Eddystone Radio

MODEL 1650
LF/HF Radio Communication Receiver

The new-generation receiver for today's military, professional and commercial user.

No-one has more expertise than Eddystone when it comes to radio communications technology. For decades our equipment has been internationally-renowned for its quality and reliability – and as part of Marconi Communication Systems, we offer you the reassurance of dealing with one of the largest radio communication specialists in the world.

With the Eddystone 1650, we bring you a new generation of high-stability synthesised communications receivers. They combine traditional Eddystone reliability with advanced features like in-built microprocessor control, LED display and powerful programmable memory, accessed by a sealed membrane keypad. Its easy to maintain, too, because the modular design makes unit replacement fast.

The result is a high-performance receiver that's sophisticated, versatile, reliable, simple to maintain and easy to operate.

Sealed membrane front panel, preventing the ingress of dirt, dust and moisture.

Channel selection with store, tune and receive facility.

Selectable RF attenuator, 0, −10, −20dB.

Channel and frequency display with bright red LED's.

Mode selection.

AGC selection.

Scan facility of all or some of programmed channels.

Rapid channel and frequency selection by keypad entry.

LED signal meter.

Selection of wide and narrow filter options.

AF volume (independen line output).

Sweep facility over all or part of band.

Rotary encoder knob, with analogue 'feel', tunes in 5Hz steps.

BFO select.

IF gain and mute level control.

Advantages.

- Full 10kHz to 30 MHz coverage.
- Remotely controlable.
- Variable speed tuning.
- Built-in RF front end pre-selector option.
- Scan and sweep facility.
- 99 programmable memories.

Front panel loudspeaker for local monitoring.

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Variable display intensity control.

Pre-set line output level adjustment.

Headphone socket.

Eddystone

A Leading Light in Communications

MODEL 1650 LF/HF SYNTHESISED RECEIVER

The 1650 is the first in a new generation of Eddystone receivers designed to combine high performance with a wide range of operating facilities including remote or unattended operation.

Easy to operate

Control, both local and remote, is achieved via an inbuilt microprocessor, affording such facilities as 'Scan', 'Sweep' and memory storage channels.

Careful attention has also been paid to the front panel layout, with easy-to-read LED displays for frequency, channel, mode, attenuation, bandwidth and a.g.c. Correct operation of the controls is acknowledged by an audio tone.

Normal 'Search' tuning is by a single rotary encoder tuning knob with automatic variable tune rate. There is a 99 channel programmable memory for instant recall of pre-selected frequencies (together with their attenuation mode, bandwidth and a.g.c. characteristics) via a membrane keypad.

Outstanding reliability

High-quality components and the employment of a microprocessor ensure outstanding reliability. All devices are solid-state, ensuring a wide temperature operating range and good shock and vibration performance – essential characteristics for receivers operating in mobile, naval and military applications.

Furthermore, the front panel of the 1650 is formed by a sealed membrane mounted onto a metal plate. This is ideally-suited for receivers operating in hostile environments as its sealed construction prevents the ingress of dust, grit and moisture – elements which all too often contribute towards mechanical and electrical deterioration in such equipment.

Easy to maintain

Repairs and servicing are made simple by extensive use of plug-in modular panels – each unit being readily accessible and involving a minimum of mechanical work. All of which means the MTBF is high and the MTTR is very low – ensuring the continuous and reliable operation essential for receivers employed in critical roles.

Power supply

The 1650 is normally used on an AC supply (as detailed in the Specification table) and has an automatic 'Changeover' circuit enabling a 24V DC supply to be used as a standby. An internal back-up battery is fitted to prevent the memory information being lost in the event of both power sources failing.

Technical performance

The 1650 meets the requirements of British MPT Specification 1201, CEPT Specification for a Maritime Main Receiver and is generally in accordance with British Defence Specification 133 Class L2. Detailed technical parameters and specifications are given on a separate data sheet.

1650/3 ISB version.

SPECIFICATION SUMMARY.

Frequency Coverage
10kHz to 30MHz in synthesised steps of 5Hz.

Reception Modes
1650/1 AM, CW, USB
1650/2 AM, CW, USB, LSB
1650/3 AM, CW, USB, LSB, ISB

Sensitivity
12dB S/N on SSB for 1μV input.

Power requirements
A.C.–100V/130V or 200V/260V (40Hz-60Hz) single phase
or
D.C.–24V negative ground.

Environmental

Operational temperature	:	−15°C to +55°C
Storage temperature	:	−40°C to +70°C
Relative humidity	:	95% at +40°C

Reception Bandwidths

Very Narrow	:	400Hz
Narrow	:	1kHz
SSB	:	2.4kHz
Intermediate	:	3kHz
Wide	:	8kHz
Very wide	:	14kHz

Image Rejection
Typically 100dB

IF Rejection
Typically 100dB

Frequency Stability
1 part in 10^{-7} above 1MHz
Facility for locking to external master can be provided

Audio Output

Line (600Ω)	:	10mW Pre-Set
Loudspeaker	:	1W maximum
Headphones	:	10mW maximum Low/Medium impedance

IF Output
1.4 MHz
Suitable for driving panoramic display units or F.S.K. demodulators.

Eddystone Radio

A MARCONI COMMUNICATION SYSTEMS COMPANY.

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Eddystone Radio

MODEL 1161
PANORAMIC DISPLAY UNIT

SERIES 1161

FEATURES

- Sealed membrane front panel.
- Easy to operate.
- Rugged construction.
- High-Contrast LCD flickerless Display.
- Dual speed electronic Cursor.
- 4-Channel Store & Recall facility.
- High Dynamic range.
- Rear mounted recorder output for hard copy.

PANORAMIC DISPLAY UNIT — MODEL 1161

DESCRIPTION

The 1161 Panoramic Display Units are designed for operation with the 1650 LF/HF and 1995 VHF/UHF receivers, providing improved facilities for the detection and analysis of signals depending on the sweep and selectivity chosen. Band occupancy, signal level, modulation and frequency spacing can be readily determined.

The use of a high contrast liquid crystal display enables the 1161 PDU to show a wide range of frequency spectrum on a 230mm by 62mm viewing area with a completely 'flickerless' display. The front panel is of the membrane type as used on the companion receivers, with led indicators to show the settings and status of the unit. An electronic cursor on the display permits rapid determination of frequency spacing between signals or the frequency offset from the centre frequency of the signal received on the associated receiver.

The display can be frozen by the HOLD button, and up to four sets of display data can be stored for later analysis. Two electronic cursor speeds in each direction are provided for rapid signal frequency identification. The signals can be displayed on either linear or logarithmic scales, and the IF ATTENUATOR and RF ATTENUATOR buttons used to adjust the input level to give the required display.

Rear panel connections are provided to enable the information which appears on the screen to be transferred to an external intelligent printer or recorder for hard copy purposes.

DATA SUMMARY

Model 1161/1 for use wth 1650 receiver.
Model 1161/2 for use with 1995 receiver.

Input Frequency

46.205MHz ±1.5MHz for 1161/1.
10.7MHz ±3MHz for 1161/2.

Sweep Dispertion

3000,1000,300,100,30,10,3kHz for 1161/1.
6000,1000,300,100,30,10,3kHz for 1161/2.

Selectivity

8kHz, 3kHz, 600Hz. 200Hz, 60Hz.

Sensitivity (log)

1mV fsd.

Dynamic Range (log)

64dB

Sensitivity (linear)

1mV fsd at maximum gain. IF Attenuation in 6dB steps to 42 dB.

Dynamic Range (linear)

26dB displayed.

Input Impedance

50 ohms unbalanced.

RF Input Attenuator

0 to 40dB in 10dB steps.

Display

480 by 128 pixcell backlit LCD with 230mm by 62mm display area.

Display Memory

Current display plus 3 stored channels.

Fast Scan

Fast scan facility for rapid signal location.

Cursor Frequency Display

6 digit frequency display of true or offset frequency.

Marker Cursor

Dual speed electronic cursor.

Recorder Drive

32 digital output plus 9 address lines.

Power Supply

100/150V and 200/260V (40-60Hz) single phase AC. Operation from 24V DC negative ground is automatically selected in the absence of an AC mains supply.

Environmental

Operational temperature : −15°C to +55°C
Storage temperature : −40°C to +70°C
Relative humidity : 95% at +40°C

Mounting Style

Rack mounting: Including handles and cabling at rear.
Height 133mm (5.25 inches),
Depth 490mm (19.29 inches),
Width 483mm (19 inches).

