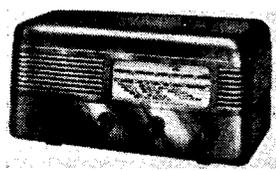


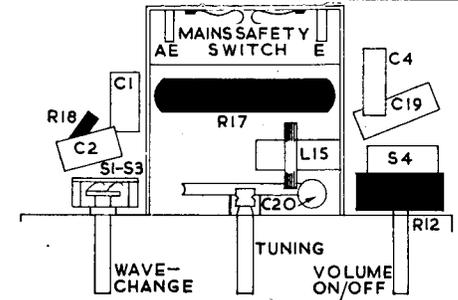
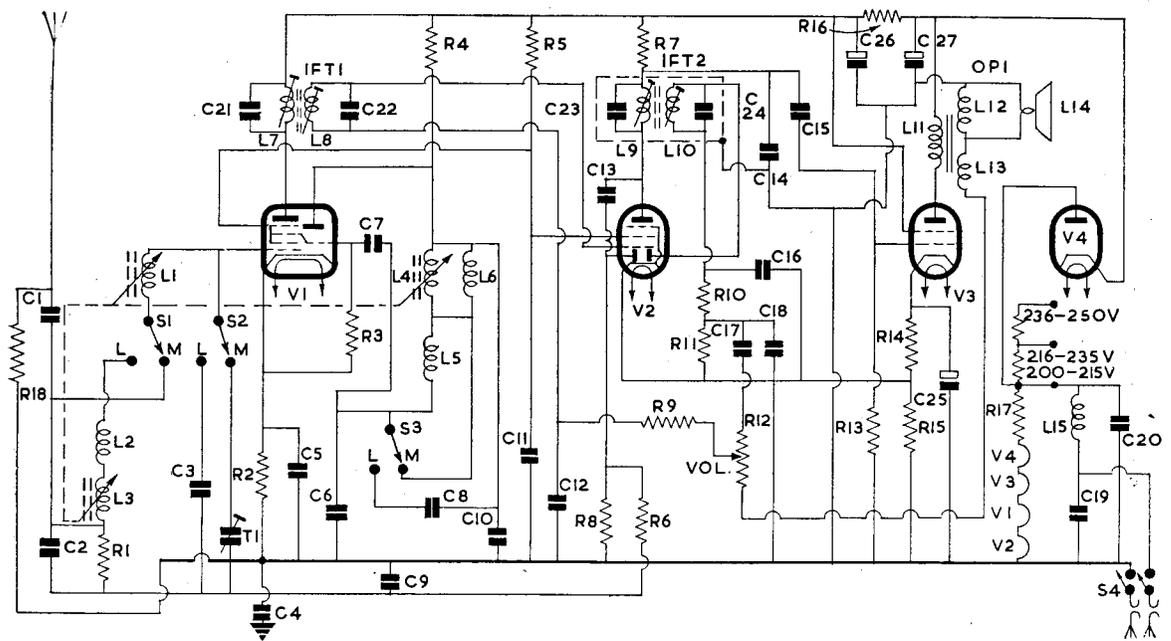
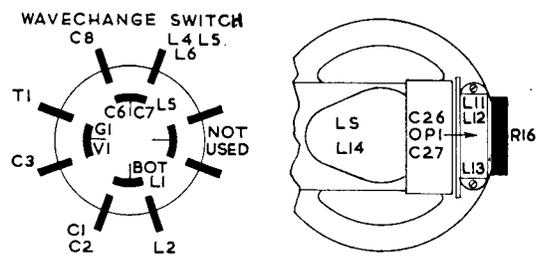
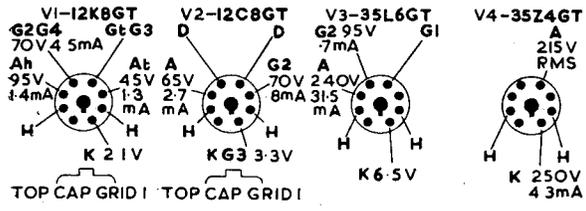
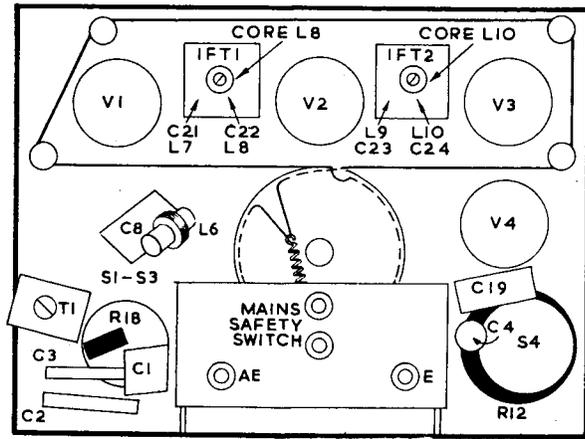
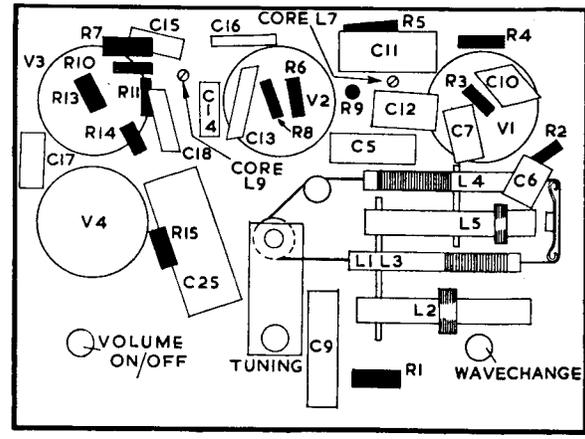
For more information remember www.savoy-hill.co.uk

