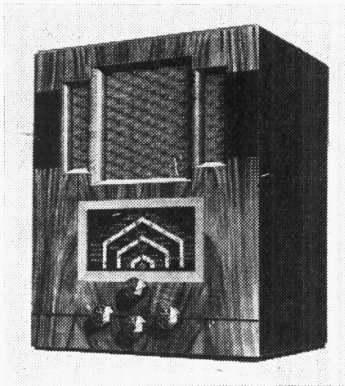


TRADER SERVICE SHEET

# 303

# PYE QAC38

## 3-BAND AC SUPERHET



PROVISION is made for using both a gramophone pick-up and an extension speaker in the Pye QAC38 4-valve (plus rectifier) AC 3-band superhet. It has a short-wave range of 16.5-52.6 m.

The standard model is designed for mains of 200-250 V, 40-100 C/S, but special models are also available for 100-150 and 200-250 V, 40-100 C/S (one model), and 200-250 V, 25-39 C/S. This Service Sheet was prepared on one of the first models.

### CIRCUIT DESCRIPTION

Aerial input via coupling coils L2 (MW and LW) and L1 (SW) to single-tuned circuits comprising L3 (SW), plus L4 (MW), plus L5 (LW), tuned by C24, which precede triode hexode valve (V1, Ever Ready metallised A36B or Mullard TH4A) operating as frequency changer with internal coupling. Oscillator grid coils L6 (SW), L7 (MW) and L8 (LW) are tuned by C25; parallel trimming by C26 (MW) and C6 (LW);

valve (V3, Ever Ready metallised A23A or Mullard TDD4). Audio frequency component in rectified output is developed across load resistance R10 and passed via AF coupling condenser C12 and manual volume control R9 to CG of triode section, which operates as AF amplifier. IF filtering by C13, C14, R8 and C17. Provision for connection of gramophone pick-up across R9.

Second diode of V3, fed from V2 anode via C11, provides DC potential which is developed across load resistance R14 and fed back through decoupling circuits as GB to FC and IF valves, giving automatic volume control.

Resistance-capacity coupling by R12, C16, R15, via stopper R17, between V3 triode and pentode output valve (V4, Ever Ready A70D or Mullard PenA4). Fixed tone correction by C19, and three-position tone control by C18, R16, S7, S8, in anode circuit. A measure of negative feed-back is introduced by the omission of cathode by-pass condenser across R18. Provision for connection of low impedance external speaker across secondary of output transformer T1 by means of the socketed plugs used for connection of internal speaker speech coil; these latter may be withdrawn if it is desired to mute the internal speaker.

HT current is supplied by full-wave rectifying valve (V5, Ever Ready S11D or Mullard DW4/350). Smoothing by transformer field L17 and dry electrolytic condensers C20, C21.

### DISMANTLING THE SET

A detachable bottom is fitted to the cabinet and upon removal (four round-head wood screws) gives access to most of the components beneath the chassis.

**Removing Chassis.**—Remove the four knobs (pull off), taking care not to lose the springs, and the four bolts (with washers) holding the chassis to the bottom of the cabinet. The chassis may now be withdrawn to the extent of the speaker leads, which should be sufficient for normal purposes.

