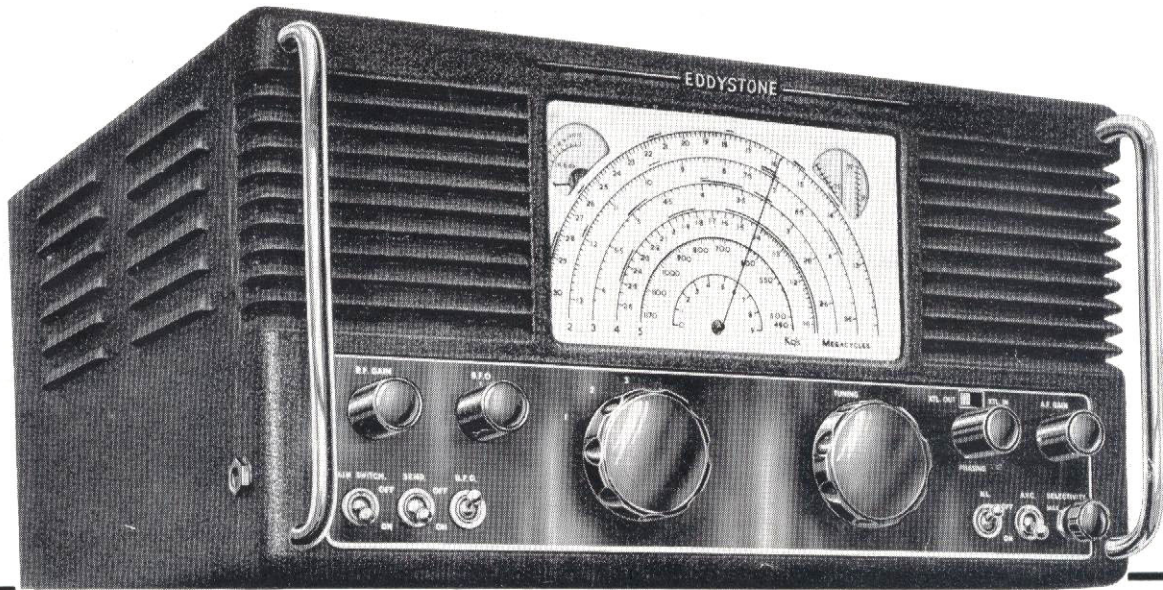


# EDDYSTONE MODEL "680" COMMUNICATIONS RECEIVER



**A high grade instrument with wide frequency coverage for PROFESSIONAL COMMUNICATIONS requirements**

The "680" is a fifteen valve superheterodyne receiver embodying advanced technique. New features in the design add to the outstanding and reliable performance of which the receiver is capable. The appearance is impressive, whilst the construction and general workmanship is of the finest in the Industry.

## SPECIAL FEATURES INCLUDE

- Continuous coverage from 30 Mc/s to 480 Kc/s.
- Two Radio-Frequency stages.
- Two I.F. stages.
- Crystal Filter.
- Beat frequency Oscillator.
- Push-pull output stage.
- Variable Selectivity.
- "S" Meter.
- Noise Limiter.
- Standby switch.
- Stabilised H.T. voltage to Oscillator, etc.
- Provision for relay operation of transmitter.
- High signal-to-noise ratio and sensitivity.
- Highly attenuated Image response.
- Very effective A.V.C.
- Large accurately calibrated dial.
- Provision for twin feeder and single aerial.
- Adjustable dial illumination.
- Modern miniature all-glass valves.
- Flywheel loaded tuning — 140 to 1 reduction ratio.
- Mechanical bandspread logging device.
- All controls separate and conveniently arranged.
- Robust construction.
- Finished for tropical service.



*manufactured  
by*

**STRATTON & CO LTD**  
EDDYSTONE WORKS · BIRMINGHAM · ENGLAND  
CABLES: STRATNOID BIRMINGHAM

# TECHNICAL SPECIFICATION

## FREQUENCY COVERAGE.

The complete range from 30 Mc/s. to 480 Kc/s. is covered by five switched coil assemblies with a suitable overlap between each.

The five ranges are

Band 1	...	30 Mc/s. to	13 Mc/s.
" 2	...	13 Mc/s. to	5.5 Mc/s.
" 3	...	5.8 Mc/s. to	2.5 Mc/s.
" 4	...	2.5 Mc/s. to	1.12 Mc/s.
" 5	...	1120 Kc/s. to	480 Kc/s.

