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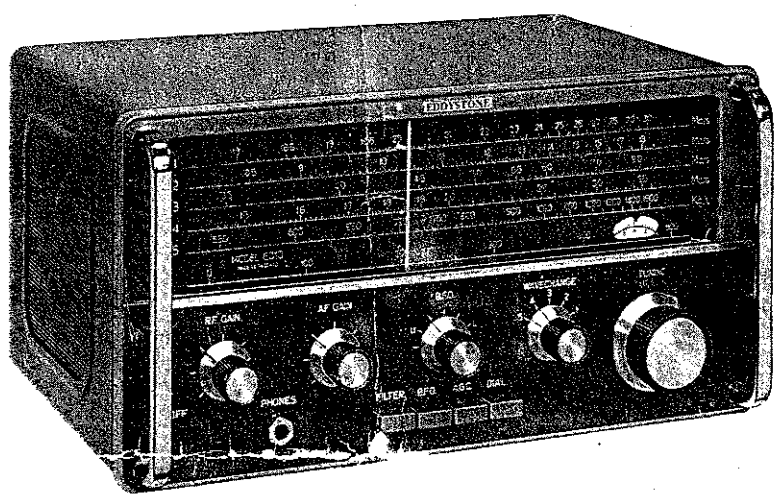
Eddystone

TRANSISTORISED COMMUNICATION RECEIVER MODEL EC10

INSTRUCTION MANUAL



The EDDYSTONE Model EC10 is a fully transistorised single conversion communication receiver covering the frequency band 550 kc/s to 30 Mc/s in five ranges. Provision is made for AM and CW reception and the unit is powered by a self-contained battery pack.

A total of ten transistors is employed together with five diodes one of which is a zener type which serves to stabilise the supply for the RF section of the receiver. This arrangement helps to maintain a sensibly constant performance with falling battery voltage. Current drain has been kept to a minimum to prolong battery life.

A wide variety of aerials can be accommodated including a small telescopic rod aerial for portable operation. An internal five inch loudspeaker is fitted and arrangements are made for using low impedance telephones where this is more convenient. A push-pull audio output stage is employed and a selective audio filter can be introduced for CW reception under conditions of severe adjacent channel interference.

Independent RF and AF Gain controls are fitted and the other controls include separate BFO and AGC switches and a variable BFO pitch control. The tuning drive is a geared type and is flywheel-loaded for ease of operation. Tuning scales are some nine inches in length and are calibrated directly in terms of frequency. Dial illumination is provided for use when necessary and is controlled by a switch on the panel.

The receiver is light in weight, has contemporary styling with compact dimensions and is housed in a strong metal cabinet. High quality components are used in all parts of the circuit and reliable operation is assured throughout the world.

TECHNICAL DATA

Frequency Coverage

550 kc/s to 30 Mc/s in 5 ranges :—

Range 1	18·0 — 30·0 Mc/s
Range 2	8·5 — 18·0 Mc/s
Range 3	3·5 — 8·5 Mc/s
Range 4	1·5 — 3·5 Mc/s
Range 5	550 — 1500 kc/s

Intermediate Frequency

465 kc/s

Semiconductor Complement

TR1	OC171	RF Amplifier
TR2	OC171	Mixer
TR3	OC171	Local Oscillator
TR4	OC171	1st IF Amplifier
TR5	OC171	2nd IF Amplifier
TR6	OC171	Beat Oscillator
TR7	OC71	Audio Amplifier
TR8	OC83	Audio Driver
TR9 TR10	2 × OC83	Audio Output
D1	OA70	AGC Attenuator
D2	OA90	Detector/AGC
D3	OAZ203	Voltage Stabiliser
D4/5	2×DD006	Aerial Protection Diodes

Power Supply

9V from 6 × 1·5V leak-proof dry cells, external supplies of 12V or 24V DC (positive earth) using Voltage Converter Type 945 or standard AC mains supplies using AC Power Unit Type 924

Consumption

36mA quiescent, 77mA at 50mW and 180mA at 500mW output
Dial lamps when in use add 90mA to the normal current drain

Aerial Input Impedance

Ranges 1 — 4	75Ω (nom) balanced or unbalanced.
Range 5	400Ω (nom) balanced or unbalanced

A high impedance input connection is provided for use on all ranges and is suitable for use with short rod aerials

Sensitivity

Better than 5uV for 15dB s/n ratio on Ranges 1—4.
Better than 15uV on Range 5

IF Selectivity

Typical overall bandwidths at 6dB and 40dB down are 5 kc/s and 25 kc/s respectively.

