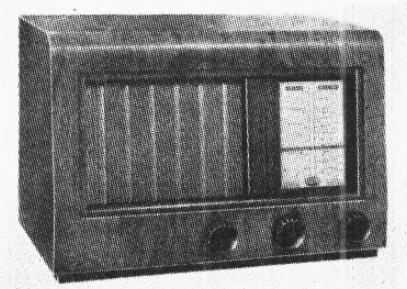
"TRADER" SERVICE SHEET 1168

EVER READY "SKY PRINCE"

All-dry 2-band Transportable Superhet



EMPLOYING a range of valves with low consumption (25 mA) filaments, the Ever Ready "Sky Prince" is a 2-band 4-valve transportable table superhet designed to operate from a single-unit all-dry battery. No provision is made for an external aerial or earth. The waveband ranges covered are 194-550 m and 920-2,000 m.

Release date and original price: August 1954, £10 12s 6d, *plus battery and purchase tax.*

CIRCUIT DESCRIPTION

Tuned frame aerial inputs by **L3,** loading coil **L2, C21** (M.W.) and **L3,** loading coils **L1, L2, C21** (L.W.) which precede heptode valve **(V1, Ever Ready DK96)** operating as frequency changer with electron coupling.

Oscillator grid coils **L4** (M.W.) and **L5** (L.W.) are tuned by **C22.** Parallel trimming by **C23** (M.W.) and **C23, C24** (L.W.); series tracking by **C6, C26** (M.W.) and **C6, C7, C25, C26** (L.W.).

Reaction coupling from anode circuit by **L6** (M.W.) and **L7** (L.W.) Oscillator stabilization by **R3.**

Second valve **(V2, Ever Ready DF96)** is a variable-mu R.F. pentode operating as intermediate frequency amplifier with tuned transformer couplings **C3, L8, L9, C4** and **C9, L10, L11, C10.**

Intermediate frequency 470 kc/s.

Diode signal detector is part of diode pentode valve **(V3, Ever Ready DAF96).** Audio frequency component in rectified output is developed across volume control **R7,** which acts as diode load, and passed via **C13** to control grid of pentode section, which operates as A.F. amplifier.

D.C. potential developed across **R7** is fed back as bias via decoupling circuit **R6, C1** to **V1** and **V2,** giving automatic gain control. I.F. filtering by **C11, R5, C12** and **C15.**

Resistance-capacitance coupling by **R10, C16** and **R11** between **V3** and pentode output valve **(V4, Ever Ready DL96).** Tone correction in anode circuit by **C17.** Grid bias for **V4** is obtained from the voltage drop across **R12** in the H.T.

(Continued col. 1 overleaf)

