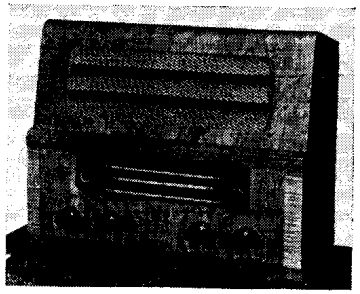
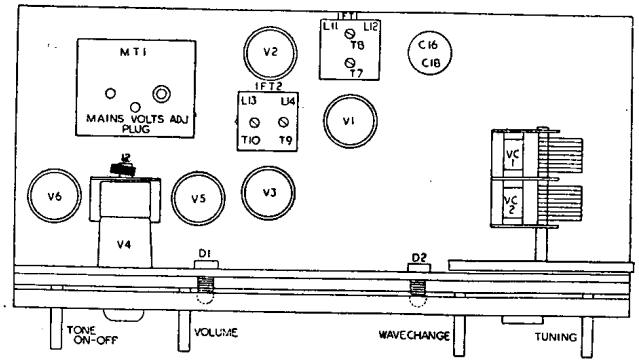
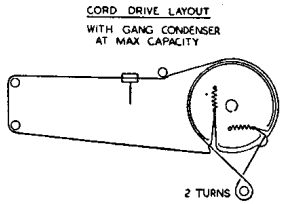
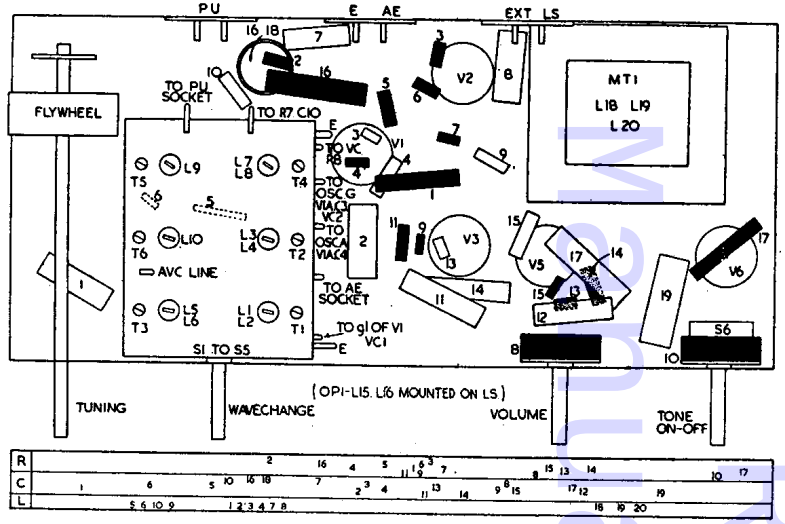
ETRONIC ETA632

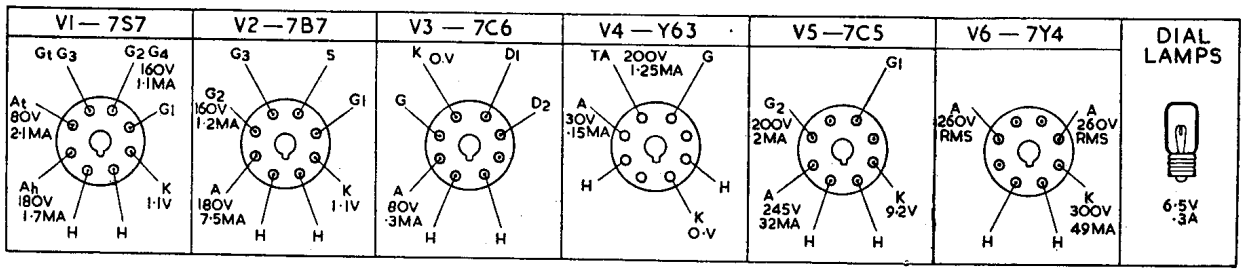


Six-valve, three-waveband superhet with magic-eye tuning indicator and sockets for high-resistance pickup and low-impedance extension speaker. Capacity plate aerial. Figured walnut table cabinet. For 200-250V, 40-100c/s mains. Made by Hale Electric Co., Ltd., Talbot Road, West Ealing, London, W.13.









