PYE QU3

Four-valve, plus rectifier, three waveband superhet for operation from AC or DC mains 200–250-v. A cathode-ray visual tuning indicator is incorporated and provision made for an external speaker, Made by Pye, Ltd., Radio Works. Cambridge.

Circuit.—The aerial is fed via C1 to the coupling coils L2 (SW) and L4 (MW and LW), with an IF filter comprising L1 and C2 across L4. The tuning coils are L3 (SW), L5 (MW) and L6 (LW). The coils are tuned by VC1 section of the gang condenser and the signal is fed direct to the control grid of the triode hexode frequency changer valve V1.

AVC is applied to the control grid via R2 decoupled by C3. Permanent bias is obtained from R4, which is decoupled by C6, while the screening grid is fed from the HT line through R3 voltage dropper decoupled by C5.

The oscillator triode has a tuned grid circuit with L8 (SW), L10 (MW) and L11 (LW) for the various wavebands; these are tuned by the oscillator section VC2 of the gang condenser. The HF coupling condenser C11 is common to both grid and anode circuits on SW.

R7 and C8 are the grid leak and condenser with R6 as a grid limiter. Reaction is provided by L7 for SW and L9 for MW and LW. The voltage dropping resistance for the oscillator anode is R8, which is decoupled by C12.

The IF signal is transferred by the first intermediate frequency transformer L12 T4, L13 T3, in the anode circuit of V1 to the grid of the HF pentode V2. AVC is applied to V2 from the AVC line via R10, which is decoupled by C13.

V2 is permanently biased by R9 in the cathode circuit decoupled by C14. The screening grid and anode of V2 receive full HT voltage and the IF signal is transferred by a second IF transformer L14 T2, L15 T1, to the diodes of the double diode triode second detector valve V3.

The AVC diode is fed from L14 via C19, the AVC load being R20. Delay bias for the AVC diode and LF bias for the triode section of V3 is obtained from R17 decoupled by C22.

The signal diode is fed from L15, the signal load comprising the resistances R14 and R15. HF by-passing is effected by C16 and the LF signal is taken from the junction of the resistance to provide the correct voltage for application to the volume control R1. C18 is the coupling condenser with the IF filter network R16 and C20. A potential divider network R12, R13 across R15 allows a suitable voltage to be applied to the control grid of the cathode ray visual tuner.

The signal applied to the grid of V3 from the volume control is resistance capacity coupled by R19 and C23 from the anode of V3 to the grid of the pentode output valve V4 via the grid stopper R23. R18 is the voltage dropper for the anode of V3 and is decoupled by C21.

R22 is the grid to cathode resistance for V4 and is shunted by a high note by-pass condenser C24, decoupled by C29. Permanent tone correction for the anode circuit of V4 is effected by C28, while the variable tone control network comprises the switch S7 and the components R21, C25, C26, C27.

Cathode bias is obtained from R24.

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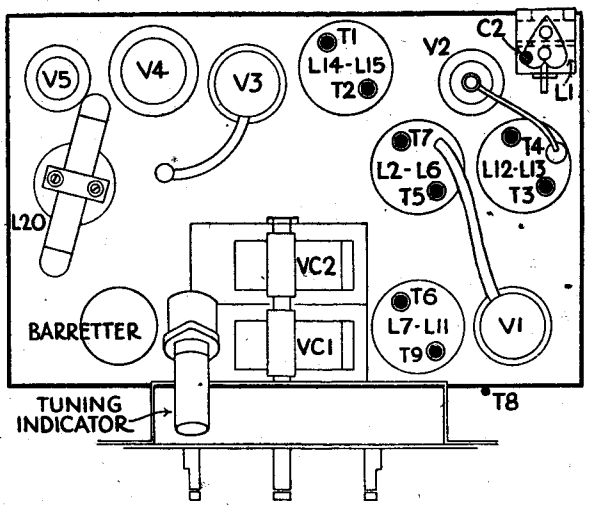
VALVE READINGS

Valve Readings (on 250 v AC mains).

