

SEVEN valve table model receiver covering long, medium and VHF bands. Suitable for 195-250V. AC only. Manufactured by Baird Television, Brighouse, Yorks, the set was released August, 1955, and is priced at £30 10s. Od., inclusive of £8 8s. Od. purchase tax.

AM circuit is normal superhet type employing ECH81 frequency-changer V1, EF89 IF amplifier V2, EABC80 detector and AF amplifier V3, EL84 output pentode V5 and EM34 magic-eye indicator V7.

FM circuit uses ECC85 RF amplifier and self-oscillating mixer V1, ECH81 first IF amplifier V2, EF89 second IF amplifier V3, and EABC80 ratio detector and AF amplifier V4. Remainder of circuit is as for AM.

IF for FM is 10.7mc/s, for AM 470kc/s. Wavebands: LW 1,030-2,000m.; MW 200-550m.; and FM 87.7-95.6mc/s.

Speaker is 6 1/2 in. circular type, and mains consumption is approximately 60W.

### FM OPERATION

**Aerial.** Receiver incorporates a built-in aerial which operates as a dipole on FM and as a plate on LW and MW, if required. To use the internal aerial the twin leads from it should be plugged into the 300 ohm aerial sockets. If it is required for LW and MW the small wander plug on aerial panel should be plugged into the LW, MW aerial socket.

For use with an external FM aerial an 80 ohm coaxial input socket is provided, the internal aerial being unplugged. The external FM aerial can be used for MW, LW, reception in the same manner as before.

Signal is aperiodically coupled across grid and cathode of V1A by L5 L6, C1 being shunted across L5 to provide correct matching for different aerials. L1, C4, in series with V1A cathode, form IF rejector circuit.

Feed from V1A anode to V1B grid is conventional, signal being fed to a point of zero oscillator potential to prevent oscillator radiation, C11 providing adjustment for minimum radiation.

Oscillator is tuned grid type. IF output appears across L10, tuned by C15 to 10.7mc/s.

**IF Stages.** For FM operation triode section of V2 is rendered inoperative by S1B, which removes the anode HT supply. A small voltage appears on the anode, due to R13, to prevent cathode poisoning. R13 performs a similar function on AM for V1.

V2 operates as first IF amplifier on FM, V3 is second IF amplifier and partial limiter. The limiting is effected by C37, R14, which cause grid limiting on large signals.

**Ratio detector.** Centre-tapped secondary L25 of IFT2 feeds the ratio detector circuit. Signal is fed to centre tap by L24 which is close-coupled to primary L23. Voltage in L23 leads or lags current as input frequency swings above or below 10.7mc/s.

Voltag es are induced in two halves of L25 with phase variation in step with variation of phase in L23, i.e., in accordance with modulation.

Voltag es at top and bottom of L25 are equal and opposite at any time and to these two voltages a reference IF is added from L24.

The resultant voltages obtained are applied to the two ratio detector diodes, and are such that their ratio is proportional to the modulation.

Two diodes each have two conducting paths. The path via L24 R18 R19 is common, but the respective currents flow in opposite directions, hence, with no modulation they balance out and no voltage appears across R19. When modulation is applied an AF voltage appears at junction of R18 R19.

C52 functions as an automatically variable diode load and serves to smooth out any amplitude variations.

R20, C50 form de-emphasis network compensating for treble boost applied at transmitter.

### AM OPERATION

**Aerial input** is transformer coupled to signal grid of V2 and mixer and IF stages are conventional.

**Volume control** is VR2. Signal is fed from S1B, via C59 to top of control, AF signal being taken from slider of VR2 through C61 to grid of V4 triode which functions as AF amplifier.

Tone control VR1 in conjunction with C60 forms top-control across volume control and C59.

AVC is derived from signal diode circuit and is applied to V2, V3. AVC is not used on FM, the AVC line being earthed by S1D.

**Output stage.** Output valve V5 is fed from anode V4 by C58 and grid stopper R30. Feedback network R32 C56 R28 R29 is connected between anode and grid with switches S1A, S1B.

