



In the last article of this series the theory of the Trinadyne receiver was briefly discussed and further details promised.

Now, the Trinadyne circuit happens to be one with which the writer has experimented very considerably, and in the course of his experiments he has formed a very high opinion of its capabilities. Therefore, following the policy outlined earlier in this series, fairly complete constructional data will be given of a typical receiver employing this principle of reception.

A two-valve version has been chosen for description, as, while a one-valve will give loudspeaker strength within reasonable distance of a broadcasting station, listeners located at a distance from any station will be glad of the additional amplification afforded by the second valve. Moreover, who is there among us who does not occasionally succumb to that major malady of the radio enthusiast, DX fever?

A well-made Trinadyne is very good medicine for DX fever, considering its modest two valves, and its capabilities in this direction do not detract in the slightest from its merits as a "quality" receiver for the local station.

The Main Features.

A GOOD idea of the main features of the receiver can be gained from the circuit diagram given in Fig. 1. The output of the crystal detector is applied to the primary of an audio-frequency transformer, the secondary of which feeds the grid of the first valve. As in any case where a transformer follows a crystal detector, the transformer may have a high step-up ratio (5-1 or more).

The detector has a comparatively low a.c. resistance, so that there is no object whatever in following it with a transformer having a tremendously high primary inductance.

The second transformer must be considered rather differently, as its primary is in the plate circuit of a valve. This transformer should have a fairly high primary inductance, and this is

more likely to be obtained in an instrument of low ratio than in one of high ratio. In any case, the constructor should, if possible, avoid using two identical transformers in the construction of the set, as this is apt to result in bringing the little resonances to which any transformer is subject into an unpleasant degree of prominence.

The Detector.

ALTHOUGH the Trinadyne will operate quite satisfactorily with the cat-whisker type of detector, one of the permanent or semi-permanent type will

Material for the Trinadyne

Panel, 14in. x 7in.

Baseboard, 10in. wide.

2 Terminals, mounted on scrap of ebonite.

1 Semi-permanent Crystal Detector.

1 .00035 mfd. Tuning Condenser.

1 .00025 mfd. Reaction Condenser.

1 .0001 mfd. Fixed Condenser.

2 .001 mfd. Fixed Condensers.

1 Coil Unit, as described.

2 High-frequency Chokes.

1 Audio Transformer (ratio 5-1).

1 Audio Transformer (ratio 3-1).

2 Valve-holders.

Wire, Screws, etc.

be found very advantageous. The considerable amplification of the set renders the adjustment of the detector rather a noisy process, so that it is just as well to avoid the need for it as far as possible.

Quite apart from this consideration, the semi-permanent detector is more convenient, it is quite cheap, and its life should be at least twelve months.

By-Pass Condensers.

IT will be noticed that the plate circuits of both valves are by-passed with .001 mfd. condensers. Although the receiver will usually operate without these, their inclusion is strongly recommended.

From its very nature, the Trinadyne is rather more apt than most sets to suffer from high-frequency currents feeding through into the low-frequency amplifier. Adequate by-passing will eliminate any possibility of trouble on this score, while the value of the condensers has been so chosen as not to impair the frequency response characteristic of the low-frequency amplifier.

The H.F. by-pass condenser bridging the crystal detector and the first transformer is shown as having a value of .0001 mfd. It is difficult to obtain a fixed condenser having a less value than this, but if one can be secured it should be used. Within limits, the smaller this condenser is the better, but of course there comes a point where it is too small to provide a proper reaction effect.

The two high-frequency chokes employed should preferably be of different types, as cases have been known where the use of two identical chokes has resulted in oscillation.

The Coil Unit.

THE construction of the coil unit will be the first item to occupy the attention of the builder. A 5½-inch length of ebonite tubing 2½ inches in diameter will be required. Starting about an inch and a quarter from one end the tuning winding of 90 turns of No. 22 d.c.c. may be wound on, the ends being brought out to soldering tags or small screws and nuts affixed to the former.

The aerial and reaction coils may then be wound one on each side of the tuning windings and separated from it by an eighth of an inch or so.

The aerial coil comprises 35 turns and the reaction coil 58 turns of No. 32 d.c.c.

Do not worry about the direction of winding, as if the reaction coil is "back to front" it is a simple matter to reverse the connections to it.

The reaction coil may seem unduly large, but it must not be forgotten that we are depending upon reaction to overcome not only the aerial damping, but also that due to the crystal detector. The low-potential ends of the tuning and aerial windings are, of course, connected to the same tag.

Mounting the Components.

