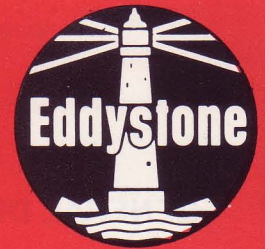


Eddystone Radio Limited

Member of Marconi Communication Systems Limited



General Purpose High Stability Communication Receiver

1837/2

FEATURES

High Stability Operation

Digital Readout to 100Hz

Continuous Tune

Muting Relay

No Preselector Required

Tuned Bandpass Input

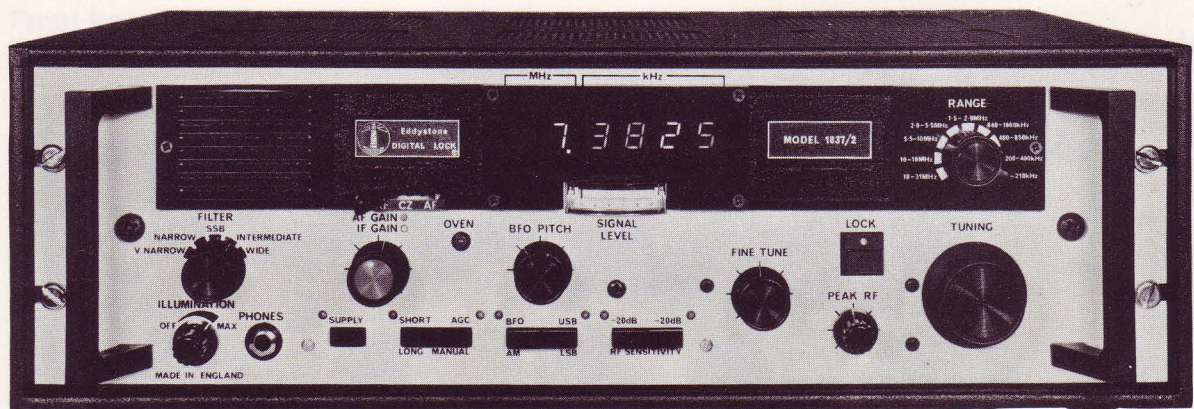
Front End Protection

Optional FSK

AM/CW/SSB(USB/LSB)FSK

Wide Frequency Range 100kHz/30MHz

Six Filters for Optimum Selectivity



Model 1837/2

GENERAL DESCRIPTION

The 1837/2 is the second in the series of 1837 receivers developed from the 1837/1 Marine main receiver, it provides reception facilities for CW, MCW and AM signals together with upper and lower sideband reception of A3A, A3H and A3J signals. Operation is from any standard 40-60Hz supply or 12/24V DC using an external inverter.

The receiver has a 483mm (19 inch) panel to suit standard racking and is also available complete with cabinet for use in bench-mounted installations: it can also be equipped with shock mounts for mobile use. Other accessories include a cabinet loudspeaker unit, a plinth loudspeaker in matching style.

A highly advanced circuit design is employed using the latest digital techniques and components. Double conversion applies on all ranges except in the 840 - 1600kHz band where single conversion is used. On the HF ranges the 1st IF is variable by means of a Fine Tune control over the range ± 10 kHz. The frequency to which the receiver is tuned is shown by a 6 digit electronic display on the front panel.

When set to the 'tune' condition, the receiver is operated in the 'search' mode as a normal medium stability receiver. The received frequency is shown on the digital display. On pressing the "Lock" button, an error-correcting circuit is brought into use and the receiver changes to the high stability mode. The receiver is now locked to the reception frequency at the instant the "Lock" button is pressed. The tune frequency is shown on the digital display. The digital display will flash at a

100 millisecond repetition rate to indicate that the received frequency is close to the limits of the error correcting circuits. The receiver will continue to function but with medium stability until reset.

Selectivity is adjustable to suit signal mode and the normal diode detector is replaced by a product detector when receiving CW and SSB. The associated beat oscillator generates pre-tuned carrier insertion frequencies for CW reception, adjustment being possible by use of the BFO control. For USB/LSB reception the carrier insertion frequency is derived from the high stability master oscillator at 100kHz. The 100kHz IF output is available for connection to ancillary equipment.

Separate AGC systems are employed for the RF and IF stages with provision for manual control of IF gain when required. The RF AGC line is permanently connected. The IF AGC line is brought out for interconnection when operating receivers in dual diversity and is also used to operate the integral meter to indicate carrier level. In addition to carrier level the meter is switched to indicate FSK tune condition (Centre zero) and 600ohm line level output. For FSK operation keying speeds of 300 bauds and shifts of 85Hz upwards can be accommodated.

Audio outputs are available for loudspeaker, headset and lines, the line output being fed from an independent low-level amplifier with adjustable pre-set gain control. A monitor speaker is fitted and all external connections except the headset socket are located at the rear. An aerial muting relay and input attenuator are also incorporated.



Rack Mounted version.

Model 1837/2

SPECIFICATION

Frequency Coverage

100kHz to 31MHz in nine ranges with fine-tune facility on Ranges 1-5.

Range 1	18.0MHz	-	31.0MHz
Range 2	10.0MHz	-	19.0MHz
Range 3	5.5MHz	-	10.0MHz
Range 4	2.9MHz	-	5.5MHz
Range 5	1.5MHz		2.9MHz
Range 6*	840kHz	-	1600kHz
Range 7	400kHz	-	850kHz
Range 8	200kHz	-	400kHz
Range 9	100kHz	-	210kHz

*Not high stability

Intermediate Frequencies

1st IF: Tunable 1340 - 1360kHz nominal to provide fine-tune facility on Ranges 1 - 5: 1350kHz on Ranges 7 - 9. Not in use on Range 6.