V	Type	Electrode	Volts	Ma
	TH21C (Met) or	Anode	232	4.8
		Screen	60	3.8
	C36A	Cathode	2.2	—
	(Met)	Osc. Anode	57	2.4
2	VP13C (Met) or	Anode	254	11.3
		Screen	259	4.3
	C50N (Met)	Cathode	4.7	—
3	TDD13C (Met) or	Anode	124	1.1
		Cathode	3.5	—
	C23B (Met)			
4	Pen 36C or	Anode	244	34
		Screen	259	5.2
	C70D	Cathode	.14	—
5	UBIC or	Anode	250	—
		Cathode	269	67
	C10B			

Barretter—Philips C2.
Pilot lamps—6.2 v, .3 amp.
T Indicator—TV6 or C39A.



RESISTANCES

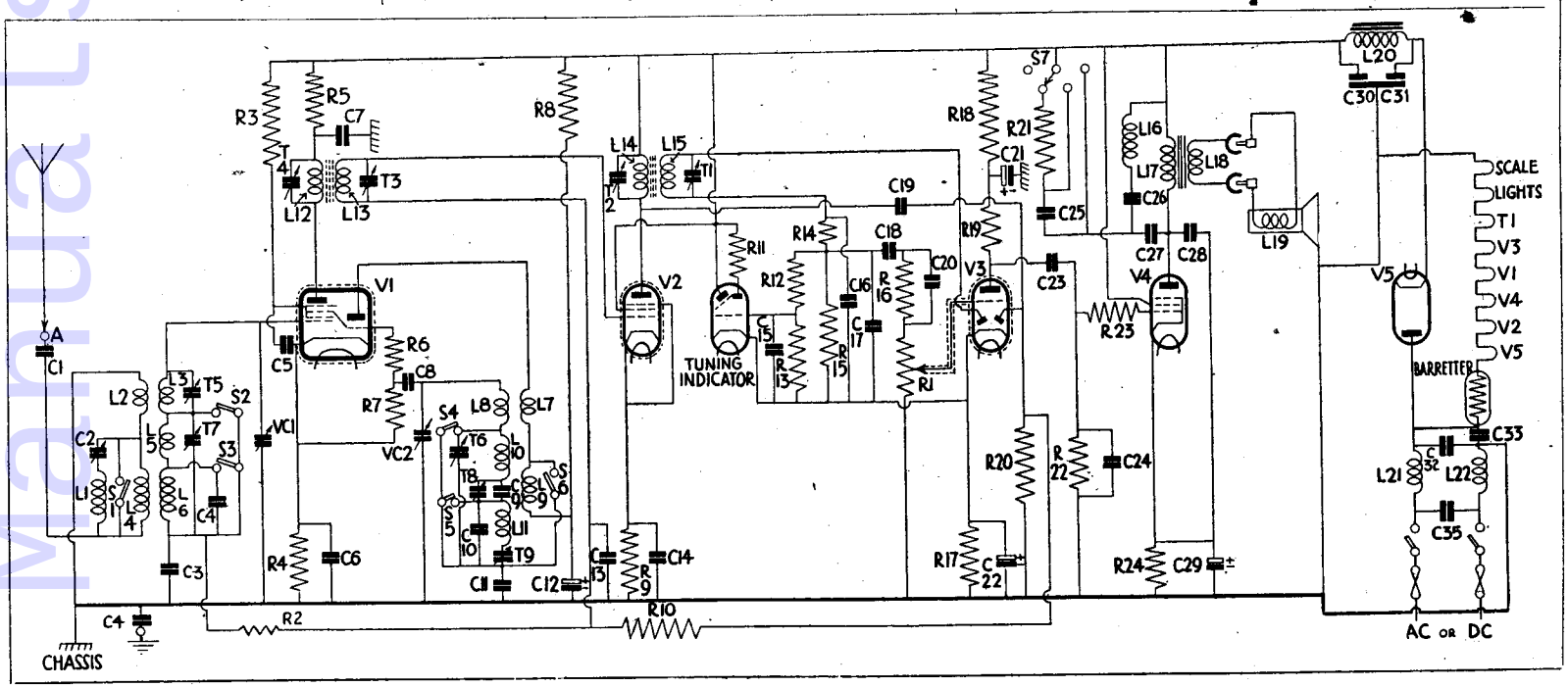
R	Ohms	R	Ohms
1	.5 meg	13	510,000
2	110,000	14	110,000
3	50,000	15	510,000
4	200	16	510,000
5	5,000	17	2,000
6	50	18	25,000
7	25,000	19	110,000
8	80,000	20	1.1 meg
9	300	21	10,000
10	1.1 meg	22	260,000
11	2.1 meg	23	25,000
12	2.1 meg	24	350

