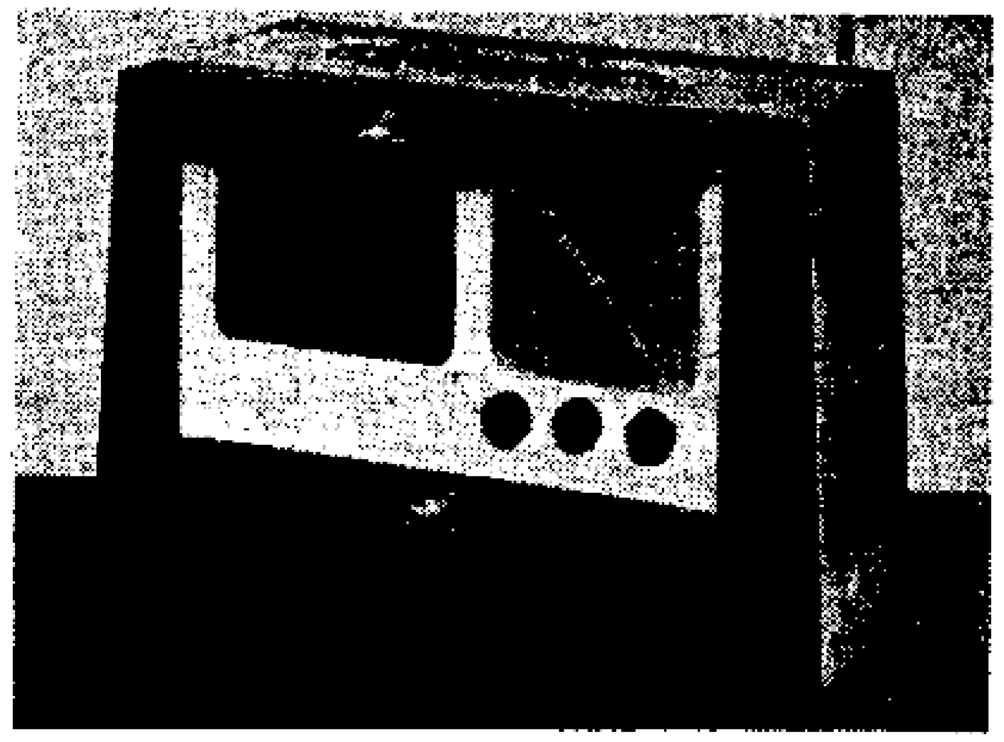
CHAMPION 741



Six-valve three-waveband AC-DC-battery portable superhet fitted with self-contained LW and MW frame aerials and a telescopic SW aerial. Sockets are provided for an external SW aerial and earth. Leatherette covered case with plastic carrying handle. A sliding shutter fitted with lock and key is fitted to protect front of receiver during transit. Suitable for operating from all-dry batteries and 110-120, 200-250V AC-DC mains. Made by Champion Electric Corporation, Seaford, Sussex.

AERIAL. Model 741B is fitted with MW and LW frame aerials L1, L3 with their respective loading coils L2, L4 and a SW aerial coupling transformer L5, L6 to the primary of which is connected a telescopic aerial and sockets for an external aerial and earth. Primary L5 is isolated from chassis by C1.

The frame aerial and loading coils are connected in series between MW and LW contacts of S1 and