INDUCTORS

L	*Ohms*
1, 2, 8, 19	Very low
3	23
4	2.6
5	92
6	17.5
7	.7
9	3.5
10	8.5
11-14	5
15	350
16, 17	.5 connected in parallel
18	400
20	36 Total

RESISTORS

R	*Ohms*	*Watts*
1	22K	1
2	150K	½
3	150	½
4	82K	½
5	47K	½
6	2.2M	½
7	56K	½
8	500K	Potentiometer
9	10M	½
10	500K	Potr. with DPST switch
11	220K	½
12	1M	½
13	470K	½
14	330	½
15	56K	½
16	4.7K	2
17	1K	WW5

CAPACITORS

C	*Capacity*	*Type*
1	.01	Tubular 350V
2	.1	Tubular 350V
3	50pF	Ceramic
4	.002	Tubular 500V
5	572pF	Silver Mica
6	33pF	Ceramic
7	.05	Tubular 350V
8	.1	Tubular 350V
9	100pF	Ceramic
10	100pF	Ceramic
11	.01	Tubular 350V
12	.01	Tubular 350V
13	.004	Ceramic
14	.01	Tubular 350V
15	.002	Tubular 1,000V
16	16	Electrolytic 350V
17	25	Electrolytic 25V
18	16	Electrolytic 350V
19	16	Electrolytic 350V

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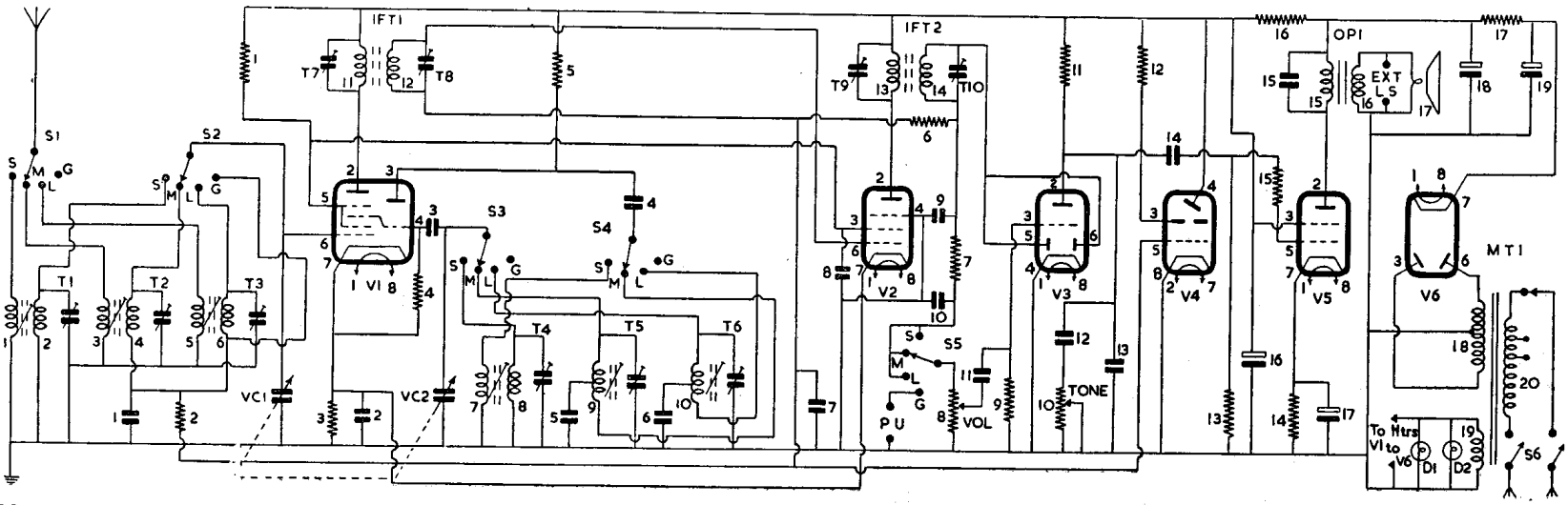


HAWKINS 'TECAL'

Continued

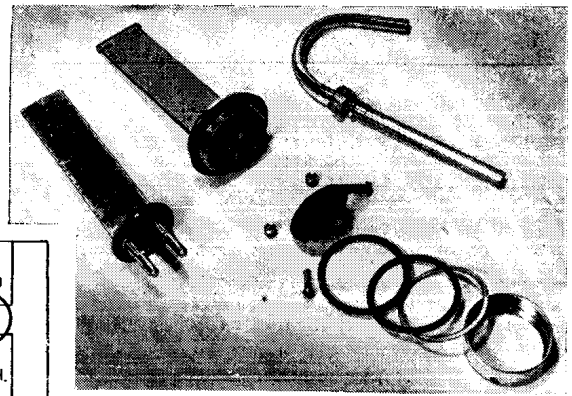
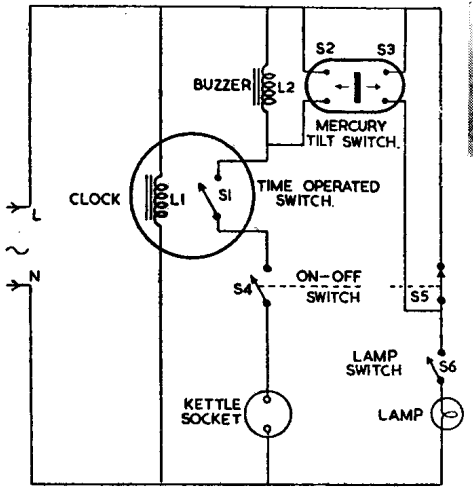


Fig. 6 (Right)—Heater element withdrawn from immersion tube, together with packing washers, clamping ring and also the siphon tube. Fig. 7 (below)—Theoretical diagram of wiring



and should be adjusted to indicate the correct time Also, if pushbar switch on lamp socket is ON, then lamp should light.