WINDINGS

L	Ohms	L	Ohms
1	18	12	5
2	very low	13	5
3	very low	14	5
4	145	15	5
5	15	16	480
6	15	17	700
7	32.5	18	very low
8	very low	19	2
9	6.5	20	226
10	1.8	21	1
11	6.5	22	1

CONDENSERS

C	Mfd	C	Mfd
1	.0005	19	.0001
2	—	20	.0001
3	.05	21	2
4	.00001	22	20
5	.1	23	.025
6	.1	24	.0005
7	.1	25	.025
8	.0001	26	.002
9	.00055	27	.05
10	.00002	28	.003
11	.005	29	50
12	2	30	16
13	.05	31	8
14	.1	32	.1
15	.1	33	.01
16	.00005	34	.05
17	.00005	35	.1
18	.01		



HMV 531, 553

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speech coil, which has a DC resistance of 11 ohms.

The other pair of pink sockets is for an external loudspeaker which should have a similar DC speech coil resistance.

The HT supply is obtained from the full wave rectifier, V10, the output from which is taken through CK4 which is tapped to ensure maximum smoothing at the standard mains frequency with C24 and C25. The HT circuit from CK4 is taken via the two red sockets on the amplifier chassis which feed the field winding (2,000 ohms) of the loudspeaker. This connection is made by a twin flex with two red plugs. After passing through the field winding the HT circuit continues to CK3 with its condensers C26 and C27 and thence to the HT positive terminal on the terminal panel of the amplifier. The connections between this terminal panel and the cable to the radio chassis are shown in the circuit diagram.

Fuses are incorporated in each mains lead and in one of the motor leads.

In the model 553 a resistance of 15,000 ohms is connected from HT to earth to compensate for the load of the radio chassis.

As previously stated, the models are suitable for mains voltages from 100 to 160, and 200 to 260. Adjustment is made by inserting two leads in a terminal strip at the front of the mains transformer, but the motor coils must be paralleled on the 100 to 160v. range and connected in series on the 200 to 260v. range.

GANGING

IF Circuits.—Connect milliammeter in place of link across terminals 4 and 5, switch to medium waves, volume control at maximum, tuning about halfway, oscillator valve out. Couple output from test oscillator to anode of mixer valve, V3 (MS4 Met).

Set test oscillator to 125.2 kc. Adjust all IF trimmers to peak. Note change in detector anode current, as shown on meter, caused by switching test oscillator on and off.

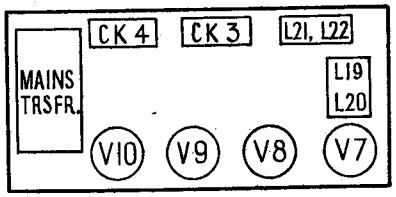
Increase capacity of T5 by screwing in clockwise direction so that the *change* in current is reduced by 18 per cent. Repeat with T3.

