Eddystone

COMMUNICATIONS RECEIVERS

EDDYSTONE RADIO LIMITED
BIRMINGHAM 31

Eddystone

COMMUNICATIONS RECEIVERS

EDDYSTONE radio communications equipment has been manufactured since 1923 and the trademark has become famous throughout the world, being synonymous in fact with the qualities possessed by the well-known lighthouse from which the name is derived. The very considerable value of this long experience is reflected in the current range of professional receivers which are designed, developed and produced to combine high performance, reliability and ease of control. Finish, workmanship, engineering and general construction reach the highest standards. The association that now exists between Eddystone Radio and the Marconi Company will lead to further advancement as time goes on.

A wide range of receivers and ancillary equipment is available, covering frequencies from 10 kc/s to 870 Mc/s. In the design of each item, study has been made of the facilities needed for the majority of applications which arise, bearing in mind these include practical communications, monitoring, field survey work, laboratory research and development, interference investigations and other special uses. The majority are available as table models or for mounting in standard racks.

The abridged details given in this catalogue relate mainly to those receivers intended for professional and commercial operations. The information serves to indicate the suitability of a given model for a project, and amplified information in a separate data sheet is readily available for each piece of equipment.

Your enquiries will receive full and prompt attention.

EDDYSTONE RADIO LIMITED

ALVECHURCH ROAD, BIRMINGHAM 31, ENGLAND

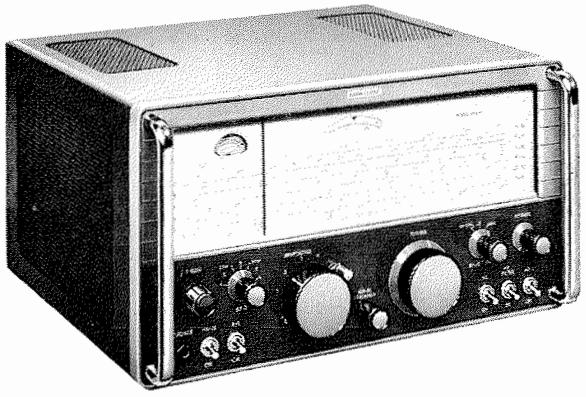
Telephone PRIORY 2231 Cables EDDYSTONE, BIRMINGHAM

Telex 33708

Eddystone

850/4
LOW FREQUENCY COMMUNICATIONS RECEIVER

The Eddystone "850/4" receiver is a special low frequency model giving complete coverage from 10 kc/s to 600 kc/s and having the facility for crystal control on eight spot frequencies. It accepts the modes of signal normal to this range of frequencies and a high performance obtains throughout. Eleven preferred type valves are used in the single superheterodyne circuit, and normal communications facilities are provided. Three selectivity positions, two having crystal filters, meet the majority of requirements. In addition, an efficient audio filter reduces the bandwidth to approximately 100 c/s.



Frequency Coverage

Range 1	300 to 600 kc/s.
Range 2	150 to 310 kc/s.
Range 3	80 to 160 kc/s.
Range 4	40 to 85 kc/s.
Range 5	19 to 40 kc/s.
Range 6	10 to 20 kc/s.

Circuit

RF Amplifier : Frequency changer : two IF amplifiers : AM and CW detectors : noise limiter : IF output stage : audio amplifier and output : stabiliser : rectifier.

Tuning Drive and Scales

Geared drive mechanism with 140/1 reduction ratio, having smooth precise movement. Horizontal scales are clearly marked in kilocycles to an accuracy within 0.5% above 100 kc/s, and within 2.5% below 100 kc/s. A secondary logging scale is provided.

Controls

Tuning : Wavechange : Crystal Selector Switch : Aerial Trimmer : RF Gain : IF Gain : AF Gain : Selectivity : CW/AM : BFO on/off and Pitch : AGC : Noise Limiter : AF Filter : Mains : Meter zero adjuster.

A carrier level meter is fitted and terminals at the rear permit desensitising when necessary. A low impedance IF outlet (720 kc/s) is provided and an AGC connection is brought out to terminals at the rear.

Sensitivity

The CW sensitivity is better than 5 uV for a 15 dB signal/noise ratio throughout. An equally good performance obtains on AM signals.

Selectivity (IF)

Position 1 (crystal) ..	400 c/s.
Position 2 (crystal) ..	1500 c/s.
Position 3	6 kc/s.

With audio filter in circuit, approximately 100 c/s. (figures are overall bandwidths at 6 dB points).

Image Rejection

Better than 75 dB at 600 kc/s and progressively greater at lower frequencies.

AGC

Increasing input level 80 dB above 10 uV (at 600 kc/s) results in a change of output not exceeding 10 dB.

Audio Outputs

1 watt maximum into 2.5 ohms ; 10mW into 600 ohm lines ; telephone jack. Audio response is within 6 dB from 200 c/s to 5 kc/s.

IF Output

Approximately 100 mV into 75 ohms for an input of 5 uV.

Dimensions and Weight

Width	$16\frac{7}{8}$" (43 cm).
Depth	15" (38.1cm).
Height	$8\frac{3}{4}$" (22.2 cm).
Weight	50 lb. (22.6 kgs).

