SERVICE CASEBOOK

REGENTONE A22

I PRESENT this as a recommendation to check the valve line up in all cases except where the fault is immediately apparent.

In this instance the trouble appeared as a very high whistle at certain settings of the volume control. Investigating the output valve I found the usual 6Y6 had been replaced by one of different characteristics. Fitting a 6V6 cured the trouble. —K. U.

BUSH AC MODEL

WEAKNESS, with oscillation on part of MW band. After trying a few stock approaches I decided to test the IF response.

Reading the primary of the first IF transformer, I discovered that I could not get it to peak. Opening up the can and changing the 60pF across the primary winding I again began to trim. Performance was brought to normal and the oscillation ceased.—K. U.

COSSOR 918

THE width would decrease until there was an inch-wide gap each side of the picture. The picture would at all times respond to the effect of the width control but even when placed at the extreme position, this failed to fill the screen.

We first changed the 185BT line output valve, then the booster rectifier, the line blocking oscillator, and even the power rectifier. All this leading nowhere we concentrated on component checking in the line timebase circuit and eventually found that the cause of the trouble was a faulty .001mF condenser in the grid circuit of the 185BT. —G. R. W., Liverpool.

COSSOR 484

A COSSOR model 484 radio was normal on SW and LW but intermittent at the top end of the MW band.

Above 340 metres stations faded out after only a few minutes of switching on. The missing stations could always be made to re-appear by tuning to below 340 metres, when the set would again become "live," and then tuning up the dial again.

Obviously, F. C. trouble; tuning down to a low wavelength re-started the local oscillator.

We tried a new frequency-changer without improvement and, as both LW and SW were perfect, concentrated on checking the picofarad condensers and other components in the MW oscillator wiring. After some time, however, we found the cause of the trouble was that the 120 pF condenser, forming the anode feed to the three oscillator coils, was greatly below capacity.—G. R. W., Liverpool.

BAIRD TV

THIS 15in. TV was on test prior to being put into service. Trouble was experienced in the shape of complete break up of picture such as when the line "hold" will not function. We went through the controls just to make sure these weren't at fault. Then it was noticed that as the sound modulation ceased there was some semblance of a "picture."

Here was a clue. What about the sound reflector circuit? This is in the cathode circuit of the second vision IF and consists of the usual dust-cored coil with a 500 pF condenser in parallel.

Adjusting the core nearly out of the coil put everything OK. So out came the 500 pF, a new one inserted, and the core adjusted to the approximate position it was in previously. Everything was OK.

Time and again I have found out that a careful study and a good think about what is shown on the "screen" can help a lot when one is in trouble. —H. HENSON, Wincanton.

HMV MODEL NO. 1117

VERY low output was the complaint. Checked valves and voltages in output section; these were normal. Tried the "old one" of touching the top cap of DH63 with wet finger tip very low "click" or "thump"; so the trouble must be there somewhere.

Finally it was found that volume control track was leaking from "hot end" to earth via the case, value being about 2,000 ohms.

After taking volume control adrift and cleaning, everything was back to normal.—H. HENSON, Wincanton.

KB FB10

INTERMITTENT signals. This model gave a fair bit of trouble as whenever the meter was put on to check voltages the sudden surge started the set off normally perhaps for two hours at a stretch.

It was finally decided that the signal generator would have to be used, so by working back stage by stage on "soak" test, it was found that the first IF stage was the culprit.

As the mica condensers in the IF transformers are often a source of trouble, both these were changed. This put everything in order once more. —H. HENSON, Wincanton.

GEC RADIO

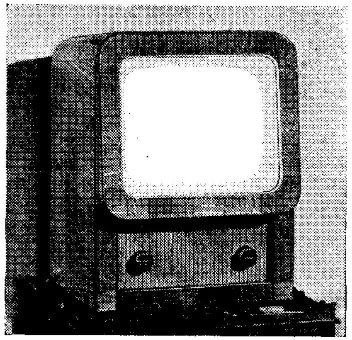
A GEC radio was "dead." This fault was soon repaired, being only valve trouble, but it was noticed that the set was below normal, lacking output and quality.

