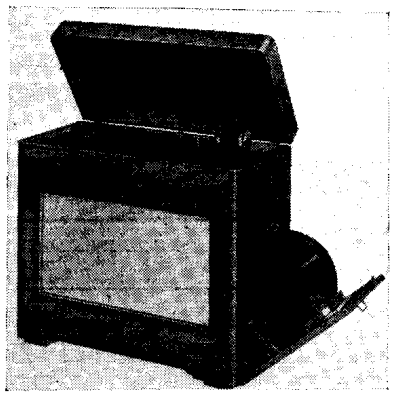
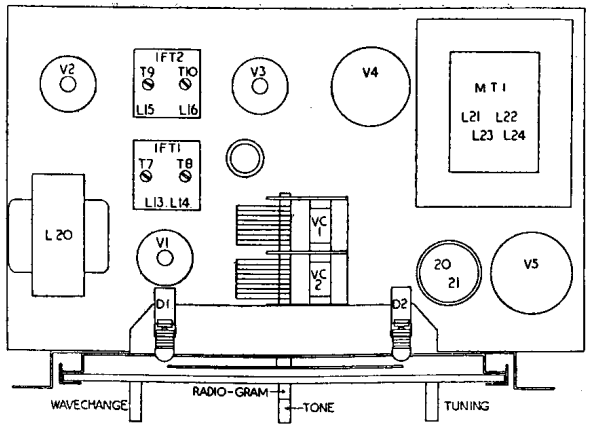
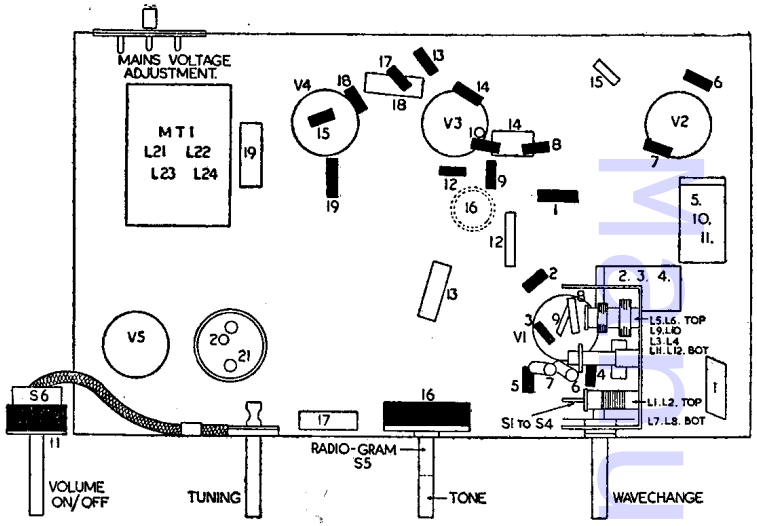
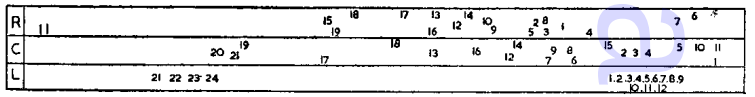
PORTOGRAM RG523, 531/A

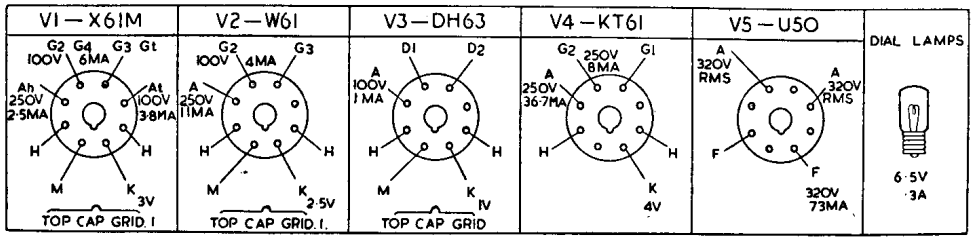




Five-valve, three-waveband superhet radiogram fitted with automatic record changer and lightweight pickup. Walnut veneered console cabinet. Models for 100-120, 200-220, 230-250*V 50c/s AC mains. Manufactured by Portogram Radio Electrical Industries Ltd., Preil Works, St. Rule Street, S.W.8.*