IF Breakthrough

Ranges 1 — 4	greater than 85dB down
Range 5	greater than 65dB down.

Image Rejection

20dB at 18·0 Mc/s and 50dB at 2·0 Mc/s.

Calibration Accuracy

1% on all ranges

Frequency Stability

Drift does not exceed 1 part in 10^4 per °C change in ambient temperature.

AGC Characteristic

An 80dB increase in signal produces less than 12dB change in output. Taken from 6uV at 2·0 Mc/s on Range 1

Audio Output and Response

The maximum audio output exceeds 1 watt and 500mW is available at 10% distortion.

Frequency response is level within 6dB over the range 300 c/s to 8 kc/s except when using the audio filter. The filter is resonant at approximately 1,000 c/s and can be brought into circuit for selective CW reception. 6dB bandwidth is of the order 180 c/s.

Dimensions and Weight

Height	6⅜" (16·2 cm)
Width	12½" (31·7 cm)
Depth	8" (20·3 cm)
Weight (less batteries)	12¾ lb (5·8 kg)
Weight (with batteries)	14 lb (6·3 kg)

CIRCUIT DESCRIPTION

The RF Section of the receiver comprises TR1, TR2 and TR3 (3 × OC171). TR1 is a grounded-base amplifier with signal input applied to the emitter from a tap on the appropriate tuned circuit which is selected by Sla, b and c. L1/C2 is introduced on Range 5 and serves as an IF rejector circuit to limit IF breakthrough when using this band. AGC can be applied to the RF Stage and manual gain control is effected by RV1 which also controls the 1st IF Amplifier TR4. The RF Stage is coupled to the Mixer by L7-L11 which have low impedance secondaries to match the base impedance. Oscillator injection is to the emitter and IF output is taken from the collector to the 1st IF transformer IFT1.

A tuned collector circuit is employed in the Local Oscillator Stage (TR3) which tracks above the signal frequency on all ranges. Injection for the Mixer is taken from a low impedance link winding on the appropriate oscillator coil.

All three stages in the RF Section are operated from the stabilised supply provided by the zener diode D3 (OAZ203). This gives a nominal 6·5V and maintains sensibly constant performance with falling battery voltage. All tuned circuits associated with TR1-TR3 employ precision wound coils and have individual trimming adjustments. The circuits are arranged in such a manner that the coils which are not in use are shorted out to prevent absorption and dead spots in the tuning.

IF amplification is provided by TR4 and TR5 (2 × OC171) which operate at 465 kc/s with a total of five tuned circuits to ensure a high degree of adjacent channel selectivity. AGC and manual gain control are applied to the first stage while the second operates at constant gain. Improved operation under strong signal conditions is given by the diode switch (D1 : OA70) which introduces a damping resistor (R19) across the primary of IFT1 when the signal exceeds a certain level. This action assists the AGC circuit and prevents overloading of the Detector and TR5.

The diode (D2 : OA90) which serves as the Detector is housed in the IFT3 screening can and also provides the AGC voltage which is applied to TR1 and TR4 via the filter circuit C61/R28. Audio output from the Detector is coupled through C74 to the base of the Audio Amplifier which is an OC71 (TR7).

TR6 is introduced for CW reception and provides a locally generated carrier which is amplified by TR5 and applied to the Detector along with the normal signal The beat frequency obtained can be adjusted by means of the pitch control C70 TR6 derives its supply from the zener diode D3

An audio filter (L18/C76) is included in the coupling between TR7 and the Audio Driver Stage TR8 (OC83). The filter is resonated at approximately 1,000 c/s and will be found most useful for CW reception when interference is severe The filter can be switched out by S4 when receiving AM signals

The push-pull Output Stage operates in Class "B" and provides a 3Ω output to feed the internal loudspeaker Low impedance telephones can be plugged into a socket on the panel and the circuit is arranged so that the speaker output is interrupted when telephones are in use.

INSTALLATION

Batteries

The EC10 receiver is supplied without batteries **Six** standard 1 5V dry cells are required and these are of a type which is available in all parts of the world. It is recommended that leak-proof types are used wherever possible, the Ever Ready HP2 being suggested as the most suitable battery for this receiver Other batteries which can be used are as follows:—

EVER READY	U2	OLDHAM	K532
VIDOR	V0002	PERTRIX	601
DRYDEX	T20/T21	SIEMENS	T1
G E C	BA6103	RAYOVAC	3LP

N A T O Stock No 6135–99–910–1101

To fit the batteries first unscrew the two knurled screws which retain the battery box at the rear of the receiver Lift the box clear and free from the receiver by disengaging the four-way connector at the right-hand end Now remove the inner cover from the box, sort the batteries into two groups of three and slide them into the battery troughs

