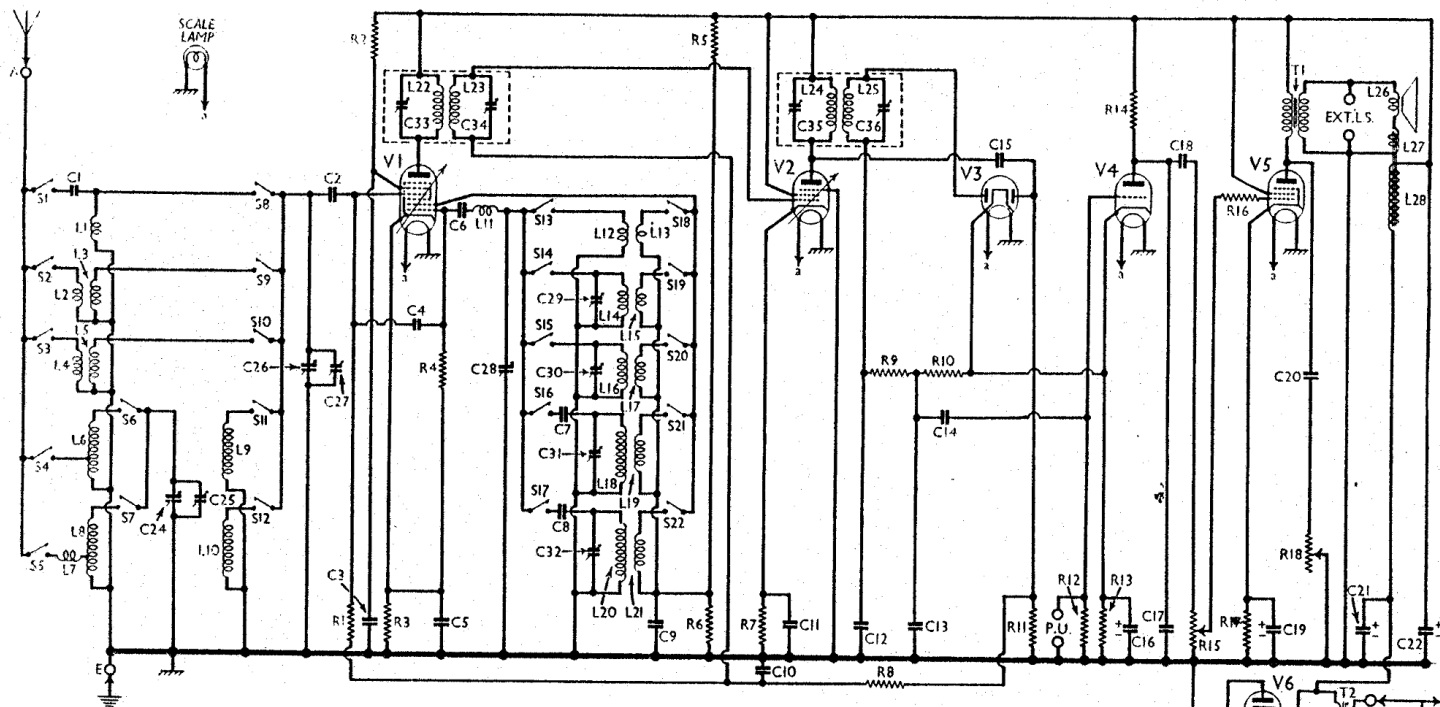


INVICTA - AW 57



Circuit diagram of the Invicta AW57 all-wave A.C. receiver. Three S.W. bands are incorporated. Separate coil units for each band are fitted.

CONDENSERS	Values (μF)
C1 Aerial coupling (S.W.1) ..	0.00007
C2 V1 pentode C.G. condenser ..	0.00015
C3 V1 S.G.'s by-pass ..	1.0
C4 Image suppressor ..	0.0000018
C5 V1 cathode by-pass ..	0.1
C6 V1 osc. C.G. condenser ..	0.00015
C7 Oscillator M.W. tracker ..	0.00066
C8 Oscillator L.W. tracker ..	0.00024
C9 Osc. anode decoupling ..	0.1
C10 V1, V2 A.V.C. line decoupling ..	0.05
C11 V2 cathode by-pass ..	0.1
C12 I.F. by-passes ..	0.00015
C13 I.F. coupling to V4 ..	0.00015
C14 Coupling to V3 A.V.C. diode ..	0.00015
C15 V4 cathode by-pass ..	25.0
C16* V4 anode I.F. by-pass ..	0.001
C17 V4 to V5 I.F. coupling ..	0.05
C18 V5 cathode by-pass ..	25.0
C19* Part of T.C. filter ..	0.05
C20 H.T. smoothing ..	8.0
C21* Mains aerial coupling ..	8.0
C22* Band-pass pri. tuning (M.W., L.W.) ..	0.001
C23 Band-pass pri. trimmer ..	0.00055
C24† F.C. C.G. circuit tuning ..	0.00055
C25† F.C. C.G. circuit trimmer ..	0.00055
C26† Oscillator C.G. circuit tuning ..	0.00055
C27† Osc. trimmer (S.W.2) ..	0.00004
C28† Osc. trimmer (S.W.3) ..	0.00004
C29† Osc. trimmer (M.W.) ..	0.00004
C30† Osc. trimmer (L.W.) ..	0.00004
C31† 1st I.F. trans. pri. tuning ..	0.00014
C32† 1st I.F. trans. sec. tuning ..	0.00014
C33† 2nd I.F. trans. pri. tuning ..	0.00014
C34† 2nd I.F. trans. sec. tuning ..	0.00014

