Post Office
Telecommunications

Telecommunications Projects
Names and dates for students

Telecommunications:

'any transmission, emission or reception of signs, signals, writings, images and sounds, or intelligence of any nature by wire, radio, visual or other electromagnetic systems.'

(Definition : International Telecommunication Union)

Telecommunications is a fascinating subject.
Interwoven in the fabric of daily life it caters for the country's social, commercial and industrial needs. And whether it is radio or television, telephony or telegraphy, telex or data transmission, or (in this space age) satellite communication, there is no aspect wherein the Post Office does not play a vital part.

Many students undertake communications projects making telecommunications their especial study.
If you wish to do so the names, dates, and information we give you will help. However, *you* will have to do the work which will make meaningful the information we supply.

Because the subject is such a wide one you may like to pursue one particular line of enquiry, say the development of the telephone system or the life and work of one man. We are sure you will realise that, in a publication of this size, we cannot include all the aspects of telecommunications given in the ITU definition quoted above.
To assist you, we have included a 'Further Sources of Information' section.

Projects Leaflet – Tele Ed 24.

Corrections

First Page: EDISON Thomas Alva
substitute '1847' for '1874'.

1900: 8th word
substitute 'in' for 'to'.

1934: 2nd line, last word
substitute 'repeaters' for 'receivers'.

The names of a few of the men of many nations who, by their research, inventions or work made possible today's telecommunications

BAIRD John Logie	1888 – 1946
BAUDOT Jean Maurice Emile	1845 – 1903
BELL Alexander Graham	1847 – 1922
BETULANDER Gotthelf Ansgarius	1872 – 1941
BRANLY Edouard	1844 – 1940
BRAUN Carl Ferdinand	1850 – 1918
BRETT Jacob	1808 – 1898
BRETT John Watkins	1805 – 1863
CLARK Latimer	1820 – 1898
COOKE William Fothergill	1806 – 1879
DAVY Humphrey	1778 – 1829
DE FOREST Lee	1873 – 1961
DU FAY Charles Francoise	1698 – 1739
EDISON Thomas Alva	1874 – 1931
ERWIN Edson L	not known
FARADAY Michael	1791 – 1867
FIELD Cyrus W	1819 – 1892
FLEMING John Ambrose	1849 – 1945
FRANKLIN Benjamin	1706 – 1790
GALVANI Luigi	1737 – 1798
GAUSS Johann Carl Friedrich	1777 – 1855
GILBERT William	1540 – 1603
GRAY Elisha	1835 – 1901
GRAY Stephen	c.1670 – 1736
HAUKSBEE Francis	– d.c.1713
HEAVISIDE Oliver	1850 – 1925
HENRY Joseph	1797 – 1878
HERTZ Heinrich Rudolph	1857 – 1894
HUGHES David Edward	1831 – 1900
KELVIN (William Thomson)	1824 – 1907
LODGE Oliver Joseph	1851 – 1940
MARCONI Guglielmo	1874 – 1937
MAXWELL James Clerk	1831 – 1879
MOLINA E C	not known
MORSE Samuel Finley Breeze	1791 – 1872
NOLLET Jean Antoine	1700 – 1770
OERSTED Hans Christian	1777 – 1851
PALMGREN Nils Gunner	not known
POPOFF Alexander Stepanovitch	1859 – 1905
PUPIN Michael Idvorsky	1858 – 1935
REIS Philipp	1834 – 1874
REYNOLDS John N	not known
RIGHI Augusto	1850 – 1920
ROBERTS Homer J	not known
ROBERTS J G	not known
RONALDS Francis	1788 – 1873
SCHILLING Pavel Lvovitch	c.1780 – c.1836
SENLECQ Constantin	1842 – 1934
SIEMENS Ernst Werner von	1816 – 1892
SOEMMERRING S T von	1755 – 1830
STROWGER Almon Brown	d.1902
STURGEON William	1783 – 1850
THOMSON William (Lord Kelvin)	1824 – 1907
VARLEY Cromwell Fleetwood	1828 – 1883
VOLTA Alessandro	1745 – 1827
WATSON Thomas A	not known
WEBER Wilhelm Eduard	1804 – 1891
WHEATSTONE Charles	1802 – 1875

This list does not claim to be comprehensive; perhaps you can add to it ?

Important dates and events in the development of telecommunications with particular reference to the United Kingdom and the British Post Office

1753 A letter from a correspondent with the initials 'C.M.' was sent to the Scots Magazine, and published on 17th February, predicted the electric telegraph and suggested a way in which such a telegraph might be worked.

