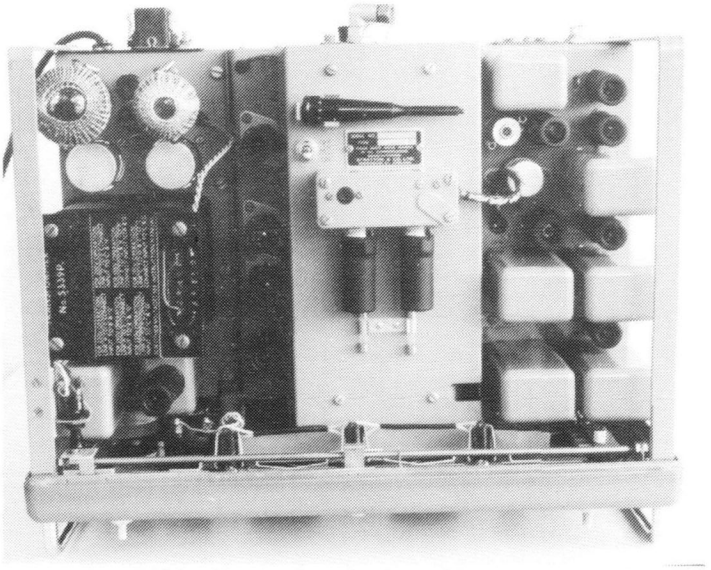
THE EDDYSTONE 730/4 GENERAL COVERAGE RECEIVER

by BEN NOCK

THE 730/4 general coverage receiver, made by Stratton & Co. Ltd of Birmingham 31, was in 1959 a very nice piece of equipment. Indeed, by today's standards it is still a very nice receiver to drive. Yes, it is valved; yes, it does weigh a 'tonne', but nevertheless it still has a feel and a quality that makes tuning around the bands very much of a joy with this set. It is one of a number of Eddystone receivers of its era, all of a similar styling, covering frequencies up to the gigahertz range.



Eddystone 730/4: Above-chassis view with case removed

The set uses 15 valves, and has two RF stages of amplification, two IF stages of amplification, stabilised HT for VFO and BFO, audio filter, crystal IF filter, crystal calibrator and a noise limiter. The set tunes from 480kHz to 30MHz in 5 bands, and is a single conversion superheterodyne with an IF of 450kHz. The oscillator is on the high side of the received frequency. The actual coverage for each band is:

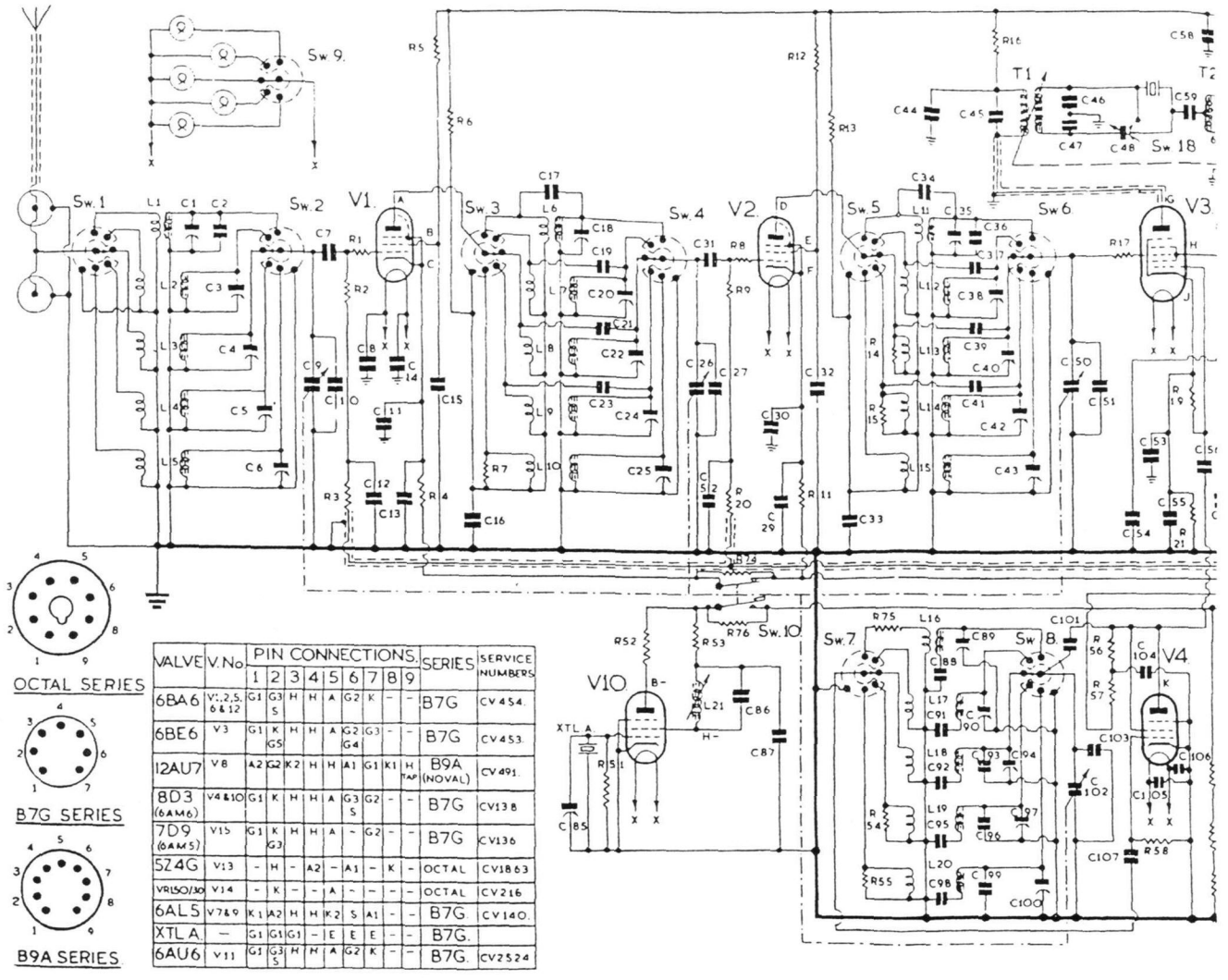
Band 1	12.3-30.00MHz
Band 2	5.3-12.5MHz
Band 3	2.5-5.7MHz
Band 4	1.11-2.5MHz
Band 5	480-1100kHz

