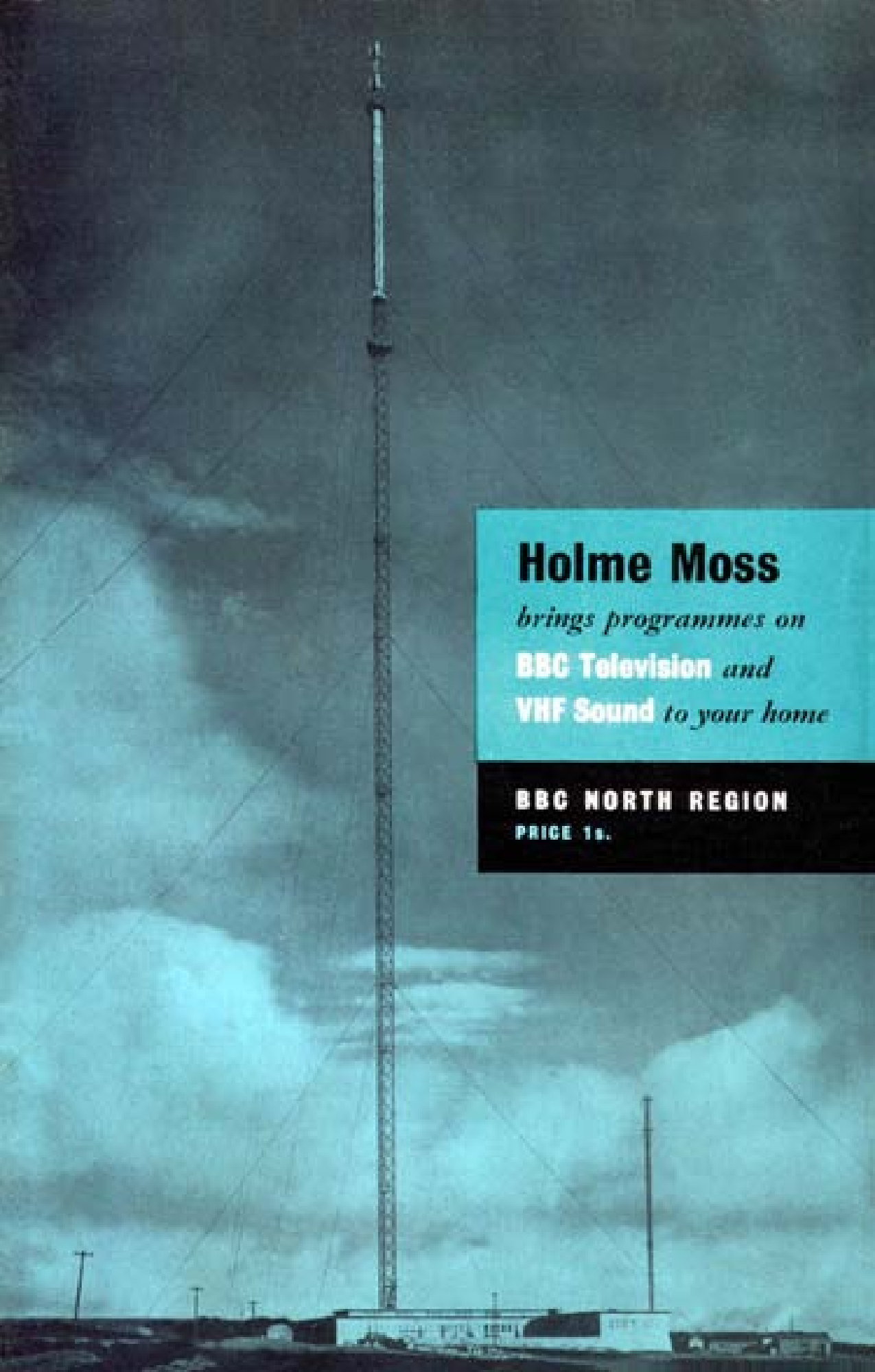


Holme Moss

brings programmes on

BBC Television *and*

VHF Sound *to your home*

BBC NORTH REGION

PRICE 1s.

BBC Television

More than Twenty-five Years of progress

The first regular public television service in the world was inaugurated by the BBC on 2 November, 1936. Experiments in television transmission had been undertaken since 1929.

The public service began with one hour of broadcasting in the afternoon and an hour in the evening and was confined to the London area where there were fewer than 300 receiving sets. There were about 20,000 sets when the service had to be suspended on 1 September, 1939, just before the outbreak of war. When it was resumed in June, 1946 the number of receivers grew swiftly until in 1951 there were over a million.

As television transmitting stations were erected in the provinces—first at Sutton Coldfield to serve the Midlands, then at Holme Moss for the North of England—the number of sets increased by leaps and bounds. The coverage by BBC Television has steadily increased until now 98·8 per cent of the United Kingdom population is within its reach. There are well over 11,000,000 licences of which more than 3,500,000 are in the north of England.

