

cuit, put the receiver into the Lock Mode and allow locking to take place. Adjust the Fine Tune control quickly to give a change of approx 30Hz and adjust RV2 so that the overshoot of the correction circuit is approximately 10Hz, i.e. 30%.

The current drawn by the module is :      +9V supply: 530mA  
    -20V supply: 27mA  
    -9V supply: 68mA

#### 4.12.5. Components List. Module Prefix 12.

##### Capacitors

Ref	Value	Type	Voltage	Tolerance
C 1	10n	Disc Ceramic	25V	+80%-20%
C 2	10n	Disc Ceramic	25V	+80%-20%
C 3	10n	Tantalum Electrolytic	25V	20%
C 4	1n	Disc Ceramic	250V	20%
C 5	100p	Ceramic	750V	20%
C 6	100n	Polycarbonate	100V	20%
C 7	150 $\mu$	Tube Electrolytic	16V	+50%-10%
C 8	820p	Silvered Mica	350V	10%
C 9	100p	Silvered Mica	350V	10%
C10	820p	Silvered Mica	350V	10%
C11	10 $\mu$	Tantalum Electrolytic	25V	20%
C12	150 $\mu$	Tubular Electrolytic	16V	+50%-10%
C13	150 $\mu$	Tubular Electrolytic	16V	+50%-10%
C14	220 $\mu$	Tubular Electrolytic	10V	+50%-10%
C15	4 $\mu$ 7	Tantalum Electrolytic	35V	20%
C16	4 $\mu$ 7	Tantalum Electrolytic	35V	20%
C17	10 $\mu$	Tantalum Electrolytic	25V	20%
C18	10 $\mu$	Tantalum Electrolytic	25V	20%
C19	10 $\mu$	Tantalum Electrolytic	25V	20%
C20	10 $\mu$	Tantalum Electrolytic	25V	20%
C21	10n	Disc Ceramic	25V	+80%-20%
C22	10n	Disc Ceramic	25V	+80%-20%
C23	10n	Disc Ceramic	25V	+80%-20%
C24	10n	Disc Ceramic	25V	+80%-20%
C25	10n	Disc Ceramic	25V	+80%-20%
C26	10n	Disc Ceramic	25V	+80%-20%
C27	10n	Disc Ceramic	25V	+80%-20%
C28	10n	Disc Ceramic	25V	+80%-20%
C29	10n	Disc Ceramic	25V	+80%-20%
C30	10n	Disc Ceramic	25V	+80%-20%
C31	10n	Disc Ceramic	25V	+80%-20%
C32	10n	Disc Ceramic	25V	+80%-20%
C33	10n	Disc Ceramic	25V	+80%-20%
C34	10n	Disc Ceramic	25V	+80%-20%
C35	10n	Disc Ceramic	25V	+80%-20%
C36	10n	Disc Ceramic	25V	+80%-20%
C37	10n	Disc Ceramic	25V	+80%-20%

##### Resistors

Ref	Value ( $\Omega$ )
R 1	1k
R 2	10k
R 3	330

Ref	Value ( $\Omega$ )
R 4	1k5
R 5	1k5
R 6	1k5

Resistors continued.....

Ref	Value ( $\Omega$ )	Ref	Value ( $\Omega$ )
R 7	1k5	R19	100
R 8	47	R20	1k2
R 9	47	R21	560
R10	47	R22	3k3
R11	47	R23	4k7
R12	1k5	R24	4k7
R13	1k5	R25	1k
R14	220	R26	1k
R15	220	R27	1k
R16	2k2	R28	1k
R17	2k7	R29	1k
R18	3k9	R30	1k

All resistors are Mullard CR25, 0.3 Watt 5%.

Potentiometers

Ref	Description	Part No.
RV1	4k7 Carbon linear preset	9031P
RV2	560 Carbon linear preset	9034P

Chokes

Ref	Value/Type/Part No.		
CH1	4.7mH	Sigma	SC60
CH2	D5116	Eddystone	
CH3	1mH	Sigma	SC60
CH4	1mH	Sigma	SC60

Diodes

Ref	Type
D1	BZX79 C4V7

Transistors

Ref	Type
TR1	BC107B

Integrated Circuits

Ref	Type	
IC 1	SN75107AN-00	Texas
IC 2	SN74S113N -00	Texas
IC 3	MC1035P	Motorola
IC 4	MC1068P	Motorola
IC 5	SN74S51N-00	Texas
IC 6	SN74393N-00	Texas
IC 7	SN7402N -00	Texas
IC 8	SN7470N -00	Texas
IC 9	SN74L75N-00	Texas
IC10	SN74L75N-00	Texas
IC11	SN74197N-00	Texas
IC12	SN74197N-00	Texas
IC13	SN74116N-00	Texas
IC14	MC1408L-8	Motorola
IC15	SN74490N-00	Texas
IC16	SN74490N-00	Texas
IC17	SN74490N-00	Texas
IC18	SN7470N -00	Texas
IC19	SN7400N -00	Texas
IC20	SN74164N-00	Texas
IC21	SN7430N -00	Texas
IC22	SN7400N -00	Texas
IC23	SN7472N -00	Texas
IC24	MC7805CT	Motorola
IC25	MC79L15CP	Motorola
IC26	MC79L05CP	Motorola

Miscellaneous

Description	Part No.
Printed Circuit Board	9570P
Printed Circuit Board Assembled	LP3506/1
SKA. Connector 10 way	9865P
PLA . Connector 10 way. Free (Mating for above)	9866P
Correction Module complete	LP3506/1