Eddystone Radio

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Eddystone Radio

500 WATT VHF/FM BROADCASTING TRANSMITTER SYSTEM

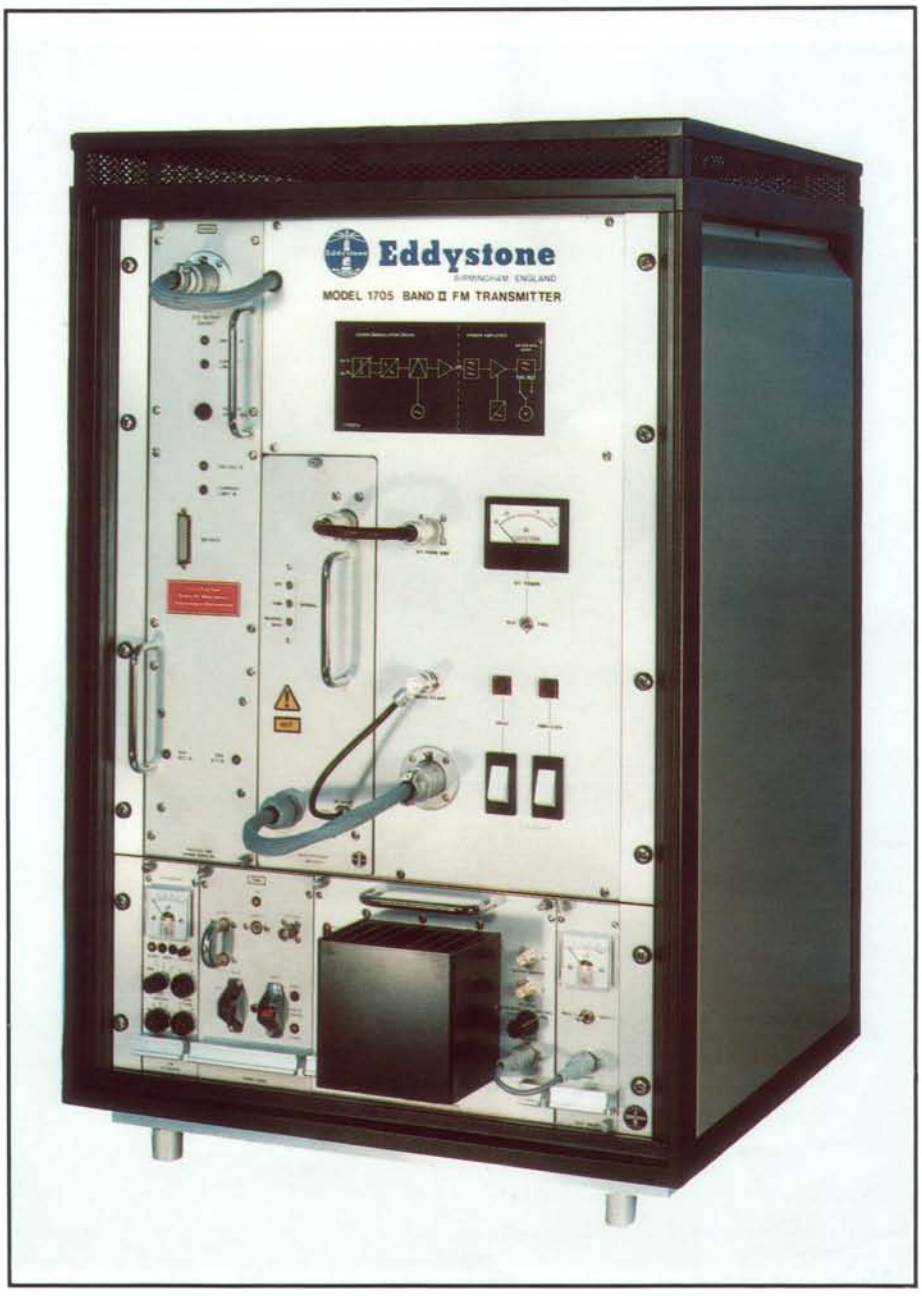
SERIES 1705

FEATURES

- Completely solid state.
- Broadband RF power amplifier and filter.
- Built to meet high standards of performance and reliability at an economical price.
- Extremely quiet operation using very efficient convection cooling.
- Good accessibility for maintenance purposes.
- Extensive protection and monitoring facilities.
- Completely self contained. complete with Mono, Stereo, or Rebroadcast transmitter drive.

Options Available

Model 1705/1A – Stereo
Model 1705/2A – Mono
Model 1705/3A – Amplifier only (less drive)
Model 1705/4A – Rebroadcast version



MODEL 1705 BAND II FM TRANSMITTER COMPLETE WITH STEREO CODER AND DRIVE

500W VHF/FM TRANSMITTER — MODEL 1705

GENERAL

500 Watt Amplifier Module

The 500 watt module is broad-band and covers the broadcast band 87.5MHz - 108MHz with no adjustment. The module is fully protected against all output mis-match conditions including infinite VSWR and over-temperature. A fault condition causes progressive cut-back of RF power to maintain safe operating conditions for the output devices. The output power can be accurately preset in the range 300 watts - 500 watts and is held constant against variations in drive level by an internal AGC loop.

Switching Power Supply

The switching power supply operates from low voltage AC derived from a dual screened mains isolating transformer, thus providing a high degree of safety. Additionally the use of an input transformer provides good noise rejection and enables a relatively simple yet highly efficient switching regulator to be used. The main 28V DC outputs are short-circuit and over-voltage protected. Both the power supply and the RF amplifier module contain separate 'A' and 'B' halves to preserve redundancy under fault conditions.

Baseband Modules

The base-band modules consist of a stereo or mono line attenuator, a stereo coder (stereo versions only) and a transmitter drive/modulator to feed the RF power amplifer.

The line attenuator accepts two incoming balanced audio signals (one input only for mono versions), which can have a range of input levels, to produce standard level, unbalanced output signals. It also incorporates a dual sensitivity ±100kHz/±50kHz deviation meter together with demodulated audio monitoring signals, both of which are fed from the transmitter driver.

The stereo coder, where fitted, accepts 'Left' and 'Right' channel inputs from the line attenuator, generates a 19kHz pilot and adds 50 µS pre-emphasis if required. The multiplex signal is then fed to the transmitter drive/modulator, for amplification to the correct RF level to feed the power amplifier.

Where rebroadcast is required, the stereo line attenuator and stereo coder are replaced by an 'off-air' receiver. This receiver's output is a multiplex signal fed to the transmitter drive/modulator

Monitoring

Full monitoring facilities are available on the front panel.

PERFORMANCE DATA

(Not to be interpreted as a test specification).

Output frequency:
87.5MHz to 108MHz in 25kHz increments.

Output impedance:
50Ω unbalanced

Output connector:
Type HN

Maximum VSWR:
1.4:1

Frequency stability:
Within 500Hz of nominal output frequency for ambient temperature range −5°C to +35°C

Spurious outputs:
< −60dBc

Residual AM:
< −55dB 50kHz bandwidth

AM due to FM:
< −40dB with ±75kHz deviation

Power supply 'Lock':
100mV peak to peak 19kHz stereo pilot locks PSU switching frequency to pilot tone

Working ambient:
−10°C +50°C

Audio input:
0dBm ±10dB into 600Ω balanced or high impedance

Harmonic distortion:
< −50dB with ±75kHz deviation

Signal/noise ratio:
Stereo −
> 66dB weighted relative to ±75kHz deviation
Mono −
> 70dB weighted relative to ±75kHz deviation

Stereo separation (/1 version only):