Voltages were found to be satisfactory and our attention was drawn to a slight hum. An 8mF electrolytic on top of the chassis aroused curiosity as we could see that it was a replacement. Bridging this condenser with another had no effect but, if we connected our replacement from the positive end to check, the performance was greatly improved.

A glance at the circuit of the BC5050 circuit showed the condenser had been replaced incorrectly. The 8mF had been replaced instead of a 20-4mF condenser (C21—C22) and the positive-end had been connected to C21 lead and negative to C22 lead and the can insulated from chassis.

Replacing the condenser with our nearest replacement, an 8—16mF can negative, brought performance back to normal.—B. EDWARDS, Bednall, Nr. Stafford.

HIS MASTER'S VOICE Model 1814



Fourteen valve, five channel, television receiver with 12in. aluminised CRT. Walnut-finished table cabinet. Suitable for 200-250V AC/DC. Similar sets are the 1816 console and Marconiphone VC59, VT59. Distributed by E.M.I. Sales and Service Ltd., Hayes, Middlesex.

THE receiver is a superhet operating on lower sideband of vision carrier. Aerial, RF and oscillator circuits are tuneable over a range covering all five of the BBC television channels. Aerial connection panel incorporates an attenuator that can be brought into circuit by inserting aerial plug in appropriate position. Picture interference and sound noise suppression circuits are fitted. Average consumption of receiver is 130 watts.

Aerial input is for use with 50-ohm coaxial feeder. The outer screening and centre core are DC isolated from receiver chassis by C1 C2 respectively. Earth socket is coupled direct to aerial socket to which outer screening of feeder should be connected and thus C1 is the earthing capacitor for the chassis. With aerial plug in A1 socket, signal is fed through C2 direct to primary L1 of aerial coupling transformer RFT1. When receiver is operated close to transmitter the aerial plug should be placed in A2 socket, the signal then passing through attenuator R1 R2 and thence through C2 to L1.

RF amplifier.—Aerial signal is coupled by secondary L2 of RFT1 to grid of RF amplifier V1 and the amplified signal at anode is single-peak transformer coupled by RFT2 and fed via oscillator coil L5 and capacitor C6 to grid of V2.

Frequency-changer is pentode V2 operating as combined oscillator and mixer. Oscillatory tuned circuit L5 C5 is between screen and grid, automatic bias being developed on C6 with R5 as leak. Oscillator anode voltage is obtained from anode and screen feed R4 of V1 through RFT2 to tap on oscillator coil L5. RF and oscillator signals are thus mixed, producing across L6 in the anode a vision IF of 34mc/s and a sound IF of 37.5mc/s.

Vision and sound IF signals at anode V2 are fed by C8 to common IF amplifier V3, the gain of which is controlled by VR1, **Contrast control.** Amplified signals are developed across R12.

Vision channel consists of a further IF amplifier V4, followed by signal rectifier V5A, interference limiter V5B and video amplifier V6. Vision and sound signals at anode V3 are fed by C11 to L7 and L9. The vision signal is developed across L7 and applied to V4 and the sound signal developed across L9 and fed to sound IF amplifier V7.

Sound-on-vision rejection at 37.5mc/s is given by L9 C12. L8 C13, tuned to 41.5m/cs, prevent breakthrough of London sound channel carrier frequency due to its close proximity to receiver sound IF frequency of 37.5mc/s.

Amplified vision signal at anode V4 is fed by C16 to L11 L12 in signal rectifier diode anode circuit. L12 C17, tuned to 37.5mc/s, give further sound-on-vision rejection.

Rectified video signal across R15 C18 passes through L13 to video amplifier V6, the output of which is applied through anti-flutter filter R24 C24 R25 to cathode of CRT.

