MURPHY B24, B25

Continued from opposite page

voltage is applied to V1, while V3 grid circuit is connected to the junction of R14 and R15. Delay volts are derived from the bias potentiometer.

The anode circuit of V4 incorporates a heterodyne filter comprising L19, L20, C19, C20, and C21. The voltage dropper for the anode circuit is R12 decoupled by C16, while R13 is the LF load resistance. LF signals are passed from this via the coupling condenser, C24, to the primary L21 of the intervalve transformer. The secondary, L22, feeds the two grids of V5, the QPP double output pentode. The centre tap of L22 connects to the grid bias potentiometer network via the grid stopper R17. The two anodes of V5 connect in the usual way to the secondary L23 of the centre tapped primary output transformer.

A variable tone control network comprising C23, R22, and VR2 is connected across L23.

GANGING

IF Circuits.—Switch receiver to MW and short circuit L9 or L11 to prevent V1 oscillating. Inject a 117-kc signal via a dummy aerial to the grid of V3. Keep input low to prevent AVC action and adjust T1, T2 for maximum.

Next inject the signal into the grid of V1 and adjust T3 and T4 for maximum output. Remove short across L9 or L11.

MW Band.—Inject a signal of 220 m into the aerial and earth terminals of the receiver via a dummy aerial. Tune the receiver to this signal and check scale reading. If it is incorrect adjust the receiver tuning point to 220 m and adjust T5 for maximum output.

Next adjust T6 to see whether the output can be increased. Without touching the tuning controls, adjust T7 for best output and repeat adjustments to T6 and then again T7 until best results are obtained.

LW Band.—Switch receiver to LW and inject a signal of 1100 m. Tune the receiver to this signal and if the pointer calibration does not register 1100 m adjust the pointer to the 1100-m mark, and trim T8 for maximum output.

MODEL B25

Although the circuit and layout of the B25 receiver are almost identical with those of the B24, a few differences do exist.

R19 has been altered in value from 100 to 200 ohms, and at the same time has been connected between Tags B and D instead of Tags B and C. As a result, Tag C will be at chassis potential instead of one volt negative, thus altering the delay voltage on V2 diode anode. Tag D will remain, as before, two volts negative, since the resistance between it and chassis is still 200 ohms; furthermore, the voltage distribution at the other tags will be unchanged. It should be noted that, in the B25, R18 is necessary only to provide a DC path across C2.

Another change is to be found in the tone control circuit; here, a 50,000 ohms variable resistance, following a logarithmic law, has been used to replace the 100,000 ohms control shunted with a fixed resistance, R22.

In the B24, C4 has a value of .00025 mfd. In

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BEETHOVEN "LITTLE PRODIGY" 909 AC

Four-valve, plus rectifier, two waveband, superhet portable, with internal frame aerials. A socket is provided for the use of an external aerial. For operation from AC mains 100-110 volts, 200-250 volts, 40-100 cycles. Marketed 1939 by Beethoven Electric Equipment, Ltd., Chase Road, North Acton, London.

THE frame aerials L1 (MW) and L2 (LW) are tuned by VC1 section of the gang condenser and connect direct to the grid of the triode-heptode valve V1. This valve is permanently biased by R1, while R2 feeds the screening grid from the HT line.

The triode section employs a tuned grid circuit, the grid leak and condenser being R3 and C2. The grid coils L3 (MW) and L4 (LW) are tuned by VC2 section of the gang condenser while L5 and L6 are the respective anode reaction windings.

V1 is coupled to the gird of the IF amplifying valve V2 by the IF transformer comprising L7 and L8. V2 is permanently biased by R4 in the cathode circuit while a second IF transformer L9, L10 couples the output to the diode of the single diode triode valve V3.

The signal load resistance is the volume control R6 which has an IF by-pass condenser C5 across it. AVC is obtained from the DC potential across R6 and is fed via decoupling components R5 and C4 to the grid circuits of V1 and V2.

C6 couples the LF signal from the volume control to the grid of the triode section of V3, R7 being the grid leak. V3 is resistance capacity coupled by R8, C8 and R9 to the grid of the pentode output valve V4. This valve is biased by R10 and is coupled by the output transformer L11, L12 to the low impedance permanent magnet loudspeaker L13. A permanent degree of tone correction is effected by C9 across the primary of the output transformer.

V5 is the full wave rectifying valve and the HT output is smoothed by C12, R11, and C11. C13 and C14 provide the HF filtering for the mains input and HT secondary winding of the mains transformer. The on/off switch, S1, is ganged to the volume control R6.

GANGING

IF Circuits.—Switch to MW and set volume control to maximum. Inject a 450.5 kc signal via a .1 mfd condenser to the control grid of V1 and adjust T1, T2, T3 and T4 for maximum output keeping input low to avoid AVC action.

MW and LW Bands.—Switch to MW and turn gang to minimum and see that pointer registers with the 200-m mark on scale. Inject a 200-m signal to the external aerial socket and adjust T5 for maximum output. Switch receiver to LW and keeping gang at minimum, inject a 895-m signal into the aerial socket and adjust T6 for maximum output.