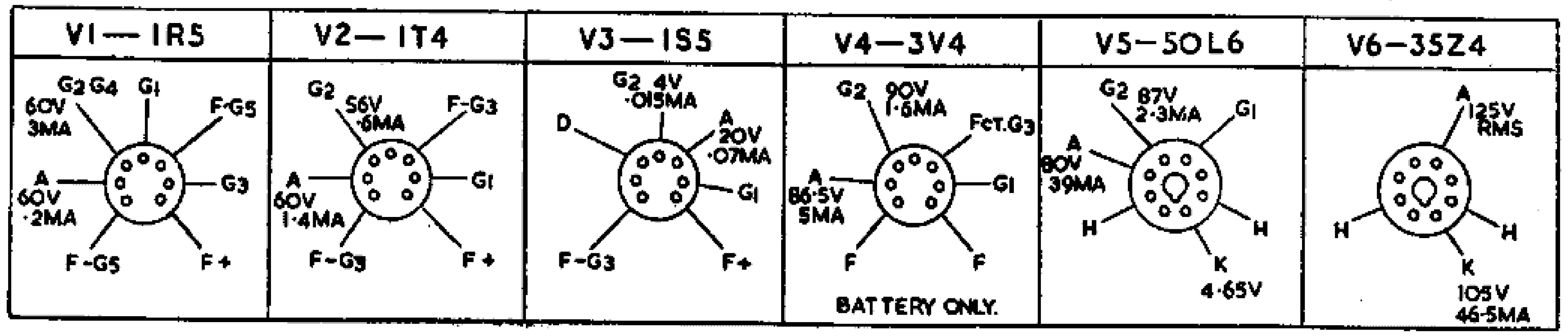
Continued overleaf

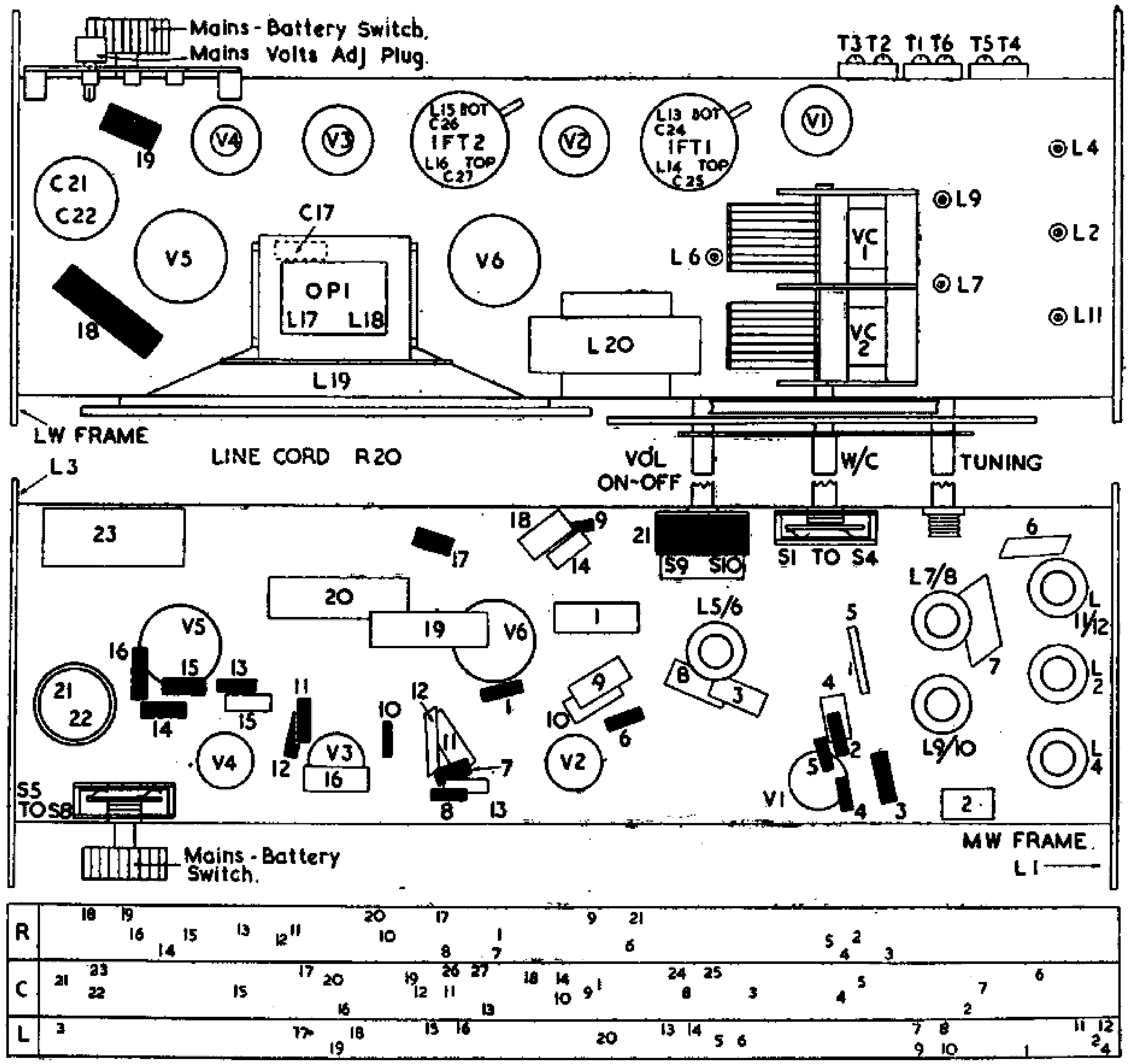
RESISTORS

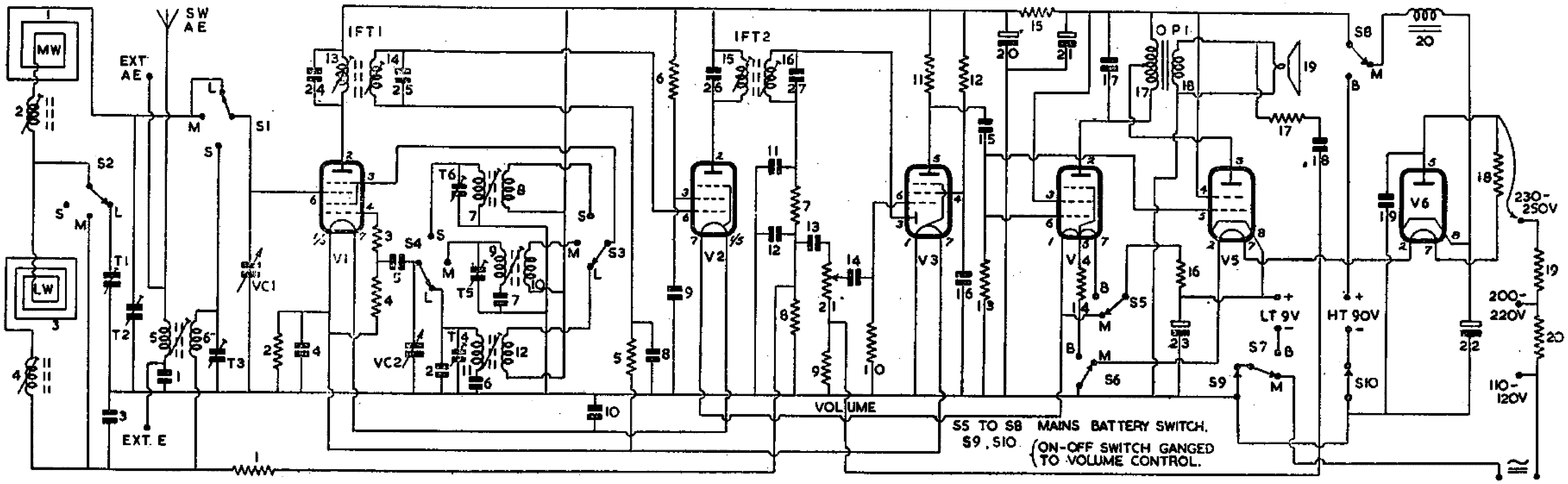
R	Ohms	Watts
1	4.7M	¼
2	270	¼
3	30	¼
4	100K	¼
5	470K	¼
6	4.7K	¼
7	47K	¼
8	470K	¼
9	2.2K	¼
10	10M	¼
11	220K	¼
12	3.3M	¼
13	470K	¼
14	1.5K	¼
15	4.7K	¼
16	30	¼
17	10K	¼
18	350	WW10W
19	150	WW5W
20	380	.2A Line Cord
21	500K	Potentiometer with DPST switch

