

**Short Waves and the Amateur—**

commercial stations show evidence of "round-the-world" transmission with very little attenuation. Excellent signals have been heard from VK, ZL, PY, LU and CN countries at this period. Condi-

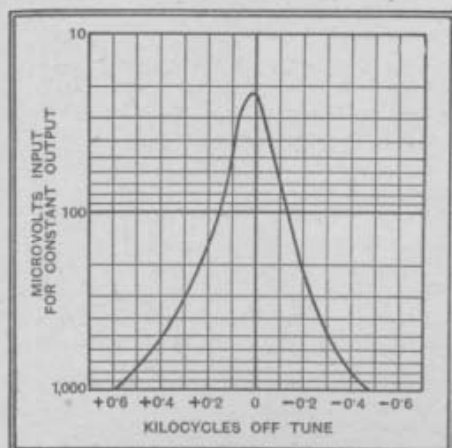


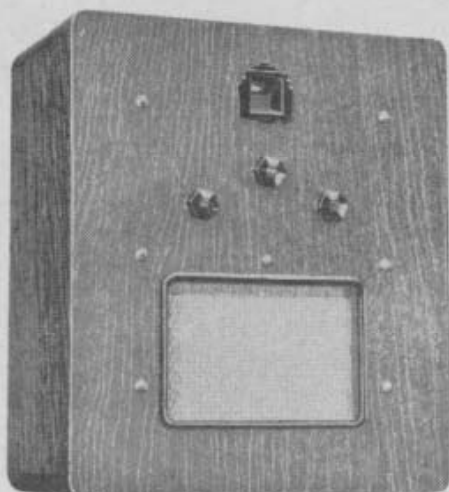
Fig. 4.—Resonance curve of a correctly neutralised quartz crystal filter arranged as in Fig. 3.

tions in the afternoon and until 2100 GMT are also good with reception from five Australian districts and all American districts.

**Lissen Model 8102**

**A New Class "B" Battery Portable**

THE very reasonable price and the wide range of usefulness of this receiver are sufficient to ensure for it an important place in the Lissen range of receivers for the coming season. It is fitted in a polished figured oak cabinet, which also houses the self-contained frame aerials. Provision is made for the addition of an outside aerial if desired.



The latest addition to the range of Lissen receivers, the Model 8102 Class "B" portable.

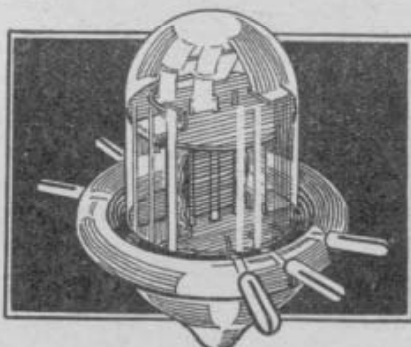
The circuit is straightforward, and the valves are arranged as follows: Screen-grid H.F.—detector—driver—Class "B" output. The two tuned circuits are ganged, and a combination of reaction and variable bias on the H.F. amplifier provides volume control.

The specification includes a permanent-magnet moving-coil loud speaker, and the price of 9 guineas includes valves and batteries. The makers are Lissen, Ltd., Worples Road, Isleworth, Middlesex.

**An American Development for Ultra Short Waves**

IT is well known that successful reception on the ultra-short wavelengths demands careful attention to detail in receiver design, but although ordinary valves can be used on wavelengths around 5 metres, there is a definite limit in wavelength below which they cannot be employed. It has been shown<sup>1</sup> that if the dimensions of a valve are reduced it can function at lower wavelengths, and so the logical step in ultra-short wavelength technique is to employ specially small valves of minute physical dimensions.

The September issue of *Electronics* contains details of the first type of ultra-short wavelength valve, and it is known as the Acorn valve in view of its astonishingly small size. It is an indirectly heated triode rated for 6.3 volts at 0.16 ampere and for a 180 volts HT supply, its heater rating being chosen so that the valve may be used for AC or battery operation. It has an internal resistance of 12,500 ohms and a mutual conductance of 2 mA/V., and it passes an anode current of 4.5 mA. with a grid bias of 5 volts.