2nd IF: 100kHz. BFO/Carrier Insertion ± 3 kHz swing at 'CW'. Fixed 100kHz at USB/LSB.

Aerial Input Impedance

75 Ω (Nominal) on all ranges.

Reception Modes

A1, A2 and A2H telegraphy. A3, A3A, A3H and A3J telephony with upper or lower sideband selectable in SSB mode. Separate filters are used for single and double sideband working. Optional FSK working.

Environmental

The receiver conforms to the climatic and shock/vibration requirements of British MPT1201/MPT 1204 and CEPT draft

recommendations and DEF 133 Clause L2. Operating temperature rating: -15°C to $+55^{\circ}\text{C}$ ($+40^{\circ}\text{C}$, 95% relative humidity).

Muting

Internal reed relay controlled from associated transmitter interrupts aerial feeder and grounds input circuit during transmission.

Power Supply

100/130V or 200/260V (40-60Hz) single phase AC. Consumption approximately 50VA. 12/24V DC with separate inverter.

Scale Resolution

Display indicates to 100Hz.

Mounting Styles

Rack-mounting, bench-mounting and bench-mounting with resilient mounts. Plinth loud-speaker unit available to order.

Dimensions and Weight

Rack-mounting (with dust covers)

Width:	483mm (19in)
Height:	133mm (5.25in)
Intrusion into rack:	334mm (13.125in)
Weight (approx.):	16.8kg (37lbs)

Bench-mounting (with cabinet)

Width:	502mm (19.75in)
Height (with feet):	164mm (6.5in)
Depth (overall):	376mm (14.8in)
Weight (approx.):	21.8kg (48lbs)

Our equipment is designed generally to meet British Defence Specification 133 Class L2.

CONTROLS

Front Panel

Range switch. Main tune knob. Fine tune knob. Frequency lock button. Peak RF knob. Filter select knob. Audio gain/IF gain concentric knobs. BFO Pitch knob. RF sensitivity 2x-20dB push buttons. BFO/AM and USB/LSB buttons. AGC/Manual & Long/Short time constant push buttons. Meter switch. Supply On/Off push button. Illumination control.

Back Panel

Line level preset. FSK M/S adjust.

FACILITIES

Front Panel

Tuning meter. Phone socket. Oven light.

Back Panel

Aerial input. IF output. Ancillaries connectors. Mains input socket. Fuses.

TYPICAL PERFORMANCE†**Sensitivity**

15dB S/N ratio, 3kHz bandwidth AM - $1.5\mu\text{V}$
CW/SSB - $0.5\mu\text{V}$ (75 Ω input all ranges).

IF Selectivity

Four selectable bandwidths using switched L/C filter plus separate USB/LSB Filters.

Position	-6dB	-60dB
400Hz	400Hz	2.4kHz
1.3kHz	1.3kHz	4.5kHz
SSB (USB/LSB)*	2.4kHz at -3dB	3.9kHz
3kHz	3kHz	12kHz
8kHz	8kHz	22kHz

*Asymmetrical response, meeting requirements of MPT1201 and CEPT draft recommendations.

Image Rejection

100kHz	-	525kHz	: : 80dB
525kHz	-	18MHz	: : 70dB
18MHz	-	30MHz	: : 50dB

IF Rejection

100kHz	-	1600kHz	: : 60dB
1.6MHz	-	2.9MHz	: : 60dB
2.9MHz	-	30MHz	: : 85dB

Frequency Stability

Figures quoted after 30 minute warm-up period.
'Tune' mode - 1 part in $10^4/^\circ\text{C}$ (typically 5 parts in $10^5/^\circ\text{C}$).

'Lock' mode typically not worse than 5Hz per day or 5Hz in any period of 15 minutes for 7°C increase in ambient temperature.

Cross Modulation

With a wanted signal $60\text{dB}\mu\text{V}$ producing standard output, unwanted output will be at least 30dB below this level with an interfering signal 20kHz off-tune and of level $90\text{dB}\mu\text{V}$.

Intermodulation

The level of third-order intermodulation products 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 $30\text{dB}\mu\text{V}$ producing standard output two unwanted signals adjusted to produce a third-order intermodulation product at the wanted frequency, must each be of a level greater than $80\text{dB}\mu\text{V}$ to produce standard output when neither signal is closer than 30kHz to the wanted frequency.

Blocking

With a wanted signal $60\text{dB}\mu\text{V}$, output will be affected by less than 3dB with an interfering carrier 20kHz off-tune of level $100\text{dB}\mu\text{V}$.

AGC Characteristic

Output is maintained within 5dB for 90dB increase in signal from threshold reference level (taken at 8MHz).

AGC Time Constant

Position	Charge	Discharge
Short	30mS	0.5 sec
Long	200mS	1.5 sec

Audio Output

Ext. speaker (3 Ω)	: 500mW at 5% distortion (1.5W max.)
Line (600 Ω)	: 10mW (adjustable)
Headset	: Low/medium Z (10mW max.)

Audio Response

Within 3dB over the range 200Hz to 4.5kHz. Overall response is dependant on IF selectivity.

IF Output (100kHz)

$1.5\mu\text{Vp}$ at aerial produces an IF output of at least 20mV across 75 Ω .

Radiation

Less than 400pW (typically 20pW).

FSK (optional)

Frequency shift 85Hz - 1100Hz fitted internally.

† Not to be interpreted as a test specification.

As we are always seeking to improve our products, the information in this document gives only general indications of product capacity, performance and suitability, none of which shall form part of any contract. The information herein is subject to confirmation at the time of ordering.

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