

The Loftin-Four

(Continued from page 17.)

It can fit in the main chain 3500 ohm. position of the main sketch. To find out the resistance divide the voltage given by the current taken by the field multiplied by 1000, and there you are with everything cut and dried.

The Power-Pack.

IN the first series of Loftin-White articles a power-pack with one-inch corded transformer and choke was specified. This power-pack is suitable for a single 245 output valve, or other valve requiring a plate circuit of not more than 32 miles or so. A pair of 245's or a single 250 would require 64 mills in the 7-5 case and 55 in the latter. It would not be advisable to attempt to supply this demand from the power-pack already specified even with increased secondary turns, so the specifications are given for a larger transformer and choke specially suited to supply a single 250 valve, or a pentode.

The transformer and choke both have cores built of 1½ in. stalloy the transformer core built to 1-3-8 thick, and the choke core to 1½ in. in order to increase the inductance as only one choke is used, a centre-tap being provided for connection to a 1 m.f.d. smoothing condenser.

For the 250-valve a half-wave transformer is used, giving 650 volts from the high voltage secondary consisting of 3250 turns of 32 s.w.g. enamelled wire in one continuous winding without centre tap.

To give 450 volts full-wave for a pair of 245's, the secondary winding should consist of two half-width windings side by side of 2200 turns each, or a continuous winding of 4400 turns tapped at 2200, for which 34 wire could be used.

Stalloy sizes for the transformer are 4½ x 1½ and 2½ x 1½, with windows 3½ x 1 1-8 and spool ends 3½ in. square, clamps drilled 4½ centres for ½-in. bolts.

The primary winding will consist of 1100 turns of 24 s.w.g. enamelled wire to carry 100 watts, as allowing 60 m.a. for the 250 and r.f. valves, and for the filaments of 250, 281, and four 224 valves there is a total demand of 74 watts. without allowing for losses. Filament winding of 18 d.c.c. should be as follows:—

7½ volts (250)	45 turns
2½ volts (224)	15 "
2½ volts (1 227)	15 "
2½ volts (2 227's)	17 "
4 volts (—)	25 "

Voltage is best maintained for heaters by running only one 227 from each winding, but two may be run if the extra two turns are provided to maintain voltage.

The rectifier and screen-grid detector should both be heated from separate windings, and in the case of the rectifier this is imperative. It is permissible to parallel several windings of equal voltage and supply the detector and several r.f. valves from common leads. The windings must be paralleled in correct phase, which is tested by connecting two windings in parallel; if they are correctly connected, a 4 or 6-volt flash-lamp placed across them will light, but if the windings are opposed, the lamp will not light, and one winding must be connected the reverse way. The power valve must have a separate winding. The usual primary fuses and one secondary fuse must be provided.

The Choke.

THE core is of the V pattern, with a piece across the open end, giving two gaps. The clamp at the gap end is 1½ in. wide, overlapping the ends of the V by ½ in. The two gaps must not be less than 1-32 in. each, the space being filled with cardboard. The window is 2½ x 13/16. Four sizes of stalloy are used, 3 5-16 (across end), 3½, 2½ and 2 in. by 1½ in. wide, one heap of each size 1½ in. high. Spool ends are 3 1-8 x 2 15-16 in. Put on 7000 turns of 32 wire, tapping at 3500. More than 7000 may be put on if there is room—up to 500 extra—the fact of the tap not then being exactly in the centre will not matter. Two pounds of

wire will be required, and the inductance with 60 m.a. passing will be 34 henries.

The d.c. resistance of 7000 turns will be 450 ohms., and the voltage drop as follows:—

50 m.a. passing drop	22 volts
60 m.a. passing drop	28 "
70 m.a. passing drop	32 "
80 m.a. passing drop	36 "

If it is desired to use a factory-built choke, the Ferranti B1 is the most suitable, having a d.c. resistance of 500 ohms., and in inductance of 18 henries with 50 m.a. passing, dropping 25 volts. These chokes are not provided with a centre-tap.

Next Week.

WE set out on this article with the best of intentions to give the complete instructions for the construction and operation of the four-valve set, but we find that the number at the top of our manuscript tells us that the allotted space is already nearly exhausted. Space has slipped away in discussing many points that, were they left untreated, would worry constructors, so we have gone to some length to set everyone at rest.

For those who want to purchase their parts we give a list, and they can collect these during the week, for we can assure them there will be no more theoretical considerations.

We have now all the circuits, with the exception of the parallel output, we shall publish for a few weeks, and any new

Radio Telephony Device

To Prevent Eavesdropping

BECAUSE of criticisms concerning the absence of privacy in long-distance radio telephony conversations, an interesting device has been perfected which prevents any intelligible reception of the signals by unauthorised persons.

By the system adopted, the component parts of speech are split up into portions by an electrical device, and transmitted in a mixed arrangement which conveys nothing intelligible until the parts have been rearranged in their correct form at the distant end. This system is now in use on most of the inter-continental radio telephony services of to-day.

ones can be easily made with a few alterations to the existing ones.

Before we conclude this week's instalment it may be worth mentioning that the coils are the same as for the Loftin-Three. Complete kits of these are readily available at all dealers, but there is no great difficulty in making them. About that part of the business we shall have more to say next week.

IT'S ON ITS WAY!!

"Radio's Clearest Voice"

*Incorporating revolutionary new developments
never previously made public*

Completely automatic remote control
A new method of volume control
A new band-pass selector circuit
A new automatic interstage coupling
A new dynamic speaker

A NEW PERFORMANCE

Entirely New ————— Completely Different

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