

PYE MODEL QAC2 SUPERHET

CIRCUIT.—A band-pass filter circuit is used to couple the aerial to V1, a frequency changer.

An I.F. transformer tuned to 127 kc. couples the signal to V2, an H.F. pentode, and a second I.F. transformer feeds the double diode section of V3, a combined double diode and output pentode.

One diode is used for demodulation and is coupled to the pentode section through a resistance and capacity stage. The other diode receives part of the signal from the anode of V2, through C19, and applies it as A.V.C. bias to the preceding valves in the orthodox manner.

Early versions of this receiver will be found to have a separate double diode and output pentode. The circuit is, however, the same, except that C23 is connected between the anode of V4 and H.T. +, and not between anode and cathode, as in the three-valve model.

The volume control R10 forms part of the L.F. coupling network between the demodulator diode and the pentode, and varies the input to the grid.

V3 is tone controlled by C25 and R14 and a three-position switch.

Mains equipment consists of trans-

former, full-wave rectifier, electrolytic condensers and the speaker field.

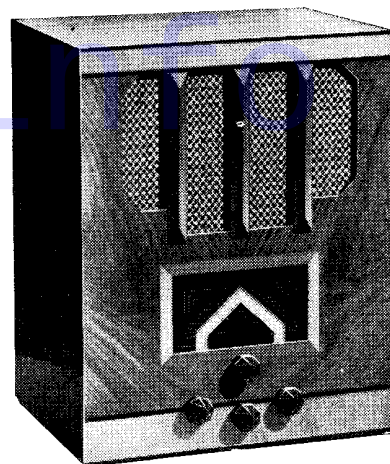
Special Notes.—Provision is made for using an external speaker with this receiver. The connections are on the secondary of the output transformer, and an extension speaker should have a speech coil impedance of about 2 ohms.

The internal speaker plugs are of the socketed plug type, so that the extension speaker plugs may be connected to them or, if desired, the internal speaker may be disconnected.

VALVE READINGS

No signal. Volume maximum. 200 volt A.C. mains.

V.	Type.	Electrode.	Volts.	Ma.
1	All Ever-Ready.			
	A80A met. (7)	Anode ..	230	3.55
		Screen ..	58	2.5
		Osc.anode..	60	1.2
2	A50P met. (7)	Anode ..	230	10.3
		Screen ..	230	3.85
3	A20B met (5)	Diode ..	—	—
4	A70D (7) or A27D	Anode ..	250	29
		Screen ..	230	5.3
5	511D (4)	Filament ..	350	—