Use the diagram printed on the battery container as a guide when fitting the batteries and make absolutely sure that they are in the correct positions before switching on the receiver **Switching on with the batteries connected the wrong way round will damage the transistors**. Replace the inner cover re-connect the four-way plug and then re-fit the battery container in the rear of the set. It should be noted that the plug is a non-reversible type so that there is no chance of the battery polarity being reversed at this point

Aerial Connections

Sockets are provided for connecting short rod aerials normal single wire aerials and either balanced or unbalanced transmission line feeders Single wire aerials are connected to the "A1" socket with the special shorting plug in position between the "AE" socket and the "EARTH" terminal This same shorting plug is also used when the receiver is fed with coaxial line or when using a short rod aerial In the case of a coaxial feeder the outer braid is attached to the "EARTH" terminal and the inner conductor to the "A1" socket

If a balanced feeder (twin transmission line) is employed, the shorting plug is removed and the feeder wires are connected to "AE" and "A1". The shorting plug can be pushed temporarily into the "A2" socket to avoid loss. This latter socket is used only for connecting short rod aerials when a full size aerial is not available The socket is not suitable for connection of resonant loaded whip aerials which should be connected at the "A1" socket with the link in place between "AE" and "EARTH"

In some cases a good earth will give improved results and it is well worth taking the trouble to install one. Reduction in the level of locally generated noise will be one of the advantages gained from proper earthing of the receiver.

Telephones

Telephones or an external loudspeaker can be connected to the socket on the panel The output is matched to 3Ω and will give satisfactory results with telephones of up to 600Ω impedance Higher impedance can be used but with some reduction in output and slightly inferior quality

OPERATION

Operation of the receiver is quite straightforward and a few minutes spent in manipulating the various controls will quickly familiarise the user with their functions.

The SUPPLY switch is ganged to the RF GAIN control and is moved to the "on" position by rotating the RF GAIN in a clockwise direction. Tuning is with the large knob at the right-hand side of the panel the drive mechanism being a precision unit employing spring-loaded split-gears giving a reduction ratio of the order 110–1 This facilitates accurate tuning on the HF ranges while flywheel-loading allows the control to be "spun" to permit rapid movement from one part of the dial to another The dial calibration is in Mc/s on all ranges except Range 5 where the scale is marked in kc/s Range numbering appears at the left-hand end of the dial and is repeated on the WAVECHANGE switch which is located immediately to the left of the TUNING control

The calibrated vernier which appears in the window above the TUNING control is used in conjuction with the bottom logging scale on the main dial Combining the two readings will give an arbitrary figure which corresponds to the actual frequency to which the receiver is tuned The readings can be recorded to allow rapid re-setting to specific frequencies

Independent RF and AF GAIN controls are provided the former being a combined RF and IF control. Four push-button switches control the following functions :—

AF FILTER IN/OUT, BFO ON OFF, AGC ON/OFF and DIAL LIGHTS ON OFF The DIAL LIGHT switch is mechanically biased to the "off" position and must be held in the "on" position to obtain scale lighting Illumination of the dial will not normally be required and since the scale light consumption doubles the average current drawn from the supply, this facility should be used only when absolutely essential The other switches are of the press-to-operate press-to-release type and lock in the "on" position

The remaining control is the BFO PITCH control which is functional only when receiving CW signals. It allows the BFO to be set to either side of the incoming signal and when using the audio filter it provides a means of setting the beat note to coincide with the resonant frequency of the filter (1,000 c/s).

The AGC will normally be switched "off" when receiving CW signals (BFO "on") and under this condition of operation it is usual to reduce the setting of the RF GAIN to prevent overloading of the pre-detector stages. When receiving AM signals the AGC should be in use and the RF GAIN is then advanced to maximum to secure optimum AGC action

MAINTENANCE

General

The EC10 receiver should require very little in the way of routine maintenance apart from replacement of the batteries. If a fault should develop, the cabinet can be removed by carrying out the procedure detailed below :—

1. Remove the battery container by unscrewing the two knurled retaining screws and disengaging the four-way battery connector at the right-hand end
2. Remove the four cabinet retaining screws.
3. Free the cabinet from the panel by applying pressure with the fingers between the rear inner edge of the cabinet and the ends of the strip which supports the IF printed board near the top of the cabinet
4. Slide the cabinet away from the panel.

Dial Bulbs

Faulty dial bulbs can be changed by levering the holders free from the rubber mounting grommets at the extreme ends of the dial. Replacement bulbs should be of the L E S type rated at 6V. 50mA.