1786 Luigi Galvani, professor of anatomy at the University of Bologna in Italy, observed electrical convulsion in dead frogs' legs when in contact with dissimilar metals.

1793 Ignace Chappe, a Frenchman, (a brother of Claude Chappe who invented a system of semaphore) first used the word 'telegraph' in April 1793. The word is derived from the two Greek words 'tele' meaning 'far' and 'graphein' meaning 'to write'. The name was later applied to the electric telegraph.

1800 Alessandro Volta, professor of the University of Pavia in Italy, announced his invention of the Voltaic Pile, the first electrical battery.

1819 Hans Christian Oersted of Copenhagen, showed that a wire carrying an electric current would deflect a magnetic needle.

1839 The world's first commercial telegraph line, using equipment invented by William Fothergill Cooke and Charles Wheatstone of King's College, London, was built between Paddington and West Drayton.
It was working to Hanwell by 6th April and was completed to West Drayton on 9th July.
This was also the first commercial use of electricity.

1841 Charles Wheatstone invented the first type printing telegraph.
This year he also proposed a time-division multiplex telegraph system.

1843 A message was sent by telegraph (the first telegraph line in the USA) from Washington to Baltimore by Samuel Morse.
Morse used equipment of his own invention which was totally different from that of Cooke and Wheatstone. (He also used what became known as 'Morse Code').
The line was not fully operational until 1st January 1845.

1849-1850 The world's first central telegraph station was opened by the Electric Telegraph Company in Founders' Court, Lothbury in the City of London.

1850 The first telegraph cable was laid between England and France, this was also the first telegraph cable laid in the open sea and was laid by H.M. Tug 'Goliath' accompanied by H.M. Packet 'Widgeon'. It failed after only a few messages, but a successful cable was laid the following year.

1851 An Englishman, Thomas Russell Crompton devised the first armoured submarine cable which was laid between England and France.

1858 The first trans-Atlantic telegraph cable was laid between Valentia Island, County Kerry, Ireland and Trinity Bay, Newfoundland.
The cable was laid by HMS 'Agamemnon' and the USNS 'Niagara'.
The first messages were sent on 5th August.

Charles Wheatstone patented the automatic telegraph system in which the message is first transposed into the form of perforations in a paper tape, and then transmitted and received at high speed.
This was the forerunner of modern systems using punched tape.

1865 On 17th May, twenty countries formed the International Telegraph Union, the object being to achieve international co-operation in the field of telegraph communication.
(This ultimately became today's International Telecommunication Union).

1867 The Scottish physicist James Clerk Maxwell proved mathematically that in certain circumstances it would be possible to produce electro-magnetic waves, that is, radio waves, and that these waves would travel with the speed of light.

1868 An Act of Parliament gave the Postmaster-General the exclusive right to set up and operate inland telegraphs.

1869 A second Act of Parliament allowed the Postmaster-General to take over the telegraphs from the private companies operating in the United Kingdom.

1870 The transfer of telegraphs from the private companies operating in the United Kingdom took place on 3rd February. Some 60,000 miles of aerial line, 2,800 telegraph offices were taken over and £5,717,048 was paid in compensation.

1871 Great Britain was admitted to the membership of the International Telegraph Union.

1874 Emile Baudot invented the Baudot printing telegraph system using the multiplex principle suggested by Wheatstone. The Baudot system was the first to use a code consisting of five units of equal length.
Five unit codes of this type were later adopted for use with teleprinters.

1875 Alexander Graham Bell constructed his first experimental telephone and patented the telephone the following year.

1877 Thomas Alva Edison invented the carbon transmitter for telephones.

1878 In January, Alexander Graham Bell demonstrated the telephone before Queen Victoria at Osborne House on the Isle of Wight.
His demonstration included calls to Southampton and London.
These were the first long-distance calls in Britain.

The Telephone Co. Ltd. was registered on 4th June with a capital of £100,000 to work the Bell Patents in Britain.

1879 The Edison Telephone Co. of London Ltd. was floated on 2nd August with a capital of £200,000 to work the Edison telephone patents.

Daniel Connolly, T.A. Connolly and T. J. McTighe exhibited an eight line automatic telephone exchange at the Paris Exhibition.