## CIRCUIT AND VALVE SEQUENCE.

Two R.F. Stages	6BA6 or equivalent.	Push Pull Output	EL91 or equivalent
Frequency-changer	X81 or 7S7	B.F.O.	6BA6 " "
Oscillator	6AM6 or equivalent	Noise Limiter	6AL5 " "
Two I.F. Stages	6BA6 " "	(all the above are of all-glass types).	
Det. and A.V.C.	6AL5 " "	Voltage Regulator	VR150/30
Audio Amplifier	6AU6 " "	Power Rectifier	5Z4G
Phase Inverter	6AU6 " "		

## CONTROLS.

The tuning control is positive, free from backlash and very smooth in action. The gear-driven, flywheel controlled mechanism has a reduction ratio of approximately 140 to 1. An easily read mechanical bandspread device is incorporated. It takes the form of an auxiliary dial fitted in one corner of the main dial and gives a scale length equivalent to ninety inches per range. This dial can be read to one degree and greatly assists in the accurate logging of particular stations.

All ranges are directly (and very accurately) calibrated in frequency, with additional markings to indicate broadcast and amateur bands.

The major controls have been grouped on the front panel, particular attention being paid to easy and convenient accessibility. The controls are:—

Main Tuning.	Crystal Phasing.
Band Selector.	Crystal in/out Switch.
R.F. Gain.	Variable Selectivity.
A.F. Gain.	Noise Limiter on/off Switch.
B.F.O. Pitch.	A.V.C. on/off Switch.
B.F.O. on/off Switch.	Standby Switch.
	Mains on/off Switch.

Two additional controls are fitted at the rear of the receiver. One is a rheostat (knob operated) by which the dial illumination can be adjusted to suit individual requirements. The second control is the "S" Meter zero adjustment, the slotted spindle of which is fitted with a screw-on cover.

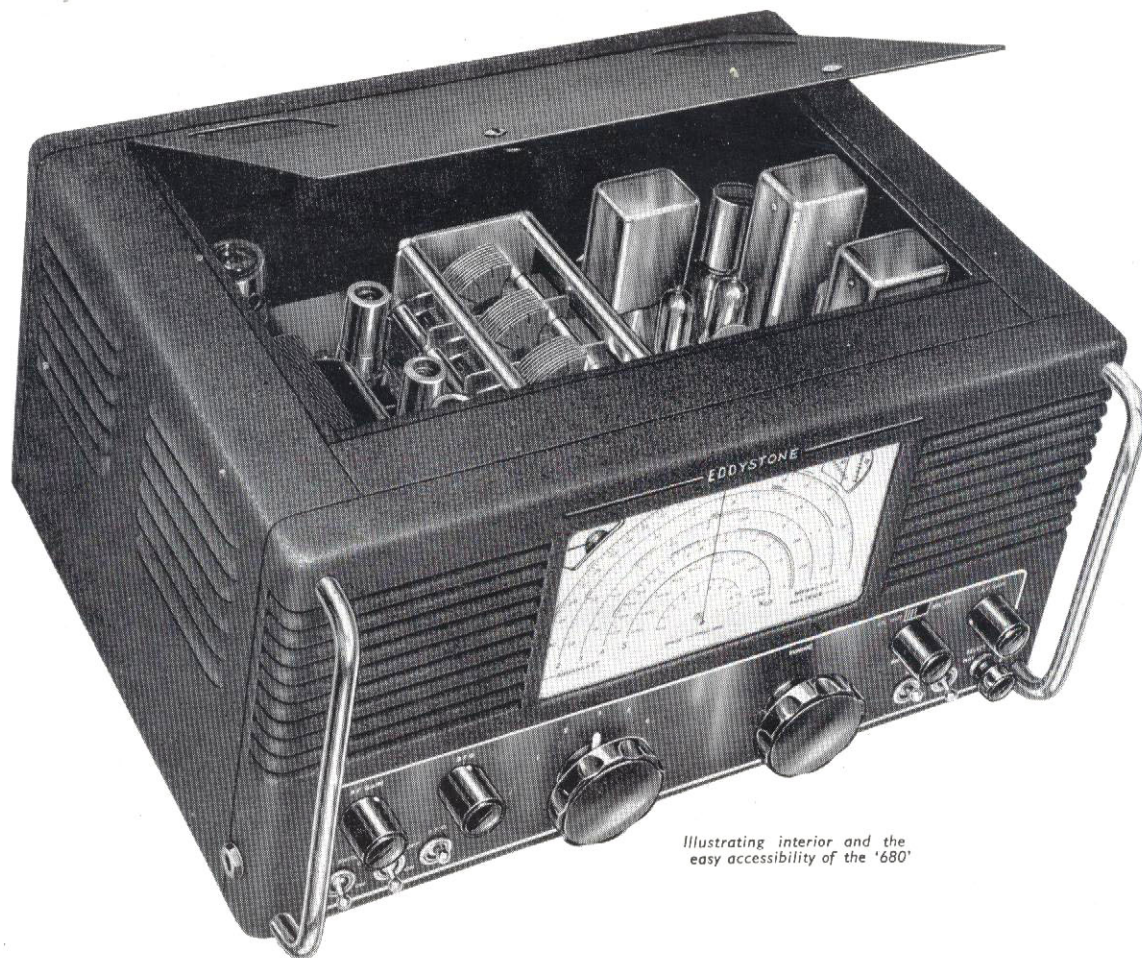
## TUNING UNIT.