There are four main television stations to serve North Region—at Holme Moss, Pontop Pike in County Durham, Sandale in Cumberland, and Douglas in the Isle of Man—and in addition satellite television transmitters, to extend the coverage even further and to provide better reception in difficult areas, similar to the one already in operation in Sheffield, are planned for the Morecambe Bay (Barrow), Scarborough and Skegness areas, and others are projected.

Besides the new Television Centre in London—the most up-to-date centre in the world specially designed for television—and other London studio locations, there are television studios in many parts of the country. North Region has studios in Manchester and Newcastle-upon-Tyne, and from these and outside broadcast points programmes are contributed to the television network.

The BBC was not only a pioneer of public service broadcasting but has always been in the forefront of programme and technical development. Eurovision and Cablefilm across the Atlantic are just two examples of BBC pioneering. It looks ahead to even more exciting and adventurous experiments and developments.

KENNETH ADAM, *Director of Television Broadcasting*

Holme Moss Transmitting Station

High on the Pennines, just within the Yorkshire boundary with Cheshire and alongside the road which drops steeply to Holmfirth on one side and the Woodhead reservoirs on the other, the Holme Moss transmitting station was opened on 12 October, 1951. It is the highest television station in the country, with its 750-foot mast on a moorland site of 160 acres more than 1,700 feet above sea level.

The television transmissions are on channel 2 and serve an area with a population of about 13,000,000, extending from the North Riding of Yorkshire to the Cumberland coast in the north and to a line running from the Wash to North Wales in the south.

Vision signals reach Holme Moss by coaxial cable from Manchester, which is on the BBC's main national television programme distribution system and is connected to London by coaxial cable via Birmingham. The sound component of the television programmes reaches Holme Moss by way of normal Post Office 'music' lines.

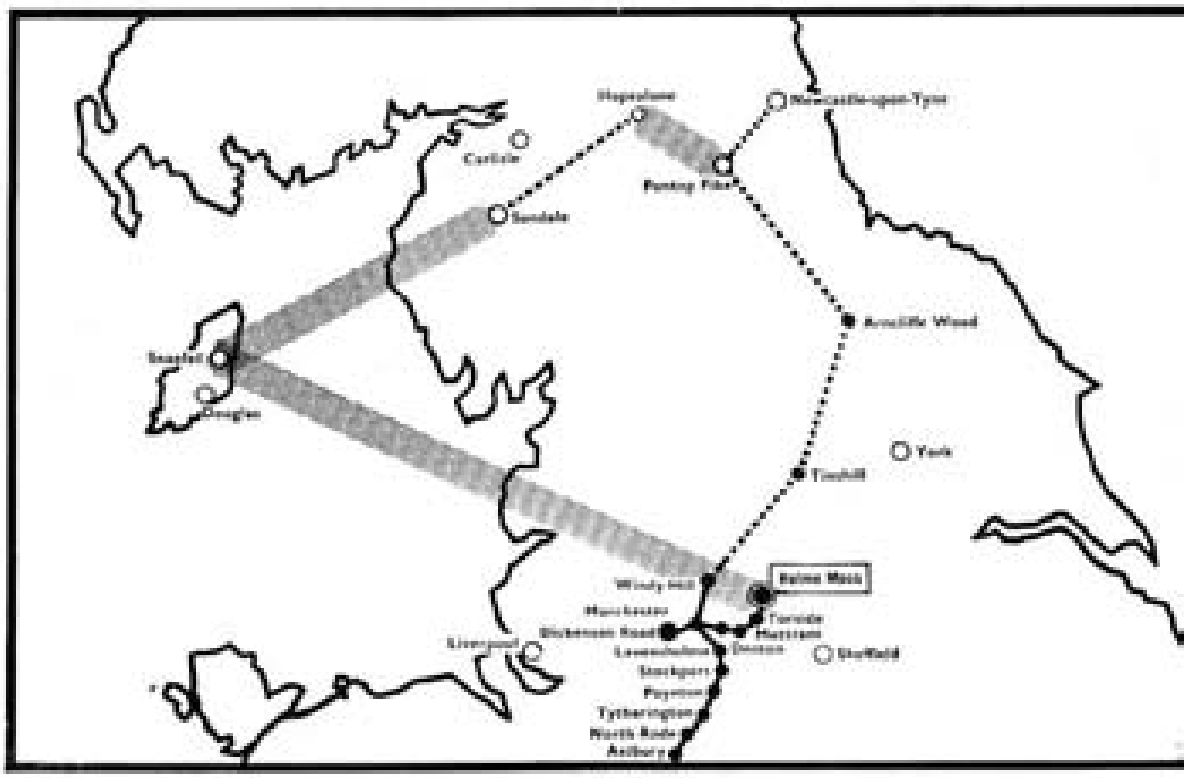
The VHF sound broadcasting transmitters came into regular service on 10 December, 1956, providing the most extensive VHF coverage in Britain in area and population. The coverage is almost as great as that of television.

North of England Home Service, Light, and Third Programme (with Network Three) are transmitted on VHF.

