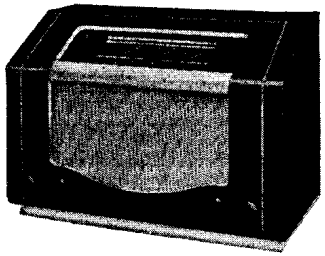
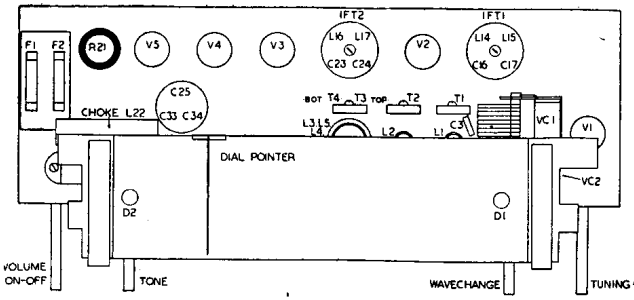
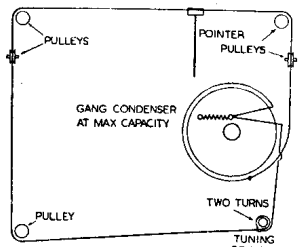
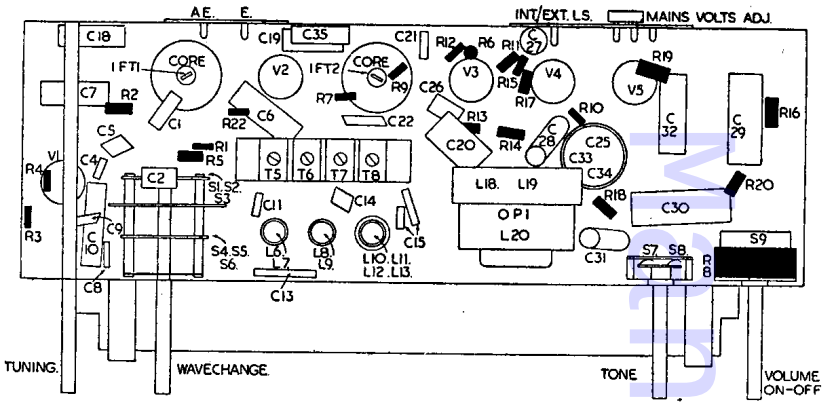
INVICTA 73

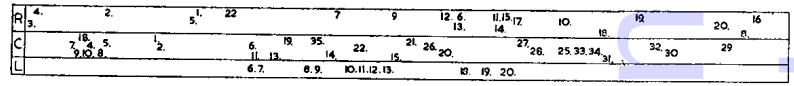


Five-valve, four waveband superhet for use with external aerial and earth. Sockets for low-impedance extension speaker. For 100-130 and 200-250V AC/DC mains. Mahogany-veneered table type cabinet. Manufactured by Invicta Radio, Limited, Parkhurst Road, London.









RESISTORS

R	Ohms	Watts
1	22K	¼
2	1M	¼
3	220	¼
4	22K	¼
5	10K	¼
6	220	¼
7	470K	¼
8	1M Potr. with Switch	
9	47K	¼
10	47K	¼
11	82K	¼
12	1K	¼
13	1M	¼
14	1M	¼
15	470K	¼
16	150	¼
17	82K	¼
18	4.7K	¼
19	150	¼
20	68	¼
21	1100 dropper tapped 150, 150, 850	
22	22K	¼

