

“HIGH - QUALITY SIX”

Latest Circuit From The Kingsley Laboratory

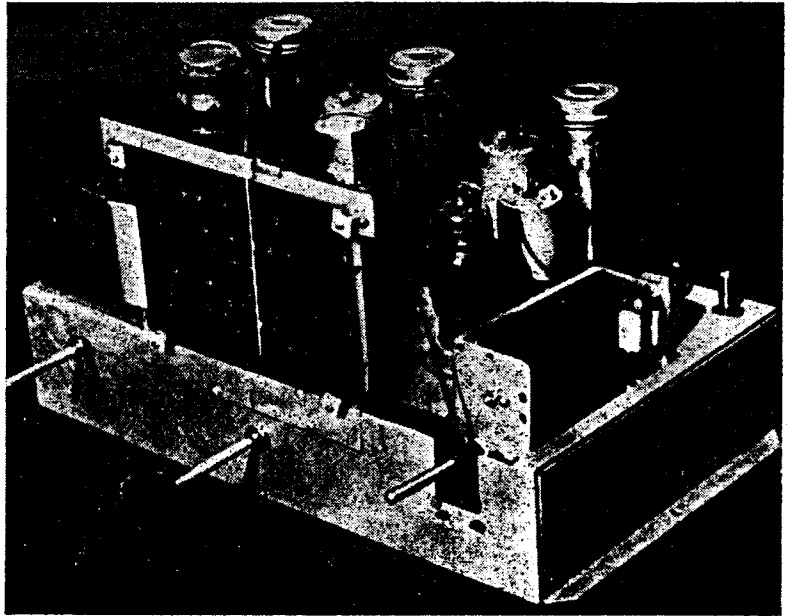
WHILE visiting the Kingsley factory recently we happened to be going through the laboratory when our attention was attracted by the sound of familiar broadcasting voices being reproduced in a most unfamiliar way. A few words of enquiry brought forth the explanation; some of the Kingsley lab. men were working on an experimental

BY

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set-up embodying two features which are keynotes in high-quality reproduction; direct coupled audio and wide-band i.f. stage.

Over the past eighteen years a lot has been heard of direct-coupled audio systems and their ability to give a type of reproduction which is hard to define. Even when measured with laboratory instruments you may have a resistance-coupled amplifier which appears to have the same characteristics as a direct-coupled one, but when you put the old ear to the speaker, well, there isn't any doubt about the difference being very real.



Front view of the experimental chassis, showing Ferrotune unit with cover removed.

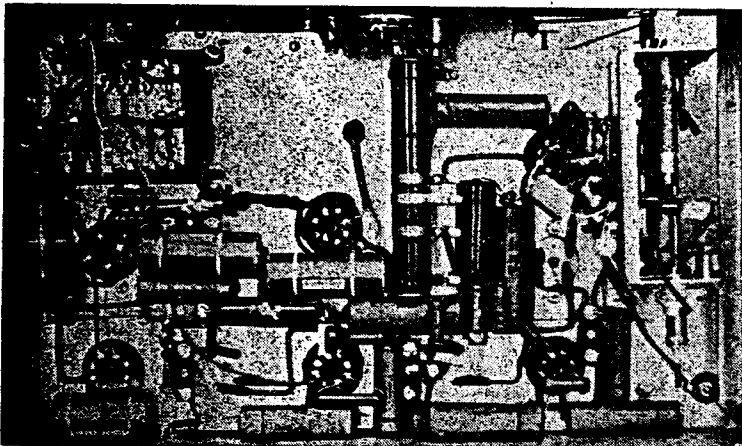
In the July, 1946, issue we detailed a set using the Kingsley coupled audio system. This set was a fine little job and proved popular, but its performance was limited by the intermediate frequency stage, where normal selec-

tivity was used. This does not allow full reproduction of the audio range. The new version has a special wide-band intermediate stage, made up by using two stages of amplification at the comparatively high i.f. frequency of 1900 Kc. By this means it is possible to get enough selectivity to separate the local broadcasting stations, but with a flat top characteristic which permits a degree of fidelity of reproduction which is impossible with normal intermediate channels.

There being two stages of intermediate amplification, precautions have been taken to ensure adequate stability by decoupling the plate power supply to each intermediate transformer by means of 5,000 ohm resistors and .1 mfd. condensers.

The tuning unit is a special Kingsley "Ferrotune" job which has been developed to suit an in-

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Underside view, showing the wiring and layout of components.

"HIGH-QUALITY 6"

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intermediate frequency of 1,900 Kc. As is now so well-known, the "Ferrotune" units tune over the band by varying the inductance of the tuning coils by the movement of an iron core in and out of the coil. The scheme has many advantages over conventional tuning systems, especially for home set builders who do not have facilities for aligning the circuits.

The converter valve is a 6J8G, followed by a 6U7G first intermediate amplifier. For the second intermediate amplifier a 6G8G is used, the diodes also supplying a convenient a.v.c voltage and detection as well. This leaves the audio amplifier as a unit, handling only audio signals.