Instructions for re-stringing the drive cord

In the unlikely event of the pointer drive cord either breaking or slipping out of the pulley grooves, replacement will present no real problems if the instructions given below are followed carefully. If the cord is broken, a new length should be obtained and this can be made longer than the length actually required (32" : 82 cm.) to make it easier to handle. Right-hand and left-hand in the instructions given below are as viewed from the rear of the receiver.

1. Remove the existing cord and then set the tuning gang to full mesh
2. Tie a double knot in one end of the replacement cord and feed the cord through the hole provided in the left-hand drive pulley with the knot on the inside of the rim. The hole should lie at approximately "4 o'clock."
3. Wind approximately one and a half turns anti-clockwise round the drive pulley and then pass the cord under and over the left-hand guide pulley
4. Pass the cord across the dial from left to right and then, while holding the free end of the cord in tension, rotate the tuning control to fully unmesh the tuning gang. This operation will wind just over three complete turns of cord onto the left-hand drive pulley and tension must now be maintained to prevent the cord from slipping out of the pulley groove
5. Pass the cord clockwise round the jockey pulley (right-hand side of the receiver) and then back across to the right-hand drive pulley. Feed the cord into the pulley groove and then through the hole in the rim (hole lies at about "10 o'clock"). Increase the tension on the cord until the outer rim of the jockey pulley takes up a position level with the nearest edge of the panel handle retaining screw. Mark the cord with a pencil at the point where the retaining knot must be tied
6. Free the cord from the jockey pulley and while maintaining tension draw the cord through the hole in the right-hand drive pulley until the cord tightens on the left-hand guide pulley.
7. Tie a double knot in the position marked in (5) above and cut off any surplus cord. Feed the cord back through the hole and replace in position round the jockey pulley
8. Set the tuning gang to full mesh and slide the pointer to 'O' on the logging scale. Attach the pointer to the cord (when viewed from above the cord should pass under the two outer prongs at the rear of the pointer carrier) and then check the drive for free and normal operation

Re-alignment

The initial factory alignment of the receiver should hold for a long period of time and re-alignment should not be carried out unless there is a clear indication that it is in fact necessary. Alignment should be carried out only by individuals with a sound knowledge of the procedures involved and the test equipment listed below must be available if the task is to be completed satisfactorily. It should be noted that any figures quoted for sensitivity etc, are based on the assumption that a new set of batteries is in use. It is further assumed that the receiver cabinet has been taken off as described earlier.

The following items of test equipment are required for re-alignment–

Signal generator(s) covering 465 kc/s and the range 550 kc/s to 30 Mc/s with provision for modulation at 30% (400 c/s) and with an output impedance of 50/75Ω.

Crystal controlled harmonic generator providing 100 kc/s markers up to 7.5 Mc/s and 1 Mc/s markers up to 30 Mc/s

Output meter matched to 3Ω with plug to mate with telephone socket

Trimming tools :— Miniature insulated screwdriver with $\frac{1}{16}$" blade, small metal-tipped insulated screwdriver and a Neosid Type H S 1 hexagonal core adjuster

Re-alignment of the IF Stages and BFO

First locate and remove the four screws which retain the IF printed wiring board. Turn the board through 90° into a vertical position and replace two of the screws to keep the board in this position. All trimming adjustments are now accessible and there is no need to unsolder connections to the board.

Now stand the receiver on one end to allow connection of the generator output lead to the Range 5 Mixer coil L11 (see underside view of receiver). The generator should be arranged to provide a 50Ω source and the earth lead can be clipped to the screen adjacent to the coil. Disable the Local Oscillator by shorting out the forward section of the tuning gang (C48) and then plug the lead from the output meter into the telephone socket on the panel. The speaker is automatically disconnected on insertion of the plug and the meter will therefore indicate true output power.

Switch on the generator, allow it adequate time to stabilise against drift and then set the receiver controls as follows :—

Range Switch	Range 5	AGC/BFO	Off
Tuning	560 kc/s	Audio Filter	Out
RF/AF Gains	Maximum		

Tune the generator to 465 kc/s (with modulation 30% at 400 c/s) and then set the attenuator to give a reading of approximately 50mW on the output meter. Peak the cores in IFT1, IFT2 and IFT3 for maximum output, all cores being set on the "outer" peak. Re-check each adjustment several times to ensure accurate alignment and then set the attenuator for an output reading of 50mW. The input should be of the order 4uV at 465 kc/s. If the IF sensitivity appears to be on the low side investigation can commence with a

check on the AF sensitivity. At 1,000 c/s an input of 12mV across RV2 should result in an output of 50mW

