# RADIO DIRECTORY

## What to Buy and Where

### CITIES

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| AERIAL MASTS | Domestic Radio Co., Ltd., 300 Queen Street, Auckland. |
| ALTONA & HAMMARLUND-ROBERTS SETS. | Johns, Ltd. Chancery Street, Auckland. |
| AMPLION LOUDSPEAKERS | All Radio Dealers. |
| BURGESS RADIO BATTERIES, | All Radio Dealers. |
| CROSLEY RADIO | Abel, Smeeton, Ltd., 27-29 Customs St. E., Auckland. |
| CROSLEY RADIO RECEIVERS | G. G. Macquarrie, Ltd., 120 Willis Street, Wellington. |
| CROSLEY RADIO | Abel, Smeeton, Ltd. Rep.: G. MOSES. James Street, Whangarei. |
| DAYTON All-Electric Radio | Superadio, Ltd., 147 Queen Street, Auckland. |
| EMMCO RADIO PRODUCTS | Johns, Ltd., Chancery St., Auckland. |
| EMMCO RADIO PRODUCTS | Thos. Ballinger & Co., Ltd. Victoria St., Wellington. |
| EMMCO RADIO PRODUCTS | L. B. Scott, Ltd., Worcester St., Christchurch. |
| KING RADIO RECEIVERS | F. J. W. Fear & Co., 63 Willis Street, Wellington. |
| LISSEN RADIO PARTS AND KITS | All Radio Dealers. |
| LOUDSPEAKER AND TRANSFORMER REPAIRS | A. E. Strange, 404 Worcester Street, Christchurch. |
| MAJESTIC RADIO RECEIVERS | Kirkcaldie & Stains, Chief Wellington Agents, Lambton Quay. |
| MULLARD VALVES | All Radio Dealers. |
| PILOT 1930 PARTS AND KITS, ETC. | Abel, Smeeton, Ltd., 27-29 Customs Street East, Auckland. |
| PILOT 1930 PARTS—PILOT SUPER WASP KITS, GILFILLAN, KELLOGG and ATWATER KENT SETS | Harrington's, N.Z., Ltd., 138-140 Queen St., Auckland. 40-42 Willis St., Wellington. |
| RADIOLA RECEIVERS and Expert Radiola Service. | Farmers' Trading Co., Ltd., Hobson Street, Auckland. |
| RADIO REPAIRS AND SERVICE | E. G. Shipley, 185 Manchester Street, Christchurch. |

### COUNTRY TOWNS

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| CROSLEY RADIO | J. C. Davidson, Main Street, Pahiatua. |
| CROSLEY SETS | Abel, Smeeton, Ltd. Rep.: C. Ruscoe. 409 Devon Street, New Plymouth. |
| CROSLEY RADIO | D. A. Morrison & Co., Victoria Avenue, Wanganui. |
| MAJESTIC ELECTRIC RADIO | Berryman's, The Home of Music, Palmerston North. |
| MAJESTIC, ATWATER-KENT AND RADIOLA ELECTRIC SETS | Radio House, Hamilton. G. S. Anchor, Manager. |
| PHILIPS VALVES AND APPARATUS | All Good Radio Dealers. |

coupling to the point where the mutual inductance was of the order of microhenry, was sufficient to ensure stability of a two-stage high-frequency amplifier. To attain this low figure with coils having a diameter of three inches entailed a spacing so great as to militate against compactness; coils of diameter 2¾ inches, however, could fairly readily be arranged to have a mutual inductance of less than one microhenry by spacing them a reasonable distance apart and positioning them so that their axes were mutually perpendicular—that is to say, the first coil might be mounted vertically, the second horizontally, and the third also horizontally, but at right angles to the second.

With coils having a diameter of 2 inches, it is a comparatively easy matter to reduce the coupling to the required point. As an example, Fig. 4 gives in graph from the mutual inductance between two 2-inch coils mounted

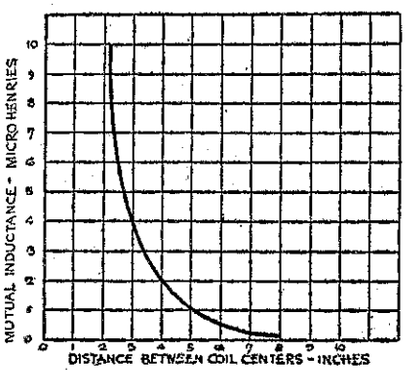


**Fig. 4.—Curve showing Coupling between Two Coil Secondaries having Parallel Axes.**

vertically and at varying distances one from the other. It will be seen that, mounted with centres 5 inches distant, the coupling was reduced to the required one microhenry. Furthermore, having all coils vertically mounted reduces the possibility of impairing their performance by mounting metallic objects within the intense part of their field; any coil of solenoid form has a comparatively weak field at the side of the coil, the major field being concentrated at the ends—thus, with horizontally-mounted coils, the woes of the designer are added to by the necessity of keeping other apparatus well away from the ends of the coil.

Where more than two high-frequency stages are purposed, it becomes impossible to mount the necessary four or more coils with their axes mutually perpendicular, so that we are more or less forced to the use of small diameter coils. It must not be forgotten, however, that unless the dictates of efficiency are departed from by introducing resistance or other losses into appropriate points in the circuit (e.g., stabilising grid resistance between the grid of the radio-frequency valve and the preceding radio-frequency transformer, the coupling must be reduced below the 1 microhenry mentioned as being sufficiently low for a two-stage amplifier. The problem may be solved either by increasing the spacing or reducing the dimensions of the coil. In practice, however, increasing the spacing is undesirable, owing to the huge dimensions attained by the finished receiver, while reducing the coil diameter below 2 inches also reduces its efficiency disproportionately and impairs selectivity; the best compromise is the use of series grid resistances.

**(To be concluded next week.)**

## *Eliminating Interference*

### *Use of a Counterpoise*

IN localities where interference from power mains or electrical machinery is experienced, an improvement may be effected by the use of a counterpoise earth. This consists of two or more wires arranged, if possible, symmetrically underneath the aerial. It is important that these wires should be just as well insulated from earth as the aerial itself.

For example, if a three-wire counterpoise is to be erected, the central wire should be arranged exactly underneath the aerial, and the two outer wires should run parallel to this at a distance of about four feet. If this is impracticable, the counterpoise should be erected as nearly in this position as possible.

The height of the counterpoise above the ground may be anything from one foot to eight feet, the former distance being the more effective, and the latter the more convenient. All the wires should be joined at one end and a single lead then taken to the earth terminal of the set.

## *An Effective Insulator*

### *For Preventing Short Circuits*

THE risk of short-circuiting is considerable in a set which employs screened coils, or which has the shields or cores of the transformers earthed. This is due to the large areas of exposed metal which are connected to the A battery supply, and which may be connected accidentally to a B battery positive lead. Though contact may be only momentary, yet the high voltage thus applied would probably burn out the valve filaments.

The risk of short circuits can be greatly reduced by covering such exposed metal surfaces with an insulating layer. A simple and effective method of doing this is to apply two coats of quick-drying stove enamel or shellac varnish to these surfaces. In the case of earthed transformers it is also necessary to paint the heads of the baseboard screws if these pass through metal lugs in electrical contact with the frame or the shield.

This method of providing insulation is an exceedingly useful one for other purposes as well. Bare leads, for example, can be protected in this way after the wiring of the receiver has been completed. Soldered connections to tags can be insulated in the same way. Precautions should be taken, however, to prevent the enamel or shellac from running under terminals or over ebonite insulation.