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# MURPHY A38

Four-valve, plus rectifier, two wave-band superhet, incorporating a cathode-ray tuning indicator. Provision is made for the connection of low-impedance speakers. Suitable for operation from AC mains, 200 - 260v. Manufactured by Murphy Radio, Ltd., Welwyn Garden City, Herts.

An inductively coupled bandpass filter circuit couples the aerial to the grid of the frequency changer valve V1. Image suppression is achieved via LO and CO.

The triode oscillator section of V1 has a tuned anode circuit with the reaction winding L9, L10 in the cathode circuit. R1 and C3 are the grid leak and condenser, while R2 is the bias resistance.

The IF signal from V1 is transferred by the IF transformer L13—L14 to the grid of the amplifying pentode V2. The transformer has a subsidiary winding L14a and components R5 and C6, which are switched into circuit by the selectivity and tone control switch S4. As will be seen, S4 has several sections which control tone correcting condensers in V3 and V4 grid circuits.

V2 is biased by R6, decoupled by C8, while the suppressor grid may be returned either to cathode—which is normal

arrangement—or to the signal diode load network, thus forming an inter-station suppression circuit.

A second IF transformer L15—L16 passes on the signal to the signal diode of the double-diode-triode V3. The filter and load resistances are R12, R13, R14, R15. The tapping between R13 and R14 controls the grid of the tuning indicator.

Condensers C14, C15, C17 and C18 are for tone control and are brought into action by the sections of the switch S4. C16 is the coupling condenser which passes on the signal through the grid coil R18 to the grid of the triode section of V3. The grid circuit is completed via R17 and R20 to a tapping on the grid bias potential divider network R25, R26, R27.

The AVC diode of V3 is fed via C11 from the primary L15 of the second IF transformer. R9 and R10 are the load resistances and full AVC is applied via R11, decoupled by C12 and R29 to the grid circuit of V1.

V2 grid circuit requires less control and is returned via R8, decoupled by C9 to the junction of R9, R10. The AVC diode is fully delayed by being returned to the chassis line which is at full bias potential across R25, R26 and R27.

V3 is resistance-capacity coupled by R22 and C29 to the grid circuit of V4, the pentode output valve. A comprehensive tone corrector circuit is introduced between R22 and C29 and comprises L17 and the condensers C23 to C28 which are controlled by sections of the switch S4.

The volume control R19 is in the grid circuit of V4 and is taken to the junction

of R26 and R27 for bias. The signal is passed via the grid stopper R24 to the grid of the valve from whence it is transformer-coupled by L18, L19 to the energised loud-speaker.

A permanent degree of tone correction is effected by R28, C30. L20 is the speech coil across which are connected the extra speaker sockets.

HT supply circuit comprises the full-wave rectifier valve V5, and smoothing is effected by the smoothing choke L22 and the speaker field winding L21, with smoothing condensers C31, C33 and C34.

### GANGING

**IF Circuits.**—Switch receiver to LW and tune to 2,000 metres. Inject a signal of 119kc via a dummy aerial to the control grid of V2 and chassis. Keeping the input from the oscillator low, adjust T1 and T2 for maximum output.

Transfer the oscillator leads to the control grid of V1 and chassis and adjust T3 and T4 for maximum output on a 119kc signal.

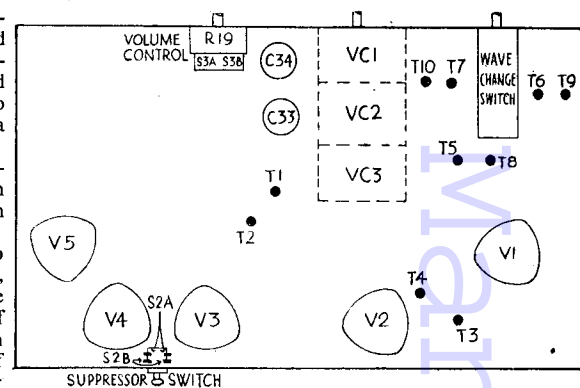
**MW Band.**—Switch receiver to MW and with a normal aerial and earth connected, tune the receiver dial to a wavelength of a known broadcast station as near to 220 metres as possible. Adjust T5 to receive the station at maximum volume.

