Eddystone

MODEL
1680/2

INSTALLATION NOTES
OPERATING INSTRUCTIONS
AND
SERVICE DATA

Eddystone Radio Limited
Member of Marconi Communication Systems Limited
Alvechurch Road, Birmingham B31 3PP, England
Telephone: 021-475 2231
Cables: Eddystone Birmingham Telex: 337081

NOTE : : AC MAINS CONNECTOR

The following information is issued in compliance with British Standard BS415:-

If the colours of the wires in the mains lead of this apparatus do not correspond with the coloured markings identifying the terminals in your mains connector (or plug) proceed as follows:-

1. The GREEN/YELLOW wire must be connected to the plug terminal marked "E" or " ⏚ " or coloured GREEN or GREEN/YELLOW.

2. The BLUE wire must be connected to the plug terminal marked "N" or coloured either BLUE or BLACK.

3. The BROWN wire must be connected to the plug terminal marked "L" or coloured either BROWN or RED.

4. If a 13 amp (BS1363) FUSED PLUG is used to facilitate connection to the supply outlet, the plug MUST be protected by a 3 AMP FUSE unless expressly declared otherwise (see para. 5 below). If another type of plug is used, a fuse of the appropriate rating must be fitted either in the plug, or the adaptor, OR AT THE DISTRIBUTION BOARD.

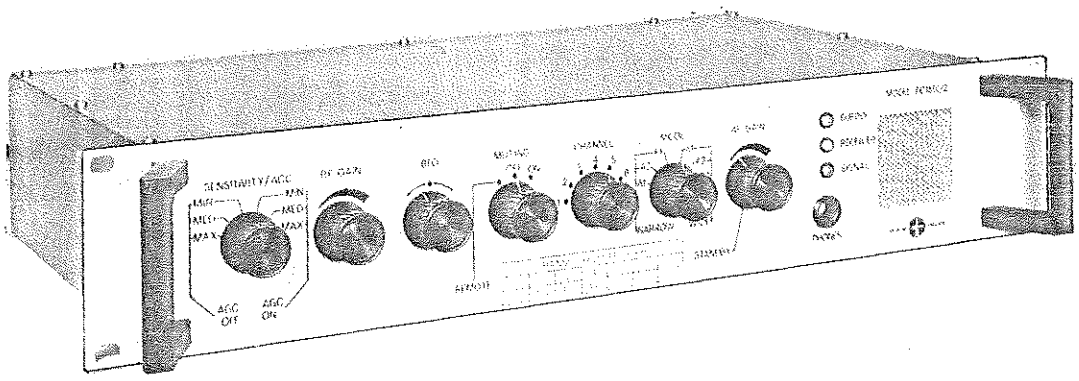
5. NOTE:

   A 3 AMP fuse rating is sufficient for most equipments, but in some instances, to allow for switching surges, it may be necessary to use a 5 AMP FUSE RATING. In all instances where the higher rating is applicable, specific notice will be given in the INSTALLATION SECTION of the handbook at the POWER SUPPLIES subsection.

Eddystone

SEVEN CHANNEL RECEIVER

MODEL 1680/2



Manufactured in England by

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AMENDMENT RECORD

Amend No.	Pages subject to change	Amended by	Date
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10			
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23			
24			
25			
26			
27			
28			
29			
30			

The Manufacturer reserves the right to modify the content of this publication as necessary to accommodate modifications, design improvements etc. Relevant Amendment Sheets will be incorporated at date of issue.

Contents List 1680/2

GENERAL DESCRIPTION AND PERFORMANCE SUMMARY

The Eddystone model 1680/2 receiver is a compact low-cost receiver for operation on seven channels in the frequency range 400kHz-535kHz. It provides for reception of MCW (A2A), CW (A1A) with variable BFO, and FSK (F1A) with high stability carrier insertion oscillator, and has wide and narrow bandwidth positions.

Power supply arrangements can be chosen to suit the customer's installation requirements. The standard receiver operates from standard 40Hz-60Hz AC supplies and from 24V DC supply (negative earth). For 12V or floating earth supplies, an external converter can be supplied.

Audio outputs provided are for connection to standard 600Ω circuits, output for headset, and 2 watts to an internal speaker plus 2 watts to an external speaker.

Audio-derived AGC is used for CW and FSK reception and IF-derived AGC for MCW. A manual RF gain is provided which can be used in conjunction with or instead of the AGC. A fast-acting muting circuit is included which provides 17dB of noise-quieting in the absence of a signal.

A single conversion circuit design is employed, with an output provided at the 1.4MHz intermediate frequency for connection to ancillary units, and operation in dual diversity is possible.

Remote control of all functions is available.

GENERAL SPECIFICATION

Frequency

Seven channels between 400kHz and 535kHz. Frequency range could be extended to specific customer requirement.

Intermediate Frequency

1400kHz

Reception Modes

CW (A1A)
MCW (A2A)
FSK (F1A) (required audio output to be specified by customer)

Aerial Input

50Ω unbalanced
30V RMS continuously applied will not damage the receiver

Power Supplies

AC 100V/130V and 200V/260V (40Hz-60Hz) standard fitting
24V DC with negative earth standard fitting
12V DC and 24V DC with floating earth optional extra
Consumption 25VA

Environmental

Operational	:	-10°C to +55°C
Storage	:	-40°C to +70°C
Humidity	:	95% at +40°C
Vibration	:	Compatible with all marine specifications

Dimensions

Panel	:	483mm x 88mm (19 inches x 3.5 inches)
Intrusion into rack	:	282mm (11 inches) over cover plus 50mm (2 inches) for cabling
Weight	:	6.5Kg.

Controls

Aerial Attenuator	:	3 position providing nominal 0dB, -20dB, -40dB
AGC	:	On/Off switch combined with aerial attenuator
RF Gain	:	Can be used with AGC On or Off
BFO	:	Range ±3kHz provided
Muting	:	On/Off control. Muting threshold dependent on RF gain setting
Remote	:	Remote/Local selection, combined with muting control
Channel	:	Selects channels 1-7
Mode	:	Select CW, MCW or FSK with a choice of two bandwidths
AF Gain	:	Adjusts audio output to headset and loudspeaker
Standby	:	Combined with AF gain removes HT from receiver leaving power applied to oven.
Line Level	:	Situated on rear panel adjusts 600Ω audio output level.

Indicator LED's for power applied, receiver on, and signal received (i.e. mute circuit inoperative).

Remote Operation

Controls of all functions is possible by grounding the necessary input lines.

BFO	:	8 lines
RF Gain	:	5 lines
Mode	:	2 lines
AGC On/Off	:	1 line
Aerial Attenuator	:	2 lines
Muting On/Off	:	1 line
Bandwidth	:	1 line
Channel	:	3 lines

PERFORMANCE SPECIFICATION
(Not to be interpreted as a test specification)

Sensitivity

1μV for 12dB SINAD on CW

Selectivity

Wide	±1.5kHz at -6dB ±3kHz at -60dB
Narrow	±150Hz at -6dB ±300Hz at -60dB

Image Rejection

Greater than 80dB

IF Rejection

Greater than 90dB

Audio Output

Line 600Ω balanced or unbalanced	:	Preset to +10dBm maximum
Headset	:	600Ω nominal, output adjusted by AF gain control to +10dBm maximum
Loudspeaker	:	2 watts maximum
External loudspeaker	:	2 watts maximum into 8Ω

Overall Response

Level within 6dB over 300Hz to 1.5kHz in wide bandwidth. Distortion better than 5%, typically 2%.

Blocking

With a wanted signal 60dB above 1μV, an unwanted carrier 10kHz off-tune must be of a level greater than 110dB above 1μV to affect the output by 3dB.

Cross Modulation

With a wanted carrier 60dB above 1μV adjusted to give standard output at an audio frequency of 1400Hz, an unwanted signal 20kHz off-tune and modulated 30% at 1000Hz must be of a level exceeding 90dB above 1μV to produce an audio output greater than 30dB below standard output.

Intermodulation (In-Band)

The third order intermodulation products at 600Hz and 1800Hz produced by two carriers of level 80dB above 1μV tuned to produce outputs of 1000Hz and 1400Hz will be more than 30dB below standard output when the individual carriers each provide an output equal to standard output.

Intermodulation (Out-Of-Band)

With a wanted signal 1μV 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 80dB above 1μV to produce standard output when neither signal is closer than 30kHz to the wanted frequency.

AGC Characteristic

CW and FSK	:	Output level changes by less than 3dB for 100dB increase from 2μV.
MCW	:	Output level changes by less than 3dB for 90dB increase from 5μV.

Stability

Within 15Hz over operating temperature range -10°C to +55°C.

CIRCUIT DESCRIPTION

The aerial attenuator is situated on the RF/Remote board, Reference 3 and is connected between the aerial input socket and the RF amplifier input coupling on 3L1. A front panel switch 1SW2 SENSITIVITY/AGC selects either a straight through position or one or both of two identical 'T' networks to provide aerial attenuation of 0dB, 20dB or 40dB via relays 3RLB, 3RLC and 3RLD.