RESISTORS

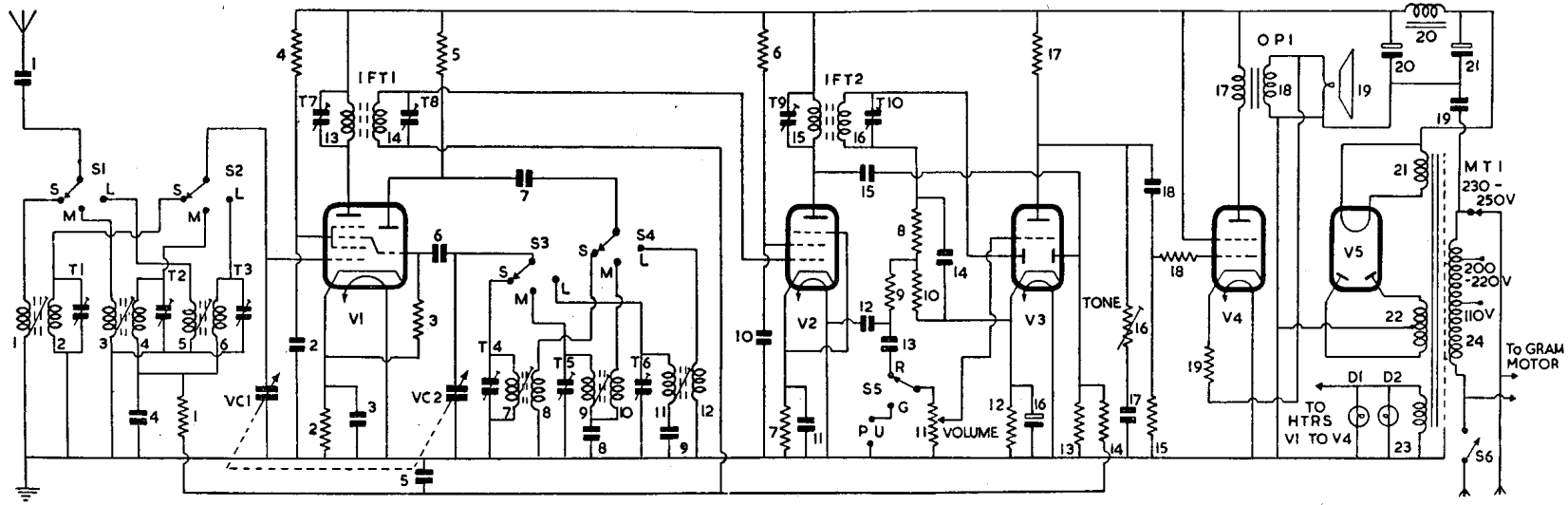
R		Ohms	Watts
1	...	220K	¼
2	...	220	¼
3	...	47K	¼
4	...	30K	¼
5	...	30K	¼
6	...	30K	¼
7	...	220	¼
8	...	220K	¼
9	...	47K	¼
10	...	100K	¼
11	...	500K Potr. with switch	½
12	...	2K	¼
13	...	1M	¼
14	...	1M	¼
15	...	220K	¼
16	...	50K Potr.	
17	...	220K	¼
18	...	12K	¼
19	...	100	½