On FM operation R29 is cut out by S1A giving increased bass lift to compensate for increased high frequency response available.

HT is derived from indirectly heated full wave rectifier V6, smoothed by R34 C32B and C. Reservoir capacitor C32C is rated for 200mA ripple current.

**Magic-eye indicator** is conventional type, indicator grid voltage being taken from point on AVC line between R8 and R24. The remote end of R8 is earthed on FM to render AVC inoperative, so tuning indicator operation is unaffected.

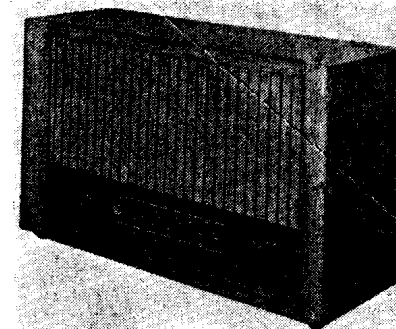
**Modification.** Sets with serial number 1,000-1,999 inclusive are fitted with EF85 as V3; R16 is 56K 1/2W; C41 is between R17 and pin 8 V3. Note: Ratio detector transformer used with EF85 is not suitable with EF89.

**Removal of chassis.** Remove four control knobs (pull

### VALVE VOLTAGES

		Anode	Screen	Cathode
V1	ECC85 (a) ...	148	—	1.9
	(b) ...	154	—	0
V2	ECH81 (p)-AM ...	225	81	0
	-FM ...	212	72	0
	(t)-AM ...	96	—	0
V3	EF89-AM ...	216	77	0
	-FM ...	200	67	0
V4	EABC-AM ...	67	—	0
	-FM ...	62	—	0

For EM34, EL84, EZ80, see overleaf.



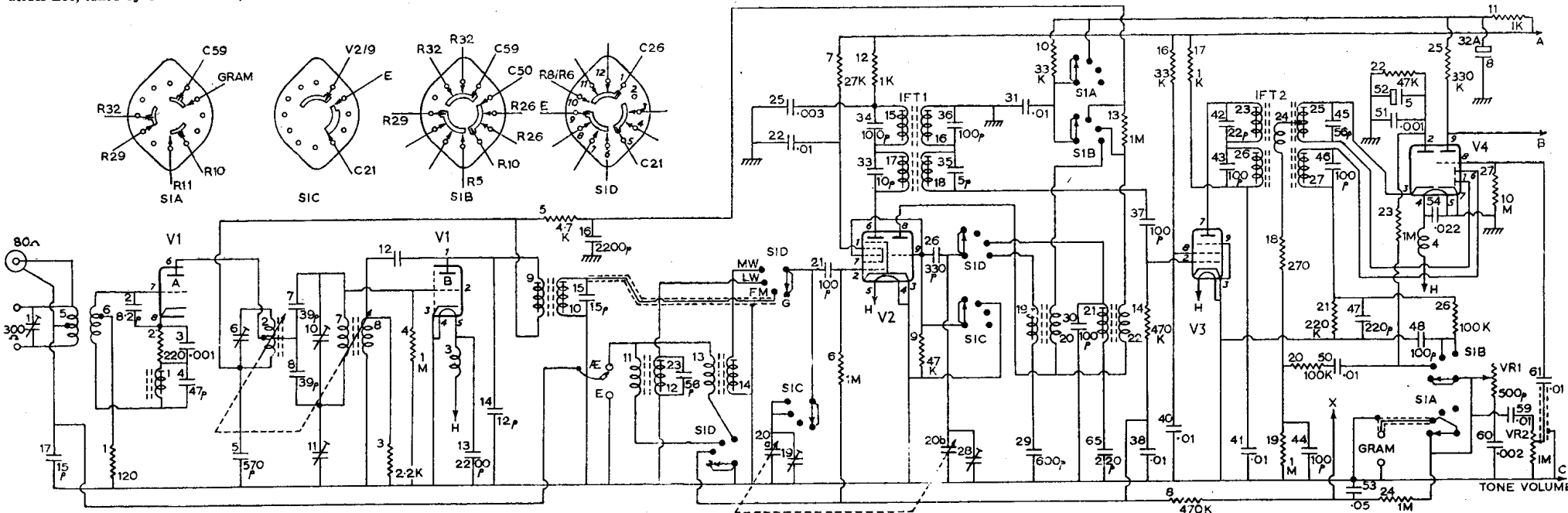
off), remove four chassis fixing screws from underside of cabinet and unsolder speaker leads from speaker. Slide chassis out gently.