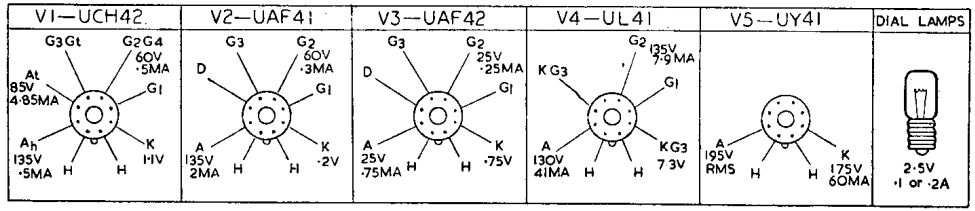
INDUCTORS

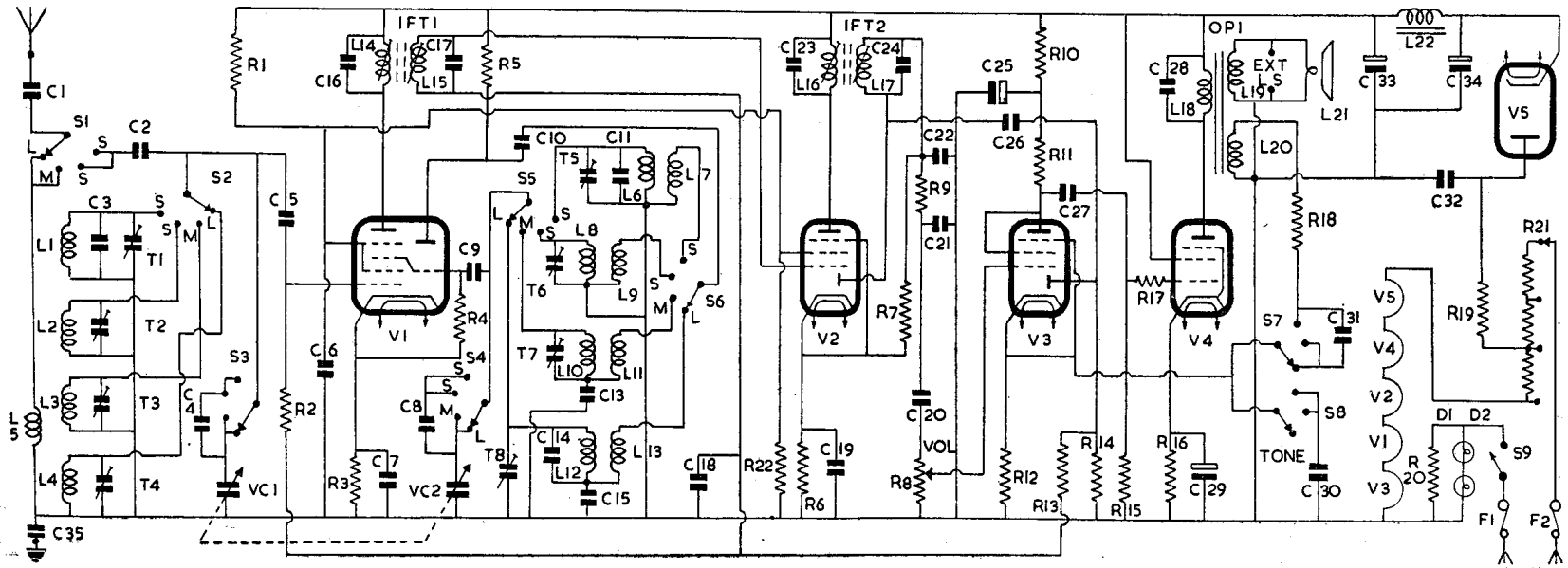
L	Ohms
1	very low
2	very low
3	5
4	13
5	70
6	very low
7	.5
8	very low
9	.6
10, 11	.5
12	3
13	2.25
14-17	10
18	200
19, 20	.5
21	2.5
22	650