Leave the generator tuned to the intermediate frequency, switch off the modulation and unplug the output meter. Set the BFO pitch control to mid-travel (index on knob at 12 o'clock) and check that the mid position corresponds to the half-capacity setting of the capacitor and that clockwise rotation of the control results in an increase in capacity If necessary, slacken the grub screw and re-set the knob before proceeding. With the control at mid-travel, switch on the BFO and adjust the core in L17 for zero-beat Check for normal operation of the BFO control and then disconnect the generator and the shorting link across C48

Re-alignment of the RF Section

The first step in this part of the procedure is a check on the overall calibration accuracy Proceed as follows :—

Connect the output of the harmonic generator to the "A1" and "AE" sockets with the shorting link in place between "AE" and "EARTH." Set the generator to provide 1 Mc/s markers and then with the BFO switched on, tune across Range 1, checking the scale accuracy at each megacycle point. The scale accuracy should be within 1% (i.e. 300 kc/s at 30 Mc/s 180 kc/s at 18 Mc/s etc) and re-alignment of the Local Oscillator should not be attempted unless the error observed is greater than this

Repeat the check on Ranges 2 and 3, again using the 1 Mc/s markers and then check Range 4 The 100 kc/s markers can be introduced on this range so that checks can be made at the half-megacycle points. Finally use the 100 kc/s markers to check Range 5.

Range	Frequency	Trimmer	Frequency	Core
1	29 0 Mc/s	C39	18 0 Mc/s	L12
2	18 0 Mc/s	C40	8 5 Mc/s	L13
3	7 5 Mc/s	C41	3 5 Mc/s	L14
4	3 5 Mc/s	C42	1 5 Mc/s	L15
5	1400 kc/s	C43	560 kc/s	L16

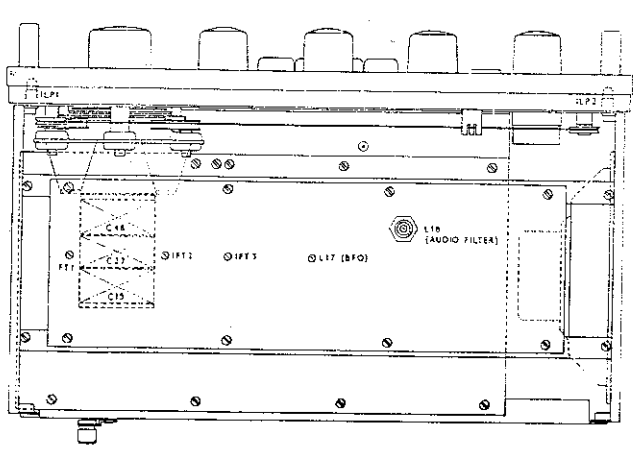
If errors in excess of 1% are noted, carry out normal tracking procedure using the alignment frequencies and adjustments listed in the preceding Table. Adjustment should be restricted to the ranges on which excessive error is noted and care should be taken to repeat the adjustment of trimmer and core until interaction between the two adjustments is nullified.

Alignment of the RF (Aerial) and Mixer circuits can now be commenced Disconnect the harmonic generator and connect the standard signal generator (modulation 30% at 400 c/s) and arrange the output impedance to match 75Ω for Ranges 1—4 and 400Ω for Range 5. Re-connect the output meter and switch off the BFO

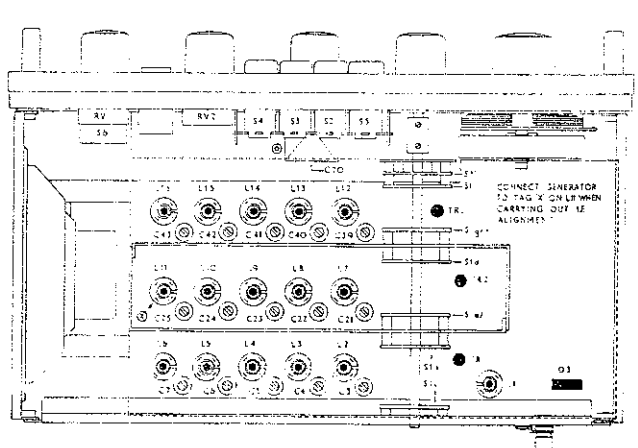
Adjustments are made at the same frequencies employed for oscillator alignment but using the trimmers and cores listed in the second Table As with oscillator alignment each adjustment should be repeated several times to cancel the interaction between core and trimmer