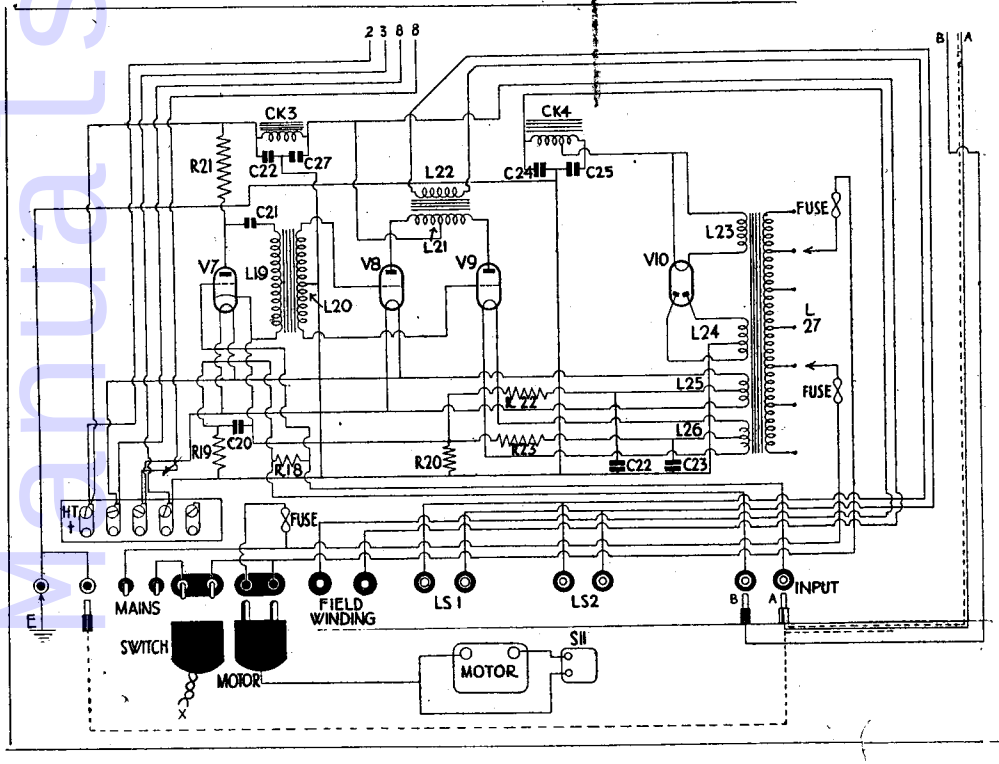
MW Band.—Inject a signal of about 220m. and adjust T9, T8, T7 and T10 for maximum output. Adjust T11 for maximum output on a signal of about 450m.

LW Band.—There are no adjustments for the LW band.

CONDENSERS

C		Mfd	C		Mfd
1	..	6 mmfd	15	.. ..	.0024
2	..	.00072	16	.. ..	2
3	..	.002	17	.. ..	1
4	..	.5	18	.. ..	.1
5	..	.1	19	.. ..	.001
6	..	150 mmfd	20	.. ..	.1
7	..	150 mmfd	21	.. ..	.2
8	..	150 mmfd	22	.. ..	6
9	..	150 mmfd	23	.. ..	6
10	..	.1	24	.. ..	4
11	..	150 mmfd	25	.. ..	2
12	..	150 mmfd	26	.. ..	2
13	..	.1	27	.. ..	2
14	..	1			





Circuit of the HMV output and power chassis, and (above) the chassis layout diagram.

WINDINGS

L		Ohms
1	..	38
2	..	5
3	..	5
4	..	16
5	..	19
6	..	19
7	..	5
8	..	4.2
9	..	.9
10	..	19
11	..	10
12	..	2.9
13	..	39
14	..	39
15	..	39
16	..	39
17	..	39
18	..	39
19	..	1,250
20	..	10,000
21	..	700
22	..	1.25
23	..	.2
24	..	200 + 150
25	..	.1
26	..	.2
27	..	6.3 total
CK1		43
CK2	..	85
CK3		4,000
CK4		340 + 23

GEC 3446

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The negative HT supply is taken via the fuse lamp, which takes the form of a 3.5 v .15 amp. flash lamp bulb. HT decoupling is effected by C18 and C19.

GANGING

IF Circuits.—Set range switch to LW and tuning control to maximum capacity setting of gang condenser. Set volume control to maximum.

Remove oscillator valve (V2) and connect modulated oscillator to the top connection of the front section of gang condenser.

Connect output meter across primary of output transformer (tags to which the orange flexible leads are connected) or to the external speaker sockets. If a multiple meter is used, set this to the 100 v or 120 v AC range.

Tune modulated oscillator to 125 kc and adjust its attenuator to give about 20 v reading on the output meter.

Adjust T1, T2, T3, T4 in that order to give a maximum peak reading on the output meter, progressively reducing the oscillator output by means of the attenuator to maintain the output meter reading at about 20 v.

Insert oscillator valve.

MW Band.—Check that at each extreme of travel; the pointer is equidistant from the outer scale fixing rivets.

Connect service oscillator to aerial and earth sockets via dummy aerial.