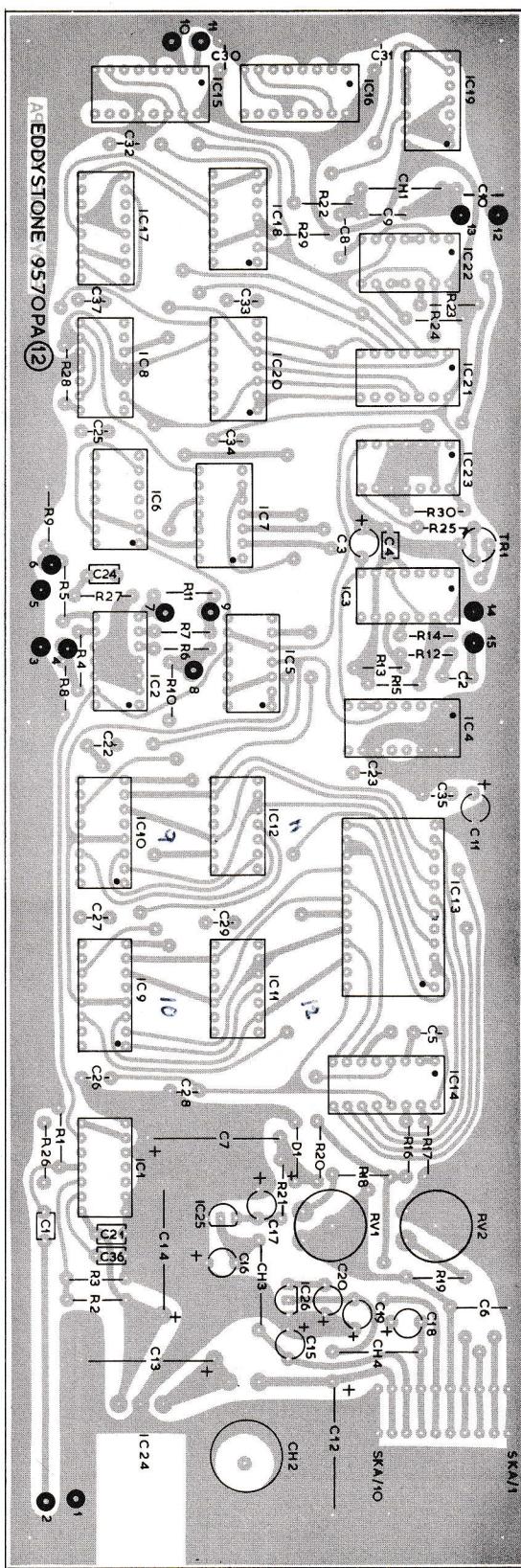
Spares should be ordered by quoting the complete Circuit Reference including the module prefix (where applicable), the description and the part number given in the list. From time to time, components of the type listed may be unavailable and equivalent types may be fitted or supplied as spares. All orders and enquiries should be directed to the address below, quoting the Type and Serial Nos. of the receiver in all communications.

EDDYSTONE RADIO LTD.,  
SALES AND SERVICE DEPT.,  
ALVECHURCH ROAD,  
BIRMINGHAM B31 3PP.  
ENGLAND.

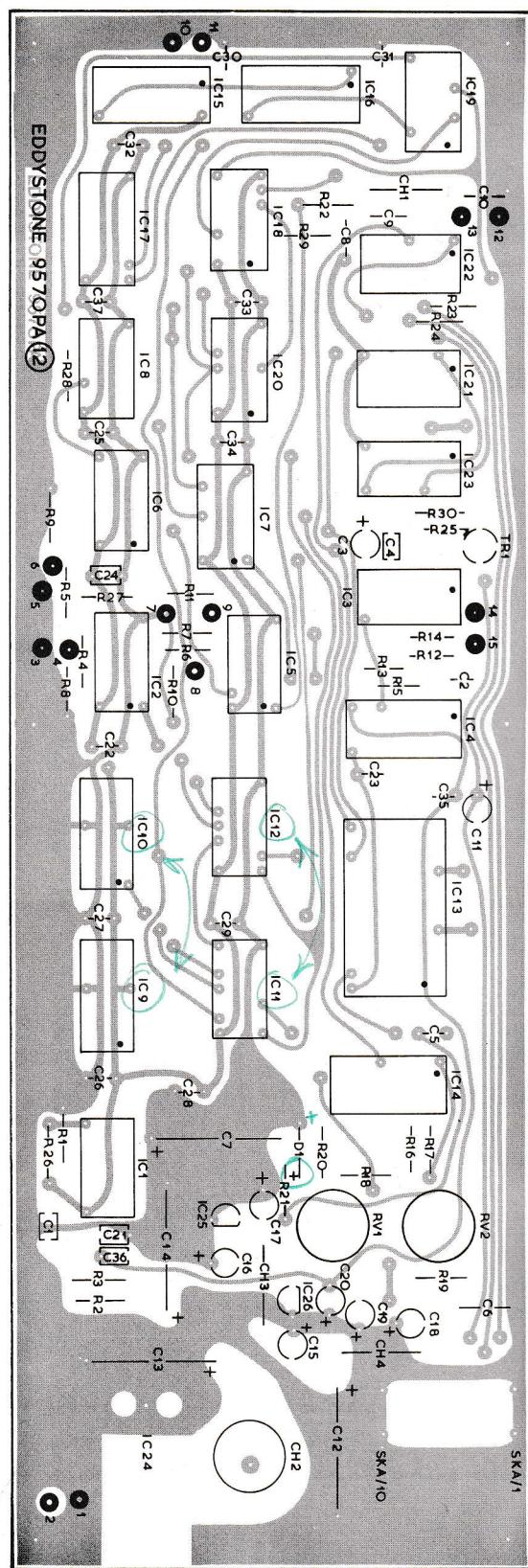
TELEPHONE : 021-475-2231  
TELEX : 337081  
CABLES : EDDYSTONE  
BIRMINGHAM

#### **4.12.6. Printed Circuit Board.**

The printed circuit board is shown viewed from the legend side, and is slightly less than actual size.



### Showing rear copper pattern



## Showing front copper pattern

## 4.13. Switchboard

### 4.13.1. Introduction

This printed circuit board carries the push button switches which protrude through the front panel, and the interconnections between the switches. On Model 1837/2 some switching functions are achieved by the use of analogue transmission gates which are activated by the push button switches. On 1838 Series receivers some switches are omitted and some of the functions transferred to the Selectivity switch.

### 4.13.2. Circuit Description.

a. Supply Switch. This interrupts the supply to all sections of the receiver except the Master Oscillator crystal oven and the 1st Oscillator section in the coilbox, the supplies to which are maintained whilst the AC supply remains connected.

b. AGC Switching. Power from the -9V supply is regulated by IC 1 which provides the negative bias for the IF AGC line when manual IF gain control is selected.

1837 Series: When AGC is selected, the AGC time constant is selectable by switching either C1 or C2 to the AGC line; when manual is selected the AGC line is controlled from 1RV1.

1838 Series: S2 is omitted and the appropriate time constant is selected automatically by the Selectivity switch.

#### c. Mode Switching.

Model 1837/1 only. Two interconnected push buttons provide selection of CW, SSB or AM reception, the audio signals being routed directly via the switch contacts.

Model 1837/2 only. S4b routes the signal from either the Product Detector (for CW) or the AM Detector (for SSB and AM) to transmission gate IC2b, whilst transmission gate IC2c always receives the Product Detector output.

In the absence of a 12V supply on SKB pin 2, TR2 will be conducting and IC2c will be in its high impedance state, IC2b will be low impedance and so S4b selects either AM or CW. SKB pin 2 carries +12V only when the SSB filter on the Selectivity Unit is selected, in this case IC2b is high impedance, IC2c low impedance and the Product detector output is selected. S5a now has +12V applied to it, derived via IC2d and TR3 and when USB is selected this energises via SKB pin 5, the relays in the selectivity unit which select the required filter (because of IF inversion this will be a filter having an LSB response). The LED switching is arranged in a similar manner so that in all cases the correct indicator lamp is illuminated.