Without altering the setting of the tuning control replace the aerial and earth with the dummy aerial of the service oscillator. Tune the oscillator to obtain maximum output from the receiver, ignoring the actual calibration. Adjust T6 and T7 for maximum output.

**LW Band.**—Reconnect the aerial and earth and switch receiver to LW and tune the scale to the wavelength of a known LW station.

Adjust T8 to receive the station chosen at maximum output.

Tune in receiver to exactly 1,000 metres, connect the service oscillator in place of the aerial and earth and rotate the dial of the service oscillator to the point giving maximum output from the receiver. Adjust T9 and then T10 for maximum output.



### VALVE READINGS

Taken with no signal.

V	Type	Electrode	Volts
1	AC/TP (Mazda)	Anode	153
		Screen	153
		Cathode	4
2	AC/VP2	Osc. anode	80
		Anode	236
		Screen	200
3	AC/HLDD	Cathode	2
		Anode	118
		Screen	16
4	AC/4 Pen	Anode	224
		Screen	236
		Cathode	16
5	UU4	Anode	324
		Screen	32
		Cathode	236
Tuning Indicator AC/ME		Anode	32
		Screen	236
		Cathode	16

### CONDENSERS

C	Mf/ds	C	Mf/ds
0	.. . . . .0095	18	.. . . . .01
1	.. . . . .1	19	.. . . . .0005
2	.. . . . .00035	20	.. . . . .2
3	.. . . . .0005	21	.. . . . .05
4	.. . . . .05	22	.. . . . .8
5	.. . . . .001	23	.. . . . .001
6	.. . . . .002	24	.. . . . .0005
7	.. . . . .01	25	.. . . . .0003
8	.. . . . .1	26	.. . . . .0005
9	.. . . . .05	27	.. . . . .01
10	.. . . . .05	28	.. . . . .001
11	.. . . . .00005	29	.. . . . .025
12	.. . . . .01	30	.. . . . .04
13	.. . . . .0001	31	.. . . . .16
14	.. . . . .0303	32	.. . . . .25
15	.. . . . .0001	33	.. . . . .8
16	.. . . . .05	34	.. . . . .8
17	.. . . . .025		

### RESISTANCES

R	Ohms	R	Ohms
1	.. . . . .50,000	16	.. . . . .1 meg
2	.. . . . .500	17	.. . . . .250,000
3	.. . . . .100,000	18	.. . . . .25,000
4	.. . . . .5,000	19	.. . . . .100,000
5	.. . . . .100,000	20	.. . . . .1 meg
6	.. . . . .300	21	.. . . . .1 meg
7	.. . . . .1 meg	22	.. . . . .50,000
8	.. . . . .1 meg	23	.. . . . .3,000
9	.. . . . .800,000	24	.. . . . .5,000
10	.. . . . .600,000	25	.. . . . .28
11	.. . . . .2 meg	26	.. . . . .83
12	.. . . . .100,000	27*	.. . . . .118
13	.. . . . .400,000	28	.. . . . .4,000
14	.. . . . .150,000	29	.. . . . .5,000
15	.. . . . .40,000		

\* 113 ohms in early chassis.

### WINDINGS

L	Ohms	L	Ohms
0	.. . . . .1	14	.. . . . .40
1	.. . . . .1.4	14A	.. . . . .10
2	.. . . . .9	15	.. . . . .40
3	.. . . . .4	16	.. . . . .40
4	.. . . . .12	17	.. . . . .500
5	.. . . . .3	18	.. . . . .180
6	.. . . . .2	19	.. . . . .1
7	.. . . . .4	20	.. . . . .1.8
8	.. . . . .12	21	.. . . . .900
9	.. . . . .2.5	22	.. . . . .122
10	.. . . . .23	23	.. . . . .—
11	.. . . . .3.5	24	.. . . . .180—200
12	.. . . . .8	25	.. . . . .—
13	.. . . . .40	26	.. . . . .28 (total)

