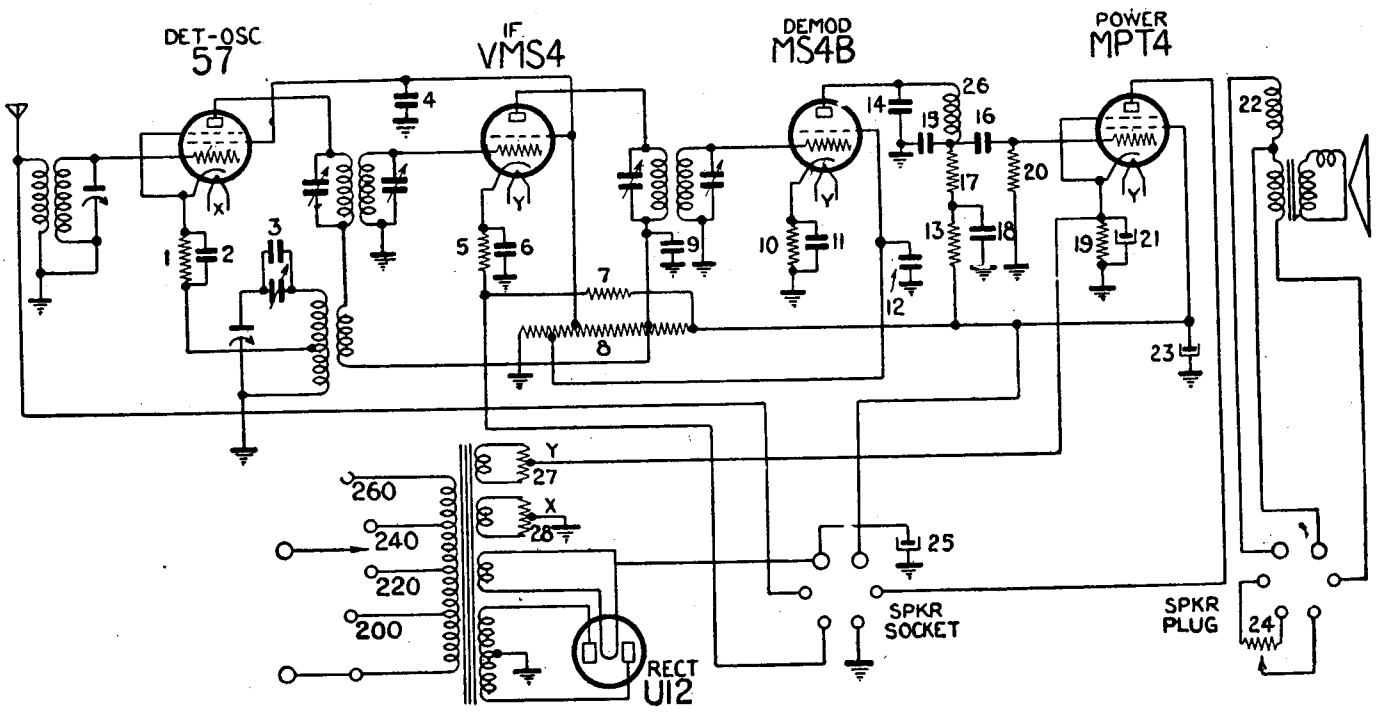
"Genalex" A.C-operated Broadcast Mantel Model BC200



Genalex model "BC200" is a five-valve receiver designed for broadcast coverage and operation from 200-260 v. A.C. mains. This receiver is fitted to a compact mantel type cabinet and is fitted with two controls, these being for tuning and volume. This model was marketed during 1935.

Before outlining the electrical features of this receiver, it is of interest to note that the volume control is of the wire-wound "R.F." type (component 24, res. 10,000 ohms) and, besides being located in the centre of the loudspeaker fret (actually inside the cone and only accessible by removing the loudspeaker), is connected into the receiver by means of three of the loudspeaker cable and plug connections. The electrical arrangement is shown in the circuit diagram and should be followed carefully. The loudspeaker employed is an 8-inch diameter unit and has a field-coil resistance of 1,500 ohms.

