

"TRADER" SERVICE SHEET  
**1511**

# EVER READY "SKY CAPTAIN"

Also Covering the Berec "Buccaneer"

**E**MPLYING four low-consumption valves the Ever Ready "Sky Captain" is a battery portable receiver of conventional design. The complete receiver, with the exception of the 4in speaker, is wired on a single printed circuit panel. The panel is mounted with the speaker on a wooden baffle which has a plastics covering on its face side and forms the receiver front.

It is designed for M.W. and L.W. reception using an internal ferrite rod aerial and is powered by a combined H.T. and L.T. all-dry battery.

Waveband ranges are 192-545m (M.W.) and 187-1,070m (L.W.).

The Berec "Buccaneer" employs the same chassis housed in a similar cabinet.

Release date and original price (both models): April 1961, £7 3s 1d. Purchase tax extra.

### VALVE ANALYSIS

Valve voltages and currents shown in the table, col. 2, are derived from information supplied by the manufacturer.

Some electrodes are fed through high-value resistors and were measured with a high-impedance valve voltmeter. These readings are marked with an asterisk. All other readings were made with a 1,000Ω/V multirange meter.

The receiver was tuned to the low frequency end of the M.W. band and the volume control was set at maximum. Due allowance should be made for component tolerances.

### Valve Table

Valve	Anode		Screen	
	(V)	(mA)	(V)	(mA)
V1 DK96† ..	84	0.38	68*	0.1
V2 DF96 ..	84	1.45	67*	0.52
V3 DAF96 ..	42*	0.04	28*	0.01
V4 DL96 ..	82	5.3	84	1.0

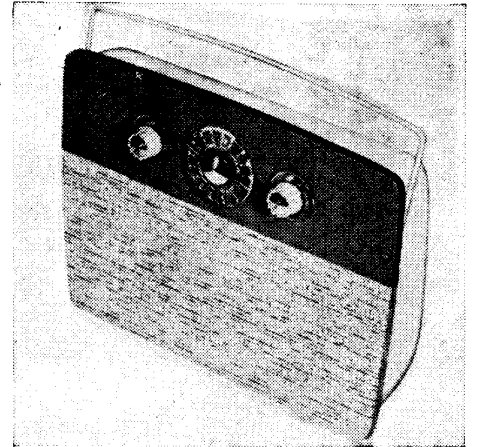
†V1 oscillator voltage (pin 3) 32.5V, measured with a high impedance electronic voltmeter. Oscillator current 1.4 mA.

\*Measured with a high input impedance electronic voltmeter.

### CIRCUIT DESCRIPTION

Input from the ferrite rod aerial L1 and L2 feeds directly into a heptode frequency changer V1. The aerial coils operate in

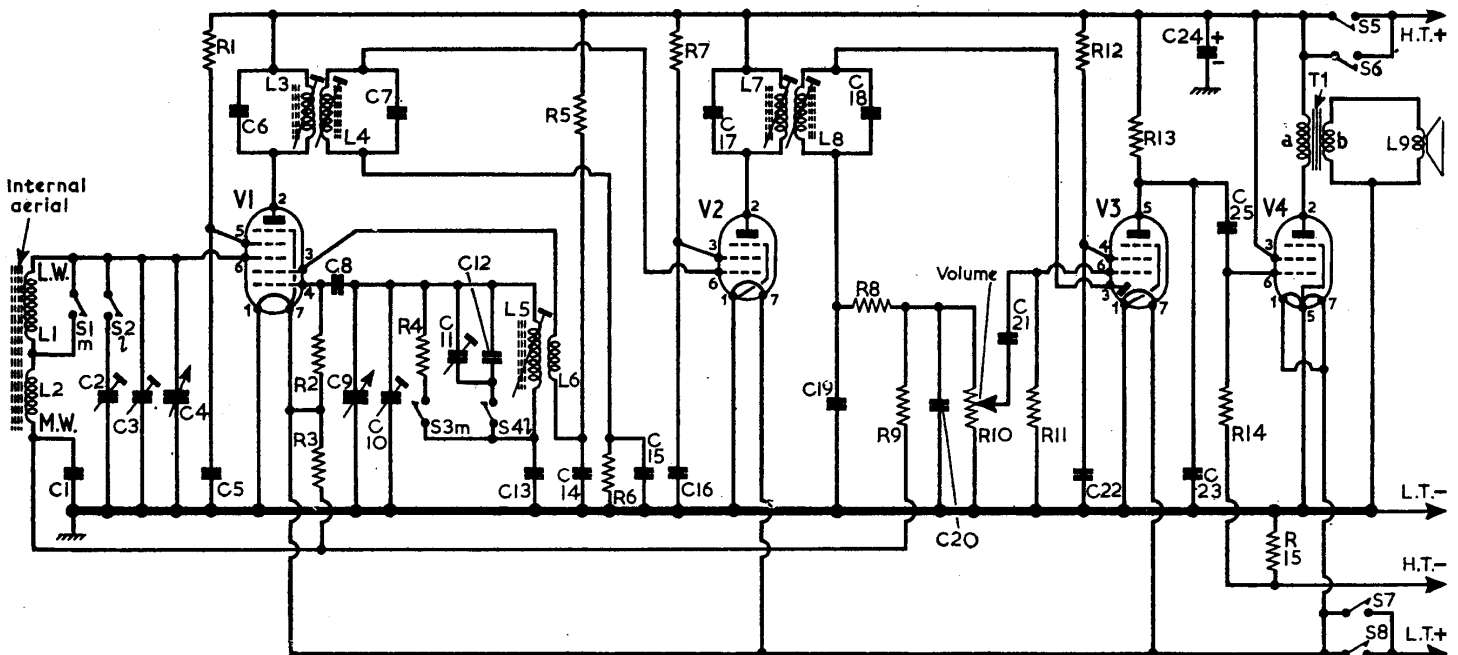
(Continued col. 1 overleaf)