Range	Trimmer			Core		
	Frequency	Aerial	Mixer	Frequency	Aerial	Mixer
1	29 0 Mc/s	C3	C21	18 0 Mc/s	L2	L7
2	18 0 Mc/s	C4	C22	8 5 Mc/s	L3	L8
3	7 5 Mc/s	C5	C23	3 5 Mc/s	L4	L9
4	3 5 Mc/s	C6	C24	1 5 Mc/s	L5	L10
5	1400 kc/s	C7	C25	560 kc/s	L6	L11

On completion of the adjustments on Range 5 tune the receiver to the low frequency alignment point (560 kc/s) and the generator to 465 kc/s Increase the generator output until an indication is obtained on the output meter and then adjust the IF rejector coil L1 for **minimum** output Re-tune the generator to 560 kc/s, reduce its output and check the alignment of L6 for maximum signal. Repeat the checks once more at both 465 kc/s and 560 kc/s and then carry out a sensitivity check on all ranges.



Plan View of Model EC 10 Receiver



Underside View of Model EC 10 Receiver

VOLTAGE ANALYSIS

The voltage readings given in the Table will prove useful in the event of the receiver developing a fault which makes it necessary to carry out voltage checks. All readings are typical and were taken with a meter having a sensitivity of 20,000Ω V. The batteries were in new condition and a tolerance of 10% will apply to all readings taken with a meter of the sensitivity quoted. The tolerance should be increased if a meter of lower sensitivity is employed and allowance must be made for the state of the batteries.

Readings should be taken under "no-signal" conditions with the controls set as follows: All readings are NEGATIVE with respect to chassis and the stabilised supply should lie in the range 6.4—6.6V.

Wavechange	Range 1	AF Gain	Maximum
Tuning	20 Mc/s	AGC	Off
RF Gain	Maximum	BFO	On

Reference	Collector	Base	Emitter
TR1*	6.35V	1.0V	0.68V
TR2	6.5V	1.2V	1.1V
TR3	6.3V	1.35V	1.2V
TR4**	5.6V	1.15V	0.87V
TR5	7.5V	0.7V	0.4V
TR6	6.3V	0.75V	0.6V
TR7	4.0V	0.97V	0.9V
TR8	8.9V	1.5V	1.5V
TR9	9.1V	0.15V	0.07V
TR10	9.1V	0.15V	0.07V

* Readings become 6.5V, 0.1V and 0V with RF Gain at min

** Readings become 7.35V, 0.35V and 0.16V with RF Gain at min

SPARES

The following list details all major spares for the EC10 receiver. The Serial No. of the receiver must be quoted in all correspondence and enquiries should be directed to the "Sales and Service Dept."

Inductors, Transformers etc.

L1	465 kc/s IF Rejector coil	D3204
L2	Range 1 RF (Aerial) coil	D3189
L3	Range 2 RF (Aerial) coil	D3190
L4	Range 3 RF (Aerial) coil	D3191
L5	Range 4 RF (Aerial) coil	D3192
L6	Range 5 RF (Aerial) coil	D3193
L7	Range 1 Mixer coil	D3194
L8	Range 2 Mixer coil	D3195
L9	Range 3 Mixer coil	D3196
L10	Range 4 Mixer coil	D3197
L11	Range 5 Mixer coil	D3198
L12	Range 1 Oscillator coil	D3199
L13	Range 2 Oscillator coil	D3200
L14	Range 3 Oscillator coil	D3201
L15	Range 4 Oscillator coil	D3202
L16	Range 5 Oscillator coil	D3203
L17	Beat Oscillator coil	6656P
L18	Audio Filter coil	D3216
IFT1	1st IF transformer (465 kc/s)	6653P
IFT2	2nd IF transformer (465 kc/s)	6654P
IFT3	3rd IF transformer (465 kc/s)	6655P
T1	Audio Driver transformer	6657P
T2	Audio Output transformer	6658P

Miscellaneous

Range Switch	Clicker mechanism	5625P
	Wafers : Sla/c, Sle/f, Slg/h	5393P
	Wafers : Slb, Sld, Sli, Slj	5404P
Push Switch Assembly (S2—5)		6510P
RF Gain control (with switch)		6861P
AF Gain control		6860P
Dial bulbs (L.E.S. 50mA, 6.7mm.)		6659P
Dial bulb holders		6600P
Phone jack		6660P
Loudspeaker		7347P
Aerial socket strip		D3209
Earth terminal		6371P
3-gang tuning capacitor		6528P
Flexible coupler		D2017
BFO tuning capacitor		D830
Drive Assembly		LP2864
Pointer Assembly		D3215
Dial glass (calibrated)		D3188
Knobs (large)	D3613/1 : Skirt	7089/1P
Knobs (small)		D3617/2
Shorting plug (AE)		D3210