The outstanding electrical feature of this receiver is found in the use of Osram "Catkin" valves in the I.F., second detector and output sockets. These valves were the first metal-envelope "receiving" types to be introduced and are to be found in several Genalex models released during 1935. In some areas, it may be difficult to obtain replacements for these "Catkin" valves and the question of substitution arises. As these valves are of the English-base type, substitution becomes rather difficult. The simplest change that can be effected involves replacement of the sockets by standard American "UY" types and rewiring of the leads to the corresponding contacts. If this is done, the VMS4 may be replaced by a Philips E445 or E455, the MS4B by a Philips E452T, and the MPT4 by a Philips E463. Slight re-alignment of the I.F. circuits will be necessary if this is done.

A rather more elaborate, but more satisfactory, change-over can be effected if the sockets are changed to standard octals. If this is done, the 4 volt and 2.5 volt filament windings on the transformer can be wired in series and used to supply modern valve types such as the 6U7G, 6J7G and 6F6G. Apart from the filament voltage change-over, no other alterations to components will be required, although of course it will be necessary to watch the socket connections carefully and change-over the top-cap leads to the I.F. and second detector valves.

The rectifier presents something of a problem also, as this is of the English-base type and also operates from a filament potential of 4 volts. Here it will be necessary to change the socket to a standard American "UX" type, and if this is done, either a Philips 1561 or a Mullard DW4 can be employed with equally satisfactory results. It should be understood that the valve change-overs suggested above are merely for guidance in case of emergency and are not intended as a general procedure.

The circuit arrangement employed in this receiver is a straightforward "autodyne" type superhet. system which uses an I.F. of exactly 445 kC. One point of interest is provided by the positive potential applied to the "Catkin" heaters by returning the centre-tap to the MPT4 cathode, while another interesting item is found in the provision of a bleed resistor from B. max. (component 7, res., 50,000 ohms) in order to increase the voltage drop across the volume control. This resistor should be checked first in cases where the volume control is not operating correctly.

Operating Voltages

The following measurements were made with a 1,000 o/v meter between chassis and the socket contact indicated. For the majority of measurements the volume control was adjusted to its maximum position, but as a further check-up, readings are given in parentheses for the I.F. valve plate current and cathode voltage when the volume control is at its minimum setting.

57, Autodyne Frequency Converter: Plate, 245 v.; screen, 110 v.; cathode, 6 v. Plate current, 1.25 mA.

VMS4, 445 kC. I.F. Amplifier: Plate, 245 v.; screen, 110 v.; cathode, 5 v (44 v.). Plate current, 7 mA. (zero).

MS4B, Anode-bend Second Detector: Plate, 110 v.; screen, 45 v.; cathode, 2 v. Plate, current, 0.2 mA.

MPT4, Output Pentode: Plate, 240 v.; screen, 245 v.; cathode, 16 v. Plate current, 20 mA.

U12, Rectifier: Each plate, 350 v., r.m.s., A.C. Total output current, 50 mA.

Component Values

The index numbers preceding the following component values correspond with those used on the circuit diagram.

1—4,000 ohms; **2, 16**—0.01 mfd., mica; **3**—0.0003 mfd., mica; **4, 6, 9, 11, 12**—0.1 mfd., paper; **5, 19**—500 ohms; **7**—50,000 ohms; **8**—15,000 ohms, voltage divider; **10**—20,000 ohms; **13**—0.1 megohm; **14**—0.001 mfd., mica; **15**—0.00025 mfd., mica; **17**—0.25 megohm; **18**—0.25 mfd., paper; **20**—0.5 megohm; **21**—25 mfd., 25 v. W., electro; **22**—1,500 ohms, loudspeaker field coil; **23, 25**—8 mfd., 500 v. W., electro.; **24**—10,000 ohms, volume control; **26**—R.F. choke; **27, 28**—C.T. resistors.