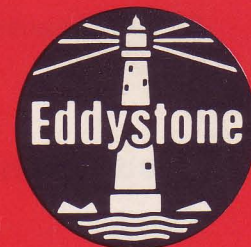


Eddystone Radio Limited

Member of Marconi Communication Systems Limited



General Purpose VHF/UHF Communication Receiver

1990R Series

Features

Option of 25–235MHz or 25–500MHz coverage

AM – FM – CW – pulse

Continuous tuning plus choice of 10-channel crystal facility or synchronizer for high stability working

Choice of IF filters

Modular construction

40–60Hz AC or 12v DC operation



Model No. 1990R/2S

Description

Model 1990R is the 'Series' designation for a range of professional-grade VHF receivers intended for communications and laboratory use. Current versions are Model 1990R/1 which covers the band 25–235MHz, and Model 1990R/2 which has an additional frequency range to extend the coverage to 500MHz. The two receivers are otherwise identical and provide reception facilities for AM, FM, CW and PULSE transmissions. Operating voltage can be taken from any standard 40–60Hz AC supply or 12V DC with negative earth.

Both receivers employ single-conversion with an intermediate frequency of 21.4MHz and utilize a MOSFET RF Amplifier and diode quad balanced mixer for good two-signal performance. Coverage of the additional 230–500MHz range of Model 1990R/2 is achieved by means of a separate varactor-tuned RF Unit which feeds the balanced mixer through a pin-diode switching circuit. Front-end selectivity is provided by three tuned circuits ahead of the mixer on each range but these can be bypassed to allow direct input to the mixer for wideband applications.

Provision is made for high stability working as a standard feature and all receivers are supplied with either a switched 10 channel crystal facility (X) or a synchronizer unit (S) which allows continuous tuning in increments of 100Hz. Standard crystal facility is for 10 channels 25–235MHz on /1 variant and 5 channels 25–235MHz and 5 channels 235–500MHz on /2 variant. The appropriate arrangement and particular crystal frequencies must be specified when ordering. Available to order 10 crystal channels distributed throughout tuning range 25MHz to 500MHz.

1990R variants fitted with 10 channel crystal facility can also be operated with externally derived oscillator signals as a further alternative to normal continuous tuning with free-running local oscillator.

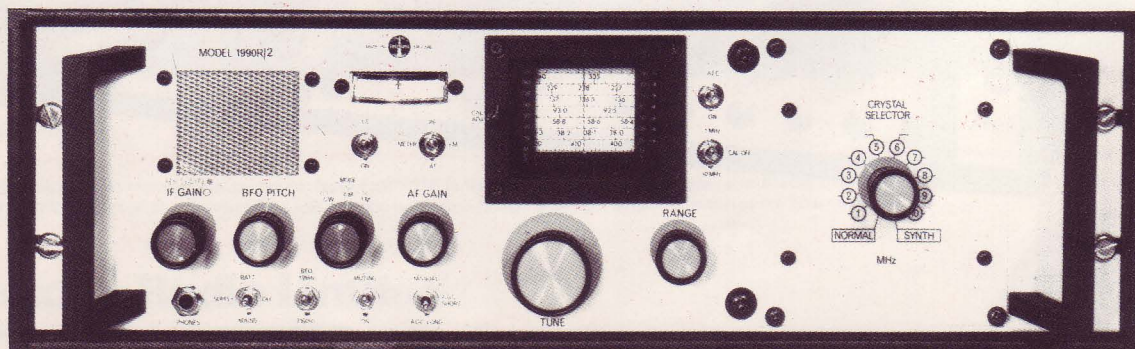
AFC can be used on any model in free tune mode.

The IF filter complement fitted on standard production receivers comprises one L/C filter with 250kHz bandwidth and one crystal filter with 30kHz bandwidth to suit 50kHz channel spacing. A spare position on the selectivity switch allows installation of an additional crystal filter which can be chosen to suit 25kHz or 12.5kHz channelling to customer's request. Alternatively, either of the two narrow filters can be fitted in place of the standard crystal filter if required. Low-level pre-filter and post-filter IF outputs are available at low-impedance for connection to ancillary equipment.

Separate detectors are employed for each signal mode with a product detector for CW. The BFO utilizes a varactor-tuned crystal oscillator with selectable control range. Manual gain adjustment is provided, together with independent RF/IF AGC circuits and a carrier-controlled muting system. The video circuits provide separate positive- and negative-going outputs at low impedance.

