

EDDYSTONE

Model 820

General Description : Eight-valve (including rectifier and tuning indicator) broadcast receiver unit for reception of F.M. Stations in Band II and for A.M. stations on one spot frequency in the L.W. band and two spot frequencies in the M.W. band. Audio-frequency output is at a level suitable for feeding into a high-quality amplifier or to the pick-up terminals of a conventional receiver.

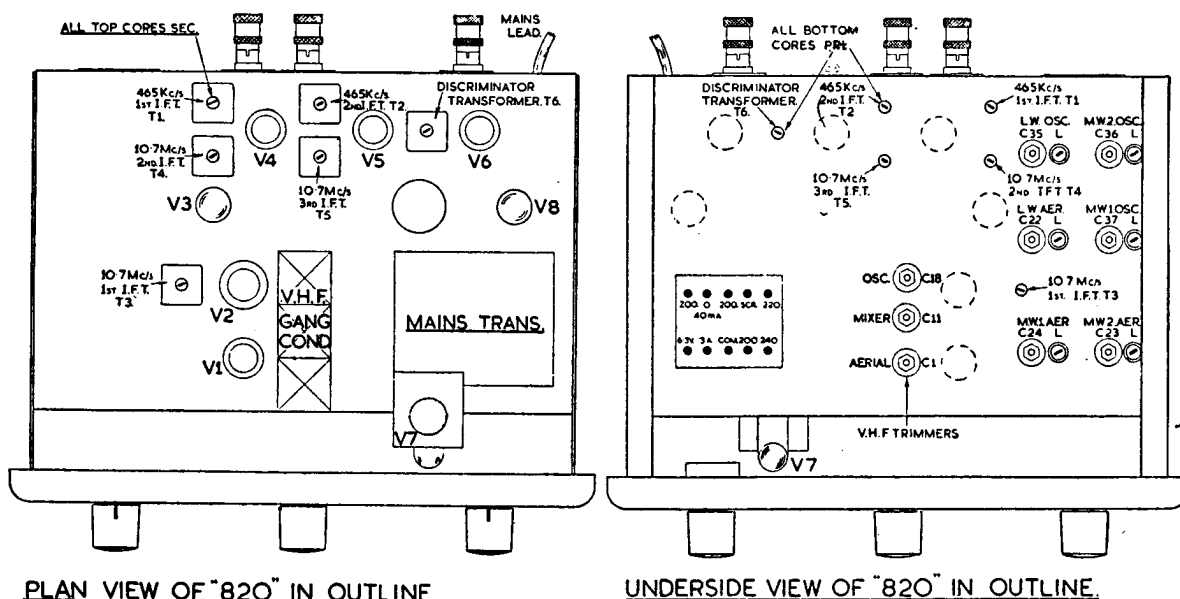
Power Supply : A.C. mains, 200–250 volts (built-in power unit).

