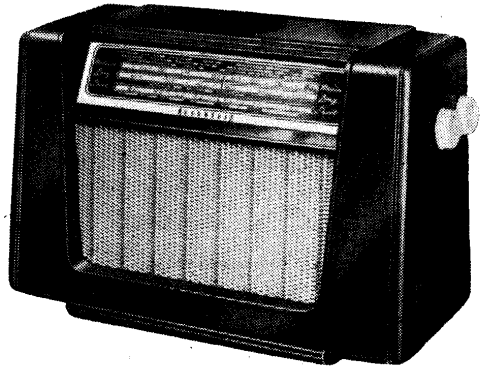


"TRADER" SERVICE SHEET
1062

REGENTONE P21

Low-voltage A.C./D.C. Superhet



DESIGNED to operate from A.C. or D.C. mains of high voltage or low voltage, the Regentone P21 is a 4-valve (plus rectifier) 3-band superhet covering the wave-band ranges of 16.6-50 m, 180-500 m and 1,000-2,000 m. The chassis is fitted at the top of the cabinet with the deck inclined towards the rear, permitting convenient access to valves and trimmers.

Release date and original price: February 1952, £13 4s 9d. Purchase tax extra.

CIRCUIT DESCRIPTION

Aerial input via coupling coil **L2** on S.W. and the bottom capacitance coupler **C4** on M.W. and L.W. to single-tuned circuits **L3, C28** (S.W.), **L4, C28** (M.W.) and **L5, C28** (L.W.) which precede triode-heptode valve (**V1, Brimar 14S7**) operating as frequency changer with internal coupling. **R1** shunts the **A** and **E** sockets to prevent the build-up of static charges on the aerial, and **L1** shunts the input to the aerial coils to prevent modulation hum. The **A** and **E** sockets are isolated from chassis by **C1, C2**. For local reception a plate aerial is provided which can be plugged into the **A** socket.

Oscillator grid coils **L6** (S.W.), **L7** (M.W.) and **L8** (L.W.) are tuned by **C29**. Parallel trimming by **C30** (S.W.), **C31** (M.W.) and **C7, C32** (L.W.); series tracking by **C8** (S.W.), **C9** (M.W.) and **C10** (L.W.). Inductive reaction coupling to

the oscillator anode by **L9** (S.W.), **L10** (M.W.) and **L11** (L.W.), with additional coupling across the common impedance of the trackers on all bands.

Second valve (**V2, Brimar 7B7**) is a variable-mu R.F. pentode, operating as

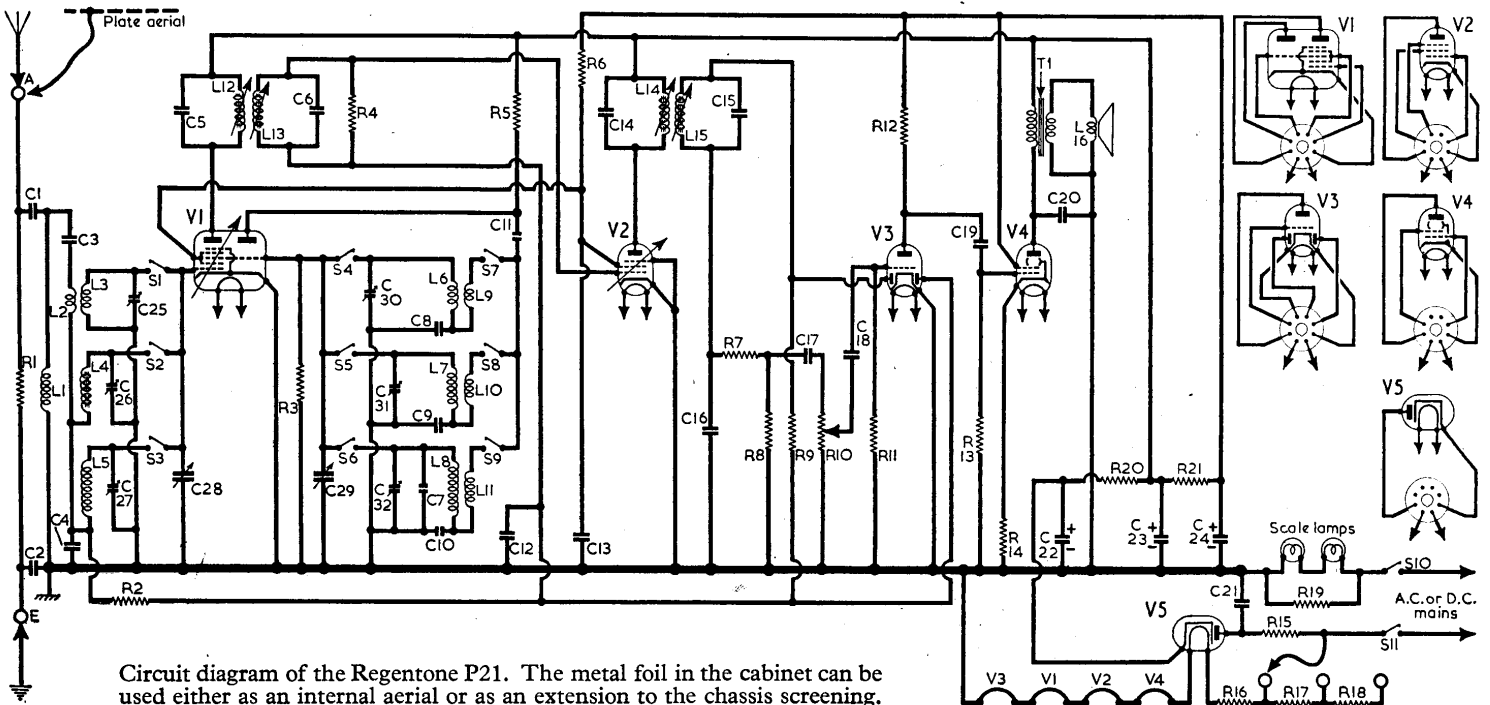
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COMPONENTS AND VALUES