30Hz	to 100Hz	>40dB
100Hz	to 5kHz	>46dB
5kHz	to 15kHz	>40dB

Power supplies:
Single phase 190 - 260V AC 50Hz

6.5A RMS input Power factor approximately unity

Efficiency:
AC in to RF out approximately 55%

Dimensions (mm):
520 width x 712 height x 610 depth

Weight (kg):
100

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Eddystone Radio

1000 WATT VHF/FM BROADCASTING TRANSMITTER SYSTEM

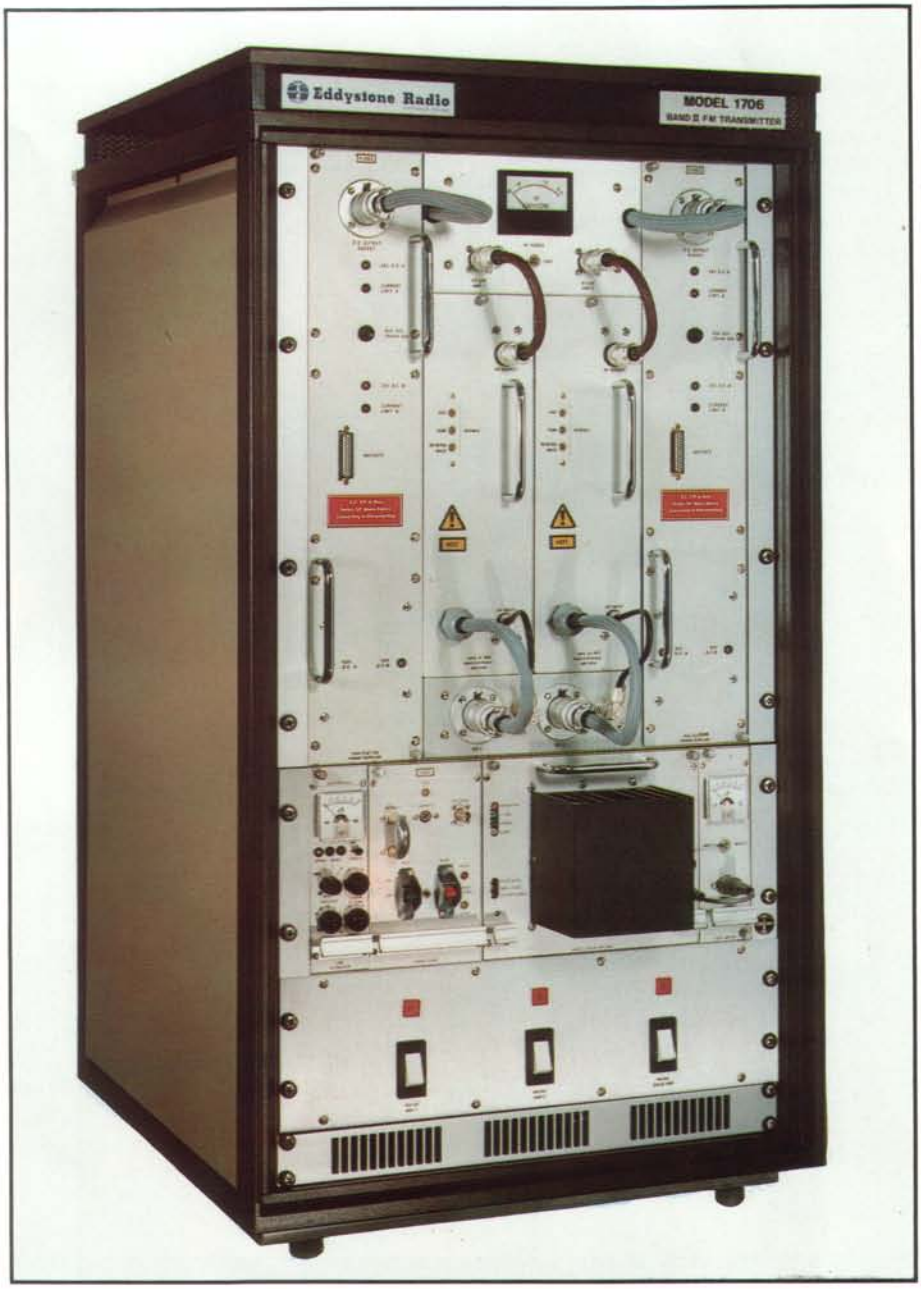
SERIES 1706

FEATURES

- Completely solid state.
- Broadband RF power amplifier and filter.
- Built to meet high standards of performance and reliability at an economical price.
- Extremely quiet operation using very efficient convection cooling.
- Good accessibility for maintenance purposes.
- Extensive protection and monitoring facilities.
- Completely self contained, complete with Mono, Stereo, or Rebroadcast transmitter drive.

Options Available

Model 1706/1A – Stereo
Model 1706/2A – Mono
Model 1706/3A – Amplifier only (less drive)
Model 1706/4A – Rebroadcast version



MODEL 1706 BAND II FM TRANSMITTER COMPLETE WITH STEREO CODER AND DRIVE

1000W VHF/FM TRANSMITTER — MODEL 1706

GENERAL

500 Watt Amplifier Modules

Each 500 watt module is broad-band and covers the broadcast band 87.5MHz – 108MHz with no adjustment. The module is fully protected against all output mis-match conditions including infinite VSWR and over-temperature. A fault condition causes progressive cut-back of RF power to maintain safe operating conditions for the output devices. The output power can be accurately preset in the range 300 watts – 500 watts and is held constant against variations in drive level by an internal AGC loop.

Switching Power Supplies

Each switching power supply operates from low voltage AC derived from a dual screened mains isolating transformer, thus providing a high degree of safety. Additionally the use of an input transformer provides good noise rejection and enables a relatively simple yet highly efficient switching regulator to be used. The main 28V DC outputs are short-circuit and over-voltage protected. Both the power supply and the RF amplifier modules contain separate 'A' and 'B' halves to preserve redundancy under fault conditions.

Baseband Modules

The base-band modules consist of a stereo or mono line attenuator, a stereo coder (stereo versions only) and a transmitter drive/modulator to feed the RF power amplifier.

The line attenuator accepts two incoming balanced audio signals (one input only for mono versions), which can have a range of input levels, to produce standard level, unbalanced output signals. It also incorporates a dual sensitivity ±100kHz/±50kHz deviation meter together with demodulated audio monitoring signals, both of which are fed from the transmitter driver.

The stereo coder, where fitted, accepts 'Left' and 'Right' channel inputs from the line attenuator, generates a 19kHz pilot and adds 50μS pre-emphasis if required. The multiplex signal is then fed to the transmitter drive/modulator, for amplification to the correct RF level to feed the power amplifier.

Where rebroadcast is required, the stereo line attenuator and stereo coder are replaced by an 'off-air' receiver. This receiver's output is a multiplex signal fed to the transmitter drive/modulator.

Monitoring

Full monitoring facilities are available on the front panel.

PERFORMANCE DATA

(Not to be interpreted as a test specification)

Output frequency:
87.5MHz to 108MHz in 25kHz increments.

Output impedance:
50Ω unbalanced

Output connector:
Type DIN 7/16

Maximum VSWR:
1.4:1

Frequency stability:
Within 500Hz of nominal output frequency for ambient temperatures range –5°C to +35°C

Spurious outputs:
<–60dBc

Residual AM:
<–55dB 50kHz bandwidth

AM due to FM:
<–40dB with ±75kHz deviation

Power supply 'Lock':
100mV peak to peak 19kHz stereo pilot locks PSU switching frequency to pilot tone

Working ambient:
–10°C + 50°C

Audio input:
0dBm ± 10dB into 600Ω balanced or high impedance

Harmonic distortion:
<–50dB with ±75kHz deviation

Signal/noise ratio:
Stereo –
>66dB weighted relative to ±75kHz deviation
Mono –
>70dB weighted relative to ±75kHz deviation

Stereo separation (/1 version only):
30Hz to 100 Hz >40dB
100Hz to 5kHz >46dB
5kHz to 15kHz >40dB

Power supplies:
Single phase 190 – 260V AC 50Hz

7.5A RMS input Power factor approximately unity

Efficiency
AC in to RF out approximately 55%

Dimensions (mm):
550 width x 1040 height x 600 depth

Weight (kg):
210

Eddystone Radio

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Eddystone Radio

'Tardis' Multi-Service FM Transposer System

TM4/11

General Description

The 'TARDIS'* Multi-Service FM Transposer System is an integrated design for installation at FM Relay sites. It offers up to six complete 40W FM Receiver-Drives, each with its own check demodulator, within a standard 19ins cabinet together with associated splitting and combining filters. The unit has been designed as a complete system with an exemplary RF performance. The modulator architecture of TARDIS, which is based on previous successful designs, ensures high reliability with minimal maintenance.

Output Power Options

High-Power Version

10-28 Watt per service via an integral combiner for output carrier spacing down to 600kHz. Where output carrier spacing is >1.2 MHz the power output rises to 40W per service.

75 Watt per service available (without combiner) for feeding high-power amplifiers.

Low-Power Version

2-10 Watt per service via an integral combiner for output carrier spacing down to 600kHz. Where output carrier spacing is>1.2MHz the power output rises to 14W per service.

30 Watt per service available (without combiner) for feeding high-power amplifiers.

*STAndardised Receiver-Drive Integrated System

The TARDIS FM Transposer System was designed by the British Broardcasting Corperation and manufactured under licence by Eddystone Radio Limited.

'Tardis' Multi-Service FM Transposer System Data Summary

Basic Design

The basic design offers up to six services in a standard 19" cabinet rack to be used at FM Relay sites. Up to 40W per channel is available for feeding directly to an antenna. For higher power sites the equipment can be used as a driver stage for high power amplifiers such as the Eddystone B6600 series (250W to 10kW) by omitting the combining filter. Individual receiver drive sub-racks (TM4M/13) can be supplied if required.

Description

A common set of broad-band plug-in modules form the receiver, drive (exciter) and monitoring demodulator. Two broad band power amplifier modules offer a wide range of output powers. Functional modules are interchangeable without any re-alignment. Local frequency selection is by means of thumb wheel switches, remote frequency selection is also available.

Careful attention to design enables transpositions down to 500kHz with excellent audio fidelity. In applications requiring 400kHz transpositions, a narrow-band IF filter is easily fitted. Output carrier spacings down to 600kHz are possible with exceptional spectral purity. Each service channel is provided with its own monitoring quality check demodulator. Outputs for driving external monitoring systems are also provided.

Filtering Options

While performance of the standard IF filter is adequate in most situations, an optional pluggable IF filter allows very low frequency transpositions to be achieved.

Standard IF Filter

Minimum frequency transposition of 500kHz with a receiver protection ratio of 40dB and >46dB stereo crosstalk with >53dB stereo THD

Narrow Band IF Filter

Minimum frequency transposition of 400kHz with a receiver protection ratio of 40dB and 40dB stereo crosstalk with 50dB stereo THD

Outline Specification

Frequency range: 87.5MHz - 108MHz in 100kHz increments.