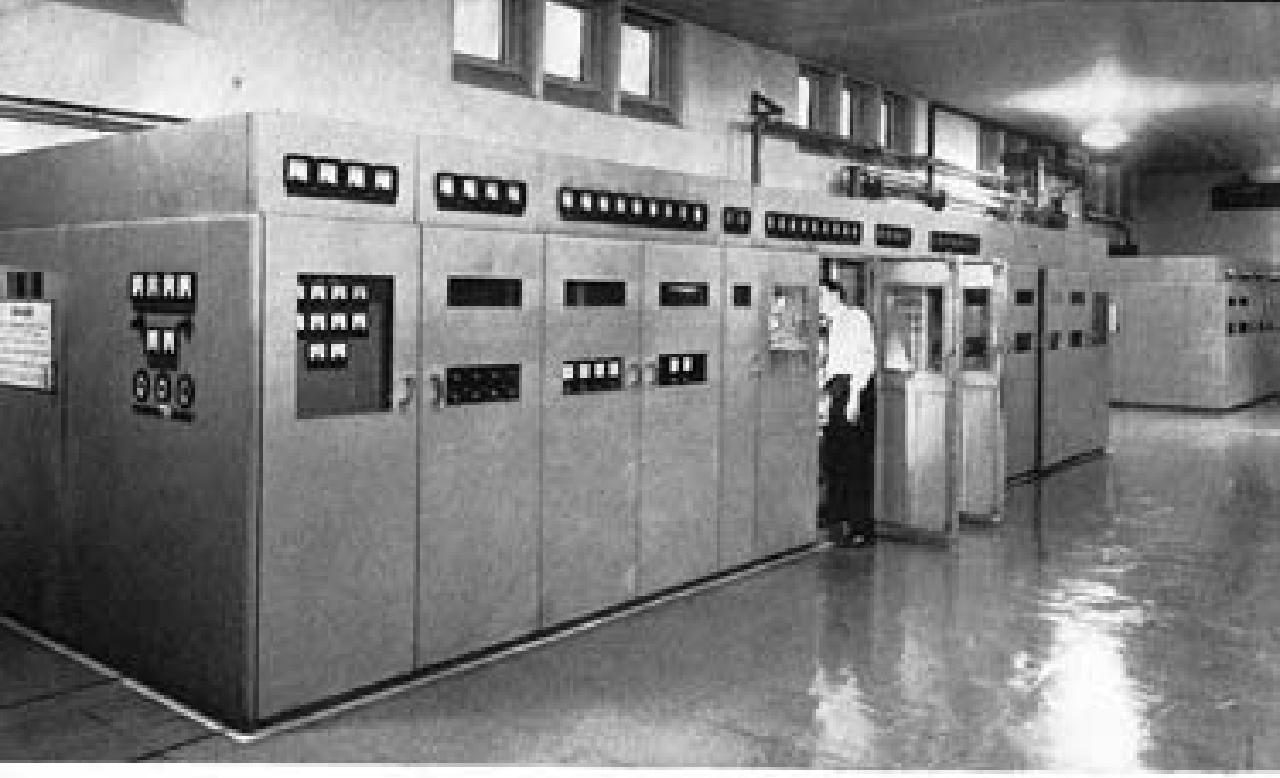
The station building is specially designed to suit the landscape and to resist the severe weather experienced during the winter at this exposed altitude: besides deep snow, gusts of wind of 120 m.p.h. have been recorded. The walls are faced with local stone and all external windows are double-glazed for thermal insulation. Often Holme Moss is in glorious sunshine, with the mast reaching to a clear blue sky, when the valleys below are lost in mist, but at times access to the station is barred by snowdrifts and provision is made for the staff to sleep on the premises. There is a well-equipped kitchen.

The station is designed to withstand the worst of weathers, squat and sturdy in stone which harmonizes with the countryside. The BBC crest over the door was carved by a local craftsman. In some winters the staff is marooned by snow and ice. The picture below shows three members bringing provisions through deep drifts.

The BBC Television system



Television signals on the BBC network distribution are transmitted by cable from London to Holme Moss. The transmitter in the Isle of Man receives its signal by direct radio reception from Holme Moss and/or Sandale and rebroadcasts it on another channel. The Pontop Pike transmitting station, which serves the north-east, receives its signal from Manchester by Post Office point-to-point radio link. The Sandale station receives its signal from Pontop Pike by way of the Post Office relay station at Hopealone, and the signal is sent on to Sandale by Post Office point-to-point radio link.



In the television transmitter hall the high-power vision and sound transmitters are arranged in line, facing the control room. Their combined outputs feed the aerial at the top of the mast through a 5-inch diameter coaxial feeder.
The operator at the control desk has a view of the transmitters through double windows (for sound insulation) and monitors the incoming and outgoing sound and vision by means of high-quality loudspeaker, picture and waveform monitors. The transmitters are switched and metered from the desk, and illuminated panels on the wall show switching sequences and also indicate fault conditions.

Holme Moss Masts and Aerials

The mast consists of a triangular section, 610 feet high, surmounted by a cylindrical section of 100 feet. This cylinder has eight tiers of four vertical slots, each covered by a perspex window, and these form the transmitting aerial for North Home Service, Light, and Third Programmes on VHF. The aerial for the television transmissions is supported on a 40-foot square section mast which surmounts the cylinder. The television aerial consists of eight folded dipoles in two tiers of four fitted with electrically heated de-icing gear.

