

The VEGA Dual-Wave Five

The usual way of making a dual-wave receiver is to employ a dual-wave bracket, but it is also possible for the set builder to buy separate broadcast and short-wave coils and wire them up to the necessary switch, as shown in this article on the construction of a modern receiver.

THE receiver which is the subject of this article was designed and built by the technical staff of the factory which makes the "Vega" range of coil units which were mentioned in our columns for the first time in last month's issue.

Although primarily designed for use with the new "Vega" coils the circuit is a thoroughly well engineered one which is equally suitable for use with all types of modern coils. It contains several features of great interest to the technical enthusiast, including a novel tone control arrangement which operates as a combination of the usual plate by-passing, as well as selective inverse feedback.

As will be seen from the photographs of the original chassis, there is a new component used in this set, at least, one which is new to our readers. We don't think we have ever shown photographs of a chassis using the new-style speaker plugs which have recently come on the market. Up till now it has been usual to fit an ordinary four or five-pin valve socket for the speaker plug to fit into. Now there are these miniature sockets and plugs to do the same job, but they are much smaller and neater. It will be noticed that they are used for the main speaker, also for an extension

speaker fitting, and for the pick-up input terminals.

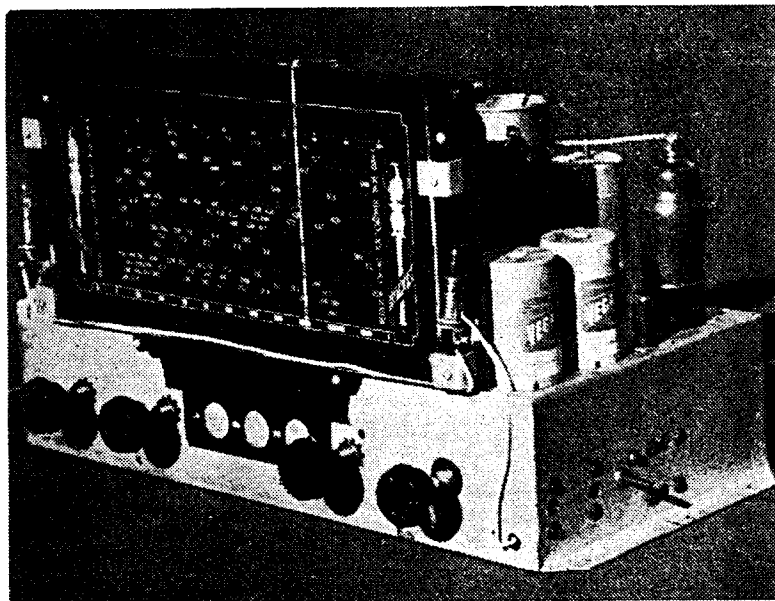
THE CIRCUIT

As will be seen from an examination of the circuit schematic, the first valve is a converter using the X61M type valve which is becoming increasingly popular on account of its low noise level and low wattage heater. Most of the Australian-made Radiotrons have been based on American types and the most popular converters over the past few years have been types 6A8G and 6J8G, both American types. Not far behind and meeting with considerable popularity with some technical men have been the special Philips type of con-

verters such as the EK2, EK32 and the ECH35. To cut a long story short, along comes the X61M, based on a war-time converter of the English Osram range.

The rest of the valves used in the Vega are normal types. Bias for the converter and i.f. valves is taken from the negative high tension, applied via the a.v.c. circuit. This arrangement allows the cathodes of both valves to be earthed directly. Sometimes this gives greater stability, as even the best of paper condensers have some reactance to r.f., which causes enough coup-

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THE VEGA DUAL-WAVE FIVE (Cont.)

ling to create instability when really high gain is attempted. The bias is derived from the full high tension current flow through a 50 ohm resistor in the negative high tension lead. If the total current drain of the set is normal this voltage (by Ohm's Law; 60 milliamps through 50 ohms) will be about 3 volts. It is a handy checking point for servicing, too, as any variations in plate currents, such as caused by broken down coupling condensers, or faulty valves, will be revealed by abnormal or subnormal voltage drop across this resistor. If the resistor burns out it will indicate that there is a short circuit of the high tension to earth.