* Electrolytic. † Variable. ‡ Pre-set.

RESISTANCES	Values (ohms)
R1 V1 pentode C.G. resistance ..	300,000
R2 V1 S.G.'s H.T. feed ..	40,000
R3 V1 fixed G.B. resistance ..	300
R4 V1 osc. C.G. resistance ..	60,000
R5 V1 osc. anode H.T. potential divider ..	40,000
R6 V2 fixed G.B. resistance ..	40,000
R7 V1 and V2 A.V.C. line decoupling ..	140
R8 I.F. stopper ..	300,000
R9 V3 signal diode load ..	120,000
R10 V3 A.V.C. diode load ..	300,000
R11 V4 C.G. resistance ..	300,000
R12 V4 G.B. resistance ..	1,000,000
R13 V4 anode load ..	2,500
R14 Manual volume control ..	120,000
R15 V5 C.G. I.F. stopper ..	500,000
R16 V5 G.B. resistance ..	20,000
R17 Variable tone control ..	500
R18 ..	50,000

OTHER COMPONENTS	Approx. Values (ohms)
L1 F.C. C.G. tuning coil (S.W.1) ..	Very low
L2 Aerial coupling coil (S.W.2) ..	0.25
L3 F.C. C.G. tuning coil (S.W.2) ..	0.2
L4 Aerial coupling coil (S.W.3) ..	0.5
L5 F.C. C.G. tuning coil (S.W.3) ..	0.5
L6 Band-pass primary (M.W.) ..	2.4
L7 Aerial choke coil (L.W.) ..	4.8
L8 Band-pass primary (L.W.) ..	17.0
L9 Band-pass secondary (M.W.) ..	2.2
L10 Band-pass secondary (L.W.) ..	17.0
L11 V1 osc. C.G. S.W. choke ..	Very low
L12 Osc. tuning coil (S.W.1) ..	Very low
L13 Osc. reaction coil (S.W.1) ..	0.4
L14 Osc. tuning coil (S.W.2) ..	0.15
L15 Osc. reaction coil (S.W.2) ..	0.35
L16 Osc. tuning coil (S.W.3) ..	0.4
L17 Osc. reaction coil (S.W.3) ..	12.5
L18 Osc. tuning coil (M.W.) ..	1.3
L19 Osc. reaction coil (M.W.) ..	36.0
L20 Osc. tuning coil (L.W.) ..	3.3
L21 Osc. reaction coil (L.W.) ..	43.0
L22 1st I.F. trans. Pri. ..	6.0
L23 1st I.F. trans. Sec. ..	6.0
L24 2nd I.F. trans. Pri. ..	5.0
L25 2nd I.F. trans. Sec. ..	5.0
L26 Speaker speech coil ..	1.6
L27 Hum neutralising coil ..	0.2
L28 Speaker field coil ..	3,000.0
T1 Output trans. Pri. ..	450.0
T1 Output trans. Sec. ..	0.25
T2 Mains trans. Pri. total ..	45.0
T2 Mains trans. Heater sec. ..	0.1
T2 Mains trans. Rect. heat. sec. ..	0.15
T2 Mains trans. H.T. sec. total ..	360.0
S1 Waveband switches ..	—
S22 Mains switch, ganged R15 ..	—

VALVE ANALYSIS

The table below gives the valve voltages and currents as measured in our receiver when it was operating on mains of 220 V, using the 216-235 V tapping on the mains transformer. The receiver was tuned to the lowest wavelength on the medium band and the volume control was at maximum, but there was no signal input.

Voltages were measured on the 1,200 V scale of an Avometer, with chassis as negative.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 FC4*	220	1.6	65	3.2
V2 VP4B	220	11.0	220	4.2
V3 2D4A	—	—	—	—
V4 354V	80	0.9	—	—
V5 Pen4VA	200	29.0	220	2.5
V6 1W3	330†	—	—	—

* Osc. anode (G2) 65 V, 1.3 mA.