To test tea making, fill kettle with cold water to within half-an-inch of top. Replace lid and place wire clip in position on top of knob. Place kettle on platform and slide it forward on tray until plug is fully in socket.

Set alarm indicator to required time and place alarm switch in ON position.

When filled kettle is placed in position its weight causes the platform to tilt. The tilt switch is operated and contacts S2 are closed and S3 opened (see Fig. 7). Thus buzzer L2 is short-circuited and lamp is extinguished—S5 being opened and S4 closed when alarm switch is placed in the ON position.

When the clock indicates a time approximately 10 minutes in advance of the alarm setting, S1 is closed, and power is switched on to the kettle and the water commences to heat up. When the water is heated, steam is generated. This can escape only through the small vent in knob of lid—thus when steam is generated faster than it can escape pressure is built up. When the pressure reaches approximately 2 lb. per square inch the water is forced up siphon tube and out into teapot. When water level in kettle falls to just below bottom of siphon tube then steam pressure is released and siphon action ceases.

The weight of the displaced water is sufficient to cause platform to tilt back into its original position. The tilt switch is operated, thus opening S2 which (*a*) places buzzer L2 in series with kettle heater circuit, and so produces an audible alarm, and (*b*) closes S3, which completes circuit to lamp on top of clock housing.

When buzzer L2 is switched in circuit the current through the heater is reduced to a few milliamps, so preventing element from over-heating.

To silence the alarm the switch on front panel is placed in the OFF position. This opens S4 to break the alarm and heater circuit and closes S5. With S3 closed the operation of alarm switch merely shunts S5 across it.

MAINTENANCE

The only items likely to require attention are the clock and kettle.

Clock. Intermittent stopping of clock may be caused by dirt. Dirt should be removed by blowing, use of a feather or application of a solvent. A suitable light oil should then be applied to gears. Failure of gears or switch cam through wear or if field coil becomes open circuit will necessitate the clock being returned to the makers for servicing.

To remove clock. Undo the four hexagonal domed nuts on front of main housing and carefully ease off back panel (Fig. 2). Remove screw just above alarm ON/OFF switch. Undo and remove the two slotted nuts securing clock to the two horizontal brackets at rear of housing and carefully withdraw clock with top section of front panel (Fig. 3).

Remove lower section of front panel. Unsolder mains leads (black) from clock field coil tags and earth (green) lead from clock frame, and also the two leads (yellow, brown) to contact switch mounted on front end plate.

With clock, front and rear panels removed, the mercury tilt switch with its operating arm, and buzzer are accessible.

Kettle. To renew element, unscrew and remove the clamping ring of immersion tube. Remove packing washers and withdraw tube through hole in top of kettle. Undo the two screws on opposite sides of paxolin plate on end of tube and then gently pull out the element with plug panel attached (Fig. 6).

Unscrew plug pins and remove connecting strips of heater element from slots in screws. Renew heater element and reassemble in reverse order. Finally, test kettle for water leakage around immersion tube seal.

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AERIAL signal is switched by S1 to aerial coupling coils L1 (SW), L3 (MW), L5 (LW). A capacity type aerial formed by a sheet of metal foil fixed to inside of rear panel is provided for reception of local stations. The aerial is fitted with a wander plug and this requires to be inserted in the aerial socket at rear of chassis.

Grid coils L2 (SW), L4 (MW), L6 (LW), trimmed by T1, T2, T3 respectively, are switched by S2 to aerial tuning capacitor VC1 and to grid of triode-hexode frequency-changer V1. Cathode bias by C2, R3 is common to V1 and V2. AVC decoupled by R2, C1 is fed through tuned coils L4 (MW), L6 (LW) to g1 of V1. Screen (g2 g4) voltage is obtained from R1 and decoupled by C8. Primary L11, T7 of IFT1 is in the hexode-anode circuit.

Oscillator is connected in a tuned-grid shunt fed circuit. Grid coils L8 (SW), L9 (MW), L10 (LW), trimmed by T4, T5, T6 respectively and padded by C5 (MW), C6 (LW), are switched by S3 to oscillator tuning capacitor VC2 and coupled by C3 to oscillator grid (gt) of V1. Bias for grid is developed on C3 with R4 as leak resistor. Reaction voltages are obtained inductively from L7 (SW), L9 (MW), L10 (LW) and switched by S4 through C4 to oscillator anode of V1 of which R5 is the load resistor.