WITH the coil wound, it and the remaining components may be mounted more or less in accordance with the constructional plan given in fig. 2. The lay-out is not critical and constructors will find that any reasonable changes from that shown may be made quite safely.

The coil is mounted in a vertical position by means of two small angle-brackets. A terminal strip has been

More Crystal-Valve

Constructional Details of the Trinadyne

(By "CATHODE")

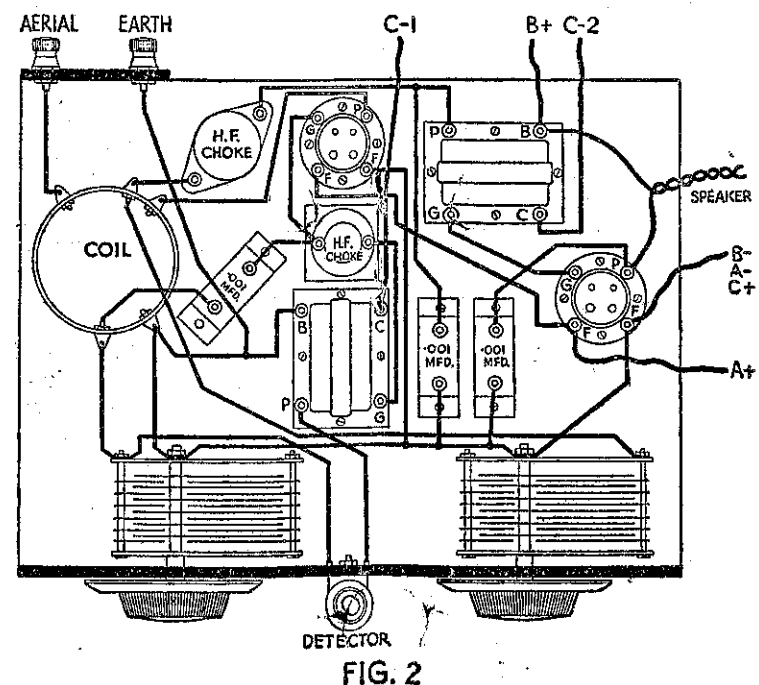
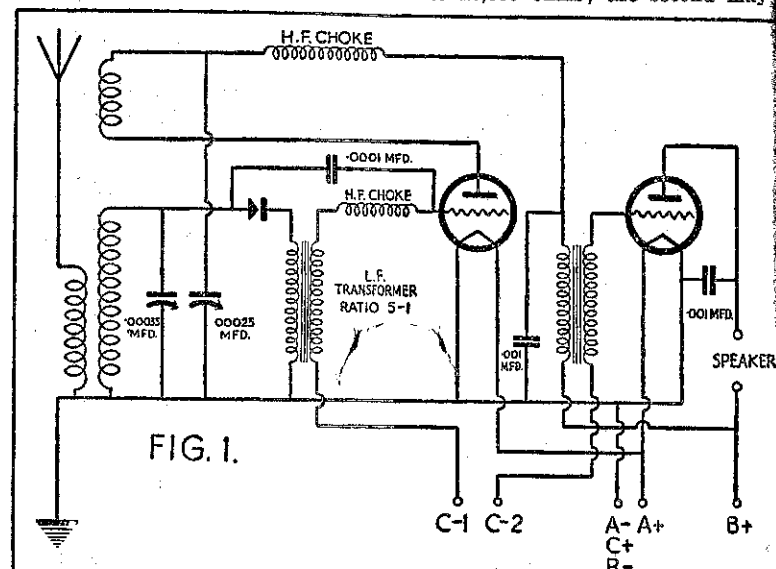
dispensed with, the leads for batteries and speaker having been brought straight out from appropriate points on the wiring.

With these remarks, and with the theoretical and practical wiring diagrams to assist him, the constructor should not have any difficulty in completing the set.

A filament switch may be included to avoid the inconvenience of coming and disconnecting the "A" battery. If this is done, the switch should be located in the A+ head.

The Valves Required.

THE first valve should be of the type, having an impedance of to 10,000 ohms; the second may



The layout and theoretical diagrams.

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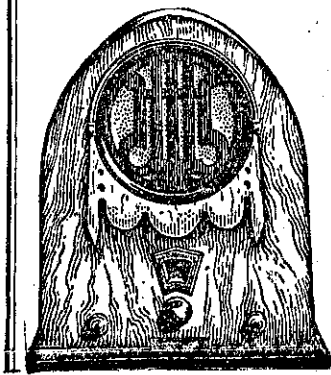
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