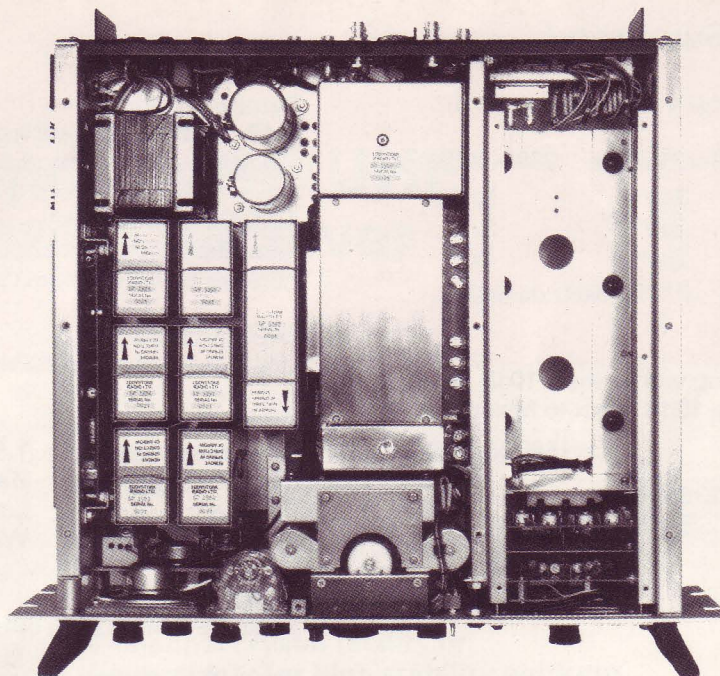
A small monitor loudspeaker is fitted on the panel and outputs are available for connection to headset, external loudspeaker and 600 Ω lines. Two separate amplifiers are used, one of which provides the line output alone and is equipped with pre-set level control. The external loudspeaker circuit is muted when the headset is connected and the panel loudspeaker can be muted by means of a panel switch.

Other facilities include a dual-frequency crystal calibrator and a panel meter which can be switched to read carrier-level or 600 Ω line-level and also serves as a centre-zero tuning indicator for FM. The tuning system is gear driven and frequencies are displayed on a metal film scale which has a length of 915mm (36in) for each range. Modular construction is used throughout and the equipment is intended for installation in standard 483mm (19in) racking. Accessories include a cabinet for bench-mounting, a plinth loudspeaker, special aerial systems and a matching panoramic display unit.



Front view

Model No. 1990R/2X



Plan view showing modular construction
Model No. 1990R/2X

Specification

Application

General-purpose solid-state VHF/UHF receiver with versatile frequency control suitable for point-to-point communications, search and surveillance, monitoring and laboratory use.

Reception Modes

AM — FM — CW — PULSE

Frequency Coverage

Models 1990R/1-X & 1990R/1-S: 25—235MHz in five ranges.

Models 1990R/2-X & 1990R/2-S: 25—500MHz in seven ranges.

Suffix identity 'X': crystal facility (ten channels)
'S': integral synchronizer

Intermediate Frequency

21.4MHz.

Filter Complement

Standard bandwidths: 250kHz + 30kHz.

Options: 'A' 250kHz + 30kHz + 15kHz
'B' 250kHz + 30kHz + 7.5kHz
'C' 250kHz + 15kHz + 7.5kHz
'D' 250kHz + 15kHz
'E' 250kHz + 7.5kHz

Specify at time of ordering. Options A, B & C at extra cost.

Specify 30kHz filter b/w for 50kHz channelling.

15kHz	25kHz
7.5kHz	12.5kHz

NB: Use of crystal facility or synchronizer is recommended when using 7.5kHz and 15kHz bandwidth.

Aerial Input

50/75Ω unbalanced. Additional input available direct to bal. mixer for wideband applications.

Output Facilities

Separate 'wide' and 'narrow' IF outputs, positive video, negative video, external loudspeaker, headset and 600Ω lines (bal. or unbal.).

Environmental

−10°C to +50°C (−20°C to +70°C storage).

Calibration Accuracy

Within ½% to 235MHz and 1% from 235—500MHz without use of built in calibrator. (Cursor adjustor at mid-position).

Calibrator provides 1MHz and 10MHz markers for precise frequency setting.

Power Supplies

AC: 100/130V or 200/260V (40—60Hz).

DC: 12V with negative earth.

Consumption (AC/12V): RECEIVER — 15W/10W
RECEIVER COMPLETE WITH SYNCHRONIZER — 35W/30W.

