

EC958 receivers can be installed directly in standard equipment racking and are also available complete with cabinet for bench-mounted installations. Cabinet receivers can be equipped with shock-absorbent mounts for mobile use and can also be supplied with a detachable plinth loudspeaker unit. Rack-mounting receivers are fitted with protective dust covers and are designated EC958/RM.

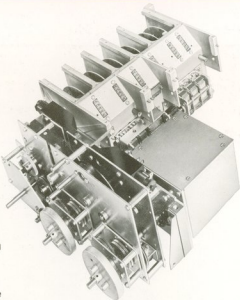
Brief Circuit Details All variants of the EC958 employ the same basic circuit configuration using solid-state techniques and integrated circuits throughout; construction follows current modular practice. FET's and MOSFET's are used almost exclusively in the RF, Mixer and IF stages, input protection being included to permit safe operation in close proximity to associated transmitting equipment. Desensitizing facilities are incorporated as a standard feature.

The receiver operates with single, double or triple-conversion to suit the frequency range selected. In double- or triple-conversion mode, the final stage of frequency conversion derives its oscillator injection from a dual-frequency crystal oscillator which permits upper/lower sideband switching for SSB and mark/space reversal in FSK-equipped receivers. A high order of stability is maintained by suitable choice of the crystals used in the oscillator position.

Five degrees of selectivity are provided at the final IF (100kHz), ranging from 400Hz to 8kHz to suit all normal signal modes. A multiple crystal filter is introduced for SSB and some variants include a dual-crystal filter having a bandwidth of 150Hz for narrow-band CW working. IF output is available for use with ancillary equipment and two independent AGC systems provide separate control for the RF and IF stages: the IF control line is brought out for diversity use.



3/4 view of EC958/RM with covers fitted.

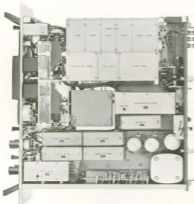


Tuning drives, RF Assembly and Incremental Oscillator Unit.

A MOSFET product detector is utilised for CW/SSB reception with carrier insertion derived from the Master Oscillator Unit when taking SSB signals. At CW, this is replaced by a tunable beat oscillator having a control swing of $\pm 5\text{kHz}$ ($\pm 8\text{kHz}$ to special order). A reduction drive is fitted for ease of adjustment.

Audio outputs are provided for external loudspeaker, telephones and line, the line output being fed from a totally independent amplifier with separate level control. A miniature internal loudspeaker is fitted on all versions.

Other features include a panel meter which indicates carrier level or line level and can also be switched to serve as an FSK tuning monitor, an internal scale check facility and provision for synthesized operation when high-stability working is required at frequencies lower than 1.6MHz. Two receivers can be operated in dual-diversity with common oscillator control and connections are available for remote tuning over a range of $\pm 100\text{Hz}$ at frequencies in the range 1.6 – 30MHz.



Plan view of EC958 showing modular construction

GENERAL SPECIFICATION

Frequency Coverage

10kHz to 30MHz in ten ranges. Continuous tuning available on all ranges plus provision for incremental tuning in bands of 100kHz at frequencies above 1.6MHz

Frequency Ranges

| | | |
|----------|----|-------------------|
| Range 1 | :: | 20.0MHz – 30.0MHz |
| Range 2 | :: | 10.0MHz – 20.0MHz |
| Range 3 | :: | 4.0MHz – 10.0MHz |
| Range 4 | :: | 1.6MHz – 4.0MHz |
| Range 5 | :: | 680kHz – 1650kHz |
| Range 6 | :: | 280kHz – 690kHz |
| Range 7 | :: | 125kHz – 285kHz |
| Range 8 | :: | 53kHz – 126kHz |
| Range 9 | :: | 24kHz – 55kHz |
| Range 10 | :: | 10kHz – 24kHz |

Intermediate Frequencies

| | | |
|----------|----|--|
| 1st IF* | :: | 1335kHz (tunable 1235 – 1335kHz to provide incremental facility above 1.6MHz). |
| 2nd IF** | :: | 250kHz (ceramic ladder filter) |
| 3rd IF | :: | 100kHz (variable selectivity) |

(*) used on Ranges 1-4 only.
(**) used on Ranges 1-6 and Range 8 only.

Reception Modes

A1, A2 and A2H telegraphy. F1 telegraphy also available when optional module is fitted.

A3, A3A, A3H & A3J telephony with upper or lower sideband selectable in SSB mode.

Aerial Input Impedance

Ranges 1-4 : 75Ω. Ranges 5-10 : 75Ω or 600Ω.

Operational Temperature Rating

0°C to -50°C.

Controls

Range Switch, Main Tuning, Incremental Tuning, Aerial Trimmer/Peak RF Control, Aerial Attenuator, Cal Switch, Cal Adjusters, High Stab/Continuous Tune Switch, Mode Switch, Selectivity Switch, USB/LSB Switch, IF and AF Gains, Meter Switch, Line Level (pre-set), BFO Pitch, AGC Switch, Speaker Switch, Supply Switch, Dial Dimmer.

Power Supplies

| | | |
|----|----|--|
| AC | :: | 100/125V or 200/250V (40-60Hz). Consumption of the order 35W. |
| DC | :: | 12V or 24V (Eddystone Power Units Types 978/12 or 978/24). Consumption of the order 45W. |

Mounting Styles

Available for bench-mounting, rack-mounting and with anti-vibration mounts for mobile use. Matching plinth speaker unit available to order.