CAPACITORS		Values	Locations
C1	Aerial and earth isolators ...	0.01μF	G3
C2		0.01μF	G3
C3	Aerial coupling ...	0.01μF	G3
C4		3,750pF	A1
C5	1st I.F. trans. tuning ...	100pF	B1
C6		100pF	B1
C7	L.W. osc. trim. ...	50pF	F4
C8	S.W. osc. tracker...	2,700pF	G4
C9	M.W. osc. tracker...	415pF	G4
C10	L.W. osc. tracker...	98pF	F4
C11	Osc. reaction coup.	50pF	F4
C12	A.G.C. decoupling	0.1μF	F3
C13	H.T. decoupling ...	180pF	E4
C14	2nd I.F. trans. tuning ...	100pF	C1
C15		180pF	C1
C16	I.F. by-pass ...	500pF	D3
C17	A.F. couplers ...	0.01μF	D3
C18		0.01μF	E3
C19	Mains R.F. by-pass	0.02μF	D4
C20	Tone corrector ...	0.01μF	D3
C21	Mains R.F. by-pass	0.01μF	F3
C22*	H.T. smoothing ...	16μF	B2
C23*		32μF	B2
C24*		8μF	B2
C25†		—	A1
C26†	S.W. aerial trim. ...	—	A1
C27†	M.W. aerial trim. ...	—	A1
C28†	L.W. aerial trim. ...	—	A1
C29†	Aerial tuning ...	—	G3
C30†	Oscillator tuning ...	—	G3
C31†	S.W. osc. trim. ...	—	A2
C32†	M.W. osc. trim. ...	—	A2
C33†	L.W. osc. trim. ...	—	A2

RESISTORS		Values	Locations
R1	Anti-static leak ...	1.2MΩ	G3
R2	A.G.C. decoupling	100kΩ	F3
R3	V1 osc. C.G.	47kΩ	F3
R4	V2 C.G. shunt ...	1.2MΩ	E3
R5	Osc. anode feed ...	22kΩ	F4
R6	H.T. feed ...	4.7kΩ	E3
R7	I.F. stopper ...	47kΩ	D3
R8	Signal diode load ...	270kΩ	E3
R9	A.G.C. decoupling	2.2MΩ	E3
R10	Volume control ...	250kΩ	C1
R11	V3 C.G. ...	10MΩ	E3
R12	V3 anode load ...	270kΩ	E4
R13	V4 C.G. ...	680kΩ	D4
R14	V4 G.B. ...	270Ω	D3
R15	V5 surge limiter ...	100Ω	E4
R16	Heater ballast ...	120Ω	D4
R17		786Ω	D4
R18		200Ω	E4
R19		60Ω	D4
R20	Scale lamp shunt...	1kΩ	F4
R21		10kΩ	E3

* Electrolytic. † Variable. ‡ Pre-set.