The valve types used are as follows:

6BA6	V I (RF amp. 1), V2 (RF amp. 2), V5 (IF amp. 1), V6 (IF amp. 2), V12 (BFO)
6BE6	V3 (Mixer)
12AU7	V8 (Audio pre-amps I & 2)
6AM6	V4 (local osc.), V10 (crystal calibrator)
6AM5	V15 (audio output)
6AL5	V7 (detector/AGC), V9 (S-meter/noise limiter)
6AU6	Vl1 (IF amp. (output feed))
5Z4G	V13 (double diode rectifier)
VR150/30	V14 (voltage regulator)

The general appearance of the set is in the traditional Eddystone die-cast case, fluted sides, large chromed grab-handles the full height of the set at each end of the front panel, with large, easy to use, black knobs. The slate grey case is contrasted by a black scuff panel behind the knobs and controls, each control identified with silver lettering. The Eddystone badge takes pride of place in the upper centre of the front panel.

The tuning scale is nearly the full width of the receiver. It is large and rectangular, with a moving vertical cursor and a logging scale that appears in a centre window cut-out. The band in use is indicated by one of a vertical row of miniature bulbs to the right of the dial area. Two large black knobs are centrally located, one for band selection, the other main tuning, a large flywheel inside ensuring a very smooth tuning action. The remaining controls are fitted with smaller black knobs or comprise chromed toggle switches. The two stages of RF amplification are AGC-controlled to the g_1 pins, with the manual RF gain being in the cathode leads of the two RF stages and the second IF stage.



VALVE	V.No	PIN CONNECTIONS 1	2	3	4	5	6	7	8	9	SERIES	SERVICE NUMBERS
6BA6	V1,2,5,6&12	G1	G3 S	H	H	A	G2	K	-	-	B7G	CV454
6BE6	V3	G1	K G5	H	H	A	G2 G4	G3	-	-	B7G	CV453
12AU7	V8	A2	G2	K2	H	H	A1	G1	K1	H TAP	B9A (NOVAL)	CV491
8D3 (6AM6)	V4&10	G1	K	H	H	A	G3 S	G2	-	-	B7G	CV138
7D9 (6AM5)	V15	G1	K G3	H	H	A	-	G2	-	-	B7G	CV136
5Z4G	V13	-	H	-	A2	-	A1	-	K	-	OCTAL	CV1863
VR150/30	V14	-	K	-	-	A	-	-	-	-	OCTAL	CV216
6AL5	V7&9	K1	A2	H	H	K2	S	A1	-	-	B7G	CV140
XTL A	—	G1	G1	G1	-	E	E	E	-	-	B7G.	
6AU6	V11	G1	G3 S	H	H	A	G2	K	-	-	B7G.	CV2524