INDUCTORS

L	Ohms
1	.75
2	1.5
3	10.5
4	10
5	.25
6	very low
7	very low
8	.25
9	3
10	1
11	8
12	1.5
13	10.5
14	14
15	10.5
16	11.5
17	500 tapped 150
18	very low
19	2.5
20	350
741A	
21	very low
22	very low
23	very low
24	very low







CAPACITORS

C	Capacity	Type
1	.002	Tubular 1000V
2	50pF	Silver Mica
3	.1	Tubular 150V
4	.1	Tubular 150V
5	100pF	Silver Mica
6	150pF	Silver Mica
7	500pF	Silver Mica
8	.1	Tubular 150V
9	.1	Tubular 150V
10	.1	Tubular 150V
11	100pF	Silver Mica
12	100pF	Silver Mica
13	.01	Tubular 350V
14	.002	Tubular 350V
15	.01	Tubular 350V
16	.1	Tubular 150V
17	.01	Tubular 350V
18	.1	Tubular 150V
19	.01	Tubular 1000V
20	4	Electrolytic 200V
21	32	Electrolytic 250V
22	32	Electrolytic 250V
23	100	Electrolytic 12V
24	100pF	Silver Mica
25	100pF	Silver Mica
26	100pF	Silver Mica
27	100pF	Silver Mica

741B—Continued

AVC line. On MW band L3, L4 are shorted out by S2 and L1, L2 trimmed by T2 are switched by S1 to aerial tuning capacitor VC1 and to g3 of heptode frequency changer V1.

On LW band, short across L3, L4 is removed and LW trimmer T1 is switched in circuit across L3, L4. On SW band L6 trimmed by T3 is switched by S1 to g3 of V1 and VC1. AVC decoupled by R1, C3 is fed through the tuned coils to g3 of V1. Primary L13, C24 of IFT1 is in the anode circuit.

Oscillator is connected in a tuned-grid series-fed HT circuit. The grid coils L7 (SW), L9 (MW), L11 (LW) trimmed by T6, T5, T4 respectively and padded by C7 (MW) C6 (LW) are switched by S4 to oscillator tuning capacitor VC2 and coupled by C5 through R3 to oscillator grid (g1) of V1. Automatic bias for g1 is developed on C5 with R4 as leak. Anode reaction voltages are developed inductively from L8 (SW), L10 (MW), L12 (LW) which are switched by S3 in series with HT to oscillator anode (g2 g4) of V1.

IF amplifier operates at 465kc/s. Secondary L14, C25 of IFT1 feeds signal to IF amplifier V2. Grid is returned through R5 to positive side of V3 filament for biasing—decoupling being given by C8. Screen voltage is obtained from R6 decoupled by C9. Primary L15 C26 of IFT2 is in the anode.

Signal rectifier. Secondary L16, C27 of IFT2 feeds signal to diode anode V3. R8 is diode load and R7, C11, C12 an IF filter.

AVC. The DC component of the rectified signal across R8 is decoupled by R1, C3 and applied through the tuned coils to g3 of V1.

AF amplifier. Rectified signal is fed by C13 to volume control R21 and thence coupled by C14 to pentode section of V3. Automatic bias for grid is developed on C14 with R10 as leak.

Output stage. (Battery operation.)—Signal at anode V3 is fed by C15 to pentode output valve V4 of which R13 is load. Grid is biased negatively by virtue of the filament being at the high potential side of LT supply. Screen voltage is obtained direct from HT line decoupling being given by C21. Primary L17 of output matching transformer OP1 is in the anode circuit. Tone correction is C17.