Interference limiter, diode V5B, has its cathode connected to anode of V6 and its anode down to chassis through C19. Anode is biased positively through R18 R19 R20 and VR2, the **Picture Interference Limiter** control, so that at peak white signal the diode just remains cut-off. Interference pulses greater in amplitude than peak white cause V5B to conduct and short them to chassis through C19.

Sound IF of 37.5mc/s is developed across L9 C12 and fed to amplifier V7. The signal is band-pass transformer coupled by L17 L18 and fed through C34 to one diode of V8. Audio signal appears across R28 and is applied direct to grid of pentode AF amplifier section of V8.

Amplified audio signal at anode is fed through noise suppressor MR1 and C37 to **Volume Control** VR3 in grid of pentode sound output amplifier V9 which is transformer coupled by OP1 to a 5in. energised speaker L30.

Noise suppressor. Rectifier MR1 is maintained in a state of conduction by positive bias from R32. Time constant of R32 C37 C38 is such that charge on C37 C38 follows audio signal fed through MR1. When a large-amplitude high-frequency interference pulse appears at anode of V6, charge on C37 C38 is unable to follow and on the positive swing MR1 cuts off thus preventing interference pulse reaching grid of output amplifier V9.

Sync separator. Video signal at V6 is fed through R16 C20 to pentode section V10. Positive sync pulses drive the valve into grid current and the resultant bias across R37 places video portion of waveform beyond cut-off—thus only sync pulses appear at anode.

Frame sync pulses are integrated on R38 C47 and fed through pulse shaping circuit R46 MR1 and applied by C50 to anode of triode frame scan oscillator section of V14. Line sync pulses are developed across R36 and fed through C44 R40 to triode line scan oscillator section of V10.

Line scan oscillator is triode section V10 operated as a grid blocking oscillator with anode to grid back-coupling by transformer LT1. Scan waveform is developed on C46. Variation of grid voltage by VR5 gives **Line Hold** control and adjustment of anode voltage by VR4 gives **Line Linearity** control. Adjustment of VR4 affects grid voltage from VR5 in order to maintain correct oscillator frequency.

Line amplifier. Scan voltage on C46 is fed by C47 through R45 to grid of pentode line amplifier V11. Waveform at anode is transformer coupled by LT2 to line deflector coils L23 on neck of CRT.

Width of line is controlled by variation of series inductance L26. Transformer loading, hence EHT voltage and focus, is maintained reasonably constant with variation of line width, by employment of a differentially variable inductance coil L25 shunted across section L35 of LT2.

Inductance of L25 is varied differentially to that of L26 by means of the adjustable iron dust core used for Width Control.

Efficiency diode. Additional HT for anode of line amplifier V11 is provided by voltage across C53 which is charged up by V13 when it conducts to rectify and damp out shock oscillation set up in LT2 when V11 cuts off at end of each line scan.

EHT for anode of CRT is provided by V12 which rectifies high surge voltage developed on primary L33 and its overwind L34 when V11 is cut off. EHT is smoothed by C51.

Frame scan oscillator is triode section V14 operated as grid blocking oscillator with anode to grid back-coupling by transformer FT1. Scan voltage is developed on C56. Variation of grid voltage by VR6 gives **Frame Hold** and adjustment of anode voltage by VR7 gives **Height** control. Adjustment of VR7 also alters grid voltage from VR7 thus maintaining correct oscillator frequency.

Frame amplifier. Scan voltage on C56 is fed through R67 C57 to pentode frame amplifier section of V14. Scan voltage at anode is transformer coupled by FT2 to frame deflector coils L21 on neck of CRT. **Linearity** is controlled by adjustment of anode grid negative feedback by VR8.