The coils are housed and effectively screened in a robust aluminium diecasting, which ensures high electrical and mechanical stability. All coils have adjustable dust-iron cores, which increase the "Q" values and enable the four tuned circuits to be aligned very accurately. The trimmer condensers in the R.F. and F.C. stages are of the air-dielectric type — an important factor in maintaining high efficiency at the higher frequencies. Another important feature is the ceramic trimmers used in the oscillator stages, which ensure stability and freedom from microphonic effects.

All insulating materials in the coil compartments have been carefully selected for their excellent electrical and radio frequency properties.



# OF THE EDDYSTONE "680" C



*Illustrating interior and the easy accessibility of the '680'*

## **GENERAL CONSTRUCTION.**

The front panel and tuner unit chassis are aluminium diecastings, which provide an extremely rigid foundation for the receiver. This is an important feature, since any flexing of the chassis when being lifted is detrimental.

The remaining units are of stout brass, heavily nickel-plated and securely fastened to the main castings. The cover, of heavily rust-proofed steel, is provided with a lift-up lid. Adequate ventilation is arranged through side louvres and top grille.

The cover can easily be removed by withdrawing the four rear fixing screws. The chassis is fitted with protecting rails which reduce the risk of damage to valves and components, when the receiver is inverted for inspection or servicing.

The cabinet and front panel are finished a handsome ripple black set off by the chromium plated carrying handles. The finger plate is black and silver. The appearance of the receiver is solid and impressive and in true keeping with its general performance.

**DIMENSIONS.** Overall width,  $16\frac{3}{4}$ ". Depth from front to rear,  $13\frac{3}{4}$ ". Height,  $8\frac{3}{4}$ ". Weight, 41-lb.

A rack-mounting model is available to special order at a small additional cost. The cabinet is retained.

# COMMUNICATIONS RECEIVER

## **I.F. STAGES AND CRYSTAL FILTER.**

The carefully designed I.F. transformers are permeability tuned to 450 Kc/s. Coupling between the coils in the transformers is varied mechanically by a panel control, giving a wide range of selectivity. Compensation is made for variations in gain. A vacuum mounted crystal, of high stability, is employed in the filter incorporated in the anode circuit of the first I.F. valve. The panel phasing control permits maximum rejection of interfering signals.

## **BEAT FREQUENCY OSCILLATOR.**

The B.F.O. unit is neat and compact, with the valve mounted on top of the unit. A panel operated pitch control is provided, giving an adequate degree of variation.

## **" S " METER.**

A sensitive moving coil microammeter is fitted in the upper left-hand corner of the main dial. It is marked in divisions up to S9 and in decibels above S9. The zero adjuster is at the rear of the receiver. The current passing through the meter is limited by one half of a double diode valve, which also prevents reverse current flowing when the R.F. gain is reduced. The " S " Meter enables stations to be tuned in accurately and gives a comparative indication of signal (carrier) strength. It operates with the B.F.O. on or off.

## **NOISE LIMITER.**

A highly effective series type of noise limiter is incorporated. The constants associated with it have been chosen carefully to give efficient limiting action without detriment to signal strength.