Finish

Two-tone grey ; chromium plated handles ; matching finger plate. Available in table and standard rack matching versions.

Eddystone

880/2

HIGH STABILITY HF COMMUNICATIONS RECEIVER

Of most advanced design, this model offers many advantages, and is directly suitable for reception of single-sideband signals. Notable are the extremely high frequency stability, precise frequency setting, and ease of operation. The first oscillator is crystal controlled and the second tunable oscillator is specially designed for high thermal, mechanical and voltage stability. In effect, the "880/2" gives the equivalent of crystal control whilst permitting continuous coverage from 500 kc/s to 30.5 Mc/s. Other advantages are a very low level of radiation, and provision for use in diversity with common oscillator control. The standard table model is easily converted to rack mounting.

Circuit and Valves
Two fully tuned RF stages : mixer : crystal controlled oscillator : tunable IF, mixer and oscillator : three stage 500 kc/s amplifier with filters : noise limiter : AM and CW SSB detectors : AF amplifiers and separate stages for line and speaker : voltage stabilisers : silicon diode HT rectifiers. In all, 23 preferred type valves plus diodes.

Intermediate Frequencies
The first IF tunes over either 2500 to 3500 kc/s, or 3500 to 4500 kc/s, as automatically selected by the range switch. The second IF is 500 kc/s, with variable selectivity. Two crystal filters are fitted, one of which gives a 3 kc/s bandwidth for s.s.b. signals.

Sensitivity
For 15 dB signal/noise ratio, better than 3 microvolts above 1·5 Mc/s, and averaging 5 microvolts on Range 1 (500 to 1500 kc/s) at bandwidth of 3 kc/s.

Selectivity
Five positions provided. Bandwidths range from 400 c/s to 14 kc/s, at 6 dB points. Audio filter gives a bandwidth of approximately 100 c/s.

Stability
After four hours running, with ambient temperature and mains supply constant, the frequency drift is in the order of ±20 cycles.

Spurious Responses
Attenuated 90 dB at frequencies below 15 Mc/s, (except Range 1) and greater than 60 dB elsewhere.

Tuning Accuracy
Calibration 1 kc/s. and re-setting better than 500 c/s

AGC
Three time-constants provided—fast, slow and s.s.b.

Audio Outputs
0·75 watts for speaker (internal monitor speaker is fitted). Independent 600 ohm line channel with separate level control. Jack for telephone headset.

Aerial Input
75 ohms unbalanced.

Radiation
Does not exceed 5 uV into 75 ohms.

Dimensions
Rack Mounted Version :
Width 19″ (48·3 cm) Depth 20½″ (52·1 cm).
Height 8¾″ (22·2 cm).
Table Mounted Version :
Width 19½″ (49·5 cm). Depth 20½″ (52·1 cm).
Height 9 7/16″ (23·9 cm).

Weight
Rack Mounted Version : 87 lb. (39·5 kgs).
Table Mounted Version : 99 lb. (44·9 kgs).

Finish
Modern styling and presentation in two-tone grey finish.

Other Features
100 kc/s. crystal calibrator : fine tuning control (panel and remotely) : output at second IF : carrier level meter : provision for diversity operation : desensitising.

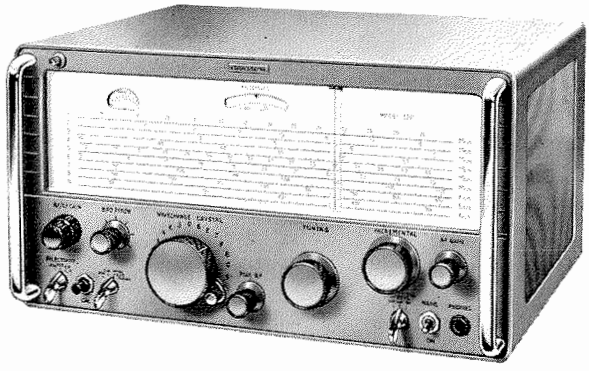
Eddystone

830/7
HF/MF COMMUNICATIONS RECEIVER

A high grade general purpose receiver, having extremely versatile tuning arrangements, including provision for crystal-control and an incremental facility covering 100 kc/s above or below the frequency selected on the main scale. It is suitable for the reception of AM, CW and SSB signals, and has a good performance throughout. Standard finish is grey. Normally supplied for table mounting but standard rack-mounting version is available.

Frequency 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 Mc/s
Range 4	4 Mc/s to 6·7 Mc/s
Range 5	2·5 Mc/s to 4 Mc/s
Range 6	1·5 Mc/s to 2·5 Mc/s
Range 7	860 kc/s to 1500 kc/s
Range 8	480 kc/s to 860 kc/s.
Range 9	300 kc/s to 520 kc/s.



Circuit
Double superheterodyne on ranges 1 to 6; single superhet on ranges 7, 8 and 9. First oscillator free-running or crystal-controlled on eight spot frequencies. Second oscillator designed for high stability and can also be crystal controlled. Incremental tuning facility, with total coverage of 200 kc/s, available from 1·5 Mc/s to 30 Mc/s. Second IF is 100 kc/s, with variable selectivity.