Serial 7640 R.4 Brown Green Brown Silver
R.3 Red Red Black Silver
R.2 was originally 150Ω was needed

Manufacturers :

EDDYSTONE RADIO LIMITED

ALVECHURCH ROAD, BIRMINGHAM 31

Telephone : 021-475 2231 Cables : EDDYSTONE, BIRMINGHAM

Telex : 33708

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Eddystone

TRANSISTORISED COMMUNICATION RECEIVER

MODEL EC10 Mk II

SUPPLEMENT TO EC10 INSTRUCTION MANUAL

The EC10 Mk II is the current production replacement for the well established EC10 Communication Receiver. It incorporates several additional features and has modified styling. Scale calibration is marked in kHz and MHz in line with the general changeover to standardised nomenclature. This supplement contains details of all modifications and should be used in conjunction with the basic EC10 Instruction Manual supplied with the receiver.

Fine Tuning Control

A voltage variable capacitance diode (D6 : BA111) is wired across the oscillator section of the three-gang tuning capacitor to permit fine tuning independently of the main tuning control. Control is effected by means of a potentiometer (RV3) which varies the DC voltage applied to the diode. Fine tuning coverage varies from range to range, but in each case is compatible with the tuning rate provided by the main tuning control. Typical frequency swings provided by the Fine Tuning control are 150kHz and 35kHz at the high frequency ends of Ranges 1 and 3 respectively.

In normal operation, the Fine Tuning control should be maintained at its mid-travel position (index against mark on finger plate), so that adjustment up or down in frequency is available at any setting of the Main Tuning control.

Carrier Level Meter

The built-in carrier level meter will be found very useful as a tuning indicator and can also be used for comparison of relative carrier level, for which purpose the scale is calibrated in arbitrary divisions 0-10.

The meter is controlled by the AGC voltage but is arranged to operate normally irrespective of the setting of the AGC SWITCH. A signal is correctly tuned when the meter deflection is greatest.

Standby Switch

This control is arranged to desensitise the receiver when set to the "STANDBY" position, and is primarily intended for use when the receiver is used in conjunction with an associated transmitter. It must be set to the 'non-standby' position for normal reception.

Two spare contacts are available on the switch for connection to the transmitter control circuit when single-switch changeover facilities are required. Connection should be made directly at the switch and the hole provided near the 'A2' socket can be used to bring the twin lead out from the receiver to the appropriate termination on the transmitter. The switch circuit will be closed when the switch is set to 'STANDBY'.

As an alternative, the desensitising facility can be controlled from a spare switch section on the transmitter changeover switch (or relay), in which case the receiver STANDBY SWITCH is left permanently in the 'non-standby' position. With this form of control, the two leads from the transmitter switch should be wired in parallel with the existing connections to S7a. The transmitter switch must close this circuit to duplicate the normal operation of S7 in the transmit condition.

NB It is important that an efficient aerial changeover relay is used in any installation where an EC10 Mk II receiver is used with an associated transmitter.

Low-level Audio Output

This facility was included on late versions of the basic EC10 receiver and has been fitted also to the Mk. II variant. The output socket is located at the rear of the set (adjacent to the PHONES socket which was previously on the panel). It can be used to feed a tape recorder, or an external audio amplifier providing greater volume than that available from the receiver loudspeaker. A suitable plug is supplied and should be used to terminate a screened cable for connection to the external unit. The braid of the cable should be soldered to the neck of the plug shell and the inner wire to the pin.

The external unit can remain permanently connected and will not affect normal operation of the receiver. Control of volume when using an external amplifier, or recording level when taping a received signal, must be by means of the appropriate control fitted on the external unit. The receiver AF GAIN will not affect the level of signal at this output and would normally be set to minimum when using an external high power amplifier.

Telescopic Aerial Kit LP3126

A specially designed telescopic aerial is available for use with the EC10 Mk II receiver and can be obtained from your local dealer. Pre-drilled holes are provided at the rear of the receiver for simple attachment. The LP3126 aerial is primarily intended for use when a normal short-wave aerial is not available, e.g. in occasional portable operation. A properly designed aerial system is strongly recommended when the receiver is installed at a permanent location.