Circuit of the 730/4 receiver. All drawings in this article are reproduced from the equipment handbook, by kind permission of the Managing Director of Eddystone Radio Limited

The IF stages, also having AGC applied to them, have variable IF transformers along with the crystal filter to give a wide range of selectivities for different modes of reception. There is a four-position switch that alters the coupling of the IF transformers to affect the selectivity. A 'phasing' knob brings the crystal filter into operation and these two controls, along with the switchable audio filter, afford a high degree of choice in the range of selectivity available. Indeed, it takes some practice to obtain the best from these three controls.

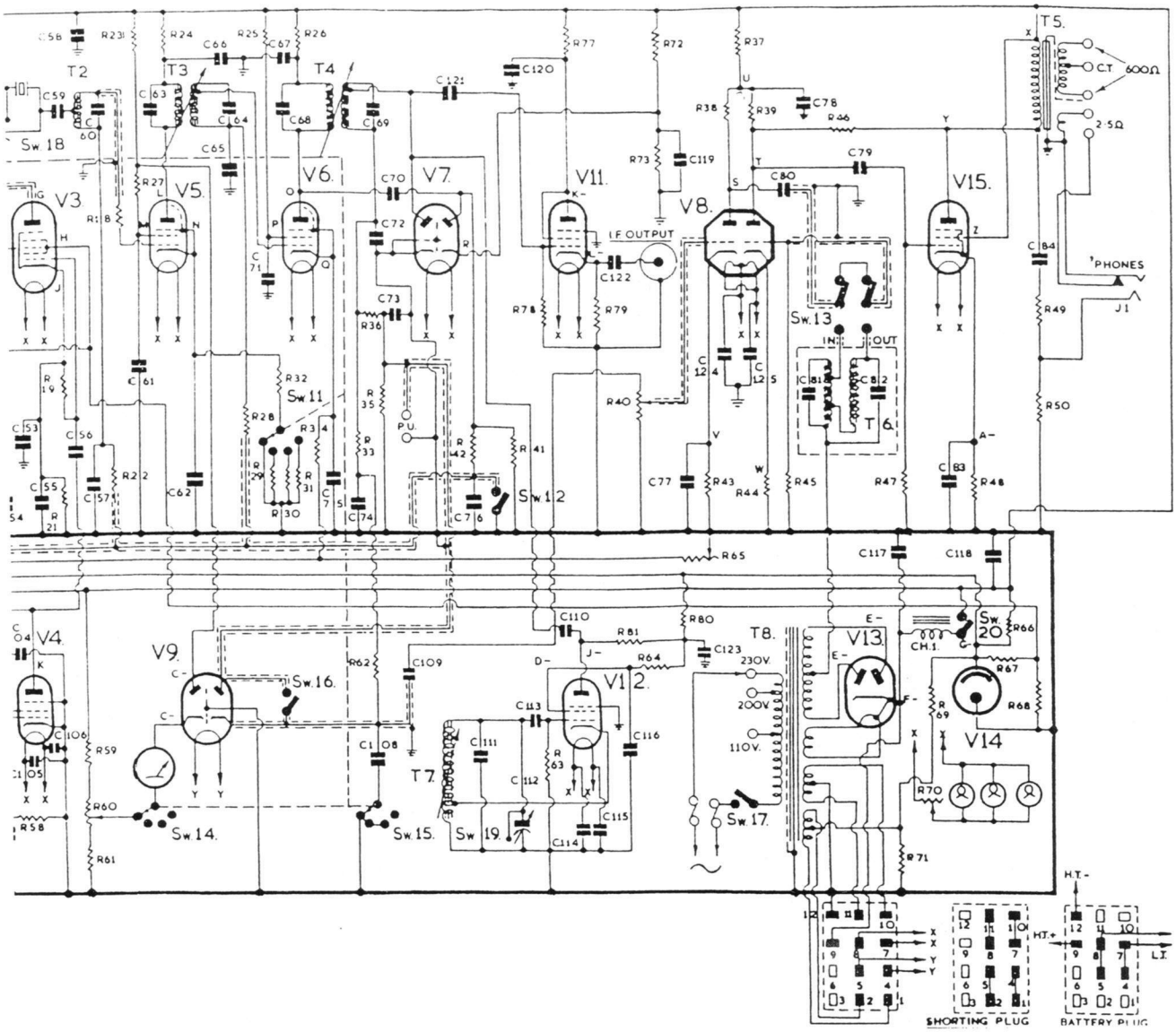
The IF bandwidths with the different settings are approximately:

widest setting	10kHz at -3dB
first reduction	4kHz at-3dB
second reduction	2kHz at-3dB
max. reduction	1.3kHz at -3dB
max. red. + xtal filt.	0.5kHz at -3dB

These figures are estimated from the IF response curves in the manual.