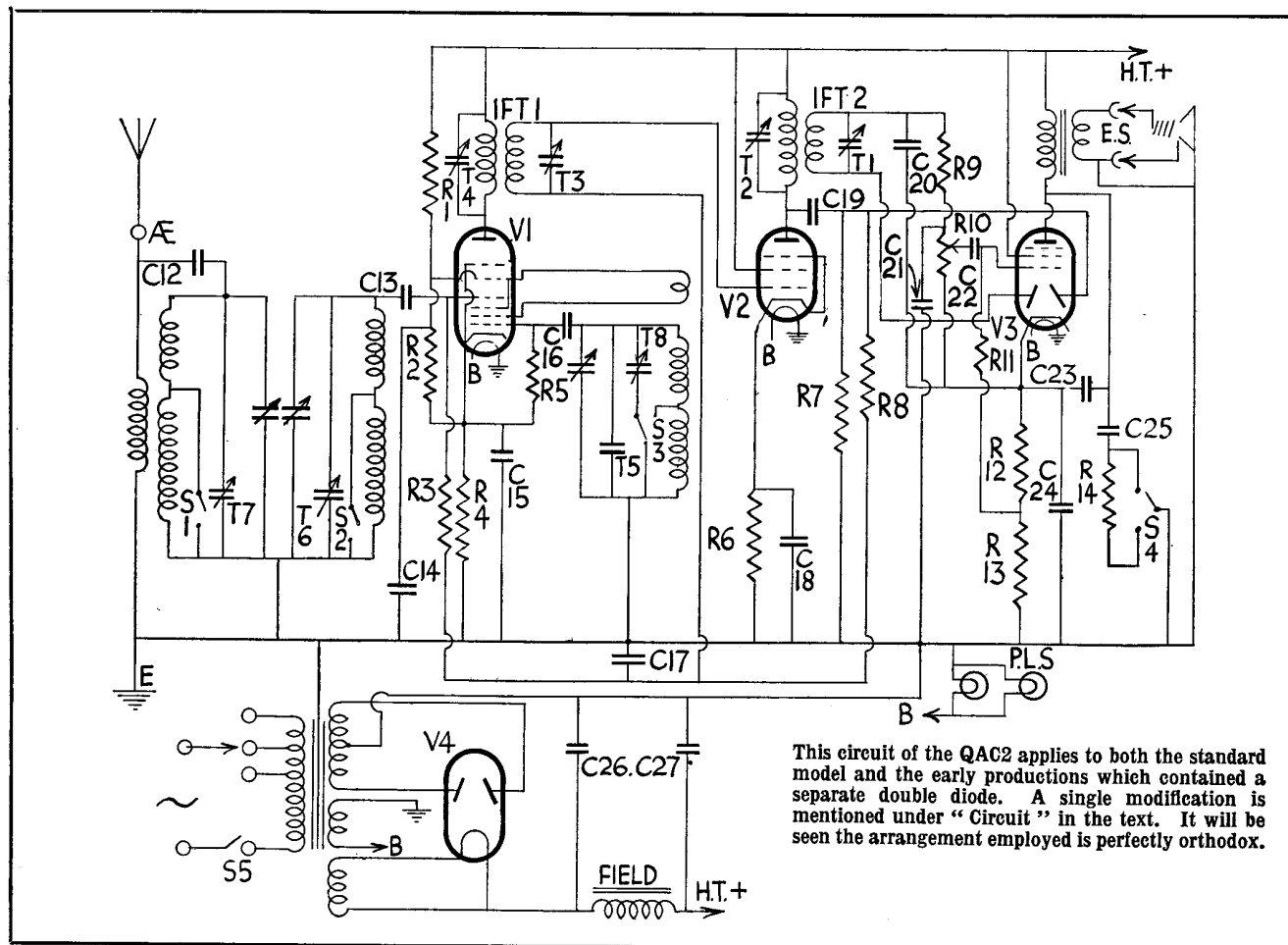


The Pye QAC2 is a three-valve plus rectifier superhet. Early models contained five valves in all, one being a separate double diode.

QUICK TESTS

Quick tests are available on this receiver on the terminal strip at the back of the speaker. Volts measured between this and the chassis should be:—

Red lead, 350 volts, unsmoothed H.T.
Black lead, 230 volts, smoothed H.T.



The dial lights are rated at 6.2 volts .3 amp., and the holders are secured to the dial assembly by a knurled headed nut in the centre of the dial. Removal of this allows the holders to be taken out clear of the chassis.

C26 and C27 are in one block mounted on the speaker baffle.

Removing Chassis.—Most of the work necessary on this receiver can be done without removing the chassis, by taking off the false fibre bottom of the cabinet. It is secured by four wood screws.

Complete removal of the chassis is as follows:—

Take off the four control knobs, which are secured by spring clips, and disconnect the speaker plugs from the back of the chassis. Next free the field leads from the small terminal strip on the speaker chassis by undoing the bolts. When reconnecting, see that the red lead goes to the tag on the left.

Take out the four bolts from underneath the cabinet, and the chassis may then be completely removed.

Circuit Alignment Notes

Calibration.—Fully mesh the gang condenser plates and check that the pointer is parallel with the end of the transparent scale opening. If this is not so, then adjust it by loosening the set screw in the centre.

The flat end of a pencil should be pushed up through the hole in the chassis and against the condenser vanes to see that they are fully meshed.

Keep the output from the oscillator as low as possible so as to avoid bringing the A.V.C. into operation. A maximum reading of .5 volts on the output meter should be used throughout.

I.F. Circuits.—Remove the grid lead to V1 and in its place connect a .5 meg. resistance—that is, between the grid and earth.

Connect a .25 mfd. condenser between the oscillator anode and the chassis to stop it oscillating, and an output meter across the external speaker terminals. This should read a maximum of about 1 volt.

Inject a signal of 127 kc. to the grid cap of V1 from a modulated oscillator via a .002 mfd. condenser. Adjust T1, T2, T3 and T4 for maximum output.

During the adjustment of the I.F. transformers a loading resistance of 50,000 ohms must be used. When tuning the primary of either transformer, the resistance is connected across the secondary and while adjusting the secondary the resistor must be connected across the primary.

Medium Waves.—Tune the receiver to 210 metres (1,425 kc.) and inject a signal of this wavelength to the aerial and earth terminals via a dummy aerial.