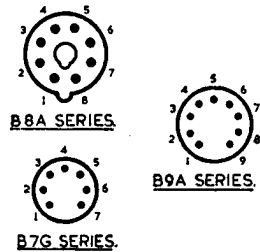
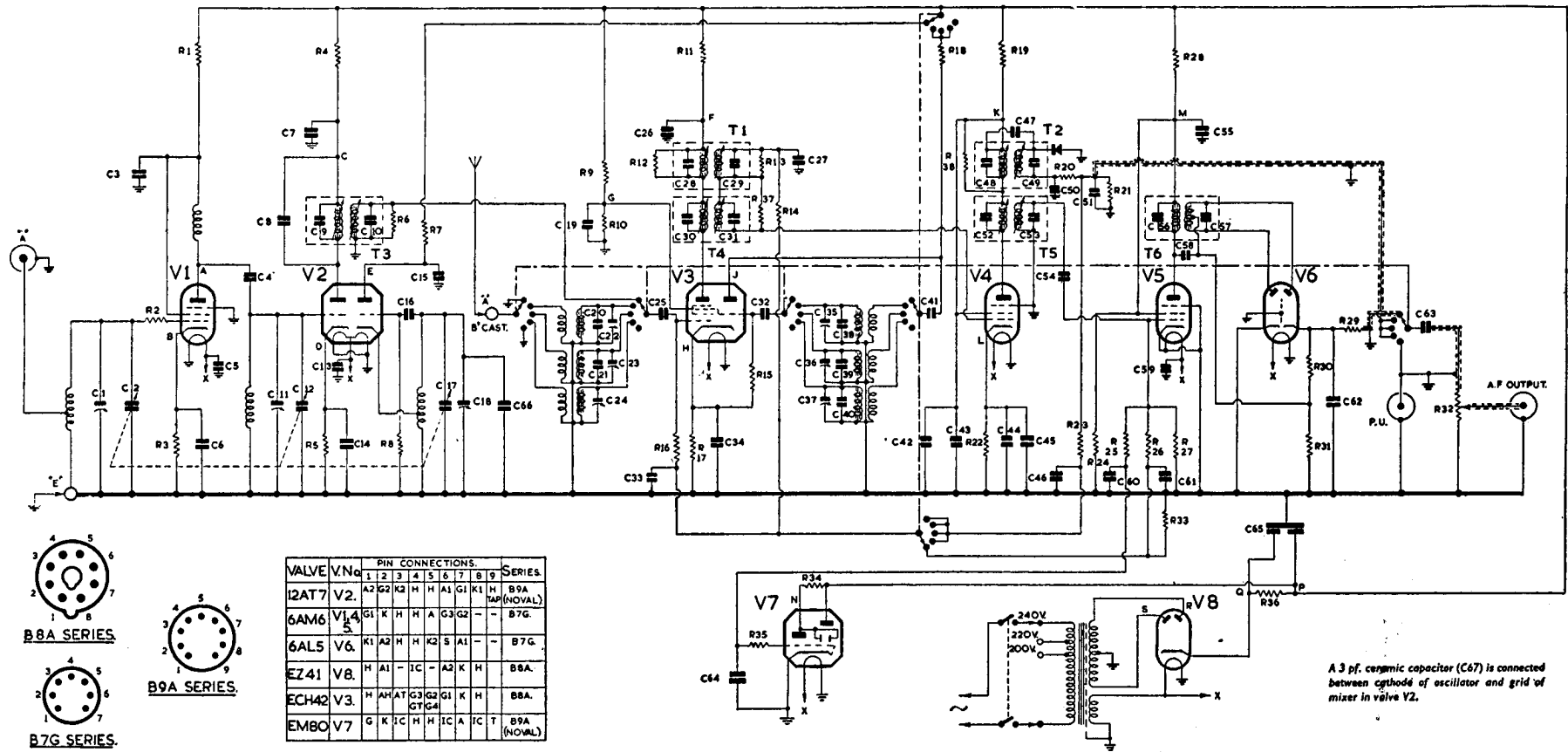
Wavebands : M.W. 1, 960–1550 kc/s.; M.W. 2, 610–960 kc/s.; L.W. 200 kc/s.; V.H.F. 85–101 Mc/s.

Valves : (V1) 6AM6 (V.H.F. amp.); (V2) 12AT7 (V.H.F. frequency changer); (V3) ECH42 (10.7 Mc/s. I.F./A.M. frequency changer); (V4) 6AM6 (10.7 Mc/s./462 kc/s. I.F. amp.); (V5) 6AM6 (10.7 Mc/s. I.F. amplifier and limiter); (V6) (Foster–Seeley type discriminator) 6AL5; (V7) EM80 (tuning indicator); (V8) EZ41 (rectifier). On A.M. only V3, V4 and V8 are used, a crystal diode being used for detection/A.G.C.

Alignment Procedure : The following notes are based on the use of a centre zero 50–0–50 micro-ammeter and either an A.M. or (preferably) an F.M. signal generator, covering up to 110 Mc/s.

10.7 Mc/s. I.F. Channels : The earthy end of R27 should be unsoldered and the micro-ammeter placed in series (if 0–50- μ A. type is used, positive terminal should be connected to chassis). The output from the signal generator is fed direct to the grid of V4, and with the generator set to 10.7 Mc/s., the output is increased until a deflection is observed on the micro-ammeter. The primary and secondary cores of T5 are adjusted for maximum output. A sensitivity of approximately 15 mV. for 4 μ A. deflection should be obtained. The generator lead is then transferred to the signal grid of V3 and T4 adjusted for maximum deflection: sensitivity should be about 700 μ V. for