CAPACITORS

C		Capacity	Type
1	...	500pF	Silver Mica
2	...	.05	Tubular 500V
3	...	.05	Tubular 500V
4	...	.05	Tubular 500V
5	...	.05	Tubular 500V
6	...	100pF	Tubular Ceramic
7	...	100pF	Tubular Ceramic
8	...	500pF	Silver Mica
9	...	150pF	Silver Mica
10	...	.05	Tubular 500V
11	...	.05	Tubular 500V
12	...	500pF	Mica
13	...	.02	Tubular 500V
14	...	100pF	Silver Mica
15	...	100pF	Tubular Ceramic
16	...	50	Electrolytic 12V
17	...	.02	Tubular 500V
18	...	.02	Tubular 500V
19	...	.01	Tubular 500V
20	...	16Electroylic	500 V
21	...	16	Electrolytic 500V

INDUCTORS

L		Ohms
1	...	very low
2	...	very low
3	...	35
4	...	3.5
5	...	60
6	...	35
7	...	very low
8	...	very low
9	...	2.5
10	...	1
11	...	12.5
12	...	5.5
13	...	4.5
14	...	4.5
15	...	4.5
16	...	4.5
17	...	450
18	...	very low
19	...	2.5
20	...	700
21	...	very low
22	...	450
23	...	very low
24	...	26 total



PORTOGRAM RG523—*Contd.*

AERIAL is fed through C1 to S1 and thence switched to aerial coupling coils L1 (SW), L3 (MW), L5 (LW). The grid coils L2 (SW), L4 (MW), L6 (LW) which are trimmed by T1, T2, T3 respectively, are switched by S2 to tuning capacitor VC1 and to triode-hexode frequency-changer V1. AVC voltages decoupled by R1, C4 are applied to V1 on MW and LW ranges through the tuned coils L4, L6. Cathode bias is provided by R2 decoupled by C3. Screen voltage is obtained from R4 decoupled by C2. Primary L13, T7 of IFT1 is in the hexode anode circuit.

Oscillator is connected in a tuned-grid shunt-fed circuit. The grid coils L7 (SW), L9 (MW), L11 (LW), which are trimmed by T4, T5, T6 respectively, and padded by C8 (MW), C9 (LW), are switched by S3 to oscillator tuning capacitor VC2 and coupled by C6 to oscillator grid of V1. Automatic bias is developed on C6 with R3 as leak. Anode reaction voltages are developed inductively on L8 (SW), L10 (MW), L12 (LW) and are switched by S4 through C7 to oscillator anode of V1, of which R5 is the series load.

IF amplifier operates at 465kc/s. Secondary L14, T8 of IFT1 feeds signal and AVC voltages decoupled by R14 C5, to V2. Cathode bias is provided by R7 decoupled by C11 and screen voltage by R6 decoupled by C10. Primary L15, T9 of IFT2 is in the anode circuit.

Signal rectifier. Secondary L16, T10 of IFT2 feeds signal to one diode of V3. R8, R10 form a tapped diode load and C14 is a filter capacitor.

AVC. C15 feeds signal at anode of V2 to second diode of V3. R13 is the load and R14, C5, R1, C4 give decoupling. Cathode voltage across R12 provides AVC line delay voltage.

AF amplifier. Demodulated signal is fed through IF filter R9, C12 and coupled by C13 to S5 which in its radio position switches signal to volume control R11 and thence to grid of triode section of V3. Cathode bias is provided by R12 decoupled by C16. R17 is the anode load.

Tone control. Variable top cut is given by R16, C17 between anode of V3 and chassis.

Output Stage. C18 feeds signal through grid stopper R18 to beam-tetrode output valve V4. R15 is grid resistor and cathode bias is developed across R19 which is returned to chassis through secondary L18 of output matching transformer OP1 thus introducing negative feedback.

Primary L17 of OP1 is in V4 anode circuit. Secondary L18 feeds signal to a 10in. PM speaker L19.

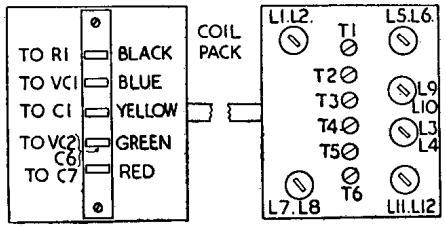
HT is provided by directly-heated fullwave rectifier V5. Secondary L21 of mains input transformer MT1 supplies V5 heater current and L22 provides anode voltages. Choke-capacity smoothing is given by L20, C20, C21. Ripple rating of C21 is approximately 100mA.