Receiver Noise Figure: <10dB at splitter input.

Receiver Protection Ratio: better than -40dB at 500kHz carrier spacing for wide IF filter option. Better than -40dB at 400kHz for narrow IF filter option

RF Power option: 2-40W combined. Up to 75W uncombined.

Frequency accuracy: within ±250Hz (after 30min. warm-up)

Minimum spacing between carriers: 600kHz.

Spurious outputs, uncombined: 90dBc at >100kHz from carrier for any single transmitter.

Spurious outputs, combined: -80dBc with 600kHz carrier spacing. -90 dBc with >1.2MHz carrier spacing.

Transmission Characteristics

Frequency response: ±0.2dB, 40Hz - 59kHz. >1dB down at 76kHz. >20dB down at 114kHz >40dB down at 400KHz.

Audio THD: <-53dB at 1kHz, 100% modulation.

Stereo crosstalk (1kHz, 100% mod.) <-46dB (wide IF). <-40 dB (narrow IF)

Stereo S/N ratio (1mV RF Input): >53dB (weighted) at 24.2kHz deviation.

Residual AM: >50dB.

General Characteristics

Chassis Dimensions (mm): 2134x526x616 (HxWxD)

Power supply: 190-260Vac. Consumption 2kVA for six services at full power.

Eddystone Radio

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Eddystone Radio

MODEL 5600
HF FSK/VOICE SYSTEM

SERIES 5000

FEATURES

- Easy to operate.
- Low cost.
- Versatile.
- Simple to maintain.
- British made.

TECHNICAL SUMMARY

- Frequency Range: 2 to 16 MHz
- 6 Channel Capacity
- Power Output: 60w FSK
  120/150w p.e.p. SSB
- Power Supply: 100 – 260v 50/60Hz AC
  13.6 VDC (SSB only)

HF FSK/VOICE SYSTEM — MODEL 5600

GENERAL DESCRIPTION

The 5600 FSK System uses field proven reliable equipments, namely the ORION Transceiver and 1629/1529 FSK Modulator/Demodulator, to provide a compact FSK terminal for operation on up to 8 channels over 2 to 16MHz. A heavy duty A.C. power supply is included which permits continuous operation at powers up to 60 watts. SSB operation is also possible at a power level of 120/150 watts PEP, and in the event of a mains failure, operation is still possible in this mode from a standby D.C. supply. All the switching voltages are provided in the Modulator/Demodulator to allow interfacing with a wide variety of teleprinters, and a tuning meter is provided to assist the operator with fine tuning for optimum reception.

The ALC and VSWR protection circuits afford a complete safeguard to the Power Amplifier of the transmitter for a wide range of antenna mismatch conditions, including open and short circuit of the output.

A comprehensive range of accessories including teleprinter/terminals, antennas, antenna tuners, power amplifiers and spares kits make it suitable for use by Police, Government Departments, survey teams, relief organisations, engineering contractors, shipping companies and any group requiring reliable long distance communication.

GENERAL SPECIFICATION

Frequency Range:
Continuous coverage from 2 to 16MHz.

Channels:
One channel is fitted as standard with no restriction on frequency. Extra channels to a maximum of 6 are available for simplex operation, with a further 2 channels available if within ± 1% of other channels. Semi-Duplex operation is possible on 2 channels as an optional extra.

Modes of Operation:
FSK with recommended frequency shift of ± 85Hz at 50 or 75 baud rate. Different frequency shifts can be catered for, as the 1529 FSK demodulator will accept frequency shifts from 50Hz to 1100Hz whilst the 1629 modulator can be preset in the range 150Hz to 3.5kHz. The Modulator and Demodulator can also accept baud rates up to 300 bauds. The FSK signal is centred on 1000Hz in the upper sideband on the 5600 system.
USB (J3E) operation is fitted as standard, or LSB can be provided to special order.

Frequency Stability:
± 0.005%
± 20Hz with optional proportional oven control.

Power Supply:
100/130 or 200/260V A.C. 50/60Hz.
13.6V D.C. for operation on SSB only.

Environmental:
Operational Temperature: −10°C to +55°C
Storage Temperature: −40°C to +70°C
Relative Humidity: 95% at +40°C

Dimensions:
Height: 240mm
Width: 500mm
Depth: 480mm
Weight: 22Kg

Controls:
Transceiver: Channel select, Clarifier, RF Gain, AF Gain, FSK/USB, Squelch on/off.
1629 Modulator: Traffic, Test, Reverse Polarity, Supply on/off.
1529 Demodulator: Fine Tune, Traffic, Output Hold, Supply on/off.

External Connections (Modulator/Demodulator):
Levels 80V, 6V, 20mA unipolar or bipolar. (RS232C catered for).
Impedance 5K ohms at 80V
500 ohms at 6V
2 volts drop at 20mA.

External Connections (Transceiver):
A.C. Mains Connector
Antenna 50 ohms connector.
Ancillary connector for external loudspeaker and antenna tuner control.
D.C. standby supply connector.
Microphone/handset connector suitable for medium or high output dynamic or ceramic microphone.

TRANSMITTER

Power Output:
FSK 60 watts
SSB 120/150 watts P.E.P.

Intermodulation Distortion:
At 150W, typically −25dB.
At 100W, better than −30dB.

Carrier Suppression:
−45dB.

Hum and Noise:
−45dB.

Harmonic Suppression:
−50dB typical, −40dB minimum.
Other spurious products better than −43dB.

ALC:
10dB audio increase causes less than 0.5dB increase in power output with intermodulation distortion remaining within specification.

Audio Bandwidth:
350Hz to 2700Hz on SSB.
800Hz to 1200Hz on FSK.

RECEIVER

Sensitivity:
0.5uV pd. for 20dB SINAD on SSB.

Selectivity:
−6dB 300Hz to 2700Hz
−60dB −400Hz and 3400Hz — SSB
−6dB +800Hz to +1200Hz
−60dB +400Hz and +1600Hz — FSK

AGC:
Less than 3dB change in AF output from 5uV to 100mV signal input.
20mSec attack and 2 sec. delay, optimised for SSB operation with pedestal action.

Image Rejection:
Typically −55dB.

IF Rejection:
70 to 90dB depending on carrier frequency.

Audio Output:
3 watts at less than 5% distortion.

Squelch:
Operative from syllabic change optimised for SSB operation.

Cross Modulation:
With a wanted carrier 60dB above 1uV adjusted to give standard output at an audio frequency of 1400Hz, an unwanted signal 10kHz off-tune and modulated 30% at 1000Hz must be of a level exceeding 90dB above 1uV to produce an audio output greater than 30dB below standard output.

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HF SSB
MARINE TRANSCEIVER

MODEL ORION 5700

- ★ PROVEN RELIABILITY
- ★ RUGGED AND ROBUST DESIGN
- ★ FULLY MODULAR CONSTRUCTION
- ★ 120/150 WATTS PEP OUTPUT
- ★ WIDE OPERATING TEMPERATURES
- ★ FULL PROTECTION CIRCUITS
- ★ BASE AND VESSEL VERSIONS
- ★ BUILT IN ALARM GENERATOR

Eddystone

HF SSB TRANSCEIVER – 5000 SERIES

GENERAL DESCRIPTION

The ORION 5700 is a compact marine transceiver with an output of 150 watts P.E.P. over the frequency range 1.6 – 16MHz. Up to 6 channels are available, and operation is on upper or lower sideband in simplex or semi-duplex mode.

A radio-telephone alarm generator meeting the international specifications is provided on the 2182 kHz distress frequency.

Plug in printed circuit board techniques are used, providing ease of maintenance and maximum security against loss of service.

Operation directly on DC permits the transceiver to be simply connected to a vessel's battery, without the need of a power supply or convertor. Operation from 115/230V AC is also available for fixed station use. The comprehensive range of accessories supporting this transceiver make it suitable for marine or base station use, by Patrol Craft, Fishing Boats, Rescue Launches, Supply Vessels, Custom's Craft, or any marine authority requiring reliable medium to long range communications.

Full range of accessories available

Marine antennas
Base station antennas
Microphones
Antenna tuners
Mounting kits
Spares kits

GENERAL SPECIFICATION

Frequency Range:
Continuous coverage 1.6 to 16MHz.

Channels:
1 Channel fitted 2182 kHz for A3H operation and with radio-telephone alarm. Extra channels to maximum of 6 total.

Mode of Operation:
Simplex, USB (A3J) standard, USB and LSB optional.

Optional Facilities:
Semi-duplex available on 2 channels only.

Operational Temperatures:
–10°C to +55°C.

Humidity:
95% relative, suitable for marine and tropical service.

Altitude: (For Base Installation)
5000m.

Controls:
Front panel – Audio gain with supply switch, RF gain, squelch on/off, clarifier, channel selector, USB/LSB (when fitted), alarm test, alarm stop and alarm send.