Protection against high induced aerial voltages is afforded by diodes 3D1-3D8 connected between aerial input and earth.

A further relay 3RLA is fitted for RF muting. This disconnects the aerial input and connects the attenuator input to earth, and is operated by applying +12V to Pin 10 on the ancillary socket 1SK1.

RF Amplifier

Signals from the aerial attenuator are fed to a tap on 3L1 which with 3L2, 3L3, 3L4, 3L5, 3L6 and 3L7 and associated capacitors 3C5, 3C6, 3C7, 3C8, 3C9, 3C10, 3C11 and 3C12 form a bandpass filter with a 400kHz-535kHz passband. From the filter signals are fed via 3C13 to the base of RF amplifier 3TR1. 3CH2 forms the collector load of 3TR1 and the signal then passes to the mixer 3IC3 via low pass filter 3CH3, 3C17, 3C18 and 3C20.

Mixer

Input to the high level double balanced mixer 3IC3 is via toroid input transformer 3T1 and output is via toroid output transformer 3T2. A potentiometer 3RV2 enables the supply current to the mixer to be adjusted for optimum intermodulation intercept point. IF output signals from the mixer are then amplified by gain controlled stage 3TR4 before passing to 'Wide' filter 2FL1.

1st Oscillator

This circuit consists of a crystal oscillator 3TR2 with seven crystal positions 3XTL1-3XTL7 selected by diode switches 3D16-3D22. Fine adjustment of oscillator frequency is by trimmer capacitors 3C23, 3C26, 3C29, 3C32, 3C35, 3C38 and 3C41. The oscillator frequency is in the region of 8MHz to enable optimum temperature stability to be obtained. Output from the crystal oscillator passes via buffer stage 3TR3 to the hex buffer 3IC1 which provides a square wave signal to divide by four, (dual JK flip flop) 3IC2 which produce the correct oscillator frequency (signal frequency +1.4MHz).

A low pass filter 3CH11, 3C52, 3C53 and 3C54 attenuates oscillator harmonics before feeding to the double balanced mixer 3IC3.

1.4MHz IF Amplifier

The 1680/2 normally includes a wide filter (±1.5kHz) 2FL1 preceding the first IF amplifier 2TR1. 1.4MHz IF signals from IF pre-amplifier 3TR4 are fed to 2FL1. After filtering and amplification, signals from 2TR1 then pass to the narrow filter (±150Hz) 2FL2 via a quad analog switch 2IC1. 2IC1 selects 'NARROW' or passes the 'WIDE' signal via tuned circuit 2L1 to a second quad analog switch 2IC2. 2IC2 selects either the output of the 'NARROW' filter or the 'WIDE' filter (via 2IC1). Signal from 2IC2 are fed to the main IF amplifier 2IC3.

The above filter complement may be varied to customer requirements.

The IF signal from 2IC3 is further amplified by 2TR2 and 2TR3 before passing to the AM detector for A2A reception and product detector for A1A and FSK reception.

Carrier insertion to 2IC4 for FSK (A1A) and BFO insertion for CW (A1A) is from the BFO/C10 module, Reference 5.

AM, CW or FSK output from 2IC4 is selected via 1SW4 'MODE' quad analog switch 2IC5, part of which also serves as audio muting controlled from panel switch 1SW3 ('MUTING').

BFO/Carrier Insertion Module, Reference 5

Crystal 5XTL1 and 5TR2 form the carrier insertion oscillator which is oven controlled with 5TR3 as the heating element and bridge circuit 5IC1, thermistor 5TH1 and associated components as temperature control.

The BFO also contained within this module has TR1 with L1 forming the oscillator. Capacity diode 5D1 controlled from the front panel by 1RV6 provides ±3kHz swing and the output is fed to 2IC4.

IF Pre-Amplifier AGC

Output from analog switch 2IC2 is also taken to amplifier stages 2TR8, 2TR7 and 2TR6 and then to detector and AGC generator 2IC7. From 2IC7 the AGC output is amplified by 3IC8 and applied to the 2nd gate of the IF pre-amplifier stage 3TR5.

IF AGC

Audio AGC (CW and FSK), is generated by 2IC11 which takes its input from 2IC4 via emitter follower 2TR4. Carrier AGC (MCW), is derived from 2IC4. The appropriate AGC circuit is selected by quad analog switch 2IC10 which is controlled by front panel switch 1SW4 ('MODE'). After selection by 2IC10 the AGC voltage is amplified by 2IC9a, 2IC8b and 2IC8a before being fed to gain control IF amplifier 2IC3. The AGC voltage applied to 2IC3 is also fed to Pin 4 on the ancillaries socket 1SK1. Provision is also made at this point for an external voltage from Pin 11/1SK1 to reduce IF gain.

RF Gain

AGC voltage from 2IC10 is summed into 2IC9a together with a DC voltage from the RF gain control network 2R82, 2R83 and front panel control 1RV1. When AGC is switched to 'ON' whichever voltage is the greater controls the gain of IF amplifier 2IC3.

Muting Circuit

DC voltage from the RF gain control network is also fed to one input of Schmitt Trigger 2IC9b with AGC voltage fed to the other input. When 'MUTING' is 'ON' the output of IC9b will be 'high' when the AGC voltage rises above the DC voltage from the RF gain circuit.

The output from 2IC9b is applied to the control of analog gate 2IC5 which is connected in series with the audio output to 2TR5.

If there is no signal input to the aerial (with the 'MUTING' switch 'ON') the output of IC9b will be 'low' and the audio output will be attenuated in the order of -17dB. When a signal is received IC9b will go 'high' when the AGC developed is higher then the DC voltage due to the position of the 'RF GAIN' control and the audio output will be restored to normal.

When the 'MUTING' control is set to 'OFF' a high standing voltage appears on IC9b preventing its output from going 'low' regardless of the voltage on the AGC line, thus audio output is normal under all conditions.

Audio Amplifiers

Audio output voltage from 2TR5 is fed to audio power amplifier 2IC13 via front panel control 1RV4 (AF GAIN) and to audio line amplifier 2IC12 via rear panel preset control 1RV3 (LINE LEVEL). Audio output from the line amplifier is unaffected by the setting of the 'AF GAIN' 1RV4. Line output is taken via 2T1 to Pins 6, 7 (ct) and 8 on 1SK1 (ancillary socket). Audio output from IC13 is taken to Pin 1 on 1SK1 and also the phone jack 1JK1. The internal loudspeaker is enabled by linking sockets 1 and 2 on 1SK1.

Insertion of headset plug will disconnect the internal loudspeaker.

Remote Interface

All control functions of the 1680/2 (with the exception of audio gain levels) can be remotely controlled via the internal circuitry on RF/Remote board, Reference 3.

The following descriptions all assume that 1SW5 has been set to 'REMOTE'. When 1SW5 is set to 'LOCAL' all output pins of 3IC9 and 3IC10 go high impedance and Pins 4 to +12V allowing normal receiver function via diodes 3D25-3D35.

RF Gain

Remote control of the RF gain is via D/A converter 3IC5. Five input lines are provided giving 32 steps of gain control. The output of 3IC5 is applied to one input of 3IC7a, the output of which is connected via the REMOTE/LOCAL switch 1SW5 to 2D6. 1SW5 also disconnects the normal input to 2D6 from the RF gain control 1RV1. Presets 3RV4 and 3RV5 adjust the range of DC voltage applied to 2D6.

BFO

Remote control of the BFO is via D/A converter 3IC6. Eight input lines are provided giving 256 steps of frequency swing. The output of 3IC6 is applied to amplifier 3IC7b, the output of which is connected via REMOTE/LOCAL switch 1SW5 to 2/48. 1SW5 also disconnects the normal input to 2/48 from the 'BFO' control 1RV7. Presets 3RV6 and 3RV7 adjust the range of DC voltage applied to the BFO.

Aerial Attenuator

With Remote Plug 1PL2 Pins 14 and 15 earthed, 3TR5 and 3TR6 will be cut off. Relays 3RLC, 3RLD and 3RLE will now be unenergised giving 0dB attenuation.

With 1PL2 Pin 14 earthed and Pin 15 o/c, TR5 will be cut off and TR6 will conduct. Relays 3RLC and 3RLD will now be energised and 3RLE unenergised giving nominal 20dB attenuation.

With 1PL2 Pin 14 o/c and Pin 15 earthed, TR5 will conduct and TR6 will be cut off. Relays 3RLC and 3RLE will now be energised and 3RLD unenergised giving nominal 40dB attenuation.

Channel Select

Seven channels can be selected by applying '0' or '1' to Pins 22, 23 and 24 of remote connector 1SK2.

See table on page 6 of section 4. This causes one line of the BCD to one of eight decoder 3IC8 to select the relevant channel crystal.

A2A (MCW) Mode

With remote plug 1PL2 Pins 17 and 20 o/c, 3IC10a Pin 14 will go 'LOW', and 3IC10c Pin 11 will go 'HIGH' allowing 3TR7 to conduct. This will remove the positive supply to the CIO part of CIO/BFO module, Reference 5.