To show the construction of the Acorn valve clearly our sketch is printed at twice the size of the actual component.

The construction is one leading to very small inter-electrode capacities; the grid-cathode capacity is 1 mmfd., the anode-cathode 0.6 mmfd., and the grid-anode capacity only 1.4 mmfd. This is obtained through the small dimensions of the electrodes and the absence of the usual pinch. No base is fitted, and the connections are made to metal stubs set around the periphery of a glass ring. As shown in the drawing, these stubs support the electrodes, and some idea of the smallness of the valve may be gathered when it is said that its overall height is less than one inch, while the diameter around the ring is under 3/4 in. The diameter of the bulb is about 1/4 in.

The valve is being developed in the Radiotron Laboratories, and it is understood that successful operation has been secured at as high a frequency as 600 mc/s (0.5 metres). Previously operation at such frequencies has only been possible with the Barkhausen oscillator, and the ability to

<sup>1</sup> *Vacuum Tubes of Small Dimensions for Use at Extremely High Frequencies*, by B. J. Thompson and G. M. Rose, Jun. Proc. I.R.E., December, 1933.

**Acorn Valves**

employ ordinary circuit technique represents a big step forward in this important branch of radio development.

**What is an Earth?**

COMMENTING on the revised I.E.E. regulations, a contributor to *The Electrician* notices radical alterations, even with regard to the official definitions of the significance attaching to expressions used in the regulations.

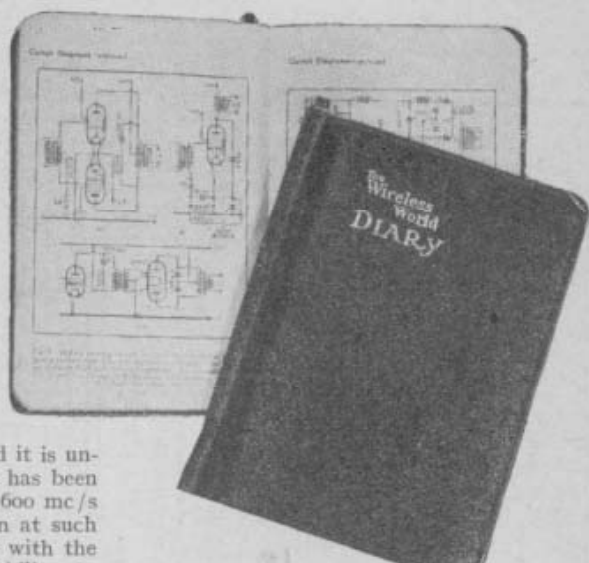
The old and time-honoured definition of the expression *earth*, implying a connection to "the general mass of the earth in such a manner as would ensure at all times an immediate discharge of electrical energy without danger" no longer appears. According to the writer, its impossible and pretentious provision has at last been found suspect and its fallacy exposed.

The new definition is "*Earth*: A connection to the general mass of the earth by means of an earth electrode. An object is said to be earthed when it is electrically connected to an earth electrode, and a conductor is said to be solidly earthed when it is connected to earth without a fuse, leak, switch, circuit breaker, resistor or impedance in the earth connection." A later definition states that an earth electrode may be a metal plate, water pipe, or other conductor which is electrically connected to the general mass of the earth in such a manner as to comply with these regulations.

This will immediately arouse an intense desire to find out just what is now required by these regulations.

**The Wireless World Diary for 1935**

DO you know off-hand how to fit an anti-interference filter to your mains? How to wind a 40-metre tuning coil? How to wire up a Westinghouse HT8 rectifier? What is the wavelength of Reykjavik? The normal anode current of a PX25?



Answers to all such questions are in the 1935 edition of *The Wireless World Diary*, obtainable from booksellers or direct from Iliffe and Sons, Ltd., Dorset House, Stamford St., London, S.E.1 Price 1s. 6d. (by post, 1s. 7d.).