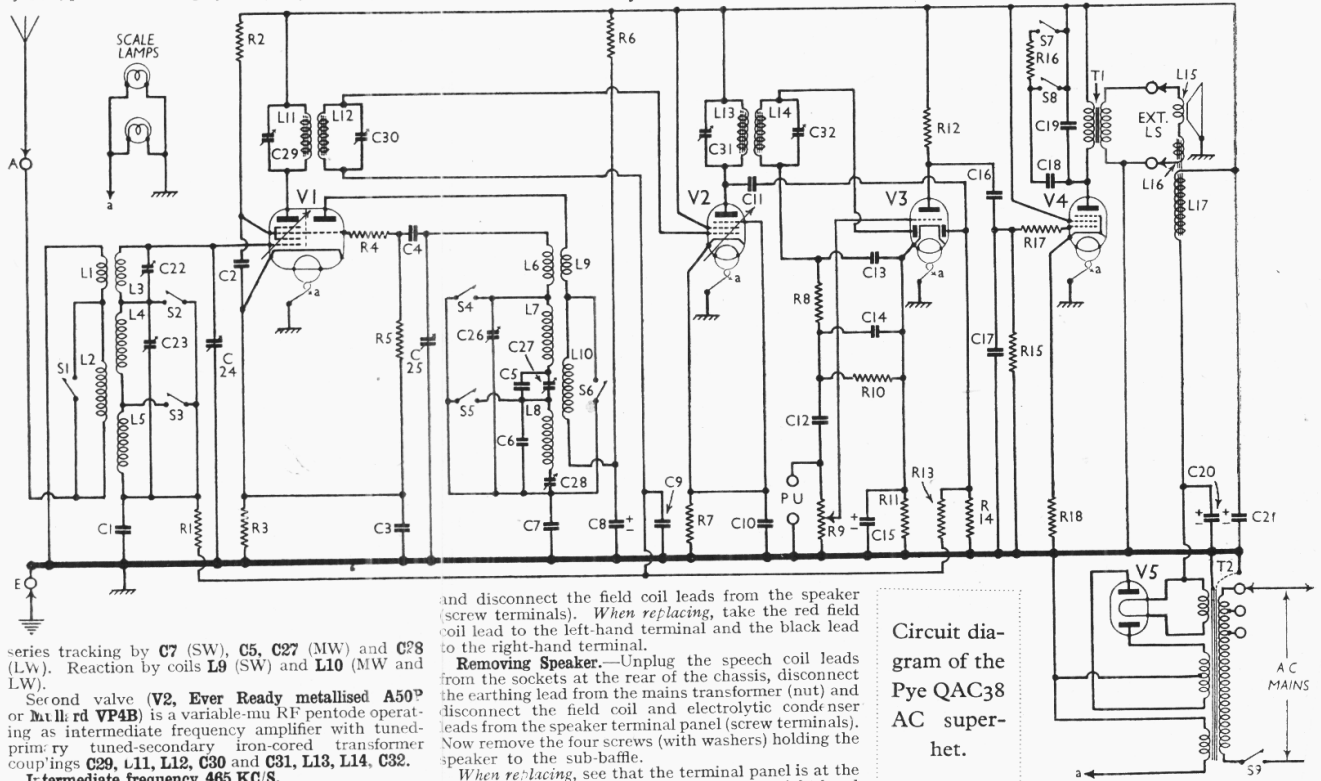
To free the chassis entirely, free the speaker leads from the cleats, unplug the speaker speech coil leads from the sockets at the back of the chassis, disconnect the earthing lead from the mains transformer (nut),

screw and the black electrolytic condenser lead on the bottom left-hand screw, and take the red field coil lead and yellow electrolytic lead to the left-hand terminal on the panel, and the black field coil lead and red electrolytic lead to the right-hand terminal.

### COMPONENTS AND VALUES

CONDENSERS		Values (μF)
C1	V1 hexode CG decoupling	0.05
C2	V1 SG decoupling	0.1
C3	V1 cathode by-pass	0.1
C4	V1 osc. CG condenser	0.0001
C5	Osc. circuit MW fixed tracker	0.00055
C6	Osc. circuit LW trimmer	0.00001
C7	Osc. circuit SW tracker	0.005
C8*	V1 osc. anode decoupling	2.0
C9	V2 CG decoupling	0.05
C10	V2 cathode by-pass	0.1
C11	Coupling to V4 AVC diode	0.0001
C12	AF coupling to V3 triode	0.01
C13	IF by-pass condensers	0.00005
C14		0.00005
C15*	V3 cathode by-pass	20.0
C16	V3 triode to V4 AF coupling	0.01
C17	IF by-pass	0.0005
C18	Part of tone control circuit	0.01
C19	Fixed tone corrector	0.001
C20*	HT smoothing	8.0
C21*		16.0
C22†	Aerial circuit SW trimmer	—
C23†	Aerial circuit MW trimmer	—
C24†	Aerial circuit tuning	—
C25†	Oscillator circuit tuning	—
C26†	Osc. circuit MW trimmer	—
C27†	Osc. circuit MW tracker	—
C28†	Osc. circuit LW tracker	—
C29†	1st IF trans. pri. tuning	—
C30†	1st IF trans. sec. tuning	—
C31†	2nd IF trans. pri. tuning	—
C32†	2nd IF trans. sec. tuning	—

\* Electrolytic. † Variable. ‡ Pre-set.



series tracking by C7 (SW), C5, C27 (MW) and C28 (LW). Reaction by coils L9 (SW) and L10 (MW and LW).

Second valve (V2, Ever Ready metallised A50P or Mullard VP4B) is a variable- $\mu$  RF pentode operating as intermediate frequency amplifier with tuned-primary tuned-secondary iron-cored transformer couplings C29, L11, L12, C30 and C31, L13, L14, C32. Intermediate frequency 485 KC/S.