### FM ALIGNMENT

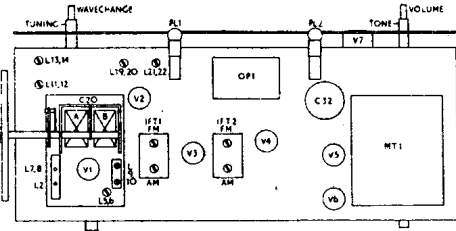
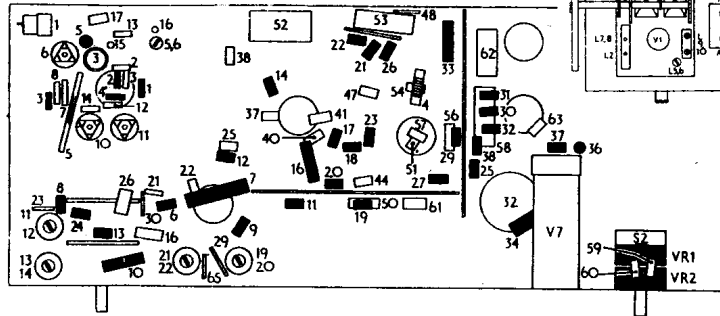
**IF.** Inject 10.7mc/s, AM modulated, from signal generator across 100 ohms to grid of V3 via C37. Adjust IFT2(FM) bottom core, for maximum output on tuning indicator, and top core for minimum sound from speaker. The latter should have a sharp null point. It is essential that cores in ratio detector coil should always be in outer tuning positions, otherwise coupling coefficient will be made too large.

Now inject 10.7mc/s across 100 ohms into V2 mixer grid via 47K resistor. Adjust L18 17 10 9 for maximum output.

If frequency modulated signal generator is available connect as above with sine wave deviation of 85kc/s and



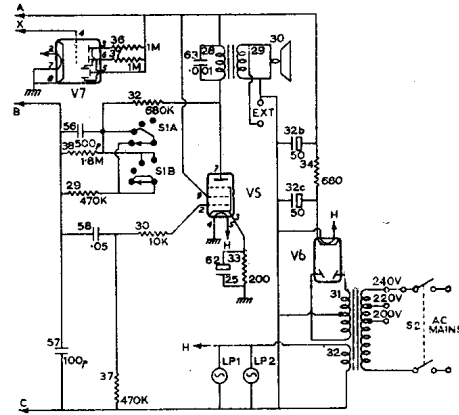
**Resistors**  
 Wirewound 6W: R34  
 Carbon 1W: R7  
 Carbon ½W: R10 16 33  
 Remainder all carbon ½W  
**Potentiometers**  
 Coaxial carbon: VR1 VR2



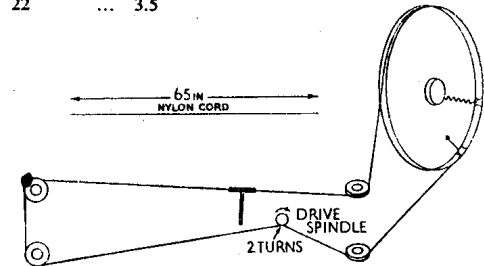
**Capacitors**  
 Paper tubular 350V: C25 31  
 40 41 51 53 54 58 60 63  
 Paper tubular 150V: C22 38  
 50 52 59 61  
 Silver Mica: C17 21 23 26 29  
 30 33-37 42-48 56 57 65  
 Electrolytic 350V: C32 A B C  
 Electrolytic 150V: C52  
 Electrolytic 25V: C62

