

show how this was done, on a large scale, between countries.

With all the new electrically operated devices threatening to spoil radio reception, manufacturers of filtering devices have been alert; so that there are few forms of interference that will not yield to one or another of these filters.

OF particular interest to dwellers in city districts where the lighting service is direct current, is a new product of a well-known manufacturing firm. So new is this, in fact, that as yet neither details or price can be obtained. It will prove an undoubted boon, however, as it is nothing less than a properly filtered and shielded miniature motor generator set; permitting the d.c. dweller to avail himself of the most modern of a.c. receivers.

Last but not least—perhaps to show the versatility of radio—was a device known as the Theramin, a totally new musical instrument for the home. An offshoot of radio, the demonstrations of this instrument at the show proved it to be capable of producing some really fine tone shadings, both volume and pitch being controlled entirely by proximity of the operator's hands.

PERHAPS the most important thing of all at the Radio Show (speaking now particularly of the Radio World's Fair at Madison Square Garden, New York) escaped the casual visitor entirely.

Seven years ago when broadcasting took the public by storm, the first attempt at a public showing of radio apparatus on the Hotel Pennsylvania roof in New York was swamped, and from the attendance figures at the various shows throughout the country it may be seen that radio interest is far from being on the wane.

AN experimental short-wave station situated in Holland recently broadcast a special programme of Dutch national dance songs on an ultra-short wave-length for relay in the United States. The programme was relayed through 29 American stations from Boston to San Francisco and from Florida to the Canadian frontier. This broadcast, which was completely successful, will probably be the forerunner of a series of trans-Atlantic exchange programmes.

Germany's Radio Capital

A Comprehensive Plant

GERMANY to-day is said to possess the most extensive wireless station in the world. This is situated at Nauen, some 20 miles from Berlin, and it was here that the first commercial wireless company in Germany erected its original plant. In the early days of radio communication it was mistakenly believed that the longer the wave-length or lower the frequency used, the greater would be the distance over which the transmissions could be heard, and the Nauen station was equipped accordingly.

In 1919 a world congress decided that the best way to keep amateurs from disturbing official communications

The Regional Scheme in England

"Brookman's Park" Transmitter

LATE in September the first of the B.B.C.'s new regional transmitting stations for the provision of alternative programmes commenced broadcasting. By the adoption of the regional scheme, the B.B.C. hopes to bring the whole of England within crystal range of one of their stations.

In fulfilment of this object the present broadcasting network of stations is gradually being replaced by a number of powerful transmitters strategically situated throughout the country. The first of these new stations to commence broadcasting is located at Brookman's Park, a few miles north of London.

The buildings which comprise this station are situated in a flat field of some 30 acres in area. At the four corners of the field are steel masts, which are of the lattice tower type and are insulated from earth at the base. The masts are only 200 feet high—much lower than the height which would have been chosen from an engineering point of view. Unfortunately, there are Air Ministry limitations on the height of masts which may be erected near London. Other regional stations throughout the country, however, will have masts which will probably be about 700 feet high.

The distance between each of the masts at Brookman's Park is 600 feet, and there are 900 feet between the building and each aerial. There is an electrically lit red lantern at the top of each mast which serves to warn aircraft attempting to land in the neighbourhood. Below the centre of each aerial is a small, square, stone building, containing the feeder system, coupling the feeder wires from the main building to the aerial itself, and underneath, radiating from this building is the earth system consisting of a number of wires buried one foot below the surface of the ground, the ends of the wires forming an oval extending about 200 feet on each side of its par-

ticular aerial, and 150 feet beyond each mast.

The power-house itself contains four 300 horse-power Diesel engines, to each of which is coupled a direct-current dynamo generating 220 volts. These engines, which are each of six cylinders, are mounted on a single bed of concrete which is so constructed that vibration cannot be transmitted to other parts of the building. The supply is direct current at 220 volts in order to make possible the use of a "buffer" battery. The storage battery has a capacity of 2000 ampere hours, and is intended to supply current when the transmitters are not running. The main motor generator room contains six large motor generators besides smaller ones.