The BFO and crystal IF phasing controls are unusual in that, with the BFO tuning control fully anticlockwise and the phasing fully clockwise those functions are off; turning the BFO tuning knob clockwise brings the BFO into operation, turning the phasing knob anticlockwise activates the crystal. The supply volts are permanently connected to the BFO, the tuning capacitor effectively being shorted out when turned anticlockwise past a pre-set point.

The audio output is transformer-coupled to 2.5Ω and 600Ω sockets on the rear apron. A front-panel mounted 'phone jack, high impedance, disconnects the loudspeaker (low impedance) output when used. Also available on the rear apron is a low-impedance IF take off, for use with such items as a panoramic adapter. A



rear-mounted variable resistor allows the brightness of the dial lamps to be adjusted.

The 500kHz crystal calibrator is operated by a push button on the upper left front of the receiver. The position of the dial cursor can be adjusted by altering a small knurled knob situated on the upper right of the front panel.

The set was designed for mains operation, 110 or 230 volt 50/60Hz, consuming 80 watts. A multi-pin plug assembly on the rear apron allows an external supply to be used.

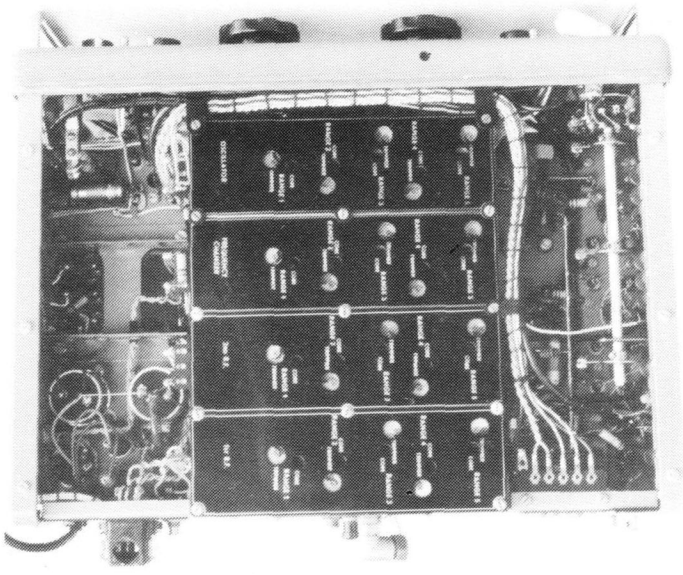
SERVICING THE SET

The cabinet is removed after four large screws on the rear of the set are released. An initial check that all the valve heaters are alight and that the VR150/30 is emitting a violet glow can be easily made.

Unless one is skilled in the alignment of receivers, in which case you probably will not be reading this, it is unwise to judge the effects of adjustments by ear alone. The alignment assumes therefore that a signal generator (450kHz to 32MHz with 30% AM modulation) is available, along with some form of test meter capable of measuring watts at audio frequencies. A multimeter measuring volts across a resistor fitted to the speaker terminals will give an indication though.

IF amplifier

Due to the complexity of the IF stages a wobbulator is recommended for any serious alignment work. It is unlikely that a fault will develop within the IF transformers, and adjustments of these should not be disturbed unless absolutely necessary. For checking purposes the following figures are given, all leads connected in the set, so therefore not strictly true ones but quite adequate for comparison. Test condition: RX Range 5, AGC & NL OFF, Pitch OFF, Xtal Phase OFF,



Chassis: underneath view

Selectivity Maximum, RF gain Maximum. Signal generator 30% modulation, direct output. 50mW output at speaker terminals for 11 mV at grid 1 of V6, or 220mV at grid 1 of V5

To measure the overall sensitivity of the IF amplifier at the grid of V3 (frequency changer), will require unsoldering the lead at point X marked in the underneath view shown. The signal generator is injected at this point, 20µV input should give 50mW at the speaker terminals.

