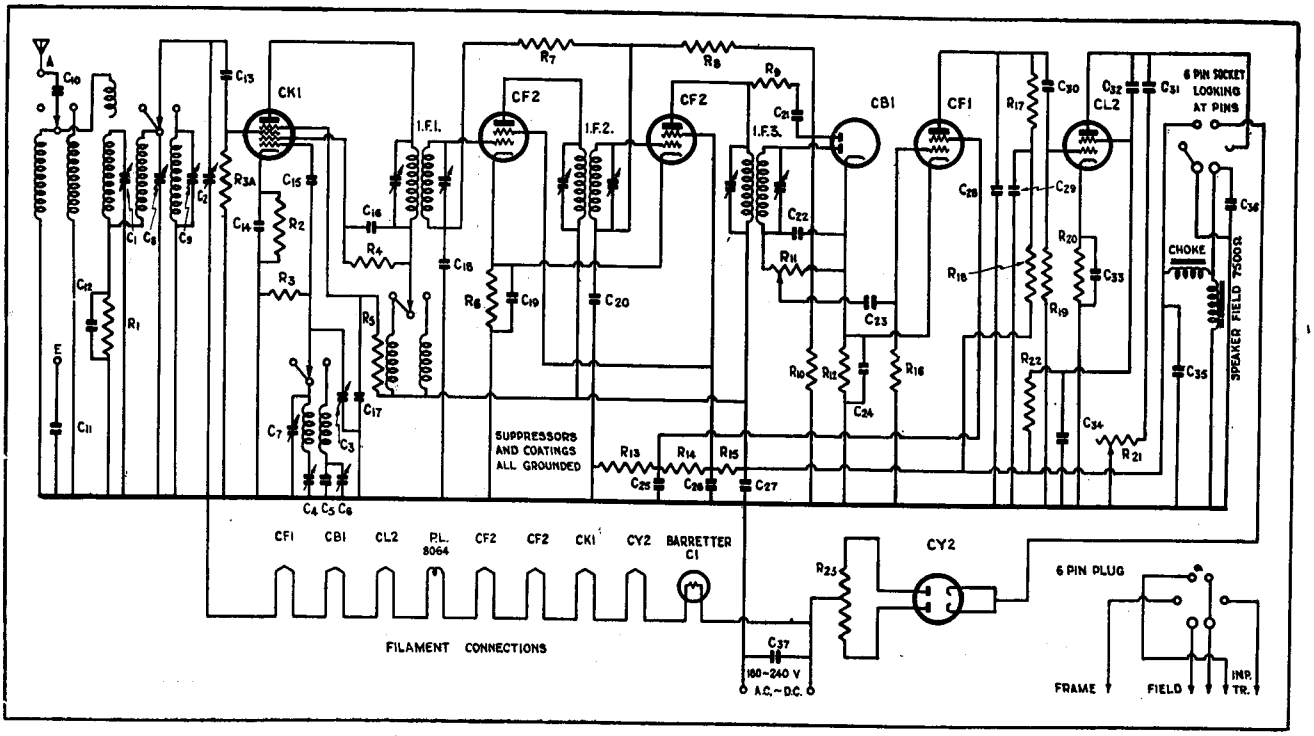
"Briton" A.C./D.C.-operated Dual-Wave Model 12DWS



Briton model "12DWS" is a seven-valve receiver designed for dual-wave coverage and operation from 180-250 v., A.C. or D.C. mains. Automatic adjustment to suit varying line voltage conditions is provided by the use of a Philips type C1 iron-hydrogen barretter for filament voltage regulation. This receiver is of the console type and is fitted with four controls, these being for volume, tuning, tone (continuous) and wave-change (with extra position for sensitivity reduction on local broadcast reception). The loudspeaker employed is an 10-inch unit with a field-coil resistance of 7,500 ohms. This model was marketed during 1935.