Connectors:
Front panel – microphone or handset. Rear panel – power connector, antenna connector, and ancillary connector for external loudspeaker and antenna tuner control.

Indicators:
Power on L.E.D.
Alarm test L.E.D.
Alarm send L.E.D.
Transmitter antenna current meter.
(Reads signal strength on receive).

Power Supplies:
DC Model – 13.6V DC negative ground.
(24V DC available as option).
AC/DC Model – 115/230V, 50/60Hz or 13.6V DC.

Power Consumption:
DC Model : Receive – 100/300mA:
Transmit – 12A average, voice operation (13.6V).

Dimensions:
30 x 25 x 10 cms. approximately. DC version.
30 x 35 x 10 cms. approximately. AC/DC version.

Weight:
4.5 kg. DC version.
6 kg. AC version.

TRANSMITTER

Power Output:
Within the range 120/150W.

Intermodulation Distortion:
150W –25dB 3rd order typical:
100W –30dB order minimum.

Frequency Stability:
Standard – ± 005%
·001% or ± 20Hz with proportional oven option.

Audio Bandwidth:
–6dB, 350 to 2700Hz.

Carrier Suppression:
–45dB.

Hum and Noise:
–45dB.

Harmonic Suppression:
–50dB, typical –40dB minimum.
Other spurious rejection better than –43dB.

ALC:
10dB audio increase causes less that 0.5dB increase in power output. Intermodulation distortion remains within specification.

Microphone:
Gain adjustable for all medium or high output dynamic or ceramic microphones.

Antenna Filter:
5 pole Tchebycheff.

Circuit:
Single conversion, 1400kHz IF, all solid state. Final amplifier broadband 1.6 to 16MHz.

RECEIVER

Sensitivity:
0.5uV p.d. for 20dB S–N/N.

Selectivity:
–6dB, 2.4kHz:
–60dB 3.8kHz.

AGC:
Less than 3dB change in AF output from 5uV to 100mV signal input. 20m sec attack and 2 sec decay, optimised for SSB operation, with pedestal action.

Clarifier:
Incremental receiver tuning, connected only in receive mode.

Image Rejection:
–55dB typical.

Netting:
Internal connection for netting transmitter frequency while in the receive mode.

IF Rejection:
70 to 90dB.

Squelch:
Operates from syllabic change, optimised for SSB operation.

Audio Output:
3W at less than 5% distortion.

Loudspeaker:
8 cm internal.

Circuit:
Single conversion all solid state, 1400kHz. I.F.

Cross Modulation:
With a wanted carrier 60dB above 1uV adjusted to give standard output at an audio frequency of 1400Hz, an unwanted signal 10kHz off-tune and modulated 30% at 1000Hz must be of a level exceeding 90dB above 1uV to produce an audio output greater than 30dB below standard output.

Eddystone Radio

A MARCONI COMMUNICATION SYSTEMS COMPANY.
Eddystone Radio Limited,
Eddystone Works, Alvechurch Road, Birmingham B31 3PP, England.
Telephone: 021 475 2231 Telex: 337081 Facsimile: 021-477 5224

Eddystone Radio

MODEL 6200
VLF/HF RECEIVER

SERIES 6200

FEATURES

- Sealed membrane keyboard front panel with illuminated LCD display.
- Easy to operate.
- Tuneable in 10Hz steps.
- Rugged construction.
- Built-in test equipment (B.I.T.E.).
- Frequency coverage 10kHz to 30MHz.
- Independent sideband operation in 2U size.
- Non-volatile 99 channel memory, with scan and sweep facilities.
- Remote control facility.

VLF/HF RECEIVER

MODEL 6200

Frequency Coverage
1600kHz to 30MHz in 10Hz increments.
10kHz to 30MHz /A and /F options.

Reception Modes and Variants
AM, USB, LSB, CW : /2 variant.
AM, USB, LSB, CW, ISB : /3 variant.
FSK : /K option.

Reception Bandwidths

SSB/ISB	-6dB 300Hz to 2700Hz
	-60dB -400Hz and 3400Hz
Wide	-6dB ±3kHz
	-60dB ±10kHz
Intermediate	-6dB ±1.2kHz
	-60dB ±1.9kHz
Special	To customer order. Up to 2 additional filters (/C option).

RF Selectivity
Wideband over specified range on all but /A option which has sub-octave filters above 1600kHz.

BFO
±2.4kHz in 100Hz steps derived from master oscillator.

Stability
All frequencies derived from internal master oscillator with stability 1ppm over -10°C to +50 °C. 0.1ppm on /X option receivers.
Option for 8720kHz external standard with no internal standard fitted (/S option).

Search Tuning
Frequency selection by tuning knob with any step in range 10Hz to 99.99kHz (10Hz increments) or with automatic variable rate with 10Hz resolution. Frequency can also be directly entered via numeric keyboard with 10Hz resolution.

Stored Channels
A maximum of 99 channels can each be stored with frequency, mode, bandwidth, AGC, RF sensitivity and BFO offset settings. On /B option receivers, the selected antenna can be stored and on /T option receivers, the scan start and stop times. Channel contents can be interrogated and changed without interruption of the signal being received. A lithium battery backed up RAM retains the contents of all channel memories in excess of 10 years without the external supply.

Scanning
Any number of the 99 stored channels can be automatically scanned with a dwell time on each channel of between 0.1 and 9.9 seconds (0.1 second steps). If squelch is selected, the scan will halt on channels with signals above the set threshold and remain there for a hang period after the signal ceases. This hang period can be set between 0 and 9 seconds (1 second steps). At all times, the scan position can be altered using the main control knob and can be stepped on or halted using the rear panel hold scan/sweep input. On /T option receivers; selection of channels by time of day or week is also provided.

Sweeping
Automatic tuning using the selected step can be performed using the frequencies stored in adjacent channel memories as limits. The receiver remains on each step for the selected dwell period. If a step of 5kHz or more and squelch are selected, the sweep will halt on steps with signals above the set threshold, and remain there for a hang period after the signal ceases. This hang period can be set between 0 and 9 seconds (1 second steps). At all times, the sweep position can be altered using the main control knob and can be stepped on or halted using the rear panel hold scan/sweep input.

BITE (Built In Test Equipment)
In BITE mode, tests can be made using internally fitted test equipment to aid fault finding, general test and maintenance procedures. In all modes, the BITE monitors various parameters and provides immediate indication of a potential fault which can be investigated in BITE mode, providing fault finding to module level.

Remote Control
All major functions, except audio gain, can be controlled and interrogated using 1200 Baud asynchronous data at RS232c level. Standard modems (V22 or V23), multiplexers, line drivers and RS422a adapters can be used to provide control over half or full duplex, two or four wire links as required.

Squelch
Audio squelch is derived from carrier/sideband level, with squelch threshold level adjustable from the front panel. Twin bargraph meters are provided to simultaneously display squelch and signal levels.

RF Attenuation
Attenuation of 0dB, 10dB, and 30-50dB is available.

Antenna Input
50 Ohm unbalanced input, BNC connector.
Overload protection is provided for continuous application of an emf of 30V rms from a 50 Ohm source. Internal reed relay controlled (by contact to ground) from associated transmitter open circuits receiver antenna input during transmission.

Audio Output
External Loudspeaker : 1W maximum into 4 or 8 Ohms.
Internal Monitor speaker : 1W maximum.
Line : 20mW maximum into 600 Ohms.
Headphones : 10mW maximum into Low/Medium impedance.

Intermediate Frequencies
45MHz 1st IF
1.4MHz 2nd IF

Power Supply
100V/130V and 200V/260V AC 40Hz-60Hz single phase.
A.C. consumption 30VA maximum.
Operation from a 19-32V DC supply (negative ground) will continue in the absence of an AC supply. DC current consumption approximately 1.8A at 19V to 1A at 32V.

Environmental
Operational temperature: -15°C to +55°C
Storage temperature: -20°C to +70°C
Relative humidity: 95% at +40°C
Bump and Vibration: Meets MPT1204 and CEPT requirements.

Mounting Styles (19" rack mounting)
Height 88mm (2U)
Width 483mm (19 inches)
Depth 440mm (intrusion into rack including cabling)
Weight 12kg

Sensitivity (400kHz to 30MHz)
AM: 1.8µV emf input 60% modulated at 1kHz, for 10dB Sinad (S+N/N) at line output, with 6kHz selectivity.
SSB: 0.6µV emf input with 1kHz audio output, for 10dB Sinad (S+N/N) at line output, with 2.4kHz selectivity.
CW: 0.4µV emf input with 1kHz audio output, for 10dB Sinad (S+N/N) at line output, with 2.4kHz selectivity.

These correspond to a noise figure of 12dB.

AGC
Less than 4dB change in audio output for 100dB increase in input level above AGC threshold (typically +3dBµV emf). Choice of three time constants in addition to manual gain to suit mode selected.

Image
100dB (1st)
80dB (2nd)

IF Rejection
100dB.

Intermodulation (in-band)
The level of third order intermodulation products produced by two in-band signals of +90dBµV emf will be at least 45dB below the level of either signal.