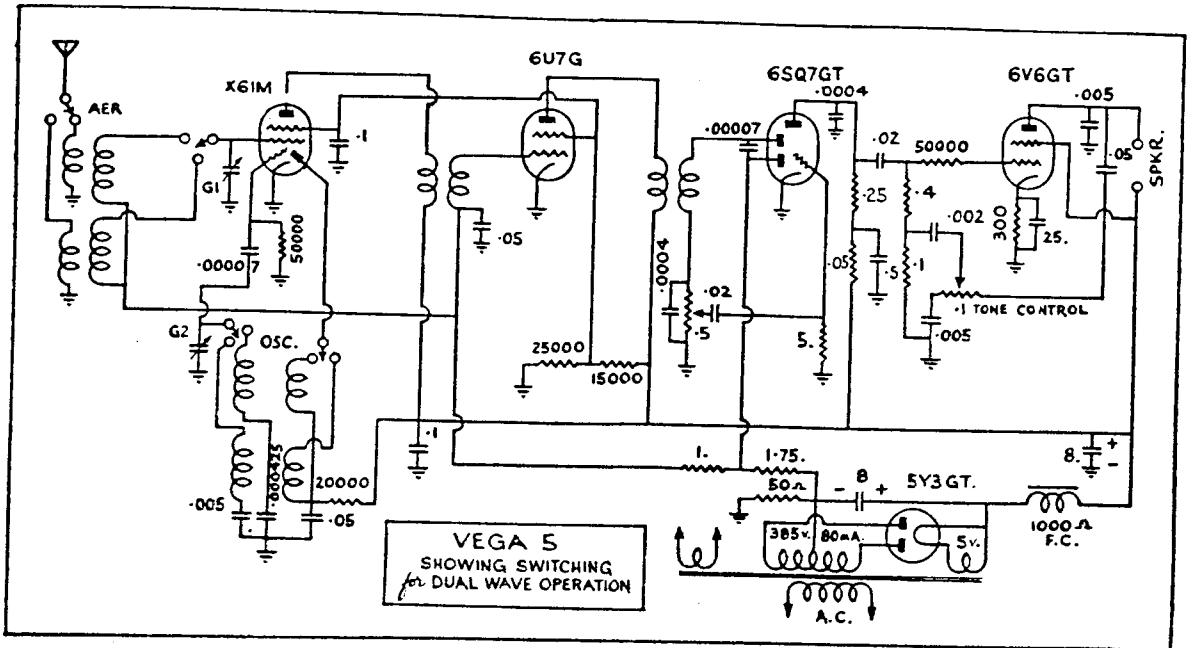
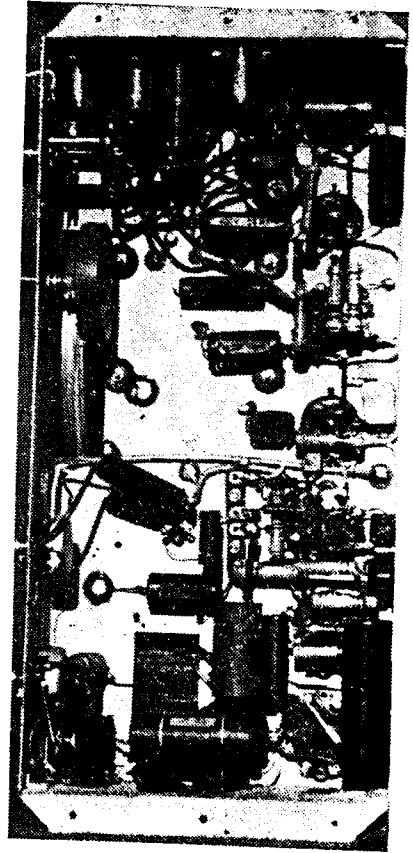
There is a point to watch when the centre-tap of the power transformer is not earthed, as in this case. The negative side of the first filter condenser must be returned to the centre-tap, not to earth. Otherwise hum trouble may be encountered.

With the filter condensers fitted properly the bias resistor can actually help in reducing hum, acting in much the same way as a choke.

