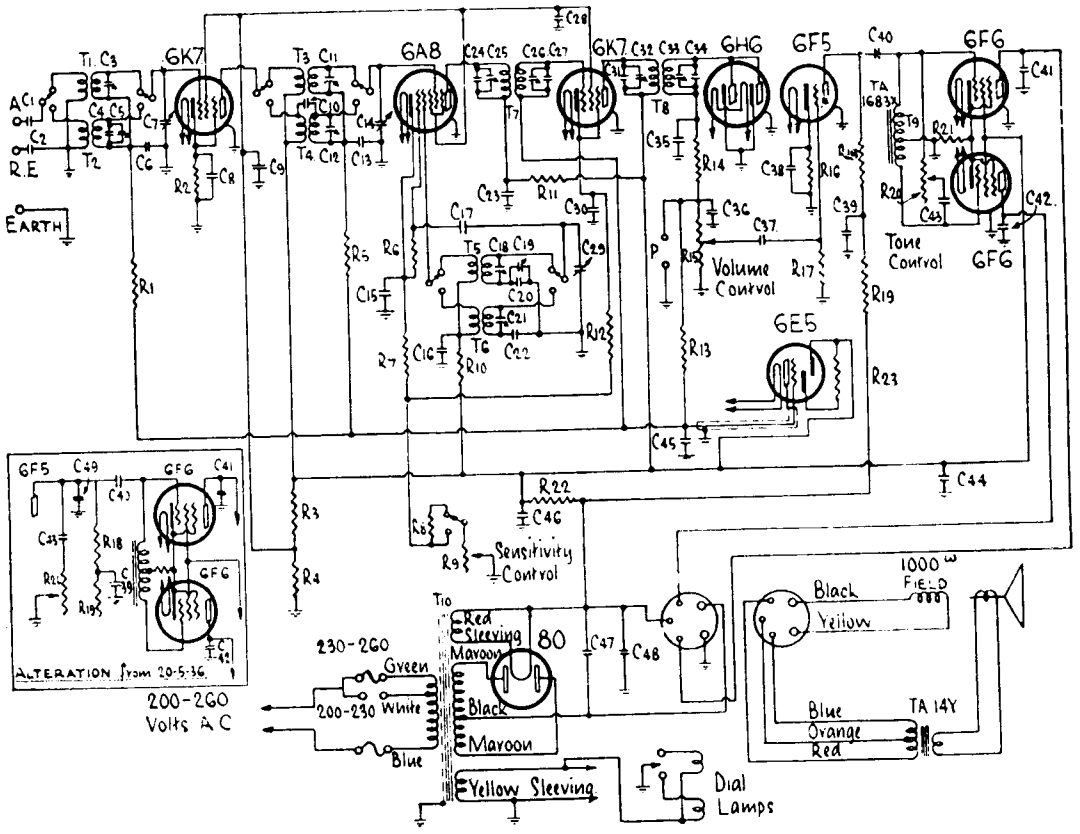
"Radiola" A.C. Dual-Wave Models 251, 303



RADIOLA models "251" and "303" use chasses of identical design, the difference between the two models being found in the cabinet style and the fact that model "303" is equipped as a "radiogram" by the incorporation of a pick-up, motor, and automatic record-changing device. The basic model, however, is the "251" and this will be described.

Model "251" is an eight-valve receiver designed for dual-wave coverage and operation from 40-60 cycles A.C. mains, with potentials between 190 and 260 volts. The loudspeaker used is a heavy-duty type with an overall diameter of 10 inches and a field coil resistance of 1,000 ohms. Control features of this receiver are the use of a straight-line type edgelit dial with wave-band indication and an automatic (reverse type) vernier drive. Five controls are fitted in a line under the dial and these are, in order from left to right, for tone (continuous), volume, sensitivity (continuous), tuning, and wave-change (two positions). A tuning indicator of the 6E5 type completes the panel layout.

The circuit arrangement is fairly straightforward and little difficulty will be experienced in following the wiring. Attention must be drawn, however, to the fact that the aerial and radio earth terminals are bridged by a 100,000 ohms resistor. This resistor is not shown on the circuit diagram. Another point of interest is the arrangement for driving the push-pull 6F6 pentodes. This consists of a centre-tapped high-impedance audio choke (T9), one half of which is wired into the grid circuit of the directly-driven valve. An equal voltage is developed in the other half by auto-transformer action and as the grid connection for the remaining 6F6 is taken from the opposite end of the choke, the required phase reversal is provided. It should be noted that in early serial

(Continued on page 319)

COMPONENT VALUES

The abbreviation "P.N.," followed by a number, which appears after some of the following component indices, is the official A.W.A. part number and exact replacements may be obtained by quoting this number when ordering.