Intermodulation (out-of-band)
With a wanted signal +10dBµV emf producing standard output, two unwanted signals adjusted to produce a third order intermodulation product equal to standard output at the wanted frequency, must be greater than +90dBµV emf when at least 30kHz removed from the wanted frequency. This is equivalent to a third order intercept point of +17dBm.

With a wanted signal of +10dBµV emf producing standard output, two unwanted signals adjusted to produce a second order intermodulation product equal to standard output at the wanted frequency, must be greater than +80dBµV emf when each is approximately half the wanted frequency. This is equivalent to a second order intercept point of +37dBm. This figure is increased for wanted frequencies above 1600kHz when the sub-octave preselector is fitted (/A option receivers).

Cross Modulation
With a wanted signal of +60dBµV emf producing standard output, an unwanted signal, of level +100dBµV emf at 20kHz off-tune, modulated 30% at 1kHz, will produce an output at least 30dB below standard output.

Reciprocal Mixing
The level of a signal 20kHz removed from the tuned frequency will be at least +95dBµV emf to produce a noise signal equivalent to 0dBµV emf at the tuned frequency (USB/LSB/ISB modes).

Blocking
With a wanted signal +60dBµV emf, output will be affected by less than 3dB by an interfering signal 20kHz off-tune at level +110dBµV emf.

Antenna Radiation
The level of radiated signals at the antenna socket will be less than 2µV pd across 50 Ohms.

MTBF
At least 30,000 Hours to BT HRD4 (British Telecom).

Options

/A	Frequency coverage 10kHz - 30MHz with sub-octave preselector above 1600kHz.
/B	With 8 bit parallel data output, indicating selected antenna number (enabling control of antenna selecting switches or other similar equipment). This output can be factory programmed to provide other status/control signals if required. When supplied with /T option, time scan output control signals are provided. This is not available with option A.
/C	With additional customer specified filters (to a maximum of two).
/F	Wideband input giving operation 10kHz to 30MHz (reduced performance below 400kHz).
/I	With 1.4MHz intermediate frequency output (not available on ISB variants).
/K	With internal FSK demodulator, providing FSK demodulation for frequency shifts from 85Hz to 1100Hz and corresponding keying speeds up to 300 bauds, at RS232c output level.
/P	With low level RF output to drive an Eddystone 1161/1 Panoramic Display Unit.
/S	External standard operation.
/T	With real time clock allowing channel scanning by time of day or week
/X	High stability internal master oscillator.

Ancillary Equipment
Diversity Switching Unit
1529/20 External FSK Demodulator
Remote Control Systems
1161/1 Panoramic Display Unit
External Frequency Standards
Antennas
Bench Cabinet

Eddystone Radio

A GEC-MARCONI COMMUNICATIONS COMPANY.
Eddystone Radio Limited,
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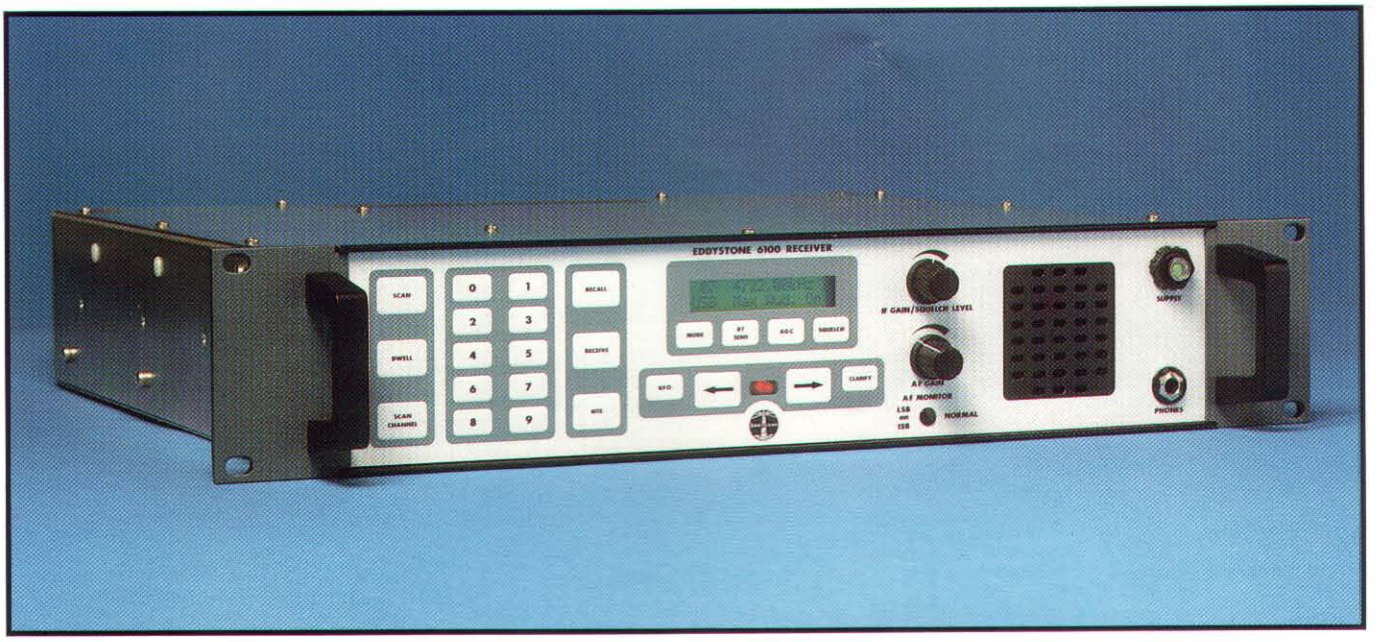
Eddystone Radio

MODEL 6100
LF/HF CHANNELISED RECEIVER

SERIES 6100



FEATURES

- Sealed membrane front panel with illuminated LCD display.
- Easy to operate.
- Up to 99 channels, programmable from front panel.
- Rugged construction.
- Built-in test equipment (B.I.T.E.).
- Frequency coverage 10kHz to 30MHz.
- Independent sideband operation in 2U size.
- Scan facility.
- Remote control facility.

LF/HF CHANNELISED RECEIVER — MODEL 6100

Frequency Coverage
1600kHz to 30MHz Standard with 10Hz resolution.
10kHz to 30MHz /F option.

Reception Modes
AM, USB, LSB, CW.
ISB /3 variant.
FSK /K option.

Reception Bandwidths

SSB/ISB	-6dB 300Hz to 2700Hz
	-60dB -400Hz and 3400Hz
Wide	-6dB ±3kHz
	-60dB ±10kHz
Intermediate	-6dB ±1.2kHz
	-60dB ±1.9kHz
Narrow	To customer order

RF Selectivity
Wideband filter from lower frequency limit to 30MHz.

BFO
100Hz steps over ±2.4kHz derived from master oscillator.

Stability
All frequencies derived from internal master oscillator with stability 1ppm over temperature range.

Optional 0.1ppm (/X). Option for 8720kHz external standard with no internal master fitted (/S).

Channels
Non-volatile memory storage is provided for storage of 99 channels with frequency, mode/bandwidth, RF sensitivity, AGC, BFO and clarifier settings. These contents can be interrogated and changed without interruption of the signal received.

The memory has an integral lithium battery which retains all information for a total period of approximately 10 years with power removed.

Scanning
Any number of the channels can be automatically or manually scanned by selecting the required channels to be in the 'scan table'.

The dwell period on each channel can be set in the range 0.1 to 9.9 seconds (0.1 second increments). A hang period of 0 to 9 seconds (one second increments) can also be selected.

If 'Squelch On' is selected, scanning will stop on an occupied channel and will restart when the signal ceases, after waiting for the hang period selected. Adjustment of the scan position is possible using the tuning buttons with total manual control (i.e. tuning by stored channel) if a dwell period of 00 is selected.

BITE (Built In Test Equipment)
In BITE mode, tests can be made using internally fitted test equipment to aid fault finding, general test and maintenance procedures. In all modes, the BITE monitors various parameters and provides immediate indication of a potential fault which can be investigated in BITE mode when convenient.

Remote Control
Various remote control options can be selected via internal DIL switches. Local or remote priority can be selected as can 300 or 1200 Baud asynchronous data rates.

These options allow the use of a variety of standard MODEMs (V21, V22 or V23) multiplexers and line drivers etc thus providing control over half or full duplex, two or four wire links as required.

Parallel remote control (/1 and /4 variants) is provided which allows selection of up to 7 channels and adjustment of clarifier and IF Gain.

Squelch
Audio squelch is derived from carrier level on all modes with level adjustable from the front panel.

RF Attenuation
Attenuation of 0dB, 10dB, and 30-50dB is available.

Antenna Input
50 Ohms impedance.
Overload protection provided for continuous application of 30V e.m.f. at input.
Internal reed relay controlled from associated transmitter interrupts aerial feeder during transmission.