Sensitivity
On AM, better than 3 microvolts for 15 dB signal/noise ratio, at IF bandwidth of 3 kc/s. CW sensitivity approximately 1 microvolt.

Selectivity
Continuously variable, with positions indicated for AM (6 kc/s); SSB (3 kc/s); CW (1300 c/s) and a very narrow position (50 c/s) with crystal filter switched in (figures refer to 6 dB bandwidths).

Spurious Responses
Image ratio is better than 50 dB at 30 Mc/s, and better than 70 dB below 10 Mc/s. Figures for cross-modulation, intermodulation and blocking are equally good.

Oscillator Stability
Frequency drift is low after the usual warm-up period. Using crystal controlled first oscillator, drift is less than 100 c/s in any one hour. Crystal calibrator and cursor adjuster permit high accuracy of frequency resolution.

Audio Outputs
Plug and socket terminations for 600 ohm line and 2·5 ohm speaker. Output 2·5 watts maximum.

Power Supply
AC mains, 200/250 volts and 100/125 volts, 40/60 cycles. Consumption 85 watts. Ancillary equipment socket at rear.

Physical Details

Width	16¾" (42·5) cm).
Depth	15" (38·1 cm).
Height	8¾" (22·2 cm).
Weight	49 lb. (22·2 kg).

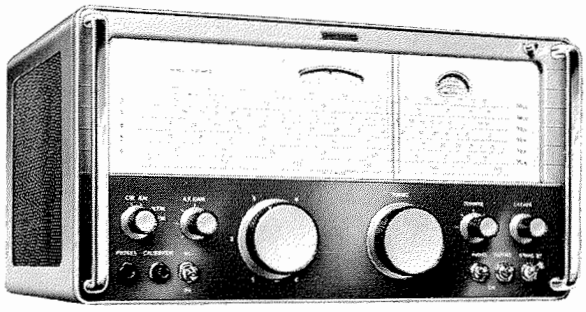
Other Features
Carrier level meter : noise limiter : fast and slow AGC : output at 100 kc/s : independent RF, IF and AF gain controls : fine tuning for SSB : band-pass input circuits on ranges 1 to 6 : provision for muting.

Eddystone

770R

MARK II
VHF COMMUNICATIONS RECEIVER

Fully tunable over the range 19 Mc/s to 165 Mc/s, accepting various modes of signal and having many applications in the communications and instrument fields. The combination of six scales and a precision slow motion drive, with a reduction of 140/1, permits relatively fine tuning. Many specially designed units are incorporated and an excellent performance results throughout the range. Operation is from standard AC mains supplies.



Frequency Coverage
Six position, diecast turret tuning assembly contains coils to give the following ranges:

Range 1	.. ..	114 Mc/s to 165 Mc/s.
Range 2	.. ..	78 Mc/s to 114 Mc/s.
Range 3	.. ..	54 Mc/s to 78 Mc/s.
Range 4	.. ..	39 Mc/s to 54 Mc/s.
Range 5	.. ..	27 Mc/s to 39 Mc/s.
Range 6	.. ..	19 Mc/s to 27 Mc/s.

Circuit and Valves
The circuit is a single superhet, with a fully tuned RF stage. In all, twenty preferred type valves and three germanium diodes are used.

Signal Modes
The receiver accepts CW : AM : FM and NBFM. On CW, a fixed BFO gives a preset beat of 1000 c/s. The two FM deviations are 15 kc/s narrow band, and 75 kc/s wide band. The degree of selectivity is automatically adjusted to suit the type of signal.

Sensitivity and Noise Factor
Sensitivity on AM, 50 mW output, 15 dB signal/noise, is better than 5 microvolts on all ranges. Noise factor varies from 5 dB on Range 6 to around 14 dB at the high end of Range 1.

Selectivity

AM/CW	6 dB down	15 kc/s. off resonance.
	40 dB down	100 kc/s. off resonance.
FM	6 dB down	40 kc/s. off resonance.
(narrow band)	40 dB down	160 kc/s. off resonance.
FM	6 dB down	150 kc/s. off resonance.
(wide band)	40 dB down	350 kc/s. off resonance.

Image Ratio
Approximately 20 dB at 165 Mc/s and correspondingly greater at lower frequencies.

Stability
Frequency drift is less than ·003% per degree C and similar for a 5% change of mains voltage.

Crystal Calibrator
A crystal calibrator gives markers at 5 Mc/s intervals. A device is fitted to permit correct alignment of the cursor.

I.F. Output
A co-axial socket at the rear provides a wide-band IF signal at 5·2 Mc/s, for use with auxiliary units.

Input Impedance
75 ohms (co-axial socket).

Audio Output
2·5 watts maximum into 2·5 ohms to terminals. 600 ohms output for line. Telephone jack on front panel.

Physical Details

Width	.. ..	$16\frac{3}{4}$″ (42·5 cm).
Depth	.. ..	15″ (38·1 cm).
Height	.. ..	$8\frac{3}{4}$″ (22·2 cm).
Weight	.. ..	$60\frac{1}{2}$ lb. (27·4 kgs).

Modern styling and two-tone grey finish. Available in table mounting and rack mounting styles.