Fully unscrew T5 and then slowly screw it in until maximum reading is obtained on the output meter. Then adjust T6 and T7 for maximum.

To check the above adjustments, inject and tune in a signal of 520 metres (580 kc.). If the dial reading is in the region of 500 metres, then the adjustment of the oscillator trimmer T5 is incorrect, so roughly gang T5, T6 and T7 at 520 metres and then return to 210 metres and regang accurately, remembering that if

Pye QAC2 on Test

MODEL QAC2.—Standard model for 200-250 volt, 40-100 cycle A.C. mains. 8 gns.

DESCRIPTION.—A three-valve, plus rectifier two-waveband A.C. super-het table receiver. Conventional table type wood cabinet.

FEATURE.—Full-vision, coloured, wavelength and station name scale. Standard controls. Tone varied by two-position switch.

LOADING.—78 watts.

Sensitivity and Selectivity

MEDIUM WAVES (200-565 metres).—Sensitivity is representative for the valve combination employed. Overlap is only on channels adjacent to local stations and the background is fairly free from whistles. Gain and selectivity are both well maintained.

LONG WAVES (900-2,000 metres).—The gain is representative and the selectivity sufficient to give all the usual stations.

Acoustic Output

The volume is adequate for normal room requirements. The tone is fairly well balanced and in the brilliant position there is appreciable crispness and attack.

In the lower tone position the reproduction is not unduly muffled.

more than one peak is found while adjusting T5, the one nearer minimum capacity is correct.

Long Waves.—Tune the receiver to 1,000 metres (300 kc.). Inject a signal of this wavelength to the aerial and earth terminals and adjust T8 to a point half way between two consecutive peaks.

Replacement Condensers

Replacement parts for this receiver are available in the ordinary way from Pye Radio, Ltd. Suitable electrolytic condensers, specially made for this receiver, are also available from A. H. Hunt, Ltd., of Garratt Lane, Wandsworth, London, S.W.18.

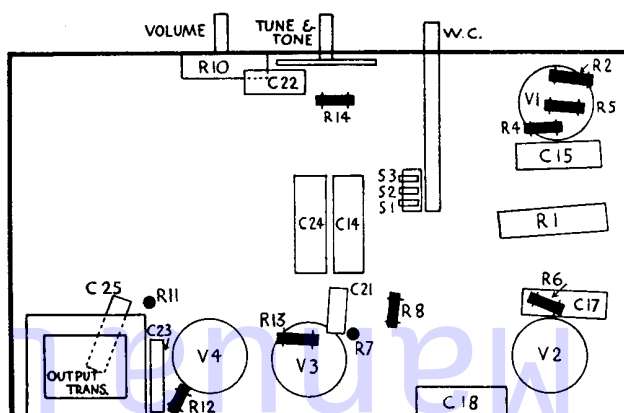
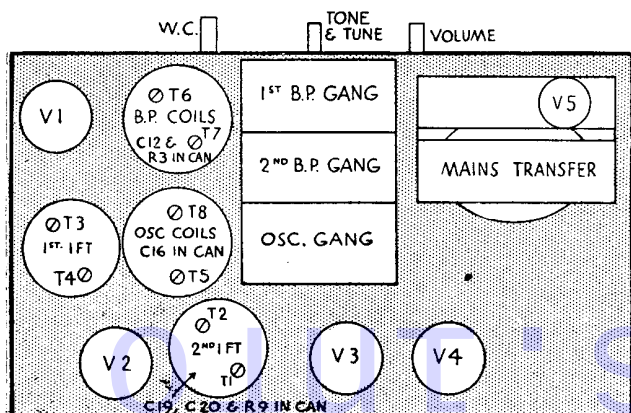
These are: Block containing C26, 27, list number 2002 (7s.); C24, list 2935 (1s. 9d.); C14, list 2964 (1s. 10d.).