While the station is running on full load two motor generators will be in use—one for each transmitter, while the third will act as a spare for either transmitter. The other three large machines in this room are for heating the filaments of the transmitting valves. It is interesting to note that while the average wireless set absorbs about .5 ampere to light the valves, the transmitting valves at this new station absorb 2600 amperes!

The transmitters normally deliver 30kw. to each aerial and employ modulation at low power. There is first a drive stage, for which special precautions are taken to keep the frequency constant to within about 200 cycles. The output from the drive valve is applied to the separator stage, after which comes the modulated amplifier. This is the stage at which the modulation takes place, and the power level is approximately 1kw.

Next to the main transmitter hall are two control rooms where the programmes are received on the land-lines running to the studio at Savoy Hill. These two rooms, one for each transmitter, contain all the necessary amplifiers and controlling gear, while the lines to Savoy Hill are underground all the way to ensure constancy of performance and reliability. In these control rooms are also small receiving sets built-in so that the modulation can be tested as received from the aerial of each transmitter, as well as controlled and watched in the ordinary line circuits.

Everything has been done to make the station as up to date and as per-

Wireless News

BY one of those delightful hazards which achieve more than the most carefully-thought-out plans, the song of a Canadian robin was recently broadcast to the infinite pleasure of many bed-ridden radio enthusiasts and thousands of others. During preparations for a broadcast by CNRM (Canadian National Railways, Montreal), the microphone was placed near the open window. On the ledge a Canadian robin perched and commenced to chirp, finally bursting into full song. Holding their breath and moving on tiptoe the personnel of the studio performed the necessary operations for sending the impromptu concert into the ether. The red-breasted songster concluded its recital with a satisfied chirp, and did not even return for its recompense, which, in the form of a feast of crumbs, lay untouched on the window-ledge for days.

AN innovation in electioneering was seen last May during the British General Election, when speeches made by the leaders of the political parties were retransmitted by landline and heard simultaneously in a number of different towns. Such a scheme had, however, never been adopted by a commercial firm until recently, when speeches made at a trade luncheon given in London by a well-known radio manufacturing firm were relayed by wire to six large provincial cities. Not only were those actually attending the luncheon enabled to hear the speeches made, but by means of microphones suspended in front of the speakers and connected to long-distance telephone lines the proceedings were followed with the utmost ease by similar trade gatherings in provincial centres over 300 miles from the capital city.

fect as possible, and there is no doubt that it is a wonderful achievement from a technical point of view, and also from the point of view of appearance, for the station is systematically and artistically laid out. The cost of this modern wonder is stated to be under £150,000, and its opening marks the beginning of a most important era in the history of British broadcasting.

The mighty maze of aerials at Nauen, with its 12 high masts, two of them 853 feet high each, seven others each 690 and the other three each 492 feet high, is by now almost anticipated, so rapid has been the advance of technology. The great masts are now used only for the two long-wave senders, which chiefly take care of communication with America and the Far East. Between them stand the new masts, only about 65 feet high, from which are strung the aerials for short-wave sending. These look but little different from the telegraph wires along the neighbouring railroad line.

Two somewhat larger nets of aerials, hung from masts 245 feet high, are being built for the service to North and South America. These aerials are so directed toward the destination to be reached as to prevent the waves from going backward around the earth. With a wave-length of 15 metres by day and 25 to 30 by night, they take

care of the entire short-wave traffic, above all to South America, Siam, Manila and Cairo. This short-wave traffic will soon be extended to Mexico, and perhaps also to the British dominions, in case an agreement can be reached with the British Government.

UNDERNEATH the great web of aerials stands the station's power plant—for all the world like a great spider in the middle of its net. Here the great generators hum their monotonous song, bringing the electrical current up to the vast tension of 120,000 volts for the two long-wave senders. They run day and night without ceasing. One of them has been running ever since 1916, with a pause of but four hours per week.

Every transmitter at the Nauen station is operated from the central office at Berlin. Thus the station requires only sufficient employees to

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