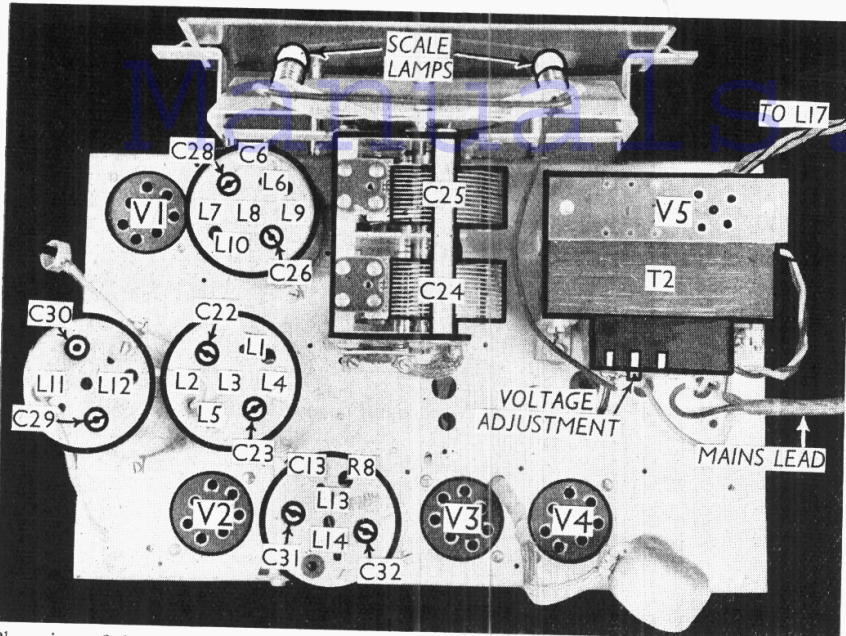
Diode second detector is part of double diode triode

and disconnect the field coil leads from the speaker (screw terminals). When replacing, take the red field coil lead to the left-hand terminal and the black lead to the right-hand terminal.

**Removing Speaker.**—Unplug the speaker coil leads from the sockets at the rear of the chassis, disconnect the earthing lead from the mains transformer (nut) and disconnect the field coil and electrolytic condenser leads from the speaker terminal panel (screw terminals). Now remove the four screws (with washers) holding the speaker to the sub-baffle.

When replacing, see that the terminal panel is at the bottom, replace the cleat on the bottom right-hand

Circuit diagram of the Pye QAC38 AC superhet.



Plan view of the chassis. All the coils are in the four units shown, and each unit contains two trimmers.

RESISTANCES		Values (ohms)
R1	V1 hexode CG decoupling	110,000
R2	V1 SG HT feed	80,000
R3	V1 fixed GB resistance	200
R4	V1 osc. grid circuit stabiliser	50
R5	V1 osc. CG resistance	15,000
R6	V1 osc. anode HT feed	80,000
R7	V1 fixed GB resistance	400
R8	IF stopper	110,000
R9	Manual volume control	1,000,000
R10	V3 signal diode load	510,000
R11	V3 GB and AVC delay	1,000
R12	V3 triode anode load	110,000
R13	AVC line decoupling	1,100,000
R14	V3 AVC diode load	1,100,000
R15	V4 CG resistance	260,000
R16	Part of tone control circuit	15,000
R17	V4 grid stopper	25,000
R18	V4 GB resistance	200

Voltagcs were measured on the 400 V scale of a model 7 Universal Avometer, chassis being negative.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 A56B	228	1.1	45	2.2
	30	2.4	—	3.2
V2 A50P	228	8.8	228	—
V3 A23A	62	1.6	—	—
V4 A70D	203	29.0	228	4.7
V5 S17D	318†	—	—	—

† Each anode, AC.

GENERAL NOTES

Switches.—S1-S6 are the waveband switches, in a single unit beneath the chassis. All the switches are indicated in our under-chassis view. The table (col. 3) gives the switch positions for the three control settings,

OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial SW coupling coil	0.5
L2	Aerial MW and LW coupling	145.0
L3	Aerial SW tuning coil	Very low
L4	Aerial MW tuning coil	2.8
L5	Aerial LW tuning coil	12.5
L6	Osc. circuit SW tuning coil	Very low
L7	Osc. circuit MW tuning coil	1.6
L8	Osc. circuit LW tuning coil	4.5
L9	Oscillator SW reaction coil	34.5
L10	Oscillator MW and LW reaction	7.5
L11	1st IF trans.	Pri... 5.0
L12		Sec... 5.0
L13	2nd IF trans.	Pri... 5.0
L14		Sec... 5.0
L15	Speaker speech coil	1.7
L16	Hum neutralising coil	0.15
L17	Speaker field coil	2,000.0
T1	Output trans.	Pri... 700.0
		Sec... 0.3
	Mains trans.	Pri, total 24.0
		Heater sec. 0.05
		Rect. heat. sec. 0.1
		HT sec., total 600.0
S1-S6	Waveband switches	—
S7, S8	Tone control switches	—
S9	Mains switch, ganged R9	—

VALVE ANALYSIS

Valve voltages and currents given in the table (col. 2) are those measured in our receiver when it was operating on mains of 227 V, using the 216-235 V tapping on the mains transformer. The receiver was tuned to the lowest wavelength on the medium band, and the volume control was at maximum, but there was no signal input.

starting from fully anti-clockwise. A dash indicates open, and C closed.