HT is provided by halfwave metal rectifier MR3 fed direct from input mains on 200-235V AC or 200-255V DC and through section R64 of mains dropper resistor on 235-255V AC supplies. Choke-capacity smoothing is given by LS field coil L41 with C62 C64. HT current is fed to receiver through focus coil L22 shunted by VR10 C63 to provide electromagnetic focusing of CRT beam. Reservoir capacitor C64 should be rated to handle 500mA ripple.

Heaters of V1 - 11, V13 - 14 and CRT are series connected with surge limiter R59 and obtain their current from the input mains through R61 on 200-220V, through R61 R63 - R64 on 220-235V, and through R61 - R64 on 235-255V AC and DC supplies. Heaters of individual valves are RF decoupled by C25 to C29. Heater of EHT rectifier V12 is fed from winding L24.

Mains input is fitted with 2A fuse in each lead and filter coil L42.

CRT is a 12in. triode Emiscope type 3/31 with aluminised screen. Video signal is fed to its cathode and picture **Brightness** is controlled by variation of grid voltage by VR9. Electromagnetic focus is employed the focus coil L22 being connected in series with HT feed to receiver. Focus coil current is adjusted by variation of shunt resistor VR10.

Some early issues of these receivers were not fitted with L27 C67 C68 R60.

ALIGNMENT INSTRUCTIONS

Apparatus required :—Signal generator covering 30-70mc/s, high resistance DC voltmeter and suitable AC output meter. DC voltmeter should be connected across R21 to indicate video output and AC output meter across secondary L29 of OP1.

IF stages. Short circuit oscillator coil L5 and inject signal into A1 aerial socket.

Inject 37.5mc/s (modulated)—adjust L17 L18 for maximum sound output and then L12 L9 for minimum vision.

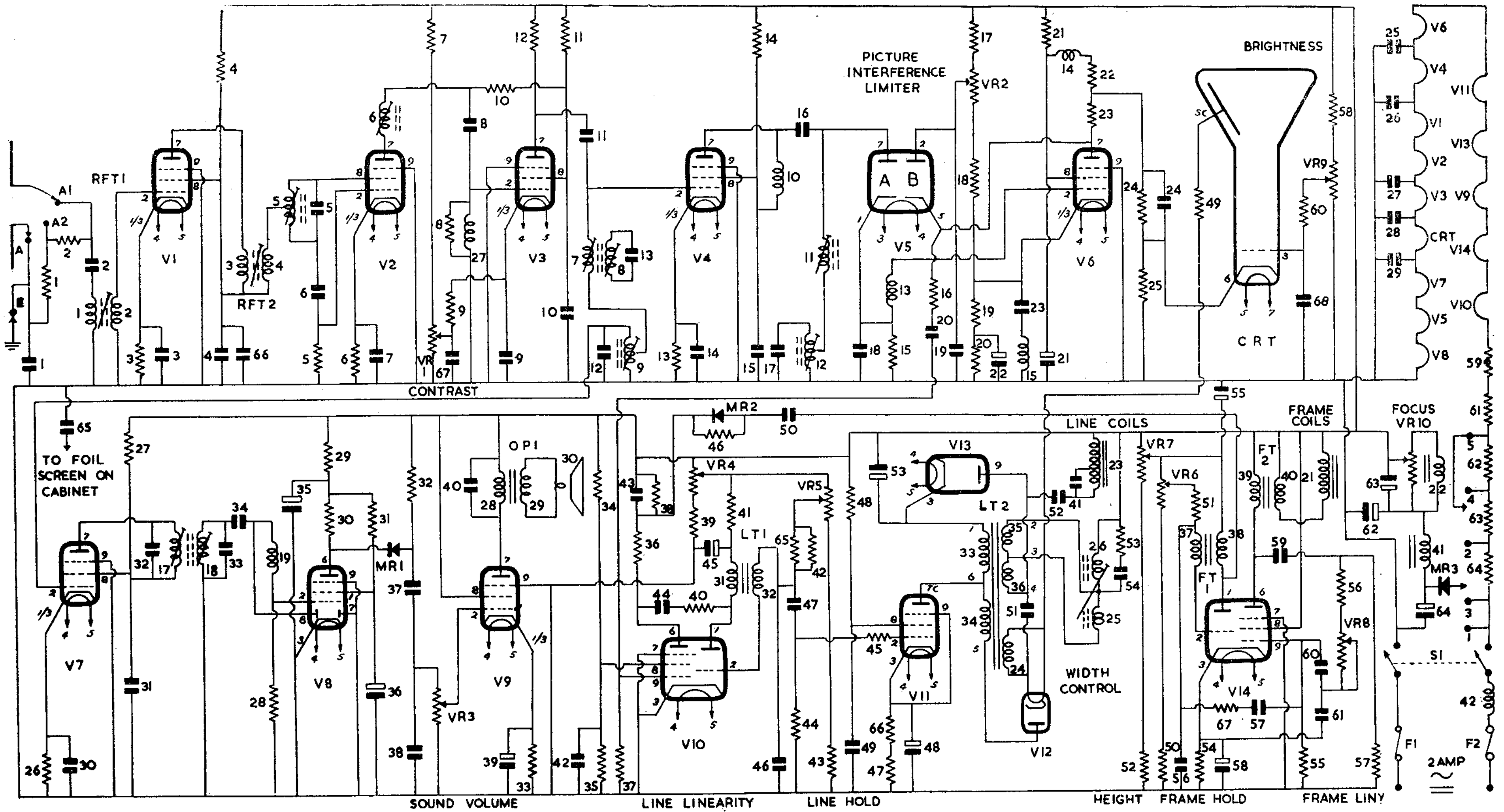
Inject 41.5mc/s—adjust L8 (bot.) for minimum.
Inject 34.125mc/s—adjust L11 for maximum.
Inject 35.125mc/s—adjust L7 (top) for maximum.
Inject 36mc/s—adjust L6 for maximum vision.
Remove short circuit across L5.