The Telephone Co. Ltd., opened Britain's first public telephone exchange at 36 Coleman Street, London.
The same year the rival Edison Telephone Co. of London Ltd. started to operate with exchanges in Lombard Street and Queen Victoria Street.

Oliver Lodge, an Englishman, transmitted wireless signals a distance of 150 yards.

1880 Post Office telephone exchanges were established in Newcastle-on-Tyne, Hull, Bradford and Middlesbrough.

On 13th May the Telephone Co. Ltd. and the Edison Telephone Co. of London Ltd. were amalgamated to form the United Telephone Co.

1881 The Government authorised the Post Office to offer the public telephone as well as telegraph service.

1882 G. L. Anders of London patented a central battery system by which telephones could be supplied with electrical power from the exchange thereby making batteries at the telephone unnecessary.

1884 L. M. Ericsson of Sweden combined the transmitter and receiver to form the earliest telephone handset.

1885 The Post Office reduced the charge for telegrams to sixpence for twelve words and embarked on a vast programme of expansion.
In this year fifty million telegrams were sent compared with 33 million the previous year.

1886 Dane Sinclair invented an automatic line selector which was installed at Coatbridge near Glasgow.

1887 An Englishman, Oliver Heaviside, propounded the theory that the effect of the large electrostatic capacitance of cables could be minimised by increasing their inductance.
This led to the successful development of long-distance telephone cables.

1888 Heinrich Hertz, a German successfully transmitted electro-magnetic waves, that is, radio waves, proving that they could be reflected and refracted, thus confirming the mathematical theory of James Clerk Maxwell.

Almon Brown Strowger, an undertaker of Kansas City USA, built the first automatic telephone selector capable of being interconnected to form a large exchange.

1889 The United Telephone Co. and its subsidiaries were amalgamated to form the National Telephone Co.

1891 The first telephone cable was laid by HMTS 'Monarch' (No 1) between England and France enabling telephone conversations to be made between London and Paris.

1896 The Post Office take over the trunk telephone lines of the United Kingdom in accordance with a government decision of 1892, £459,114.3.7d was paid in compensation.

The telephone dial was invented by the Americans E. A. Keith, C. J. Erickson and John Erickson.

1897-1898 Britain's first long-distance cable was laid between London and Birmingham. This cable was normally used for telegraphy but was also used experimentally for telephony.

1900 The first large central battery type exchange to Europe was installed in Bristol.

1901 On 12th December, Guglielmo Marconi, an Italian, transmitted the first radio signals across the Atlantic from Poldhu in Cornwall to Signal Hill, Newfoundland.

Inductance was added experimentally to the London-Birmingham cable laid in 1897-1898 applying the theory of Oliver Heaviside of 1887.

F. G. Creed (founder of the firm of Creed & Co. of Croydon), developed a receiving reperforator enabling telegraph signals received from line to be recorded in the form of perforations in a paper tape at speeds of up to 200 words per minute.

1904 John Ambrose Fleming, an Englishman, invented the thermionic valve.

1906 Twenty-nine countries formed the International Radiotelegraph Convention. (Later known as the International Radiotelegraph Union).

1907 Lee de Forest of the USA added a grid to the Fleming valve and showed how it could be used for amplification.

Charles L. Krumm and his son H. Krumm introduced the first stop-start type of telegraph. This instrument known as the 'teletype' used a typewriter keyboard for direct sending and a 5-unit code with stop-start signals, as used by modern teleprinters.

1908 The Post Office opened its first ship-to-shore radio station at Bolt Head in Devon.

1912 On the 1st January the Postmaster-General took over the National Telephone Co. and for the first time a unified telephone system was available throughout most of Britain. 1,565 exchanges were transferred of which 231 had more than 300 subscribers each ; 68 were of the central battery type, most of the rest were of the magneto type.
There followed a period of rapid expansion.
In the next three years no fewer than 450 new exchanges were opened in places with no previous telephone service.
On the 13th March, the Post Office opened Britain's first public automatic telephone exchange in Epsom.

1913 The first long-distance telephone cable in Europe was laid between Leeds and Hull.

1916 The Post Office made the first effective use of amplifiers on telephone circuits when their research staff installed experimental repeaters in London to Belfast and London to Dublin circuits at Liverpool.
A few weeks later, the first permanent repeaters were installed in the London to Liverpool cable at Birmingham.

1920 G. A. Campbell, an American, invented the anti-sidetone telephone circuit.
In the older type of telephone circuit the power from the transmitter was divided between the line and the local receiver, so that the caller heard his own voice. This is called 'sidetone'.
In the circuit which G. A. Campbell devised this unwanted current is considerably reduced, leading to greater efficiency.