In addition 3IC10b Pin 9 will go 'LOW' and 3IC10d Pin 2 will go 'HIGH' allowing 3TR8 to conduct, cutting off 3TR9 and removing the positive supply to the BFO part of the C1O/BFO module.

'WIDE' or 'NARROW' bandwidths can be selected by means of 1PL2 Pin 21. With 1PL2 Pin 21 o/c, IC9c Pin 4 will be low and IC9d Pin 5 will be high selecting 2FL1 'WIDE' filter. With 1PL2 Pin 21 earthed, IC9c Pin 4 will be 'HIGH' and IC9d Pin 5 'LOW' selecting 2FL2 'NARROW'.

A1A (CW) Mode

With remote plug 1PL2 Pin 17 earthed and Pin 20 o/c, 3IC10a Pin 14 will be 'LOW' and 3IC10c will be 'HIGH' allowing 3TR7 to conduct. This will remove the positive supply to the C1O part of the C1O/BFO module, Reference 5.

In addition with 3IC10b Pin 9 will be 'HIGH' and 3IC10d 'LOW' cutting off 3TR8 and allowing 3TR9 to conduct and apply a positive supply to the BFO part of the C1O/BFO module, Reference 5.

Bandwidth may be selected as for A2A bandwidth mode.

F1A (FSK) Mode

With remote plug 1PL2 Pin 17 o/c and Pin 20 earthed, 3IC10a Pin 14 will be 'HIGH' and 3IC10c Pin 11 'LOW' cutting off 3TR7 and applying a positive supply to the C1O part of the C1O/BFO module, Reference 5.

In addition 3IC10b Pin 9 will be 'LOW' and 3IC10d Pin 2 'HIGH' allowing 3TR8 to conduct and cutting off 3TR9 thus removing the positive supply to the BFO part of the C1O/BFO module.

Bandwidth may be selected as for A1A and A2A modes.

NOTE: Receiver panel markings are in the older mode classification A2 for A2A, A1 for A1A and F1 for F1A.

AGC

With Pin 19 on remote plug 1PL2 earthed, Pin 9 of 3IC9b will go 'HIGH'. Pin 12 of 2IC10 will now go 'HIGH' selecting AGC 'ON'. With Pin 19 o/c the reverse function will select AGC 'OFF'.

Muting

With Pin 18 on remote plug 1PL2 earthed Pin 7 of 3IC9a will go 'HIGH'. Pin 5 2IC9b will now go 'HIGH' making 'Muting' inoperative.

With Pin 18 on 1PL2 o/c Pin 7 of 3IC9a will go 'LOW', 2IC9b Pin 5 will now be 'LOW' allowing the muting circuit to operate.

Power Supply

The power input requirements for the 1680/2 are covered by two options. AC supplies 40Hz-60Hz 100V/130V and 200V/260V and +24V DC supply with negative earth.

AC supplies are routed through a filtered mains socket to a transformer 1T1 and bridge rectifier 2D12-2D15. A fuse is incorporated in the 'LINE' side of the supply to the transformer. After rectification the voltage passes through a DC fuse to the reservoir capacitor 2C94 and to an 18V regulator 1IC1.

From 1IC1 the supply is fed directly to the BFO/C1O module and 1st oscillator module ovens and via 1SW1a and 1SW1b to the remainder of the receiver.

DC supplies are connected to the ancillaries socket 1SK1 Pin 24 (+) and Pin 25 (-).

Negative supply Pin 25 is connected to main board, Reference 2, Pin 38.

The DC supply is fed to 1FS2 (DC fuse) via protection diode (D11) which prevents damage due to accidental reversal of DC supply polarity. Front panel LED (1D3) 'SUPPLY' indicates presence of supply (AC or DC) and LED (1D2) 'RECEIVER' indicates receiver operational. 'RECEIVER' indicator will not be illuminated with AF gain control switch set to 'STANDBY'.

MECHANICAL CONSTRUCTION

General

All versions of the 1680 Receiver have the same overall dimensions and are designed for direct mounting in 483mm (19 inches) racking. Fixing slots conform to a standard centre-spacing of 76mm (3 inches) and the receiver should be secured to the rack by four M6 x 16mm chromium plated screws (Eddystone 11328P).

Damage to the front panel finish can be prevented by the use of insulated cup washers (Eddystone 11329P). The dimension of 50mm given in Section 1 for rear-mounted plugs etc., includes sufficient space to allow cables entering the receiver in the same plane to be bent at right-angles over a reasonable radius.

Internal Construction

Two printed circuit boards are used for the 1680 circuitry. One board, Reference 3, contains the RF circuit, 1st oscillator and remote interface circuits. The second board Reference 2, contains IF circuits, filters BFO/CIO module, audio amplifiers, AGC amplifiers etc. All board earths are connected to the frame.

The power unit is contained in a screening box at the right hand rear. A removable cover allows access for mains voltage adjustment. The bridge rectifier diodes and the reservoir capacitor are mounted on the main printed circuit board, Reference 2. AC and DC fuses are accessible from the rear panel.

Section 4

INSTALLATION

General

The following table lists the contents of the accessory kit supplied with the 1680 range of receivers.

Table 4.1

Contents of Accessories Kit

Quantity	Description	Part Number
1	AC Supply Connector (complete with 2 metres of 3-core cable) (1SK3)	D4815
1	Ancillaries Connector (25 Pin plug complete with cover)(1PL1)	D5676
1	Remote Connector (25 Pin socket complete with cover) (1SK2)	D5677
1	Spare Fuse (1A for AC)	9816P
1	Spare Fuse (2A for DC)	10577P
	The following available to special order	
1	Aerial Connector (BNC Plug 50Ω) (1PL4)	8012P
1	IF Output Connector (BNC Plug 50Ω) (1PL5)	8012P
1	Box Key for Control Knobs	9057P

Mains Transformer Voltage Adjustment (See Figure 4.1)

Unless otherwise specified at the time of ordering all 1680 receivers are supplied set for 240V/260V operation.

The power transformer is located in a screened compartment at the right hand rear of the receiver. It will be necessary to remove the receiver top cover (ten M3 screws) and the power unit screened compartment cover (four M3 screws, two are located on the receiver back plate) to gain access for mains voltage adjustment.

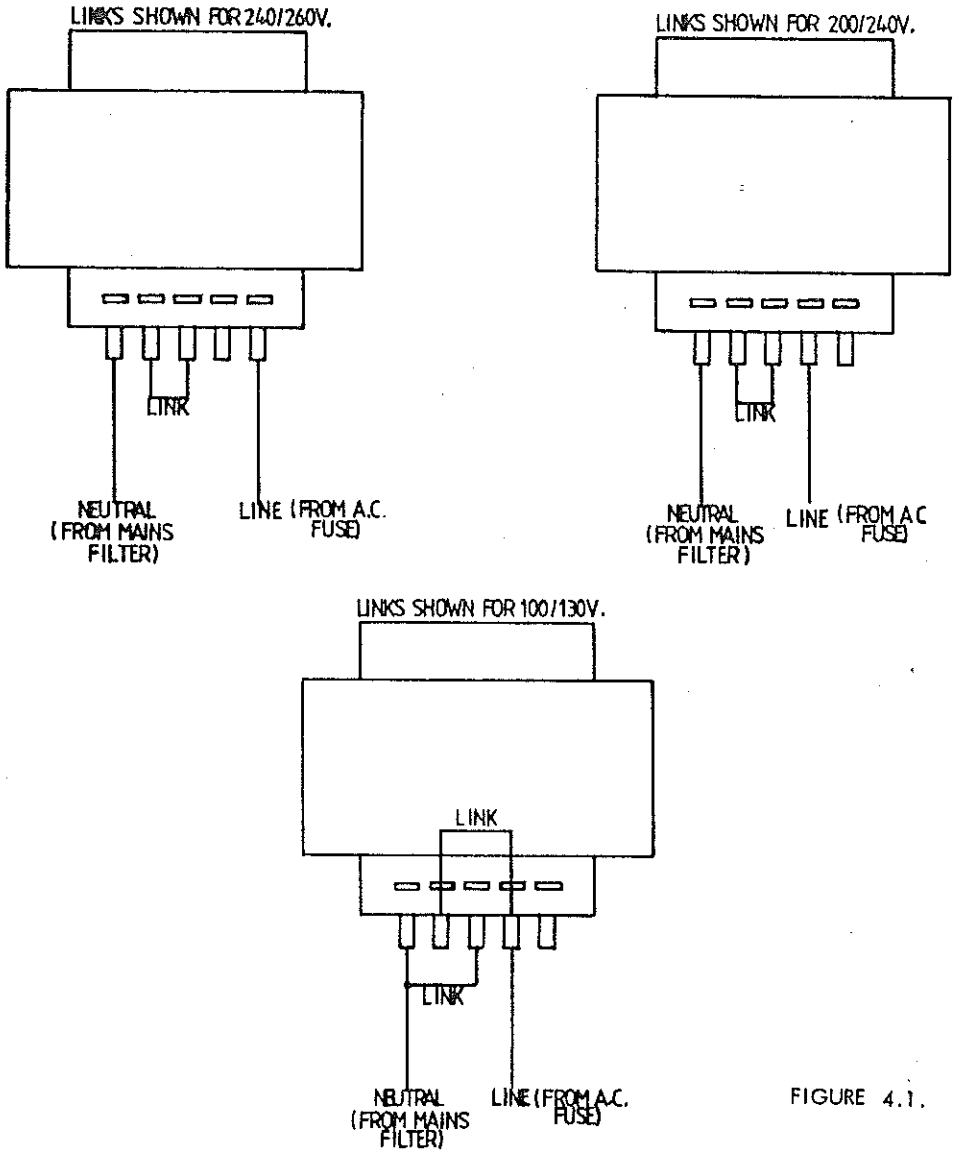


FIGURE 4.1.