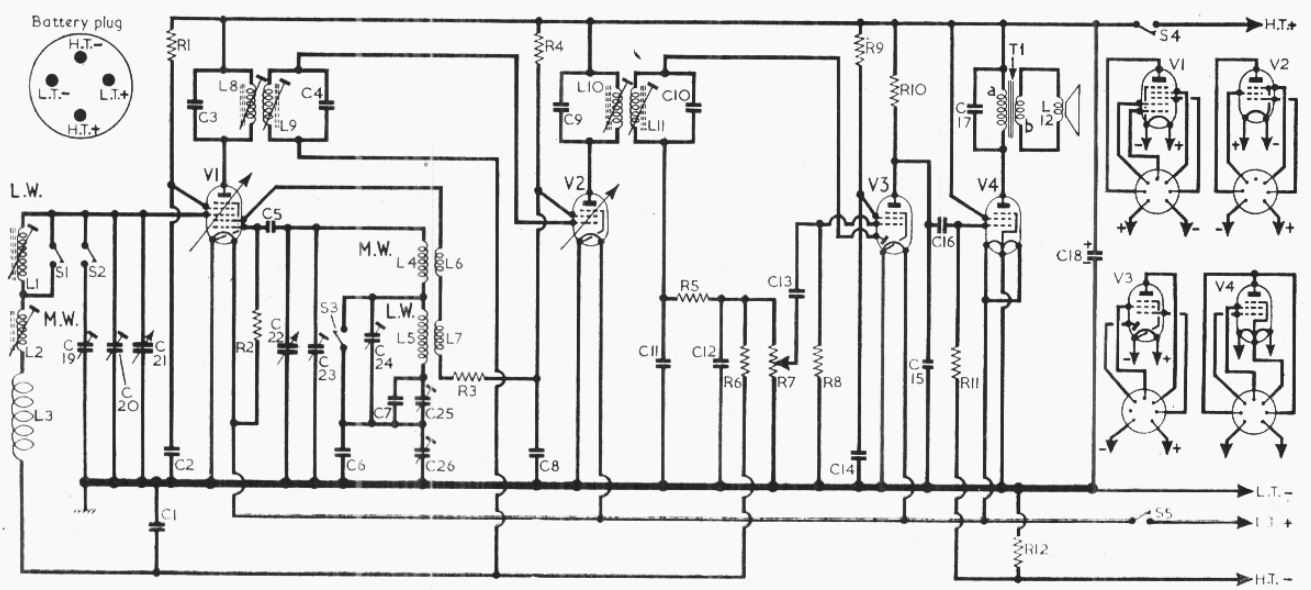
COMPONENTS AND VALUES

	RESISTORS	Values	Locations
R1	V1 S.G. decoupling	68kΩ	F4
R2	V1 osc. C.G. ...	100kΩ	F3
R3	Osc. stabilizer ...	2·2kΩ	F4
R4	H.T. decoupling ...	15kΩ	E4
R5	I.F. stopper ...	47kΩ	D4
R6	A.G.C. decoupling	2·2MΩ	E4
R7	Volume control ...	500kΩ	D3
R8	V3 C.G.	10MΩ	D3
R9	V3 S.G. decoupling	5·6MΩ	D4
R10	V3 anode load ...	1·2MΩ	D4
R11	V4 C.G.	2·2MΩ	D3
R12	V4 G.B.	560Ω	D3

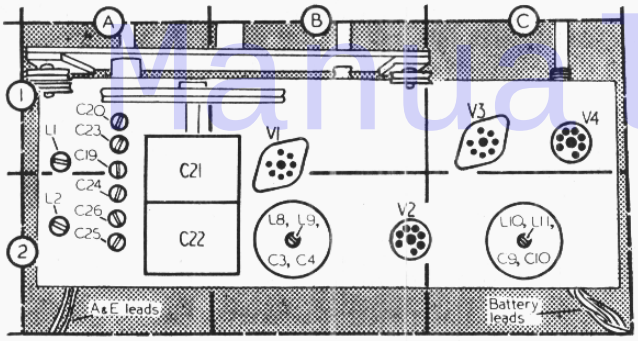
	CAPACITORS	Values	Locations
C1	A.G.C. decoupling	0·05μF	E4
C2	V1 S.G. decoupling	0·1μF	E3
C3	1st I.F. trans. tun.	100pF	B2
C4	1st I.F. trans. tun.	100pF	B2
C5	V1 osc. C.G. ...	60pF	F4
C6	M.W. osc. tracker...	350pF	G4
C7	L.W. osc. tracker...	150pF	G4
C8	H.T. decoupling ...	0·1μF	F4
C9	2nd I.F. trans. tun.	100pF	C2
C10	2nd I.F. trans. tun.	100pF	C2
C11	I.F. by-passes ...	100pF	D4
C12	I.F. by-passes ...	100pF	D3
C13	A.F. coupling ...	0·001μF	D3
C14	S.G. decoupling ...	0·1μF	D4
C15	I.F. by-pass ...	60pF	D3
C16	A.F. coupling ...	0·001μF	D3
C17	Tone corrector ...	0·002μF	D3
C18*	Battery reservoir...	8μF	F3
C19‡	L.W. aerial trim. ...	120pF	G3
C20‡	M.W. aerial trim....	25pF	G3
C21†	Aerial tuning ...	523pF§	A1
C22†	Oscillator tuning ...	523pF§	A2
C23‡	M.W. osc. trim. ...	60pF	G3
C24‡	L.W. osc. trim. ...	120pF	G4
C25‡	L.W. osc. tracker...	200pF	G4
C26‡	M.W. osc. tracker...	200pF	G4

*Electrolytic. †Variable. ‡Pre-set.
§"Swing" value, min. to max.