Output stage. (Mains operation.)—Signal at anode V3 is also fed by C15 to beam-tetrode output valve V5—the grid load being R13 as in the case of V4. Cathode bias is obtained from voltage set up across filaments of V1 to V3 which are connected in series with R16 and cathode of V5 down to chassis. Bias and filament voltage is decoupled by C23. Screen voltage of V5 is obtained direct from HT line, decoupling being provided by C21. Section of primary L17 of output matching transformer OP1 is in the anode circuit. C17 gives tone correction. Secondary L18 of OP1 feeds signal to a 5inch PM speaker L19.

Negative feedback from secondary L18 of OP1 is fed by R17, C18 to R9 in the bottom end of volume control R21 and thence through C14 to V3.

HT of 90V is provided by two 45V B104 batteries connected in series or alternatively from the mains. S8 switches receiver HT line to either source of supply. C21 provides HT battery decoupling and on mains functions as smoothing capacitor. S10 is HT battery ON/OFF switch.

Mains HT is provided by a half-wave indirectly heated isolated cathode rectifier V6. Its anode voltage is obtained from the mains direct in case of 110-120V supplies, and through dropper resistor R19, R20, on 200-250V mains. Choke-capacity smoothing is given by L20, C21, C22. Modulation hum is eliminated by C19. HT feed to V1 to V3 is further resistance-capacity smoothed by R15, C20. Reservoir smoothing capacitor C22 is rated to handle 125 mA ripple current.

Heaters of V5, V6 are connected in series and obtain their current from the mains through dropper R18 and on the higher mains voltages through R19, R20. Chassis side of heater chain is connected down to chassis by S6 in mains position.

LT of 7.5V for the series-connected filaments of V1 to V4 is provided by two 4.5V All-dry 28 batteries coupled in series or alternatively from the mains. When operating from battery source the negative side of battery is switched by S7 through the ON/OFF switch S9 to chassis whilst the positive side of battery is permanently connected to cathode of V5. Battery is decoupled by C23 and filament current is fed through dropper resistor R16 and thence switched by S5 to positive side of V4 filament. R2 decoupled by C4 and R14, which is switched in circuit by S6, are current bypass resistors.

On mains operation the filament of V4 is switched out of circuit by S5, leaving filaments of V1 to V3 connected in series with cathode of mains output amplifier V5, the cathode current of which is sufficient to provide a filament voltage of approximately 3.5 to 4V.

Switches. S5 to S8, which switch receiver from mains to battery or vice-versa, consists of a four-pole two-way switch mounted at rear of chassis and is accessible only on removal of rear panel of case. S9, which functions as LT battery ON/OFF and also as mains ON/OFF switch, is ganged with HT battery ON/OFF switch to spindle of volume control.

Chassis removal. Remove the three front control knobs held by grub screws. Remove rear panel of case by undoing fully the screw at top. Disconnect and remove batteries and remove the two slide-in battery partitions. Undo from bottom of case the bolt holding telescopic SW aerial and carefully withdraw aerial through rubber grommet in top of case. Remove the two screws securing external aerial and earth socket panel to side of case. Remove the three chassis fixing bolts accessible from below shelf. Withdraw entire chassis.

TRIMMING INSTRUCTIONS—741B

Apply signal as stated below	Tune Receiver to	Trim in order stated for max. output
(1) 465kc/s to g3 of V1 via .01mF.	MW	Core L16, L15, L14, L13
(2) Check that pointer is level with horizontal line on dial with gang set at max. capacity. Fully extend telescopic aerial for SW trimming		
(3) 300kc/s to Frame AE via Loop placed nearby	1000 metres	T4, T1
(4) 166.6kc/s As above	1800 metres	Core L11, L4 and repeat 3 and 4
(5) 1.5mc/s As above	200 metres	T5, T2
(6) 600kc/s As above	500 metres	Core L9, L2 and repeat 5 and 6
(7) 15.7mc/s to telescopic AE via loop	19 metres	T6, T3
(8) 6.12mc/s As above	49 metres	Core L7, L6. Repeat 7 and 8