Oscillator alignment

All receivcr controls are left as for the IF check. A crystal oscillator or thc internal crystal calibrator, if known to be correct, should he connected to the aerial terminal. Set the receiver to range 1, BFO to centre position, and check calibration at 28MHz and 14MHz. To allow for subsequent calibration adjustments ensure the vernier pointer is set at the mid-point of its travel.

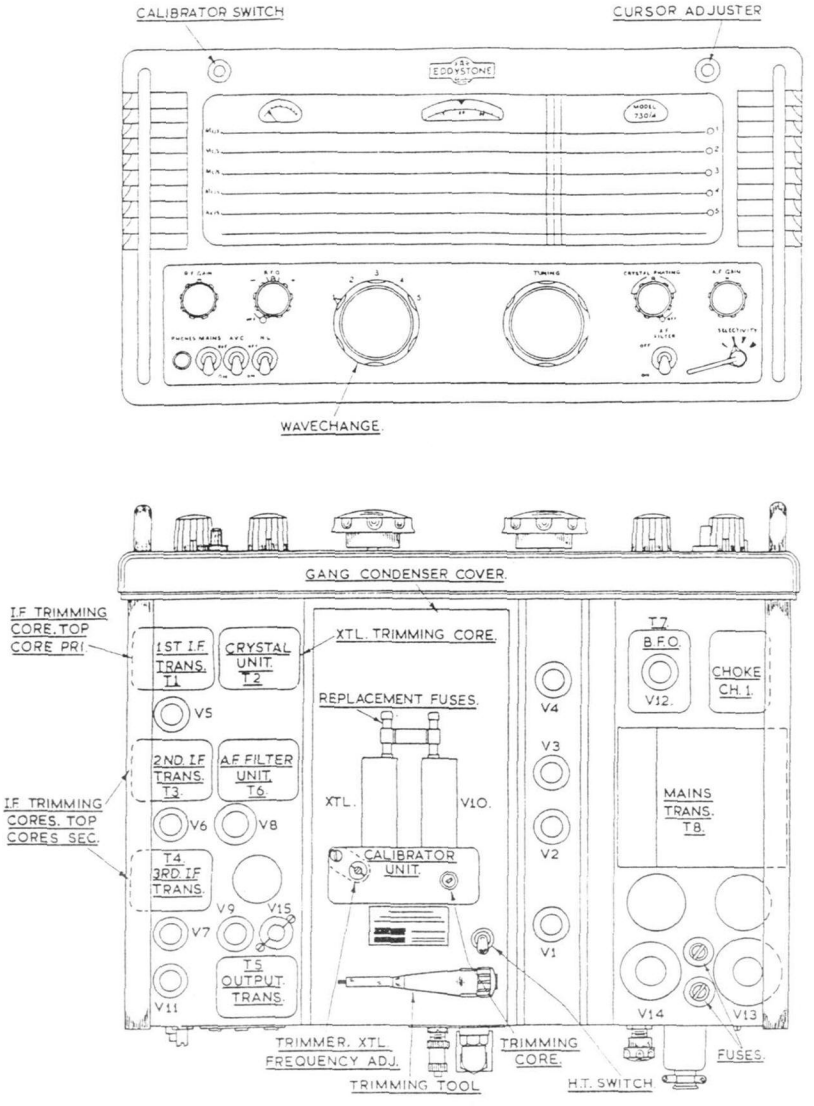
If the 28 and 14MHz points are appreciably off then correct the 14MHz calibration by adjusting range 1 oscillator *core*. The 28MHz point should he corrected using the associated *trimmer*. The other bands follow the same pattern.

	Trimmer	Core
Range 1	28MHz	14MHz
Range 2	12MHz	6.0MHz
Range 3	5.6MHz	2.5MHz
Range 4	2.5MHz	1.2MHz
Range 5	1.0MHz	500kHz

RF alignment

Using the signal generator set to give 10µV, switch off the BFO, receiver on range 1 tuned to 13.3MHz, inject a 13.3MHz modulated signal into the aerial socket. Use the RF gain control to keep the S-meter needle on the scale. Adjust the *cores* only of the two RF coils and one frequency changer coi for that band. Tune for highest output on meter.

Next, tune set to 28MHz, inject 28MHz from generator and adjust the three appropriate *trimmers*. Repeat the above until no further improvement is possible. Using the same procedure repeat for the other ranges.