RF stages—adjust oscillator coil L5 for maximum sound output. Adjust L1/2 and then L3/4 for maximum vision output. Finally repeat adjustment of oscillator coil L5.

RESISTORS

R	Ohms		Watts
1	68	...	¼
2	330	...	¼
3	330	...	¼
4	1K	...	¼
5	100K	...	¼
6	330	...	¼
7	1M	...	¼
8	33K	...	¼
9	330	...	¼
10	6.8K or 8.2K		½
11	1K	...	¼
12	8.2K	...	½
13	330	...	½
14	1K	...	¼
15	6.8K	...	¼
16	6.8K	...	¼
17	3.3K	...	¼
18	3.3K	...	¼
19	150	...	¼
20	150	...	¼
21	3.9K	...	1
22	2.7K	...	½
23	2.7K	...	½
24	150K	...	¼
25	100K	...	¼
26	330	...	¼
27	1K	...	¼
28	220K	...	¼
29	10K	...	½
30	15K	...	½
31	47K	...	¼
32	1M	...	¼
33	330	...	¼
34	470K	...	¼
35	24K	...	¼
36	68K	...	¼
37	1M	...	¼
38	150K	...	¼
39	47K	...	¼
40	22K	...	¼
41	33K	...	¼
42	330K	...	¼
43	15K	...	½
44	470K	...	¼
45	1K	...	¼
46	2.2M	...	¼
47	47	...	½
48	2.7K	...	1
49	470K	...	¼
50	10K	...	½
51	1.5M	...	¼
52	22K	...	½
53	6.8K	...	1
54	1K	...	¼
55	2.2M	...	¼
56	22K	...	¼
57	150K	...	¼
58	68K	...	¼
59	Thermistor		
60	10K	...	¼
61	210	Tapped Mains Dropper Resistor	
62	56	Tapped Mains Dropper Resistor	
63	49	Tapped Mains Dropper Resistor	
64	18	Tapped Mains Dropper Resistor	
65	1M	...	¼
66	47	...	½
67	6.8K	...	¼