MODEL 741A

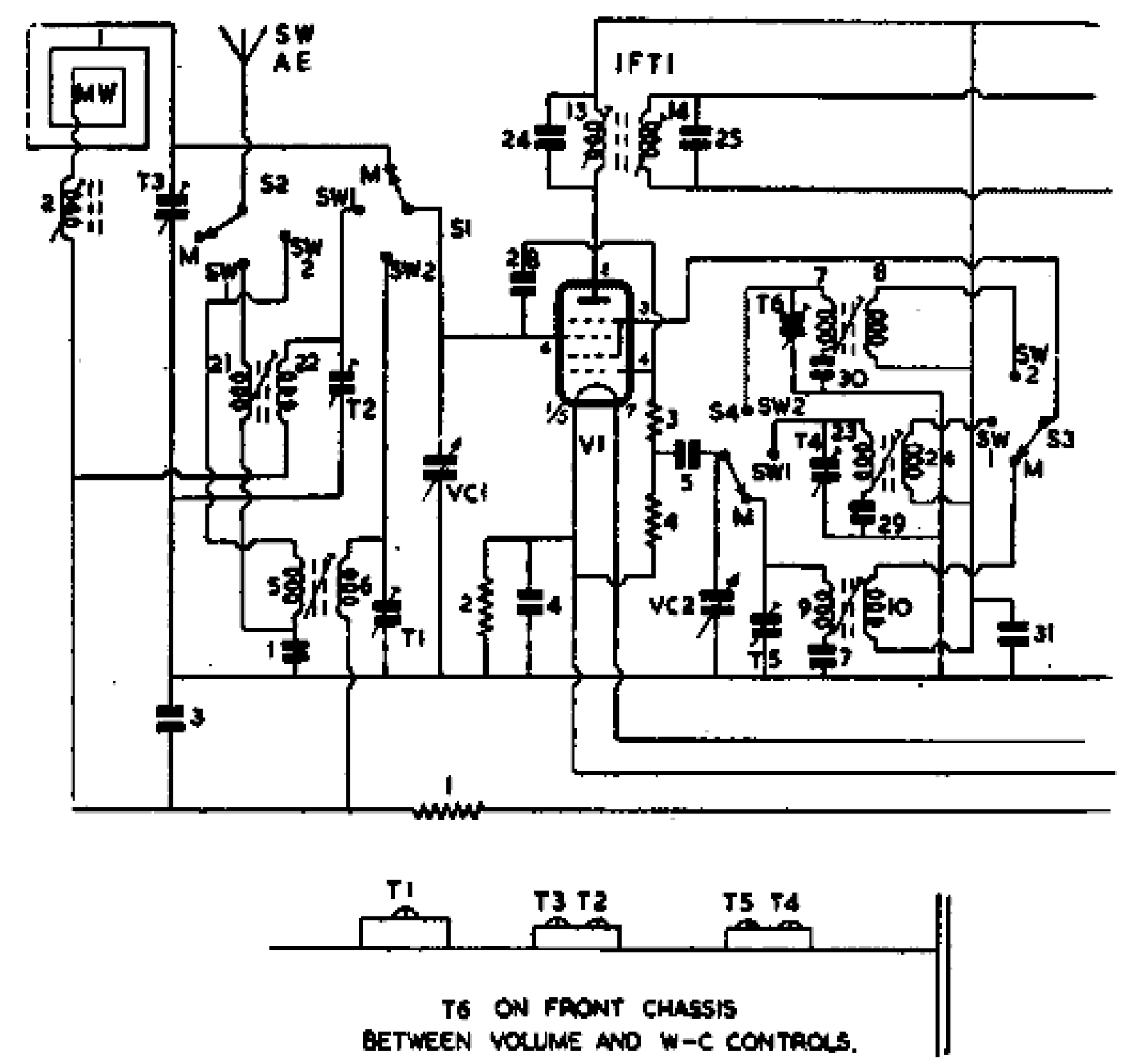
Departures from model 741B are explained below.