The Post Office commenced their long-distance radio-telegraph service to ships.

1921 The first of the 'rural automatic exchanges', which were intended to give automatic telephone service to sparsely populated areas, was opened at Ramsay in the Peterborough Area.
The name 'rural automatic exchange' was later changed to 'unit automatic exchange'.

1922 After a series of full scale experiments in which six different automatic telephone systems were tried, the Post Office decided to adopt the Strowger system as its standard.
It had been thought that there might be difficulties using the Strowger system in very large cities such as London but this problem was solved when the Automatic Telephone Manufacturing Co. Ltd. of Liverpool (now AT & E Co Ltd.) working in conjunction with the Post Office developed the 'director'.
This is a piece of equipment designed to 'direct' telephone calls through the complex network of circuits linking telephone exchanges in large cities.

1927 Regular telephone service between Britain and the USA began on 7th January using radio.

The first director exchange was used at Holborn, London.

1928 The first high-frequency radio telephone link between Britain and the USA opened in June.

1929 The development of the immersed electrode principle in transmitter design and advances in plastics technology, made it possible for the Post Office to introduce a new telephone with a plastic case and a handset suitable for all types of exchange.

The Post Office decided to adopt the teleprinter as the standard instrument for inland telegraph circuits.

1930 The radio-telephone service was opened to Australia, Buenos Aires and Capetown.

1931 The page printing teleprinter (the teleprinter 7B) was introduced by Creed.

The first voice frequency telegraph system with 12 carrier channels was installed between London and Dundee.

1932 The International Telecommunication Union (the oldest of the inter-governmental organisations which form the specialised agencies of the United Nations) was created from the International Telegraph Union and the International Radiotelegraph Union.

The Post Office introduced the Telex Printergram service.

The first ultra-short-wave radio telephone link, used as part of the inland telephone network, was set up across the Bristol Channel, over a distance of 13 miles.

The first submarine cable for carrier working was laid from Britain to La Panne in Belgium. It contained 120 wires arranged as 4-wire circuits and provided ninety telephone circuits using one-plus-two carrier equipment.

The Post Office introduced trunk service on demand, relieving telephone users of the need to book trunk calls in advance.

The Post Office introduced telephones with anti-sidetone induction coil (see 1920 entry).

The first British experiments in carrier telephony were carried out using the London-Derby cable.

1933 Imperial Chemical Industries Ltd. discovered Polyethylene, or Polythene, as it has become known. This material, because of its low dielectric constant, became widely used for submarine cable insulation and for many other purposes in telecommunications.

1934 H. S. Black, an American, formulated the principle of negative feedback revolutionising the design of telephone receivers.

On the 1st October, the Post Office introduced cheap night rates for trunk telephone calls as part of the Kingsley Wood (the then Postmaster-General) plan for advertising and popularising the telephone.

1936 A specially designed 12-channel carrier cable between Bristol and Plymouth was laid by the Post Office.

The Post Office laid the World's first coaxial telephone cable between London and Birmingham.

The Post Office extended the Telex service to give a limited service to the Continent.

1937 The '999' emergency telephone service was introduced in London and later extended throughout the country.

A pair of coaxial submarine cables was laid between Britain and Holland.

1938 The first Administrative Telegraph and Telephone and Radio Conferences of the new International Telecommunication Union were held in Cairo.

Pulse Code Modulation (a telephone transmission system) was invented by an Englishman, A. H. Reeves.

1943 The first submerged repeater was laid. It was inserted in a submarine coaxial cable between Anglesey and the Isle of Man.

1945 The West Country space expert, Mr. Arthur C. Clarke, in an article in the 'Wireless World' was the first to suggest using synchronous satellites for communication.

1948 The Bell Telephone Laboratories, USA, announced the invention of the transistor.

1950 The first long-distance television cable was brought into service in October between London and Sutton Coldfield.

1951 Post Office research engineers evolved an entirely new type of deep sea telephone cable. Known as lightweight submarine cable it had a steel strand in the centre instead of the conventional layer of steel armour wires on the outside. This lightweight type of cable was both cheaper and easier to lay.

1953 Agreements were signed on 1st December between the British Post Office, the American Telephone and Telegraph Company, the Canadian Overseas Telecommunication Corporation and the Eastern Telephone and Telegraph Company for the provision of the Transatlantic Telephone Cable.