Dimensions and Weight

Bench-mounting

| | | |
|---------------------|--------|-----------|
| Width: | 502mm | (19.75in) |
| Height (with feet): | 165mm | (6.5in) |
| Depth (overall): | 457mm | (18in) |
| Weight: | 22.7kg | (50lb) |

Rack-mounting

| | | |
|----------------------|--------|----------|
| Width: | 483mm | (19in) |
| Height: | 133mm | (5.25in) |
| Intrusion into rack: | 411mm | (16.2in) |
| Weight: | 19.6kg | (43.5lb) |

EC958 VARIANTS

The EC958 variants listed below are available at the time of printing. Other versions are in the course of development and enquiries are invited for further modified versions tailored to satisfy special requirements.

EC958 Standard general-purpose receiver with optional internal FSK facility.

***EC958/1** Fitted with special filter for optimum reception of single-sideband transmissions utilising reduced carrier. Carrier controlled AGC system and beat meter facilitate operation in conjunction with Lincomplex equipment.

***EC958/2** Specialised network monitoring and surveillance receiver—major design changes include 150Hz CW bandwidth in lieu of SSB position, continuous high-stability operation on ranges 1-4 (free running continuous tune facility not provided), incremental scale-check facility (10kHz markers), low-level BFO output and monitored AFC.

EC958/3 Similar to EC958/2 with additional 10kHz scale-check facility on Ranges 5-10.

EC958/4 Variant of standard receiver for military applications only.

EC958/5 Modified version of EC958 meeting requirements of M.P.T. Specifications TSC87, TSC102 and TSC105. Primarily for shipping installations.

(*) Internal FSK facility not available—external FSK can be provided to order.

TYPICAL PERFORMANCE†

Sensitivity

AM : 3 μ V (for 10dB S/N ratio)
 CW/SSB : 1 μ V with 3kHz B/W)

IF Selectivity

Switched L/C filter provides four selectable bandwidths plus SSB position using crystal filter. Overall bandwidths are as follows:—

| Position | -6dB | -60dB |
|----------|--|--------|
| 1 | 400Hz | 2.4kHz |
| 2 | 1.3kHz | 4.5kHz |
| 3 | 3kHz | 12kHz |
| 4 | 8kHz | 18kHz |
| SSB | 2.4kHz B/W at -3dB with 60dB points at carrier +400Hz and carrier -3.5kHz | |

Note 1 Alternative filters can be fitted to order.

Note 2 Maximum overall bandwidth is governed by the front-end circuits on the very low frequency ranges.

Image and IF Rejection

| Freq. | Image | IF |
|--------------|-------|------|
| 18MHz-30MHz | 50dB | 90dB |
| 1.6MHz-18MHz | 70dB | 90dB |
| 10kHz-1.6MHz | 60dB | 60dB |

Frequency Stability

The figures quoted below are indicative of the stability achieved after a 30-minute warm-up period. Those for 1.6-30MHz are for high-stability working in which mode a supply voltage change of $\pm 10\%$ does not affect the tune frequency by more than 2Hz.

Drift with constant ambient temperature

| | |
|---------------|--|
| 1.6MHz-30MHz | Less than 20Hz (long-term). |
| 160kHz-1.6MHz | Less than 1 part in 10^4 in any 5-minute period. |
| 10kHz-160kHz | Less than 50Hz in any 5-minute period. |

Drift with 5°C change in ambient temperature

| | |
|---------------|-------------------------------|
| 1.6MHz-30MHz | Less than 20Hz. |
| 160kHz-1.6MHz | Less than 5 parts in 10^4 . |
| 10kHz-160kHz | Less than 150Hz. |

Cross Modulation

With a wanted signal 60dB above 1 μ V, the interference produced by an unwanted signal 20kHz off-tune and of level 90dB above 1 μ V will be more than 30dB below standard output.

(†) Not to be interpreted as a Test Specification

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

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.

Blocking

With a wanted signal 60dB above 1 μ V, an unwanted carrier 20kHz off-tune must be of a level exceeding 100dB above 1 μ V to affect the output by 3dB.

Intermodulation

The level of third-order intermodulation products given 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 of 30dB above 1 μ V, two unwanted signals whose sum or difference frequency equals that of the wanted signal, must each be of a level 80dB above 1 μ V to produce standard output.

AGC Characteristic

Output is maintained within 6dB for a change in input of 90dB from 3 μ V reference level.

AGC Time Constant

Governed by Mode Switch. Of the order 40 milliseconds charge and 1 second discharge at 'AM' and 'CW/SSB'; increased to 200 milliseconds and 10 seconds respectively when switched to 'SSB HIGH-STAB'.

Audio Output

Ext. Loudspeaker (3 Ω): 1W at 5% distortion
 Line (600 Ω): 10mW max.
 Telephones: Low/medium-Z

Audio Response

Level within 3dB over the range 300Hz to 4kHz.

IF Output (100kHz)

20mV into 75 Ω for 3 μ V at aerial input.

Radiation

Less than 400pW (typically 20pW).

Calibration Accuracy

Calibration interval of 200Hz on incremental scale permits frequency setting to within 50Hz: signals can be continuously resolved to within 10Hz.

1MHz markers are provided for scale checking and additional calibration facilities are available on variants of the standard receiver.

Remote Fine Tuning

100Hz above and below local tune frequency. This facility is available on Ranges 1-4 only.

FSK Performance

Keying speeds up to 200 bauds with shifts of 85-850Hz can be accommodated when FSK Module Type LP3058 is fitted.