When fitted with MW and two SW bands the receiver is known as Model 741A. Main differences are as follows :—

LW frame L3 and loading coil L4 removed and replaced by SW1 aerial transformer L21, L22. S2 used to switch SW telescopic aerial to coupling coils L5 (SW2), L21 (SW1). Trimmers changed over to T3 (MW), T2 (SW1), T1 (SW2).

LW oscillator coils L11, L12 replaced by SW1 coils L23, L24. HT feed to anode reaction coils decoupled by C31—neutralising capacitor C28 fitted between g1 and g3 of V1.

Circuit diagram of aerial and oscillator stages is given below together with trimmer location and RF alignment.



TRIMMING INSTRUCTIONS—741A

Apply signal as stated below	Tune Receiver to	Trim in order stated for max. output
(1) (2) As for Model 741B		
(3) 1.5mc/s to Frame AE via Loop	200 metres	T5, T3
(4) 600kc/s As above	500 metres	Core L9, L2, and repeat 3 and 4
(5) 7.5mc/s to telescopic AE via Loop	SW1 40 metres	T4, T2
(6) 3mc/s As above	100 metres	Core L23, L22. Repeat 5 and 6
(7) 18.75mc/s As above	SW2 16 metres	T6, T1
(8) 7.3mc/s As above	41 metres	Core L7, L6. Repeat 7 and 8

SERVICE CASEBOOK

AC/DC MURPHY

A PRE-WAR universal Murphy came in dead on all bands and without any suggestion of speaker "ripple." Obviously HT or output stage trouble, so the first thing was to test for HT short circuit. No short, so we switched on and made voltage tests.

Commencing at the cathode of the rectifier, we found that instead of the usual 200V or more there was only about 25.

With a new rectifier the unsmoothed voltage remained just as low and replacement of all the electrolytics failed to bring improvement.

Suspecting that somewhere there was a trimmer, decoupling condenser or coil that broke down only when HT was applied to it, we uncoupled the HT supply to each valve in turn. With the feed to every valve disconnected and with only a new 16 mF condenser connected to the rectifier cathode, we still could only get about 25V.

On measuring the AC voltage applied to the rectifier anode it was seen to be equally low. This indicated the source of the trouble and we found that the cause of the low voltage was a 50 ohm resistor in series with the anode of the rectifier which had gone almost OC.—G. R. W., Liverpool.

PYE FV1 FV1C

FAULT : Sound but no vision. Test shows no, or very low, EHT. Test line scan coils, L72-73, for shorted turns lowering efficiency of line output transformer.

Fault : frame slip. May be due to MR3 or 4 in interlace filter or R75—reduce this to 82K.

Fault : HT fuse blows and surge limiter part of mains dropper burns out. HT line tests at 6K but when set is switched on again bang goes the HT fuse.

After much testing it was decided to replace scanning coil assembly. This proved to be faulty but we could not find any fault in insulation by usual tests.—E. CAINS, Pocklington.

(Part Nos. are from SERVICE CHART, Sept. 1951.)

COSSOR BATTERY SUPERHET

A COSSOR battery all-wave superhet gave reception of the local stations that was barely audible while all the time a persistent crackle was reproduced. Voltages everywhere were normal, a complete valve change produced no improvement, and after checking the secondary windings of the two IFTs, which were OK, we decided we were in for a sticky time, as it seemed difficult to diagnose the faulty stage.

The crackling noise we supposed to be a symptom of the trouble, so set about removing that first. Removal of the frequency-changer and IF valves in no way affected the noise, but once the 210DDT was removed the crackle volume dropped considerably.

After changing every suspect condenser in that circuit a doubt arose concerning the valveholder.

Although the valveholder appeared perfect, we carefully scraped both the upper and lower sides of the paxolin base. Upon re-testing, reception was 100 per cent. and all crackles vanished.

I have known faulty valveholders to cause crackles before, but this is the first occasion we have known one has drastically reduced performance as well.—G. R. W.