Heaters of V1 to V4 and dial lights are connected in parallel and obtain their current from secondary L23 one side of which is connected down to chassis. Primary L24 of MT1 is tapped for inputs of 100-120, 200-220, 230-250V 40-100c/s.

C19 is a mains filter capacitor. In later models of this receiver this capacitor is connected from bottom end of L24 to chassis. S6 which is ganged to volume control spindle, is the ON/OFF switch to receiver and also breaks the mains supply to auto-changer motor.

Auto-changer may be a Collaro model RC500 or an EMI type AC100. Both units have lightweight moving-iron pickups using push-in Silent Stylus miniature needles. The EMI pickup has a matching transformer which is fitted to underside of motor board.

Motors fitted to these auto-changers are provided with dual field coils which can be connected in parallel for 100-120V or in series for 200-250V supplies. Auto-changers fitted are normally suitable for 50c/s mains. Models for other frequencies can be supplied as required.



TRIMMING INSTRUCTIONS

Apply signal as stated below	Tune Receiver to	Trim in Order Stated for Max. Output
(1) 465 kc/s to g1 of V1 via .01 mF	SW band,	T10, T9, T8, T7.
(2) 600 kc/s to AE socket via dummy aerial	500 metres	Core L9-10, L3-4.
(3) 1.5 mc/s as above	200 metres	T5, T2, repeat (2) and (3).
(4) 150 kc/s as above	2000 metres	Core L11-12, L5-6
(5) 300 kc/s as above	1000 metres	T6, T3 repeat (4) and (5).
(6) 6 mc/s as above	50 metres	Core L7-8, L1-2.
(7) 15 mc/s as above	20 metres	T4, T1, repeat (6) and (7).

TESTING VISION GAIN

LOW gain in a vision amplifier may be a very difficult thing to remedy. The best thing is to rely on the signal generator and I have made myself a coupling tool which can be used with any set with open coils. It consists of a bit of co-axial fed from the 90-ohm output of the oscillator and ending in a two-turn loop.

To start with, I pull out all the RF or IF amplifiers except the last and then place the two-turn loop over or close to the grid coil of the last stage. With the HF input modulated at AF, dark horizontal bands should be seen on the tube and, by experience, one can assess the amount of gain being obtained. By inserting the other valves in turn and injecting a signal to their grids the point is found at which the gain does not step-up as it should, or where instability sets in.

By testing this way I have located a dry joint between grid coil and valve tag, a shorted bias circuit (which was causing excessive gain and consequent instability) and an OC screen decoupling capacitor.

I think it would be a good scheme for makers of signal generators to supply an output for working straight into impedances of the order found in TV anode and grid circuits. This would simplify injection tests.—W.K.

SWS COOKERS—*Cont. from opp. p.*

above plug housing to enable plates to be withdrawn easily and without placing unnecessary strain on their plug pins or sockets.

To withdraw hotplates, grasp handle so that fingers are curled under handle and thumb is pressed downwards on the hotplate surface near to edge (Fig. 2). Grasp opposite side of hotplate with the other hand and carefully lift plate upwards.

Renewal of fuses. Remove righthand side panel of cooker by undoing the two screws at rear. Positions of fuse-holders from left to right are: oven, 6¼in. hotplate, 8in. hotplate, grill-boiler.

Removal of oven elements. These are removed by grasping element sheath firmly and pulling in a forward direction. Each element has its position stamped on the end of sheath.

Renewal of oven element spirals. Undo screw passing through outer sheath and porcelain plug pin blocks and slide spiral supports out of sheath. Remove old spiral and clean out ducts. Divide new spiral into four equal sections (allowing sufficient at ends for connecting to plug-pins) and thread it through ducts in fireclay supports. Attach ends of element to the two outer plug pins and slide assembly back into sheath. Make sure ceramic end plate and packing strips are in position before finally replacing fixing screw.