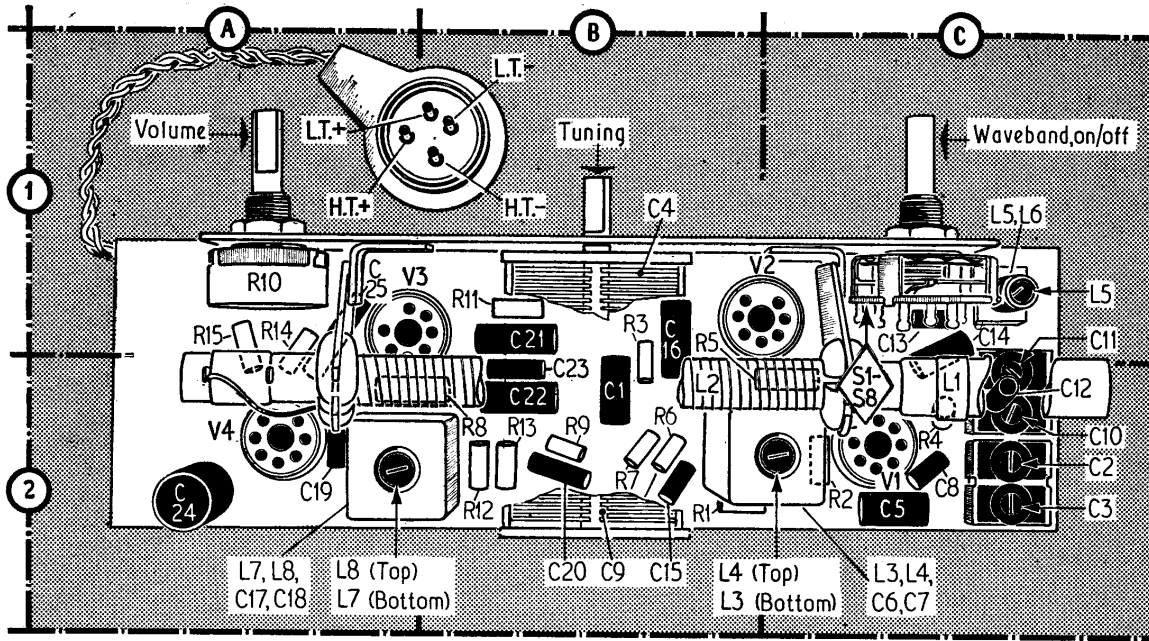
Appearance of the Sky Captain.

Resistors		Capacitors		Coils*		Miscellaneous*	
R1	150kΩ	B2	C3	60pF	C24	8μF	A2
R2	27kΩ	C2	C4	—	C25	0.01μF	A1
R3	2.2MΩ	B1	C5	0.04μF	<b>Coils*</b>		
R4	47kΩ	C2	C6	80pF	L1	8.5	C2
R5	33kΩ	C2	C7	80pF	L2	—	B2
R6	1MΩ	B2	C8	80pF	L3	17.0	C2
R7	39kΩ	B2	C9	—	L4	12.0	C2
R8	47kΩ	B2	C10	60pF	L5	4.0	C1
R9	2.2MΩ	B2	C11	200pF	L6	—	C1
R10	500kΩ	A1	C12	350pF	L7	17.0	A2
R11	10MΩ	B1	C13	575pF	L8	12.0	A2
R12	5.6MΩ	B2	C14	0.04μF	L9	3.0	—
R13	1.2MΩ	B2	C15	0.01μF	<b>Miscellaneous*</b>		
R14	2.2MΩ	A1	C16	0.04μF	T1	{ a 600.0	} —
R15	560Ω	A1	C17	80pF	S1-S8	—	
<b>Capacitors</b>		B2	C18	80pF			
C1	0.04μF	B2	C19	100pF			
C2	200pF	C2	C20	100pF			
		C2	C21	0.01μF			
		C2	C22	0.04μF			
		C2	C23	100pF			

\*Approximate D.C. resistance in ohms.