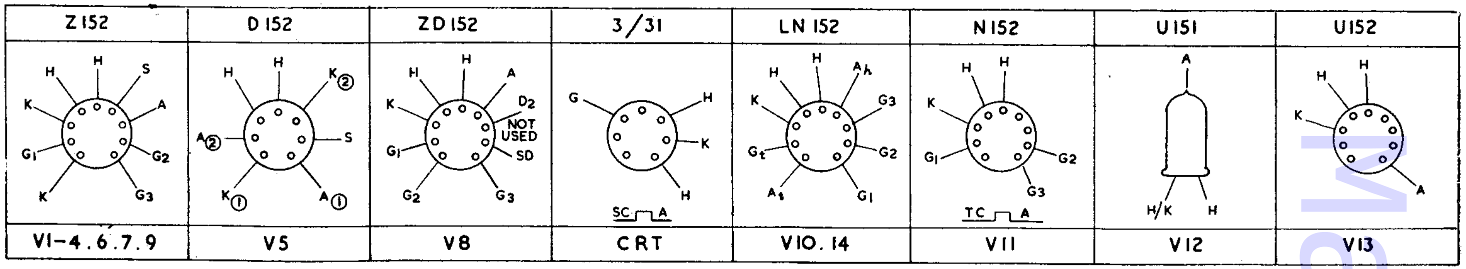
VR1	10K	WW Potr.
VR2	15K	WW Potr.
VR3	500K	Potr.
VR4	25K	WW Slider Potr.

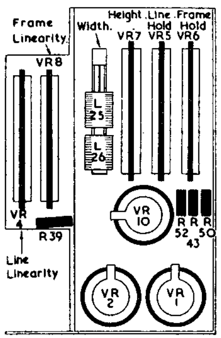


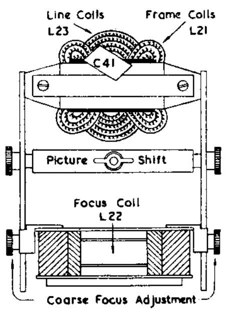
VOLTAGE READINGS

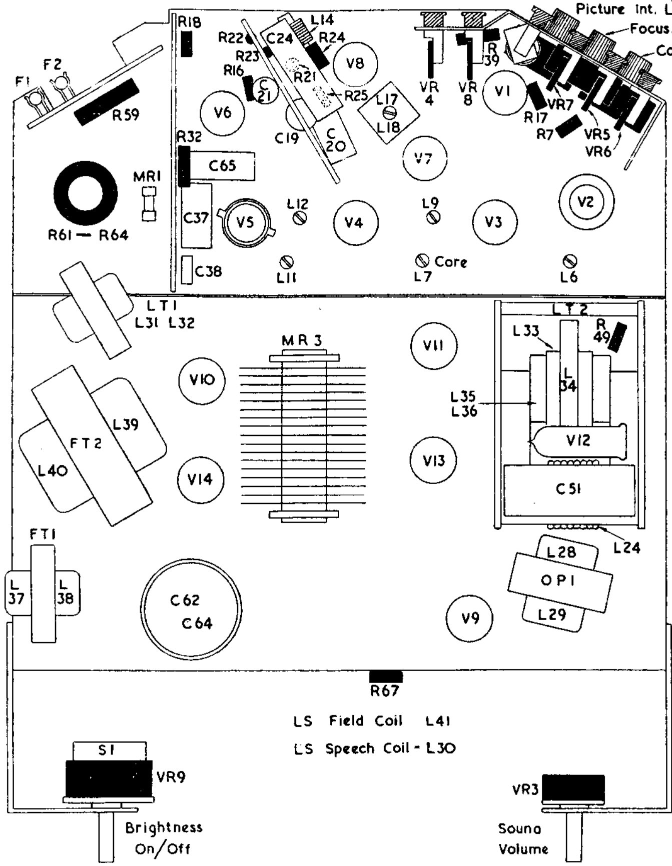
	Type	A	G_2	K	Remarks
1	Z152	215	215	3.2	—
2	Z152	155	215	3.8	—
3	Z152	215	220	3–6	VR1 min.–max.
4	Z152	210	215	3	—
5 A	D152	—	—	2	—
5 B	D152	30–190	—	160–190	—
6	Z152	160–190	210	5.4–4.4	—
7	Z152	215	215	3.3	—
8	ZD152	90	65	0	—
9	Z152	220	230	3	—
10 P	LN152	90	10	0	—
10 T	LN152	105	—	0	—
11	N152	290	170	10	—
12	U151	—	—	8.5kV	—
13	U152	230	—	300	—
14 T	LN152	5	—	13	—
14 P	LN152	225	230	13	—
CRT	3/31	8.5kV	—	50	Grid 20–40 VR9 min.–max.