1838 Series only. These switches are omitted and the functions transferred to the Selectivity Switch.

#### d. Aerial Attenuator Switching.

These switches (only one is fitted on 1838 Series receivers) control relays in the coilbox which insert attenuation into the aerial feed.

e. Display Intensity Control.

The LED Anodes are connected via current limiting resistors and the appropriate switch to the +12V supply. The cathodes are connected to a common line, driven by emitter follower TR1 and by TR5 on 1837/2, the cathode voltage being determined by the display intensity control.

4.13.3. Removal of the board.

Set all pushbuttons to the "in" position. Remove 2 x M2.5 screws (at each end of the row of pushbuttons) holding the assembly to the front panel. Withdraw the unit, unplugging the connectors.

4.13.4. Fault Diagnosis

The existence of a fault on this board will normally be obvious from the absence of a particular facility. However in the case of Model 1837/2 failure of a switch contact in the mode selection circuit will result in the inability to select this mode, i.e. another mode may remain selected.

4.13.5. Performance Check

The performance of the module is checked by establishing the presence of the various facilities and signal paths controlled by the unit.

4.13.6. Realignment

There are no realignment adjustments to be made on this unit.

4.13.7. Voltage Analysis

All voltages measured with respect to 0V rail (SKB pin 1) with AVO8 on lowest applicable range. Normal tolerances apply.

a. Module connections.

SKA pin	1	+6.8V	pin	11	+20V	
	2	+6.8V		12	-9V	(X)
	3	+8.8V		13	-9V	
	4	-3V to 0V		14	-9V	
	5	12V	(X)	15	+9V	(X)
	6	12V		16	+9V	
	7	-20V	(X)	17	+9V	
	8	-20V		18	-3V	
	9	-20V		19	IF AGC	
	10	+20V	(X)	20	0V	

Conditions: Supply On except (X) : not relevant

	Model 1837/1	Model 1837/2	1838 Series	Condition
SKB pin	1 0V	0V	0V	
	2 0V	12V	-	
	3 -3V to 0V	-3V to 0V	-3V to 0V	
	4 12V	12V	-	CW
	5 0V	10V (USB)	-	
	6 0V	0V	-	
	7 0V	0V	-	
	8 0V	0V	-	
	9 0V	10V (USB)	0V	
	10 0V	0V	0V	
	11 12V	5.8V	-	SSB
	12 12V	12V	-	-20dB
	13 12V	12V	12V	-20dB

b. Transistors

TR1	Intensity	E	B	C
	Max	6.8V	6.2V	3.7V
	Int	8.5V	7.9V	2.1V
	Low	9.8V	9.2V	1.0V
	Off	12.0V	12.0V	0V

TR2 (Model 1837/2 only)

Mode			
SSB (USB or LSB)		11.7V	11.4V
AM		11.7V	11.0V
CW		11.7V	11.0V

**TR3 (Model 1837/2 only)**

Mode	USB	10.0V	10.7V	12V
	LSB	11.0V	11.7V	12V
	AM	0V	0V	12V
	CW	0V	0V	12V

**TR4 (Model 1837/2 only)**

Mode	SSB (USB or LSB)	0V	0V	12V
	AM	10V	10.7V	12V
	CW	11V	11.7V	12V

**TR5 (Model 1837/2 only)**

Mode (USB or BFO)	Intensity	E	B	C
	Max	5.4V	4.6V	1.5V
	Int	6.8V	6.0V	0.9V
	Low	7.7V	7.1V	0.4V
	Off	8.6V	8.8V	0V

**c. Integrated Circuits**

IC1	Input	-9V	Output	-5V
IC2	(Model 1837/2 only)			
SSB Mode				not SSB Mode
pin 1	11.7V		11.7V	
2	11.7V		0V	
3	0V		11.7V	
4	11.7V		11.7V	
5	0V		10V	
6	0V		10V	
7	0V		0V	
8	5.8V		5.8V	(High Impedance)
9	0V		5.8V	( " " )
10	5.8V		0V	( " " )
11	5.8V		5.8V	( " " )
12	11.4V		0.3V	
13	11.4V		0.3V	
14	11.7V		11.7V	

#### 4.13.8. Components List. Module Prefix 13.

##### Capacitors

Ref	Value	Type	Voltage	Tolerance
C 1***	1μ	Tantalum Electrolytic	35V	20%
C 2***	22μ	Tantalum Electrolytic	16V	20%
C 3	680n	Tantalum Electrolytic	35V	20%
C 4	10μ	Tantalum Electrolytic	25V	20%
C 5*	100n	Polycarbonate	100V	20%
C 6*	100n	Polycarbonate	100V	20%
C 7*	100n	Polycarbonate	100V	20%
C 8*	22μ	Tantalum Electrolytic	16V	20%
C 9*	10μ	Tantalum Electrolytic	25V	20%
C10*	10μ	Tantalum Electrolytic	25V	20%

##### Resistors

Ref	Value (Ω)
R 1	560
R 2	560
R 3	18 wirewound
R 4	27k
R 5	150
R 6	150
R 7***	150
R 8	150
R 9**	150
R10**	150
R11***	150
R12	150
R13	120k

Ref	Value (Ω)
R14*	560
R15*	10k
R16*	470k
R17*	100k
R18*	100k
R19*	100k
R20*	100k
R21*	100k
R22*	270
R23*	5k6
R24*	5k6
R25*	100
R26*	10k
R27*	6k8

All resistors except R3 are Mullard CR25, 0.3 Watt 5%

##### Diodes

Ref	Type	
D1	CQY 87	Telefunken
D2***	CQY 87	Telefunken
D3	CQY 87	Telefunken
D4***	CQY 87	Telefunken
D5***	CQY 87	Telefunken
D6	CQY 87	Telefunken
D7***	CQY 87	Telefunken

## Transistors

Ref	Type	Manufacturer
TR1	BD132 )	Mullard
TR2*	BC214KB )	
TR3*	BC107B )	
TR4*	BC107B )	
TR5*	BC214KB )	

## Integrated Circuits

Ref	Type	Manufacturer
IC1	MC79L05CP	Motorola
IC2*	MC14016CP	Motorola

MOS Device. See appendix for handling instructions.

