MURPHY B89S and B89

Four-valve, two-waveband, battery superhet. The B89S has SW and MW wavebands, while the B89 has MW and LW wavebands. Sockets are provided for a low-impedance extra loud-speaker with a control switch. Marketed by Murphy Radio, Ltd., Welwyn Garden City, Herts.

IN the aerial input circuit two sockets are provided into which a wavetrap may be plugged for the minimising of interference from a local powerful transmitter. The sockets may be shorted by a link when no wavetrap is required.

Signals are fed *via* an intermediate-frequency rejector circuit L1, C1 to either L2 (SW) or L3 (MW) aerial coupling coils. These transfer the signal to the tuning coils L4, L5 which are tuned by VC1 section of the ganged condenser.

From the tuning circuits the signal is fed *via* C3 to the grid of the frequency changer V1. The grid circuit is connected to the automatic volume control line and it will be seen that C3 acts as a blocking condenser to prevent a short occurring across the biasing arrangements in the HT negative line.

The oscillator section of V1 incorporates tuned anode circuits L8, (SW) L9 (MW) tuned by VC2, L6 and L7 are the grid feed-back coils.

The IF transformer L10, L11 transfers the signals from V1 to the grid of the variable-mu pentode V2 which is AVC controlled.

A second IF transformer L12, L13 couples V2 to the working diode of V3, the double-diode triode. The second diode of this valve is not used and is connected to chassis.

VALVE READINGS

V.	*Type.*	*Electrode.*	*Volts.*	*Mas.*
1	TP25	Anode	103	.6
	Mazda	Osc. Anode	30	1.2
	Met.	Screen	56	.5
3	VP23	Anode	103	1.8
	Mazda Met.	Screen	56	.6
3	HL23DD	Anode	46	.7
	Mazda Met.			
4	PEN 25	Anode	101	3
		Screen	103	.8

Readings taken on 200m. with volume control at maximum ; no signal input.

R11 is the signal load resistance with IF filtering effected by R8, C14 and C15. From R11 the audio frequency signals are coupled by C16 to the volume control VR1 and thence to the grid of the triode section of V3.

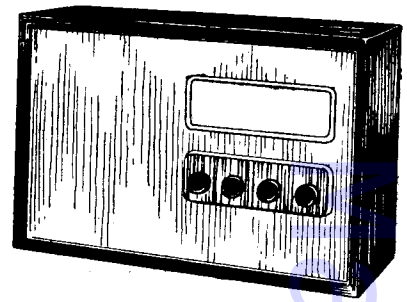
The DC variations of voltage across R11 are developed across the potential divider network R9, R10 and R15, the latter providing delay volts. A portion of the DC voltage is tapped off from R9, R10 to the grid circuits of V1 and V2 with decoupling effected by C8 and R1.

From V3 the LF signals are resistance-capacity coupled by R12, C17 and R13 to the grid of the output pentode V4 *via* the grid stopper R14. Biasing