CONDENSERS

C.	Purpose.	Mfds.
12	Band pass aerial coupling ..	.000005
13	V1 grid ..	.0002
14	V1 screen potentiometer decoupling.	2
15	V1 cathode bias shunt ..	.1
16	V1 osc. grid ..	.0002
17	V1 A.V.C. decoupling ..	.1
18	V2 cathode bias shunt ..	.1
19	A.V.C. diode coupling ..	.00001
20	H.F. filter ..	.0001
21	H.F. filter ..	.0001
22	L.F. coupling ..	.003
23	Pentode compensating ..	.001
24	V3 cathode bias shunt ..	20
25	Tone control ..	.025
26	H.T. smoothing ..	8
27	H.T. smoothing ..	8

RESISTANCES

R.	Purpose.	Ohms.
1	V1 screen decoupling pot. ..	25,000
2	V1 screen decoupling pot. ..	40,000
3	V1 A.V.C. decoupling ..	510,000
4	V1 cathode bias ..	150
5	V1 osc. grid leak ..	20,000
6	V2 cathode bias ..	300
7	A.V.C. diode load ..	1.1 meg.
8	A.V.C. decoupling ..	1.1 meg.
9	Demodulator diode load ..	110,000
10	Volume control ..	500,000
11	V3 grid leak ..	1.1 meg.
12	V3 cathode bias (part) ..	200
13	V3 cathode bias (part) ..	500
14	Tone control ..	10,000
	Speaker field ..	2,000



These diagrams show how the parts are arranged on the early QAC2 chassis. Later models are similar but for the omission of the V3 valve holder.

PYE QAC2

Three-valve (occasionally four-valve, see note), plus rectifier, two waveband superhet. Provision is made for an external loudspeaker, which may be used with, or independently of, the internal loudspeaker. Three models were made suitable for operation from AC mains in the following ranges: 200-250 v, 40-100 cycles; 200-250 v, 25-39 cycles; 100-150 v, 40-100 cycles. Marketed by Pye Radio, Ltd., Cambridge.

AERIAL input is via the coupling coil L1, which is inductively coupled to the MW and LW primary coils L2, L3, of a bandpass tuning unit. L4 and L5 are the grid windings. Capacity coupling is also effected by C1 on both wavelengths and tuning is by VC1 and VC2 sections of the ganged condenser. The filter is designed to give second channel suppression and to avoid breakthrough from MW stations on LW.

The signal is passed from the unit to the control grid of the frequency changer valve V1 via C2. This valve is cathode biased by R4, decoupled by C4,

and the grid is connected to the AVC line with decoupling components R3 and C6.

The amplifier section has variable-mu characteristics, and is AVC controlled; while the oscillator section employs a tuned grid circuit, in which L7 (MW) and L8 (LW) are tuned by VC3 section of the triple gang condenser. R5 and C5 are the oscillator grid leak and condenser, L6 being the oscillator anode coil. The screen is fed from the high-tension line through R1 and decoupled by C3.

The intermediate-frequency signal from V1 is transferred by L9 and L10 to the grid of the IF amplifying pentode V2. The grid circuit is returned to the AVC line with R8 as decoupling resistance. Cathode is biased by R6, decoupled by C7.

A second IF transformer, L11 and L12, is connected in the anode circuit of V2. The secondary

L12 feeds the signal diode of the double-diode pentode output valve V3. The load resistance is R10, with filtering effected by R9, C9 and C10. The AF signals are fed via the slider of the volume control (R10) to C11, and the grid of the pentode section of V3.

The AVC diode of V3 is fed from the anode of V2 via C8, the load resistance being R7. Delay bias is provided by the cathode resistors R12, R13, de-

Continued overleaf

WINDINGS

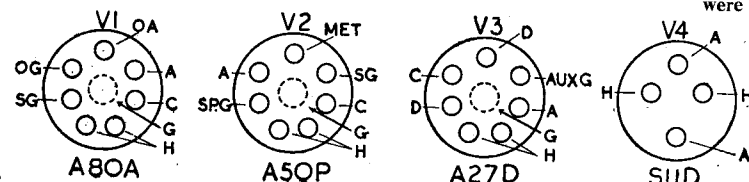
L	Ohms	L	Ohms
L1	17.0	L12	95.0
L2	2.5	L13	700.0
L3	11.5	L14	.3
L4	2.5	L15	1.5
L5	11.5	L16	.3
L6	46.5	L17	2,000.0
L7	2.75	L18	18.6-1.8-1.8
L8	2.75	L19	299-299
L9	95.0	L20	.08
L10	95.0	L21	.17
L11	95.0		

VALVE READINGS

Voltages taken with 1,000-ohm per volt meter. No signal input.

