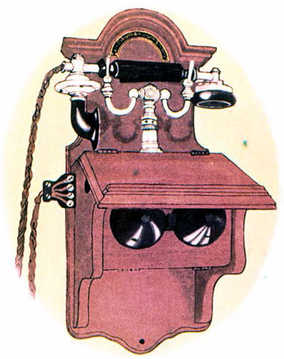


A handset telephone in an intricate Victorian design. 1895.

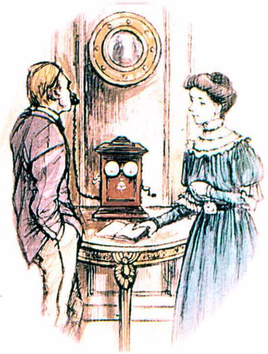


Telephones were often made of wood, which was sometimes carved. 1900.

Alexander Graham Bell with the first telephone that received speech.



Handsets gave freedom of movement to telephone users, but early handsets needed individual batteries and were not successful when electricity was fed from the exchange. 1900.



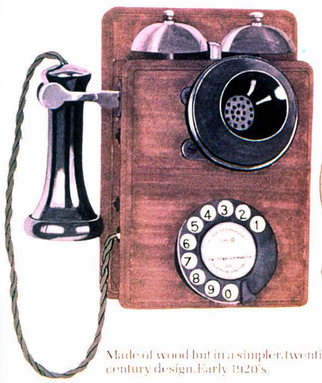
1905

Called 'candlestick' telephones because of their shape, these were used from the 1880's for over half a century. Later models had dials.

1912

1924

Because the shape of handsets affects the quality of speech, style and performance have evolved together.

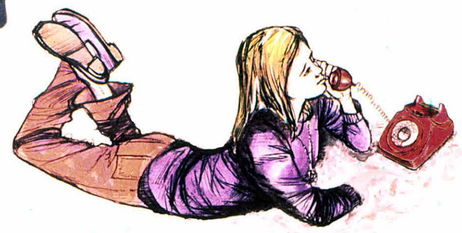


Made of wood but in a simpler, twentieth century design. Early 1920's.

Plastic telephone with improved transmitter that solved the handset problem. 1929.

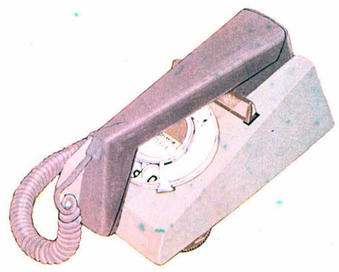
Telephone with internal bell. 1930's.

Wall telephone with handset. Mid-1950's.



Modern telephone with improved circuit to compensate for length of line.

Modern wall telephones are neat and space-saving.



Telephones with illuminated dial and variable volume electronic caller. Modern.

Push-button telephones may ultimately replace dial telephones.

Post Office Telecommunications

Issued by THQ Publicity Division Education Service

Tele Ed 36

Telephoning the Emergency Services

1
In an emergency, keep calm.

2
Find out how to get in touch by telephone with the Emergency Services in your area BEFORE an emergency. Dialling '999' is probably correct but this can depend on where you are and what telephone you use. A quick way to find out is to read the dial label of the telephone. Emergency call instructions are displayed in telephone kiosks.

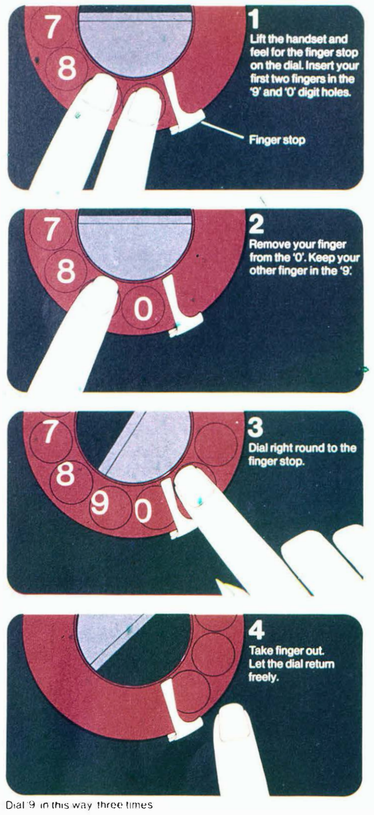
3
Although a telephone in a kiosk may APPEAR to be 'out of order', you may still be able to make an emergency call. Lift the handset. If you hear 'dialling tone' (a continuous purring sound) you should be able to make your call.

