

Invicta 430 A C Four

Three valve, plus rectifier, four band manually tuned table model superhet for 200-250 volt, 40-100 cycles, price 9 gns.

CIRCUIT OUTLINE

A SPECIAL coil arrangement with switched tuned and untuned windings forms the input to the first valve, V1, a triode hexode frequency changer with AVC. Orthodox oscillator circuits are employed, again with switched tuned and regenerative windings.

The first intermediate transformer is permeability tuned, the secondary working into the grid circuit of V2, the intermediate frequency amplifier.

This is coupled to the signal diode of V3 by a trimmer tuned transformer. V3 is a double diode pentode, the pentode section being used as the output stage.

One diode, as already mentioned, is for demodulation and the other for AVC. The signal voltages from the diode load are taken from a simple resistance filter and coupling condenser to the top of the volume control. The volume control is of the tone corrected type, a tapping being taken to earth through a resistance capacity network.

The tone is adjusted in three steps by a separate switch, which shunts the volume control with either a condenser or a condenser and resistance in series.

The power supply is by means of a full-wave rectifier, V4, provided with the usual smoothing circuit, comprising the speaker field and two electrolytic condensers.

CONSTRUCTIONAL FEATURES

WE noticed in our model several departures from standard specification. The manufacturers' specification and circuit show only an ordinary decouple on the screen of the mixing valve. In our model there was an additional HF decouple in the form of C32. In addition there is heterodyne voltage control resistance permanently connected in the oscillator grid lead.

The tone control condenser, C31, is shown in the manufacturers' specification as having a value of .001 mfd. In our receiver it was actually a .01. We would here draw attention to the fact that this circuit is in shunt with the whole of the volume control, and not between the slider and earth.

The specification of the receiver includes provision for pick-up and also an extension speaker with a 2 ohms working impedance.

Wavechange Switches

All the switching is carried out in this receiver by means of two wafers. The one nearer the chassis controls the preselector circuits and the other wafer the oscillator coils.

On each wafer there are two normal wipes and one extra wipe, consisting of a small metal tongue which is carried round by the rotor disc, a flexible connection being made between the extra wipe and the appropriate part of the circuit.

The oscillator wafer carries W1, W2 and W3, the wipe, W2, being the follow on shorting, or extra wipe. A similar arrangement is used on the preselector wafer, the extra wipe being W5.

The normal wipes on both wafers select the appropriate coils in the usual manner.

Chassis Removal

Removal of this chassis is very easy. First of all pull off the four control knobs from the front of the cabinet. Then release the four chassis-retaining bolts, and the chassis can be withdrawn from the cabinet.

For complete removal it is necessary to unsolder the speaker leads. Five leads are used. On the strip there are five tags, and the order of the leads is as follows: Red, brown, blank, blank, black, reading from the top downwards.

On the speaker transformer itself there are three tags. Again reading downwards, the order is blank, yellow, green.



Alignment

IF Circuits (Frequency 465 kcs.)

The transformers are of the inductance adjusted type and should only require adjusting if removed from the chassis or if a new one is fitted.

Before lining any of the bands see that the pointer is exactly over the centre cross in the middle of the scale and that the pointer ends line up with the 51- and 200-metre marks on the second short scale.

Medium Waves

Connect output meter to the speaker socket and generator to aerial and earth through dummy aerial.

Tune set and generator to 250 metres and adjust T1 for resonance. Then adjust T2 for resonance.

There is no padding adjustment.

Long Waves

Tune set and generator to 1,200 metres and adjust T3 for resonance.

There is no preselector trimmer and no padding operation.

