Eddystone Radio Limited

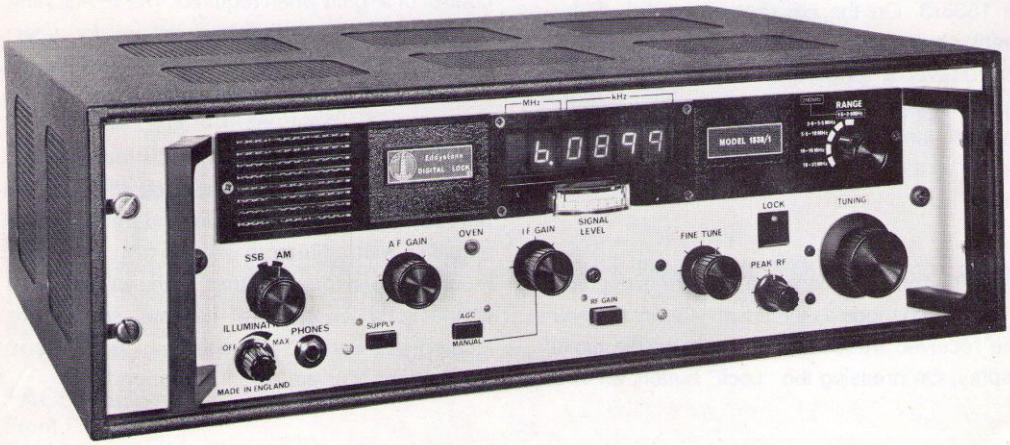
Member of Marconi Communication Systems Limited

General Purpose Telephony Receiver

1838
SERIES

FEATURES

- Eddystone Digital Lock®
- High Stability Operation
- Large Digital Readout
- Continuous Stepless Tuning
- AM & SSB with CW Option
- MF, IF, Coverage Option
- No Preselector required
- Front End Protection
- Muting Facility
- Internal Monitor Speaker
- Simple Design and Construction



British Approvals MPT 1216 and 1217

GENERAL DESCRIPTION

"1838 Series" is the designation of a family of MF/HF telephony receivers intended for Marine and general purpose use in the frequency range from 100kHz to 31MHz. The receivers are designed to provide telephony reception in AM Double Side Band and Single Side Band in the A3H and A3J modes Upper Side Band. A facility for CW reception is provided as an option. The equipment is designed in accordance with British and Foreign MPT specification requirements including the draft recommendations of CEPT: British Defence specification DEF 133L2 has been observed in the design. Approval to British MPT specification 1216 and 1217 has been obtained for the appropriate models. Operation is from any standard 40-60Hz supply or from a 12/24V DC supply using an external invertor.

The receiver has a 483mm (19inch) 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 and a plinth loudspeaker in matching style.

Advanced circuit designs are employed using the latest digital techniques and components. Double conversion applies on all ranges, except Range 6 on 1838/3. On the HF ranges the 1st. IF frequency is variable by means of the "Fine Tune" control over a range of +10kHz relative to the frequency selected by the main tuning control. The frequency to which the receiver is tuned is shown by a 6 digit electronic display on the front panel.

Under normal conditions the receiver is operated in the search mode as a 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 locked to the reception frequency at the instant the "Lock" button is pressed and this frequency is shown on the digital display. When the limits of the error correcting circuit are reached the display will flash at 100 millisecond repetition rate to draw attention to this state. The receiver will continue to function but with medium stability.

Selectivity is automatically adjusted to suit the signal mode and the diode detector is replaced by a product detector when receiving CW or SSB. The associated beat oscillator generates pre-tuned carrier insertion frequencies for CW and USB/SSB reception. The CW note is adjustable by means of a BFO control on the front panel.

For USB/SSB the carrier insertion frequency is derived from a high stability source at 100kHz. The 100kHz IF output is available on the back panel of the receiver.

Separate AGC systems are employed for the RF and IF stages with provision for manual control of IF gain when required. The IF AGC line is brought out to the back panel for interconnection when operating receivers in dual diversity and is also used to operate the integral carrier level meter; the RF AGC line is permanently connected. 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 attentuator are also incorporated.

MODELS

1838/1
Basic equipment providing DSB & SSB/Upper side band with frequency range 1.5MHz to 31 MHz.

1838/2
As 1838/1 but with CW facility

1838/3
As 1838/2 but with frequency coverage from 100kHz to 31MHz.