Front panel and chassis top views

	Trimmer	Core
Range 1	28MHz	13.3MHz
Range 2	12MHz	6.0MHz
Range 3	5.4MHz	2.6MHz
Range 4	2.3MHz	1.2MHz
Range 5	1.0MHz	520kHz

Always adjust the *trimmers* at the high frequency end of the band and the *cores* at the low frequency end.

Sensitivity

For a signal to noise ratio of 15dB, output 50mW:
AM signal modulated 30 % at 400Hz : better than 5μV
CW signal ranges 1, 2, 3, 4: better than 1μV
CW signal range 5: better than 2μV

GENERAL USAGE

Using the receiver is a joy. The large scale and the smooth tuning control allow easy progression through the bands. The variable selectivity, whilst taking some mastering, does allow the weakest of stations to be extracted from a pile-up. The considerable reduction of the tuning knob, 60 complete turns to cover the entire scale, means that even on the most cramped of the ranges, range 1, 12.3 to 31MHz, there is sufficient movement of the knob to make station separation easy.

The set is, by modern standards, large and heavy but against this must be considered the fact that it is a piece of engineering the like of which will not be seen again. Lots of design hours went into this and the other sets of the range, giving ease of operation, reliability and a 'feel' that is not apparent in modern, plastic-cased replacements. It is simply one of the better short wave receivers.

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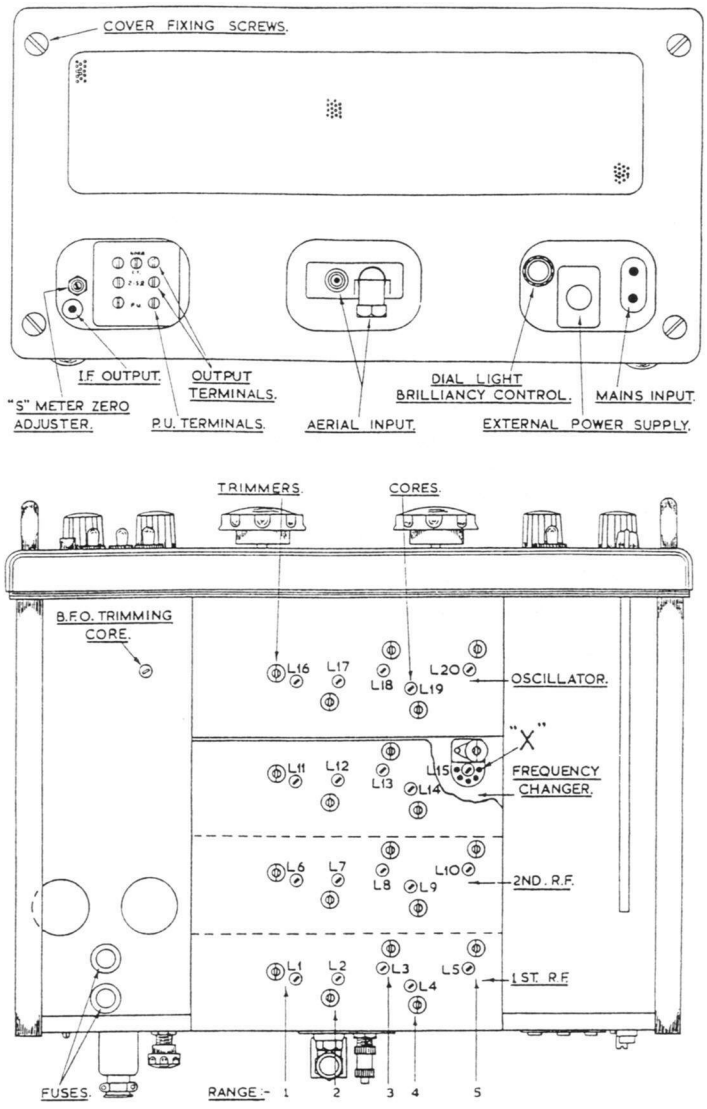
THE EDDYSTONE USER GROUP

The Eddystone User Group is a society of collectors and users of Eddystone radios. Membership benefits include a bi-monthly newsletter and access to the Group's collection of Eddystone documents and technical information.

For subscriptions, the Eddystone year commences in May. Members joining at other times will receive all of the previous newsletters for that year and a renewal notice the next May. Subscription: £11. Cheques (UK currency only) should be made payable to Eddystone User Group and sent to Graeme Wormald G3GGL, 15 Sabrina Drive, Bewdley, Worcs DY12 2RJ, UK.



Rear panel and under-chassis views

Eddystone radio kindly supplied by Bruce DeLacy