	OTHER COMPONENTS	Approx. Values (ohms)	Locations
L1	L.W. loading coil...	12·5	G3
L2	M.W. loading coil...	3·0	G4
L3	Frame aerial ...	1·5	—
L4	Oscillator tuning coils	2·0	G4
L5	Oscillator tuning coils	4·0	G4
L6	Oscillator reaction coils	3·0	G4
L7	Oscillator reaction coils	8·0	G4
L8	1st I.F. trans. Pri.	9·5	B2
L9	1st I.F. trans. Sec.	9·5	B2
L10	2nd I.F. trans. Pri.	9·5	C2
L11	2nd I.F. trans. Sec.	9·5	C2
L12	Speech coil ...	2·5	—
T1	O.P. trans. a ...	480·0	—
	O.P. trans. b ...	0·5	
S1-S5	Waveband/batt. sw.	—	E3



Circuit diagram of the Ever Ready "Sky Prince." No provision is made for the connection of an external aerial or earth.



Plan view of the chassis, showing all the R.F. and oscillator adjustments in locations A1 and A2.

Circuit Description—*continued*

negative lead to chassis. **C18** shunts the H.T. circuit to prevent instability as the internal resistance of the H.T. battery increases. The two halves of **V4** filament are connected in parallel to operate from the 1.5 V L.T. supply.

VALVE ANALYSIS

Valve voltages and currents given in the table below are those derived from the manufacturers' information. They were measured on a receiver which was operated from a new battery unit, and which was tuned to a point at the high wavelength end of M.W. where there was no signal input.

Voltages, except where otherwise indicated, were measured on the 100 V range of a 1,000 ohms-per-volt meter. Chassis was the negative connection in each case. The total L.T. consumption was 125 mA, and the total H.T. consumption was 9.8 mA.

Valve	Anode		Screen	
	V	mA	V	mA
V1 DK96	84·4	0·5	69·0*	0·15
	Oscillator			
	44·0	1·7		
V2 DF96	84·4	0·9	55·0*	0·3
V3 DAF96	38·0*	0·038	29·0*	0·06
V4 DL96	81·0	5·15	84·4	1·0

*Measured with electronic voltmeter.

GENERAL NOTES

Switches.—**S1-S5** are the waveband/battery switches, ganged in a single rotary unit beneath the chassis. This unit is indicated in our underside illustration of the chassis, and shown in detail in the diagram in column 2, where it is drawn as viewed from the rear of an inverted chassis. For M.W. operation **S1, S3, S4** and **S5** close, and for L.W. operation **S2, S4** and **S5** close. All the switches open in the "off" position.

Battery.—The battery specified by the manufacturers is an Ever Ready Batrymax type B136 combined H.T. (90 V) and L.T. (1.5 V) unit, which is fitted with a standard English 4-pin type valve base socket. The pins of the battery plug are identified in a sketch in the top left corner of the circuit diagram overleaf, where the plug is viewed from the free ends of the pins.

Drive Cord Replacement.—About 4½ft of high quality flax fishing line, plaited and waxed, is required for a new tuning drive. The tuning scale should first be removed by pressing out the six spring fasteners which secure it to the scale assembly. Then, with the gang at maximum capacitance, one end of the cord should be tied round the drive drum boss and led out clockwise round the drum as indicated in the sketch of the tuning drive system in column 3.

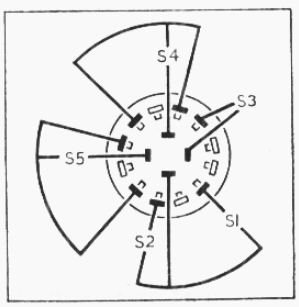


Diagram of the waveband/battery switches.