N.B. Disconnect from supply before adjusting taps or removing covers from receiver.

Installation for AC Working

1) Check that power transformer is set to the correct mains voltage tappings. (Refer to paragraph headed : Mains Transformer Voltage Adjustment).

2) Connect Earth terminal on rear panel to rack frame.

3) Connect AC supply connector (1SK3) to AC input socket (1PL3) on the rear panel and connect the mains lead to the local supply: BROWN = LINE; BLUE = NEUTRAL; GREEN/YELLOW = EARTH.

4) Check that 'SUPPLY' indicator is illuminated. If not, check both fuses.

Installation for DC Working

1) Fit a red lead to Pin 24 of 25 way ancillaries connector (plug 1PL1). Fit a black lead to Pin 25.

2) Connect red lead from Pin 24 to +24V. Connect black lead from Pin 25 to 0V (earth).

3) Check that 'SUPPLY' indicator is illuminated. If not, check DC fuse.

Aerial Input

Connect aerial to receiver with a BNC bayonet-lock co-axial connector (50Ω plug 1PL5).

Audio Output

1) If the internal loudspeaker is required link Pins 1 and 2 on the ancillaries connector (1PL1). Insertion of the headset jack plug will mute the internal loudspeaker.

2) If external loudspeaker is required connect leads to Pins 1 and 15 on ancillaries connector (1PL1). External speaker will now be muted if the phone jack is inserted. For unmuted operation connect to Pins 1 and 14.

3) If headset reception is required insert jack plug in 'PHONES' socket on front panel. Insertion of jack plug disconnects internal loudspeaker and/or external loudspeaker. (See (1) and (2).

4) For 600Ω line output. Connect lines to Pins 6 and 8 on the ancillaries connector (1PL1). Earths for these pins are Pins 19 and 21. A balanced output can be provided by connecting Pin 7 (ct) to earth (link to Pin 20). The line level can be adjusted by the preset 'LINE LEVEL' control on the rear panel. (Maximum output +10dBm without excessive distortion).

RF Muting

RF muting can be achieved by connecting Pin 10 of ancillaries connector (1PL1) to Pin 23 (+12V) via a switch or to +12V DC from a transmitter send/receive switch.

IF Desense

IF desensitising can be carried out at the same time as RF muting by linking Pin 11 to Pin 10.

An external muting indicator can be connected between Pins 13 and 23 of ancillaries connector (1PL1).

An LED indicator is recommended with a 1k resistor in series. The cathode of the LED should be connected to Pin 13 and the 1k resistor between the anode of the LED and Pin 23.

Diversity Out

The IF AGC line is brought out to Pin 5 of the ancillaries connector (1PL1) to enable diversity working to be used if required. (Refer to Section 5). (See Figure 4.2).

Remote Operation

The 1680/2 can be connected to permit digital remote control of all functions except audio gain. All circuitry is internal and access is via 25 way remote connector socket 1SK2 (25 lines). (See Figure 4.3).

Table 4.2

Remote Operation Requirements

Function	Requirements	Pin Number
BFO	Earth as required to provide 256 steps (Pin 1 MSB)	1 to 8
RF Gain	Earth as required to provide 32 steps (Pin 9 MSB)	9 to 13
Remote)	o/c for maximum attenuation (40dB)	14
Aerial)	o/c for medium attenuation (20dB)	15
Attenuator)	(14 and 15 earthed = 0dB attenuation)	14 and 15
Earth return to receiver	----------	16
Remote Mode	See Table	17
Remote Muting	o/c for muting 'ON' Earth for muting 'OFF'	18
Remote AGC	o/c for AGC 'OFF' Earth for AGC 'ON'	19
Remote Mode	See Table	20
Remote Bandwidth	Earth for narrow	21
Remote Channel	See Table	22, 23, 24

Table Mode

Pin	17	20
A2	1	1
A1	0	1
F1	1	0

'1' = o/c
'0' = Earth

Table Channel

Pin	22	23	24
Channel 1	1	0	0
Channel 2	0	0	1
Channel 3	0	0	0
Channel 4	1	0	1
Channel 5	0	1	0
Channel 6	1	1	0
Channel 7	0	1	1

'1' = o/c
'0' = earth

ANCILLARIES CONNECTOR (1PL1)
VIEWED ON WIRING SIDE.

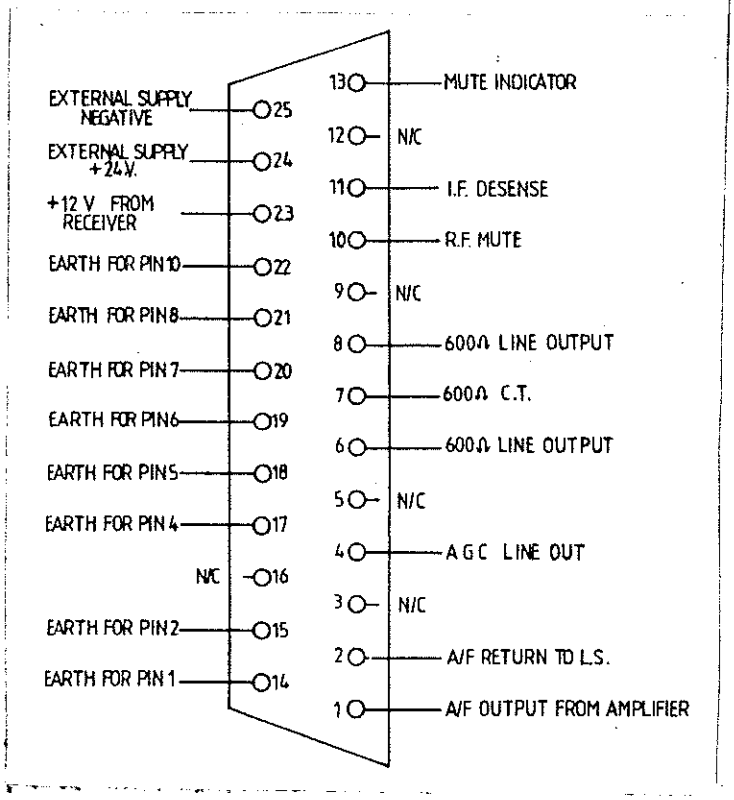


Figure 4.2

REMOTE CONNECTOR (1SK2)
VIEWED ON WIRING SIDE

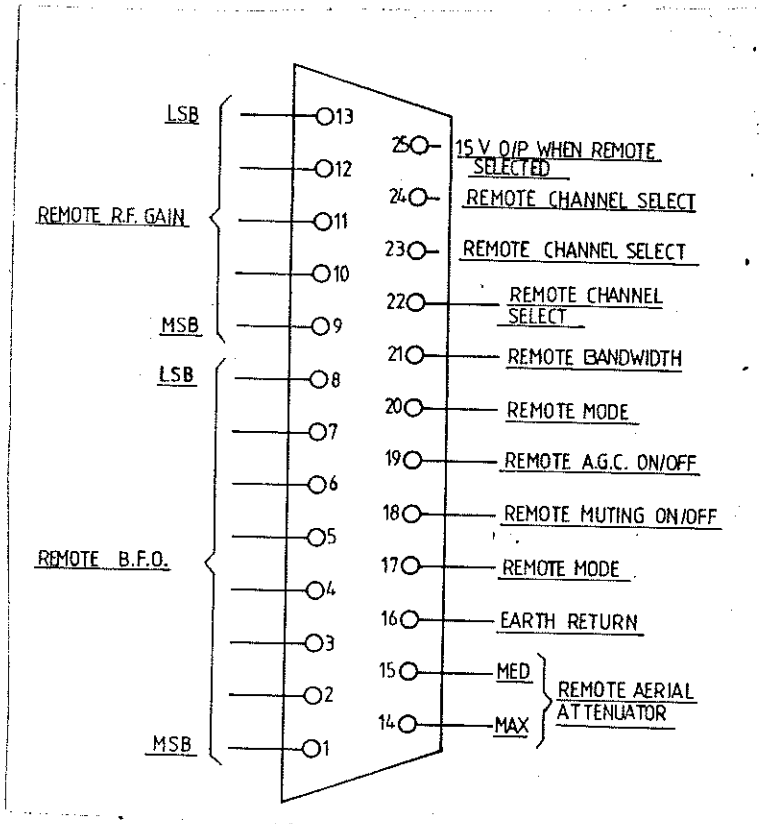


Figure 4.3

OPERATION

Control Functions

Sensitivity/AGC	:	A six position switch which selects either 0dB, 20dB or 40dB of aerial attenuation with AGC 'OFF', or 0dB, 20dB or 40dB with AGC 'ON'.
RF Gain	:	Adjusts bias to main IF amplifier. Normally set to maximum gain position and only reduced when it is desired to reduce the sensitivity of the receiver.
BFO	:	Changes reception frequency by qpproximately 3kHz either side of the centre frequency by varying the bias on a varactor-tuned circuit. Adjust for tone to suit individual preference.
Muting OFF/ON	:	When set to 'ON' receiver noise output is decreased by approximately 17dB in the absence of a desired signal. Threshold at which muting occurs is affected by position of RF gain control.
Remote/Local	:	When set to 'LOCAL' receiver functions normally (controlled by the front panel controls). When set to 'REMOTE' front panel controls are disabled (except AF gain) and receiver is operated from the remote control lines.
Mode	:	Six position switch which selects the appropriate circuitry to receiver A2A, A1A, F1A and narrow or wide bandwidths. (Filter complement may vary to specific customer requirements).
AF Gain/Standby	:	This controls the audio output level from the front panel jack socket, the internal loudspeaker and external loudspeaker. In the 'Standby' position the positive supply to the receiver circuits is switched off but power is still fed to the crystal oven to minimise receiver setting time.
Channel	:	Selects the 1st oscillator crystal for channel 1-7.