† Each anode A.C.

GENERAL NOTES

Switches.—The wavechange switches, twenty-two in number, are in three rotary units beneath the chassis. These are indicated in our under-chassis view, and the numbers in circles refer to the units in the separate switch diagrams, and the arrows the directions in which these are viewed, looking at the underside of the chassis.

All the switches are used in unit 1. Only one half of unit 2 is used, while unit 3 has three blank switches. Note that each half unit has one common contact. Only one switch in each half unit is closed for any position of the switch control.

The table (p. VIII) gives the switch positions for the various control settings, O indicating open, and C, closed. S.W.1 is the lowest S.W. range.

S23 is the Q.M.B. mains switch, ganged with the volume control **R15**.

INVICTA AW57—Continued

Switch	S.W.1	S.W.2	S.W.3	M.W.	L.W.
S1	C	O	O	O	O
S2	O	C	O	O	O
S3	O	O	C	O	O
S4	O	O	O	C	O
S5	O	O	O	O	C
S6	O	O	O	O	C
S7	O	O	O	O	C
S8	C	O	O	O	O
S9	O	C	O	O	O
S10	O	O	C	O	O
S11	O	O	O	C	O
S12	O	O	O	O	C
S13	C	O	O	O	O
S14	O	C	O	O	O
S15	O	O	C	O	O
S16	O	O	O	C	O
S17	O	O	O	O	C
S18	C	O	O	O	O
S19	O	C	O	O	O
S20	O	O	C	O	O
S21	O	O	O	C	O
S22	O	O	O	O	C

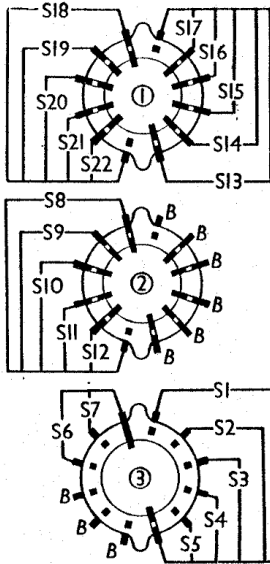
Coils.—The only coils on the chassis deck are the two I.F. transformers, **L22**, **L23** and **L24**, **L25**. The first of these contains its trimmers, while the second, in addition to its trimmers, contains also **C12**, **C13**, **C15**, **R9** and **R10**.

The remaining coils are all beneath the chassis, wound on tubular formers. They are mostly arranged with two coils on a former, and as it is difficult to indicate the positions exactly in our under-chassis view, the following notes will be of interest. It is assumed that we are looking straight down on the underside of the chassis.

L1 is on a former by itself. **L2** is a fine wire winding between the turns of **L3** at the bottom. **L4** is a separate winding below **L5**. **L6** is below **L9**. **L7** is on a former by itself. **L10** is below **L8**.

L11 is a small choke formed of a coil of

wiring-up wire. **L12** (thick wire) is below **L13**. **L15** is wound between the turns of **L14**, at the bottom. **L17** is below **L16**. **L19** is below **L18**. **L21** is the lowest of the three units on its former, the other two forming **L20**.



Diagrams of the three switch units, as seen from the underside of the chassis, looking in the direction of the arrows in the under-chassis view (p. VII).

Scale Lamp.—This is an Ever Ready M.E.S. type, rated at 6.2 V, 0.3 A.

External Speaker.—Provision is made at the rear of the chassis for an external low resistance speaker (about 2 O).

Trimmers C29-C32.—The oscillator trimmers are mounted on top of the respective coil formers. Note that the S.W.1 range has no oscillator trimmer.

Condensers C21, C22.—These are two 8 μ F dry electrolytics in a single metal case beneath the chassis. The black lead to the common negative, the red lead to

V6 valveholder is the positive of **C21**, and the red lead to **V5** valveholder the positive of **C22**.

Condensers C7, C8.—The oscillator M.W. and L.W. trackers each consist of two fixed condensers in parallel.

Condenser C4.—The image suppressor is a very small fixed condenser mounted above the chassis deck, in association with **R1** and **C2**.

C12, C13, C15, R9 and R10.—These components are all mounted inside the second I.F. transformer screen. The resistances may be identified by their colour coding. The condensers, however, are all 0.00015 μ F types. Of the two condensers mounted one above the other, **C12** is the upper one and **C13** the lower one. The remaining condenser, at the other side of the unit, is **C15**.

Speaker Field.—The resistance of this may be 2,500 O in early models.