1954 A new inland Telex service was established using a separate network integrated with international Telex circuits.

A submarine telephone cable was laid between Aberdeen and Bergen, Norway. This cable, 300 nautical miles in length was, at the time it was laid, the longest submarine cable in the World.
The cable was laid by the Post Office cable ship HMTS 'Monarch' No 4.

1956 The first transatlantic telephone cable was laid between Oban in Scotland and Clarenville in Newfoundland, a distance of 2,240 miles. After crossing Newfoundland, a further submarine cable was used to complete the connection to the mainland of North America ; some of the circuits terminating in Canada and some in the USA. The Post Office cable ship HMTS 'Monarch' participated in the lay.

1958 On 5th December, Her Majesty the Queen inaugurated the Subscriber Trunk Dialling service by making a call from Bristol Central telephone exchange, the first to have STD facilities.

The first automatic Telex exchanges were opened at Shoreditch (London) and Leeds.

1959 The trans-Atlantic telephone cable (TAT 2) was laid by the Post Office cable ship HMTS 'Monarch'.

1960 An experimental electronic telephone exchange was opened at Highgate Wood (London).

The conversion of the inland Telex service to automatic working was completed.

1961 The Anglo-Canadian cable (CANTAT 1) was laid by the Post Office cable ship HMTS 'Monarch', as the first section of the submarine telephone cable network linking the Commonwealth. This was the first time that the lightweight submarine cable, developed by the Post Office in 1951, was used in service.

1962 The Post Office Satellite Communications Station at Goonhilly Downs began working. The station was designed to track communication satellites and, through them, transmit and receive telephone, telegraph and television signals. The station used a British designed dish-type aerial which was the first of its type. Dish-type aerials were later adopted throughout the World for satellite communication. The station took part in the first trans-Atlantic television transmission made via an artificial satellite – Telstar.

Telstar was the first broad-band active communications satellite and was launched into orbit from Cape Canaveral (now Cape Kennedy) on 10th July. It circled the earth once every 158 minutes at a height of between 600 and 3,500 miles. The day after it was launched, Telstar was used to transmit the first high-definition television pictures across the Atlantic.

1963 On 8th March, International Subscriber Trunk Dialling (ISD) was inaugurated allowing London subscribers to dial Paris numbers.

The Commonwealth trans-Pacific cable (COMPAC) was laid between Canada and Australia.
The Post Office cable ship HMTS 'Monarch' participated in the lay.

1965 Intelsat 1 (Early Bird) the first commercial communications satellite was launched into a synchronous orbit of 22,300 miles on 6th April.

The Post Office introduced the Datel services.

The Prime Minister, Mr. Harold Wilson, opened the Post Office Tower in London, Britain's highest building. The Tower was designed to carry aerials for the Post Office micro-wave network covering some 130 stations throughout the country including the Post Office satellite earth station at Goonhilly; the Tower is the focal point of this network.
The Tower and the four storey building below are equipped to handle 150,000 simultaneous telephone connections and provide 40 channels for black and white or colour television.

1966 The first fully-operational production electronic telephone exchange in Europe (the first small-to-medium sized one in the World) was opened at Ambergate, Derbyshire. This was a TXE2 reed relay exchange.

1967 The final section of the South East Asia Commonwealth (SEACOM) cable linking Australia, Hong Kong and Singapore became operational.

1968 The Post Office installed the World's first Pulse Code Modulation exchange at the Empress telephone exchange in London.

1969 The Post Office ceased to be a Government Department and became a Corporation on 1st October.

The second aerial at the Post Office Satellite Communications Station, Goonhilly Downs, was completed.
The station could then communicate simultaneously with satellites over the Atlantic and the Indian Oceans. In July, Goonhilly was the European terminal for the television coverage of Man's first steps on the moon at the time of the Apollo 11 moon landing.
(A third aerial is planned for completion by the end of 1972).

1970 The World's first telephone directories produced by a fully integrated computer printing process, were completed for the Post Office in January.

The International Subscriber Trunk Dialling service was extended to allow London subscribers to dial New York numbers— the World's first major inter-Continental subscriber dialling service.

The 100th electronic telephone exchange (TXE2) was opened at Bawtry near Doncaster.

1971 Trans-Atlantic dialling was extended. Six British cities : Birmingham, Edinburgh, Glasgow, Liverpool, London and Manchester were able to dial direct to the whole of the mainland of the USA by dialling 0101 followed by the USA area code and local number.