## Switches

Ref	Description	Part No.
S1	6 pole c/o	9660P
S2***	2 pole c/o	9862P
S3	2 pole c/o	9862P
S4***	2 pole c/o	9862P
S5***	2 pole c/o	9862P
S6	2 pole c/o	9862P
S7***	2 pole c/o	9862P
	Button for S1-S7	

Components marked \* are fitted to Model 1837/2, LP3537/2 only

Components marked \*\* are fitted to Model 1837/1, LP3537/1 only

Components marked \*\*\* are fitted to both models 1837/1 and 1837/2.

## Miscellaneous

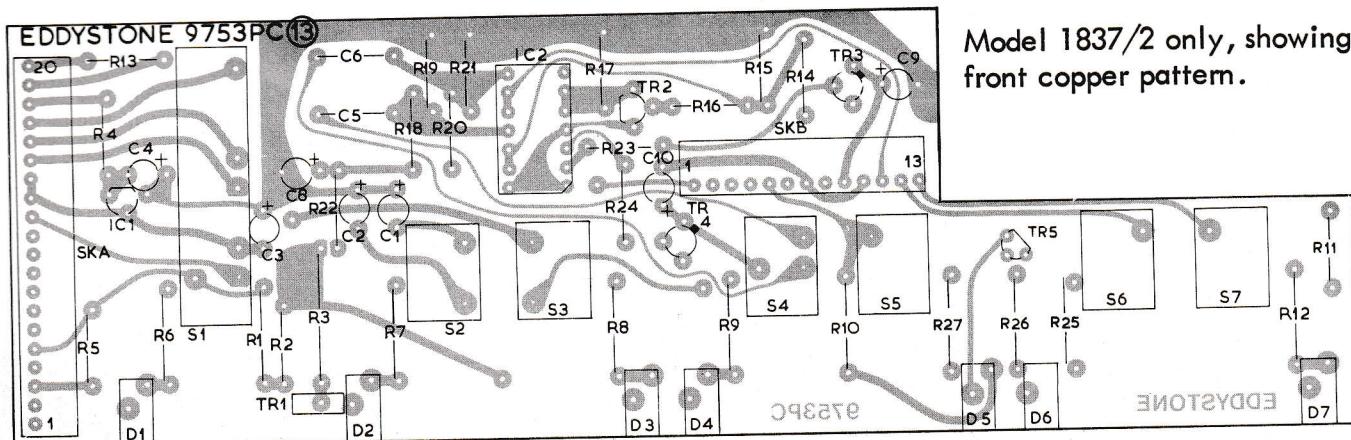
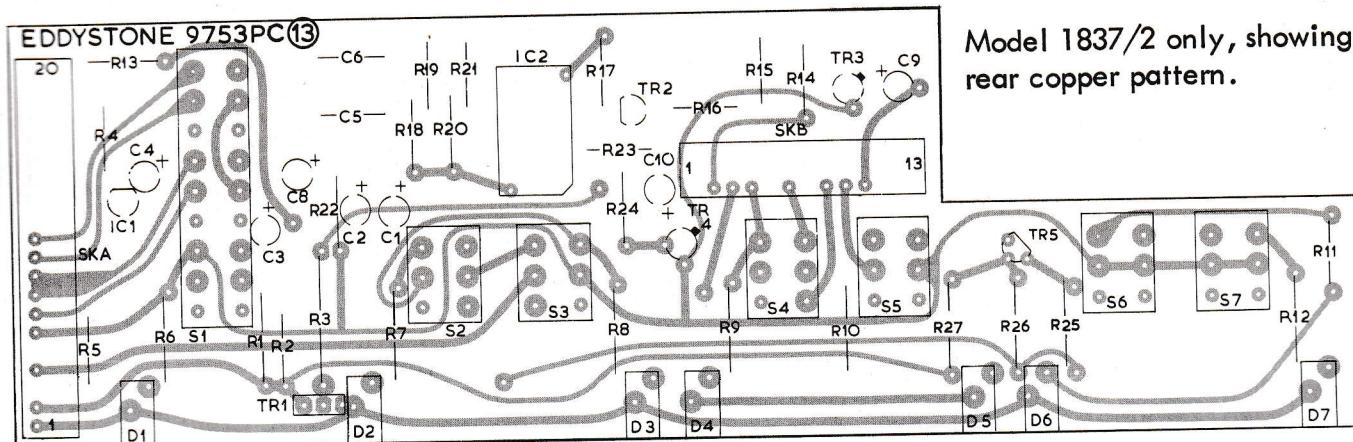
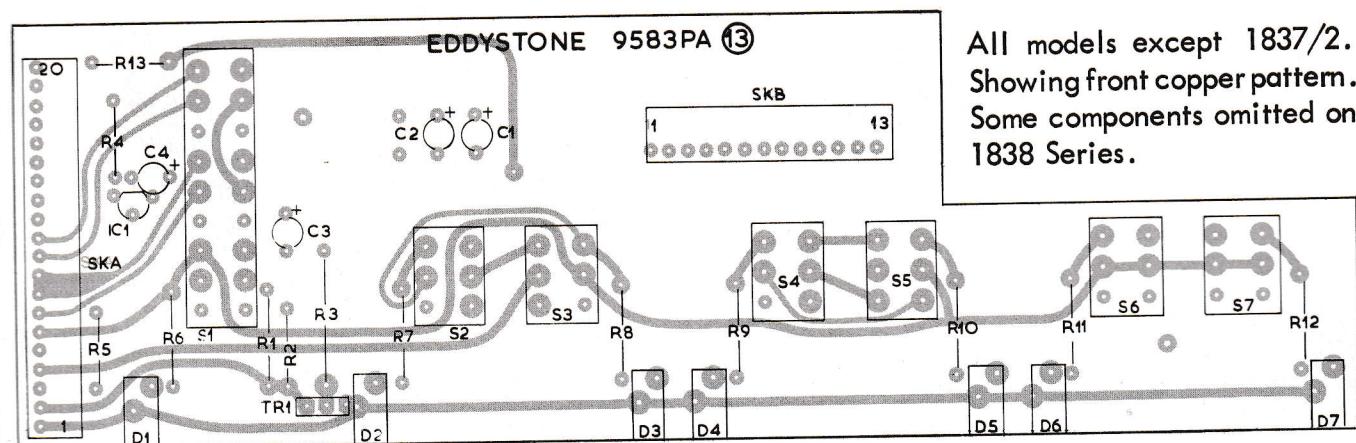
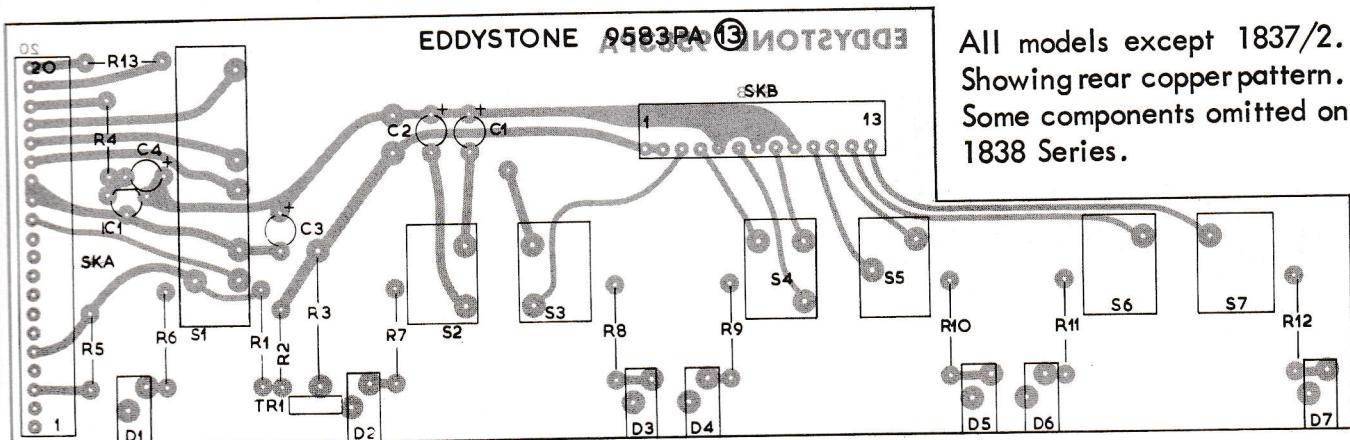
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EDDYSTONE RADIO LTD.,  
SALES AND SERVICE DEPT.,  
ALVECHURCH ROAD,  
BIRMINGHAM B31 3PP  
ENGLAND.