Line level (on rear panel) controls audio output to 600Ω lines (maximum +10dBm).

Setting-Up Procedure

1) For details of power supply connectors refer to the paragraphs in Section 4 (Installation) appropriate to the intended input voltage.

   Check that the oven supply indicator is illuminated.

2) Check that the ancillaries plug (1PL1) is fitted, with any external functions wired as instructions in Section 4.

3) Connect the aerial lead to the aerial input socket (1SK4) by means of a BNC plug.

4) Set the following controls to the positions stated:-

   Sensitivity/AGC switch to 'AGC ON' and 'MAXIMUM'.

RF Gain Control	:	Fully clockwise
BFO	:	Off-Set one side
Muting	:	'OFF'
Remote/Local	:	'LOCAL'
Mode	:	Desired reception mode
Channel	:	To desired channel

5) Advance the AF gain control from the 'Standby' position, and check that the 'Receiver LED becomes illuminated and that the desired signal can be heard. If residual aerial noise is high in the absence of a signal, operator discomforts can be avoided by backing off the RF gain control in an anti-clockwise direction.

6) Adjust BFO for desired tone on CW.

7) If a strong signal on an adjacent channel interferes with the normal working of the receiver, the RF signal from the aerial can be reduced by setting the Sensitivity/AGC switch to 'MEDIUM' or 'MINIMUM' depending on signal strength. If attenuation is altered the settings of the other controls should be checked and re-adjusted if necessary to suit prevailing conditions.

Dual-Diversity Operation

Two 1680/2 receivers can be operated in dual-diversity mode by (a) interconnecting their diversity outputs (Pin 4) ancillary plug (1PL1) and (b) combining their 600Ω line outputs as shown in Figure 5.1.

(Co-axial cable should be used to connect the diversity AGC outputs).

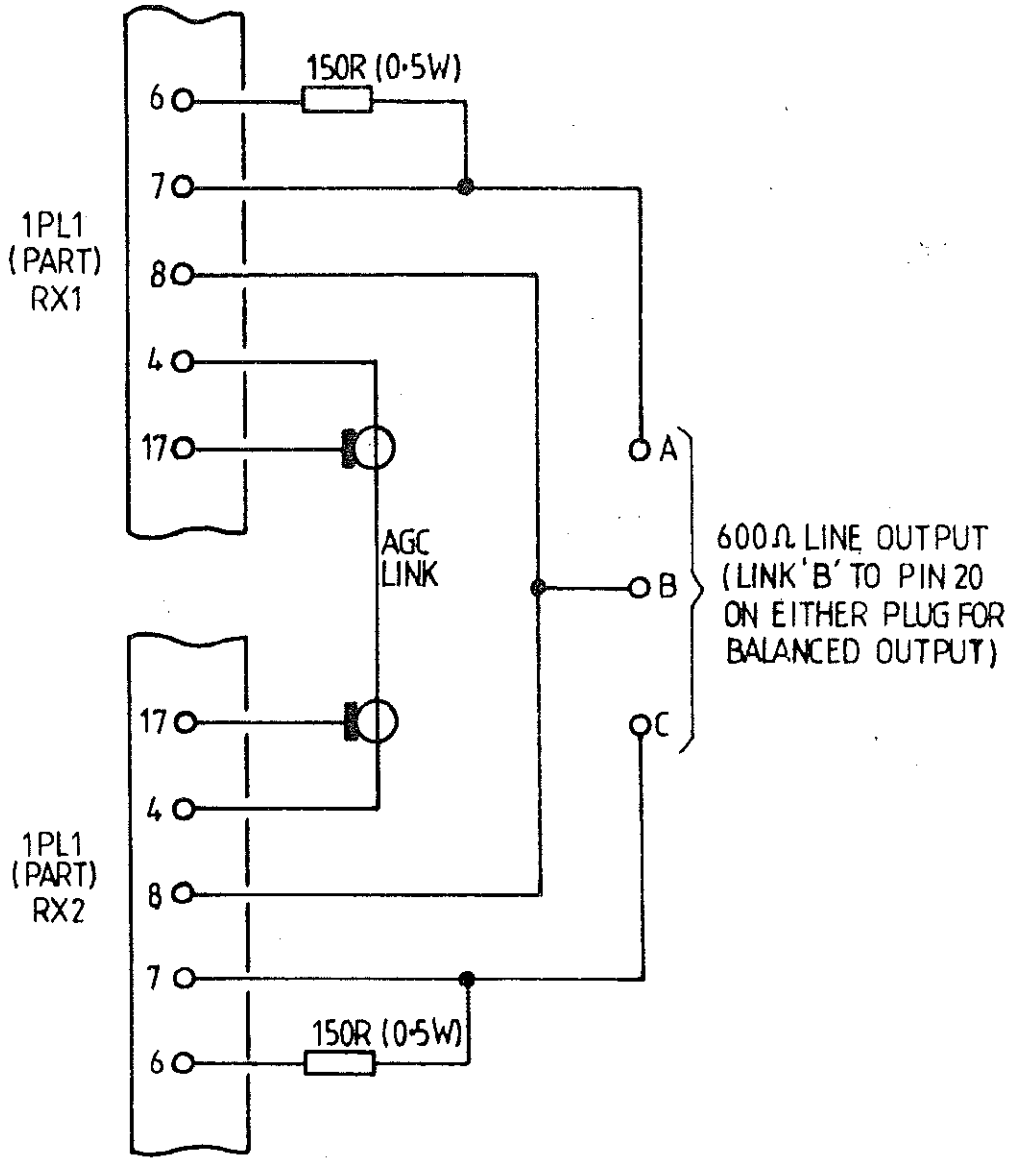
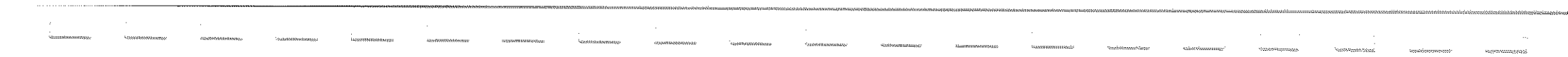

150R (0·5W)
6
7
1PL1
(PART)
RX1
8
4
17
A
AGC
LINK
600Ω LINE OUTPUT
(LINK 'B' TO PIN 20
ON EITHER PLUG FOR
BALANCED OUTPUT)
B
17
C
4
1PL1
(PART)
RX2
8
7
150R (0·5W)
6

Figure 5.1.



Section 6

MAINTENANCE

General

The basic design features of the 1680 series of receivers ensure that these are extremely reliable in service. Consequently, these receivers require very little in the way of maintenance, even when in continuous use under arduous operating conditions.

This section of the Handbook gives guidance for simple operations, such as changing fuses etc., and then progresses to more detailed instruction on performance testing and re-alignment.

Appendix 'A' contains a comprehensive analysis of all circuit voltages for reference when carrying out fault-finding, and should be used in conjunction with the circuit diagrams bound at the rear of this Handbook.

Fuse Replacement

Two screw-in type fuse holders are located on the rear panel of the receiver. The AC fuse is rated at 1A and the DC fuse at 2A. Spare fuses are included in the accessory kit supplied with each receiver and additional spares may be ordered by quoting Eddystone part number 9816P for the 1A fuse and 10577P for the 2A fuse.

Circuitry Access and Sub-Assembly Removal

General

Removal of the receiver top cover is achieved by removing ten 3mm screws.

All preset potentiometers, variable inductors etc., are immediately accessible, with the exception of those contained in separately screened modules.

The variable inductors in this receiver (interstage coupling transformers etc.,) employ self-locking cores and should not normally require re-adjustment.

