

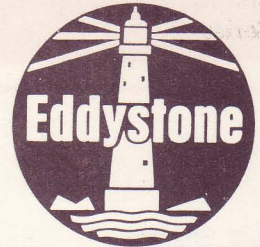
## Eddystone Radio Limited

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# General - Purpose HF/MF Communication Receivers

# 1830 Series

General Description The '1830 Series' comprises five receivers of similar basic design, each of which provide reception facilities for CW, MCW, AM & SSB transmissions in the band 120kHz to 31MHz. Internal power units are fitted for AC working (all standard 40-60Hz voltages) and the receivers can also be powered directly from a 12V or 24V battery (any arrangement including floating supply). All versions are equally suited to general-purpose or maritime applications and the standard production version (Model 1830/1) has been approved by the British Ministry of Posts and Telecommunications as a reserve receiver for use on ships. A list of current 1830 variants is included on the reverse of this sheet.

The receivers are fitted with 483mm (19in) panels to suit standard racking and are also available complete with cabinet for use in bench-mounted installations. Shock-mounts can be added for mobile use and other accessories include a cabinet loudspeaker unit and a plinth loudspeaker in matching style.

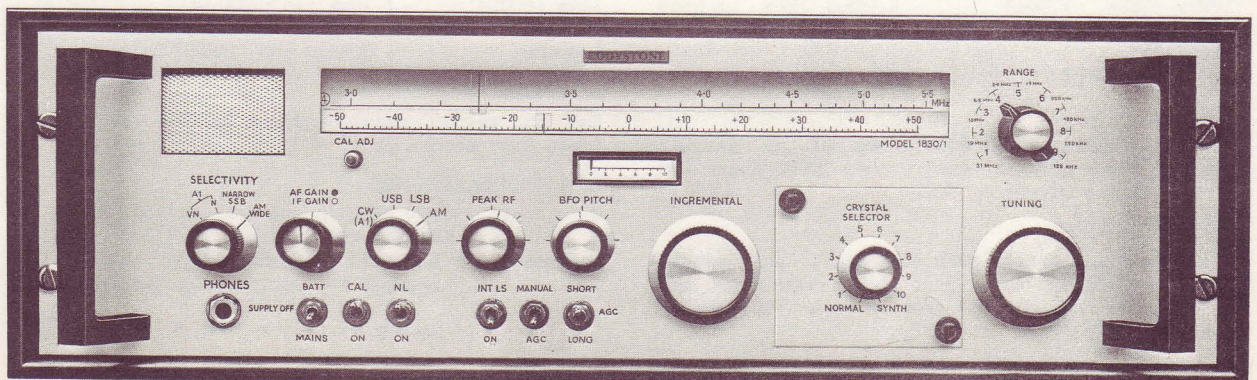
The same basic circuit configuration is employed in all 1830 receivers, using single-conversion below 1.5MHz and double-conversion from 1.5MHz up. In the latter mode of operation, the 1st IF is tunable and this provides an extremely useful incremental tuning facility giving wide band-spread throughout the HF band. An incremental coverage of  $\pm 50$ kHz is available with sensibly linear calibration and near constant tuning rate: frequencies can be set to within 1kHz after the main scale has been standardised against the internal crystal calibrator.

All variants of the 1830 incorporate a separate 1st Oscillator circuit for crystal-controlled operation in the band 1.5-31MHz. Versions are available with provision for 10-channel and 50-channel working and either can also be used in conjunction with an outboard synthesizer when greater flexibility in frequency selection is required. The incremental facility is normally retained when using the receiver in this manner but provision is also made for fitting a single crystal in the 2nd Oscillator if full control is required in an unattended installation.

Selectivity is adjustable to suit signal mode and a crystal filter is included for narrow-band CW reception. A separate detector is used when taking CW and SSB transmissions, the associated beat oscillator being switched to serve as carrier insertion oscillator for USB/LSB selection. A noise limiter is fitted and 100kHz IF output is available for use with ancillaries.

Audio outputs are provided for loudspeaker, headset and line, the line output being fed from an independent low-level amplifier with separate pre-set gain adjustment. A small monitor loudspeaker is fitted behind the panel and other standard features include separate RF and IF AGC systems with selectable time constant, an integral carrier-level meter and provision for dual diversity working. Unusual facilities can be incorporated to special order and enquiries are invited for other variants to meet special requirements.

- Incremental facility with 1kHz readout
- Crystal control - 10 or 50 channel option
- Provision for synthesized working
- Crystal calibrator
- Desensitizing relay
- Bandpass input
- FET/MOSFET front-end withstands 30V r.m.s.



GENERAL SPECIFICATION

Frequency Coverage

120kHz to 31MHz in nine ranges. Double-conversion is used above 1.5MHz with incremental facility of  $\pm 50$ kHz and provision for crystal-controlled operation. 10 channels on Models 1830/1, /3 & /5, 50 channels on Models 1830/2 & 1830/4.

Ranges: (1) 18-31MHz, (2) 10-19MHz, (3) 5.5-10MHz, (4) 2.9-5.5MHz, (5) 1.5-2.9MHz, (6) 920-1750kHz, (7) 480-950kHz, (8) 240-480kHz, (9) 120-250kHz.