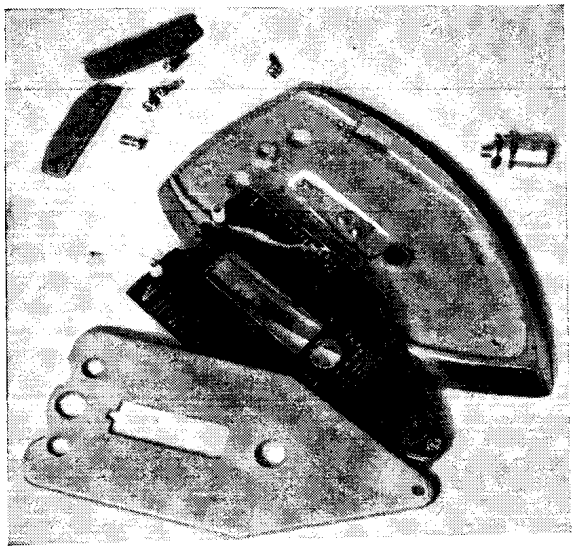
CAPACITORS

C	Capacity	Type
1	.005	Tubular 500V
2	10pF	Silver Mica
3	60pF	Silver Mica
4	140pF	Silver Mica
5	100pF	Silver Mica
6	.05	Tubular 500V
7	.05	Tubular 350V
8	140pF	Silver Mica
9	60pF	Silver Mica
10	.005	Tubular 500V
11	60pF	Silver Mica
12	Not fitted	
13	570pF	Silver Mica
14	140pF	Silver Mica
15	315pF	Silver Mica
16	100pF	Silver Mica
17	100pF	Silver Mica
18	.05	Tubular 500V
19	.05	Tubular 500V
20	500pF	Silver Mica
21	100pF	Silver Mica
22	100pF	Silver Mica
23	100pF	Silver Mica
24	100pF	Silver Mica
25	2	Electrolytic 350V
26	22pF	Silver Mica
27	.05	Tubular 350V
28	.01	Tubular 1000V
29	25	Electrolytic 25V
30	.1	Tubular 500V
31	.05	Tubular 500V
32	.02	Tubular 750V
33	32	Electrolytic 350V
34	32	Electrolytic 350V
35	.05	Tubular 500V

Circuit description, etc., see page 2







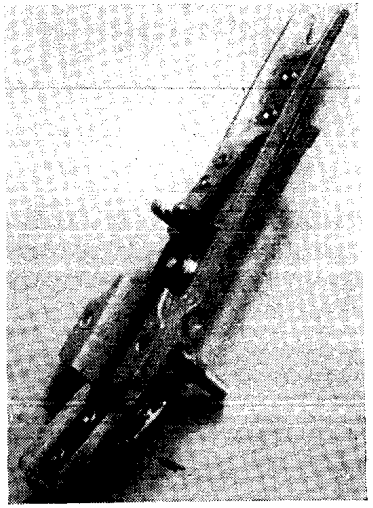


Fig. 5—Tape-wound 800W element is secured under cast clamp-plate. Bi-metal thermostat strip is fastened by two screws to centre of sole-plate

Fig. 6 (right)—Close-up of thermostat switch

terminals and remove the two screws securing switch assembly to name-plate at rear (Fig. 4).

Remove switch by withdrawing slot at front end from under shoulder on hexagonal pillar.

Remove the hexagonal pillar and name-plate securing screw and also screws holding the two side clamps and screw at toe of pressure plate. Lift off pressure plate to expose heating element.

Replace element and reassemble parts in reverse order leaving off handle and control knob to permit readjustment of thermostat switch.

Adjustment of thermostat.—Connect iron in series with a suitable ammeter to the mains supply. Insert screwdriver in slot in top of control knob spindle and turn spindle until circuit is just broken. Replace knob and spline so that arrow on body is midway between lever on knob and rayon calibration.

Once the control knob has been set in this position the operation of the thermostat is entirely automatic and cannot be altered.

Connect the three-core mains lead to terminals and replace handle.