Circuit diagram of the Ever Ready Sky Captain and the Berec Buccaneer. Two pairs of battery on/off switches are shown, one pair is operated on each of the waveband positions.



Plan view of the receiver panel removed from the cabinet. The ferrite rod aerial and the gang unit capacitors are shown cut away to reveal components beneath.

**Circuit Description—continued**

series on L.W. and L1 is short-circuited on M.W. C2 is added in parallel with C3 and C4 by the closing of S2 to provide L.W. aerial trimming. G1 and G2 of V1 function as the local oscillator grid and anode and together with L5 and L6 comprise a series fed tuned grid oscillator. L6 is common to both wavebands and is damped by R4 on M.W. to regulate oscillator amplitude. Additional capacitance, C11 and C12, is switched in parallel on L.W.

Electronic mixing in V1 produces an intermediate frequency signal of 470kc/s which appears across I.F. primary winding L3. L3 and L4 are tuned at I.F. and are inductively coupled taking the signal to the input of I.F. amplifier V2. Amplified output from V2 is tuned-transformer coupled via L7 and L8 to the detector diode in V3.

The rectified audio output passes through filter components R8, C20 and is developed across load resistor R10. R10 also functions as the volume control and feeds the audio signal to the pentode section of V3 which operates as audio amplifier. The signal from V3 is fed to output valve V4 which drives the loudspeaker via step-down transformer T1.

H.T. current is fed via R15 in the negative battery supply lead and the resulting potential developed across R15 is employed as bias for V4. The negative potential which appears across R10 as a result of signal current, is fed via R9 to V1 as A.G.C. bias. C24 by-passes the internal resistance of the battery.

**CIRCUIT ALIGNMENT**

**Equipment Required.**—An accurately calibrated signal generator; an audio output meter or a model 8 Avometer set to its 2.5V A.C. range; an aerial coupling coil (constructed by winding 20 turns of 24 S.W.G. wire to make a coil 2½in long on a 4in-diameter former), and a screwdriver-type trimming tool.

- 1.—Switch to M.W., set volume control to maximum and tuning capacitor to its fully meshed position.
  - 2.—Connect the output meter (or Avometer, leaving the speaker connected or replaced by a 30hm dummy load) across the output transformer secondary winding. Connect the signal generator between the signal grid of V1 (pin 6) and chassis.
  - 3.—Feed in a modulated 470kc/s signal and adjust the cores of L8, L7 (location reference A2) and L3, L4 (C2) for maximum output, reducing the input signal to the lowest convenient working level as each circuit comes into line. Where two peaks occur the one which is obtained with the core nearer the outer of the former is correct.
  - 4.—Re-adjust cores for absolute maximum output.
- R.F. Circuits.**—It is essential that M.W. alignment is carried out before that of L.W., since the M.W. coils and trimming capacitors are also in circuit on L.W., relating L.W. adjustment to the setting of the M.W. circuits.
- 5.—Disconnect the signal generator from the receiver and connect its output leads across the coupling coil. Lay the coupling coil about two feet away from the receiver, coaxial with the ferrite rod aerial.
  - 6.—Switch to M.W. and tune to 500m on scale. Feed in a 600kc/s signal and adjust L5 (C1) for maximum output.
  - 7.—Tune receiver to 214m by setting the scale to the small unnumbered square on the L.F. side of 200m. Feed in a 1,400kc/s signal and adjust C10 and C3 (C2) for maximum output.
  - 8.—Re-tune receiver to 500m and feed in a 600kc/s signal. Rock the tuning capacitor about the 500m mark, at the same time adjusting L5 for maximum output at 500m.
  - 9.—Re-tune to 214m. Feed in a 1,400kc/s signal and re-adjust C10

- and C3 for maximum output.
- 10.—Switch to L.W. and tune to the small unnumbered square on the H.F. side of 1,100m. Feed in a 280kc/s signal and adjust C11 (C2) for maximum output.
- 11.—Tune to 1,400m and feed in a 214kc/s signal. Rock the tuning capacitor about the 1,400m mark at the same time adjusting C2 (C2) for maximum output at 1,400m.

**GENERAL NOTES**

- Dismantling.**—Slacken grub screws and remove volume and wavechange knobs. Pull off tuning knob. Remove cabinet back (two brass screws) and take out battery. Note coding on output transformer connections and unsolder leads. Remove large hexagonal nuts from the volume and waveband control spindles. Remove chassis.
- Battery.**—The battery recommended by the manufacturers is Ever Ready "Batrymax" type B141 (combined H.T. and L.T.). Battery consumption, with H.T. 90V and L.T. 1.5V, is H.T. 10.2mA and L.T. 125mA.
- Switches.**—S1-S4 are the waveband switches; S5-S8 are battery on/off switches. They are combined in a 4 pole 3 way rotary unit shown in location reference C1. A diagram of the switch contacts is shown in this column below.
- Where a switch number is followed with a letter m or l, that switch closes on M.W. or L.W. respectively.

Diagram of the switch wafer as seen when looking into the rear of the receiver.