# INVICTA

## Models 200 & 200W



Four-valve, two-waveband superhet for operation on 200-250V AC-DC or 110V AC. Provision for external aerial and earth. Model 200 in moulded plastic cabinet, 200W in wood. Manufactured by Invicta Radio Ltd., Parkhurst Road, London, N7.



### TRIMMING INSTRUCTIONS

Apply signal as stated below	Tune receiver to	Trim in order stated for max. output
1) 465 kc/s to top cap V1 via .01 capacitor. Remove grid lead of V1 and connect .5M resistor between grid and AVC line (Brown lead on T1) ...	550 metres	Cores of L10, L9, L8, L7
2) Check to see that pointer lines up with end of scale when tuning knob is turned to maximum clockwise position.	193 metres (Spot near 200M)	Correct calibration by a SLIGHT movement to right or left of MW aerial coil L1. Retrim T1 at 1,550 kc/s and repeat until tracking is correct
3) 1.55 mc/s to aerial socket via dummy Aerial ...	300 metres	Correct calibration by a SLIGHT movement to right or left of MW aerial coil L1. Retrim T1 at 1,550 kc/s and repeat until tracking is correct
4) 1 mc/s as above ...	1,200 metres	Check calibration
5) 250 kc/s as above ...	1,666 metres (Spot near 1,700 M)	Check calibration
6) 180 kc/s as above ...		

### RESISTORS

R	Ohms	Watts
1	47 k	1/4W
2	330	1/4W
3	47 k	1/4W
4	33 k	1/4W
5	4.7 k	1/4W
6	1 m	1/4W
7	10 k	1/4W
8	1 m	1/4W
9	470 k	1/4W
10	47 k	1/4W
11	470 k	1/4W
12	600 k Potentiometer with DPST switch	
13	220 k	1/4W
14	100	1/4W
15	100	1/4W
16	15 k	1/4W
17	880 20W	tapped
	750,815	
18	500 k	1/4W

### CAPACITORS

C	Capacity	Type
1	300 pf silver mica	
2	500 pf silver mica	
3	1000 pf silver mica	
4	.01 tubular 1000V	
5	.05 tubular 350V	
6	400 pf silver mica	
7	100 pf silver mica	
8	100 pf silver mica	
9	.1 tubular 350V	
10	400 pf silver mica	
11	.1 tubular 350V	
12	300 pf silver mica	
13	50 pf silver mica	
14	.001 tubular 500V	
15	.005 tubular 500V	
16	100 pf silver mica	
17	.01 tubular 500V	
18	100 pf silver mica	
19	.1 tubular 350V	
20	.1 tubular 350V	
21	60 pf silver mica	
22	60 pf silver mica	
23	60 pf silver mica	
24	60 pf silver mica	
25	50 electrolytic 12V	
26	16 electrolytic 350V	
27	16 electrolytic 350V	

### INDUCTORS

L	Ohms
1	12
2	8.5
3	8
4	6.5
5	6.75
6	9.5
7	19.5
8	19.5
9	19.5
10	19.5
11	450
12	2.3
13	2.25
14	2.5
15	3.5

(Continued on next page)

## INVICTA 200—Continued

**CIRCUIT** consists of a triode-hexode frequency changer V1 coupled by a permeability-tuned IF transformer to a double-diode pentode V2, which combines the functions of IF amplifier, signal rectifier and AVC, and, in addition, acts as audio amplifier.