TELEPHONE : 021-475-2231  
TELEX : 337081  
CABLES: EDDYSTONE  
BIRMINGHAM

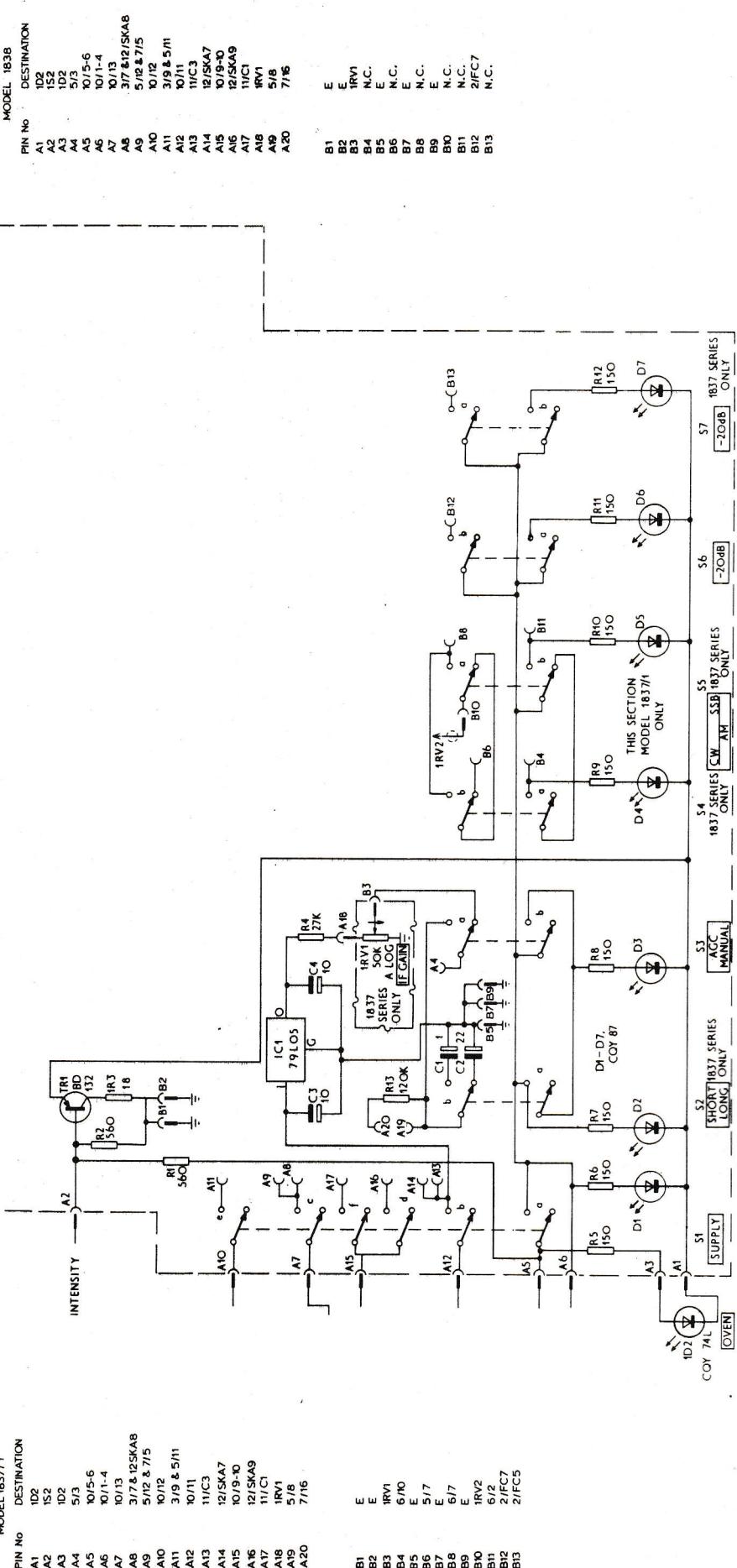
#### 4.13.9. Printed Circuit Boards.

The boards are shown viewed from the legend side, and are actual size.



**SWITCHBOARD 13**

MODEL 1837/1



MODEL 1838	
PIN No	DESTINATION
A1	1D2
A2	1S2
A3	1D2
A4	5/3
A5	10/5-6
A6	10/1-4
A7	10/13
A8	3/7 & 125KA8
A9	5/12 & 7/5
A10	10/12
A11	3/9 & 5/11
A12	10/11
A13	11/C3
A14	12/SKA7
A15	10/9-10
A16	12/SKA9
A17	11/C1
A18	1RV1
A19	5/8
A20	7/16
B1	E
B2	E
B3	1RV1
B4	N.C.
B5	E
B6	N.C.
B7	E
B8	N.C.
B9	E
B10	N.C.
B11	N.C.
B12	2/F/C7
B13	N.C.

## APPENDIX A

### Component Handling

Lead bending. Component leads need in general, to be bent to enable the device to be fitted. The bend should be made so that the radius of the bend is not less than the diameter of the lead (or the thickness of the lead in the case of flat leads), and the lead should be supported between the body of the component and the bend. The bend should be at least 2mm (approx 1/16") from the component.

