Electronic TUBE

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ELECTROPHONE

An Inexpensive Condenser Microphone for the Home Experimenter

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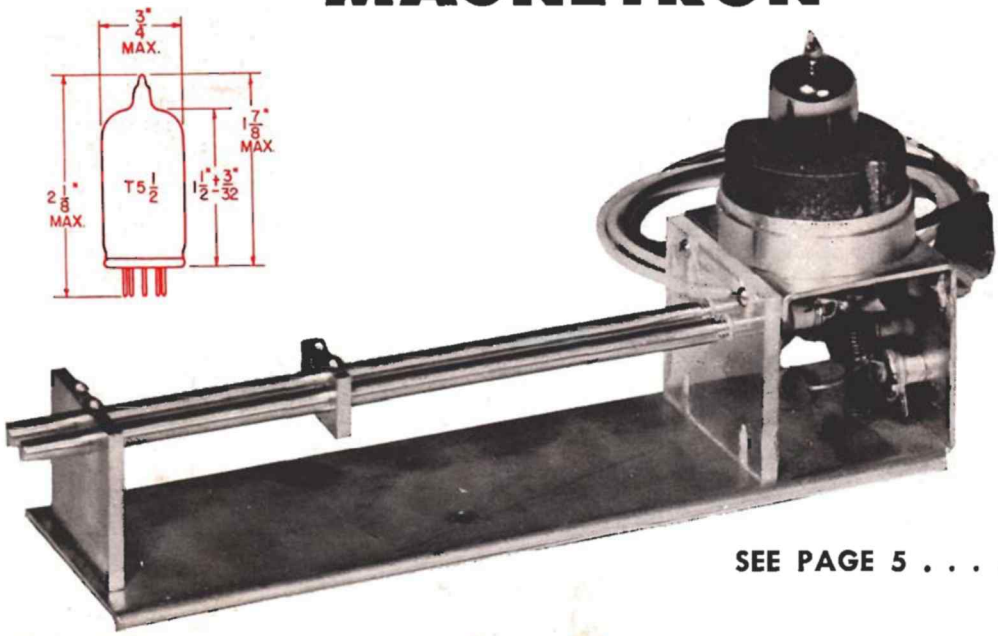
Announcing the New UHF Miniature MAGNETRON



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The New UHF Miniature Magnetron

The new miniature magnetron tube recently announced by the General Electric Tube Divisions will undoubtedly find itself in many ham shacks in the near future. This tube is capable of operating continuously from 30 to 900 megacycles at a quarter-watt output.

Although designed primarily for television receivers operating in the proposed ultra-high-frequency television band, the Z-2061 will find wide use wherever a low power oscillator at these frequencies is required. The price of the Z-2061 will be comparable with other television receiver tube prices, which means that the amateur finally will be able to procure a low cost tube for operation on the ultra-highs.

Up to this time, magnetrons have been used to generate the high power required for radar equipment and counter-radar equipment used extensively during World War II. During this time the magnetron was not generally thought of as a practical device for TV home receivers, but through the combined efforts of the G.E. Laboratories and the Tube Divisions, the magnetron principal has now been successfully applied to make it a useful tube for the proposed UHF television band.

Generally speaking, a magnetron is a diode which, when operated in a magnetic field, can be made to generate radio frequency oscillations. In the case of the Z-2061, the magnetic field is supplied by a doughnut-shaped magnet, which fits over the tube. The magnetic field strength required is approximately 600 gausses. When the tube circuit is initially adjusted, it is necessary to rotate the magnet until the magnetic poles are in the proper position for operation.

A typical test oscillator for the miniature magnetron is pictured in Figs. 8 and 9. This oscillator in appearance is not unlike others with which the amateur is familiar. The circuit of the test oscillator is given in Fig. 10. It is not particularly intended to be duplicated by amateurs or experimenters but it does indicate how simple a circuit may be used.

Tuning, in the test oscillator pictured, is accomplished by changing the position of the shorting bar on the two anode lines. The oscillator pictured may be tuned over the range from 300 to 900 megacycles. Output may be obtained by coupling to the anode lines in a manner similar to the method used with other parallel line oscillators.

Internally, the Z-2061 consists of eight vanes arranged in a circle around the cathode. Alternate vanes are connected together, so that each anode consists of four vanes. The entire tube is therefore seen to consist of 8 vanes, a cathode and a filament. Dimensions internally are large enough so that no critical spacing is involved.

Tests indicate that the tube has good frequency stability, both for voltage changes and magnetic field variations. Further, the hum and noise level is down more than 60 db below carrier level.

An early issue of the *Ham News* will give constructional data on equipment designed for amateur services and employing the Z-2061.

—*Lighthouse Larry*

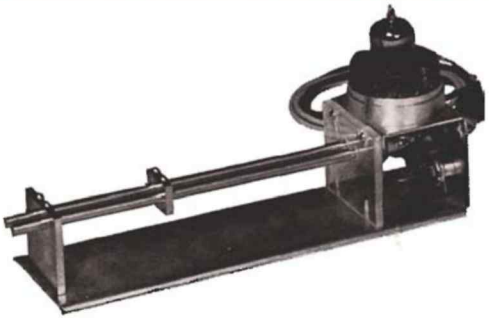

Fig. 8. Experimental test arrangement for Z-2061 magnetron

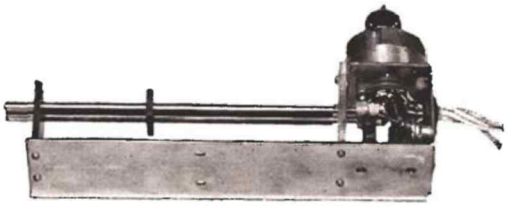

Fig. 9. Underside view of Z-2061 test setup

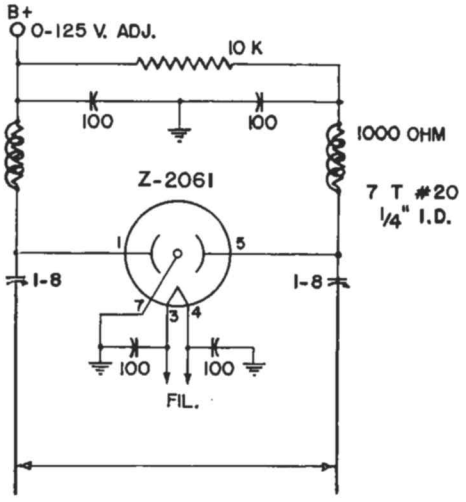

Fig. 10. Circuit diagram of Z-2061 test set