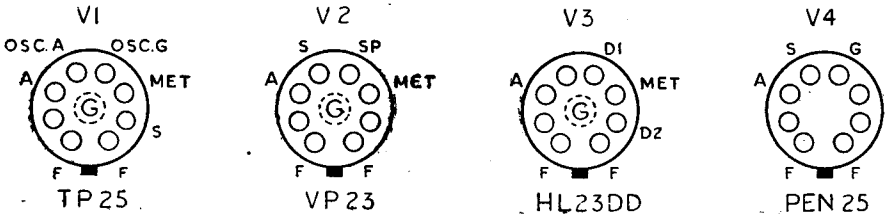
Continued overleaf

WINDINGS

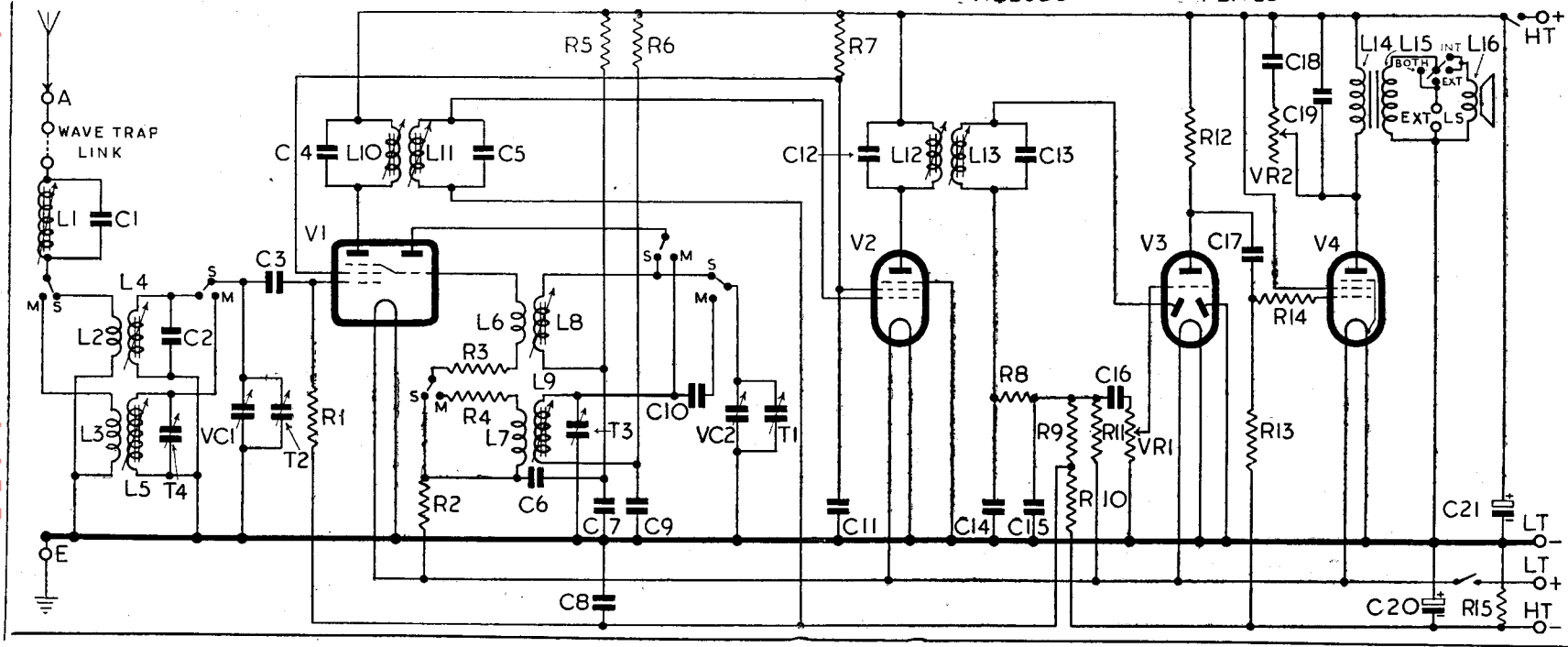
L.	*Ohms.*	*L.*	*Ohms.*
1	3.3	9	.8
2	.15	10	8
3	.8	11	8
4	Very low	12	8
5	2	13	8
6	Very low	14	.4
7	1.4	15	700
8	Very low	16	4



The Murphy B89S is a four-valve battery superhet covering short and medium wavebands. A B89 was also marketed for medium and long wavebands. The circuit on this page relates to the former set, modifications in the B89 being shown in a diagram overleaf.



The circuit is perfectly straightforward with transformer input coils and tuned anode oscillator. Iron dust cored coils are employed throughout. Bias is provided by R15 in the negative line.



RESISTORS

R.	*Ohms.*
1	470.000
2	22,000
3*	27
4	330
5*	27
6	47,000
7	39,000
8	47,000
9	2.2 meg.
10	3.9 meg.
11	1 meg.
12	68,000
13	2.2 meg.
14	270,000
15	330
VR1	2 meg.
VR2	100,000

* Not used in Model B89 circuit.

CONDENSERS

C.	*Mfds.*
1	.0005
2*	.00002
3	.0005
4	92 mmfds.
5	92 mmfds.
6	.0002
7†	.006
8	.025
9	.05
10	.0007
11‡	.05
12	92 mmfds.
13	92 mmfds.
14	.0001
15	.0001
16	.002
17	.003
18	.01
19	.003
20	50
21	8
22§	.0002

* .0008 mfds. in Model B89.
† .000414 mfds. in Model B89.
‡ .000662 mfds. in Model B89.
§ Found only in Model B89.

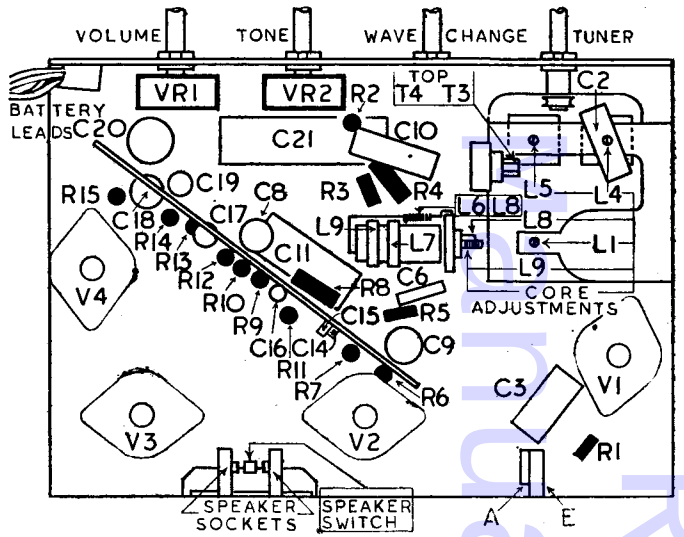
MURPHY · B89S

Continued

is provided by connecting R13 to the negative end of R15 in the HT negative line.