Soldering. A soldering iron having a bit temperature not exceeding 245°C may be used. The soldered joint should be completed within 5 seconds. Overheating may damage the component.

Heat Sinks. Certain devices which are required to dissipate power are fitted with heat sinks. When replacing these devices, the heat sinking arrangement should be carefully reproduced, eg thermal conducting compound may be used. If an insulating washer has been used, this should be replaced and thermal conducting compound applied to both sides.

MOS Devices. These have an exceptionally high input resistance and they are susceptible to damage when exposed to high static electrical charges. To avoid possible damage the following procedures should be followed:

1. Devices should be stored and transported in contact with a conductive material.
2. Soldering iron, bench surface, tools etc., should all be earthed. The operator should be earthed using a  $1M\Omega$  series resistor.
3. The equipment should be switched off when devices or boards are inserted or removed.
4. Nylon clothing should not be worn.

Anti-static precautions take on added importance in dry weather (relative humidity less than 30%).

## APPENDIX B

### Device Outlines

**TO 18**



**BC107B**

- 1 Emitter
- 2 Base
- 3 Collector and Case

**TO 72**



**UC734B**

- 1 Source
- 2 Drain
- 3 Gate
- 4 Case

**3N128**

- 1 Drain
- 2 Source
- 3 Gate
- 4 Substrate & Case

**40673**

- 1 Drain
- 2 Gate 2
- 3 Gate 1
- 4 Substrate, Source & Case

**TO 92**



**2N4254**

- 1 Base
- 2 Collector
- 3 Emitter

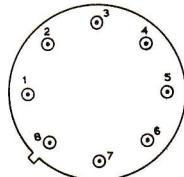
**78L00 Series**

- 1 Input
- 2 Output
- 3 Ground

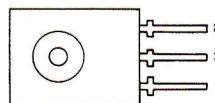
**79L00 Series**

- 1 Output
- 2 Input
- 3 Ground

**8-lead TO 5**



**7800 Series**  
**7900 Series**



**SL641C**

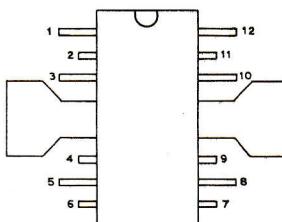
**7800 Series**

- 1 Input
- 2 Output
- 3 Ground

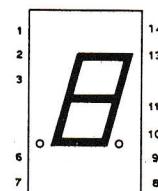
**7900 Series**

- 1 Ground
- 2 Output
- 3 Input

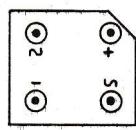
**TBA 810 SQ (Viewed from Top)**



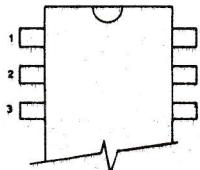
**HP5082-7663 (Viewed from Top)**



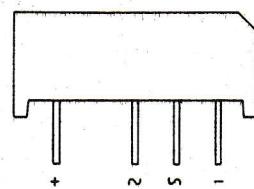
**SKB1, 2/01**



**Dual-in-Line**



**SKB 40C/3200/2200**



**CQY 74L  
CQY 87**



## SUPPLEMENTARY AMENDMENT 1837/1B

The 1837/1B receiver variant differs from the parent 1837/1 Model in the following respect:-

(1) FINE TUNE CONTROL RANGE

The range is limited to  $\pm 5\text{kHz}$ .

The following component changes have been made to effect the above modifications.

RESISTORS:

3R35 (situate on incremental board) is changed to 180k  
1R11 (situate on front panel) is changed to 180k.

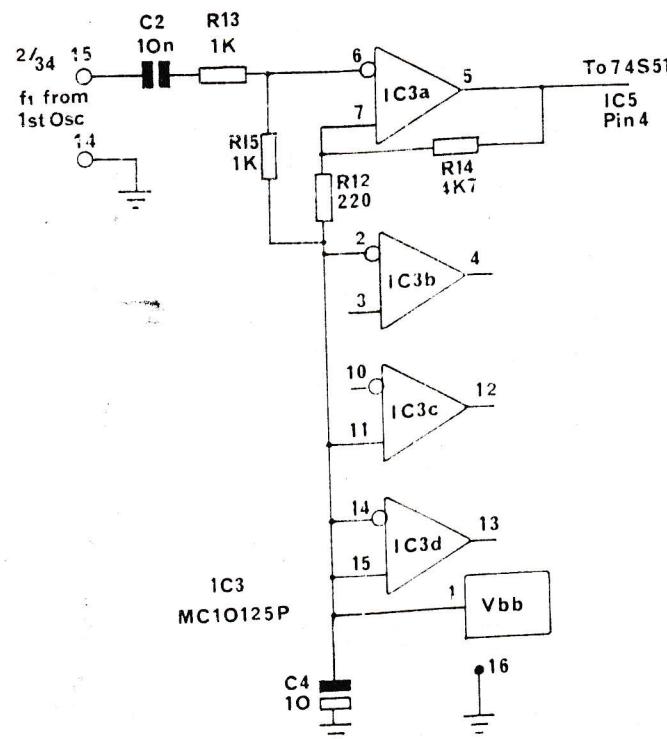
SUPPLEMENTARY AMENDMENT 1837/2B

1837/1838 SERIES

A modified correction P.C.B. is now fitted to this series.

The correction module circuit 12 is amended as follows:-

- IC4 is deleted
- IC3 is modified as shown



5V FEED	IC4 IC3	PIN 9 PIN 9	DELETED ADDED
EARTH PINS	IC3 IC4 IC3	PIN 14 PIN 16 PIN 16	DELETED DELETED ADDED
-5V SUPPLY	IC3 IC3	PIN 7 PIN 8	DELETED ADDED

