MURPHY A26

Four-valve, plus rectifier, two waveband superhet for operation from 200-255 v., 50 cycle, A.C. mains. Special models for 100 v. and 25 cycles. Made by Murphy Radio, Ltd., Welwyn Garden City, Hertfordshire.

Circuit.—The aerial is coupled to V1, the frequency-changer, by a two waveband bandpass circuit which incorporates an image suppression arrangement (L19, C1). L5, L6 provide inductive coupling and are returned to the A.V.C. line for control of V1.

The oscillator circuits are tuned anode with coupled windings for feed-back to the cathode. Padding is by fixed condensers, C5 and C6. Anode and screen decoupling condensers, C8 and C9, are returned to cathode instead of chassis.

Trimmer-tuned transformers link up V2, the I.F. amplifier and V3, the double diode. The A.V.C. diode is fed from the anode of V2 via C13; R12 and R13 are the load, and A.V.C. is fed back to both V2 and V1. R15, the volume control, is the signal demodulation diode load, R14 and C14 being an I.F. filter.

V4 is an output pentode biased by the drop across R19 in its cathode lead. The A.V.C. diode of V3 is given a delay bias by the total drop across R19 and R20.

The chassis is above true negative by the drop across the speaker field which is in the negative H.T. return. Two L.T. windings are provided, otherwise the mains section is a conventional full-wave arrangement.

GANGING

I.F. Circuits.—Inject 117 kc. to V1 signal grid, prevent V1 oscillating by shorting L9 or L11, and adjust the four I.F. trimmers for maximum on an output meter. Keep signal low to prevent A.V.C. working.

M.W. Band.—Inject 200 m. to aerial and earth, tune to 200 m., and adjust T1, T2 and T3 in that order for maximum. Repeat adjustments until no further improvement is obtained.

Padding is fixed.

L.W. Band.—Inject 950 m., tune to 950 m., and adjust T4, T5 and T6 for maximum. There is no padding.

RESISTANCES

R	*Ohms.*	*R*	*Ohms.*
1	5,100	11	1 meg.
2	3,200	12	800,000
3	50,000	13	600,000
4	1,000	14	100,000
5	100,000	15	.5 meg.
6	20,000	16	700
7	5,000	17	1 meg.
8	7,500	18	50,000
9	300	19	140
10	1 meg.	20	320

VALVE VOLTAGES

V	*Type*	*Electrode*	*Volts*	*Ma.*
1	AC/TP	Anode	200	5
		Screen	180	1.5
		Osc. anode	75	1.4
		Cathode	7	—
2	AC/VP1	Anode	240	7
		Screen	220	1.5
		Cathode	3	—
3	V914	Anodes	—	—
		Cathode	15	—
4	AC/2 Pen.	Anode	220	28
		Acreen	240	7
		Cathode	15	—
5	U12	Across C20	355	—

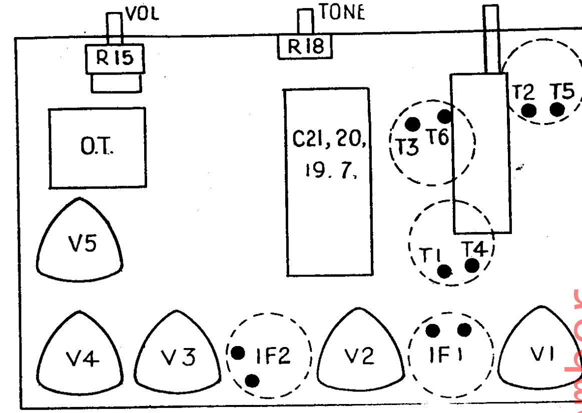
CONDENSERS

C	*Mfds.*	*C*	*Mfds.*
1	2 mmfds.	12	.05
2	.1	13	.0001
3	.0005	14	.0001
4	.1	15	.0002
5	.002	16	.005
6	.001373	17	.025
7	8	18	.002
8	.0014	19	25
9	.002	20	8
10	.01	21	8
11	.1		

WINDINGS

L	*Ohms.*	*L*	*Ohms.*
1	1	11	4
2	7	12	8
3	5	13	2,400
4	12	15–18	40
5	2.75	19	.25
6	.75	20	650
7	5	21	.25
8	12	22	2
9	1	23	24/29
10	2.5	24	255–255

An underneath layout diagram of the A 26 chassis indicating the positions of trimmers and other major components.



TESTING THE A.V.C. CIRCUIT

AUTOMATIC volume control circuit faults can cause instability, loss of amplification and distortion. Due to the low power and high resistances of the circuits, however, they are not too easy to test unless one knows how.