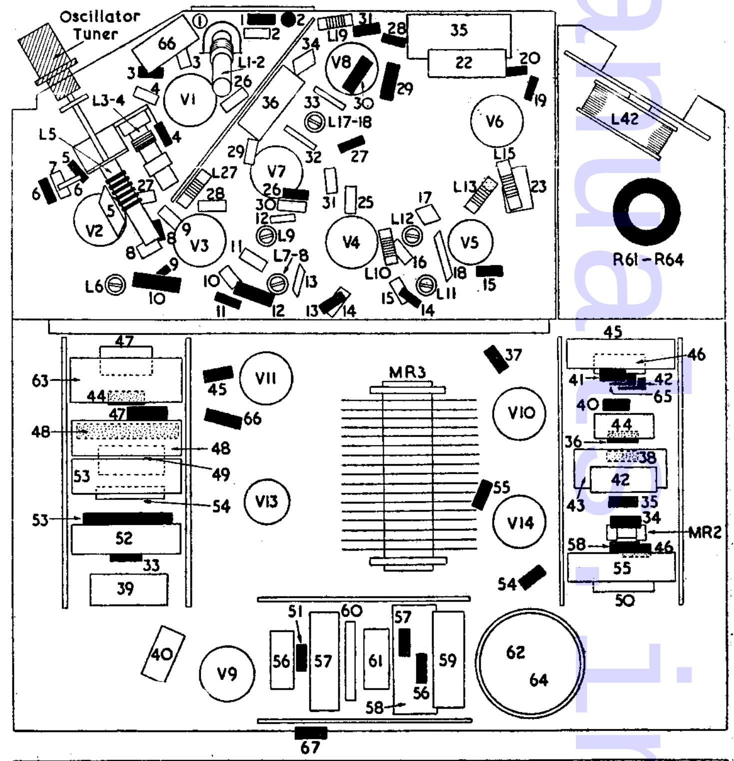
Smoothed HT voltage = 230V.
Total HT current from MR3 = 200mA.

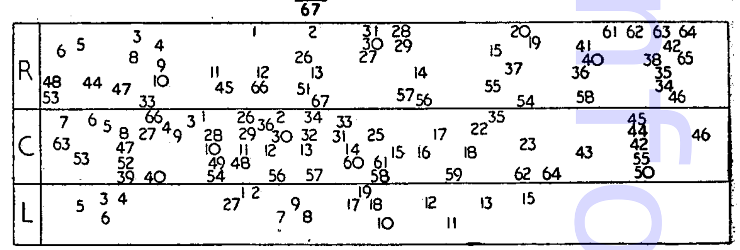












R	Ohms	Watts
VR5 ...	25K	WW Slider Potr.
VR6 ...	25K	WW Slider Potr.
VR7 ...	25K	WW Slider Potr.
VR8 ...	25K	WW Slider Potr.
VR9 ...	50K	Potr. with DP Switch
VR10...	100	WW Potr.