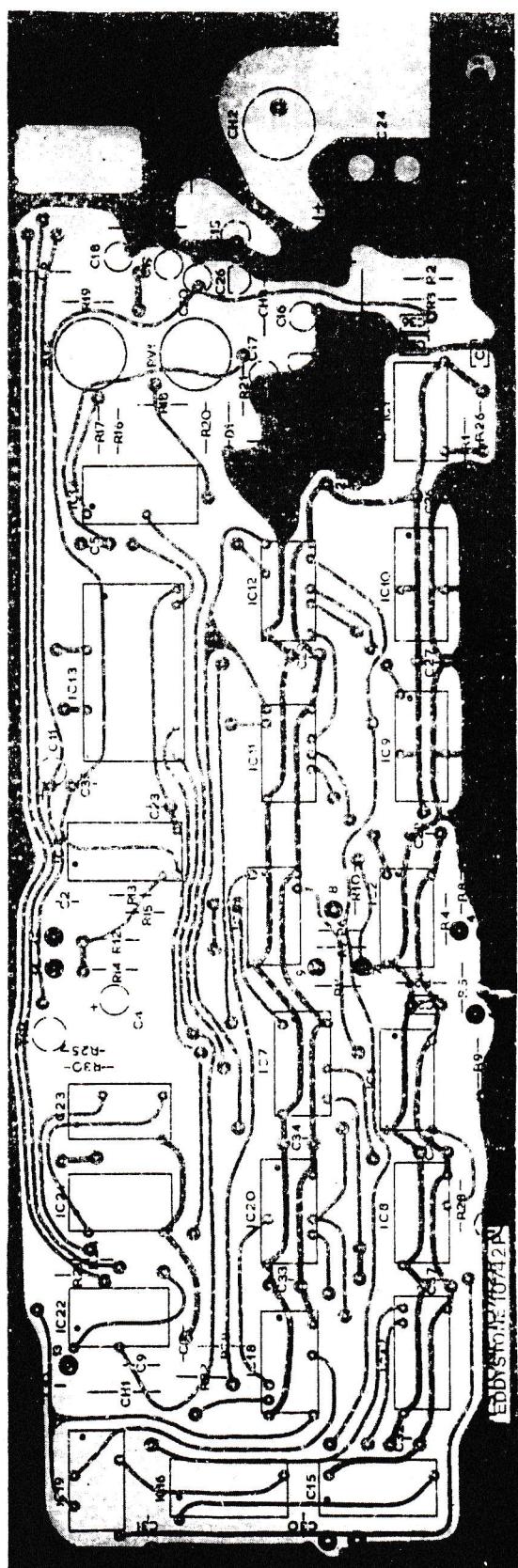
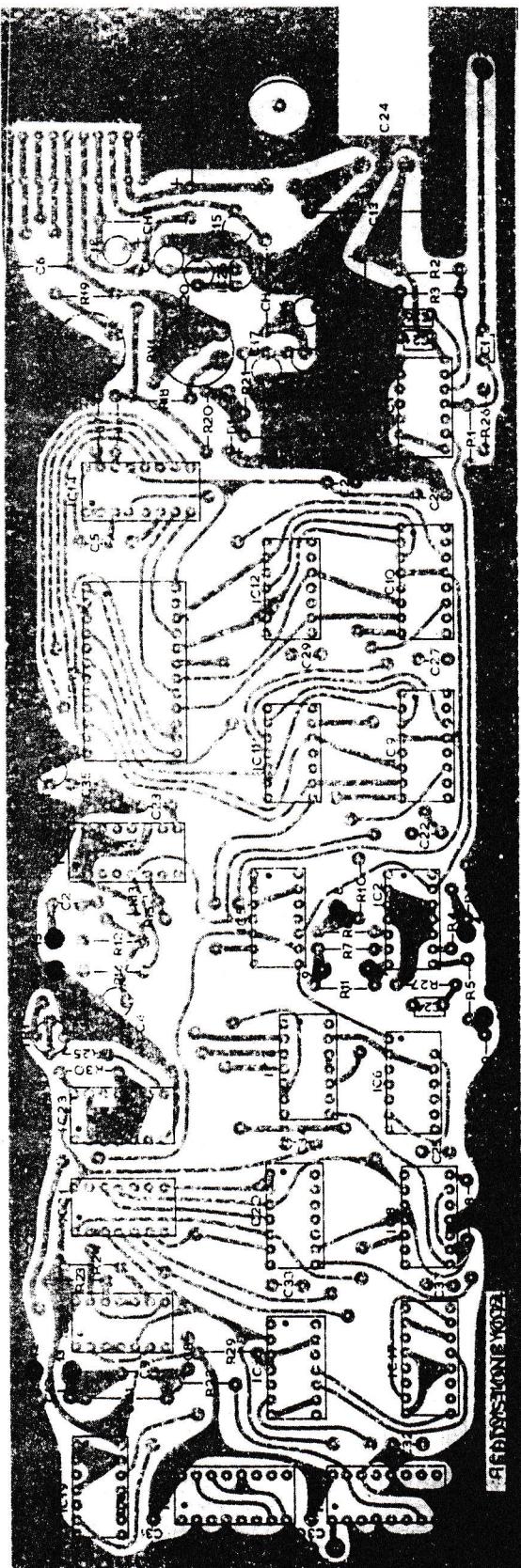
Section 4.12.2 a/ Interface.

1st Paragraph to read:

The 1st oscillator signal  $f_1$  from the coilbox is fed into an ECL line receiver connected as a Schmitt trigger with 200mV hysteresis IC3a. The output of IC3a at TTL level drives a Schottky divide by two, IC2a.

Correction Printed Circuit Board.

The printed circuit board is shown viewed from the legend side, and is slightly less than actual size.