Dimensions and Weight (with Synchronizer)

Rack-mounting style:

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

Rack intrusion: 411mm (16.188in)

Weight: 19.5kg (43 lb)

Bench-mounting style:

Width: 502mm (19.75in)

Height: 164mm (6.5in)

Depth: 457mm (18in)

Weight: 25kg (56 lb)

Performance Summary†

Sensitivity (10dB S+N/N with standard o/p)

MODE	B/W	25–235MHz	230–500MHz
*AM	30kHz	3µV	5µV
**FM	250kHz	3µV	5µV
CW	30kHz	2µV	3µV

(*) 30% mod at 1kHz. (**) 22.5kHz deviation.

Noise Factor

Typically 4dB and not worse than 10dB at any frequency: better than 10dB direct to Mixer.

Image Rejection

Greater than 50dB to 235MHz.
Greater than 40dB to 235–500MHz.

IF Rejection

Greater than 60dB.

Stability

Free-running oscillator: 1 part in $10^5/^\circ\text{C}$.
Crystal oscillator: 1 part in $10^6/^\circ\text{C}$.
Synchronizer: 0.5 part in $10^7/^\circ\text{C}$.
(*) -10°C to $+50^\circ\text{C}$.

AFC Capture

At least 1% of signal frequency (operative in free tune mode only).

Selectivity

Dependent on filter complement (see above)
Wide: 250kHz at -3dB (L/C filter).
Narrow: Passband (-6dB) Stopband (-60dB)
30kHz ($\pm 15\text{kHz}$) $\pm 50\text{kHz}$
15kHz ($\pm 7.5\text{kHz}$) $\pm 25\text{kHz}$
7.5kHz ($\pm 3.75\text{kHz}$) $\pm 12.5\text{kHz}$

Dynamic Range

40dB (with AGC disabled). Taken for 5% total distortion with 60% modulation at 1kHz.

AGC Characteristic

Less than 10dB change in output for 80dB increase in input from 3µV.

FM Deviation

Linear acceptance to 75kHz.

Audio Output

Ext. loudspeaker (3Ω): 1.5W at 10% distortion.
Line (600Ω with CT): 20mW at 5% distortion.
Headset: Low/medium Z.
Response: Within 3dB, 200Hz–8kHz

Video Outputs

Separate +ve and -ve outputs of 1V into 50Ω.

Video Response

Level within $\pm 3\text{dB}$ from 20Hz to 250kHz.

IF Outputs (quoted for 10µV signal)

Separate wide and narrow-band outputs matched to 50Ω nominal impedance.

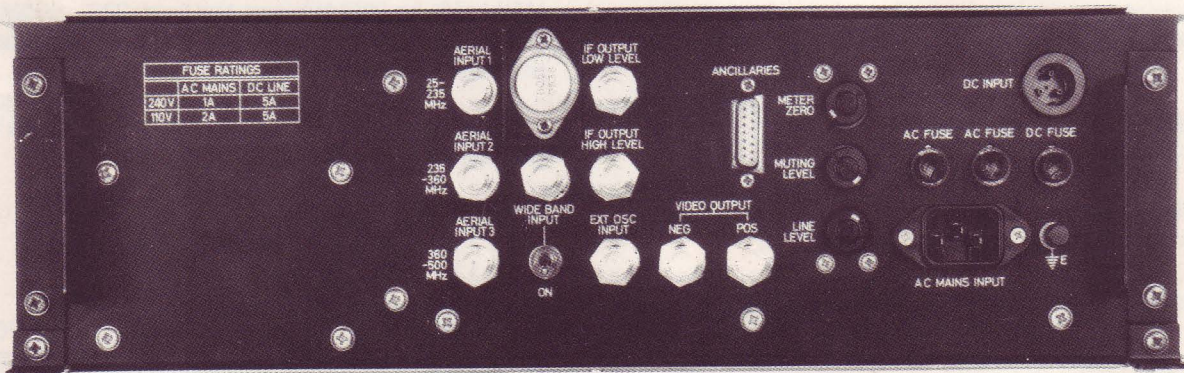
Low-level wideband output: 15µV.
Narrow-band output*: 50mV.

(*) B/W set by receiver IF selectivity.

Muting

Threshold adjustable down to 3µV carrier.

† Typical data: not to be interpreted as a test specification.



Rear view

Model No. 1990R

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 contained herein is subject to confirmation at the time of ordering.

Eddystone Radio Limited

Member of Marconi Communication Systems Limited
Alvechurch Road, Birmingham B31 3PP, England
Telephone: 021-475 2231
Cables: Eddystone Birmingham Telex: 337081