Circuit diagram of the Regentone P21. The metal foil in the cabinet can be used either as an internal aerial or as an extension to the chassis screening.

OTHER COMPONENTS		Approx. Values (ohms)	Locations
L1	Mod. hum choke ...	13·0	G3
L2	S.W. aerial coup. ...	—	A1
L3	Aerial tuning coils	—	A1
L4		2·6	A1
L5		33·0	A1
L6		5·0	G4
L7		14·5	F4
L8	Oscillator tuning coils	—	G4
L9		—	G4
L10	Oscillator reaction coils ...	1·4	G4
L11		3·3	F4
L12	1st I.F. trans. {Pri.	6·5	B1
L13		Sec.	6·5
L14	2nd I.F. trans. {Pri.	7·3	C1
L15		Sec.	5·3
L16	Speech coil ...	2·6	—
T1	O.P. trans. {Pri.	400·0	D3
S1-S9			
S10	Waveband switches	—	A2
S11		Mains sw., g'd R10	—

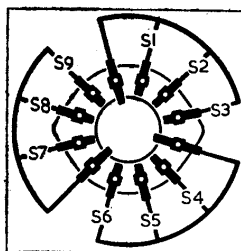


Diagram of the waveband switch unit (above) with the associated table (below)

Switch	L.W.	M.W.	S.W.
S1 ...	—	—	C
S2 ...	—	C	—
S3 ...	C	—	—
S4 ...	—	—	C
S5 ...	—	C	—
S6 ...	C	—	—
S7 ...	—	—	C
S8 ...	—	C	—
S9 ...	C	—	—

Circuit Description—continued.

intermediate frequency amplifier with tuned transformer couplings C5, L12, L13, C6 and C14, L14, L15, C15.

Intermediate frequency 470 kc/s.

Diode signal detector is part of double diode triode valve (V3, Brimar 7C6). Audio-frequency component in rectified output is developed across load resistor R8, and passed via C17, R10 and C18 to grid of triode section, which operates as A.F. amplifier.

Resistance-capacitance coupling by R12, C19 and R13 between V3 triode anode and beam tetrode output valve (V4, Brimar 35A5). Tone correction by C20 in the anode circuit and by the negative feed-back voltage developed across R14 in the cathode circuit.

H.T. current is supplied by I.H.C. half-wave rectifying valve (V5, Brimar 35Z3). Smoothing by R20, R21 and electrolytic capacitors C22, C23 and C24. Valve heaters, together with ballast resistors R16, R17, R18 and scale lamps, are connected in series across the mains input. R15 protects V5 and R19 protects the scale lamps from current surges.

CIRCUIT ALIGNMENT

I.F. Stages.—Remove chassis from cabinet and stand it in a convenient position on the bench. Connect output of signal generator, via an 0.05 µF capacitor in the "live" lead, to control grid (pin 6) of V1 and chassis. Switch receiver to M.W. and turn gang to maximum capacitance.

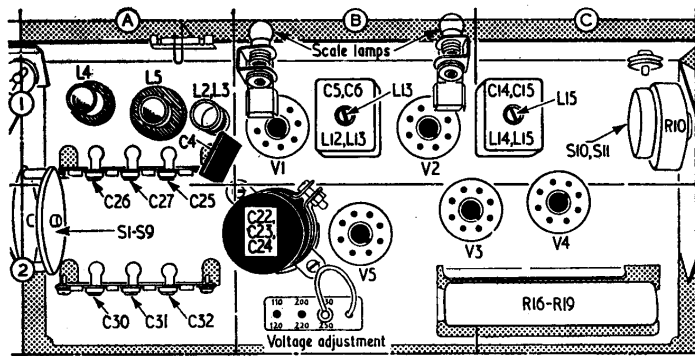
Feed in a 470 kc/s (638.3 m) signal and adjust the cores of L15, L14, L13 and L12 (location references C1, E3, B1) for maximum output, reducing the input as the circuits come into line to avoid A.G.C. action.

R.F. and Oscillator Stages.—As the tuning scale is fixed to the cabinet, the chassis should be replaced in the cabinet before commencing the following alignment. Check that with the gang at maximum capacitance the cursor coincides with the right-hand ends of the clear tuning scales. Connect signal generator output via a suitable dummy aerial to A and E sockets.