Test Report

RYNFORD MAINS TRANSFORMER FOR ELECTROLYTIC RE-AGING UNIT

RYNFORD Industries, Ltd., 56, West End, Redruth, Cornwall, have submitted a transformer designed for use in the Electrolytic Re-aging and Testing Unit described in our January supplement. It has a primary tapped for 110, 200, 225 and 250V 40-100 c/s, and a 275V secondary tapped at 100, 125, 175, 225V.

Primary and secondary are high-grade enamelled copper wire layer wound on a rigid paxolin former fitted with endplates. Connections are terminated at soldering tags mounted on core former end-plates. Windings and former are shellac impregnated.

The one-inch core is built of high quality iron stampings held in a pressed metal frame fitted with fixing feet. Dimensions are: height 2⅛ins., width 3⅛ins., overall depth 2ins., and weight 1lb. 14ozs.

We connected the transformer into the prototype tester and voltage checks indicated that secondary tappings were accurate under load Temperature rise after prolonged use was negligible.

We consider the transformer well made and thoroughly reliable. The price is 15s. net.

LOOKING FOR TROUBLE

MOST tips published deal with faulty components but one must keep a sharp lookout for other troubles. Three cases are :—

1. A Pye B16T started slipping diagonally and this eventually became a permanent fault. After checking all parts which might have bearing on the fault I did what I should have done first—stopped to give a very close visual inspection. I found a blob of solder nearly bridging two anchor points on a connecting strip.

2. A Pye 18T was intermittently faulty on vision and sound and sometimes the sound would go altogether. As soon as the chassis was disturbed the fault would clear itself for perhaps a week or more. Finally, close inspection cured the trouble by revealing that the end wire of the sound output valve's cathode resistor was turned towards the next pin, which was earthed. There was so little clearance that a short sometimes occurred.

3. On a Murphy V116 the sync. went haywire. The source of trouble proved to be a 25mF capacitor which is across the fixed and variable resistors comprising the line and frame holds. Careful investigation finally revealed that any slight movement caused the positive connection to short to the can of the capacitor.—J.A.R.

INVICTA 73—*Cont. from page 6*

AERIAL is fed through isolating capacitor C1 to S1, which, in its two SW positions, switches aerial through C2 and S2 to top of grid tuned coils L1, L2. On MW and LW bands, however, aerial is switched by S1 to a common aerial coupling coil L5. Earth socket of receiver is isolated from chassis by C35.

The grid coils L1 (SW1), L2 (SW2), L3 (MW), L4 (LW), which are trimmed by T1, C3, T2, T3 and T4 respectively, are switched by S2 through C5 to g1 of triode-hexode frequency changer V1, and are also switched by S3 to aerial tuning capacitor VC1. On the two SW bands S3 places C4 in series with the tuning capacitor VC1.

AVC, decoupled by R13, C18 is fed by R2 to g1 of V1. Cathode bias is provided by R3 and decoupled by C7. Screen (g2, g4) voltage is obtained from potential divider formed by R1, R22, and is decoupled by C6. Primary L14, C16 of IFT1 is in the hexode anode circuit.

Oscillator is connected in a tuned grid shunt fed circuit. The grid coils L6 (SW1), L8 (SW2), L10 (MW), L12 (LW), which are trimmed by T5, C11, T6, T7 and T8, C14, respectively, and padded by C13 (MW), C15 (LW), are switched by S5 through to S4 and thence to oscillator tuning capacitor VC2 and coupled by C9 to oscillator grid (gt) of V1. On the two SW bands S4 connects C8 in series with VC2. Self bias for oscillator grid is developed on C9 with R4 as leak resistor.

Anode reaction voltages are developed inductively on L7 (SW1), L9 (SW2), L11 (MW), L13 (LW) and are switched by S6 through C10 to oscillator anode of V1, of which R5 is the load.

IF amplifier operates at 465kc/s. Secondary L15, C17 of IFT1 feeds signal and AVC voltages decoupled by R13, C18 to g1 of IF amplifier V2. Cathode bias is by R6 decoupled by C19. Screen (g2) voltage is obtained from potential divider R1, R22 decoupled by C6. Suppressor grid (g3) is strapped to cathode. Primary L16, C23 of IFT2 is in the anode circuit.

