

# EDDYSTONE

## WIDE RANGE COMMUNICATIONS RECEIVER MODEL 830/2



300 kc/s. to 30 Mc/s.

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## **Eddystone 830/2 Receiver**

THE EDDYSTONE "830/2" is a high-grade general purpose HF/MF communications receiver covering from 300 kc/s to 30 Mc/s in nine ranges. It is of compact dimensions and both rack-mounting and table versions are available. Operation is from any standard AC mains supply and provision is also made for using external power supplies.

MODES OF RECEPTION encompassed are CW, AM and SSB. Selectivity is continuously variable and the bandwidth appropriate to a given signal can be readily selected. On SSB, a separate detector is used, a panel switch permits adjustment to upper and lower sideband, and a fine tuning control is available. A crystal filter with a very narrow bandwidth reduces interference with reception of CW signals.

THE CIRCUIT is single conversion on frequencies below 1.5 megacycles, and double conversion, with a tunable first intermediate frequency, on frequencies above 1.5 megacycles. An incremental coverage of 100 kc/s each side of any selected signal frequency is available when using double conversion. The first and second oscillator circuits can be crystal-controlled for high-stability operation on frequencies above 1.5 Mc/s.

TUNING ARRANGEMENTS are particularly versatile. With the main tuning scale standardised against the internal crystal calibrator, the incremental control allows accurate tuning to within one kilocycle (1.5 Mc/s to 30 Mc/s). A switch on the panel provides instant changeover to crystal-controlled operation, with rapid selection of up to eight spot frequencies. Flexibility is afforded by the fact that any crystal within 100 kc/s of the nominal value called for can be used in conjunction with the incremental tuning facility.

PERFORMANCE is of a high order, as a study of the technical characteristics given later will confirm. A design feature of importance is the low level of oscillator radiation, which makes the "830/2" suitable for use in installations where a number of receivers are operated in close proximity.

EASE OF OPERATION is assured by the convenient layout of the panel controls. The wide illuminated dial can be read with a high degree of accuracy. The high quality, gear-driven slow motion mechanism results in smooth precise tuning.

CONSTRUCTION follows the traditional Eddystone pattern. The receiver is robust and well able to stand up to arduous service. Components, workmanship and finish are of the highest grade, ensuring inherent reliability.

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## GENERAL INFORMATION

### Frequency Coverage

Nine ranges give the following coverage :—

Range 1 ..	18 Mc/s to	30 Mc/s.
Range 2 ..	11 Mc/s to	18 Mc/s.
Range 3 ..	6.7 Mc/s to	11.0 Mc/s.
Range 4 ..	4.0 Mc/s to	6.7 Mc/s.
Range 5 ..	2.5 Mc/s to	4.0 Mc/s.
Range 6 ..	1.5 Mc/s to	2.5 Mc/s.
Range 7 ..	850 kc/s to	1500 kc/s.
Range 8 ..	480 kc/s to	850 kc/s.
Range 9 ..	300 kc/s to	520 kc/s.

### Intermediate Frequencies

First IF nominally 1350 kc/s. Variable over the range 1250 kc/s to 1450 kc/s to provide incremental tuning. Second IF 100 kc/s, with variable selectivity and crystal filter.

### Valve Complement

V1	6ES8 or ECC189	(CV5331)	Cascode RF amplifier
V2	6AK5 or EF95	(CV850)	First mixer
V3	6C4 or EC90	(CV133)	Second local oscillator
V4	6AK5 or EF95	(CV850)	Second mixer
V5	6BA6 or EF93	(CV454)	First 100 kc/s IF amplifier
V6	6BA6 or EF93	(CV454)	Second 100 kc/s IF amplifier
V7	6AL5 or EB91	(CV140)	Noise Limiter
V8	6AU6 or EF94	(CV2524)	Cathode follower IF output (100 kc/s)
V9	6AT6 or EBC90	(CV452)	AM Det/AGC rect/ Audio amp.
V10	6AQ5 or EL90	(CV1862)	Audio output
V11	6AU6 or EF94	(CV2524)	Crystal calibrator
V12	6U8 or ECF82	(CV5065)	First local oscillator
V13	6BE6 or EK90	(CV453)	CW/SSB detector
V14	OA2 or 150C4	(CV1832)	HT stabiliser 1
V15	OA2 or 150C4	(CV1832)	HT stabiliser 2
D1	100SC2	—	Variable capacity diode (BFO)
D2/5	DD006 (or two DD058 diodes)	—	HT rectifier

### Scale Presentation

The main tuning scales are calibrated to an accuracy within 0.5%. Using the crystal calibrator in conjunction with the cursor adjuster, a high order of accuracy is obtainable.

The incremental tuning is indicated on a separate scale, directly calibrated in kilocycles. The whole dial is well and evenly illuminated.

### Controls

Wavechange switch and crystal selector; main tuning, with 140/1 precision reduction drive; incremental tuning; peak RF; independent RF, IF and AF gains; selectivity; mode switch, selecting AM — CW — SSB upper — SSB lower; BFO pitch; combined AGC/NL switch; crystal calibrator; cursor adjuster; mains switch. Meter zero adjuster at rear.