In the extremely unlikely event of component failure, access can be gained to the underside of the printed circuit boards as follows:-

RF/Remote Board

Unsolder leads to Pins 56 and 57 on RF/Remote board. Unsolder leads to Pins 53 and 54 on main board. Remove seven 3mm screws and hinge board upwards towards left for access to the printed track. Carefully note lead colours and positions here to facilitate correct replacement.

Main Board

Unsolder leads to Pins 41, 42, 43, 44, 46, 47, 51, 53 and 54 on the main board. Remove seven 3mm screws, the board can now be hinged upwards to the front of the receiver for access to the printed track. Carefully note the lead colours and positions to facilitate correct replacement.

Power Supply Unit

Access to the Power Supply Unit can be gained by removing four 3mm screws (two inside the receiver and two on the rear panel).

CIO/BFO Module

Access to the CIO/BFO module is achieved by sliding off the spring clip retaining the outer screening cover. The cover can now be removed and also the inner screened box lid to enable adjustments or measurements to be made. Any component replacement requires the complete unit to be unsoldered from the main printed circuit board.

Performance Testing

Test Equipment

The following equipment in the Marconi Instrument range is recommended for performance testing and re-alignment of the 1680 series of receivers.

TF2002B MF/HF AM/FM SIGNAL GENERATOR

Frequency range : 10kHz-88MHz. High discrimination electrical fine tuning, calibrated against comprehensive crystal calibrator. Internal modulating frequency continuously variable from 20Hz-20kHz.

TF2170B DIGITAL SYNCHRONISER

Provides synthesiser accuracy for TF2002B signal generator. Frequency range 32kHz-88MHz. Digital locking facility in 10Hz steps.

TF2331 DISTORTION FACTOR METER

Fundamental range 20Hz-20kHz. Distortion and noise from 0.05%. Built-in demodulator.

TF1414A COUNTER

Frequency measurement to 40MHz. 10mV sensitivity. Six digit read-out.

TELEQUIPMENT OSCILLOSCOPE D83

DC - 50MHz bandwidth.

TF893A 10 WATT AF POWER METER

Frequency range 20Hz-20kHz. Five power ranges 1mW-10W. Impedance 2.5Ω-20kΩ in 48 steps. Direct calibration in watts and dBm.

Overall performance check: If substandard performance is suspected, withdraw the receiver from service and carry out the overall performance check given in the next paragraphs.

a) Connect RF signal generator to aerial input socket (ISKa) using BNC connector.

b) Connect AF power meter (matched to 600Ω) to Pins 6 and 8 on the ancillaries connector (1PL1).

c) Set the receiver controls as follows:

Sensitivity/AGC	-	0dB/AGC ON
RF Gain	-	Maximum (Clockwise)
BFO	-	Off-set to one side
Muting	-	Off
Remote/Local	-	Local
Mode	-	A1 wide
AF Gain	-	Middle Position
Channel	-	As required
Line Level (Rear Panel)	-	Normally Preset to 0dBm. Output for 1mV input at aerial socket.

d) Tune RF signal generator to the appropriate carrier frequency and slowly increase the generator output level. Note the AF output displayed on the power meter. As soon as this ceases to increase (showing AGC threshold) note the RF input level : this should not be greater than 1μV.

e) If the overall sensitivity of the receiver as measured above is found to be low, carry out the IF sensitivity checks detailed in the following paragraph.

IF Sensitivity Check

a) Connect AF power meter (matched to 600Ω) to Pins 6 and 8 of ancillaries connector (1PL1).

b) Connect the output lead from the signal generator to Pins 1 and 2 (earth) of IF/AF printed circuit board, Reference 2. Set generator frequency to 1400kHz. (It is not necessary to disconnect co-axial cable on Pins 1 and 2).

c) Set controls as for overall performance check.

d) Check that the signal generator output level does not exceed 2μV to give an AF output reading of 0dBm.

e) If the above check does not reveal the reason for low overall sensitivity proceed with stage testing.

Re-Alignment and Stage Testing

General: Close tolerance components are used in all tuned circuits throughout the receiver, and re-alignment is not likely to be required unless coils and/or associated components have be changed.

Detailed instructions for re-aligning all preset circuits are given in the following paragraphs, on the assumption that the necessary adjustments will only be carried out by skilled personnel.

IF Alignment

a) Set 'LOCAL/REMOTE' to 'LOCAL', 'AGC' to 'OFF', 'MODE' to 'A2 WIDE' and 'MUTING' to 'OFF'.

b) Connect signal generator at 1.4MHz with 30% modulation at 1kHz to Pins 1 and 2 (earth) of IF/AF printed circuit board, Reference 2. (There is no need to disconnect co-axial cable already on these pins).

c) With generator output level at 10μV, adjust L1 and L2 for maximum output, reducing RF carrier input if necessary to prevent overloading.

d) Set 'AGC' to 'ON', increase modulation depth to 50% and generator output level to 1mV. Set 'LINE LEVEL' for 1mW into 600Ω with 1RV1.

e) Remove modulation. Change 'MODE' to 'A1/WIDE' and adjust 2RV1 to give same audio level with BFO set to give 1kHz audio output.

f) Check that S/N for 2μV input (A1) is of the order 13dB.

g) Connect to the secondary of T2 on RF printed circuit board, Reference 3, and turn AGC 'OFF'.

h) Adjust L1, L2 and L3 for maximum output, and check that the S/N with 2μV input is of the order 12dB.

i) Check the voltage on Pin 6 of 3IC8 and adjust 3RV7 if necessary to give 4.0V. Check the voltage across 3R41 and adjust 3RV8 if necessary to give 0.5V, (starting from control fully clockwise).

j) With 'RF GAIN' at maximum adjust 2RV3 until noise output from loudspeaker starts to fall. Check that turning 'RF GAIN' control reduces noise output.

k) Measure C10 output voltage at 2TR1 with receiver switched to F1 position, and adjust 2RV4 until C10 output voltage at 2TP1 is the same in F1 and A1 positions. Voltage should be approximately 200mV RMS.

Channel Re-alignment

a) Connect signal generator, tuned to channel 1 input frequency, to 'AERIAL INPUT' socket.

b) IF frequency adjustment of receiver is necessary adjust C23.

c) Switch to each channel in turn and time the signal generator to the appropriate frequency. If frequency adjustment is necessary, see table 1 for trimmer details.

CHANNEL	TRIMMER
1	C23
2	C26
3	C29
4	C32
5	C35
6	C38
7	C41

Table 6.1

Input Filter Re-Alignment

Normally no re-alignment is necessary but in the event of a coil replacement 3L1-3L7 should be adjusted to give a flat pass-band between 400kHz and 535kHz.

The use of a spectrum analyser is desirable for this adjustment.

Changing Channel Frequency

a) Check injection voltage to 3IC3 at Pin 5 and (earth) is between 100mV and 500mV

b) Connect signal generator, tuned to signal frequency to 'AERIAL INPUT' socket and set generator output level to give audible output.

c) Tune trimmer for fine frequency adjustment. (See table 1 for trimmer numbers) for fine frequency adjustment.

1680/2 Crystal Specification

Drive Level 1mW
Crystal Frequency = 4 times (signal frequency +1.4MHz)

1680 Crystal Specification
(Carrier Insertion Oscillator)

Style 'D'
AT CUT
Fundamental Mode
Initial tolerance ±10 PPM at 65°C
Frequency variation. Better than ±5PPM over 65°C ±7°C
Drive level 1mW
Tuning capacitory 30 pf
Frequency (1400.0kHz + frequency off-set to customer requirement).

1680/2 Voltage Tables

Chassis Reference Number 1

Integrated Circuits

PIN	INPUT	OUTPUT
IC1	23.5V	18.0V

Main Board Reference Number 2

Integrated Circuits

PIN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
IC1	5.2	5.2	0 5.2(1)	5.2	0 10.3(1)	10.1	0	5.2	5.2	0	5.2	0	0	11.7	-	-
IC2	0 3.6(1)	3.6	3.6	3.6	10.2 0(1)	10.1 0(1)	0	3.6 0(1)	3.6	3.6	0	0	0 10.3(1)	11.7	-	-
IC3	4.3	4.3	0.7	1.4	0	3.5	11.5	11.3	0	4.3	11.4	11.7	6.6	4.3	-	-
IC4	0.7	0.9	0.4	0.7	0	0	0	3.2	6.4	3.6	0	1.4	0	0.17	-	-
IC5	3.6(2) 0(3)	3.5	3.5	0(2) 3.5(3)	0(2) 11.2(3)	9.6(2) 0(3)	0	0	0(2) 11.2(3)	3.5	3.5	9.7	9.6(2) 0(3)	11.3	-	-
IC7	0	0.7	0.7	0.9	0.3	0.7	6.5	1.3	-	-	-	-	-	-	-	-
IC8	5.8	3.7	3.7	0	3.8	3.8	1.9	11.7	-	-	-	-	-	-	-	-
IC9	1.6	1.6	1.6	0	10.6	1.8	9.7	11.7	-	-	-	-	-	-	-	-
IC10	0(3) 2.2(4) 3.1(5)	0(3) 2.1(4) 3.1(5)	1.0(3) 2.1(4) 3.1(5)	0.9	9(2) 9.9(3)	0(2) 9.9(3)	0	0.8	0(2) 0.9(3)	0	1.0(3) 2.1(4) 3.2(5)	0	9.6(2) 0(3)	11.7	-	-
IC11	1.2	0.4 0(1)	1.0	6.6	1.4	0.6	0	0	-	-	-	-	-	-	-	-
IC12	10.1	0	0	9.8	0.7	1.4	5.1	0	0	0	0	5.2	-	-	-	-
IC13	18.0	0	0	17.6	0.7	1.5	8.9	0.1	0	0	0	9.4	-	-	-	-