In July the Post Office announced the development of the one-plus-one subscribers carrier system by means of which two subscribers can speak simultaneously on one line.

The Post Office has provided the Inner London Education Authority schools' television network. 1,300 schools and fifty universities or colleges are now connected to the 7 channel VHF system which is already the largest CCTV system in Europe. Other Post Office educational CCTV networks include ones at Plymouth and Dover. Distribution systems have been installed at various universities including Salford, Leeds and Heriot-Watt.

Further sources of information

As you know, there are wider benefits to be gained from doing project work quite apart from the knowledge you acquire about the specific subject you are studying. You add to your experience by undertaking your own research ; by learning to be selective about the material at your disposal ; by attempting to achieve a high degree of accuracy. You learn too, to familiarize yourself with the resources of libraries, museums and other institutions.
Here are a bibliography and a list of some places we suggest you visit to further your knowledge of telecommunications.

Some books to read

Do not be discouraged because you find that many of the books on telecommunications subjects are very technical.
These are intended for engineers.
Below is a selection of books you will be able to understand.
There are, of course, many others.

Title	author	publisher	date	SBN
From Semaphore to Satellite	Michaelis, A R	International Telecommunication Union	1965	
Words and Waves An Introduction to Electrical Communications	Beck, A H W	Weidenfeld and Nicolson	1967	
A History of Electrical Engineering	Dunsheath, P	Faber	1969	571 09072 9
An Illustrated History of Science	Taylor, F S	Heinemann	1956	
The Post Office from Carrier Pigeon to Confravision	Martin, N	Macmillan	1968	460 066021
A Biographical Dictionary of Scientists	Williams, Trevor I (edited by)	A & C Black	1969	7136 0924 9
Great Pioneers of Science	Shepherd, W	Ward Lock	1964	
Chambers Biographical Dictionary	Thorne, J O (edited by)	Chambers	1969	550 16001 9
Oxford Junior Encyclopaedia Vol. 4 : Communications (distribution of news) Vol. 8 : Engineering (electrical engineering)		Oxford University Press	1961 1964	
*The Story of the Telephone (Tele Ed 3)		Post Office Telecommunications Publicity Division Education Service	1970	
*Ring Around the World (Tele Ed 18)		– do –	1971	
*Radio and the Post Office (Tele Ed 19)		– do –	1971	
*List of Books for Students (Tele Ed 21)		– do –	1971	

*These Post Office publications are free of charge. Ask your teacher to write to the Telephone Manager's Office which serves your school. The request will be passed to the Regional Public Relations Officer for your area.

Teachers can also obtain the following free of charge wall charts for telecommunications projects :
Post Office International Telecommunications Services (Tele Ed 2) ;
The Routing of a Trunk Call (Tele Ed 15) ;
The Post Office's Microwave Network (Tele Ed 16) ;
The Post Office Tower (Tele Ed 17).

Some places to visit

Post Office Telecommunications Buildings in London : Post Office Tower Faraday Building *Continental, International and Inland Trunk Exchanges* Fleet Building *London Inland Telegraphs* *International Telex Exchange* *Telecommunications Museum* (*see below*) Electra House *Overseas Telegraphs*	A leaflet 'Visits to Post Office Telecommunications Buildings in London' (PH 1623) can be obtained by writing to : The Regional Public Relations Officer London Telecommunications Region Camelford House Albert Embankment LONDON SE1 The leaflet gives details of admission times, duration of visits, acceptable size of school parties, age limits, etc.
Post Office Museum of Telecommunications Equipment and Techniques Fleet Building 40 Shoe Lane LONDON EC4A 3DD	Details are given in the above-mentioned leaflet.
Post Office Telecommunications Museum Taunton Somerset	This is a small museum which is not normally open to the public but visits can be arranged by writing to : The Telephone Manager (E3/1) The Crescent TAUNTON Somerset There is no age restriction but parties should not exceed ten in number. At least two weeks' notice should be given.
Telephone Exchanges	You should be 14 years or older but exceptions are sometimes made in the case of groups of students accompanied by a teacher or youth group leader. Contact your local Telephone Manager's Office.
The Science Museum Exhibition Road LONDON SW17	It is hoped that the new Telecommunications Gallery will be open for visitors by the end of 1971. Please apply to the Museum for details about times of admission, age restrictions, school parties, lectures, etc.

Good luck with your project!

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