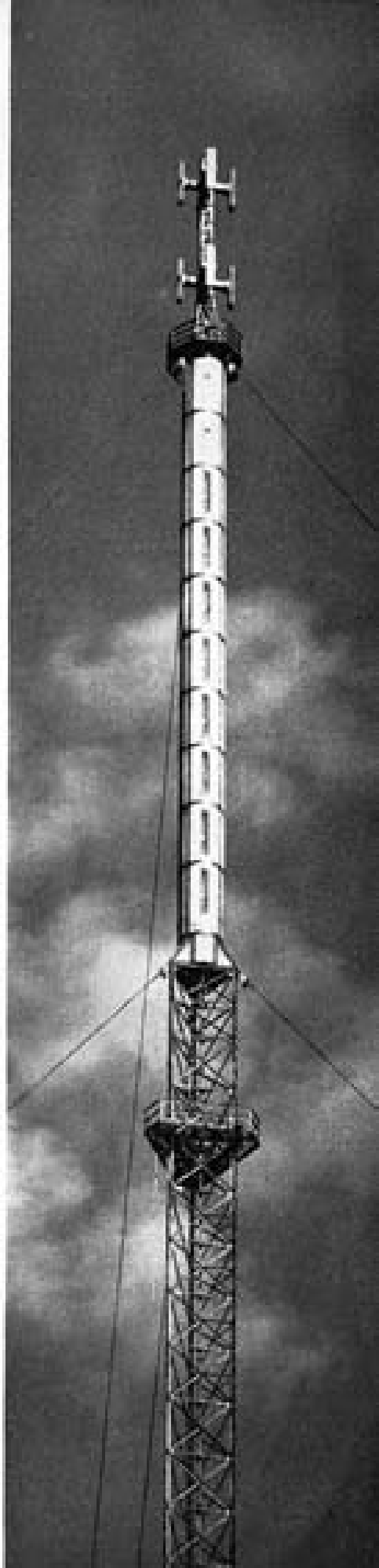
Twelve locked coil steel stays support the mast. They are in groups of four at the three corners, at 200 feet, 400 feet, 600 feet, and 700 feet from the ground, attached to reinforced concrete blocks set at various distances around the base of the mast. The whole mast structure is pivoted on a 2-inch diameter steel ball at the base to allow the mast some angular movement in high winds.

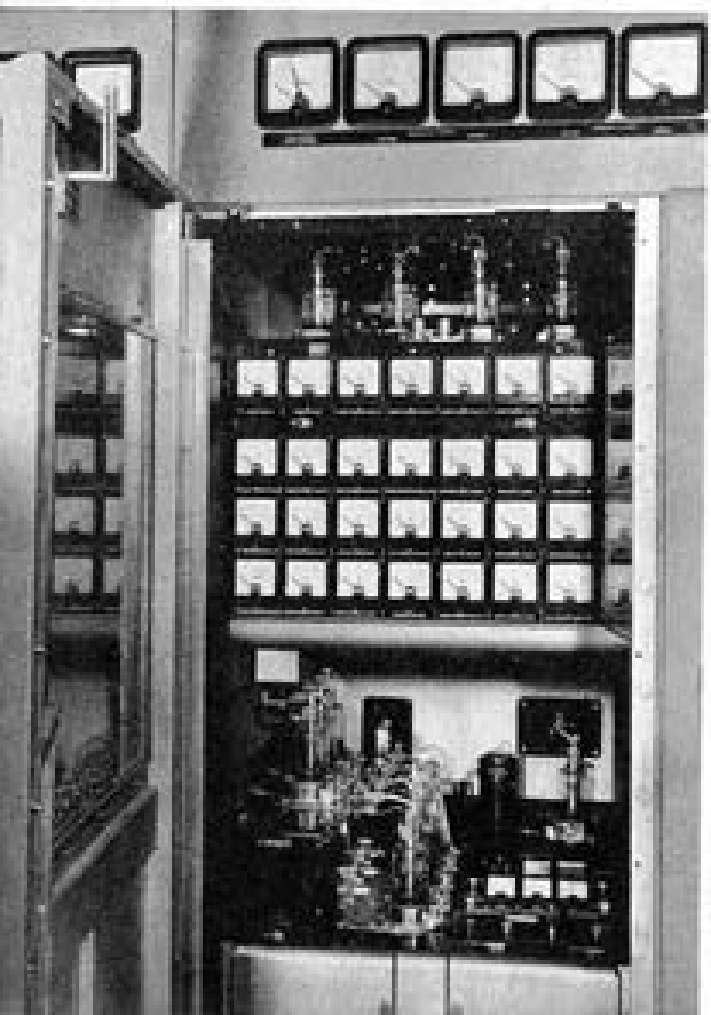
Ascent of the mast is by means of a ladder inside the framework, and an electric winch is installed for hoisting equipment.

