

mounted alongside and connected in parallel with the existing coupling condenser for the first stage, its effect being to accentuate the bass notes slightly. Where the mounting bases illustrated are used, the two condensers may be mounted one on each side; it will perhaps be necessary to replace the existing fixing bolts by slightly longer ones.

Output Filter.

IN regard to the 2mfd. condenser in series with the speaker in the output filter, a word of caution is desirable. It will be observed that this

replacing the home-made resistance of 150,000 ohms by a commercial wire-wound resistance having the same value, or perhaps a little lower, say, 100,000 ohms. Or, of course, if the constructor prefers, the change in the plate resistance may be made first, leaving the filter circuit to be incorporated at some future time.

In referring to the wiring diagram, the constructor must clearly understand that only the portions in which changes have been made are depicted. This has been done not only in order to avoid unnecessary work, but also because the changes are rendered clearer thereby. The new diagram should be studied in conjunction with the original wiring diagram published in the issue of September 6, when the precise nature and extent of the changes will be immediately apparent. No negative filament circuits are shown, since the only changes in the filament circuits are those necessary for the incorporation of the switch and these affect only the positive circuit and have been verbally described in detail.

Other Refinements.

IT is not anticipated that even the slightest trouble will be encountered in making any of these changes, particularly if, as has been suggested, they are made one at a time. When the second resistance-capacity coupling has been replaced by a transformer, try the effect of increasing the 1½-volts negative bias on the first audio valve to 3 volts negative. It will depend principally on the particular valve in use whether results are the same or worse; if they are no worse, leave the bias at 3 volts negative, as this will economise in B current; if, however, quality is impaired, return to the 1½-volts negative.

The improvements described have been dealt with more or less in the order in which they should be made. In order to dispel any shadow of doubt, however, the following suggestions as to order may be followed, particularly where it is desired to spread the expenditure over as long a period as possible and have the receiver out of commission for only a day or so at a time:—

(1) Fit panel and wire filament switch, then put receiver into commission again until funds for next improvement are in hand.

(2) Fit inter-valve transformer, or, if push-pull output is adopted, both input and output push-pull transformers. Put receiver into commission again until output choke and condenser are acquired.

(3) Fit output filter (assuming that a single output valve is used) and again introduce the receiver to the family circle.

(4) Replace home-made plate resistance for detector valve by commercial wire-wound resistance, the set then being again available for use.

(5) Incorporate filter circuit (wire-wound resistance and condenser) for detector valve.

All these changes having been completed, the receiver should now give really excellent volume and quality on the local station, providing components and construction are both sound. It is still, however, unsuitable for distant reception, although some patient listeners may be able to achieve fair results in this direction.

WANTED AND FOR SALE.

For column of casual advertisements see page 32.

RADIO DIRECTORY

What to Buy and Where

CITIES

AERIAL MASTS	Domestic Radio Co., Ltd., 300 Queen Street, Auckland.
ALTONA & HAMMARLUND-ROBERTS SETS.	Johns, Ltd. Chancery Street, Auckland.
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, Tangare.
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	Chas. Bennett, Ltd., 619 Colombo Street, Christchurch.
RADIOLA RECEIVERS and Expert Radiola Service.	Farmers' Trading Co., Ltd., Hobson Street, Auckland.
RADIO REPAIRS AND SERVICE	E. G. Shipley, 183 Manchester Street, Christchurch.
AIR COLUMN SPEAKERS	Royds-Howard Co., 553 Colombo Street, Christchurch.
COUNTRY TOWNS	
CROSLEY RADIO	J. C. Davidson, Main Street, Pahiataua.
CROSLEY SETS	Abel, Smeeton, Ltd. Rep.: C. Ruseos, 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.

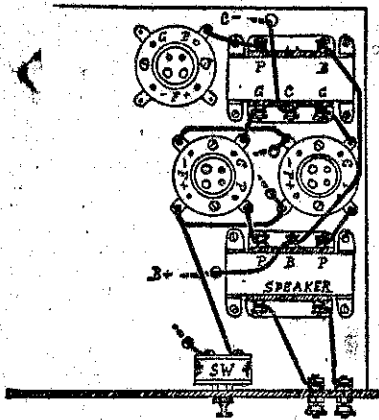


FIG. 2.

Connections for a Push-Pull Output Stage.

Note that although the speaker terminals are shown mounted side by side in order to make the connections clear, they are, in fact, mounted above one another. A reference to the panel lay-out will render this clear.

condenser is—unless the speaker is disconnected—connected directly across the B battery, whether the set is switched on or not. A leaky condenser in this position would obviously have the effect of running down the B battery, possibly with considerable rapidity, so be sure that the condenser used is one of first-class quality. In view of this objection, some constructors may wonder why this particular design of output filter is preferred to one of those in which the condenser is not connected across the B supply. The object of adopting this design is to keep the audio frequency currents out of the B supply, which, were it of appreciable impedance to these currents, might be the cause of distortion, or, worse still, an audio-frequency howl or "motor-boating."

A further refinement having the same object is that of incorporating a filter circuit in the B supply to the detector valve. This filter circuit comprises a 2 or 4 mfd. condenser (which must be of the highest quality for the same reasons as are outlined above), and a wire-wound resistance; the precise value of this resistance is not important, and if the constructor has one on hand or can readily obtain one of any value between 10,000 and 50,000 ohms, it may be used—about 20,000 ohms is the usual value. The wiring diagram depicts the manner of connection very clearly, and it is not considered necessary to give any additional directions.

When incorporating this filter circuit for the detector, it is by no means a bad plan to take the opportunity of