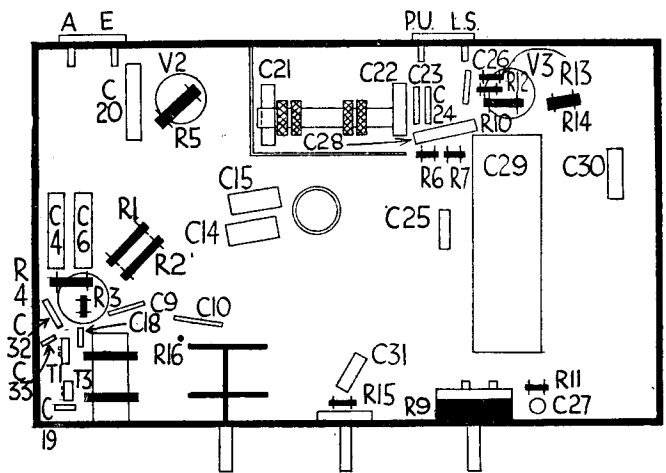
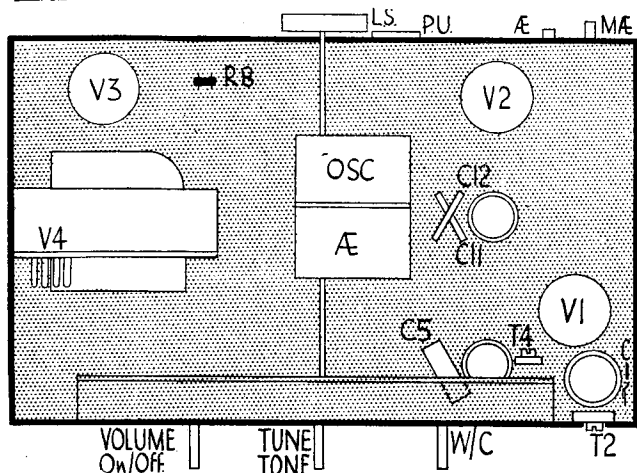
Short Waves—2

Tune set and generator to 14 metres and adjust T4 for resonance.

There is no oscillator trimmer and the padding is again fixed.

Short Waves—1

There are no adjustments.



Chassis construction is on simple and straightforward lines. These diagrams identify components both on top (diagram on left) and below the chassis.

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

IO-MINUTE FAULT-FINDER

INVICTA 430

Power Test

First check that the main HT voltages and load are correct by the following tests.

Voltages : V4 heater, 450; HT line, 250.
Resistance : L21, 3,000 ohms.
Total feed = $450 - 250 \div 3,000 = 66$ ma.

Output Stage, V3

Inject 1 volt AF at grid. If defective, check :—

Voltages : Anode, 240; screen, 250.
Resistances : Anode—HT line, 415; grid—chassis, 1 megohm.

Demodulation

Inject 465 kc. signal at V2 anode. If defective, check :—

Resistances : L18, 9; L19, 9; signal diode—chassis, 600,000 ohms.

IF stage, V2

Inject 465 kc. signal V2 grid. If defective, check :—

Voltages : Anode, 250; screen, 250.
Resistances : Grid—chassis, 2 megohms.

Mixer Section, V1

Inject 465 kc. signal V1 anode. If defective, check :—

Resistances : L17, 9; L16, 9.

Inject 465 kc. signal V1 grid. If defective, check :—

Voltages : Anode, 245; screen, 80.
Resistances : Screen—HT positive, 20,000 ohms.

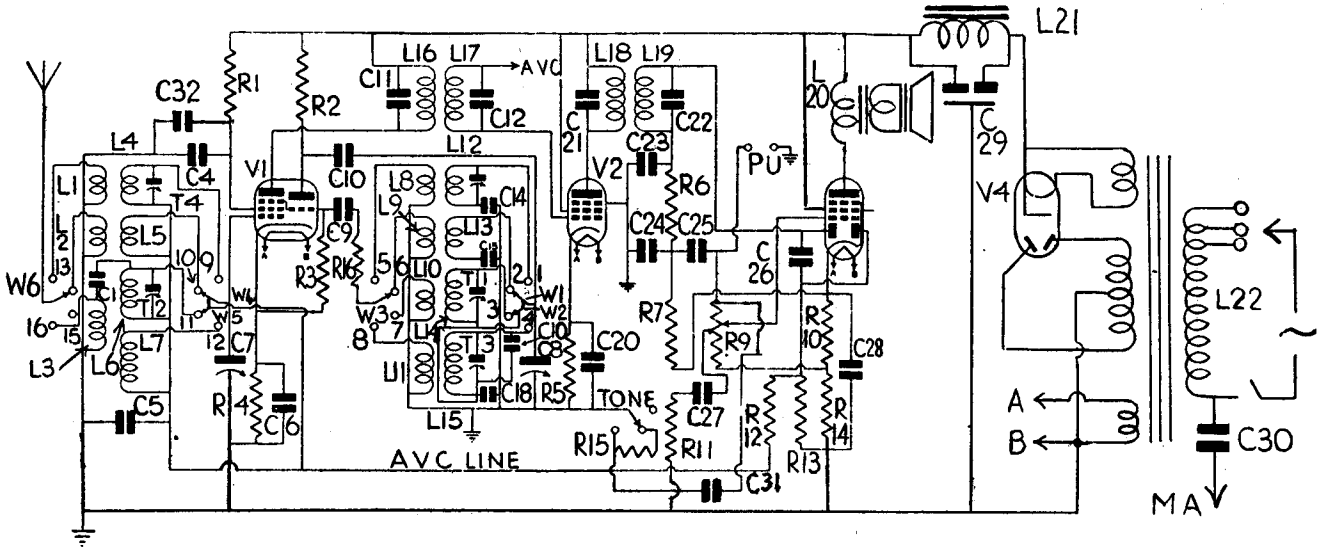
Oscillator Section, V1

If no signals, tune in local station and inject local station frequency plus 465 kc. Check :—