L.W.—Switch receiver to L.W., tune to 1,000 m, feed in a 1,000 m (300 kc/s) signal and adjust C32 (A2) and C27 (A1) for maximum output.

M.W.—Switch receiver to M.W., tune to 200 m, feed in a 200 m (1,500 kc/s) signal and adjust C31 (A2) and C26 (A1) for maximum output.

S.W.—Switch receiver to S.W., tune to 15 Mc/s, feed in a 15 Mc/s (20 m) signal and adjust C30 (A2) to the second peak obtained from the maximum capacitance



Plan view of the chassis. The waveband switch unit is seen on the left.

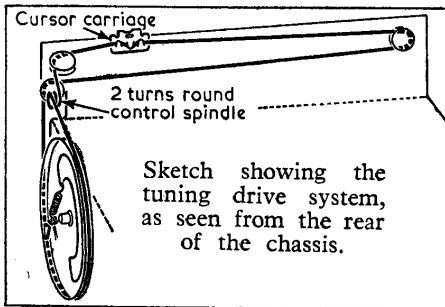
setting. Adjust C25 (A1) for maximum output while rocking the gang for optimum results.

GENERAL NOTES

Switches.—S1-S9 are the waveband switches, ganged in a 3-position rotary unit mounted at one end of the chassis deck. Its position is indicated in our plan chassis drawing, where an arrow indicates the direction in which it is viewed in the diagram inset beside the chassis drawing. The table below it gives the switch positions for the three control settings, starting from the fully anti-clockwise position of the control knob. A dash indicates open, and C, closed.

Scale Lamps.—The two scale lamps have small clear spherical bulbs and M.E.S. bases, and they are rated at 3.5 V, 0.15 A. They are shunted by a 60 Ω resistor R19.

Drive Cord Replacement.—About four feet of high grade flax fishing line, plaited and waxed, is required for a new drive cord, which should be run as shown in the accompanying sketch, where the tuning drive system is drawn as seen when viewed from above the rear left-hand corner of the chassis when the gang is at maximum capacitance. The cursor can be slipped on afterwards.



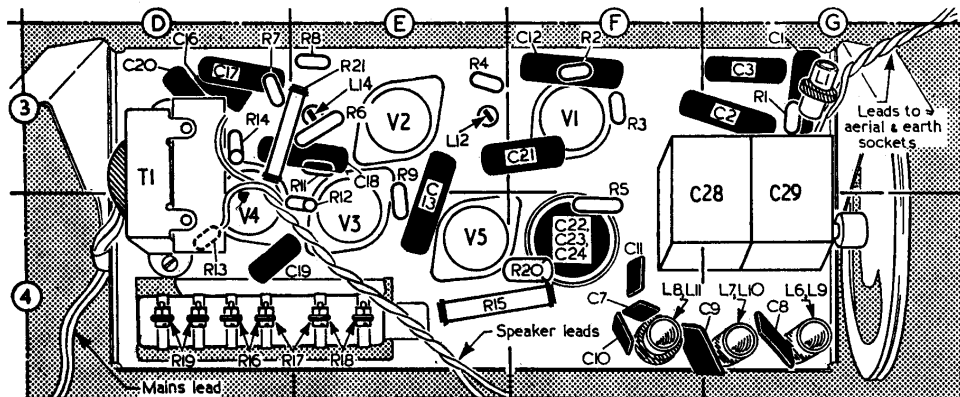
Sketch showing the tuning drive system, as seen from the rear of the chassis.

VALVE ANALYSIS

Valve voltages and currents given in the table below are those derived from the manufacturers' information, and are the average figures taken from a number of receivers which were operating from 230 V A.C. mains. The volume controls were set to minimum and the receivers were tuned to the high wavelength end of M.W. Voltage readings were measured with a 500 ohms-per-volt meter, chassis being the negative connection. The total H.T. current is given as 52 mA.

Valve	A node		Screen		Cath.
	V	mA	V	mA	
V1 14S7 ...	{ 181	2·2	87	3·3	—
	{ Oscillator				
	106	3·1			
V2 7B7 ...	181	7·3	87	1·8	—
V3 7C6 ...	44	0·16	—	—	—
V4 35A5 ...	167	34·0	107	1·4	8·7
V5 35Z3 ...	220†	—	—	—	226·0

† A.C. reading.



Underside view of the chassis. The aerial lead is mauve and the earth lead black.