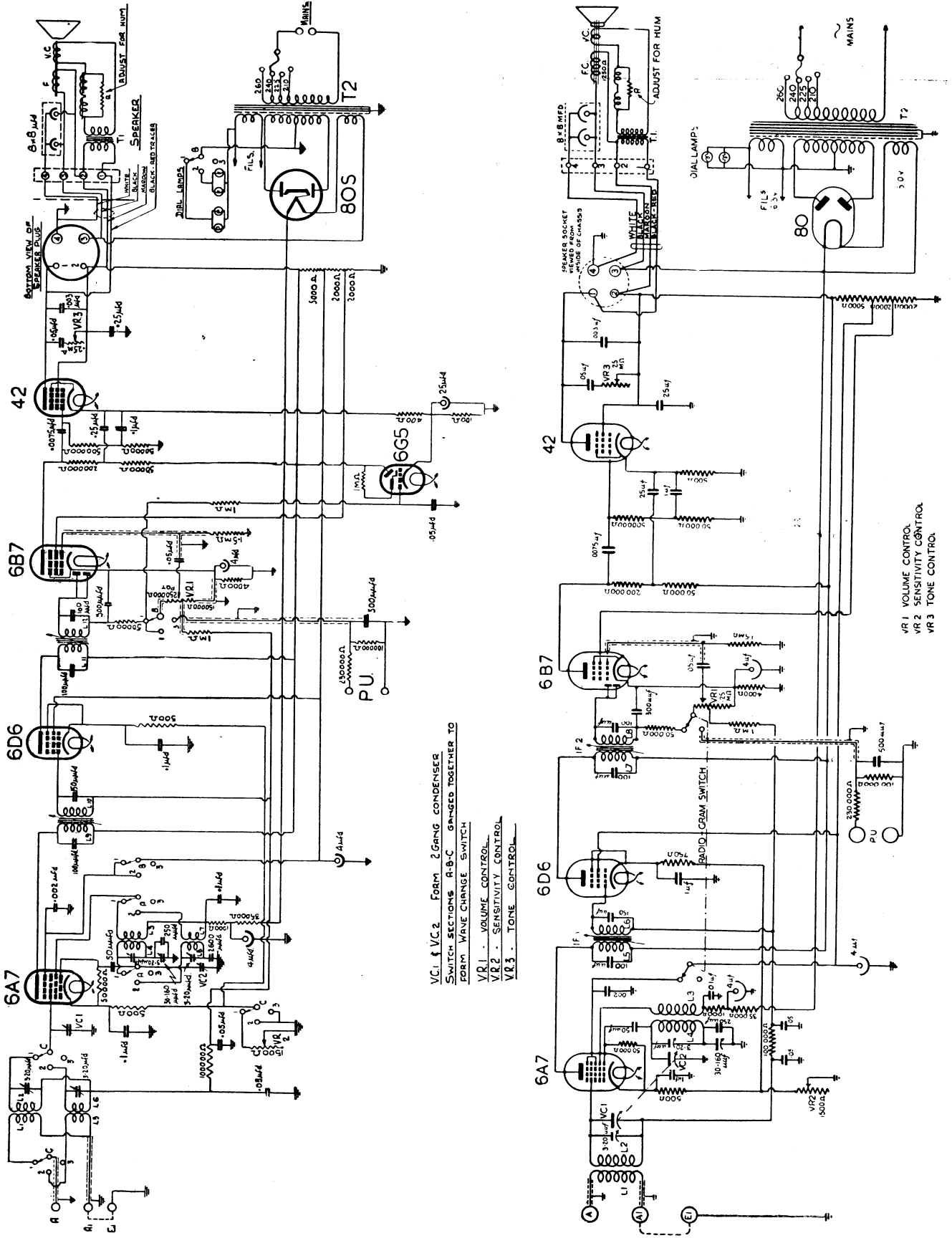


HIS MASTER'S VOICE A.C. MODELS 522 and 523



VC1 & VC2 FORM 2-GANG CONDENSER SWITCH SECTIONS A-B-C GANGED TOGETHER TO FORM WAVE CHANGE SWITCH
 VR1 - VOLUME CONTROL
 VR2 - SENSITIVITY CONTROL
 VR3 - TONE CONTROL

VR1 VOLUME CONTROL
 VR2 SENSITIVITY CONTROL
 VR3 TONE CONTROL

Above are shown the circuit arrangements for H.M.V. models 522 (bottom) and 523 (top). Complete servicing particulars of these two receivers will be given in a later issue.