## **STANDBY SWITCH.**

The standby switch on the front panel renders the receiver inoperative during periods when an associated transmitter is in operation. Additional contacts on this switch are brought out at the rear of the receiver to permit control of the transmitter, through an auxiliary relay.

## **POWER SUPPLY.**

The power unit is designed to provide good regulation and negligible hum level. A readily accessible selector panel, integral with the mains transformer, permits operation from A.C. mains of 110 volts and 200/240 volts, 40/60 cycles. The consumption is approximately 80 watts. Protecting fuses are incorporated.

The oscillator, frequency changer screen and B.F.O. are supplied with stabilised H.T. through the medium of a VR150/30 stabiliser valve.

## **AERIAL INPUT.**

The approximate impedance of the aerial circuit is 400 ohms but good results are obtainable with aerials of widely varying impedance. The terminals at the rear are arranged to take either a single wire aerial or balanced feeders.

## **OUTPUT IMPEDANCE.**

An output transformer is fitted internally, the secondary winding being brought out to terminals at the rear, to take a speaker with a coil impedance of 2 to 3 ohms. A jack is provided on the left-hand side of the receiver to take high resistance telephones (2000-4000 ohms).

An output transformer, with a 600 ohm balanced output — or as specified — can be fitted to special order, where the quantity justifies it.

## **PICK-UP TERMINALS.**

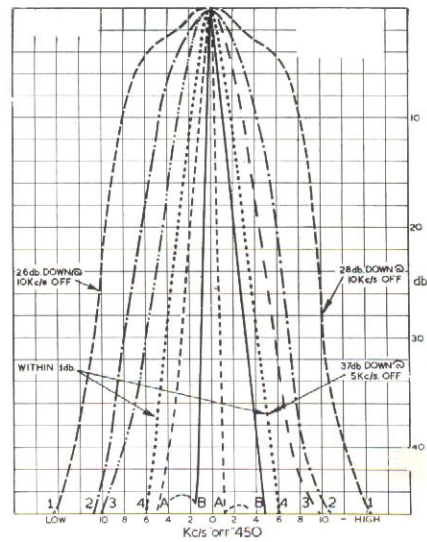
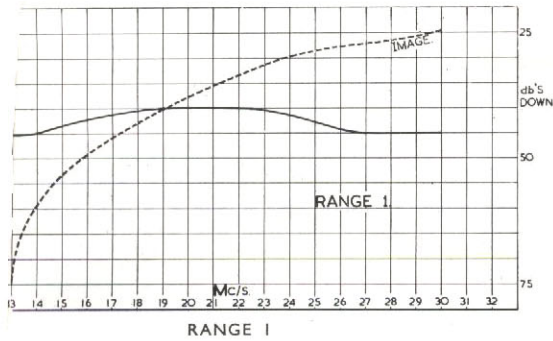
Pick-up terminals are fitted at the rear, to enable the audio section of the receiver to be used separately.

*We reserve the right to make minor modifications to the specification.*

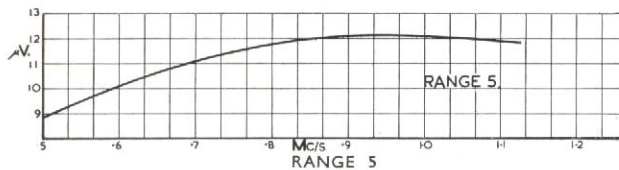
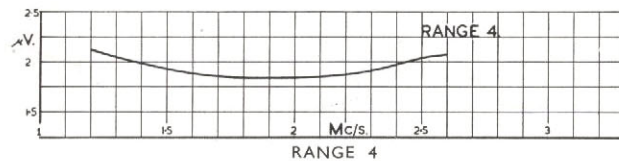
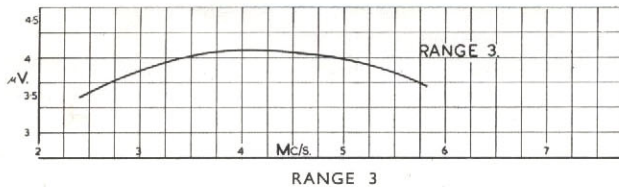
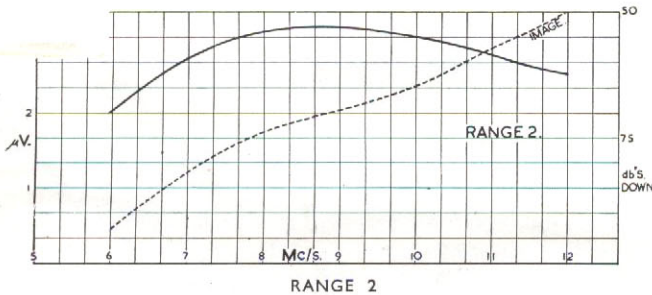