Eddystone

770U
MARK II
UHF COMMUNICATIONS RECEIVER

A versatile instrument having applications for communications, laboratory work, aerial survey and interference investigations. Coverage is continuous from 150 Mc/s to 500 Mc/s, using a specially developed six-position turret. Available in table and rack-mounting versions.

Frequency Coverage

Range 1	.. ..	400 Mc/s to 500 Mc/s.
Range 2	.. ..	330 Mc/s to 400 Mc/s.
Range 3	.. ..	270 Mc/s to 330 Mc/s.
Range 4	.. ..	220 Mc/s to 270 Mc/s.
Range 5	.. ..	180 Mc/s to 220 Mc/s.
Range 6	.. ..	150 Mc/s to 180 Mc/s.

Circuit
The front end consists of a grounded grid RF amplifier; diode mixer; 6AF4 oscillator on fundamental frequency. Then follow two IF amplifiers at 50 Mc/s; a double triode mixer; and further IF amplifications at 5·2 Mc/s. Other stages include FM limiter and discriminator; muting; noise limiting; audio output. In all, nineteen preferred type valves, four germanium diodes, and one transistor.

Input Impedance
75 ohms (co-axial socket).

Signal Modes
AM and FM, with a deviation acceptance up to ±20 kc/s.

Sensitivity
Better than 10 microvolts, 15 dB signal/noise, 50 mW output, on all ranges.

Selectivity
6 dB down 20 kc/s off resonance. 40 dB down 100 kc/s off resonance.

Image Rejection
25 dB at 400 Mc/s. 40 dB at 200 Mc/s.

Crystal Calibrator
A crystal calibrator gives markers at 50 Mc/s intervals. A device is fitted to permit correct alignment of the cursor.

Audio Outputs
Maximum of 2·5 watts at 3 ohm terminals for speaker. 600 ohm line output. Telephone jack on panel.

Special Features
Two low impedance outlets at the IF of 5·2 Mc/s are available, offering different bandwidths and permitting direct connection to the Eddystone EP17R Panoramic Display Unit. A further point allows taking off the 50 Mc/s first IF or feeding in a signal converted to this frequency. Limiter grid current can be measured at a jack on the front panel, and a carrier level meter is fitted as an aid to tuning.

Physical Details

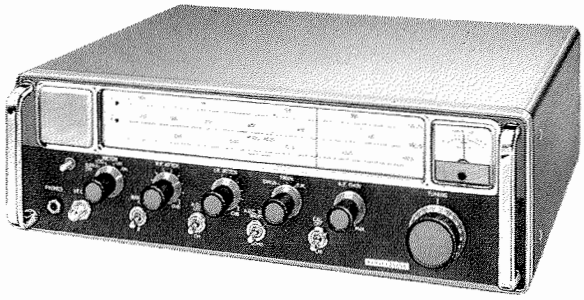
Width	.. ..	16¾" (42·5 cm).
Depth	.. ..	15" (38·1 cm).
Height	.. ..	8¾" (22·2 cm).
Weight	.. ..	52 lb. (23·6 kg).

Modern styling and two-tone grey finish. Available for rack or table mounting.

Eddystone 990S

UHF COMMUNICATIONS RECEIVER

A fully transistorised single conversion superheterodyne for reception of AM and FM signals in the ultra-high frequency band from 230 M/cs to 870 Mc/s. Operation is from any standard AC mains supplies or from a 12 volt DC supply. Available in patterns for table mounting or for fitting into a standard rack. Operational temperature range 0 to 50 degrees Centigrade.



Frequency Coverage
Two ranges are displayed on horizontal scale over 9″ wide, the coverage being 470 to 870 Mc/s on Range 1, and 230 to 510 Mc/s on Range 2.

Tuning System
Single knob, controlling flywheel-loaded geared drive, with a reduction ratio of approximately 100 to 1.

Calibration Accuracy
The scales are directly calibrated to an accuracy within 1%. By making use of the crystal calibrator and the adjustable cursor, a much higher degree of accuracy is possible.

Tuning Meter
Clearly observable meter with switch to change reading to linear, logarithmic or FM.

Input Impedance
Nominally 75 ohms unbalanced to a BNC socket.

Noise Factor
Range 1 .. .. 10 to 16 dB.
Range 2 .. .. 8 to 12 dB.

Spurious Responses
At least 50 dB down.

IF Bandwidths
AM .. alternative 6 Mc/s and 1 Mc/s positions.
FM .. 1 Mc/s (i.f. is 36·5 Mc/s).

FM Deviaton Acceptance
Up to 250 kc/s.

Frequency Stability
Better than 1 part in 10^4 per degree C. change in ambient temperature.

Outputs
At i.f. of 36·5 Mc/s:—50 millivolts at low impedance.
Video:—AM and FM channels, approximately 2·5 volts peak-to-peak into 1000 ohms. Both channels are available simultaneously.
Audio:—500 milliwatts to 3 ohm speaker; 10 milliwatts to 600 ohm line (separate gain control); jack for telephone headset. An internal monitor speaker is fitted.

Physical Details
Rigid light weight construction, with cabinet easily removable. Standard version is table mounting — the addition of brackets converts to rack mounting. Modern styling and two-tone grey finish. Weight is 18 lb. (8·16 kg). Panel measures $16\frac{3}{4}'' \times 5\frac{1}{4}''$ (42·5 × 13·3 cm). Depth approximately 14″ over projections (34·6 cm).