SPECIFICATION

Frequency Coverage:
100kHz to 30MHz 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

1838/1 and 1838/2 cover ranges 1 to 5.
1838/3 ranges 1 to 9.

Intermediate Frequencies
1st IF: Tunable 1340-1360kHz to provide fine-tune facility on Ranges 1-5; 1350kHz on Range 7-9. Not in use on Range 6.
2nd IF: 100kHz BFO/Carrier Insertion ±3kHz swing for 'CW' reception. Fixed 100kHz at 'USB'.

Aerial Input Impedance
75Ω nominal (unbalanced) for frequencies 4MHz to 30MHz. 10Ω in series with 250pF for frequencies 1.605MHz to 4MHz: 10Ω in series with 220, 390, 560pF for frequencies below 1.605MHz.

Reception Modes
A2, A3, A3A, A3H, A3J.
A1. (Models 1838/2, 1838/3)

Environmental
The receiver conforms to the climatic and shock/vibration requirements of British MPT 1204, 1216 and 1217 and CEPT draft recommendations.
Operating temperature rating:
−15°C to +55°C
Relative Humidity 95% at +40°C

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

Scale Resolution
Display indicates to 100Hz.

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

Mounting Styles
Rack-mounting, bench-mounting and bench-mounting with resilient mounts. Plinth loudspeaker unit available to order.

Dimensions and Weight

Rack-mounting (with dust covers)	
Width:	483mm (19ins)
Height:	159mm (6.25ins)
Intrusion into rack:	334mm (13.125ins)
Weight (approx):	16.783kg (37lbs)
Bench-mounting (with cabinet)	
Width:	502mm (19.75ins)
Height (with feet):	191mm (7.5ins)
Depth (overall):	376mm (14.8ins)
Weight (approx):	21.8kg (48lbs)

CONTROLS

Front Panel
Knobs:
Range. Main tune. Fine tune. Peak RF. AF Gain. IF Gain. Filter select/BFO pitch (concentric on 1838/2 & 1838/3). Illumination control.

Buttons:
High Stability lock. RF gain −20dB. AGC on/off. Supply on/off.

FACILITIES

Front Panel
Carrier level meter. Phone socket Oven light.

Back Panel
Aerial input. IF output. Ancillaries connector. Mains input socket. AC and DC fuses.

TYPICAL PERFORMANCE†

Sensitivity *for 10dB S/N ratio*
With 75Ω input all ranges
AM 3μV at 30% Mod.
CW 1μV (Not on 1838/1)

IF Selectivity

Position	−6dB	−60dB
AM DSB:	5.4kHz	10.5kHz Ceramic filter
SSB:	2.4kHz (−3dB)	3.9kHz Ceramic filter
(Not on 1838/1)		
CW	400Hz	2.4kHz LC filter

All filters meet the requirements of MPT 1216/1217 and the current draft requirements of the CEPT where appropriate.

Image Rejection

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

**1838/3 only.*

IF Rejection

100kHz*	-	1600kHz	60dB
1.5MHz	-	2.9MHz	60dB
2.9MHz	-	30MHz	85dB

**1838/3 only.*

Frequency Stability
The figures to be taken after 30 minutes warm up.
'Tune' mode - 1 part in 10^4/°C (typically 5 parts in 10^5/°C).
'Lock' mode - not greater than 20Hz (Typically 5Hz) drift in any period of 15 minutes for 7°C increase in ambient temperature.

Cross Modulation
With a wanted signal 60dBμV producing standard output, unwanted output will be at least 30dB below this level with an interfering signal 20kHz off-tune and of level 90dBμV.

Intermodulation
1. The level of third order intermodulation products given by two signals of level 80dBμV lying at carrier +1kHz and carrier +1.6kHz will be at least 30dB below the level of either signal.

2. With a wanted signal 30dBμV 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 80dBμV to produce standard output when neither signal is closer than 30kHz to the wanted frequency.

Blocking
With a wanted signal of level 60dBμV, output will be affected by less than 3dB with an interfering carrier 20kHz off-tune of level 100dBμV.

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

AGC Time Constant

Charge	Discharge
30mS	0.5 sec

Audio Output

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

Audio Response
Within 3dB over the range 200Hz to 4-5kHz.
Overall response is dependent on IF selectivity.

IF Output (100kHz)
3μV at aerial produces an IF output of at least 20mV across 75Ω.

Radiation
Less than 400pW (typically 20pW).

† Not to be interpreted as a Test Specification.

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

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