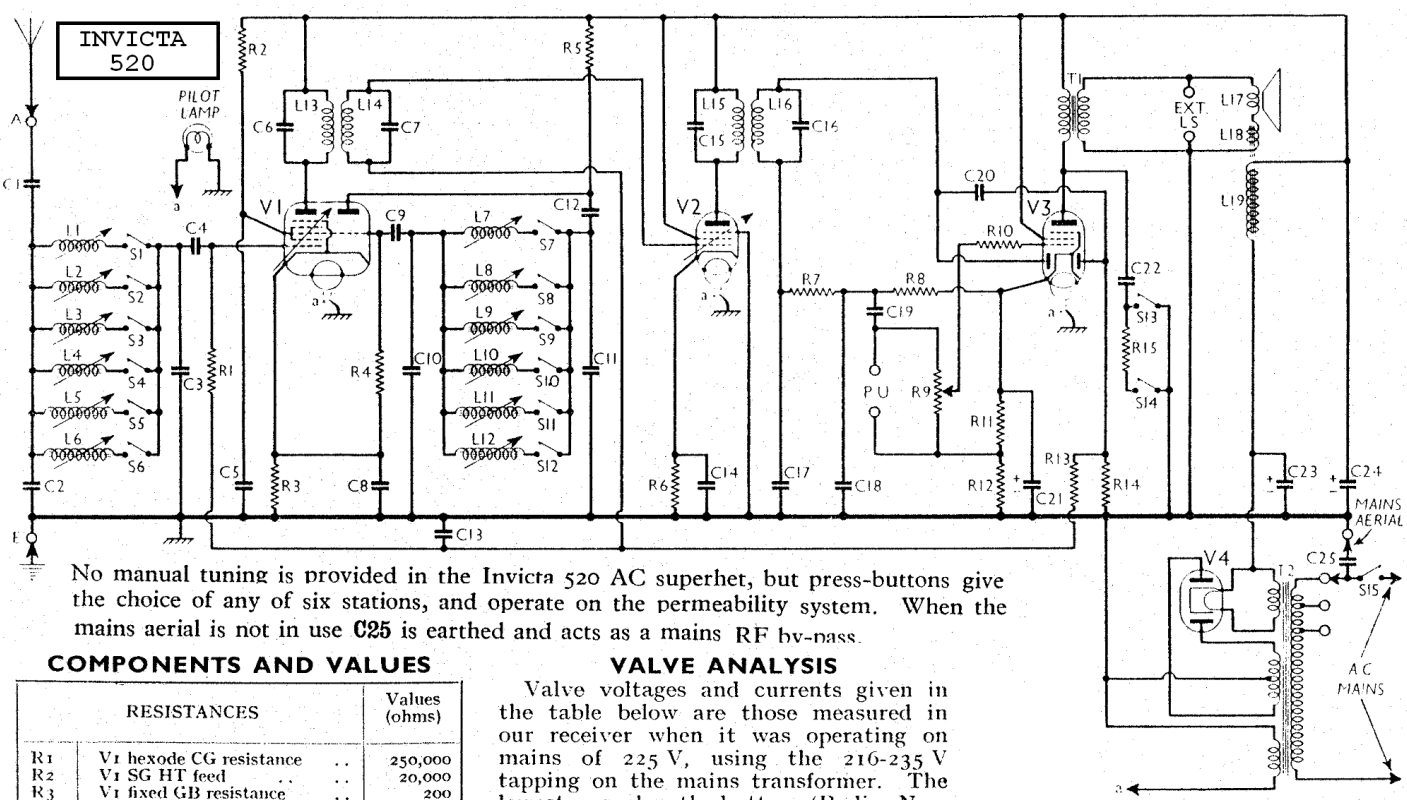

No manual tuning is provided in the Invicta 520 AC superhet, but press-buttons give the choice of any of six stations, and operate on the permeability system. When the mains aerial is not in use **C25** is earthed and acts as a mains RF by-pass.

COMPONENTS AND VALUES

	RESISTANCES	Values (ohms)
R1	V1 hexode CG resistance	250,000
R2	V1 SG HT feed	20,000
R3	V1 fixed GB resistance	200
R4	V1 osc. CG resistance	20,000
R5	V1 osc. anode HT feed	100,000
R6	V2 fixed GB resistance	100
R7	IF stopper	100,000
R8	V3 signal diode load	500,000
R9	Manual volume control	500,000
R10	V3 grid stopper	100,000
R11	V3 GB potential divider;	200
R12	AVC delay	150
R13	AVC line decoupling	1,000,000
R14	V3 AVC diode load	1,000,000
R15	Part of tone control circuit	60,000

	CONDENSERS	Values (μF)
C1	Aerial series condenser	0·0003
C2	Aerial coupling impedance	0·001
C3	Aerial fixed tuning condenser	0·0003
C4	V1 hexode CG condenser	0·00015
C5	V1 SG decoupling	0·1
C6	1st IF trans. pri. fixed tuning	0·00015
C7	1st IF trans. sec. fixed tuning	0·00015
C8	V1 cathode by-pass	0·1
C9	V1 osc. CG condenser	0·00015
C10	Oscillator circuit fixed tuning condensers	0·0003
C11		0·0003
C12	V1 osc. anode coupling	0·00015
C13	AVC line decoupling	0·1
C14	V2 cathode by-pass	0·1
C15	2nd IF trans. pri. fixed tuning	0·00015
C16	2nd IF trans. sec. fixed tuning	0·00015
C17	IF by-pass condensers	0·00015
C18		0·00015
C19	AF coupling to V3 pentode	0·05
C20	Coupling to V3 AVC diode	0·00015
C21*	V3 cathode by-pass	20·0
C22	Part of tone control circuit	0·005
C23*	HT smoothing	8·0
C24*		8·0
C25	Mains aerial coupling	0·001

* Electrolytic.

	OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial circuit MW tuning coils		1·4
L2			1·4
L3			1·9
L4			2·9
L5	Aerial circuit LW tuning coils		22·5
L6			33·0
L7	Oscillator circuit MW tuning coils		1·1
L8			1·1
L9			1·4
L10			1·8
L11	Oscillator circuit LW tuning coils		3·4
L12			3·3
L13	1st IF trans.	Pri.	6·0
L14		Sec.	6·0
L15	2nd IF trans.	Pri.	6·0
L16		Sec.	6·0
L17	Speaker speech coil		3·5
L18	Hum neutralising		0·1
L19	Speaker field coil		3,000·0
T1	Output trans.	Pri.	310·0
		Sec.	0·15
T2	Mains trans.	Pri. total	22·0
		Heater sec.	0·05
		Rect. heat. sec.	0·1
		HT sec., total	750·0
S1-S6	Aerial circuit selector switches		—
S7-S12	Osc. circuit selector switches		—
S13,14	Tone control switches		—
S15	Mains switch, ganged R9		—

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating on mains of 225 V, using the 216-235 V tapping on the mains transformer. The lowest wavelength button (Radio Normandie) was pressed and the volume control was at maximum, but there was no signal input.

Voltages were measured on the 400 V scale of a model 7 Universal Avometer, chassis being negative.

If, as in our case, **V3** should become unstable when its anode current is being measured, it can be stabilised by connecting a non-inductive condenser of about 0.1 μF from control grid (top cap) to chassis.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 TH4A	214	2·7	85	6·6
	Oscillator			
	36	2·0		
V2 VP4B	214	12·0	214	4·5
V3 Pen4DD	205	22·0	214	3·7
V4 1W4/350	365†	—	—	—

† Each anode, AC.

GENERAL NOTES

Switches.—**S1-S6** are the auto selector switches for the aerial circuit, and **S7-S12** those for the oscillator circuit. They are ganged together in a press-button unit, each button controlling two switches, one aerial and one oscillator. Thus the first button (on the right, looking at the front of the set) controls **S1** and **S7**, and so on.

When a button is depressed, its associated switches are *closed*, while in the "out" position of a button, its switches are *open*.

The switches, which are situated on both sides of the press-button unit, are all indicated in our under-chassis view.

S13. S14 are the tone-control switches, in a rotary unit at the front of the chassis. The individual switches are indicated in our under-chassis view. In the fully anti-clockwise position of the control **S13** is closed; in the central position **S14** is closed; and in the fully clockwise position both switches are open.

S15 is the QMB mains switch, ganged with the manual volume control, **R9.**

Coils.—**L1-L6** are the aerial tuning coils and **L7-L12** the oscillator tuning coils, in twelve separate tubular units beneath the chassis. Each coil is iron-cored, and is provided with an adjusting screw for station selection. All the coils are indicated in our under-chassis view.

Each pair of coils only covers a certain wavelength range, and in the standard model receivers these are as follows: **L1, L7,** 200-300 m; **L2, L8,** 200-300 m; **L3, L9,** 290-410 m; **L4, L10,** 390-540 m; **L5, L11,** 1,000-1,400 m; **L6, L12,** 1,450-1,900 m. It will be seen that the last two pairs of coils (the two left hand buttons) can only be used for LW stations.

L13, L14 and **L15, L16** are the two IF transformers, which are both unscreened, and are fixed-tuned by parallel fixed condensers. The first IF unit is on the chassis deck, and the second is beneath the chassis.

Pilot Lamp.—This is an MES type, rated at 6·2 V, 0·3 A.

Chassis Divergencies.—Resistance **R10** is not shown in the makers' diagram, while the tone control components **C22, R15, S13, S14** are shown connected from the junction of **C19, R9** to chassis.

V3 Connections.—The anode and cathode connections of the Pen4DD valve are reversed, compared with those of certain other similar types of valve.

STATION SELECTION

Stations are selected by adjusting the iron cores of the pairs of coils associated with the particular press-button to be used. Note that the stations receivable on any button are limited to the wave ranges given under "Coils" above.

Adjustment can be carried out on the actual stations, or by means of a signal generator.

As an aid to accurate setting, a wire link will be found between two tags on a piece of insulating material at the right of the coil adjustment strips beneath the chassis. If this link is temporarily removed, and a milliammeter (0-20 mA) connected across the two tags, the coil cores are then adjusted for *minimum* deflection on the milliammeter.

The milliammeter is actually connected in series with **L15** in the anode circuit of **V2.** After setting the stations, the wire link must be re-connected between the two tags.