Zeesen Short Wave Transmitter

WEEKLY reports of reception of Zeesen station appear in these columns, so the following technical description (from "World Radio") will be of interest.

Designed for the purpose of world-wide broadcasting, the new short-wave transmitter at Zeesen has recently completed a series of experimental transmissions extending over several weeks, and is now operating on a regular schedule, relaying the Konigswusterhausen programmes from seven o'clock (G.M.T.) each evening. The apparatus of the new station is actually accommodated in the same building as the Kinigswusterhausen long-wave transmitter, and the aerial employed, a single wire approximately 55 metres in length, is attached to one of the existing masts which support the larger aerial.

Like the apparatus of the long-wave station, the new transmitter was constructed by the Telefuken Company, and is very similar in general design to the powerful short-wave stations recently built at Nauen and Buenos Aires, by means of which telegraph, telephone, and picture transmission services are maintained between Germany and the Argentine. The power rating of the new station—i.e., the power in the aerial when the transmitter is operating, but no modulation applied to the carrier wave—is 8 kilowatts, and the normal wavelength is 31.38 metres.

Arrangement of Apparatus.

THE transmitter comprises seven stages, the crystal control of oscillation frequency being applied to the first stage. The desired short-wave is obtained by selecting a harmonic of the crystal frequency—which, for practical reasons affecting the reliability and life of the crystal, is lower than that corresponding to a wavelength of 31.38 metres—and amplifying and filtering the selected harmonic frequency in succeeding stages until the desired wavelength as well as the required power are eventually reached. Naturally, the valves used are of increasing power-handling capacity in progressive stages, from the ordinary type of power amplifying valve in the first stage to two 1,500-watt power valves in parallel in the fifth and sixth stages, at which latter point modulation is applied via three power valves operated in parallel. The seventh, and final, stage consists of two 20-kilowatt water-cooled valves connected for "push-pull" amplification.

Power Supply.

THE various types of valves employed necessitate different supply voltages. Power is obtained, initially, from the main station transformer, which is fed from outside power mains. The two water-cooled valves in the last stage are fed with anode current at 10,000 volts, generated by a high-tension, direct-current dynamo of 50-kilowatt capacity. Anode current for the valves in the fifth and sixth stages is supplied by a 4000-volt, 5 kilowatt machine, while the remaining stages, with the exception of the crystal-controlled oscillator, which has its own 220-volt, direct-current generator, are supplied from yet another direct-current dynamo at 2000 volts, the power rating of this machine being 2 kilowatts.

For filament heating there are provided two separate dynamos: one giving up to 5 kilowatts at 40 volts, and the other giving 2 kilowatts at 20 volts. In addition a special machine is provided for the filament heating of the modulator valve. Grid bias for the two large output valves (seventh stage) is obtained from a special 750-volt, 2-kilowatt converter.

Control arrangements throughout the station are of the most modern type; all the generators mentioned are started by means of push-buttons on a central switchboard which is situated in the basement of the station building.

Radio Reception

A New System

A GROUP of business men and scientists in New York recently witnessed a demonstration by Dr. Alger S. Riggs of a system of radio reception which he claims is entirely new. Dr. Riggs declares that special valves he has developed, when used in his special circuits, give even better than normal radio reception without making use of many features hitherto thought indispensable.

All the valves in the radio-frequency and audio amplifier stages of the circuit, he says, work with a positive bias. There is no grid leak nor grid condenser, and the radio-frequency stages are aperiodic—they work without the aid of tuning coils and tuning condensers. Condensers and tuning coils are used in the set, however, in a pre-selector circuit through which the incoming broadcast signals must pass before they reach the radio-frequency amplifier stages of the receiver.

Another important improvement claimed by Dr. Riggs is a true "threshold" detector arrangement, which, he says, makes it possible to exclude completely static or other electrical interference, provided the signal strength is sufficiently great as compared with the undesirable noise.

