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Solid-State Broadcast Receiver

Model 1002

General Description Eddystone Model 1002 is a professional-grade receiver with provision for FM reception in the VHF band 88-108MHz and AM reception in the bands 150-350kHz and 550kHz-30MHz. It is equipped with an internal power unit for use with standard 40-60Hz AC supplies and a re-chargeable NiCd battery for emergency working in the event of mains failure. This battery can also be used for short term portable working but an external 12V battery of higher capacity is required for prolonged battery operation: any battery arrangement can be accommodated irrespective of earthing polarity.

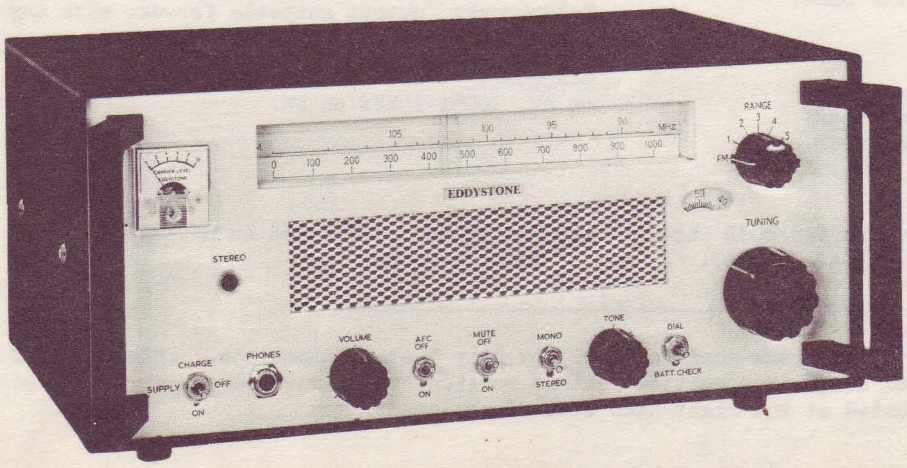
Completely separate RF and IF circuits are used for AM and FM, employing a combination of the latest FET's, MOSFET's, bipolar transistors and integrated circuits. A specially designed decoder is included which permits reception of stereo-multiplex transmissions on the VHF/FM band: a mono/stereo switch and stereo indicator lamp are provided.

Other facilities available during FM reception include an inter-station noise suppression circuit and an effective AFC system which counteracts drift in the local oscillator, so making frequent tuning adjustments totally unnecessary: both facilities can be switched off when not required. Low-level outputs are available from the L/H and R/H stereo channels for connection to a twin-channel hi-fi amplifier: terminations will accept standard connectors.

Terminations are also provided for connecting an external loudspeaker, and a further low-level output is available for recording when listening to amplitude modulated stations on the long, medium and short-wave bands. This output can be connected to a single-channel hi-fi amplifier if greater volume is required than that available from the internal loudspeaker system.

Frequency calibrations for tuning are marked on a horizontal scale drum which displays each range separately. Scale length is of the order 165mm (6.5in) on each range and a secondary scale below the main calibration can be used in conjunction with a vernier dial to provide a useful logging facility. Dial illumination is provided but this can be switched off to conserve power when operating the receiver from the internal battery pack. Tuning is by means of a precision-built, flywheel-loaded reduction drive.

Standard features not so far mentioned include a panel meter and a socket at the rear which allows independent use of the audio stages in conjunction with an external pick-up, microphone or tape replay head. The meter normally serves as a tuning indicator but in portable use can be switched to check the state of the battery. The 1002 is derived from a range of professional-class communication receivers and utilises many of the special components and techniques common to them.



GENERAL SPECIFICATION

Frequency Coverage

150kHz-350kHz, 550kHz-30MHz and 88-108MHz in seven ranges:-

Range 1	::	18.0MHz	- 30.0MHz	(SW1)
Range 2	::	8.5MHz	- 18.0MHz	(SW2)
Range 3	::	3.6MHz	- 8.5MHz	(SW3)
Range 4	::	1.5MHz	- 3.8MHz	(SW4)
Range 5	::	550kHz	- 1500kHz	(MW)
Range 6	::	150kHz	- 350kHz	(LW)
VHF/FM	::	88.0MHz	- 108.0MHz	

Intermediate Frequencies

AM (Ranges 1-6) :: 455kHz. VHF/FM :: 10.7MHz

High-grade multi-element ceramic ladder filters are used on both channels.

Reception Modes

AM and FM.

Aerial Input

Ranges 1-4 (& VHF) :: 75Ω
Ranges 5 & 6 :: 400Ω

A telescopic rod aerial for AM and FM reception is mounted at the rear of the case.

Scale Accuracy

1% on all ranges; logging scale provided.

Power Supplies

DC :: 12V from internal re-chargeable nickel-cadmium battery for short periods of operation, or 12V from external battery of higher capacity. Consumption : of the order 38mA quiescent, 230mA at maximum audio output.

AC :: 100/130V or 200/260V (40-60Hz). Consumption : approximately 12VA.

Dimensions and Weight

Height : 137mm (5.375in).

Width : 335mm (13.2in).

Depth (excldg projns) : 242mm (9.5in).

Weight (incldg battery) : 8.2kg (18lb).

Controls

Tuning, Range Switch, Volume Control, Tone Control, AFC Switch, Muting Switch, Mono / Stereo Switch, Meter / Dial Light Switch and Supply Switch (CHARGE-SUPPLY OFF-ON).

TYPICAL PERFORMANCE †

Sensitivity

Ranges 1-4	::	5μV for 15dB S+N/N ratio.
Ranges 5-6	::	15μV for 15dB S+N/N ratio.
VHF/FM	::	5μV for 15dB S+N/N ratio.

Taken with 30% modulation at 1kHz (or 22.5kHz deviation FM) for 50mW output.

Selectivity

AM :: 10kHz B/W at -6dB, 22kHz B/W at -40dB.

FM :: 250kHz B/W at -6dB.

Image Rejection

50dB at 2.0MHz, 35dB at 18.0MHz and greater than 40dB at 88MHz in the VHF band.

IF Rejection

Ranges 1-4	::	greater than 85dB.
Ranges 5-6	::	greater than 65dB.
VHF/FM	::	greater than 60dB.

AGC Characteristic

Less than 12dB change in output for 80dB increase in input (taken from 6μV at 2.0MHz).

Stereo Performance

Channel separation: better than 25dB at 1kHz.

Pilot suppression: greater than 35dB down at 19kHz, greater than 25dB down at 38kHz.

Audio Output

Int/Ext loudspeaker (8Ω): 500mW at 5% distortion; maximum output typically 1-watt.

Mono recording output: low-level, distortion less than 0.3% and hum level 50dB down.

L/H & R/H stereo outputs: of the order 100mV in 1kΩ with distortion less than 5% (typically 2%).

Telephones: output suitable for use with any low/medium-impedance headset.

Response: level within 6dB from 100Hz-10kHz on AM, 100Hz-15kHz on FM.

(†) Not to be interpreted as a test specification.

Also available in 483mm (19in) rack-mounting form for ship installations etc. Internal NiCd battery and telescopic rod aerial are omitted on this version; twin loudspeakers are replaced by a single loudspeaker mounted at the right-hand side of the panel.