Attached to the mast are other aerials ; for example, at 490 feet there are emergency transmitting aerials for use if a fault develops on the normal feeder and aerial system. At 580 feet are mounted television receiving aerials tuned to Sutton Coldfield and these are used in conjunction with a receiver in the main control room to provide a stand-by source for network programmes.

Also mounted on the mast at 600 feet are two remotely-controlled microwave 'dishes' for receiving television outside broadcasts which are then injected into the main distribution network.

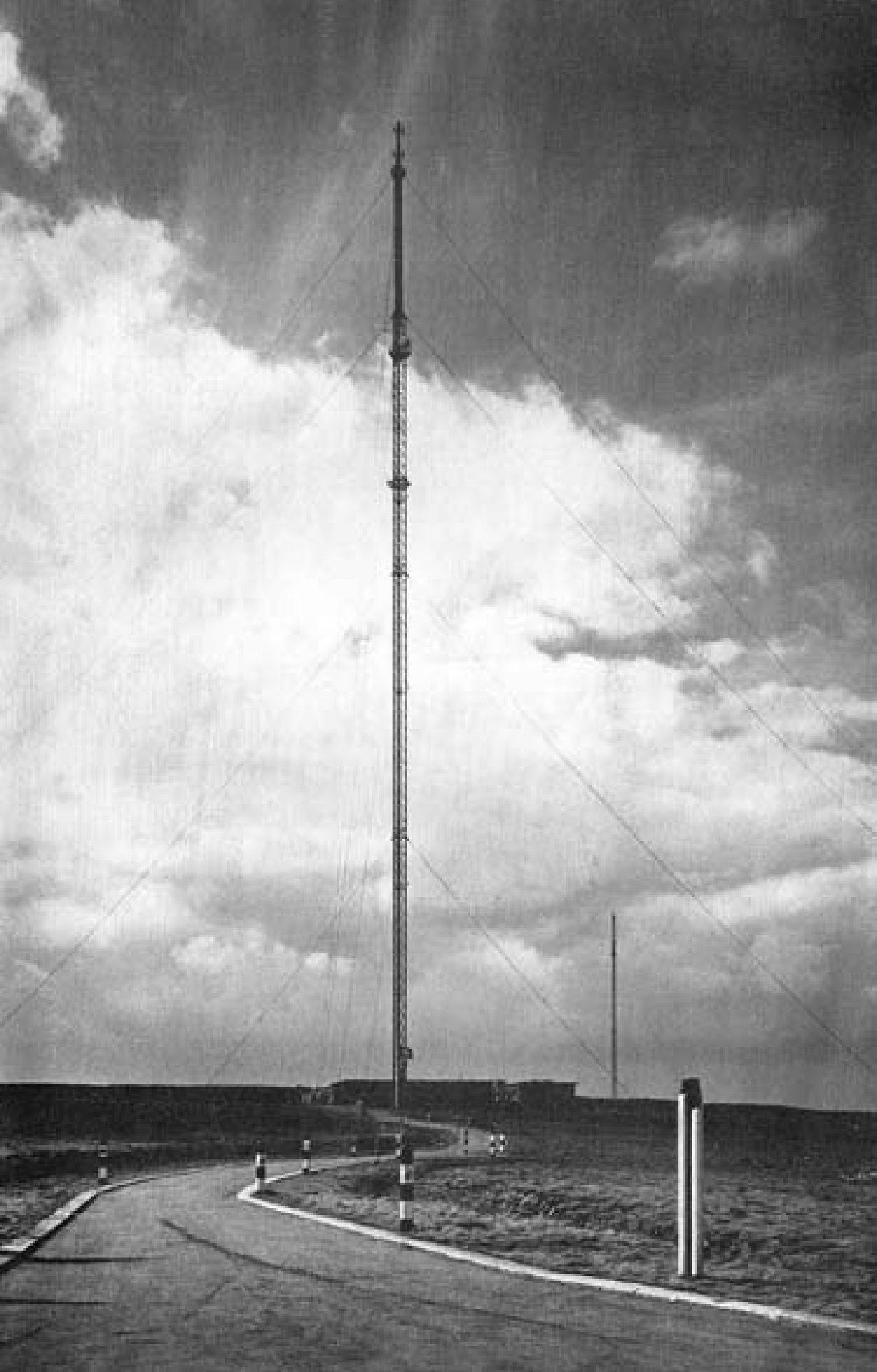
Warning lights for aircraft are fixed at 150 foot intervals, and these are continuously illuminated.