The first and easiest check is to see whether the A.V.C. is doing its job, *i.e.*, controlling the bias, and hence the anode current, of the variable-mu R.F. amplifying valves. If a tuning indicator is fitted and operates satisfactorily one can be fairly sure the A.V.C. is all correct.

If there is no indicator, or the one fitted does not operate, it is advisable to connect a milliammeter in series with the anode of one of the controlled valves or, alternatively, watch the voltage change across any resistance in the anode or cathode circuit. As an increasing signal is injected, the current should fall and the voltage across any resistance should decrease.

Where delayed A.V.C. is fitted, there should be no change of the controlled-valve current until a certain minimum signal strength has been reached. Where there is no delay or the delay bias arrangements are out of action, the A.V.C. operating on even the weakest signals reduces the sensitivity of the set.

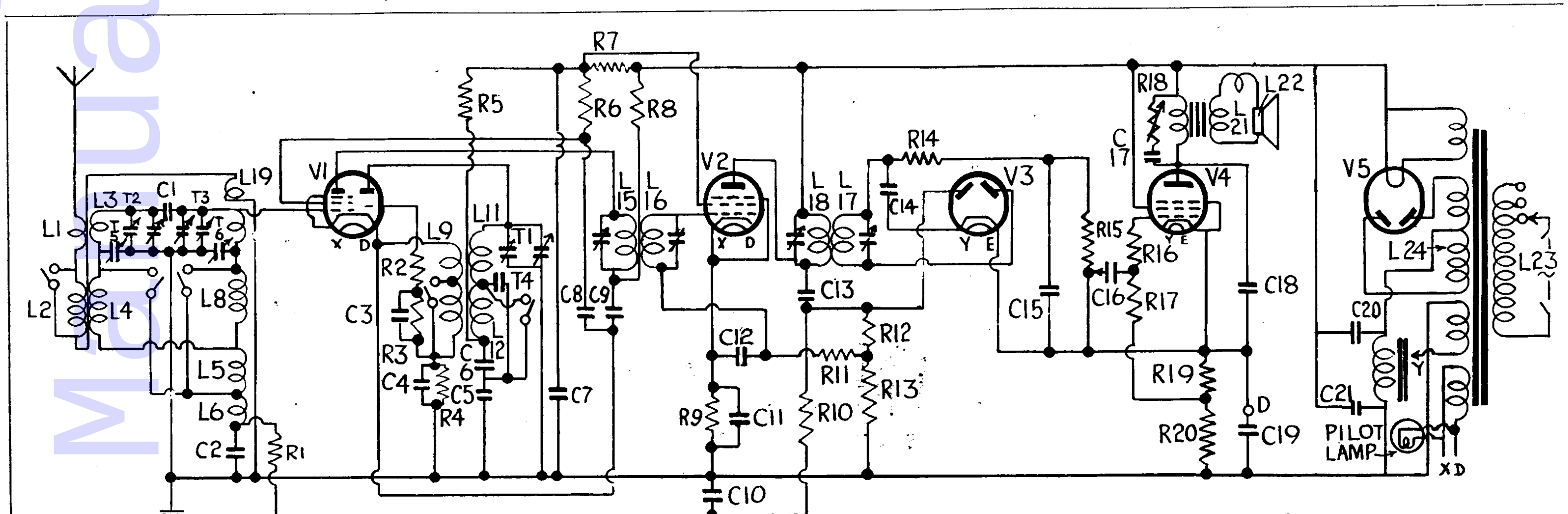
Delay Bias

A.V.C. delay is usually applied by raising the cathode of the A.V.C. diode above chassis potential. The cathode resistor for this purpose should be checked.

Absence of A.V.C. may be due to a faulty diode, excessive delay bias, open-circuit A.V.C. line or short-circuited A.V.C. decoupling condenser.

The voltage across the diode load cannot be measured except with a valve voltmeter or other type with an extremely high input resistance. If the current is measured with a microammeter, the voltage across the resistance can be calculated. Generally, it is easier to substitute the valve and check the resistances and condensers.

A shorted or low value A.V.C. feed resistance may cause instability due to "un-demodulated" H.F. signals being fed back to the grids. Defects similar to motor-boating may occur if alteration of the A.V.C. decoupling resistors and condensers leads to a change of the time constant.



Distinctive feature of the circuit is the use of cathode injection in the frequency-changer stage. Band-pass input is employed and the double-diode feeds the high-slope output pentode without any intermediate L.F. amplification.