All resistor values are designated by the standard R.M.A. (U.S.A.) colour code. Mica condenser values are stamped thereon in **micromicrofarads**, and paper condenser values are marked in **microfarads.**

COILS:

T1, T2, (P.N. 2018)—Aerial coil assembly; **T3, T4** (P.N. 2054)—R.F. coil assembly; **T5, T6** (P.N. 2020)—Osc. coil assembly; **T7** (P.N. 1991)—1st I.F. transformer; **T8** (P.N. 1990)—2nd I.F. transformer; **T9** (P.N. 1968)—Audio. choke, type TA1683X; **T10** (P.N. 1953)—Standard power transformer. Special 110 v. unit is available as **P.N. 2011.**

RESISTORS:

R1, R5, R14—100,000 ohms, 1/3 W.; **R2, R12**—600 ohms, 1/3 W.; **R3, R4**—11,000 ohms, 3W.; **R6**—60,000 ohms, 1/3 W.; **R7, R8, R11**—300 ohms, 1/3 W.; **R9** (P.N. 1578)—3,000 ohms sensitivity control; **R10**—20,000 ohms, 1/3 W.; **R13**—1½ megohms, 1/3 W.; **R15, R20** (P.N. 1668)—300,000 ohms volume and tone controls, respectively; **R16**—3,000 ohms, 1/3 W.; **R17**—500,000 ohms, 1/3 W.; **R18**—250,000 ohms, 1 W.; **R19**—25,000 ohms, 1 W.; **R21**—400 ohms, 1 W.; **R22** (P.N. 1965)—2,000 ohms, wire wound; **R23**—1 megohm, 1/3 W.

CONDENSERS:

C1, C2—500 mmfd. mica; **C3, C5, C11, C12, C18, C21**—5/20 mmfd. mica trimmers; **C4, C10**—10 mmfd. mica; **C6, C13, C16, C37, C40, C45**—0.05 mfd. paper; **C7, C14, C29** (P.N. 1754)—sections of 3 gang variable condenser; **C8, C9, C15, C23, C28, C30**—0.1 mfd. paper; **C17, C24, C27, C31, C34**—50 mmfd. mica; **C19, C20** (P.N. 1153)—composite "broadcast" padder comprising 10/50 mmfd. mica trimmer and 390 mmfd. fixed mica in parallel; **C22**—2,800 mmfd. mica padder for short wave band; **C25, C26, C32, C33**—10/50 mmfd. mica trimmers; **C35, C36**—100 mmfd. mica; **C38**—5 mfd., 25 v. electrolytic; **C39, C44**—0.5 mfd. paper; **C41, C42**—0.005 mfd. high voltage paper; **C43**—0.01 mfd. paper; **C46, C48** (P.N. 1925)—8 mfd., 500 v. electrolytics in one container; **C47** (P.N. 1926)—16 mfd., 500 v. electrolytic.

"Radiola" Dual-Wave Models 251 & 303

(Continued from page 318.)

numbers of this model the tone control (R20, C43) was wired directly across the phase-splitting choke. Later, this was found unsatisfactory and the tone control network was placed directly between the 6F5 plate and earth (see modified circuit in lower left corner of circuit diagram). It is suggested that this change be made should any of the earlier models be encountered. A final point of interest is provided by the "negative lead" position of the loudspeaker field.

OPERATING VOLTAGES.

The following voltage measurements were made with a 1,000 ohms per volt meter between the chassis and the socket contacts indicated. The line adjustment was on the 230-260 v. position and the receiver was connected to 240 v. A.C. mains. All controls were in their maximum position and the receiver was detuned from any signal. It should be noted that placing the wave-change switch in the S.W. position cuts out resistor R8 and so reduces the minimum value of bias on the converter and I.F. valves. Bias voltages for both settings of the wave-change switch are given below.

6K7, R.F. amplifier. Plate, 225 v.; screen, 100 v.; cathode, 3 v. Plate current, 6 mA.

6A8, Frequency Converter. Plate, 225 v.; screen, 100 v.; cathode (B.C.) 6 v. (S.W.) 3 v.; osc. plate, 170 v. Plate current (B.C.) 3 mA. (S.W.) 4 mA.; osc. plate current, 2.5 mA.

6K7, 460 KC. I.F. Amplifier. Plate, 225 v.; screen, 100 v.; cathode (B.C.) 6 v. (S.W.) 3 v. Plate current (B.C.) 4 mA. (S.W.) 6 mA.

6H6, Duo-diode Detector and A.V.C. rectifier. No measurable voltage. Cathode is earthed.

6F5, audio amplifier. Plate, 100 v.; cathode, 2v. The plate voltage on this valve cannot be measured accurately with an ordinary voltmeter so that the plate current is a more reliable guide. This should be 0.6 mA.

6F6, Push-pull Output pentodes. Plates, 280 v.; screens, 225 v.; cathodes, 20 v. Plate current, 30 mA. each.

6E5, Tuning Indicator. Plate, 225 v.; cathode, earthed. Plate current, 1.0 mA.

80 Rectifier. 360 v. R.M.S. A.C. per plate, total current drain, 100 mA. Drop across speaker field is 100 v., so D.C. voltage between filament of 80 and H.T. secondary C.T. should be approximately 380 v.