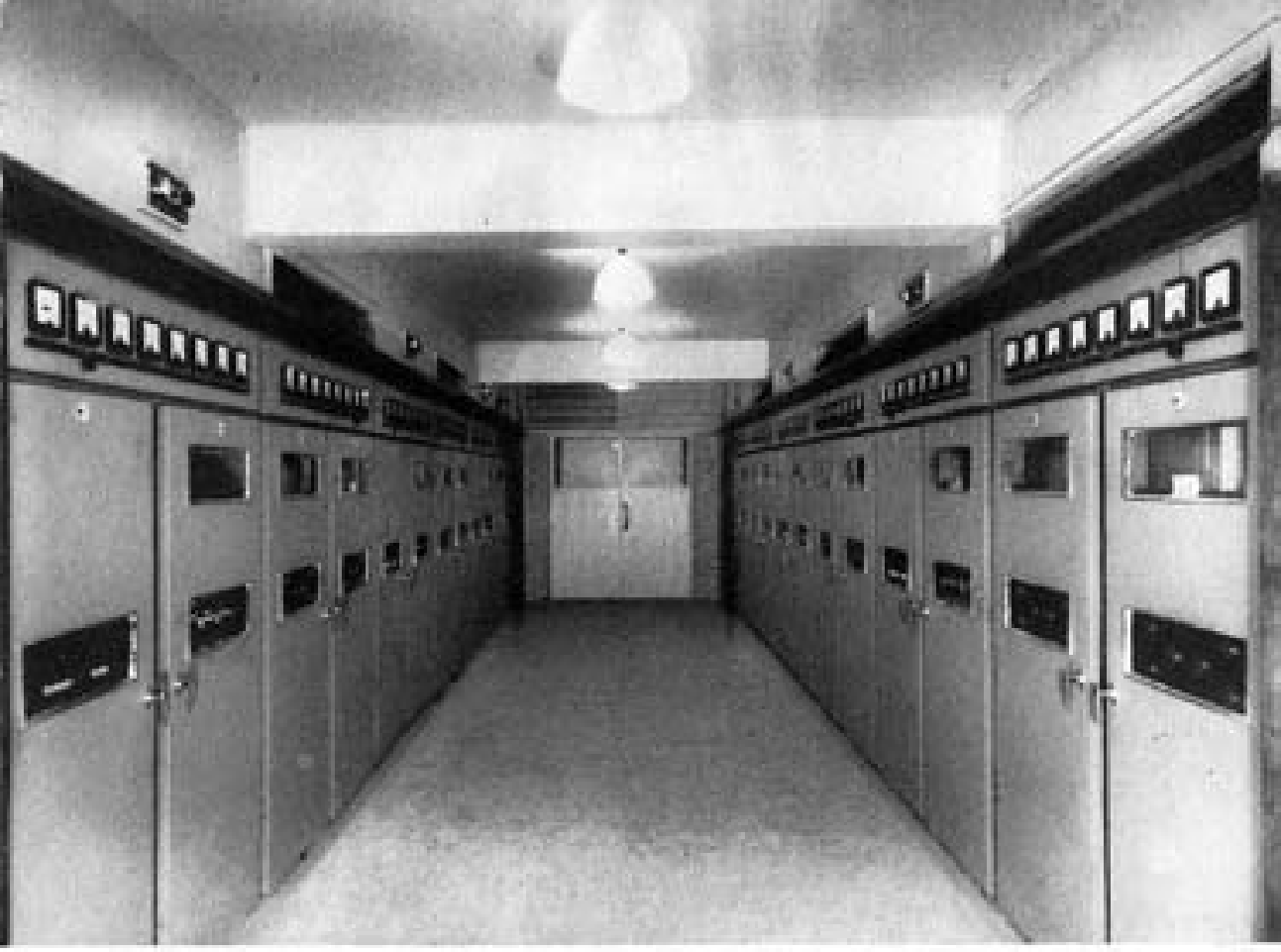


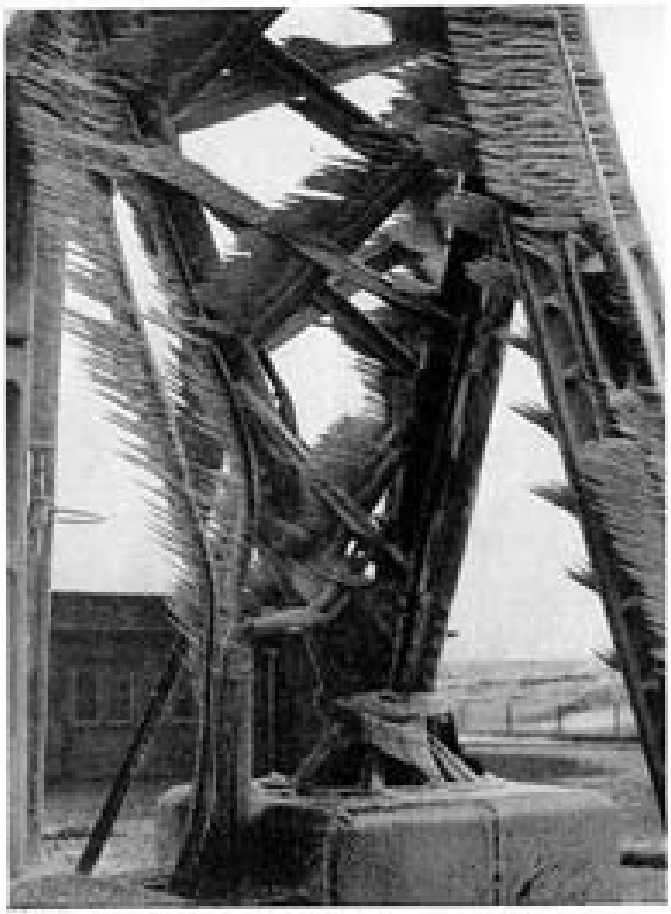


The medium-power standby transmitters are built as one unit and are controlled from a desk in the same room (above). It is possible, however, to switch them on from the main control room in an emergency so that a minimum amount of programme time is lost in the change over.