(1) Wide Selectivity
(2) A1/F1 Mode
(3) A2 Mode
(4) A1/F1 Mode Narrow Selectivity
(5) A1/F1 Mode Wide Selectivity

Integrated Circuits

PIN	INPUT	OUTPUT
IC6	18.01V	11.95V

Transistors

PIN	e	b	c
TR1	0.39	1.13	5.01
TR2	2.22	2.94	11.7
TR3	1.68	2.39	11.6
TR4	2.9	3.55	5.94
TR5	2.7	3.38	8.34
TR6	4.54	5.25	10.8
TR7	2.72	3.4	11.2
TR8	2.72	3.4	8.3
TR9	0	0.6	7.88
TR10	0	$0.78_{(0)^3}$	$0.08_{(16.78)^3}$

$(\ )^3$ MUTING 'ON'

Integrated Circuits

PIN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
IC1	11.6	11.6	0	0	11.6	11.6	1.1	0	4.7	4.7	4.7	5.1	0	5.1	1.1	0
IC2	0	11.6	0	0	11.6	11.6	0	0	0	11.6	11.6	0	11.6	11.6	0	11.6
IC3	0	0	11.2	7.4	2.0	0	0	0	0	0	3.0	4.9	4.9	11.2	0	0
IC4	0	2.2	2.1	0	0	4.0	11.6	5.3	-	-	-	-	-	-	-	-
IC5	0	0	1.6	1.7	0	0	0	5.1	5.0	5.0	5.0	5.0	5.0	2.4	2.5	2.5
IC7	1.9	2.1	2.1	0	2.9	2.9	3.9	15.1	-	-	-	-	-	-	-	-
IC8	0	0	11.7	11.6(1) 0.1(2)	0	0(1) 11.0(2)	0	0	11.7	11.7	11.7	0	0	0(1) 0.9(2)	0	11.7
IC9	11.3(1) 9.9(2)	0(1) 0.2(2)	0(1) 11.0(2)	11.6(1) 10.1(2)	11.7	11.1(1) 0(2)	0	0	0	11.7	0(1) 0.2(2)	0	11.7	11.3(1) 9.9(2)	0	11.7
IC10	0	10.7(1) 9.2(2)	0	0(1) 11(2)	11.1(1) 0(2)	0	11.7(1) 0(2)	0	0	11.7	10.7(1) 9.3(2)	0	0	0	11.7	11.7

(1) REMOTE 'ON'
(2) REMOTE 'OFF'

Transistors

PIN	e		b	c
TR1	4.5		5.2	9.4
TR2	g1 3.8	g2 3.8	s 3.9	d 10.7
	e		b	c
TR3	4.7		5.4	11.0
TR4	g1 1.8	g2 4.0	s 2.3	d 10.7
	e		b	c
TR5	0		0.7	8.1(1) 0(2)
TR6	0		0.7	8.1(1) 0(2)
TR7	0		0.7	0
TR8	0		0.7	0
TR9	0		0	17.7

(1) Remote On
(2) Remote Off

BFO/CIO Module Reference Number 5

Transistors

PIN	s	g	d
TR1	0	2.94*	4.75*
	e	b	c
TR2	0.79	1.12	7.48
TR3	0	Will vary with temperature	18.03

*Only when BFO fitted.

Integrated Circuits

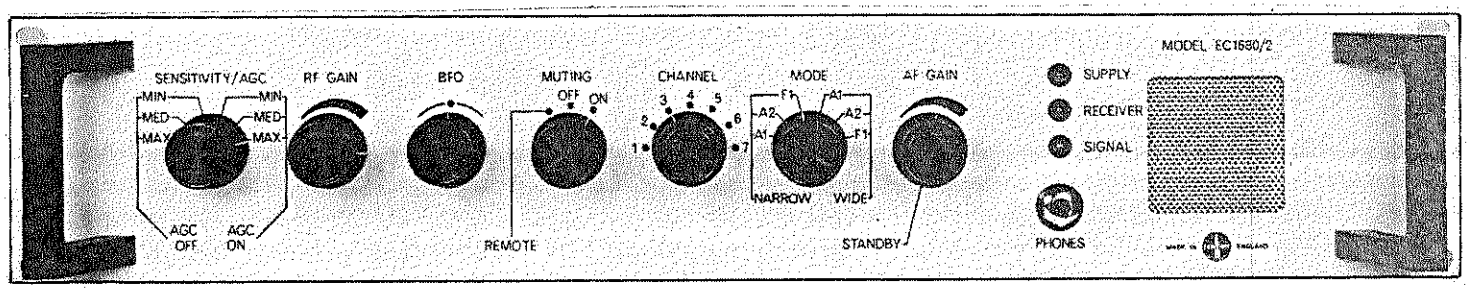
PIN	1	2	3	4	5	6	7	8
IC1	-	will vary with temp-erature	3.93	0	-	will vary with temp-erature	18.03	-

ALL VOLTAGES TAKEN ON FLUKE DIDITAL VOLTMETER

Controls set as follows: (Unless otherwise stated in notes)

Sensitivity AGC	-	Maximum/AGC ON
RF Gain	-	Maximum (Clockwise)
Muting/Remote	-	See table
Channel	-	1
Mode	-	See table
AF Gain	-	Middle Position

NO SIGNAL INPUT



RECEIVER FRONT VIEW

REAR PANEL VIEW

Section 7

SPARES

SPARES FOR CHASSIS ASSEMBLY MODULE PREFIX/REF.1 1680/2 Receiver

Variable Resistors

Ref.	Value	Tolerance	Power Rating	Type
1RV1	10k	±20%	0.5W	Lin Carbon
1RV2				Not Allocated
1RV3	10k		0.25W	Log Carbon
1RV4	10k	±20%	0.25W	Log Carbon*
1RV5				Not Allocated
1RV6				Not Allocated
1RV7	10k	±20%	0.5W	Lin Carbon

*Ganged with 1SW1a and 1SW1b

Integrated Circuits

Ref.	Type	Manufacturer	Description
1IC1	MC7818CT	Motorola	Voltage Regulator

Diodes

Ref.	Type	Manufacturer	Description
1D1	V168P	Telefunken	LED (Red)
1D2	V168P	Telefunken	LED (Red)
1D3	V168P	Telefunken	LED (Red)

Capacitors

Ref.	Value	Tolerance	Voltage Wkg.	Type
1C1	1µ	+80% -20%	100V	Electrolytic

Resistors

Ref.	Value	Tolerance	Power Rating	Type
1R1	1k	±5%	0.33W	Standard Film
1R2	1k	±5%	0.33W	Standard Film
1R3	1k	±5%	0.33W	Standard Film
1R4	22k*	±5%	0.33W	Standard Film
1R5	1k	±5%	0.33W	Standard Film

*Only when BFO fitted.

Switches

Type	Description	Part Number
SW1	2P/2W (Ganged with RV4)	11342P
SW2	Switch Spindle/Clicker 2P 6W	11268P*
SW3	Not Allocated	
SW4	Switch Spindle/Clicker 2P 6W	11268P*
SW5	Switch Spindle/Clicker 10P 3W	11267P*
SW6	Switch Spindle/Clicker 1P 12W	12167P

*Adjustable Stop Clicker.

Transformer

Ref.	Description	Part Number
1T1	Mains Transformer	11341P

Miscellaneous

1PL3	Mains Connector/Filter	9715P
1SK4/1SK5	BNC Connector 50Ω	7225P
1PL2	25 way Connector (Male)	11153P
1SK1	25 way Connector (Female)	10976P
1JK1	Phone Jack	6660P
	Loudspeaker	10558P
	Fuse Holder	9458P