"His Master's Voice" A.C. Operated Models 522, 523

His Master's Voice models "522" and "523," are basically similar five-valve A.C. operated receivers; they differ mainly in that model "522" is arranged for broadcast coverage only, while model "523" has provision for coverage of the short-wave band between 17.5 and 55 metres. A further point of difference is found in the fact that model "523" is equipped with a tuning indicator of the "magic eye" type.

Both of these models are housed in "upright" console cabinets; both use 8 inch diameter loudspeakers with a field coil resistance of 1,250 ohms; both have large rectangular edgelit dials; and both are fitted with five panel controls. A detail difference is found in the last two factors, however, in that model "523" has an independently-illuminated short-wave scale on the outside of the broadcast scale, and also has a wave-changing position on the pick-up switch. The five controls fitted to these models are, in order from left to right, as follow:— Tone (continuous); sensitivity (continuous); tuning (dual ratio); combined wave-change and pick-up switch (B.C. and P.U. positions only on model "522"); and volume.

In addition to the above, a slight difference is to be found in the valve equipment for these receivers; model "522" is normally equipped with a standard type 80 rectifier, while model "523" normally uses a type 80S, indirectly-heated rectifier. In addition, a type 6G5 tuning indicator is included in the valve complement for model "523."

The circuit diagrams for these two models appear on Page 226, and it will now be of interest to outline several features which are common to both models. The first point of interest is that permeability-tuned intermediate-frequency transformers for units of these receivers. The cores used are of the Sirufer cross-type and require a special hexagonal box spanner for their adjustment. A further point of interest is found in the fact that the two main power supply filter condensers are housed in one can and mounted on the loudspeaker frame.

Although the last point mentioned indicates that the main electrolytic filter condensers are not connected into circuit until the loudspeaker is plugged in, this does not mean that the loudspeaker plug can be removed from the receiver, while it is switched on, with impunity. Further inspection of the circuit arrangement will show that an oscillator plate voltage feed system of the "anti-jitter" type is employed. The filter condenser in this system is a 4 mfd. tubular electrolytic and, as it is connected direct to the rectifier filament through a 35,000 ohms resistor, may be damaged if the receiver load is removed from the rectifier by disconnecting the loudspeaker plug.

Another point to watch is the fused line voltage selector. This fuse is contained in the bridging arm used for selecting the desired tapping on the power transformer primary.

Two unusual features of these circuits merit a brief mention before concluding the description of these two models. The first of these is the biasing arrangement for the output pentode. At first glance, this looks like a normal "self-bias" system, but closer inspection will show that no high-capacity by-pass condenser is provided. Instead, a 50,000 ohms resistor is placed in series with the grid leak, and a 0.1 mfd. condenser is connected from the junction of these two resistors to the cathode. This system is quite effective, although unusual, and is mentioned in case it should be unfamiliar and arouse doubts as to the accuracy of the diagram.

The second unusual feature is the use of a tapped volume control as combined detector and A.V.C. diode load. This control has a total resistance of 250,000 ohms, and its element is tapped at a point 150,000 ohms from the low-volume (cathode) end; the A.V.C. voltage distribution network is connected to the tapping. In the event of a replacement being required and a control of this type not being available, no serious harm will be done if a plain 250,000 ohms potentiometer is used and the A.V.C. network is connected to its high volume end. This will result in a higher A.V.C. voltage being applied to the converter and I.F. valves. An alternative suggestion, which will result in the A.V.C. voltage remaining as originally planned, is to use a plain 500,000 ohms potentiometer and shunt this by a series combination of two resistors, 200,000 and 300,000 ohms; the A.V.C. network may then be connected to the junction of the two resistors.