Switch	SW	MW	LW
S1	C	—	—
S2	C	—	—
S3	C	C	—
S4	C	—	—
S5	C	C	—
S6	C	—	—

S7, S8 are the tone control switches, in a rotary unit at the front of the chassis. These are also indicated in the under-chassis view, and it will be noted that four of the tags on the unit are blank. In the fully anti-clockwise position of the unit, S8 is closed; in the central position, S7 is closed, and in the clockwise position, both switches are open.

S9 is the QMB mains switch, ganged with the volume control, R9.

Coils.—L1-L5, L6-L10 and the IF transformers L11, L12 and L13, L14 are in four screened units on the chassis deck. Each unit also contains two trimmers, and two of them include additional components

Scale Lamps.—The two scale lamps are Ever Ready MES types, rated at 6.2 V, 0.3 A.

External Speaker.—Two sockets are provided at the rear of the chassis, which take the plugs on the leads from the internal speaker speech coil. These plugs are socketed for the connection of a low impedance (2-4 Ω) external speaker, if desired.

Condensers C20, C21.—These are mounted inside the cabinet, to the left of the speaker unit. They are two dry electrolytics in a single carton, with a common negative (black) lead. The yellow lead is the positive of C20 (8μF) and the red the positive of C21 (16 μF).

CIRCUIT ALIGNMENT

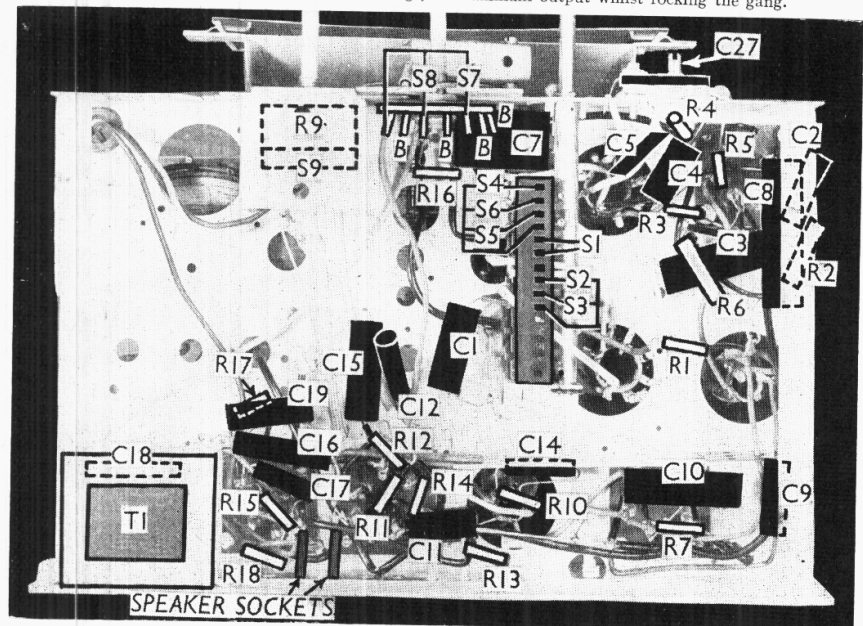
When the gang is fully in mesh the cursor should be on the setting mark at the top end of the MW scale (beyond the 50 m mark).

IF Stages.—Feed in a 465 KC/S signal to control grid (top cap) of V1 via a 0.002 μF condenser and chassis, first removing the existing lead to the control grid, and connecting a 0.5 MO resistance between control grid and chassis. Also connect a 0.25 μF condenser between oscillator anode of V1 and chassis. Adjust C22, C31, C30 and C29 in that order for maximum output. Remove the swamp condenser and the 0.5 MO resistance, and replace top cap connection of V1.

RF and Oscillator Stages.—Switch set to SW, tune to 15 MC/S on scale, feed a 15 MC/S (20 m) signal into A and E sockets, and adjust C22 for maximum output.

Switch set to MW, tune to 210 m on scale, feed in a 210 m (1,428 KC/S) signal via a dummy aerial, and adjust C26, then C23, for maximum output. Tune to 520 m on scale, feed in a 520 m (577 KC/S) signal, and adjust C27 (front of chassis) for maximum output, whilst rocking the gang for optimum results. Re-check at 210 m.

Switch set to LW, tune to 1,800 m on scale and feed in an 1,800 m (166.5 KC/S) signal. Adjust C28 for maximum output whilst rocking the gang.



Under-chassis view. Note the wavechange and tone control switches.