| VALVE | V.N | a | PIN CONNECTIONS. | | | | | | | | | SERIES |
|-------|------|----|------------------|----|----|----|----|----|----|---|-----|-------------|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | |
| 12AT7 | V2. | A2 | G2 | K2 | H | H | A1 | G1 | K1 | H | TAP | B9A (NOVAL) |
| 6AM6 | V1,4 | G1 | K1 | H | H | A | G3 | G2 | - | - | - | B7G. |
| 6AL5 | V6. | K1 | A2 | H | H | K2 | S | A1 | - | - | - | B7G. |
| EZ41 | V8. | H | A1 | - | 1C | - | A2 | K | H | - | - | B8A. |
| ECH42 | V3. | H | AH | A1 | G3 | G2 | G1 | K | H | - | - | B8A. |
| EMBO | V7 | G | K | 1C | H | H | 1C | A | 1C | T | - | B9A (NOVAL) |

CIRCUIT DIAGRAM—EDDYSTONE RECEIVING UNIT MODEL 820

Capacitors.

| | | | | | | | | | | | | | |
|-----|----------|-----|----------|-----|----------|-----|----------|-----|---------|-----|---------|-----|---------|
| C1 | 3-30 pF. | C11 | 3-30 pF. | C21 | 20 pF. | C31 | 20 pF. | C41 | 100 pF. | C50 | 100 pF. | C59 | 0.003 |
| C2 | 2-15 pF. | C12 | 2-15 pF. | C22 | 3-30 pF. | C32 | 100 pF. | C42 | 0.1 | C51 | 100 pF. | C60 | 0.01 |
| C3 | 500 pF. | C13 | 0.003 | C23 | 3-30 pF. | C33 | 0.01 | C43 | 0.01 | C52 | 20 pF. | C61 | 0.01 |
| C4 | 3 pF. | C14 | 0.003 | C24 | 3-30 pF. | C34 | 0.01 | C44 | 0.003 | C53 | 20 pF. | C62 | 100 pF. |
| C5 | 500 pF. | C15 | 0.003 | C25 | 100 pF. | C35 | 3-30 pF. | C45 | 0.1 | C54 | 40 pF. | C63 | 0.01 |
| C6 | 500 pF. | C16 | 40 pF. | C26 | 0.01 | C36 | 3-30 pF. | C46 | 0.01 | C55 | 0.003 | C64 | 0.01 |
| C7 | 0.003 | C17 | 2-15 pF. | C27 | 0.01 | C37 | 3-30 pF. | C47 | 1 pF. | C56 | 100 pF. | C65 | 32 + 32 |
| C8 | 10 pF. | C18 | 3-30 pF. | C28 | 100 pF. | C38 | 200 pF. | C48 | 100 pF. | C57 | 50 pF. | C66 | 8 pF. |
| C9 | 20 pF. | C19 | 0.01 | C29 | 100 pF. | C39 | 40 pF. | C49 | 100 pF. | C58 | 40 pF. | C67 | 3 pF. |
| C10 | 20 pF. | C20 | 100 pF. | C30 | 20 pF. | C40 | 20 pF. | | | | | | |

A 3 pf. ceramic capacitor (C67) is connected between cathode of oscillator and grid of mixer in valve V2.

| Resistors. | | | | | | | | | |
|------------|------|-----|-------|-----|------|-----|-------------|-----|---------------------|
| R1 | 2·2k | R9 | 33k | R17 | 270 | R25 | 0·47M | R33 | 68k |
| R2 | 12 | R10 | 33k | R18 | 27k | R26 | 0·47M | R34 | 1M |
| R3 | 150 | R11 | 2·2k | R19 | 2·2k | R27 | 0·27M | R35 | 0·47M |
| R4 | 2·2k | R12 | 68k | R20 | 22k | R28 | 27k | R36 | 500 (1 W., W.W.) |
| R5 | 680 | R13 | 68k | R21 | 0·1M | R29 | 68k | R37 | 47k |
| R6 | 0·1M | R14 | 0·47M | R22 | 150 | R30 | 0·1M | R38 | 0·47M |
| R7 | 2·2k | R15 | 47k | R23 | 1M | R31 | 0·1M | | |
| R8 | 10k | R16 | 0·47M | R24 | 22k | R32 | 0·5M (Pot.) | | |

4 μ A. deflection. Generator output transferred to pin 7 of V2 and cores of T3 adjusted for maximum output.