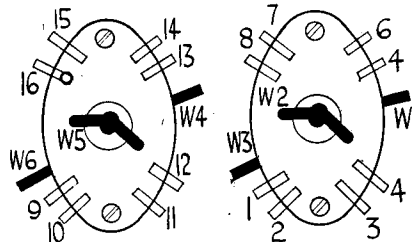
Voltage : Osc. anode, 70.
Resistances : Osc. anode—HT line, 20,000; osc. grid—chassis, 20,000 ohms.

Signal Circuits

If still no signals, inspect preselector coils and switching.



The circuit diagram is on conventional lines. Four bands are covered and the diodes are in the same "bottle" as the high-slope output pentode. For divergencies see notes in text. Right, the switches with bank nearer "click" plate on left.



VALVE READINGS

V.	Type.	Electrode.	Volts.	Ma.
<i>All Mullard.</i>				
1	TH4A	Anode	245	3.5
		Screen	80	7
		Osc. anode	70	6
2	VP4B	Anode	245	12
		Screen	245	5
3	Pen4DD	Anode	240	30
		Screen	250	6.5
4	IW4/350	Heater	450	—
Pilot lamps.		M.E.S. Round	6.2	300

RESISTANCES

	Ohms.	
1	V1 screen feed	20,000
2	Osc. anode load	20,000
3	Osc. grid leak	200,000
4	V9 cathode bias	200
5	V2 cathode bias	150
6	HF filter	100,000
7	Signal diode load	500,000
8	V3 grid stopper	100,000
9	Volume control	1 meg.
10	V3 cathode bias (part)	200
11	Tone compensation	60,000
12	AVC decouple	1 meg.

RESISTANCES (continued)

13	AVC diode load	1 meg.
14	V3 cathode bias (part)	150
15	Tone control	250,000
16	Het. volt control	25

CONDENSERS

	Mfds.	
1	Aerial top coupling	.000006
4	V1 screen decouple	.1
5	V1 AVC decouple	.1
6	V1 cathode shunt	.1
9	Osc. grid	.00015
10	Osc. anode	.00015
11	IFT primary tune	.00015
12	IFT secondary tune	.00015
14	SW1 padder	.005
15	SW2 padder	.0013
18	MW and LW padder	.000675
19	LW osc. fixed trimmer	.00026
20	V2 cathode shunt	.1
21	IFT 2 primary tune	.00015
22	IFT 2 secondary tune	.00015
23	LF osc.	.00015
24	HF filter	.00015
25	LF coupling	.05
26	AVC coupling	.00015
27	Tone compensation	.01
28	V3 cathode shunt	20

CONDENSERS (continued)

29	HT smoothing	8-8
30	Mains aerial	.001
31	Tone control	.01
32	V1 screen bypass	.00015
33	SW osc. fixed trimmer	.00002

WINDINGS

L.	Ohms.	Range.	Where measured.
1	V. low	SW1	Aerial and chassis.
2	1	SW2	Aerial and chassis.
3	60	MW	Aerial and chassis.
4	V. low	SW1	V1 grid and AVC line.
5	1	SW2	V1 grid and AVC line.
6	3	MW	V1 grid and AVC line.
7	13	LW	V1 grid and AVC line.
8	55	SW1	W3 and chassis.
9	77	SW2	W3 and chassis.
10	15	MW	W3 and chassis.
11	20	LW	W3 and chassis.
12	V. low	SW1	W1 and C14.
13	1	SW2	W1 and C15.
14	2	MW	W1 and C18.
15	3	LW	W1 and C18.
16	9	—	V1 anode and HT positive.
17	9	—	V2 grid and AVC line.
18	9	—	V2 anode and HT positive.
19	9	—	Signal diode and R6.
20	415	—	V3 anode and HT positive.
21	3,000	—	V4 heaters and HT positive.
22	23	—	Mains plug.

Replacement Condensers

EXACT replacement electrolytic condensers are available from A. H. Hunt, Ltd., Garratt Lane, Wandsworth, London, S.W.18. For the block C29, there is unit list number 1,573A, price 6s. 6d., and for C28, unit 2,935, price 1s. 9d.

For more information remember