Audio Output
External Loudspeaker : 1W maximum into 4 or 8 Ohms.
Internal Monitor Loudspeaker : 1W maximum.
Line : 20mW maximum into 600 Ohms.
Headphones : 10mW maximum into Low/Medium impedance.

Intermediate Frequencies
45MHz 1st IF
1.4MHz 2nd IF

Power Supply
100V/150V and 200V/260V (40Hz-60Hz) single phase.
A.C. consumption approx. 30VA.
Alternate operation from 24V D.C. negative ground with reverse polarity protection.

Environmental
Operational temperature: -15°C to +55°C
Storage temperature: -40°C to +70°C
Relative humidity: 95% at +40°C
Bump and Vibration: Meets MPT1204 and CEPT requirements.

Mounting Styles
Rack mounting:
Height 88mm (2U)
Depth 440mm (intrusion into rack including cabling)
Width 483mm (19 inches)
Weight 12kg

Sensitivity
AM: 1.8µV emf (-108dBm) input 60% modulated at 1kHz, for 10dB Sinad (S+N/N) at line output, with 6kHz selectivity.
SSB: 0.6µV emf (-118dBm) input with 1kHz audio output, for 10dB Sinad (S+N/N) at line output, with 2.4kHz selectivity.
CW: 0.4µV emf (-121dBm) input with 1kHz audio output, for 10dB Sinad (S+N/N) at line output, with 2.4kHz selectivity.

AGC
Less than 4dB change in output for 100dB increase in input level from threshold.
Choice of three time constants in addition to manual gain to suit mode selected.

Image
100dB (1st)
80dB (2nd)

IF Rejection
100dB.

Intermodulation (in-band)
The level of third order intermodulation products produced by two signals in-band will be at least 45dB below the level of either signal.

Intermodulation (out-of-band)
With a wanted signal -83dBm (30dBµV emf) producing standard output, two unwanted signals adjusted to produce a third order intermodulation product at the wanted frequency, must each be of a level greater than -17dBm (96dBµV emf) to produce standard output when neither signal is closer than 30kHz to the wanted frequency.

Cross Modulation
With a wanted signal -53dBm (60dBµV emf), producing standard output, an unwanted signal, of level -13dBm (100dBµV emf) at 20kHz off-tune, modulated 30% at 1kHz, will produce an output at least 30dB below standard output.

Reciprocal Mixing
In USB/LSB or ISB modes, the level of a signal 20kHz removed from the tuned frequency must be at least 95dBµV emf to produce noise equivalent to 0dBµV emf at the tuned frequency.

Blocking
With a wanted signal -53dBm (60dBµV emf), output will be affected by less than 3dB with an interfering signal 20kHz off-tune at level -3dBm (110dBµV emf).

Antenna Radiation
Less than -101dBm (2µV pd across 50 Ohms).

Variants

6100/1:	Parallel remote control only.
6100/2:	Full serial remote control only.
6100/3:	ISB reception with full serial remote control only.
6100/4:	ISB reception with parallel remote control only.

Options

/B	External pre-selector drive output
/C	With additonal customer specified filter.
/F	Frequency coverage 10kHz to 30MHz.
/J	Programmable from receiver front panel.
/K	With internal FSK demodulator.
/S	External standard operation.
/X	High stability internal master oscillator.

FSK (optional extra)
Internally fitted module providing FSK demodulation for frequency shifts from 85Hz to 1100Hz and keying speeds up to 300 bauds. Output voltage 10-0-10 volts (RS232c compatible).

Ancillary Equipment
1529/20 External FSK Demodulator
Remote Control Systems
Antennas
Bench Cabinet

Eddystone Radio

A GEC-MARCONI COMMUNICATIONS COMPANY.

Eddystone Radio Limited, Unit 8/9, Birkdale Avenue,
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Eddystone Radio

VHF/FM STEREO EXCITER MODEL XE11

SERIES S1836

BENEFITS

- Integral Stereo Coder
- SCA and RDS inputs
- Extensive monitoring
- Frequency Agile, plus 10 pre-set channels
- 5 to 15 watt power output
- Remotely controllable

Introduction

The XE11 Stereo Exciter is broadband, synthesized design which operates between 87.5 and 108MHz. The operating frequency can be chosen in increments of 10kHz by selection of the appropriate frequency on internal switches. Up to ten channels can be programmed into the synthesizers EPROM so that the frequency can be changed to a pre-selected channel remotely. Alternatively any frequency can be commanded remotely from the auto-controller when the exciter is used in a main/standby or N+1 system. The exciter employs direct carrier FM modulation.

Balanced audio inputs for both stereo and mono operation are provided as well as inputs for MPX, RDS and SCA channels. The audio inputs are fitted with pre-emphasis filters which can be switched on or off locally (or remotely). Adjustable input attenuators will accept signal levels of between –10dBm and +10dBm. The integral stereo coder incorporates a linear balanced modulator to generate the "S" component resulting in low spurious outputs. As well as allowing SCA operation, an input and 19kHz pilot tone output are also provided for RDS operation.

A 15 watt power amplifier module, based on the popular BGY33 module provides a variable output power of between 5W and 15W and in the B6600 series this is normally set for 6W. The exciter contains its own power supplies and the whole unit is only 3U high for 19 inch rack mounting.

STEREO EXCITER INPUTS/OUTPUTS

Inputs

Common 0V
Mono/Stereo
Remote/Local
SCA
RDS
Drive Mute
Pre-emphasis on/off
Latch Reset
MPX/MONO
Frequency selection

Outputs

Frequency Information Bit 01-16 and commons
Mono/Stereo
SCA Present
RDS Present
Drive Mute
Pre-emphasis on/off
Latch Reset
MPX/MONO
Over deviation
Audio Fail
DC Fail
Frequency Changed
Drive Mute
Stereo/Mono
Frequency Lock

VHF/FM STEREO EXCITER — MODEL XE11

PERFORMANCE SPECIFICATION

Working Frequency: Supplied adjustable to working channel in the range 87.5MHz to 108MHz in 10kHz increments. Up to ten channels can be loaded in the exciter and can be called up from a remote command.

Type of Modulation: F3

Stereo Transmission: CCIR Recommendation 450 Section 2 on pilot tone systems

Frequency Deviation: +/– 75kHz 100% Modulation (+/– 200kHz capability)

Stability of Frequency Deviation: +/– 5% over 6 months

RF output load impedance: 50 ohms unbalanced

Maximum VSWR: 1.5:1 (protected above this level)

RF Harmonies: Not exceeding –65dBc

Spurious Radiation: Not exceeding –80dBc

Carrier Frequency Stability: +/– 250Hz measured over 6 months

Carrier Frequency Stability: +/– 1kHz maximum with +75kHz deviation

Audio Input Inpedance: 600 ohms balanced. Return loss net less than 30dB from 40Hz to 15kHz.

Audio Input Level: –6dBm to +8dBm, at 500Hz for +/– 75kHz deviation

Pre-emphasis: 50 or 75 microseconds

Amplitude Frequency Response: 30Hz to 53kHz, +/– 0.5dB 53kHz to 100kHz, +/– 0.5dB relative to level at 500Hz.

Audio Total Harmonic Distortion: less than 0.3% for deviation up to +/– 75kHz at modulating frequencies between 30Hz and 15kHz.

FM Noise: –68dB (unweighted) over a 20kHz bandwidth with 75µS de-emphasis relative to +/– 40kHz deviation at 500Hz.

AM Noise: –58dB rms noise relative to 100% modulated carrier when measured using 75 microseconds de-emphasis and over a 20kHz band-width.

Synchronous AM: –48dB with +/–40kHz deviation at 500Hz with respect to 100% modulated carrier.

Stereo Crosstalk: Better than 40dB, 100Hz to 7.5kHz with 6dB per octave reduction below and above this range.