Panoramic Reception
The addition of an EP17R Panoramic Display Unit and Cat. No. 939 IF. Convertor Unit permits visual display over the whole range of frequencies covered by the receiver. This combination bears the reference EPR29.

Eddystone

PANORAMIC DISPLAY UNITS

To go with receivers already in use, of Eddystone or other make, there are four panoramic display units, two with characteristics suitable for wide band operation, with medium resolution, on very high and ultra high frequencies, and two with fine resolution for narrow band operation on low to high frequencies.

The first units referred to are the EP14 and EP17R, the former having tuned input to match a wide range of intermediate frequencies, whilst the EP17R has a fixed input frequency of 5.2 Mc/s, as used in the Eddystone 770R and 770U receivers described elsewhere in this Catalogue. Otherwise the electrical specifications are practically identical.

Similarly, the EP15 and EP20 units will operate successfully with the majority of HF receivers. The EP15 has tunable input and the EP20 a fixed input frequency of 100 kc/s.

Brief details of the specifications are given opposite and full information is available in separate folders. It should be noted that frequency converters are offered (see page 12) for matching receiver intermediate frequency outputs to panoramic unit inputs cover wide limits.

Frequency Coverage *(intermediate frequencies)*

EP14 : 5·2 Mc/s (1 Mc/s bandwidth) and tunable 6·2 to 60 Mc/s.
EP15 : 100 kc/s (30 kc/s bandwidth) and tunable 400 to 800 kc/s.
EP17R : Fixed input at 5·2 Mc/s.
EP20 : Fixed input at 100 kc/s.

Sweep Rates

Four selectable speeds are available:—
EP14 and EP17R : 5, 10, 20 and 40 sweeps per second.
EP15 and EP20 : 0·2, 0·4, 0·8 and 2 sweeps per second.

Sweep Widths

EP14 and EP17R variable from 3 kc/s to 1 Mc/s.
EP15 and EP20 variable from 100 cs/ to 30 kc/s.

Resolution

EP14 and EP17R .. 2 kc/s at optimum settings.
EP15 and EP20 .. 50 c/s at optimum settings.

Sensitivity (at full gain)

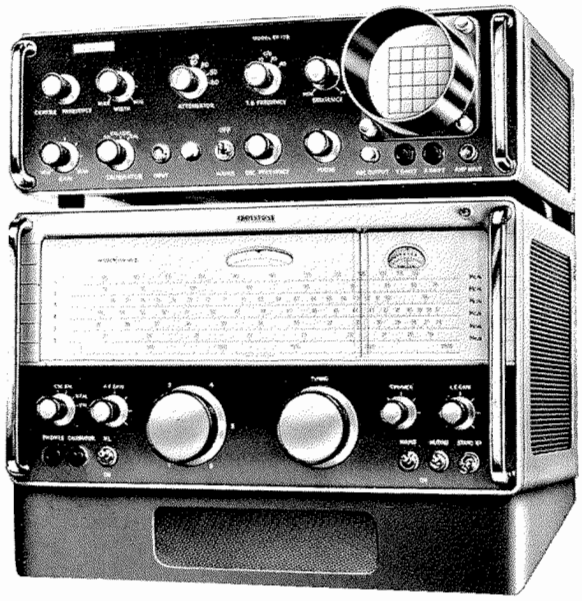
EP14 and EP17R 20 microvolts for full deflection.
EP15 and EP20 25 microvolts for 1 cm deflection.

Common Features

The *display* is given on a $2\frac{3}{4}$" diameter tube, of medium or long persistence. An *attenuator* acts on the input signal and is calibrated in 10 dB steps over a range of 60 dB. Input impedance is 75 ohms. A separate gain control is fitted. Other controls are sweep width; scanning rate; centering; brilliance; focus. The units can also be used as "wobbulators" for alignment purposes. Operation is from standard AC mains, with a consumption of 55 watts. A blower fan is fitted to prevent undue temperature rise. Dimensions EP17R and EP20 approximately $16\frac{3}{4}" \times 5\frac{1}{4}" \times 15"$. (Rack mounting EP14 and EP15 19" wide). Weight 36 lb.

Eddystone

PANORAMIC RECEIVERS



In both the communications and laboratory fields, a complete panoramic receiver will often allow tasks to be carried out quickly, simply and effectively, in a way only possible otherwise with a range of expensive equipment, which, where it exists, may well not be available at short notice. Visual monitoring; measurements of frequency, carrier amplitude and modulation; presence or absence of spurious responses and emissions; setting up transmitters and receivers for correct operation on s.s.b. and other modes of signal; studying the character and level of interference; are some of the applications which readily come to mind. It will be appreciated the higher apparent overall sensitivity of the panoramic receiver, whereby a signal barely audible can be clearly seen, is a considerable asset when carrying out bridge measurement operations. The practical communications engineer will obviously find the combination of much value in his work.

Again, as an aid in teaching, the panoramic receiver can be very useful and save much time. A student can observe at a glance variations brought about by changes of amplitude, modulation depth and character, bandwidth, insertion of filters, and other factors.