## COMPONENTS LIST

### 4.12.5 CAPACITORS

C4            10 $\mu$             TANTALUM ELECTROLYTIC 25V 20%

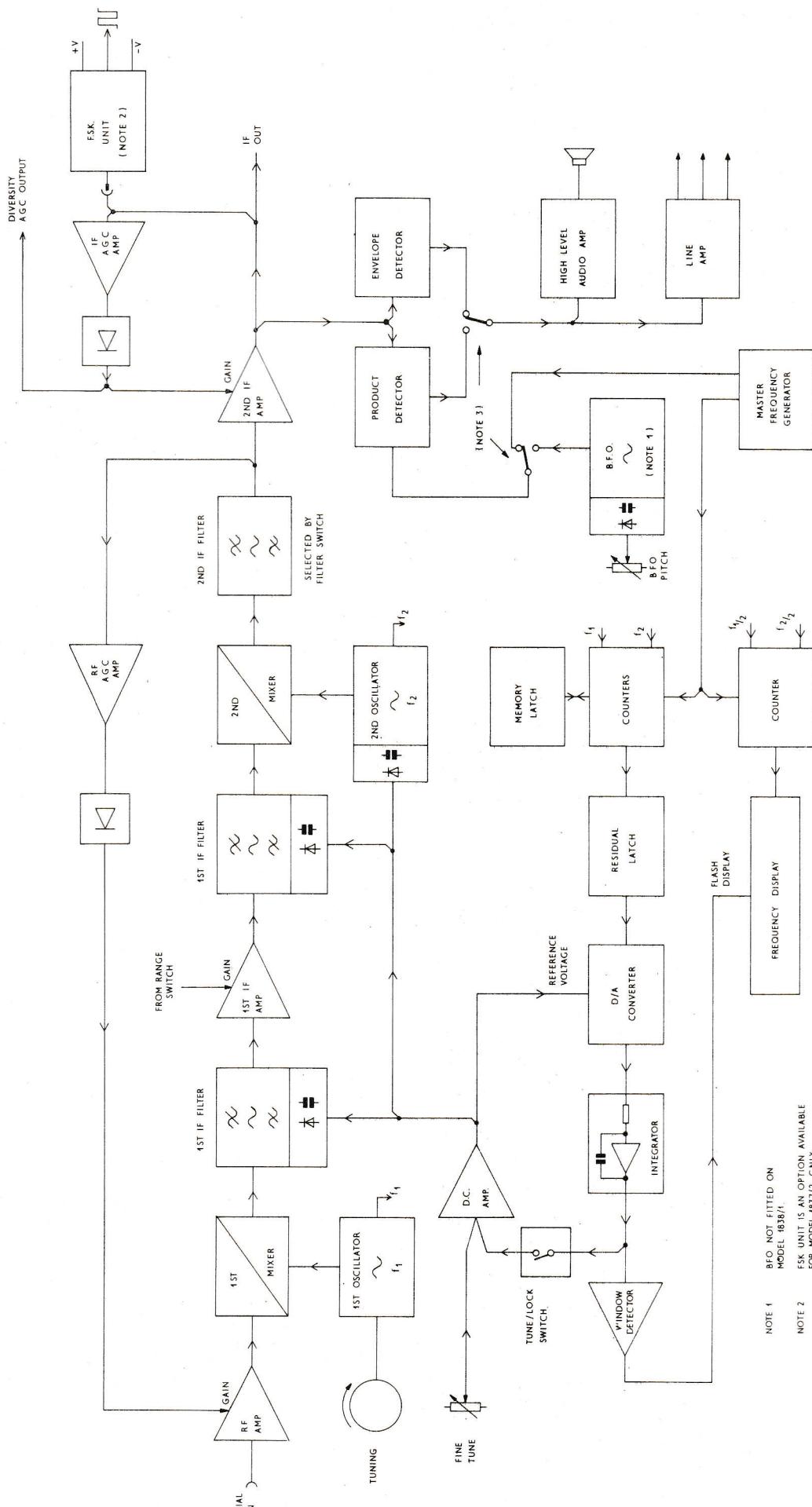
### RESISTORS

R12            1K  
R13            1K  
R14            4k7

### INTEGRATED CIRCUITS

IC3            MC10125P            MOTOROLA  
IC4            DELETED

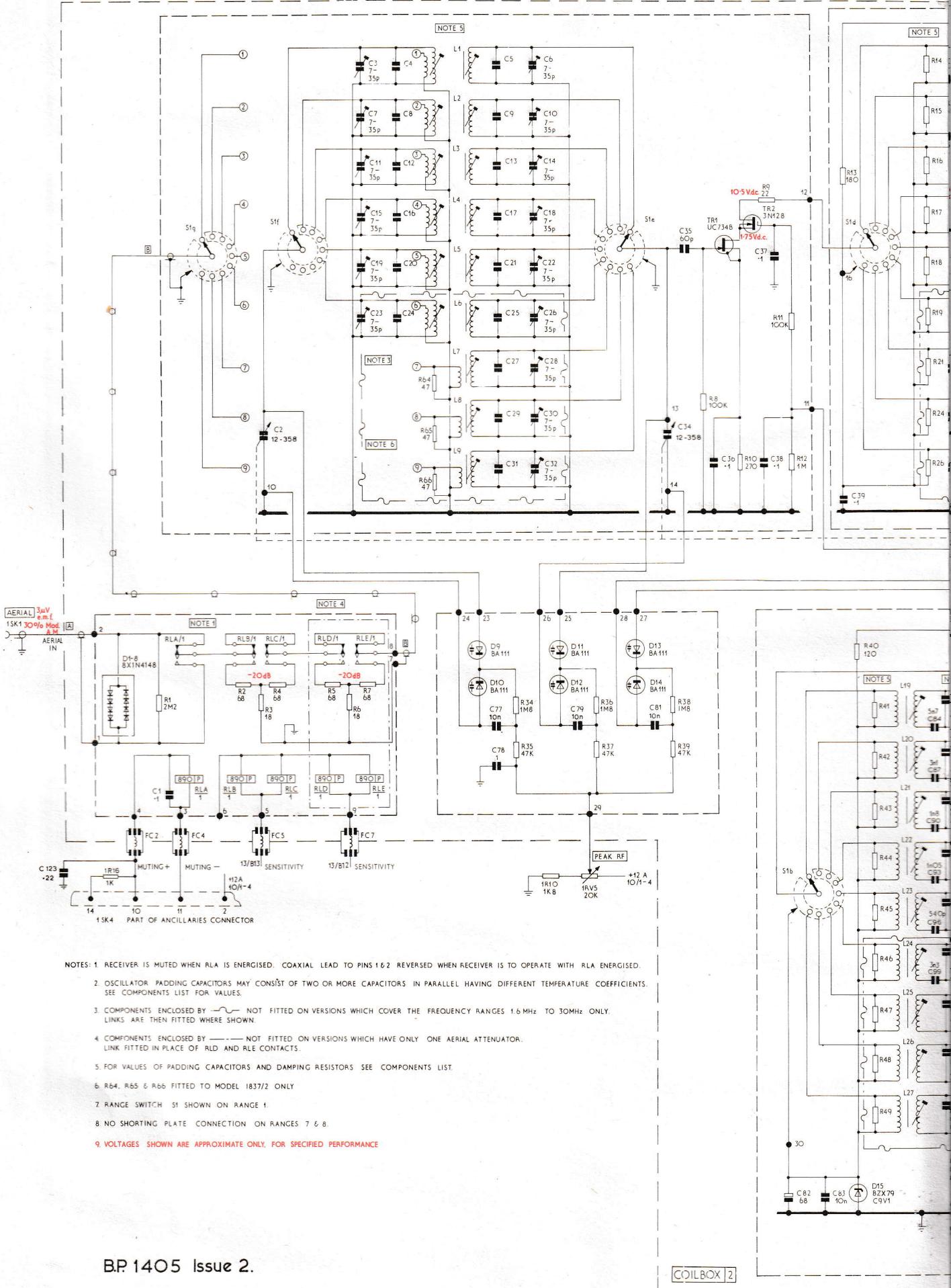
## BLOCK DIAGRAM



NOTE 1 BFO NOT FITTED ON  
MODEL 183/81.  
NOTE 2 FSK UNIT IS AN OPTION AVAILABLE  
FOR MODE 183/72 ONLY.  
NOTE 3 SWITCHING ARRANGEMENT DEPENDS  
UPON RECEIVER VARIANT

## BLOCK DIAGRAM

BP 1404 Issue 1



BP 1405 Issue 2.

COILBOX 2