Models 1830/3 & 1830/4 have modified coverage on Ranges 7 and 8 (400-535kHz, 200-400kHz) and gap in overall coverage from 535kHz to 920kHz.

Intermediate Frequencies

1st IF\* :: 1350kHz (Tunable 1300-1400kHz to provide incremental facility).

2nd IF :: 100kHz.

BFO/CIO ::  $\pm 5$ kHz swing at 'CW' and  $\pm 100$ Hz at 'USB' & 'LSB'.

(\* ) Used on Ranges 1-5 only.

Reception Modes

A1, A2 & A2H telegraphy. A3, A3A, H & J telephony with upper/lower sideband selection at 'SSB'.

Environmental

Operational:  $0^{\circ}\text{C}/+50^{\circ}\text{C}$ . Storage:  $-20^{\circ}\text{C}/+70^{\circ}\text{C}$ .

Aerial Input

75 $\Omega$  unbalanced on all ranges - BNC connector.

Power Supplies

AC :: 100/130V or 200/260V (40-60Hz single-phase). Consumption of the order 16VA.

DC :: 12V or 24V (+ve earth, -ve earth or floating supply). Consumption : 700mA at 1.5W audio output, 320mA quiescent.

Dimensions and Weight

Rack-mounting style:-

Panel : 483mm x 133mm (19in x 5.25in).

Intrusion into rack : 334mm (13.125in).

Weight : 13.1kg (29lb).

Cabinet style:-

Width : 502mm (19.75in).

Height : 164mm (6.5in) including mounting feet.

Weight : 18.1kg (40lb).

Models 1830/2 & 1830/4:-

Depth of panel on these versions is increased to 222mm (8.75in) to permit installation of the five plug-in crystal boxes required for 50-chan. wkg.

1830 Variants

1830/1 :: Standard production version, approved by British MP&T as Reserve Receiver for use on ships. 10 crystal channels.

1830/2 :: Variant of 1830/1 with provision for 50 crystal channels. 222mm panel height.

1830/3 :: As 1830/1 but with gap in coverage from 535-920kHz. 10 crystal channels.

1830/4 :: Variant of 1830/3 with provision for 50 crystal channels. 222mm panel height.

1830/5 :: Variant of 1830/1 with special SSB filter in lieu of '3kHz' selectivity posn.

TYPICAL PERFORMANCE †

Sensitivity

3 $\mu$ V for 15dB S+N/N ratio (AM mode with 3kHz B/W).

IF Selectivity

Position	-6dB	-60dB
A1 - VERY NARROW	0.1kHz	2kHz
A1 - NARROW	1.3kHz	4.5kHz
AM - NARROW (SSB)	3.0kHz	9.0kHz
AM - WIDE	8.0kHz	18.0kHz

Frequency Stability

(After 15-min warm-up with free-running 2nd Osc.). 1 part in  $10^4/^{\circ}\text{C}$ , (typically 5 parts in  $10^5/^{\circ}\text{C}$ ) with free-running 1st Oscillator. Increased to 3 parts in  $10^5/^{\circ}\text{C}$  with 1st Osc. crystal-control.

Image Rejection

120kHz-1.5MHz : 60dB  
1.5MHz-18MHz : 70dB  
18MHz-31MHz : 50dB

IF Rejection

120kHz-1750kHz : 60dB  
1.5MHz-2.9MHz : 60dB  
2.9MHz-31MHz : 85dB

Radiation

Less than 400pW (typically 20pW).

Blocking

With a wanted signal 60dB above 1 $\mu$ V, an unwanted carrier 20kHz off-tune must exceed 100dB above 1 $\mu$ V to affect the output by 3dB.

Cross Modulation

With a wanted carrier 60dB above 1 $\mu$ V, an unwanted signal 20kHz off-tune must exceed 90dB above 1 $\mu$ V to produce an output greater than 30dB below standard output.

Intermodulation

The level of third-order intermodulation products produced by two signals of equal strength lying at carrier + 1kHz and carrier + 1.6kHz will be at least 30dB below the level of either signal.

With a wanted signal 30dB above 1 $\mu$ V, two unwanted signals with sum or difference frequency equal to that of the wanted signal, must each be of a level 80dB above 1 $\mu$ V to produce standard output.

AGC Characteristic

Output is maintained within 9dB for 90dB increase in signal from 3 $\mu$ V.

AGC Attack/Decay

Fast : 30ms/0.5sec. Slow : 200ms/6.5secs.

Audio Output

Ext. speaker (3 $\Omega$ ) : 500mW at 5% distortion, 1.5W maximum.

Line (600 $\Omega$ ) : 10mW (adjustable).

Headset : Low/medium-Z.

Response : Within 6dB, 200Hz to 6kHz.

IF Output (100kHz)

3 $\mu$ V at aerial input produces an IF output of at least 20mV across 75 $\Omega$ .

Calibration Accuracy

Main scale : 0.5% with Incremental at '0' and Cal. Adj. at mid-setting.

Incremental : 1kHz after standardising main scale against appropriate crystal marker.

(†) Not to be interpreted as a test specification.