OSCILLATOR TRACKING

As will also be noted from the circuit, the latest type of oscillator tracking is employed. Instead of the adjustable padder of the old days, the padding condensers are both fixed capacity items, one of 425 micro-microfarads for the broadcast band and .005 mfd. for the short-waves. With fixed padders of this type it is essential to use the right type of alignment procedure. For this a signal generator or modulated oscillator is of the greatest assistance but it is surprising just how good results can be with the alignment done on station signals.

The essence of the scheme is to adjust the iron core in the



oscillator coil at the low frequency (2FC, 3AR) end of the band, to bring the stations in at approximately the right dial settings, then swing down to the other end and adjust the oscillator gang trimmer to bring things right at that end. If a modulated oscillator is available it can be used to go through this procedure at, say, 540 kc. with the gang fully meshed, then at 1600 kc. with the gang full open. This will ensure that the proper coverage will be obtained. Finer alignment is then carried out later at 600 kc. and 1,400 kc. which are points fairly well into the band. It won't matter much, then, if the tracking goes out slightly at the extremities.

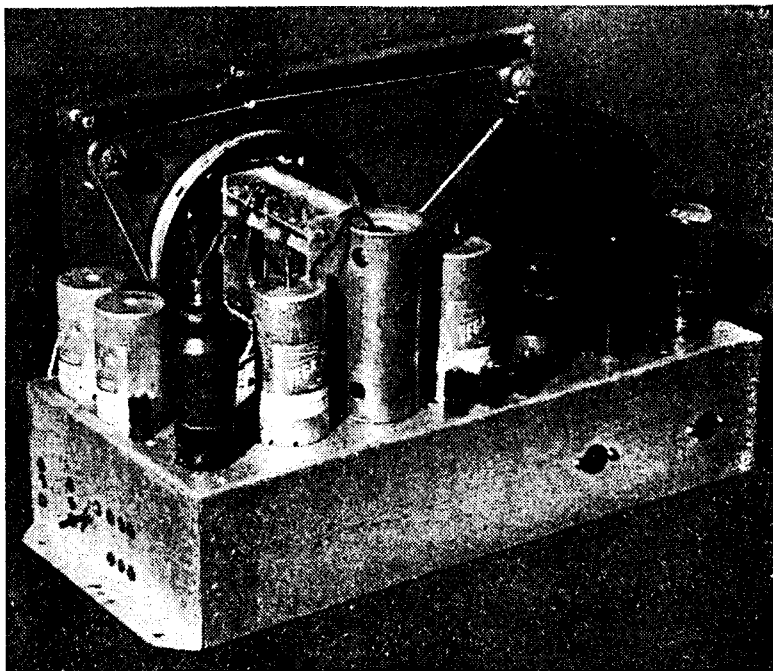
CONSTRUCTION

The general idea of the layout can be obtained from the photographs. The aerial and oscillator coils are mounted on top of the base, with the switch directly below. The short-wave coils are then mounted as close to the switch contacts as possible, but with their axis at right angles, to avoid inter-action of the fields. Trimmers are mounted on the end of the base, close in to the coils. The fixed padders are mounted directly to the coils.

Leads to and from the volume control are shielded to avoid hum.

THE FILTER

In the original set an electro-dynamic speaker with a field coil of 1000 ohms was used. Due allowance was made to have a power transformer with a voltage rating of about 325 volts, so that, with 60 volts drop in the field, there was still adequate



Rear view of the "Vega 5" dual-wave receiver.

h.t. for the plate of the output valve. Only about 4 watts of power was thus dissipated in the field, only enough for a fairly small speaker. If a bigger speaker is to be used, it would be advisable to use a field of 1,500 or 2,000 ohms, with a power transformer rated 385 volts.

Those who desire to use a permanent speaker may do so by

fitting a choke in place of the field coil shown in the circuit, with a power transformer secondary rated at 285 volts at 80 ma.

FURTHER DATA

Further information about this set can be obtained direct from Mr. Lay Cranch of Cranch Products and Trading Co., 17 Bond Street, Sydney.

TELEVISION (Continued from Page 7)

representatives who witnessed the screening acclaimed the quality and value of this television demonstration which made European history and again evidenced the place held by Philips in the forefront of the technical field.

First in America, now in Europe, a surgical operation has

been televised. In one of Holland's oldest university towns, Leiden, Philips have televised an operation to an audience of 200 medical practitioners and students, who were able to follow closely every detail of the operation.