A second permeability-tuned IF transformer, in the anode circuit of V2, applies IF signal to one of its diodes. After rectification, the signal is fed back, via the secondary of the first IF transformer, to the grid of V2 and amplified. A resistive load in the anode circuit of V2 is used to develop the AF signal which is then fed by a capacitor to the beam tetrode output valve V3. The output from V3 is fed into a 5 inch PM loudspeaker. Negative feedback, from a secondary winding on the output transformer, is applied to the grid of V2 and AVC, developed on the second diode of V2, is applied to hexode grid V1.

On AC mains HT is provided by an indirectly-heated half-wave rectifier V4.

Aerial is connected through C1 to bottom end of L2, L3 (LW) coils and through S1 to bottom end of L1 (MW) coil. R1, C2 are components associated with bottom end aerial coupling and R18 is an aerial static-drain resistor. Both the aerial and oscillator circuits in this receiver are permeability-tuned. The iron-dust cores of the coils are operated by a tape connected to a tuning drive wheel. The aerial coils L1 (MW) and L3 (LW) are wound on the same coil former and are tuned by the same iron-dust core. L2 is a LW loading coil wound on a separate former and connected in series with L3. S2 switches in circuit, across the coils, capacitor C3 on LW, and trimmer T1 on MW.

Aerial tuned coils are coupled direct to G1 of V1 and AVC is applied to G1 from R6 decoupled by C9. Cathode bias is provided by R2 decoupled by C5. Screen (G2, G4) voltage is obtained from R5 decoupled by C11. L7, C21, which form the primary of IFT1, are in the hexode anode circuit of V1.

Oscillator is basically a permeability-tuned Colpitts circuit. L4 is the tunable inductance and C6, C10 the capacitors associated with it. For LW operation L5 is placed in series with L4 and L6; C8 is shunted across the tuned circuit.

L6, connected across the tuning coil L4, ensures correct tracking over the bands covered. Bias for oscillator grid (G1, G3) is developed automatically on C7. R3 is oscillator grid leak. R4 is the anode load.

**IF Amplifier** operates at a frequency of 465 kc/s. L8, C22, the secondary of IFT1, applies the signal to G1 of V2. Cathode bias is obtained from junction of R14, R15 in the cathode circuit of V3. Screen (G2) voltage is, obtained from R5 decoupled by C11. L9, C23 forming the primary of IFT2, are in the anode circuit of V2.

**Signal Rectifier.** The secondary of IFT2, (L10, C24) feeds signal to one diode of V2. R11 is diode load and R10, C16, C18 form an IF filter circuit.

**Automatic Volume Control.** C13 feeds signal at anode of V2 to the second diode. R8 is diode load resistor and R6, C9 provide line decoupling. Cathode bias, developed on R15, provides the delay voltage for the AVC circuit. AVC is applied to G1 of V1 only.

**AF Amplifier.** In this receiver the pentode section of V2, in addition to operating as an IF amplifier, is used to amplify at audio frequency. This is achieved by feeding the rectified signal via C17 to the volume control R12 and then, by R9, through the secondary L8 of IFT1 to the grid of V2 again. Amplified audio voltages are taken from an anode load R7 and fed to V3 via C15. R9 and C12 act as a filter. Negative feedback, from secondary L13 of output transformer OPI, is applied also through R12 and R9 to G1 of V2.

**Output Stage.** C15 applies signal developed across anode load resistor R7 to G1 of beam tetrode output valve V3. R13 is its grid resistor. R14, R15, decoupled by C25, provide cathode bias. Screen (G2) voltage is obtained direct from HT line to V1 and V2 and is decoupled by C26. L11, the primary of OPI, the output matching transformer, is connected in the anode circuit of V3. The anode current for this valve is drawn direct from the reservoir capacitor C27.

L12, one of the secondaries of OPI, feeds into a 5 inch PM loudspeaker. L13, the other secondary provides the negative feedback voltages for G1 of V2.