Two final points remain for consideration in connection with model "523." These are the wiring of the tuning indicator and sensitivity control. It should be noted that the cathode of the 6G5 is taken to a tapping on the output pentode bias resistor and that, in order to prevent audio-frequency fluctuations appearing in the 6G5 pattern, this tapping is shunted by a 25 mfd., 25 volt. electrolytic condenser. The purpose of this arrangement is to offset the delay in the operation of the 6G5 which would occur if its cathode were directly earthed, and which would result in a reduction of the weak signal sensitivity of the indicator.

The arrangement of the sensitivity control is quite straightforward, but it should be noted that the wave-change switch is so arranged that one section short-circuits the sensitivity control when the receiver is operating on short-waves.

OPERATING VOLTAGES.

The following measurements were made with a "1,000 ohms per volt" meter between the socket contact indicated and chassis. During the tests the receiver was operated on the broadcast band and detuned from any signal. All controls were set to their maximum (clockwise) positions.

6A7, Frequency Converter. Plate, 280 v.; screen, 110 v.; cathode, 6 v.; osc. anode, 190 v.

6D6, 460 KC. I.F. Amplifier. Plate, 280 v.; screen, 110 v.; cathode, 5 v. An excellent check on the A.V.C. action may be made by measuring the cathode voltage of this valve when a strong local signal is tuned in. Under these circumstances, the 6D6 cathode voltage will normally be reduced to about 2 volts.

6B7, Detector, A.V.C. Rectifier and A.F. Amplifier. Plate, 45-60 v.; screen, 55 v.; cathode, 2.5 v. The apparently low plate voltage is due to the measuring limitations of a normal "1,000 ohms per volt" meter; a considerably higher reading will be obtained with a higher resistance meter.

42, Output Pentode. Plate, 265 v.; screen, 280 v.; cathode, 19 v.

80 or 80S, Rectifier. Filament or cathode to chassis, 400 volts. D.C.

As a cross-check on the above voltage measurements, the following current readings should be obtained:—Plate current of 42, 30 mA.; total high-tension current of receiver (excluding osc. anode current), 85 mA.; osc. anode current, 4.8 mA.