The high-power vision modulator (left) is designed so that many of the complicated units can easily be unplugged and replaced by spare units.







(above)
VHF Transmitter Hall

(left)
Weird designs are formed by wind and ice. Here the base of the mast is clothed in ice 'streamers' formed by wet fog clouds blown by a strong wind. From higher up the mast when this picture was taken ice fell in great masses of two to three hundredweights. Sometimes ice drops in showers from mast and stays.

VHF—FM

The letters stand for Very High Frequency, Frequency Modulation which, in non-technical language, means broadcasting on very short wavelengths and with a particular transmission technique to provide interference-free reception capable of high-quality reproduction. Holme Moss was the sixth of the permanent stations in the BBC's development plan for VHF Sound Broadcasting: now there are twenty-one serving 97 per cent of the population. Others are planned to complete the coverage.

In the Transmitter Hall there are six transmitters, two to each programme (Home, Light, and Third), and the outputs are combined in such a way that under normal conditions they feed the transmitting aerial via two three-and-a-quarter inch coaxial feeders, one to the top four tiers of slots and the other to the lower four. This arrangement of transmitters and aerial system ensures that a fault in any transmitter, or in part of the feeder-aerial system, does not result in loss of service to the listener—only a temporary reduction in power which is unnoticeable except towards the fringe of the service area.

The transmitters are designed to operate automatically—without staff in attendance—being switched on and off by time switches. The outputs are monitored electronically at Broadcasting House, Manchester, and at Moorside Edge sound transmitting station. If trouble occurs, a remote-alarm panel in the television control room at Holme Moss informs staff that investigation is required.

Water-cooled dummy aerials are provided for test purposes, and these can be used with individual transmitters or with the combined output if required.

To prevent moisture inside the coaxial feeder systems, these are fed under slight pressure with dry air from dehydrator cabinets.

Areas served by Holme Moss transmitters. (above: Television below: VHF) These join with those covered from Pontop Pike in the north-east and Sutton Coldfield in the Midlands.

Technical Notes

Vision and sound signals are carried to Holme Moss on cables provided and operated by the G.P.O., for which a rental is paid.

Sound programmes for television and the sound broadcasting services are carried on pairs of wires which are electrically screened to prevent induction from other circuits and to preserve the high-quality signal required.

The station is supplied with power at 11,000 volts by the Yorkshire Electricity Board. This supply is transformed down to 415 volts and fed to a low-voltage switchroom from which supplies are distributed to various parts of the building.

Emergency lighting can be provided, in the unlikely event of a complete failure, from a 120-ampère-hour battery which is switched into service automatically.

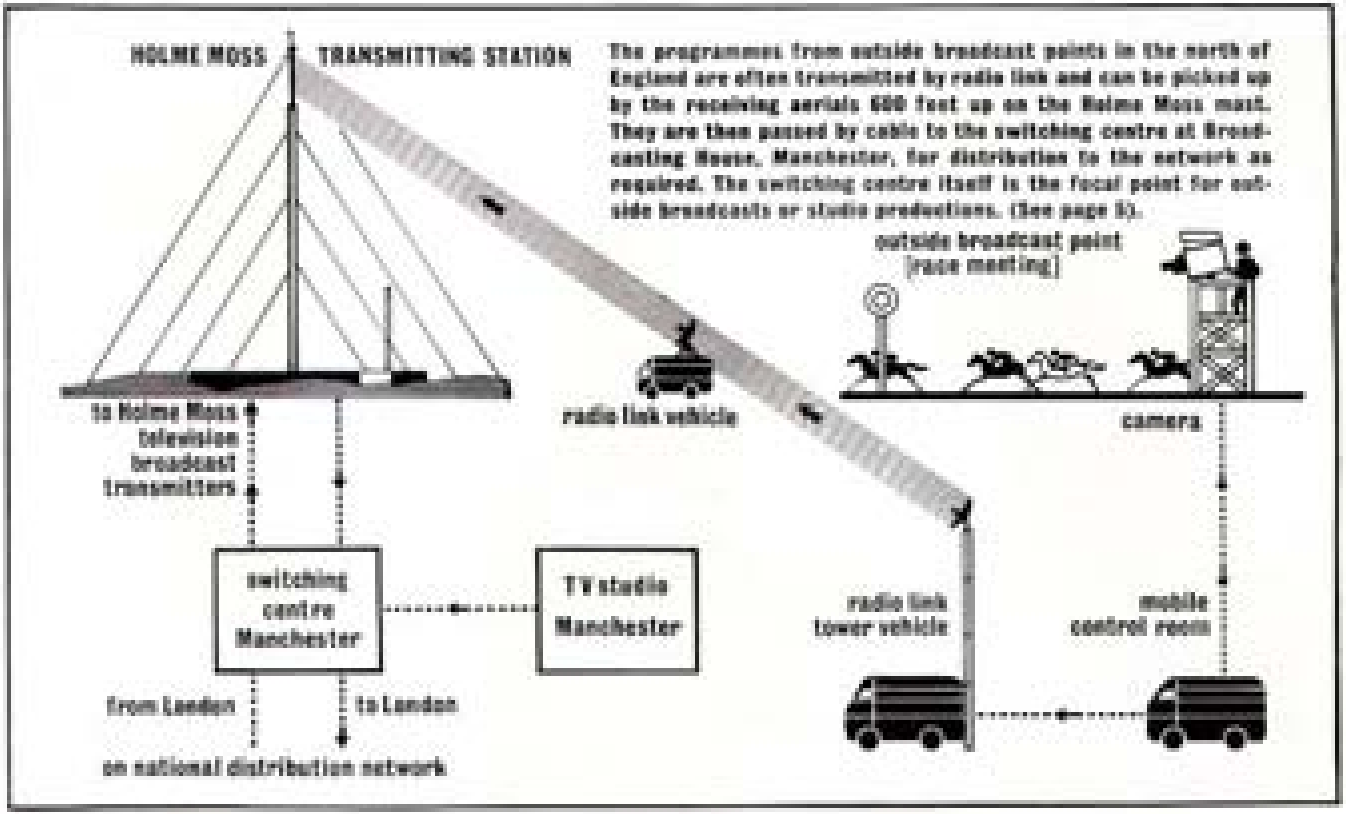
The high-power vision transmitter operates on a carrier frequency of 51·75 Mc/s and has a peak power output of about 50 kilowatts.