**INDUCTORS**

L	Ohms	L	Ohms
1-10	... Very low	23	... Very low
11	... 7.5	24	...
12	... 11	25	...
13	... 26.5	26	... 18
14	... 27	27	... 18
15	... 13	28	... 450
16	... 18	29	... Very low
17	... Very low	30	... Very low
18	...	31	... 250
19	... 3.5	32	... Very low
20	... 1	33	... 30
21	... 10.5		
22	... 3.5		



EM34	EL84	EZ80
(3) FM30 35AM	(6) FM20 25AM	FM200 213AM 260AC
O O	D O	21.5 230
		6-7 7-2 FM273 277AM



re-check L18 17 10 9 so that the maximum undistorted audio output is obtained. The latter operation is simplified if output wave form is viewed on an oscilloscope connected from junction of R20 and C50 to chassis; slugs may then be adjusted for maximum undistorted sine wave.

If no frequency modulated signal generator is available this operation may be carried out after RF circuits have been aligned using tuning note from a transmission, although this is less satisfactory as the modulation depth will not be so large.

**Oscillator radiation.** With scale set at centre and with a VTVM connected across C6 adjust C11 for a minimum reading which should be less than 1 volt. It is essential that the probe connection to the VTVM be used with short leads.

**RF and oscillator adjustment.** Set signal generator and scale to 88mc/s and adjust C10 for maximum output. Check with signal generator and scale at 95mc/s. If scale tracking is out, small movement of ceramic capacitors C8, and C7 together or apart from each other will correct for this. If spread is too large move the condensers together and vice versa.

With signal generator at about 90mc/s and receiver tuned to this frequency adjust C6 for maximum output.

**IF rejection.** Inject 10.7mc/s from the signal generator at a level of about 100mv across the 300 ohm aerial sockets and adjust L1 for minimum output.

**Aerial trimming.** With receiver connected to its normal aerial, either internal or external, finally adjust aerial trimmer C1 for maximum output on a transmission.

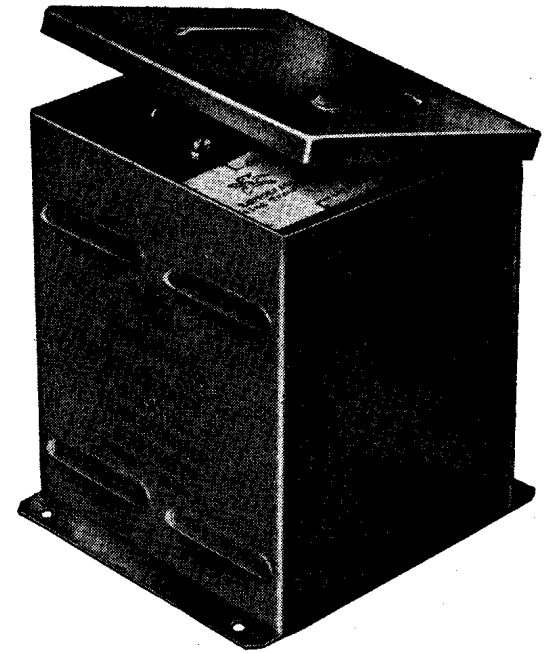
**AM ALIGNMENT**

A calibrated signal generator and standard output meter are required. A dummy scale is printed on back of scale pan and gives alignment points required. Check that the gang is fully closed when the pointer is on the 550m mark.

Apply signal as stated below	Tune Receiver to	Trim in order stated for Maximum Output
470kc/s to V2 g1 via C21	Mid scale MW 500m	L27, 26, 16, 15
600kc/s to AE via 200pF	200m	L19, 14
1,500kc/s as above	1,500m	C19 C28
2,000kc/s as above	Repeat as necessary for correct alignment	L21, 12

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