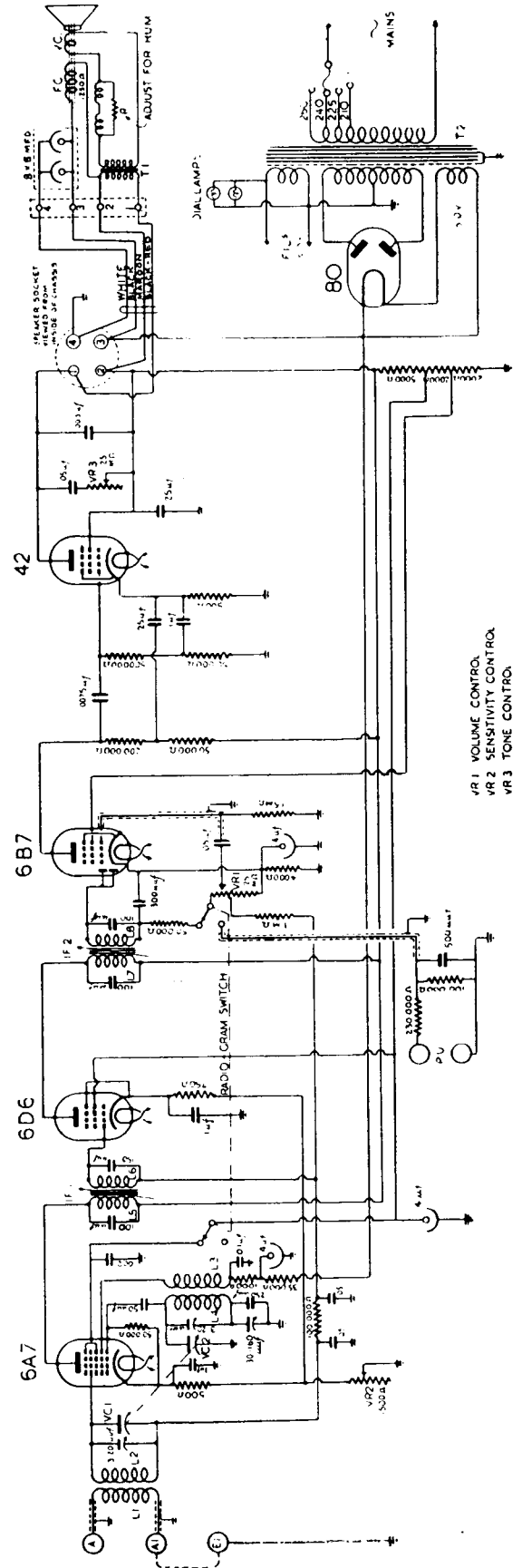
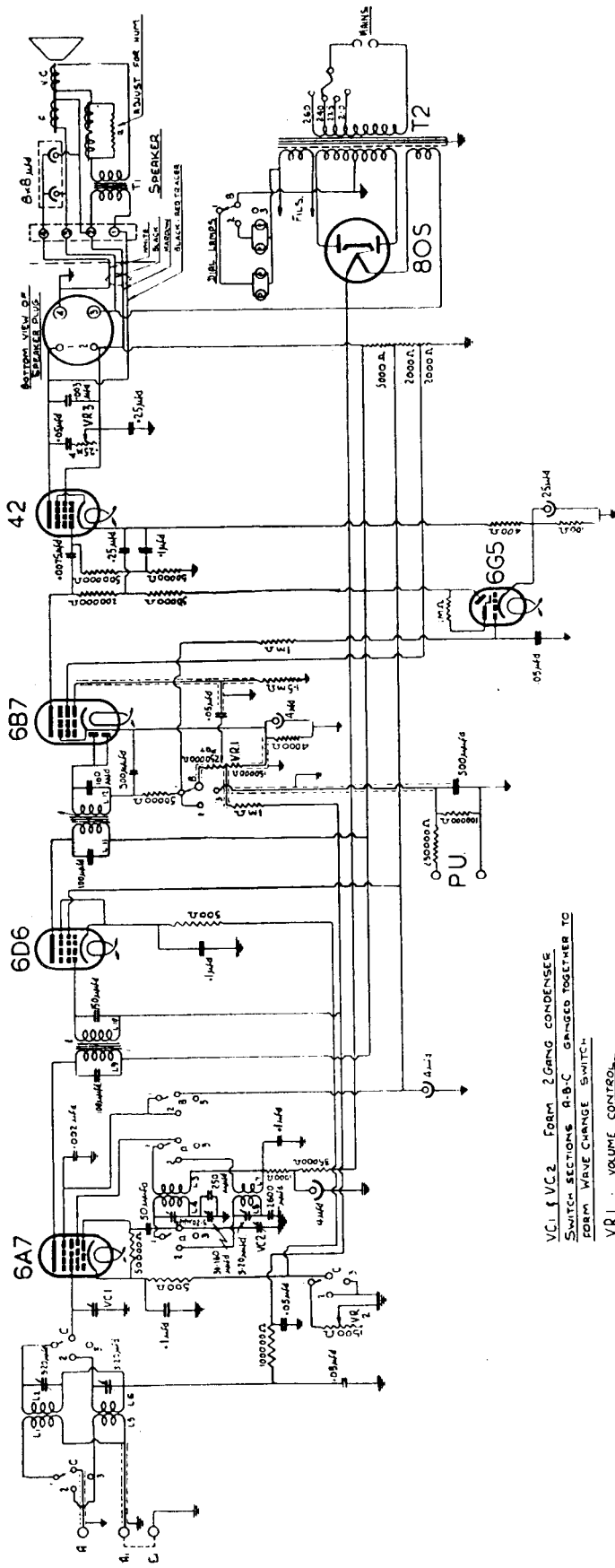
"His Master's Voice" Wiring Colour Code

In order to facilitate analysis of these receivers, a standardised wiring colour code is employed. This is as follows:—

High tension positive leads	Red
Valve plate leads when not direct to H.T. positive	Red/Yellow
Screen grids	Orange
Control grids	Green
Power transformer primary	Blue
Heaters and filaments . .	Brown/White
Cathodes	Yellow
Earth	Black
Unfiltered D.C.	Maroon
General purpose colour .	White

Yellow is used for leads which do not come within the general code, and also when stocks of any colour are temporarily exhausted at the factory.

"His Master's Voice" A.C. Operated Models 522, 523



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