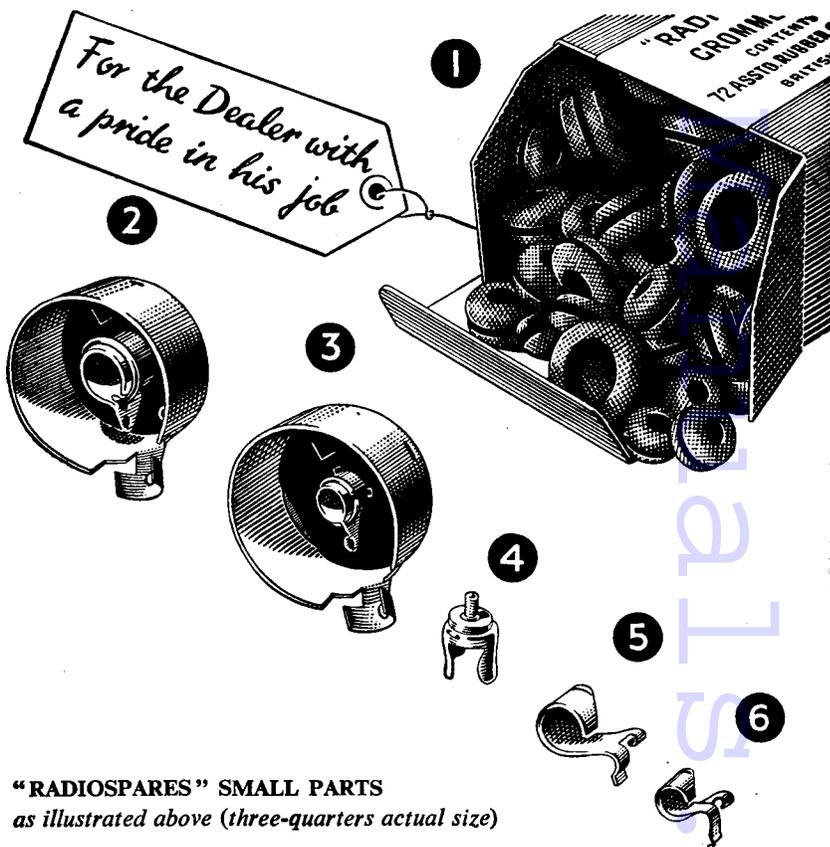
**High Tension** is provided by a half-wave, indirectly-heated rectifier V4. Its anode voltage is obtained from the input mains direct when working from 200-215 V, and through part of R17 when on 216-250 V tapings. R16, C26, 27 provide resistance-capacity smoothing of the HT supply.

Heaters of V1 to V4 are connected in series and obtain their current through dropper resistor R17, tapped for mains supply voltages of 200-250 V. When operating from 110 V supply the 200-215 V tapping is used and the two ends of the resistor R17 are connected together. The "live" side of the input mains has a filter consisting of L15, C19, C20 inserted in series with it. S4 which is ganged to the volume control is the on/off switch. A safety device consisting of a two-pin plug (attached to rear panel) and socket (on panel of chassis) ensures that the mains supply is broken before the chassis can be exposed.

**Removal of Chassis from Cabinet.** Remove back panel of receiver. Unfasten screw at each corner of chassis—lift out chassis. Unscrew screws holding loudspeaker to front of cabinet. Loudspeaker and chassis can now be completely removed from case for servicing.

## A BOOK OF TELEVISION SERVICING

*The Servicing of Television Receivers.* Philco Service Dept., Greenford, Middx, 140 pages, 12s. 6d. This book is issued by the Philco Corporation in USA and, while not of direct aid in servicing British receivers, it makes interesting reading. The American television waveform is explained and a Philco receiver described stage by stage. The difficulties of variable RF tuning—with none too much space between adjacent transmissions—become apparent; against this they have the advantage of AVC, possible with their negative modulation system. Numerous pictures of horizontal dipoles are not as useful as the following good selection illustrating picture faults. Finally, faults and tests are tabulated.



### "RADIOSPARES" SMALL PARTS as illustrated above (three-quarters actual size)

No. 1 GROMMET KITS Containing 72 assorted Rubber Grommets, from $\frac{3}{8}$ " to $\frac{3}{4}$ " @ 3/3d. per Kit.	No. 4 CONVERTER GRID-CAPS For use with both Anode and Grid Top Valves @ 2/3 per doz.
No. 2 SCREENED GRID-CAPS Standard Size @ 6d. each.	No. 5 GRID-CAPS, PUSH-ON Standard Size. @ 6d. per doz.
No. 3 SCREENED GRID-CAPS Octal Size @ 6d. each.	No. 6 GRID-CAPS, PUSH-ON Octal Size. @ 4d. per doz.

ALL PRICES QUOTED ARE "NETT" TRADE

These Products are available as and when listed in the current "Bulletin" and obtainable only direct from:

## Radiospares Ltd.

19-23 FITZROY STREET, LONDON, W.1  
Telegrams: Radosperes, Wesdo, London

MUSEum 9301/6  
Cables: Radosperes, London