MODEL EC10 Mk. II — LIST OF COMPONENT VALUES

CAPACITORS

C1 : 3*p*F Tubular Ceramic ± 0.5*p*F 750V DC wkg
C2 : 0.002uF Polystyrene ± 5% 125V DC wkg
C3-7, 21-25, 39-43 : 6-25*p*F Ceramic Trimmer
C8 : 80*p*F Silvered Mica ± 10% 350V DC wkg.
C9, 26 : 50*p*F Tubular Ceramic ± 10% 750V DC wkg
C10 : 20*p*F Tubular Ceramic ± 10% 750V DC wkg
C11, 19 : 390*p*F Polystyrene ± 5% 125V DC wkg
C12 : 330*p*F Polystyrene ± 5% 125V DC wkg
C13 : 200*p*F Polystyrene ± 5% 125V DC wkg
C14 : 790*p*F Polystyrene ± 5% 125V DC wkg.
C15, 27, 48 : 3-gang Air-spaced Variable 12-365*p*F
C16, 18, 28, 31, 33, 49, 50, 53, 54, 56, 59, 61, 62, 71, 72, 73, 76 : 0.1uF Polyester ± 20% 250V DC wkg
C17 : 0.0015uF Tubular Ceramic + 50% — 25% 750V DC wkg
C20, 34 : 70*p*F Tubular Ceramic ± 10% 750V DC wkg
C23a : 10*p*F Tubular Ceramic ± 10% 750V DC wkg
C29 : 0.005uF Tubular Ceramic ± 10% 750V DC wkg
C30, 74 : 0.01uF Metallised Paper ± 20% 200V DC wkg
C32, 45, 64 : 0.047uF Polyester ± 20% 250V DC wkg
C35 : 40*p*F Tubular Ceramic ± 10% 750V DC wkg
C36 : Reference not allocated
C37 : 0.0014uF Polystyrene ± 5% 125V DC wkg
C38 : 500*p*F Silvered Mica ± 2% 350V DC wkg
C44 : 400*p*F Silvered Mica ± 2% 350V DC wkg
C46 : 0.007uF Polystyrene ± 5% 125V DC wkg
C47 : 12*p*F Tubular Ceramic ± 10% 750V DC wkg
C48a : 27*p*F Polystyrene ± 5% 125V DC wkg.
C49a : 0.01uF Polycarbonate ± 20% 100V DC wkg
C51, 52, 57, 58 : 300*p*F Polystyrene ± 5% 60V DC wkg.
C55, 63, 82 : 10nF Tubular Electrolytic + 50% — 10% 16V DC wkg.
C60 : 350*p*F Polystyrene ± 5% 60V DC wkg.
C61 : 0.01uF Metallised Paper ± 20% 150V DC wkg.
C66, 75, 77, 79 : 100uF Tubular Electrolytic + 100% — 20% 15V DC wkg
C67 : 1*p*F Tubular Ceramic ± 0.5*p*F 750V DC wkg
C68 : 0.001uF Polystyrene ± 5% 125V DC wkg
C69 : 470*p*F Polystyrene ± 5% 125V DC wkg
C70 : 5-60*p*F Air-Spaced variable
C78 : 1.25uF Tubular Electrolytic + 100% — 10% 16V DC wkg.
C80 : 0.25uF Metallised Paper ± 20% 150V DC wkg.
C81 : 350uF Tubular Electrolytic + 100% — 20% 12V DC wkg

RESISTORS

(All 10% ½ watt unless otherwise indicated)

R1, R20:	68,000 Ω	R11:	390 Ω	R37:	82,000 Ω
R2, R10, R32, R33	1,000 Ω	R12, R13:	22 Ω	R39	1,200 Ω
R3, R19, R23, R27, R31:	470 Ω	R14:	150 Ω	R41, R46:	2,200 Ω
R4, R7:	68 Ω	R16a:	1M Ω	R43:	12,000 Ω
R5, R15, R18, R29, R30, R49, R51	100 Ω	R17, R26, R40:	4,700 Ω	R44:	680 Ω
R6	220 Ω	R17a, R36:	6,800 Ω	R45:	0.18M Ω
R8, R16, R28a, R38:	15,000 Ω	R22:	10,000 Ω	R47, R50	39 Ω 5%
R9, R21, R49a:	3,300 Ω	R24:	1,500 Ω	R48:	5 Ω 5% wirewound 3W
		R25, R35, R42:	47,000 Ω	R48a:	18,000 Ω
		R28:	8,200 Ω	RV1, RV3	10,000 Ω Potentiometer
		R34:	22,000 Ω	RV2:	5,000 Ω Potentiometer

SPARES

Dial glass (calibrated)	D3188B
Fine Tuning Control (RV3) 10,000 Ω 1in. law	7762P
Carrier Level Meter (100uA FSD)	SKM69
Audio Plug	6943P
Desensitising Switch (S7)	7352P

Manufacturers :

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