The display unit is designed for secondary use as a "wobbulator", to check the alignment of the receiver unit, with the advantage of knowing thereafter that the overall performance is at a maximum. The addition of the display unit does not in any way affect the operation of the receiver for standard applications.

Three complete combinations of receiver and panoramic display unit are offered, with details as follows. Other combinations can be supplied to special order.

The complete installation is relatively compact and blends well with other equipment. Tie-bars at the rear make for a rigid assembly and, with the inclusion of the speaker plinth, the backward tilt leads to ease of viewing and ready operation of the controls.

EPR26 (v.h.f.)

The illustration shows the EPR26 Panoramic Receiver, which comprises a standard 770R Mark II receiver, EP17R display unit, and Cat. No. 906 speaker plinth. Visual display is obtained over the normal ranges of the receiver, from 19 Mc/s to 165 Mc/s. Maximum scan is one megacycle and the other characteristics are as set out elsewhere in this Catalogue. Total power consumption is approximately 150 watts.

EPR27A (h.f.)

The second panoramic receiver is the EPR27A, a combination of the 830/7 receiver and the EP20 display unit. The appearance is similar to the illustration and the frequency coverage is from 300 kc/s to 30 Mc/s. The maximum scan is 30 kc/s (as dictated by the selectivity characteristics of the receiver) and a high degree of resolution is possible. The EPR27A is of particular assistance in correctly setting up h.f. equipment for s.s.b. and f.s.k. operations.

EPR29 (u.h.f.)

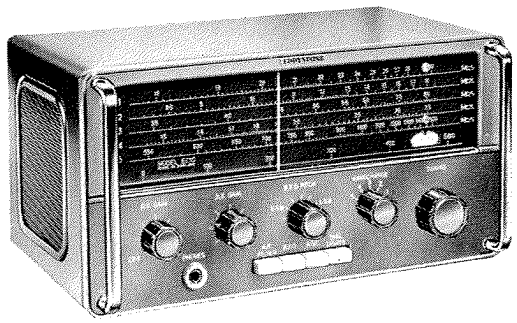
Panoramic reception over the range 230 Mc/s to 870 Mc/s is provided by the EPR29 receiver, which combines the 990S receiver, EP17R display unit, Cat. No. 939 I.F. Converter Unit, and Cat. No. 906 speaker. The overall sensitivity is high and both AM and FM signals can be studied in detail. Total consumption is about 110 watts.

Eddystone

EC10
TRANSISTORISED COMMUNICATIONS RECEIVER

Although classed as a general purpose receiver, the "EC10" is finding many applications in the professional field, and is of particular value where portability and operation independent of a mains supply are essential requirements. Continuous coverage is given from 550 kc/s to 30 Mc/s in five ranges and an excellent performance obtains throughout. The receiver accepts CW and AM signals and, whilst not specifically designed for s.s.b., it operates reasonably well in this mode also.

Relatively inexpensive, the "EC10" receiver is nevertheless built to the normal high engineering standards associated with Eddystone equipment.



Frequency Coverage
550 kc/s to 30 Mc/s, in five ranges.

Circuit
Single superheterodyne using ten transistors and three diodes. One RF stage, separate oscillator, two IF stages, push-pull class "B" output.

Power Supply
Six HP2 cells housed in a detachable compartment with Zener diode stabilisation to earlier stages. AC mains power supply unit, (Cat. No. 924), interchangeable with battery unit, available as an extra.

Tuning System
Precision slow motion drive, 110 to 1 reduction ratio. Horizontal scales, 9" long, calibrated to within 1%. Logging and auxiliary vernier scales.

Controls
Independent RF and AF gain; tuning; wave-change; BFO pitch; push-buttons for AF Filter; AGC on/off; BFO on/off; dial lights (biased at off).

Input Impedance
Nominal 75 ohms on ranges 1 to 4, and 400 ohms on medium wave range. High impedance connection for short aerial, effective on all ranges.

Sensitivity
Better than 5 microvolts on Ranges 1 to 4, and 15 microvolts Range 5, for 15 dB signal-to-noise ratio.

Spurious Responses
Image ratio approximately 50 dB at 2 Mc/s and 20 dB at 18 Mc/s. Breakthrough at the I.F. (465 kc/s) better than 65 dB.

AGC
Not more than 15 dB change of output level when input signal increased 80 dB above 6 microvolts (at 2 Mc/s on range 4).

Audio Output
Maximum output approaches 1 watt. Internal speaker and panel jack for telephones or external speaker.

Physical Details

Width	.. .. ..	12½" (31·7 cm).
Height	.. .. ..	6⅜" (16·2 cm).
Depth	.. .. ..	8" (20·3 cm).
Weight with battery	..	14 lb. (6·3 kg).

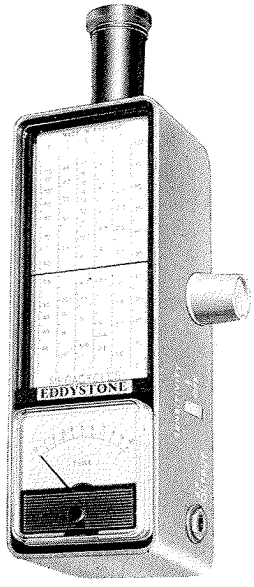
Finished two-tone grey and suitable for use in all parts of the World.