IF amplifier operates at 465 kc/s. Secondary L12, T8 of IFT1 feeds signal and AVC voltages, decoupled by R6, C7, to g1 of IF amplifier V2. Cathode bias is obtained from R3 and decoupled by C2. Screen (g2) voltage is obtained from R1 and decoupled by C8. Suppressor grid (g3) is connected down to earth. Primary L13, T9 of IFT2 is in the anode circuit.

Signal rectifier.—Secondary L14, T10, of IFT2 feeds signal to the strapped diodes of V3. R8, the volume control, is the diode load and R7, C9, C10 form an RF filter.

Pickup sockets are fitted for connection of a high-resistance pickup. When wavechange switch is in gram. position, volume control R8 is switched through to PU socket, and at the same time the aerial and oscillator coils are switched out of circuit to prevent breakthrough.

AVC.—The DC component of the rectified signal is fed by R6 to g1 of V2, and by R2 to g1 of V1. Decoupling is by C7, C1.

Tuning indicator.—The AVC signal is also fed by R6 to grid of magic-eye tuning indicator V4. Its cathode is connected down to earth and HT for anode is obtained through R12 whilst target anode voltage is obtained from HT line direct.

AF amplifier C11 feeds rectified signal appearing across volume control R8 to grid of triode section of V3. Bias is developed on C11, with R9 as leak. R11 is anode load and C13 anode RF bypass.

Tone control R10, C12 connected between V3 anode and chassis give a variable top cut tone control.

Output stage C14 feeds signal through stopper R15 to g1 of beam-tetrode output valve V5. R13 is grid resistor and bias is provided by R14, C17. Screen voltage is obtained from R16, C16.

Primary L15 of output matching transformer OP1 is in the anode circuit, the HT for which is obtained from junction of R16, R17. C15 gives a fixed degree of tone correction. Secondary L16 of OP1 feeds signal to an 8 in. PM speaker L17. Sockets are fitted on L16 for connection of a low-impedance extension speaker.

HT is provided by an indirectly heated full-wave rectifier V6 with anode voltages obtained from secondary L18 of mains input transformer MT1. Resistance capacity smoothing is given by R17, C18, C19. Further smoothing for HT to V1 to V4 and g2 of V5 is provided by R16, C16. Reservoir capacitor C19 should be rated to handle 85 mA of ripple current.

Heaters of V1 to V6 and dial lamps are connected in parallel and obtain their current from L19 of MT1. Primary L20 of mains input transformer is tapped for 200-215, 216-235, 236-250V, 40-100 c/s. S6, ganged to tone control, is on-off switch.

Chassis removal.—Remove the four control knobs—unplug plate aerial from aerial socket and remove rear panel. Undo and remove the four chassis bolts on underside of cabinet. Chassis can now be withdrawn as far as LS leads will permit.

TRIMMING INSTRUCTIONS

Apply signal as stated below	Tune receiver to	Trim in order stated for maximum output
(1) 465 kc/s to g1 of V1, via .01mF	—	T10, T9, T8, T7
(2) 18.75 mc/s to AE socket via dummy aerial	16 metres	T4, T1
(3) 6 mc/s, as above ...	50 metres	Core L8, L2
(4) 1.5 mc/s, as above...	200 metres	T5, T2
(5) 545 kc/s, as above ...	550 metres	Core L9, L4
(6) 857 kc/s, as above ...	350 metres	Check calibration at this point
(7) 375 kc/s, as above ...	800 metres...	T6, T3
(8) 150 kc/s, as above ...	2,000 metres	Core L10, L6
(9) 240 kc/s, as above ...	1,250 metres	Check calibration at this point

PHILIPS 573A, 463A, 383A and 663A

COMPLAINTS of non-linear line scan in these models have in several cases been due to the bias decoupling condenser (25mF, C119) being open circuit.

Another common fault is that the line hold control holds at one end of control only, also there is a bright line on left of tube face. This has been found due to R87 82,000 Ω feedback resistor being open circuit.—M.J.

AC-DC CROSLEY

AN AC-DC Crosley superhet gave no results, and naturally the first test was for continuity across the mains lead.

There was no continuity. As each valve heater was intact, the dropper resistor, pilot lamps, mains ON/OFF switch, and the lead itself were checked for continuity.

These were all found without fault, so next the heater wiring was checked for a break. Here again, no cause of the receiver failing to light up was found, till finally it was observed that the 6SL7 and the 6K7 valves were transposed in their sockets.

Usually this would not affect heater circuit continuity, but the 6SL7 is almost unique in having its heater connected to pins 7 and 8 instead of the more conventional 2 and 7.—G.R.W.