THE AUDIO AMPLIFIER

As mentioned before, the audio end uses direct-coupling. A 6J7G with plate screen and suppressor tied together to form a triode is the first audio valve. The plate is tied directly to the grid of the output valve, which is also triode, type 2A3 or 6A3. Actual voltage on the plate and grid which

are tied together is about 100 volts, although you won't measure it with an ordinary meter. In order to arrange correct bias for the output valve with the grid 100 volts positive in regard to earth is arranged by keeping the filament circuit about 130 to 140 volts above earth by means of the voltage drop across a 4,000 ohm resistor in the filament circuit. The bias voltage is considered as a relationship between grid and filament, and with the above voltages in respect to earth, the grid is 30 to 40 volts negative in respect to filament, which is just what is required for proper operation of the output valve.

In the original set, which we tested, the 6A3, was operating slightly below maximum ratings, with about 350 volts from plate to earth, but only 220 from plate to filament, which is the true plate voltage of a valve. Power output is still ample for ordinary domestic use.

Since the filament circuit of the valve is kept about 130 volts above earth, it is highly desirable to use a power transformer with

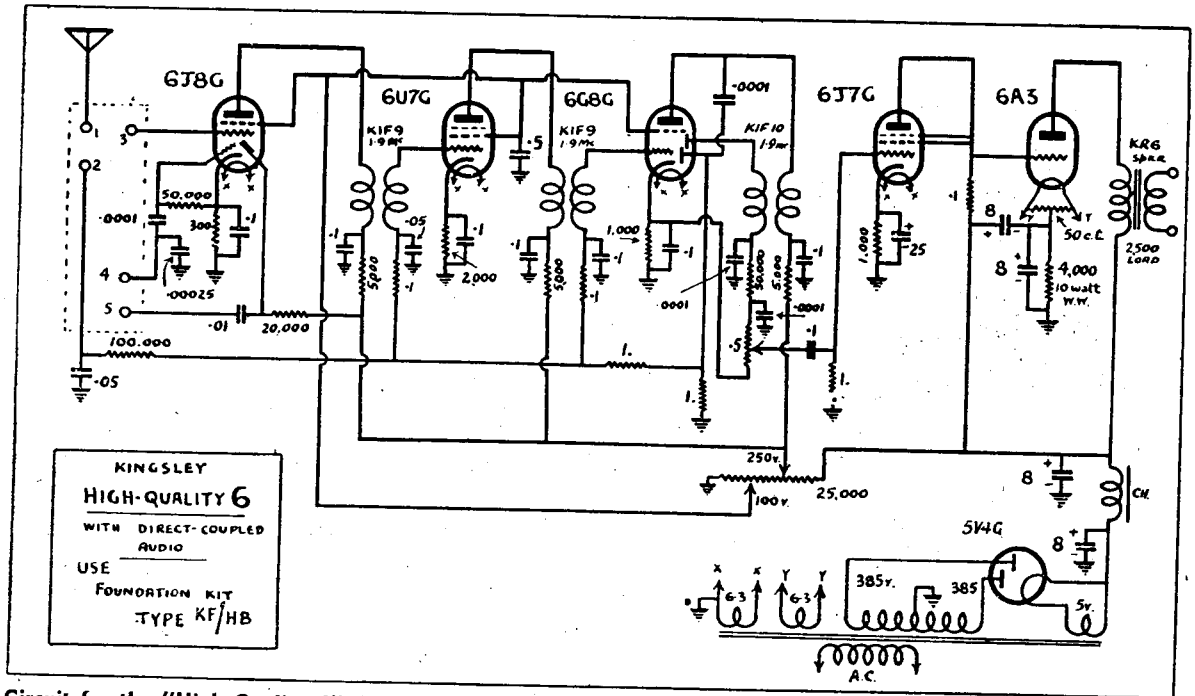
three separate heater windings, one for the rectifier, one for the r.f. and audio stages and the third for the output valve.

Whilst on the subject of power transformers: it is not a bad idea to get a power transformer with a 125 or 150 milliamp current rating for the secondary. At the lower drain of this set it can then be expected that the actual h.t. voltage will be about 400, allowing the full 250 on the plate of the 6A3, together with 150 from filament to earth.

ALTERNATIVE AUDIO

Of course, it is not essential to use direct-coupling in the audio end of the set, and if you have any special preference for any particular kind of audio amplifier you will find that the wide-band intermediate channel has its value with any type of equipment intended for high-fidelity purposes.

For example, only slight modification is necessary to make up a radio tuner for the F.F.R. amplifier from the Kingsley foundation kit which has been introduced primarily to be used with the direct-coupled version.



Circuit for the "High-Quality 6". Note that the .00025 mfd. condenser shown on this circuit as running from terminal 4 of the Ferrotune unit is now incorporated inside the unit.