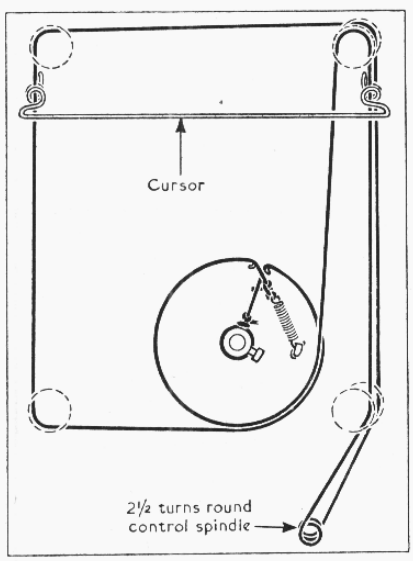
CIRCUIT ALIGNMENT

I.F. Stages.—Connect signal generator output to control grid (pin 6) of **V1** and chassis. Switch receiver to M.W., turn gang to maximum capacitance and unscrew the cores of **L8, L9, L10** and **L11.** Feed in a 470 kc/s (638.3 m) signal and adjust the cores of **L11** (location reference C2), **L10** (D4), **L9** (B2) and **L8** (F4) for maximum output. The cores of **L8** and **L10** are accessible through holes in the base of the cabinet. Repeat these adjustments until no further improvement results.

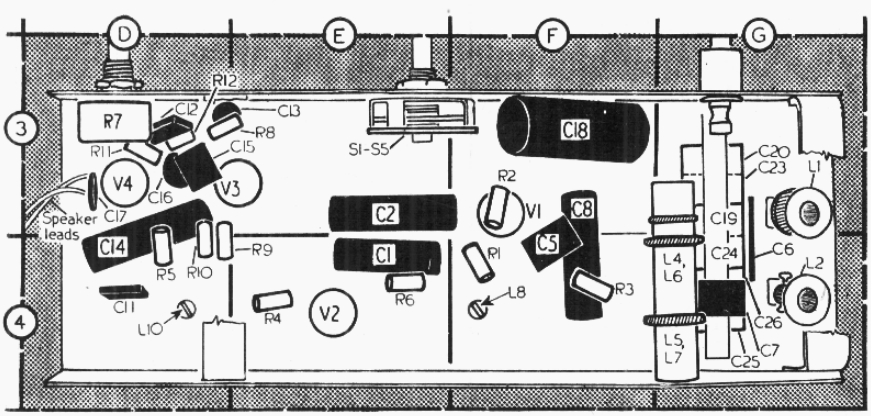
R.F. and Oscillator Stages.—The following adjustments should be made with the chassis in its cabinet and the battery in its normal position. Check that with the gang at maximum capacitance, the cursor coincides with the high wavelength ends of the M.W. and L.W. tuning scales. Transfer signal generator leads to a loop of wire placed parallel to and twelve inches away from the frame aerial.

M.W.—Switch receiver to M.W., tune to calibration mark between 200 m and 225 m on M.W. scale, feed in a 214.3 m (1,400 kc/s) signal and adjust **C23** (A1) and **C20** (A1) for maximum output. Tune receiver to 500 m, feed in a 500 m (600 kc/s) signal and adjust **C26** (A2) and the core of **L2** (A2) for maximum output. Repeat these adjustments until no further improvement results.

L.W.—Switch receiver to L.W., tune to 1,000 m, feed in a 1,000 m (300 kc/s) signal and adjust **C24** (A2) and **C19** (A1) for maximum output. Tune receiver to 1,700 m, feed in a 1,700 m (176.5 kc/s) signal and adjust **C25** (A2) and the core of **L1** (A1) for maximum output. Repeat these adjustments until no further improvement results. If the M.W. adjustments are subsequently altered, the complete R.F. and oscillator alignment must be repeated.



Above : Sketch of the tuning drive system.
Below: Under-side illustration of the chassis.



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