4
After dialling, when the Post Office operator answers, LISTEN CAREFULLY to what she asks. Tell her what emergency service you require. (If you do not know which Emergency Service you need, or if you require more than one, ask for 'Police'). She will want to know the number of the telephone YOU are using. Give her the number clearly and accurately.

5
When she has connected you to the Emergency Service, do LISTEN CAREFULLY to the person speaking to you. He will ask what the trouble is, where it is, and from where you are telephoning. Answer clearly and correctly.

6
When you have finished the call, remember to replace the handset on the telephone rest.

7
This is how to dial '999' in the dark

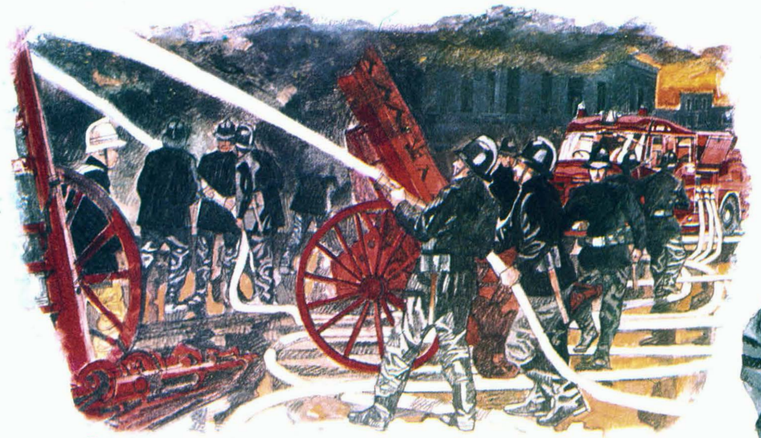


Dial '9' in this way three times

If you wish to telephone an Emergency Service on a matter which is not urgent, you must ring on its ordinary number. You will find this in the telephone directory.

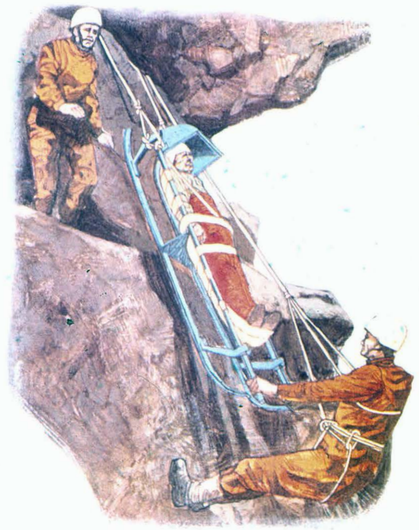
Post Office
Telecommunications

Remember
emergency calls are free of charge

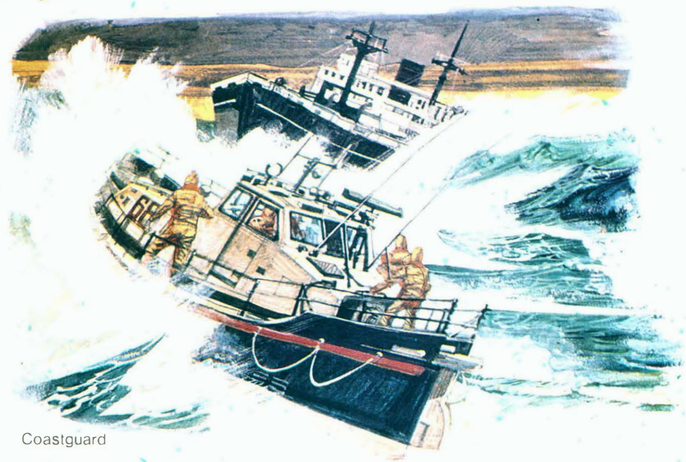

Fire


Police


Air/Sea Rescue


Cave/Mountain Rescue


Ambulance


Coastguard

Issued by THQ Publicity Division Education Service Tele Ed 42