# PERFORMANCE CURVES

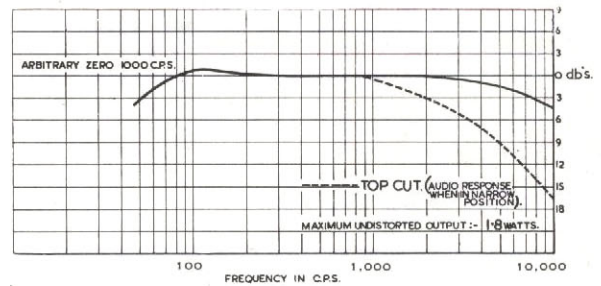
(Taken on an average "680" Receiver)



Selectivity curves for the "680" Receiver.  
 (1) ——— minimum position.  
 (2) ····· first intermediate position.  
 (3) - - - - second intermediate position.  
 (4) ····· maximum selectivity.  
 (A) - - - - maximum selectivity, with crystal filter in., and phased to reject signal on one side.  
 (B) ——— as "A", but with crystal phased on other side.

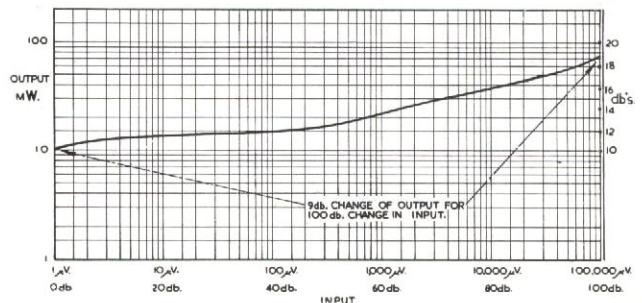


Above are sensitivity curves for an average "680" Receiver. They are based on a 15 db signal-to-noise ratio and an audio output of 50 milliwatts.



Response curve of the Audio Amplifier stages of the "680" Receiver. When the selectivity switch is at maximum, an additional top cut is introduced, the effect being indicated above by the dotted line curve.

The figure of 1.8 watts represents distortionless output, over a wide range of frequencies. Considerably more output power is actually available, without appreciable distortion.



**EDDYSTONE** "Puts Perfection into Performance"

A considerable amount of work is entailed in the development of a commercial broadcast receiver and it can be imagined how much more is necessary with a high grade communications receiver, such as the Eddystone "680."

When designing a receiver of this type, the experience of the manufacturers is a tremendous asset. Our experience goes back many years and includes much intensive war-time development work. There may be several ways of producing a certain result and the practicability, simplicity, and economy of each method have been studied and combined to obtain the most effective answer.

From the briefest glance, it will be apparent that the "680" is not a collection of components mounted on a sheet metal chassis. It is a thoroughly well engineered piece of apparatus, with every single part matched to every other part. The diecast coil-housing and front panel ensure both electrical and mechanical stability of the highest order, which features increase in importance when frequencies up to 30 Mc/s. are covered.

Every component used is thoroughly tested to ensure that (a) it is correct in every way for the position it occupies, (b) its electrical and/or mechanical strength is entirely adequate, and (c) that it is satisfactory when used under extreme climatic conditions. These tests are by no means simple to carry out but are very necessary.

High performance miniature valves are used in the "680" and each type has been specially selected for its particular function. As time goes on, other valves may become available which are slightly superior in one way or another to those specified, and the manufacturers reserve the right to vary the actual valves employed, as circumstances dictate.

Even in the best receiver, a component here and there may in time require renewal and therefore everything has been made readily accessible. The comprehensive service folder, supplied with each receiver, includes the full circuit diagram and list of component values.

Each receiver is carefully inspected at every point. Workmanship is of a high order — not only externally but in every part of the receiver and in those parts hidden from sight as much as in others. No wandering leads are permitted — the wiring is beautifully neat and tidy.

The Eddystone "680" Receiver is a true thoroughbred — in its appearance, in its workmanship and, last but by no means least, in its performance. It is an outstanding example of first class British engineering.