The high-power television sound transmitter has a carrier power output of about 12 kilowatts, operating on a frequency of 48·25 Mc/s. The transmitter is amplitude modulated in the final stage. The sound output is combined with the output of the vision transmitter and these signals are carried to the aerials by an air-spaced coaxial feeder five inches in diameter and equipped with sliding joints to overcome the effects of temperature changes. Similar feeders, but three-and-a-quarter inches in diameter, are used for the VHF transmissions.

The medium-power standby television transmitters are built as one unit and operate on the same frequencies as the high-power transmitters. The vision transmitter has a peak output of five kilowatts: the sound transmitter has a carrier output of one-and-a-quarter kilowatts.

The Holme Moss television signals are vertically polarized: the VHF sound broadcast transmissions are horizontally polarized.

The ten transmitters at Holme Moss were all manufactured by Marconi's Wireless Telegraph Co. Ltd., but the complete installations include many features which resulted from BBC design and development work. This applies particularly to the aerial systems and the automatic control and monitoring equipment for the VHF sound broadcasting transmitters.


HOLME MOSS TRANSMITTING STATION
The programmes from outside broadcast points in the north of England are often transmitted by radio link and can be picked up by the receiving aerials 600 feet up on the Holme Moss mast. They are then passed by cable to the switching centre at Broadcasting House, Manchester, for distribution to the network as required. The switching centre itself is the focal point for outside broadcasts or studio productions. (See page 5).
outside broadcast point (race meeting)
radio link vehicle
camera
to Holme Moss television broadcast transmitters
switching centre Manchester
TV studio Manchester
radio link tower vehicle
mobile control room
from London
to London
on national distribution network

Some Facts and Figures

Holme Moss is 1,720 feet above sea level on a site of 160 acres.

The television mast weighs 140 tons and is 750 feet high.

At the base of the mast are switches which enable the main or standby transmitters to be connected to the main or reserve aerials. These switches are operated hydraulically from the television transmitter hall.

610 feet up the mast is a cylindrical section of 100 feet for VHF transmissions.

Television transmissions began on 12 October, 1951: VHF transmissions on 10 December, 1956.

Television outside broadcasts may be picked up direct from outside broadcast points on the microwave 'dishes' up the mast. Signals are then fed to Manchester by the cable, where they are injected into the main television network. These 'dishes' can be turned in the required direction by remote control from ground level.

HOLME MOSS TRANSMISSIONS

BBC Television (Channel 2):		Vision—51·75 Mc/s
		Sound—48·25 Mc/s
VHF Sound:	North Home Service	—93·7 Mc/s
	Light Programme	—89·3 Mc/s
	Third (and Network Three)	—91·5 Mc/s

North Region

Besides Holme Moss, there are in the BBC North Region high-power television and VHF sound broadcasting stations at Pontop Pike in County Durham, Sandale in Cumberland, and Douglas in the Isle of Man. Satellite transmitters (taking their signals from a parent station and re-transmitting them in areas where reception is difficult) are planned for several areas.

There are ten medium-wave sound transmitters.

There are BBC television studios in Manchester and Newcastle-upon-Tyne. The main sound studios are in Manchester, Leeds, and Newcastle, and in addition there are small sound studios in Carlisle, Douglas, Hull, Lincoln, Liverpool, and Sheffield.