Set tuning condenser so that pointer indicates 214 metres.

Adjust T5 for maximum output. If two different adjustments give a maximum the one made should be that with minimum trimmer capacity.

Adjust T6 and T7 for maximum output.

Inject and tune in a 500 m signal.

Disconnect oscillator section of tuning condenser (VC3) by removing connection from its soldering tag.

Connect external variable condenser between the disconnected lead and chassis and adjust for a maximum reading.

Adjust the receiver tuning control to also give a maximum reading.

Disconnect external variable condenser and reconnect VC3. Care should be taken not to disturb the gang condenser setting before completing the next operation.

Adjust MW padding trimmer T8 for maximum output.

Note.—Should there be an error in calibration at 500 metres, the pointer should be re-set to correct for this and the complete procedure started again from and including the adjustment of T5.

Repeat preliminary adjustments to correct the setting of the oscillator trimmer T5, which will be slightly affected by the adjustment of T8.

LW Band.—Inject a 300 kc signal and tune receiver to 1,000 metres.

Disconnect oscillator section of gang condenser VC3 as before.

Connect external variable condenser as described above and adjust to give a maximum reading.

Tune receiver to give maximum output.

Disconnect external variable condenser and reconnect VC3.

Adjust LW oscillator trimmer T9 for maximum output.

Adjust service oscillator to 165 kc, and tune receiver to 1,818 metres.

Disconnect oscillator section of gang condenser VC3 as before. Connect external variable condenser and adjust to give a maximum output.

Adjust receiver tuning control to give a maximum reading and then disconnect external variable condenser and reconnect VC3.

Adjust LW oscillator trimmer T10 for maximum output.

Repeat first adjustments above to correct the setting of T9, which will be slightly affected by the adjustment of T10.

Whistle Suppressor.

This adjustment should not be made unless there is a heterodyne whistle at about 1,200 m, when an aerial is connected.

Inject a signal of 250 kc and tune receiver to heterodyne whistle at approx. 1,200 m.

Adjust suppressor trimmer T11 for minimum volume of heterodyne whistle.

V1 Neutralising Adjustment.

The original setting of T12 neutralising condenser is for an absolute minimum capacity. If this is increased, weak signals between 200 and 300 metres will result.

V4 Sensitivity Adjustment.

Connect aerial and earth to their respective sockets on the receiver.

Tune to 300 metres approx.

Increase the capacity of IF feed back trimmer T13 until when, rotating tuning condenser, stations are received with a swish on the sidebands. The capacity should then be reduced until this effect just disappears. The intermediate amplifier is then in its most sensitive condition.

Note.—It is essential to carry out the above adjustment with an HT voltage slightly in excess of 141 volts in order to maintain stability under working conditions.

PYE QU3

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C25, C27, giving four positions for the tone control.

A permament heterodyne filter circuit is provided by L16 and C26 across the primary L17 of output transformer.

The HT supply and heater circuits follow conventional lines, the heater current being controlled by a barretter thus eliminating mains voltage adjustments. The HT circuit incorporates a half-wave rectifier valve V6, the output of which is smoothed by L20, C30 and C31. The mains are HF filtered by L21, L22, C32 and C35, and fuses are included in each mains lead.

GANGING

IF Circuits.—Inject a 465 kc signal between the control grid of V1 and the chassis, via a .002 mfd condenser.

The lead to the control grid should be removed from the valve and a .5 megohm resistance connected between the valve terminal and the chassis. Then to stop the valve oscillating a condenser of .25 mfd should be connected between the oscillator anode and chassis.

Adjust T1, T2, T3 and T4 in that order for maximum reading on output meter.

SW Band.—Switch to SW. Connect service oscillator to A and E sockets. Inject and tune in a signal of 15 megacycles and adjust T5 for maximum output.

MW Band.—Switch to MW. Inject and tune in a signal of 210 metres and adjust T6 and T7 for maximum output.

Inject and tune in a signal of 520 metres and adjust T8, after which the trimming at 210 metres should be rechecked.

LW Band.—Inject and tune in a signal of 1,800 metres and adjust T9 for maximum output.

IF Filter.—The circuit L1 and C2 may be adjusted to give minimum output from an IF signal injected into the aerial circuit.