Choosing a Radio Set

Essential Qualities

WITH the rapidly-increasing number of commercial sets on the radio market, it is a distinct advantage, especially to the layman, to have a few points as a guide in comparing different sets and thus finally choosing one that will give the desired service. The following six qualities, if found to be reasonably in evidence in a receiver, will ensure ultimate satisfaction:—

(a.) Selectivity—the ability of a set to receive signals from a broadcast station of a certain wavelength or frequency to the exclusion of other stations broadcasting on practically the same wavelength or frequency. (b.) Quality—the fidelity or naturalness of musical reproduction obtained by a receiving set, based on comparing the likeness of reproduction with the music originally rendered by instruments and artists at the broadcast station. (c.) Volume—the loudness of reproduction obtainable without sacrifice of quality. (d.) Sensitivity—the ability to receive and reproduce signals from distant broadcast stations. (e.) Appearance—the outward design and finish of the receiver and its fitness to lend itself harmoniously to the surroundings in which it will be used. (f.) Simplicity of Control—the ease with which different broadcast stations may be tuned in as determined by the number of controls which must be manipulated in actual operation.

Radio Construction

Successful Models

WE continually receive comments from listeners concerning the models that have been described in the "Record" and made up by them. There are many who encounter difficulties which we can usually trace to some little fault committed by themselves.

Probably the most outstanding successes we have had have been the "B and C" eliminator described in the "Radio Listeners' Guide," "Pentode's" Dynamic Cone Speaker, the Linen Diaphragm Speaker, "Round-the-World" Two, and the Browning-Drake receivers. Following are the results of two constructors who have communicated with us recently.

"I have successfully constructed a "B" eliminator to the specifications given in the "Radio Listeners' Guide." I have varied slightly from the instructions as regards transformer and chokes. The result is that the voltage is slightly higher. I consider the task of building a very simple one and not above the capabilities of the average journeyman. Providing a little patience is used in winding the transformer, which I consider the hardest part of the task, the rest is easily built. It is not costly, for I constructed my whole outfit for less than £5. I have used a wire-wound resistance with slides for the tappings; in my case these are 16 volts, 90 volts, and 185 volts. The bar has been mounted on a piece of bakelite panel and the slides arranged in position and connected up. I had the eliminator working within an hour after having received the resistance bar, which goes to show the simplicity of this type of control unit. The cost is approximately 15/- complete. The voltage can be varied to ½-volt if necessary.

I advise any listener who desires a power pack and has a few spare evenings not, to be afraid of undertaking the construction of this one. All necessary data is given in the "Listeners' Guide." It is all very simple and easy to follow. This is especially so when using the Ratheon valve. The commercially-made power packs are excellent, but their cost, in my opinion, is rather prohibitive to the man who has the patience to build his own. To get good results one needs an output of 180 volts and 60 milliamps., and this can be delivered by this outfit in question."—S. Ellis (Nelson).

This has evidently been a very successful description, for we know of several other satisfied constructors. We have seen one very fine eliminator, the workmanship of Mr. H. R. Simmonds, of Khandallah. The instructions in this case were followed to the letter, with the exception of the arrangement of the components in the tin case. The condensers were not put underneath, but arranged so that they could be reached with ease. Grid bias has been provided by means of a wire-wound resistance of 2,000 ohms, which gives the requisite 40 volts for a 171 or smaller voltage for other types of power valves. A.C. filament voltage has been provided and lights the power valve, and there is no hum. This constructor has also built "Pentode's" dynamic cone speaker, and as we have heard this working, and have compared it with our standard model, we must compliment him on the very fine job he has made of it.

Realising the popularity of this speaker, we shall describe it again in a future issue, embodying the improvements used by Mr. Simmonds. In the meantime, we should like to hear from other constructors who have had difficulty or success, so that these cases may be dealt with in the re-description.

One of the most successful receivers we have published has been the short-wave "Round-the-World" Two This fine little receiver has been built by a very large number of constructors, and to the credit of all concerned, we have received communication from only one correspondent who encountered difficulty, and this was through not following the specifications on a vital point.

Short-Wave

(Continued from page 32.)

about 9.30 a.m. The interference referred to on the Californian was also troublesome on this stranger at night, but was absent on the following morning, but signals were weaker then.

The 20.5 metre Trans-Atlantic Telephony Station was heard several times, but like the other trans-Atlantic stations on 32-33 metres, the carrier is on for hours at a time without a word being spoken.