R.F. Stage : With pointer set to 100 Mc/s. and generator output fed to aerial-feeder socket, C18 is adjusted for maximum deflection of the microammeter. Repeat at 87·5 Mc/s.: if appreciable falling off in output occurs, a slight adjustment should be made to the inductance, repeating the process until good tracking is obtained. With generator set to 95 Mc/s., C1 and C11 are trimmed for maximum deflection.

Discriminator : Signal generator set to 10·7 Mc/s., unmodulated, output at maximum (*i.e.*, about 1 volt) and the output lead connected to grid of V5. A centre zero 50-0-50 μ A. meter is placed across the output of V6 in series with a 100k resistor, *i.e.*, from that cathode above earth, through meter and resistor, to chassis. If the stage is correctly aligned to 10·7 Mc/s., the meter will read zero. A check should be made by varying generator frequency either side of 10·7 Mc/s. For equal frequency variations, the meter should show equal deflections each side of zero. If the readings are unequal, adjustment of the primary (lower) core of T6 should restore balance. In the unlikely event of complete re-alignment of the discriminator being required, the secondary (upper) core is set so that the top of the core is flush with the top of the can of T6. The primary core is then adjusted for maximum deflection, after which the secondary core is adjusted for zero reading. The balance should be checked as above. The peak deflection obtained should be of the order of 20 μ A.

465 kc/s. I.F. : A 465-kc/s. modulated signal is injected to the grid of V4 and the cores of T2 adjusted for maximum audio output measured in the conventional manner. Signal is transferred to signal grid of V3 and T1 adjusted, the local oscillator being rendered inoperative by shorting the grid to earth. The 10·7-Mc/s. circuits should not be disturbed whilst adjusting the 465-kc/s. circuits.

L.W. : Inject signal of required frequency (*e.g.*, 200 kc/s. for Droitwich). Rotate L.W. oscillator core until a deflection is obtained: make fine adjustment with C35. Adjust core and then trimmer of L.W. mixer coil for maximum output.

M.W. : For each position, proceed as for L.W. above.

Performance V.H.F./F.M. : An input of 25 μ V. gives 1 volt at the limiter grid, and ensures full limiting action. Selectivity figures: 6 db. down 100 kc/s. off resonance and 25 db. down 200 kc/s. off. I.F. break-through greater than 70 db. down at 10·7 Mc/s. Image attenuation 35 db. Audio output 0·5 volts (approx.) for 30 per cent modulation (= 22·5 kc/s. deviation).

Performance M.W. and L.W. : Sensitivity is adequate for good results with a comparatively small aerial. Image ratio greater than 35 db.

Selectivity 25 db. down 10 kc/s. off resonance (465 kc/s.). Audio output 0.2 volt approx., 30 per cent modulation, 400 c/s., 50 μ V. input.

Output : High impedance to match into grid circuit of average amplifier.

Voltage Values : Voltages given are those between the points indicated and chassis. Set switch to F.M. for points A to E inclusive, and to a broadcast band for all other points. Values are given for A.C. input of 240 volts using two types of meter: Avo Model 8 (20,000 ohms/volt) and Avo Model 40. It will be evident that the voltage indicated depends on the sensitivity of the meter employed. Tolerance of ± 5 per cent on actual values should also be anticipated.

| | <i>Point</i> | <i>Avo 8</i> | <i>Avo 40</i> | | <i>Point</i> | <i>Avo 8</i> | <i>Avo 40</i> |
|---|--------------|--------------|---------------|----|--------------|--------------|---------------|
| A | . . . | 170 | 165 | K. | . . . | 170 | 167 |
| B | . . . | 1.2 | 0.89 | L. | . . . | 1.35 | 1.0 |
| C | . . . | 168 | 160 | M. | . . . | 55 | 42 |
| D | . . . | 2.45 | 0.73 | N. | . . . | 27 | 10 |
| E | . . . | 168 | 165 | P. | . . . | 187 | 190 |
| F | . . . | 184 | 178 | Q. | . . . | 200 | 204 |
| G | . . . | 68 | 46 | R. | . . . | 200 A.C. | 200 A.C. |
| H | . . . | 1.65 | 0.83 | S. | . . . | 200 A.C. | 200 A.C. |
| J | . . . | 79 | 70 | | | | |