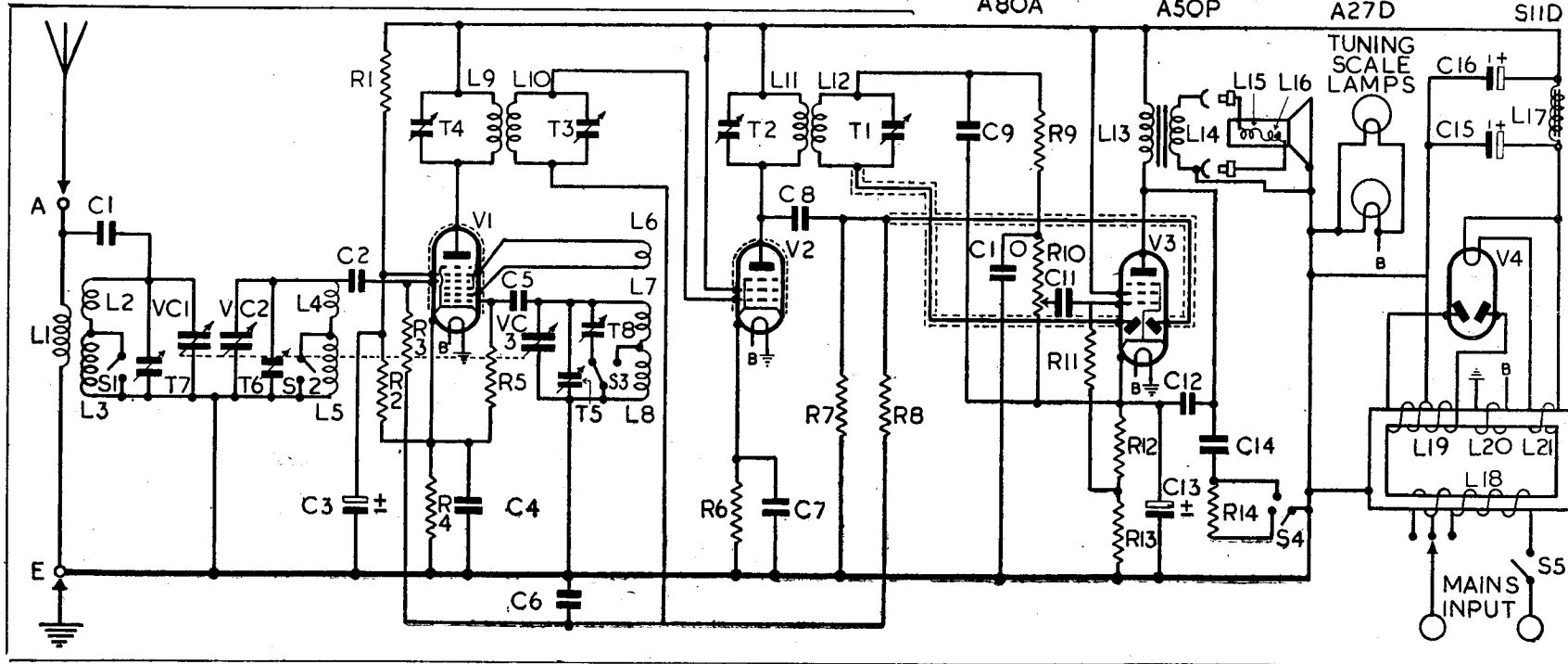
V	Type	Electrode	Volts	Ma
1	Every Ready	Anode	265	3.5
	A80A Met	Screen	68	2.5
		Osc anode	66	1.2
		Cathode	1.4	7.2
2	Every Ready	Anode	265	10.3
	A50P	Screen	265	3.9
		Cathode	4.2	14.2
3	Every Ready	Anode	245	27.5
	A27D (clear)	Screen	265	5.1
	or A20B, 170D	Cathode	22.8	32.6
4	SI1D	Anode each	340 AC	—
		Cathode	375	57

Pilot lamps: 4 volts.



Early models of the QAC2 had five valves, but afterwards the double diode and output pentode were combined.

Left.—Valve bases as seen with set inverted. Abbreviations are obvious, except perhaps for: OA, oscillator anode; OG, oscillator grid; SP.G, suppressor grid.