The output transformer L14, L15 couples V4 to the permanent-magnet moving-coil loudspeaker in which L16 is the speech coil. An extra loudspeaker may be connected to the sockets provided across L15 and the three-position switch enables either one, or both, of the speakers to be used as required.

A permanent degree of tone correction is effected by C19 while variable tone control is provided by C18 and VR2.



GANGING

IF Circuits.—Switch receiver to MW and tune to 500m. Inject a 465kc signal *via* a .1 mfd condenser into the control grid of V2 and adjust the cores of L13 and L12 for maximum output.

Transfer the service oscillator leads to the top cap of V1 and adjust L11 and L10 for maximum output.

SW Band.—Switch receiver to SW and tune it to 20m. Inject a 20m signal *via* a 400 ohm resistance into the aerial and earth sockets and adjust T1 for maximum output, employing the lesser capacity when two peaks are obtained.

Then adjust T2 for maximum output.

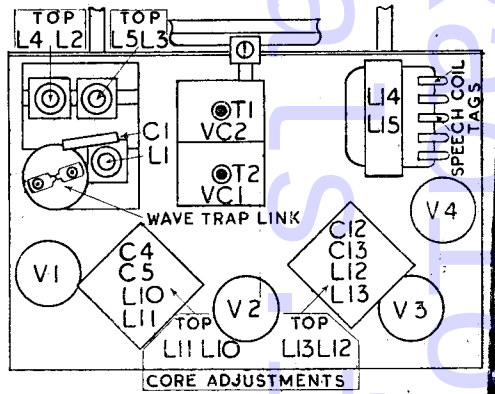
Inject a 49m signal and tune receiver to 49m on the scale. Adjust the cores of L3 and L4 for maximum output.

MW Band.—Switch receiver to MW and tune it to 220m on the scale. Inject a 220m signal and adjust T3 and T4 for maximum output.

Inject a 500m signal and tune receiver to 500m on the scale. Adjust the cores of L9 and L5 for maximum output.

If the adjustments are large, re-trim T3 and T4 and re-adjust L9 and L5.

IF Rejector.—Inject a 465 kc signal at good strength and adjust the core for L1 for *minimum* output.



MODEL B89

The B89 receiver is basically similar to the B89S, but instead of a SW and MW band there are MW and LW bands.

Circuit modifications are shown in the accompanying circuit diagram, which covers the aerial and oscillator arrangements. The LF and output circuits are similar for both models.

Differences in values of the components are given in the component tables.

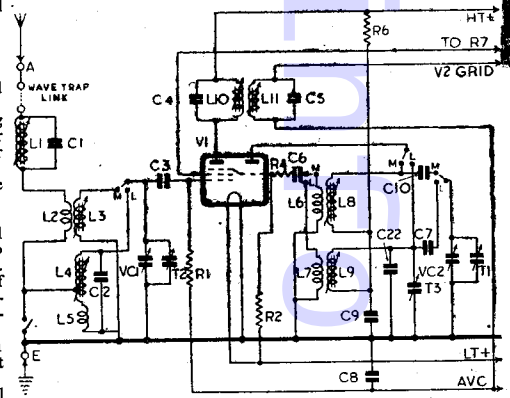
IF Circuits.—As for Model B89S.

MW Band.—Switch receiver to MW and inject a signal of 220m into the aerial and earth sockets. Tune receiver to 220m on the scale and adjust T1 and T2 for maximum output.

Tune receiver to 500m on the scale and inject a signal of this wavelength. Adjust the cores of L8 and L3 for maximum output, going over the whole trimming again if adjustments are large.

LW Band.—Switch receiver to LW and inject a 1,000m signal. Tune receiver to 1,000m on the scale and adjust T3 for maximum output.

Tune receiver to 1,900m on the scale and inject a signal of this wavelength. Adjust the cores of L9 and L4 for maximum output, re-trimming T3 and coils if adjustments are large.



The circuit modifications of the B89 apply only to the FC stage and are shown here.