### Carrier Level Meter.

On the front panel is fitted a carrier level meter, marked in arbitrary divisions over a scale of nought to ten. It is useful as a tuning indicator and for making comparative measurements of signal strength.

### Desensitising

When desensitising is a requirement, terminals at the rear (normally shorted out) can be brought into use, leads being taken either to an external switch or to contacts on a relay.

### Noise Limiter

The series-diode type of noise limiter is effective against ignition and similar pulse types of electrical interference.

### Power Supplies

Mains operation : adjustable to accept 100/125 volts and 200/250 volts AC, 40/60 cycles. Consumption 85 VA.

External supplies : when mains are not available, supplies required are 6.3 volts, 4.8 amps (approx.) and 250 volts 160 mA.

Accessory supplies : when the receiver is working from AC mains, the following are available; 250 volts, 15 mA (unsmoothed) and 6.3 volts at 1.2 amps (earthed centre tap).

### Construction

The receiver is housed in a strongly made, well finished steel cabinet of convenient dimensions and in standard form is supplied for table mounting. A rack-mounting version — the "830/2/RM" — is available for fitting into a standard 19" rack, in which it occupies a height of 8 $\frac{3}{4}$ ". The table version

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can be converted to rack mounting by fitting special angle brackets and a modified cabinet. Shock-absorbing mounts can be incorporated when excessive vibration has to be taken into account. The finish is two-tone grey.

Robust construction and high quality components lead to excellent reliability, and the receiver is intended for continuous usage under all normal climatic conditions.

## Physical Details

Width	..	16 $\frac{3}{4}$ " (42.5 cm).	
Depth	..	15" (38.1 cm).	
		(including rear projection)	
Height	..	8 $\frac{3}{4}$ " (22.2 cm).	
Weight	..	49 lbs. (22.2 kg).	-

## AVERAGE TECHNICAL FIGURES

### Sensitivity

With an IF bandwidth of 3 kc/s, the sensitivity is better than 3 microvolts for a 15 dB signal-to-noise ratio, throughout the range.

### IF Selectivity

The overall bandwidth is continuously variable within the limits of 1.3 kc/s and 6 kc/s (6dB points) and is narrowed to 50 c/s when using the 100 kc/s crystal filter. The selectivity control is marked "CW—SSB—AM," a click stop being provided for positive selection of the correct bandwidth for SSB. The crystal filter is introduced when the control is moved to the extreme right-hand position.

Typical overall bandwidths are as follows, the crystal phasing being pre-set to give a symmetrical response.

Positions	6 dB bandwidth	50 dB bandwidth
Crystal	50 c/s	2 kc/s
CW	1.3 kc/s	5 kc/s
SSB	3 kc/s	8 kc/s
AM	6 kc/s	12 kc/s

### Spurious Responses

Image rejection :—

300 kc/s to 1.5 Mc/s	..	greater than 50 dB
1.5 Mc/s to 10 Mc/s	..	greater than 70 dB
10 Mc/s to 30 Mc/s	..	greater than 50 dB

IF breakthrough — at the first intermediate frequency, better than 70 dB except at 1.5 Mc/s on range 6 where the figure is greater than 60 dB. At the second intermediate frequency, greater than 85 dB at all frequencies except on range 9 where the figure is greater than 60 dB.

### Frequency Stability

After a ten minute warm up period, drift with the free-running oscillator is approximately 25 kc/s in the first hour, at 28 Mc/s. After a further thirty minutes operation, drift at any frequency will not exceed four parts in 10<sup>4</sup>.

With the first oscillator crystal controlled, drift during the first thirty minutes does not exceed two kilocycles. After this period, drift will be less than one kilocycle in any one hour period.

### AGC Characteristic

The audio output level does not change by more than 9 dB when the carrier level is increased 90 dB above 3 microvolts (figure taken at 8 Mc/s with a 3 kc/s bandwidth). The normal AGC discharge time constant is 0.15 second and is changed to 10 seconds when the Mode switch is in an SSB position. The AGC delay is also reduced for SSB reception. The AGC potential is brought out to a socket at the rear of the receiver, for diversity and other purposes.

### Audio Output and Response

The audio output stage will deliver a maximum of 2.5 watts at either the 2.5 ohm speaker terminals or the 600 ohm line terminals, when used independently. The audio response is level within 6 dB from 200 cycles to 6000 cycles and distortion at 1000 cycles does not exceed 5% at an output of one watt. Hum level is 50 dB down at 2.5 watts. A jack accepting a standard telephone plug is fitted to the front panel.

### Intermediate Frequency Output

A coaxial socket at the rear has a nominal unbalanced impedance of 250 ohms and is suitable for terminating impedances of 75 to 300 ohms. A signal input of three microvolts will produce an output of at least 50 millivolts across 75 ohms.

### Aerial Input

Nominally 75 ohms unbalanced to a coaxial socket.

*In the interests of continued improvement, we reserve the right to amend this specification without notice.*



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