Eddystone

EDOMETER TEST INSTRUMENT

CAT. No. 902

A versatile instrument which will be found a most useful and practical addition to the equipment in any radio and electronic laboratory, workshop or maintenance department.



The "EDOMETER" provides the following facilities in the one complete unit:

STANDARD DIP OSCILLATOR

ABSORPTION WAVEMETER

HETERODYNE WAVEMETER

SIMPLE SIGNAL GENERATOR

MODULATION MONITOR

AUDIO TONE SOURCE

The main function of the instrument is as a dip oscillator, to indicate the resonant frequency of a tuned circuit. Since the unit is transistorised and self-contained, it is available for immediate use in any situation, without the inconvenience of a trailing lead or need of access to a mains supply. The illustration gives a good idea of the appearance, the length of the case (without a coil) being approximately $6\frac{3}{8}$". It will be noted that both the scales and the indicating meter can be read very easily.

Frequency Coverage
Seven plug-in coils are provided. Five of these give coverage from 1·6 Mc/s to 115 Mc/s, and read-out is against the calibrated scale. Coils 6 and 7 (Ranges 6 and 7) are mainly for alignment purposes, with the instrument functioning as a signal generator, and cover from 1700 kc/s to 390 kc/s. A separate slip-on scale is provided.

Controls
There are three controls, arranged for convenient operation with the instrument held in the hand. The TUNING KNOB operates a geared reduction drive, which makes for easier adjustment.
The SUPPLY SWITCH/SENSITIVITY control is of the edge-operated type, the knurled surface being rotated downwards to switch on the power supply. Further rotation affects the sensitivity, the meter deflection being adjusted to give a constant reading.
The MODULATION SWITCH determines the function of the second transistor, which becomes an audio amplifier in the OFF position and a tone generator in the ON position.

Outputs
Normal radiation from the exposed coil is used when a signal for test work is required. To modulate the signal, the modulator switch is placed in the ON position.
The right-hand jack socket delivers the audio signal, the frequency being nominally 1000c/s, the amplitude 100 millivolts, and the output impedance around 5000 ohms. With a plug inserted, the r.f. oscillator is disabled.
Using the instrument either as a modulation monitor or as a heterodyne wavemeter, output is taken to a telephone headset from the left-hand jack socket.

Coils
The coils are of robust construction. The windings are coated with epoxy resin, both as protection and to prevent change of inductance.

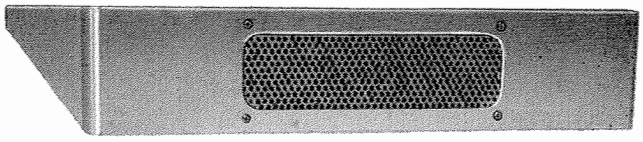
Power Supply
A PP3 battery (9 volts) fits inside the case and can easily be replaced when necessary. (Battery not supplied.)

Dimensions
The unit measures $6\frac{3}{8}" \times 2\frac{1}{4}" \times 2\frac{1}{4}"$, not allowing for the projections. The weight is 25 ozs. complete with battery.

Instructions
A comprehensive Instruction Manual, covering the various applications, is supplied with the instrument.

Eddystone

ACCESSORIES FOR USE WITH COMMUNICATIONS RECEIVERS



Plinth Loudspeaker (Cat. No. 906)
A dual purpose unit for fitting underneath a communications receiver, the latter being tilted back at an angle of about 20°, allowing a better view of the scales, and leading to easier control of knobs and switches. Fitted to the front of the unit is an elliptical speaker of 3 ohms impedance, which is suitable for direct connection to the speaker output terminals of Eddystone receivers and most other makes also. The width is 16″, the depth 10½″, and the height at the front 3$\frac{5}{16}$″. The weight is 2½ lb. and the finish smooth grey.

General Purpose Speaker (Cat. No. 935)
A useful general purpose cabinet speaker, of compact dimensions, the measurements being width 8¼″; height 4½″; depth 2½″. The cabinet, of steel, is finished a pleasing grey and matches well with most equipment. The speaker can be used free-standing and it lends itself well to mounting on wall or bulkhead. Impedance is 3 ohms and a connecting lead is fitted.

High Quality Telephone Headset (Cat. No. LP2921)
These telephones are of well above average quality and, in professional communications, ensure excellent speech quality. Because of the wide frequency range and low distortion at high sound levels, the telephones are recommended for monitoring music at high fidelity in cases where it is undesirable to use a speaker. The impedance is 400 ohms, making the headset suitable for use with the majority of receivers. Weight 10 ounces. Finish cream and black. Fitted with lead and sleeve and tip plug, and with hygienic noise-excluding pads.

Lightweight Telephone Headset (Cat. No.LP2924)
A telephone headset of modern design and possessing high sensitivity. The quality of speech reproduction is good and the telephones are equally suitable for the reception of CW signals. This type of headset is favoured by the majority of professional operators.
The material is mainly reinforced Nylon, which is strong, durable and very light in weight. The headset is adjustable and is most comfortable in use. The impedance is 600 ohms, a value which matches well with most receivers, and a cord fitted with a standard sleeve and tip plug is attached. Weight is approximately six ounces and the colour black.