The design of this receiver is fairly straightforward, the only unusual features being found in the use of a broadcast band-pass filter in front of the frequency converter, even though the I.F. used is 458 kC.; the oscillator plate-feed system; and the direct earthing of the I.F. and A.F. amplifier valve suppressors. The band-pass filter used is of the capacity-coupled type (R1, C12), and is employed as a means of preventing image interference from the transmitters which are often located in the heart of towns where an A.C./D.C. receiver finds its usual application. The oscillator plate-feed system, although not employed nowadays, was regular practice a few years ago and is quite efficient in operation. It should be noted, however, that the first I.F.T. primary trimmer is "hot" in a circuit of this type and a fully-insulated aligning tool is essential in order to achieve accurate alignment. The final point, regarding direct earthing of the I.F. and A.F. amplifier suppressors, while unusual, is quite in order and was probably employed in the design of this model in order to ensure a high degree of stability.

Another point of interest in this receiver is the use of a Philips type **8064** dial lamp. This is a special 18 v., 200 mA., filament lamp which is designed for operation in series with the valve heaters. No other replacement can be made for this lamp and, in the event of a burn-out, another 8064 must be substituted. In an emergency case, the lamp-holder may be shorted out until a replacement is available, without damage to the valve heaters, because the barretter is capable of taking care of the additional voltage drop which will be required.

COMPONENT VALUES

RESISTORS.

R1—1,000 ohms, carb.; **R2**—200 ohms, w.w.; **R3, R4, R5, R18**—25,000 ohms, carb.; **R3a, R7, R8, R10, R19**—500,000 ohms, carb.; **R6, R20**—400 ohms, w.w.; **R9**—100,000 ohms, carb.; **R11**—500,000 ohms, vol. cont.; **R12**—5,000 ohms, carb.; **R13, R14, R15**—sections of 15,000 ohms, w.w., volt. divider; **R16, R17**—250,000 ohms, carb.; **R21**—15,000 ohms, tone con.; **R22**—20,000 ohms, 1W., carb. (see note below); **R23**—50 ohms, C.T., w.w. surge limiting resistor.

NOTE: In some of these receivers it may be found that R22 has a value of only 10,000 ohms, and that as a result the CL2 screen voltage is considerably over the rated maximum of 100 v. In such cases, a resistor of the correct value should be substituted.

CONDENSERS.

C1, C2, C3—sections of var. con.; **C4**—7-plate B/C. padder; **C5**—0.001 mfd., mica, S/W. padder shunt; **C6**—11-plate S/W. padder; **C7**—B/C. osc. trimmer; **C8**—B/C. band-pass trimmer. **C9**—S/W. aer. trimmer; **C10, C11, C13, C15**—0.001 mfd., mica; **C12, C18, C20, C23, C30**—0.02 mfd., tubular; **C14, C16, C17, C25, C31, C34**—0.1 mfd., tubular; **C19, 26, C27, C29**—0.5 mfd., tubular; **C21**—0.0001 mfd., mica; **C22**—0.00025 mfd., mica; **C24, C33**—5 mfd., 25 v., W., electro.; **C28**—0.002 mfd., mica; **C32**—0.006 mfd., tubular; **C35, C36**—8 mfd., electro.; **C37**—0.01 mfd., mica.

OPERATING VOLTAGES.

The following measurements were made with a "1,000 ohms per volt" meter between the negative bus-bar and the socket contact indicated. The receiver was operated on 240 v., D.C., mains and no signal was tuned in.

CK1, Frequency Converter: Plate, 200 v.; screen, 80 v.; cathode, 2 v.; osc. anode grid, 90 v.

CF2 (two), 458 kC. I.F. Amplifiers: Plates, 200 v.; screens, 80 v.; cathodes, 2 v.

CB1, Duo-diode Detector and A.V.C. Rectifier: Cathode tied to cathode of CF1; 1.5 v.

CF1, A.F. Amplifier: Plate, 70 v.; screen, 50 v.; cathode, 1.5 v.

CL2, Output Pentode: Plate, 190 v.; screen, 100 v.; cathode, 18 v.

CY2, Rectifier: Cathode to neg. bus-bar, 230 v.

CIRCUIT ERROR: Inspection of the 12DWS circuit diagram will reveal that the oscillator grid leak (R3) is shown as being connected between the negative bus-bar and the coil side of C15. This is, of course, incorrect, and the resistor should be connected between the grid side of C15 and the negative bus-bar.