With set still switched to LW, rotate gang to maximum and inject a signal of 2,040 m and adjust T7 for maximum output. Check setting of T6 on 895 m.

Switch to MW, and, with gang still at maximum, inject a 550-m signal and adjust T8 for maximum output. Check T5 on 200 m and readjust if necessary.

Remove connection to service oscillator and tune in a weak transmission near 200 m and adjust T9 for maximum output. Switch to LW and tune in a transmission at about 1,700 m and readjust T7 while rocking gang.

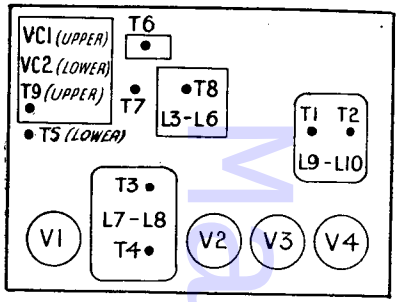
Switch to MW and tune in a transmission at about 450 m and adjust T8 for maximum output, while rocking gang.

RESISTANCES

R	Ohms	R	Ohms
1	100	7	2 meg
2	35,000	8	.25 meg
3	50,000	9	.5 meg.
4	100	10	190
5	2 meg	11	1,200
6	.5 meg		

CONDENSERS

C	Mfd	C	Mfd
1	.1	8	.002
2	.0001	9	.008
3	.015	10	.2
4	.1	11	30
5	.0001	12	16
6	.015	13	.02
7	.001	14	.1



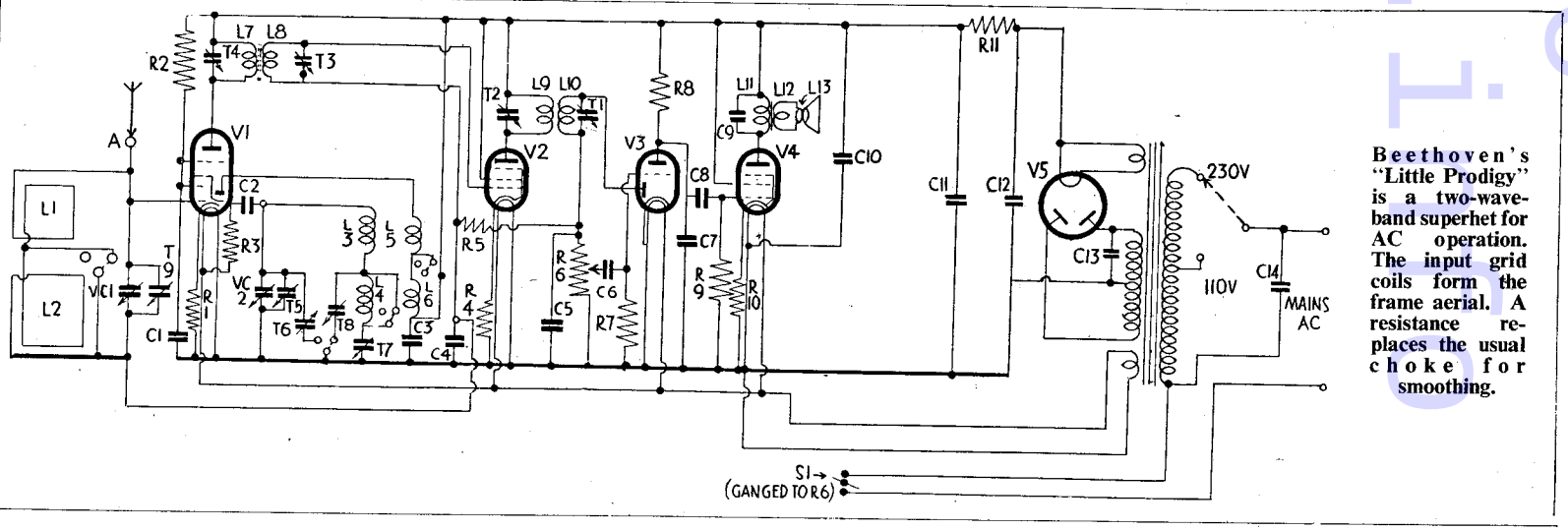
Layout diagram of the top of the Beethoven chassis indicating the positions of the main components and trimmers.

VALVE READINGS

V	Type	Electrode	Volts	Mas
1	ECH3	Anode	118	.3
		Osc. anode	118	4.2
		Screen	58	1.6
2	EF9	Anode	118	8
		Screen	118	2.6
3	EBC3	Anode	28	.4
4	EL3	Anode	112	16
		Screen	118	1.8
5	AZ1	Fil	220	—

WINDINGS

L	Ohms	L	Ohms
1	1.5	8	4
2	16	9	10.5
3	5	10	10.5
4	9	11	240
5	4.2	12	.2
6	7.5	13	2.5
7	4		



Beethoven's "Little Prodigy" is a two-waveband superhet for AC operation. The input grid coils form the frame aerial. A resistance replaces the usual choke for smoothing.