R60 not fitted to this chassis.

CAPACITORS

C	Capacity	Type
1 ...	.001	Tubular 350V
2 ...	.001	Tubular 350V
3 ...	.001	Tubular 350V
4 ...	.001	Tubular 350V
5 ...	15pF	Silver Mica
6 ...	33pF	Silver Mica
7 ...	.001	Tubular 350V
8 ...	47pF	Silver Mica
9 ...	.001	Tubular 350V
10 ...	.001	Tubular 350V
11 ...	.001	Tubular 350V
12 ...	100pF	Silver Mica
13 ...	47pF	Silver Mica
14 ...	.001	Tubular 350V
15 ...	.001	Tubular 350V
16 ...	.001	Tubular 350V
17 ...	100pF	Silver Mica
18 ...	10pF	Silver Mica
19 ...	.1	Tubular 350V
20 ...	.047	Tubular 350V
21 ...	1	Electrolytic 350V
22 ...	25	Electrolytic 12V
23 ...	220pF	Silver Mica
24 ...	.22	Tubular 350V
25 ...	.001	Tubular 350V
26 ...	.001	Tubular 350V
27 ...	.001	Tubular 350V
28 ...	.001	Tubular 350V
29 ...	.001	Tubular 350V
30 ...	.001	Tubular 350V
31 ...	.001	Tubular 350V
32 ...	10pF	Silver Mica
33 ...	10oF	Silver Mica
34 ...	47pF	Silver Mica
35 ...	4	Electrolytic 350V
36 ...	1	Electrolytic 350V
37 ...	.1	Tubular 350V
38 ...	.001	Tubular 350V
39 ...	25	Electrolytic 12V
40 ...	.0022	Tubular 350V
41 ...	47pF	Silver Mica
42 ...	.047	Tubular 350V
43 ...	330pF	Silver Mica
44 ...	220pF	Silver Mica
45 ...	1	Electrolytic 350V
46 ...	680pF	Silver Mica
47 ...	.01	Tubular 350V
48 ...	25	Electrolytic 25V
49 ...	.1	Tubular 350V
50 ...	.047	Tubular 350V
51 ...	.001	Tubular 10kV
52 ...	.22	Tubular 350V
53 ...	2	Electrolytic 450V
54 ...	680pF	Silver Mica
55 ...	1	Electrolytic 350V
56 ...	.022	Tubular 350V
57 ...	.1	Tubular 350V
58 ...	100	Electrolytic 12V
59 ...	.1	Tubular 350V
60 ...	.0082	Silver Mica
61 ...	.015	Tubular 350V
62 ...	120	Electrolytic 350V
63 ...	100	Electrolytic 12V
64 ...	100	Electrolytic 350V
65 ...	.01	Tubular 350V
66 ...	.047	Tubular 350V
67 ...	.1	Tubular 350V
68 ...	.1	Tubular 350V
C67, C68	Not fitted to this chassis	

INDUCTORS

L	Ohms
1 ...	Very low
2 ...	Very low
3 ...	Very low
4 ...	Very low
5 ...	Very low
6 ...	.25
7 ...	Very low
8 ...	Very low
9 ...	Very low
10 ...	260
11 ...	Very low
12 ...	Veryl ow
13 ...	260
14 ...	9.5
15 ...	2.5
16 ...	No comp.
17 ...	Very low
18 ...	Very low
19 ...	300
20 ...	No comp.
21 ...	6
22 ...	120
23 ...	26
24 ...	Very low
25 ...	24
26 ...	24
27 ...	Very low
28 ...	700
29 ...	.4
30 ...	3.5
31 ...	7.5
32 ...	5
33 ...	75
34 ...	230
35 ...	3.5
36 ...	12
37 ...	300
38 ...	300
39 ...	700
40 ...	1
41 ...	100
42 ...	3.5