Signal rectifier.—Secondary L17, C24, of IFT2 feeds signal to diode anode of V2, R7 being the load.

AF amplifier.—Rectified signal across R7 is fed through RF filter R9, C21, C22 to C20 and thence via volume control R8 to g1 of V3. Cathode bias and negative feedback from secondary of speaker output transformer are developed across R12. V3 is used as a triode with screen (g2) and anode coupled together. Suppressor (g3) is connected down to cathode. R11 is the anode load and R10, C25 give anode HT decoupling.

AVC.—C26 feeds signal from secondary L17, C24 of IFT2 to diode anode of V3. R14 is diode load and R13, C18, provide decoupling feed to V1, V2. Cathode bias across R12 provides delay voltage.

Output stage.—C27 feeds signal at anode V3 through stopper R17 to pentode output valve V4. R15 is grid resistance cathode bias is by R16, C29. Primary L18 of output matching transformer OP1 is in the anode of V4. C28 gives fixed tone control. Secondary L19 of OP1 feeds signal to a 6½in. PM speaker L21. Internal speaker L21 is coupled to L19 by means of plugs and sockets. This enables an extension speaker to be used with or without the internal speaker.

Negative feedback from L20 on OP1 is fed through R18 to S7 which in its top position feeds signal via C31 to R12 in cathode of V3. In middle position of S7 feedback is still applied through C31 but a bypass capacitor C30 is connected across cathode resistor R12. In low position feedback is applied direct to R12 decoupled by C30.

HT is provided by indirectly heated halfwave rectifier V5. Its anode voltage is obtained from the mains through dropper resistor R21 and current limiter R19. Choke-capacity smoothing is by L22, C33, C34. Modulation hum is eliminated by C32. Reservoir capacitor C34 should be rated to handle 130mA of ripple current.

Heaters of V1 to V5 are connected in series and obtain their current of 100mA from the mains through tapped dropper R21. The tappings provide for mains supplies of 100-130, 200-215, 216-235, 236-250V.

Dial lights are series connected across R20 in mains lead to chassis. Mains input leads are fitted with 1a fuses. ON/OFF switch S9, ganged to volume control is connected in the mains lead to chassis.

Chassis removal.—Pull off control knob and disconnect internal speaker by removing plugs from speaker sockets on rear of chassis. Undo and remove the two wood screws fastening dial support brackets to front of cabinet. Remove the two chassis fixing bolts situated one at each end of rear chassis. Tilt chassis backwards a few degrees and then withdraw it from cabinet, being careful to avoid damage to underside of chassis.

TRIMMING INSTRUCTIONS

Apply signal as stated below	Tune receiver to	Trim in order stated for max. output
(1) 465kc/s to g1 of V1 via .01mF	—	Core of L17, L16, L15, L14
(2) 20mc/s via dummy aerial to aerial input socket	15 metres	T5, T1
(3) 15mc/s as above ..	20 metres	Check calibration
(4) 12.5mc/s as above	24 metres	T6, T2
(5) 9.1mc/s as above	33 metres	Check calibration
(6) 1.5mc/s as above ..	200 metres	T7, T3
(7) 600kc/s as above ..	500 metres	Check calibration
(8) 300kc/s as above ..	1,000 metres	T8, T4
(9) 150kc/s as above ..	2,000 metres	Check calibration

HMV MODEL 1804

SYMPTOM : suspected faulty tube. The connections on the tube base are made with small metal sleeves. An examination in a dark place may show arcing at one or more of these points. Fitting a new sleeve and cleaning the leads will affect a cure.

On the subject of this model, it is well to be sure that the fixing ring on the X81 valve is really firm and secure, as any movement of this valve will give rise to a surprising number of faults.—T.W.