Renewal of oven pilot lamp. Undo grub screw securing oven control knob to spindle and remove knob.

Pull off the red Bakelite cover and withdraw ampholder from slotted bracket. Renew the 4V .3A MES bulb.

Removal of thermostat. Remove the righthand side panel as previously described. Remove the four connecting wires to thermostat terminals. Remove control knob and red cover and withdraw lampholder from its bracket. Undo the large hexagonal nut clamping the thermostat assembly of front frame. Withdraw thermostat from rear to frame, being careful not to bend or kink the oil tube. When thermostat is clear of frame carefully withdraw oil tube from interior of oven and remove thermostat complete with oil tube from cooker.

Removal of oven door. Undo the two screws in each of the hinge plates (Fig. 4) and remove door. Door hinges are pivoted on brackets mounted behind front frame and are accessible on removal of lefthand side panel of cooker.

Removal of oven door catch. Remove righthand side panel of cooker. Undo the two screws securing small cover panel to side of oven unit. Undo and remove nut at rear of rectangular housing over catch spring assembly and carefully ease housing out of aperture (Fig. 7). Undo the two bolts securing bracket (with spring attached) and withdraw from side of oven. Renew or adjust the spring and re-assemble in reverse order. Before replacing cover plate pack displaced oven lagging around catch housing.

Access to wiring. Remove righthand side panel Raise up hob and undo the four bolts at top of rear panel. Remove the two screws at bottom of rear panel and remove panel.

Adjustment of hotplate. Plates are positioned on adjustable screws. The 6¼in. can be adjusted whilst in position from below if locking nuts on screws are first slackened off. To adjust 8in. plate and grill boiler it is necessary to remove them to have access to the screws. Screws should be adjusted so that hot-plates and grill-boiler top surfaces are $\frac{1}{16}$ in. above hob level.

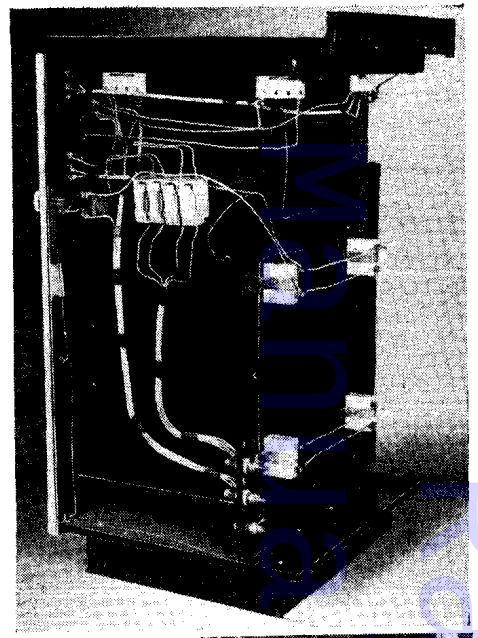


Fig. 6.—With side and rear panels removed the wiring is fully accessible and the general construction apparent

Fig. 7.—The oven door catch is to be found under a small cover at the side of the cooker

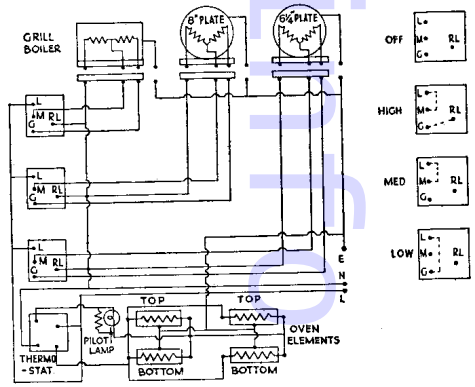


Fig. 8.—The wiring diagram with, on the right, diagrams which show the sequence of connections inside the three-hea[t] switches