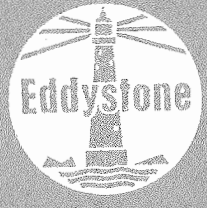
I.F. Converter Units
With the majority of the Eddystone receivers described in this Catalogue, an i.f. outlet is provided for use with auxiliary equipment such as a panoramic display unit, discriminator or recording unit. Cases arise where the frequency at the outlet does not match that required at the input of the auxiliary equipment and, to obviate possible difficulty, a range of small transistorised converter units is available. Whilst intended mainly for use with Eddystone receivers, the converter units may well fit in with other requirements. They are robustly constructed in small, well-finished diecast boxes.
The same general design applies to each of the units, a given frequency being accepted, mixed with the output of a crystal-controlled oscillator, and the desired output frequency selected, with suitable filtering to minimise spurious responses. Input and output terminations are co-axial sockets, the impedance being within the operating range of 50 to 200 ohms. The gain and the bandwidth are adjusted to near unity.
An external power supply of nine volts at a few milliamperes is required, and with the Eddystone receivers mentioned below, a socket is provided enabling the power to be drawn from the receiver itself. It should not be difficult to make suitable arrangements in other cases.

Cat. No. 929 Converts an input frequency of 500 kc/s, which is the intermediate frequency of the "880/2" receiver, to 100 kc/s.

Cat. No. 951 Converts from 720 kc/s, the intermediate frequency of the "850/4" receiver, to 100 kc/s.

Cat. No. 939 Converts from 36·5 Mc/s to 5·2 Mc/s, the former being the i.f. of the "990S" receiver and the latter the input frequency of the "EP17R" panoramic display unit.

The above are standard units but it will be appreciated the general design lends itself readily to other combinations. Specific enquiries are invited, giving technical details and quantity involved.



Printed in England November 1965

830/7

WIDE RANGE
COMMUNICATIONS RECEIVER

EDDYSTONE RADIO LIMITED
BIRMINGHAM 31

Eddystone

830/7

WIDE RANGE COMMUNICATIONS RECEIVER

The Eddystone "830/7" 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 bandwith 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 bandwith 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 availaible 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 techninical characteristics given later will confirm. A design feature of importance is the low level of oscillator radiation, which makes the "830/7" suitable for use in installations where a number of receivers are operated in close proximity.

Ease of operation has received special attention. The panel controls are laid out for maximum convenience of the operator; the wide and well illuminated scales allow the frequency to be read with a high degree of accuracy; and the finely engineered, gear-driven slow motion mechanism permits smooth, precise control of the 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.

Frequency Coverage

Nine ranges give the following coverage:—

Range 1	.. ..	18 to 30 Mc/s.
Range 2	.. ..	11 to 18 Mc/s.
Range 3	.. ..	6·7 to 11·0 Mc/s.
Range 4	.. ..	4·0 to 6·7 Mc/s.
Range 5	.. ..	2·5 to 4·0 Mc/s.
Range 6	.. ..	1·5 to 2·5 Mc/s.
Range 7	.. ..	860 to 1500 kc/s.
Range 8	.. ..	480 to 860 kc/s.
Range 9	.. ..	300 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/ECC189	(CV5331)	Cascode RF amplifier
V2	6AK5/EF95	(CV850)	First Mixer
V3(a)	6AJ8	(CV000)	Second mixer isolation stage
V4	6C4/EC90	(CV133)	Second local oscillator
V5	6BA6/EF93	(CV454)	First 100 kc/s IF amplifier
V6	6BA6/EF93	(CV454)	Second 100 kc/s IF amplifier
V7	6AL5/EB91	(CV140)	Noise Limiter
V8	6AU6/EF94	(CV2524)	Cathode follower IF output (100 kc/s)
V9	6AT6/EBC90	(CV452)	AM Det/AGC rect/ Audio amp.
V10	6AQ5/EL90	(CV1862	Audio output
V11	6AU6/EF94	(CV2524)	Crystal calibrator
V12	6U8/ECF82	(CV5065)	First local oscillator
V13	6BE6/EK90	(CV453)	CW/SSB detector
V14	OA2/150C4	(CV1832)	HT stabiliser 1
V15	OA2/150C4	(CV1832)	HT stabiliser 2
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 "830/7/RM"—is available for fitting into a standard 19" rack, in which it occupies a height of 8¾". The table version can be converted to rack mounting by fitting special angle brackets and a modified cabinet. 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	..	16¾" (42·5 cm).
Depth	..	15" (38·1 cm). (including rear projection)
Height	..	8¾" (22·2 cm).
Weight	..	49 lb. (22·2 kg).

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 12 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 10^4.
With the first oscillator crystal controlled, drift during the first thirty minutes does not exceed one kilocycle. After this period, drift will be less than 500 cycles 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.

EDDYSTONE RADIO LIMITED
ALVECHURCH ROAD, BIRMINGHAM 31, ENGLAND
Telephone PRIORY 2231
Cables EDDYSTONE, BIRMINGHAM
Telex 33708

Printed in England Issued January, 1966