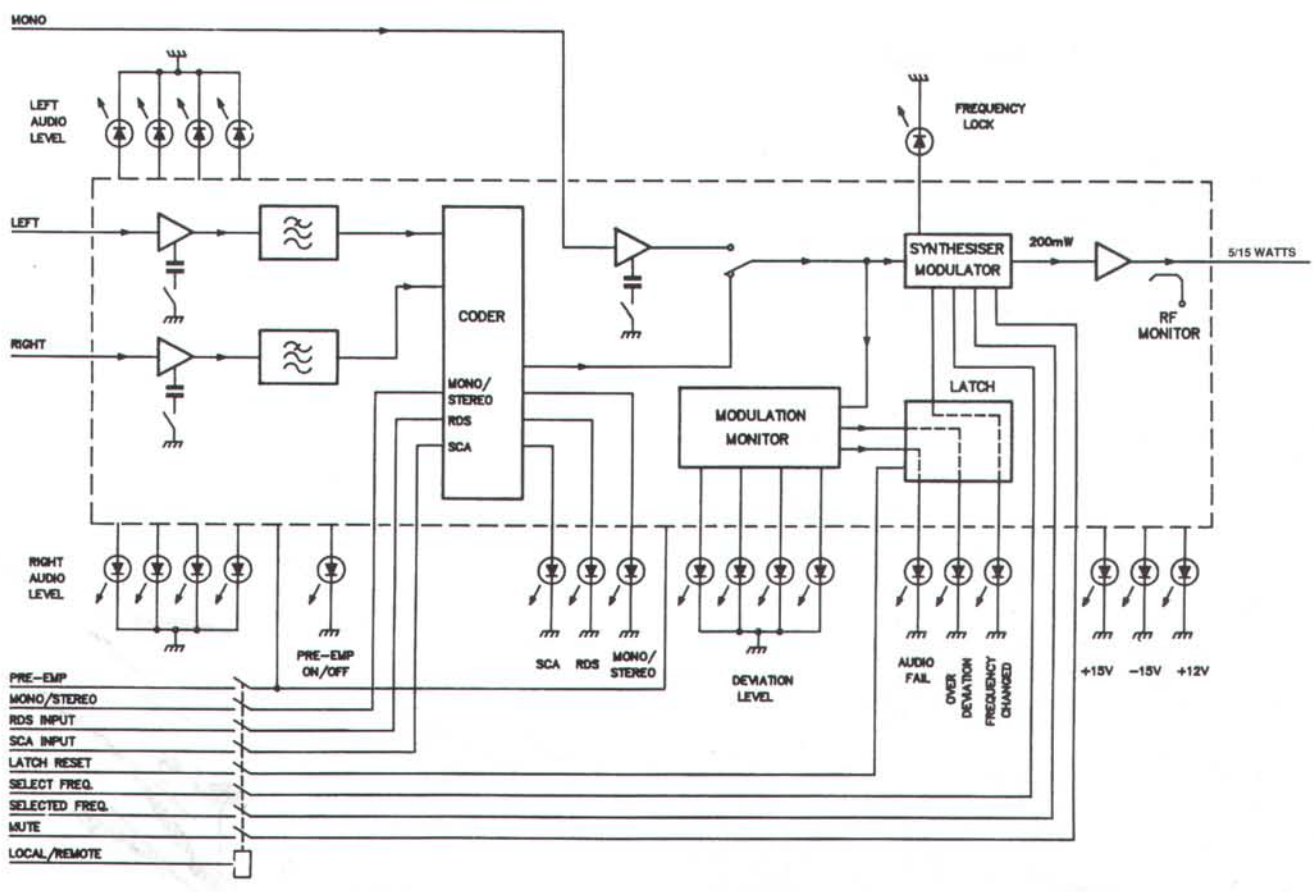
Sub-carrier Supression: Greater than 65dB below composite output level.

Cooling System: Convection. Fan Assembly on heatsink.

Ambient Temperature Range: 0 to 45 deg C, sea level to 2500m.

Maximum Relative Humidity: 95%, non-condensing.

Power Supply: 220/240V 50/60Hz A.C.



Eddystone Radio

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Eddystone Radio

ORION 7000
HF SSB TRANSCEIVER

SERIES 7000

- 1.6-30MHz Transmit, 10kHz-30MHz Receive.
- 100W PEP Output Power.
- 99 channel operation, simplex or semi-duplex.
- Improved signal transmission and reception using DSP techniques.
- Remote and extended control facilities.
- Split front panel for mobile operation.
- Multi-mode operation including SSB, CW, FSK, DATA and ALE.
- Built in Test Equipment (BITE).
- Channel scanning.
- Speech scrambler for secure communication.
- Rugged construction.

ORION HF TRANSCEIVER MODEL 7000

The Eddystone ORION 7000 HF Transceiver operates on up to 99 simplex or semi-duplex channels in the frequency range 1.6-30MHz with 100 watts RF output power. Dual microcontrollers offer a wide range of local control options in addition to full extended or remote control, and BITE (Built In Test Equipment) for rapid fault indentification.

Baseband signal processing is performed digitally, using programmable circuitry, which gives improved squelch, noise blanking, speech compression and agc/alc facilities, particularly important in maintaining communications under arduous signal conditions. Optional facilities can also be incorporated as required to modulate and demodulate a wide variety of data signals, providing easy connection to a computer or teleprinter. This also allows sophisticated adaptive communication systems to be established (ARQ/ALE for example) by suitable programming.

The ORION 7000 can be supplied for mobile use with a detachable front panel control/display module for ease of installation, and can be rack or bench mounted for use in base stations. Operation is from 13.6V DC, or from all normal single phase mains voltages using a separate power supply unit. Complementary HF linear amplifiers, antennas and tuner units, phone patch equipment etc are also available, to provide complete station installations.

General Performance

Frequency Range
1.6 to 30MHz Transmit.
10kHz to 30MHz Receive.
10Hz Frequency Resolution.

Modes of Operation
USB, LSB, CW, FSK, AME (AM reception by conversion to USB or LSB).

Frequency Stability
1ppm standard or 0.1ppm as option (/X).

User Programmable Channels
99 maximum simplex or semi-duplex.
Options to allow the operator to program channels directly or with password protection. Alternatively, transceiver can be supplied programmable only from IBM compatible PC with special software.

Front Panel Control
Removable front panel with 20 key elastomeric keypad and 'beep' tone. Receiver volume adjustment by separate rotary control. Four line by twenty character backlit LCD display.

Extended Control
Up to 100m using removable front panel control unit and additional extension kit.

Remote Control
Using additional front panel control unit or IBM compatible PC, with RS232c level serial asynchronous data at rates up to 2400 Baud.

BITE (Built In Test Equipment)
In BITE mode, tests can be made using internal test equipment to aid fault finding, general test and maintenance procedures. In all modes, the BITE monitors various key parameters and provides immediate indication of a potential fault which can be investigated in BITE mode, allowing fault finding to module level.

Power Supplies
13.6V DC (24V optional) with negative ground and reverse polarity protection. Separate power supply unit for AC mains operation.

Cloning
All or part of the channel settings and functional settings of one transceiver can be transferred to another transceiver.

Environmental
Operating Temperature: -10°C to +55°C
Storage Temperature: -20°C to +70°C
Relative humidity: 95% at +40°C
Bump and Vibration: Meets MPT1204 and CEPT requirements.

Dimensions
Height : 105mm
Width : 305mm
Depth : 300mm
Weight : 5kg

Transmitter Performance

Output Power
100W pep on SSB and AME, 100W average on CW/FSK.
Low power setting reduces output below 25W.

Intermodulation distortion
Better than -25dB.

Hum and Noise
Better than -50dB.

Carrier Suppression
Better than 50dB.

Unwanted Sideband Suppression
Better than 50dB.

Spurious Suppression (non-harmonic)
Better than 60dB.

Harmonic Suppression
Better than 43dB, typically 60dB.

Audio Bandwidth
300Hz to 2700Hz at -3dB (USB/LSB).

ALC
10dB audio increase causes less than 0.5dB increase in power output.

Protection
Transmitter fully protected against high VSWR including open and short circuit output.
Thermostatically controlled fan operates at predetermined temperature for operation at high ambient temperatures with high transmit duty cycle.

Speech Compression
Using dsp techniques (switchable).

Test Oscillator
Two tone generator built-in.

Receiver Performance

Sensitivity
Two settings, normal and high. 15dB sinad for 1µV emf signal in normal (USB/LSB mode, 2.4kHz bandwidth), corresponding to a 12dB noise figure. Sensitivity is increased by approximately 5dB in high setting. Sensitivity gradually reduces below 1.6MHz.

Third Order intercept point
+ 14dBm in normal sensitivity.

In-Band Intermodulation Products
Better than -40dB.

IF and Image Rejection
Better than 70dB.

Recption Bandwidth
-6dB 300Hz to 2700Hz
-60dB -400Hz and 3400Hz
Additional bandwidths 300Hz, 600Hz or 1kHz in dsp selected according to reception mode.

AGC
Less than 3dB change in audio output for 100dB increase above agc threshold.
Variable or fixed threshold, audio derived using dsp. Attack, decay and pedestal time constants selected according to mode of reception.

Audio Outputs
3W at less than 5% distortion into 4 0hms. 1mW maximum preset into 600 0hm.
Separate low level phones/handset output.

BFO
+/-300Hz to 2.7kHz in 100Hz steps (CW/FSK modes).

Cross Modulation
With a wanted signal of +60dBµV emf producing standard output, an unwanted signal of level +100dBµV emf at 20kHz off-tune, modulated 30% at 1kHz, will produce an output at least 30db below standard output.

Input Protection
Overload protection provided for continuous application of 30V emf from 50 ohm source.

Squelch
Speech and/or tone recognition using dsp techniques (switchable).

Noise Blanker
Using dsp techniques (switchable).

Scanning
Receive only scanning of any of the 99 channels with selectable dwell (100mS to 9.9sec) and hang (0 to 9sec) times.

Ancillary Equipment
Base station antennas and masts
Mobile antennas
Antenna Tuners
Microphones
Mounting kits
Extended control kits
AC power supply units
Power amplifiers
Phone patch Interface units
ARQ/FEC for data operation
ALE (Automatic Link Establishment)
Scrambler Facility

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