CIRCUIT ALIGNMENT

I.F. Transformers.—Feed in a 465 KC/S modulated signal between **V1** pentode section control grid (top cap) and chassis. Adjust I.F. trimmers **C36**, **C35**, **C34** and **C33**, in that order, for maximum reading on output meter.

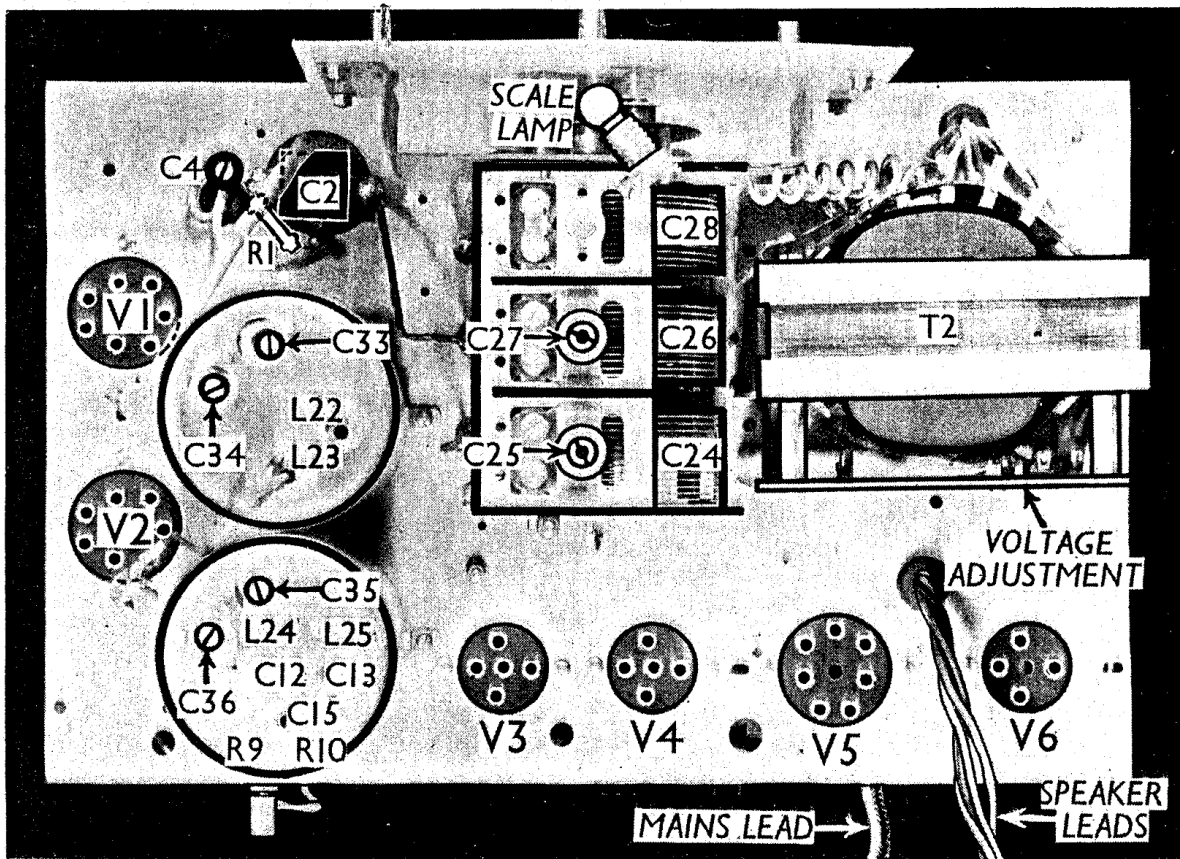
Signal Frequency and Oscillator Circuits.—First of all set scale pointer to horizontal position when gang condenser is at maximum capacity. Set waveband switch to M.W. and gang condenser to 300 m., and feed in a 300 m. signal to the aerial and earth sockets. Adjust oscillator M.W. trimmer **C31** for maximum output and then the two trimmers on the gang condenser, commencing with **C25**.

Set waveband switch to L.W. and gang to 1,200 m. Feed in a 1,200 m. signal and adjust oscillator L.W. trimmer **C32** for maximum output. Do not re-trim **C25** or **C27**.

Set gang condenser to 75 (or 100) m. on the Trawler Band (S.W.3) and feed in a 75 (or 100) m. signal. Adjust oscillator trimmer **C30**.

Set waveband switch to 30 m. (10 MC/S) band (S.W.2) and gang condenser to 30 m. Feed in a 30 m. signal and adjust oscillator trimmer **C29**.

Finally, set waveband switch to 20 m. (10MC/S) band (S.W.1) and gang condenser to 20 m. Feed in a 20m. signal and check. There is no trimmer on this band.



Plan view of the chassis. The second I.F. transformer unit contains several other components. **C4** is a small fixed condenser.