CONDENSERS

C	Mfds
1	5 mmfd
2	.0002
3	.2
4	.1
5	.0002
6	.1
7	.1
8	.00001
9	.0001
10	.0001
11	.003
12	.001
13	.20
14	.025
15	.8
16	.8

RESISTORS

R	Ohms
1	25,000
2	40,000
3	510,000
4	150
5	20,000
6	300
7	1.1 meg
8	1.1 meg
9	110,000
10	.5 meg
11	1.1 meg
12	200 ohms
13	500
14	10,000

PYE QAC2

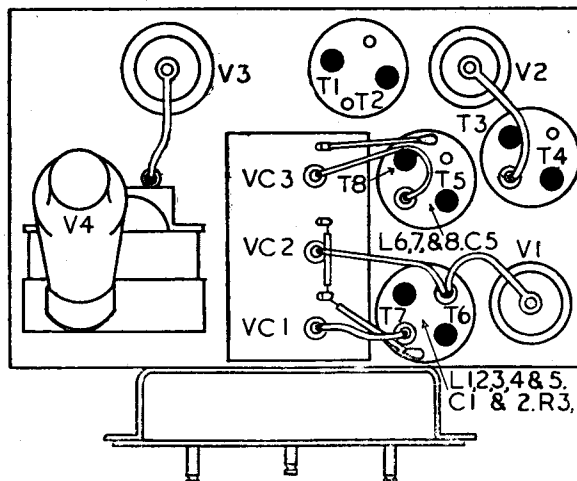
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coupled by C13. Bias to the pentode section at an intermediate value is supplied through R11.

A permanent degree of tone correction is effected by C12, and a tone-control system, C14 and R14, is controlled by a three-position switch S4.

The primary, L13, of the output transformer couples V3 to the energised moving-coil loudspeaker. The secondary, L14, terminates in sockets, into which the internal loudspeaker leads are plugged. L15 is the speech coil and L16 the humbucking coil.

The LT and HT supply circuits are conventional with HT derived from a full-wave rectifier V4, the smoothing components being L17 (field winding), C15 and C16. The smoothed output is 265 volts.



These diagrams identify all parts on the QAC2 chassis. To speed reference, resistors are in black, condensers in outline.

a signal of 210 metres (1,425 kc) between the aerial terminal and chassis.

Adjust T5 for maximum output. If more than one peak is obtained, the peak nearer to minimum capacity is the correct one.

Next adjust T6 and T7 for maximum output, then finally recheck the three trimmers.

Check at 520 metres (580 kc), and if 15-20 metres low, T5 is tuned to the incorrect peak. If this occurs, retrim roughly at 520 metres and repeat the trimming at 210 metres.

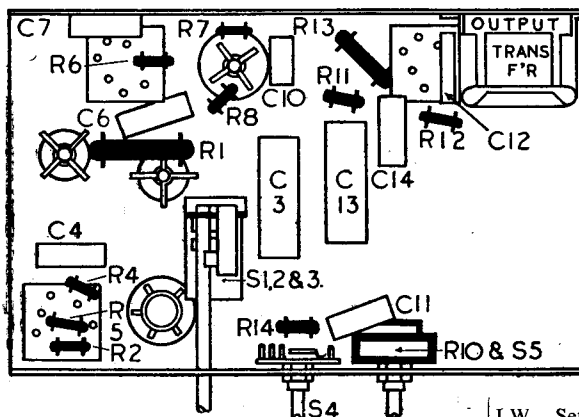
LW Band.—Switch the receiver to LW. Set pointer at 1,000 metres (300 kc), inject a signal of this frequency and adjust T8 to a point midway between two consecutive peaks.

During these adjustments it is necessary to reduce signal strength as the circuits are brought into tune and the output increases, so as to avoid bringing the AVC into action.

Service Note.—Sometimes when renewing the A27D output pentode, a high-pitched whistle is obtained when the volume is increased by means of the volume control. This trouble can be eliminated by inserting a 10,000-ohm resistance in the lead to the top-cap.

Some models use separate duo-diode and AF pentode valves, A20B and A70D; in place of the A27D.

An extension speaker can be used independently by removing the plugs of the internal speaker and plugging in the extension leads, which should go direct to a 2-4 ohm speech coil. The set should be off when making these connections. For simultaneous operation, plug extension leads into tops of internal speaker plugs.



GANGING

IF Circuits.—Connect a .25 mfd condenser between oscillator anode and chassis and inject a signal of 127 kc into the control grid of V1 via a .002 mfd condenser. The lead to the control grid should be removed and a .5 megohm resistance connected between the valve cap and chassis. A high impedance output meter should be connected across the primary of the output transformer.

Adjust T1, T2, T3 and T4 to give a maximum peak on the output meter.

A loading resistance of 50,000 ohms should be connected across the winding opposite that being trimmed, i.e., across the secondary when the primary is being trimmed and vice versa. This applies to both IF transformers.

MW Band.—Switch receiver to MW and rotate gang condenser so that the pointer registers on the mark at the lower wavelength end of the scale. Apply

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