Capacitors

Ref	Value	Tolerance	Voltage Wkg.	Type
2C1	100n	±20%	100V	Polyester
2C2	10n	+80% -20%	25V	Ceramic Disc
2C3	100n	±20%	100V	Polyester
2C4	10n	+80% -20%	25V	Ceramic Disc
2C5	10n	+80% -20%	25V	Ceramic Disc
2C6	10n	+80% -20%	25V	Ceramic Disc
2C7	10n	+80% -20%	25V	Ceramic Disc
2C8	10n	+80% -20%	25V	Ceramic Disc
2C9	10n	+80% -20%	25V	Ceramic Disc
2C10	10n	+80% -20%	25V	Ceramic Disc
2C11	10n	+80% -20%	25V	Ceramic Disc
2C12	10n	+80% -20%	25V	Ceramic Disc
2C13	270p	±1%	630V	Polystyrene
2C14	10n	+80% -20%	25V	Ceramic Disc
2C15	100n	±20%	100V	Polyester
2C16	10n	+80% -20%	25V	Ceramic Disc
2C17	10n	+80% -20%	25V	Ceramic Disc
2C18	10n	+80% -20%	25V	Ceramic Disc
2C19	100n	±20%	100V	Polyester
2C20	270p	±2%	100V	Ceramic Plate
2C21	10n	+80% -20%	25V	Ceramic Disc
2C22	100n	±20%	100V	Polyester
2C23	100n	±20%	100V	Polyester
2C24	100n	±20%	100V	Polyester
2C25	100n	±20%	100V	Polyester
2C26	100n	±20%	100V	Polyester
2C27	100n	±20%	100V	Polyester
2C27A	100n	±20%	100V	Polyester
2C28	270p	±1%	630V	Polystyrene
2C29	10n	+80% -20%	25V	Ceramic Disc
2C30	100n	±20%	100V	Polyester
2C31	100n	±20%	100V	Polyester
2C32	100n	±20%	100V	Polyester
2C33	1n5	±1%	160V	Polystyrene
2C34	10n	+80% -20%	25V	Ceramic Disc
2C35	10n	+80% -20%	25V	Ceramic Disc
2C36	100n	±20%	100V	Polyester
2C36A	100n	±20%	50V	Ceramic Multi Layer
2C37	100n	±20%	100V	Polyester
2C38	100µ	+50% -20%	10V	Electrolytic

Capacitors Continued.....

MAIN BOARD PREFIX/REF 2
1680/2 Receiver

Ref	Value	Tolerance	Voltage Wkg.	Type
2C39	1µ	+50% -20%	100V	Electrolytic
2C40	47µ	+50% -20%	25V	Electrolytic
2C41	10n	+80% -20%	25V	Ceramic Disc
2C42	10n	+80%-20%	25V	Ceramic Disc
2C43	10n	+80% -20%	25V	Ceramic Disc
2C44	100n	±20%	100V	Polyester
2C45	1µ	+50% -20%	100V	Electrolytic
2C46	10µ	+50% -20%	50V	Electrolytic
2C47	100n	±20%	100V	Polyester
2C48	100n	±20%	50V	Ceramic Multi Layer
2C49	100µ	+50% -20%	25V	Electrolytic
2C50	100µ	+50%-20%	10V	Electrolytic
2C51	10µ	+50% -20%	50V	Electrolytic
2C52	100n	±20%	100V	Polyester
2C53	1µ	+50% -20%	100V	Electrolytic
2C54	4n7	±1%	160V	Polyestyrene
2C55	100n	±20%	100V	Polyester
2C56	100n	±20%	100V	Polyester
2C56A	470n	±20%	63V	Polyester
2C57	100µ	+50% -20%	10V	Electrolytic
2C58	10n	+80% -20%	25V	Ceramic Disc
2C59	10n	+80% -20%	25V	Ceramic Disc
2C60	1µ	+50% -20%	100V	Electrolytic
2C61	100µ	+50% -20%	10V	Electrolytic
2C62	10n	+80% -20%	25V	Ceramic Disc
2C63	100n	±20%	100V	Polyester
2C64	100n	±20%	100V	Polyester
2C65	10n	+80% -20%	25V	Ceramic Disc
2C66	270p	±2%	100V	Ceramic Plate
2C67	10n	+80% -20%	25V	Ceramic Disc
2C68	10n	+80% -20%	25V	Ceramic Disc
2C69	10n	+80% -20%	25V	Ceramic Disc
2C70	10n	+80% -20%	25V	Ceramic Disc
2C71	10n	+80% -20%	25V	Ceramic Disc
2C72	100n	±20%	100V	Polyester
2C73	100µ	+50% -20%	25V	Electrolytic
2C74	1µ	+50% -20%	100V	Electrolytic
2C75	10µ	+50% -20%	50V	Electrolytic
2C76	1µ	+50% -20%	100V	Electrolytic
2C77	10n	+80% -20%	25V	Ceramic Disc
2C78	10n	+80% -20%	25V	Ceramic Disc

Ref	Value	Tolerance	Voltage Wkg.	Type
2C79	10n	+80% -20%	25V	Ceramic Disc
2C80	100µ	+50% -20%	10V	Electrolytic
2C81	100n	±20%	100V	Polyester
2C82	100n	±20%	100V	Polyester
2C83	100n	±20%	100V	Polyester
2C84	100n	±20%	100V	Polyester
2C85	100n	±20%	100V	Polyester
2C86	220µ	+50% -20%	16V	Electrolytic
2C87	1000µ	+50% -20%	10V	Electrolytic
2C88	10n	+80% -20%	25V	Ceramic Disc
2C89	220µ	+50% -20%	16V	Electrolytic
2C90	100µ	+50% -20%	10V	Electrolytic
2C91	100µ	+50% -20%	10V	Electrolytic
2C92	100n	±20%	100V	Polyester
2C93	10µ	+50% -20%	50V	Electrolytic
2C94	6800µ	+50% -20%	40V	Electrolytic
2C95				Not allocated
2C96	100n	±20%	100V	Polyester
2C97	220µ	+50% -20%	25V	Electrolytic
2C98	100n	±20%	100V	Polyester
2C99	220µ	+50% -20%	25V	Electrolytic
2C100	100µ	+50% -20%	25V	Electrolytic
2C101	4n7	±10%	100V	Ceramic Plate
2C102	820p	±10%	100V	Ceramic Plate
2C103	22µ	+50% -20%	35V	Electrolytic
2C104	100n	±20%	100V	Polyester
2C105	100µ	+50% -20%	25V	Electrolytic
2C106	1000µ	+50% -20%	25V	Electrolytic
2C107	100n	±20%	100V	Polyester
2C108	100µ	+50% -20%	25V	Electrolytic
2C109	220µ	+50% -20%	25V	Electrolytic
2C110	820p	±10%	100V	Ceramic Plate
2C111	100n	±20%	100V	Polyester
2C112	4n7	±10%	100V	Ceramic Plate
2C113	100µ	+50% -20%	25V	Electrolytic
2C114	100n	±20%	100V	Polyester
2C115	220µ	+50% -20%	25V	Electrolytic

Resistors

MAIN BOARD PREFIX/REF 2
1680/2 Receiver

Ref	Value
2R1	1k8
2R2	220R
2R3	100R
2R4	680R
2R5	47R
2R6	100R
2R7	1k5
2R8	1k5
2R9	680R
2R10	100R
2R11	22k
2R12	10k
2R13	47R
2R14	2k2
2R15	47R
2R16	47R
2R17	47R
2R18	Not allocated
2R19	2k2
2R20	4k7
2R21	47R
2R22	100R
2R23	47R
2R24	33k
2R25	15R
2R26	180R
2R27	680R
2R28	220R
2R29	1k5
2R30	100R
2R31	10k
2R32	15k
2R33	100k
2R34	100k
2R35	220k
2R36	120k
2R37	22k
2R38	47R
2R39	100k
2R40	10k

Ref	Value
2R41	330R
2R42	100R
2R43	180R
2R44	330R
2R45	1k5
2R46	220R
2R47	100k
2R48	100k
2R49	100k
2R50	100R
2R51	1k
2R52	10k
2R53	10k
2R54	3k3
2R55	100R
2R56	10k
2R57	22k
2R58	3k3
2R59	220R
2R60	3k9
2R61	22k
2R62	10k
2R63	100R
2R64	10k
2R65	Not allocated
2R66	100R
2R67	100k
2R68	100k
2R69	100k
2R70	100k
2R71	10k
2R72	10k
2R73	10k
2R74	4k7
2R75	100R
2R76	470k
2R77	10k
2R78	3M9
2R79	100k
2R80	10k

All Resistors ±5% 0.33W Standard Film unless otherwise stated.

Ref	Value
2R81	1k
2R82	27k
2R83	6k8
2R84	470k
2R85	47k
2R86	10k
2R87	100k
2R88	100k
2R89	100k
2R90	100k
2R91	560R
2R92	560R
2R93	2k2
2R94	4k7

Ref	Value			
2R95	47k			
2R96	330R			
2R97	100k			
2R98	18R			
2R99	100R			
2R100	1R			
2R101	220R			
2R102	100R			
2R103	100R			
2R104	1R			
2R105	100R			
2R106	18R			
2R107	2R7	±5%	0.5W	Carbon Film
2R108	100k			

All Resistors ±5% 0.33W Standard Film unless otherwise stated.

Potentiometers

Ref	Value	Power Rating	Tolerance	Type
2RV1	1k	0.5W	±20%	Horizontal Cermet Preset
2RV2	10k	0.5W	±20%	Horizontal Cermet Preset
2RV3	10k	0.5W	±20%	Horizontal Cermet Preset
2RV4	4k7	0.5W	±20%	Horizontal Cermet Preset
2RV5	10k	0.5W	±20%	Horizontal Cermet Preset

Filters

MAIN BOARD PREFIX/REF 2
1680/2 Receiver

Ref	Description	Type	Manufacturer
2FL1	'WIDE'	BP4597/80	Cathodeon
2FL2	'NARROW'	BP4594/10	Cathodeon

ALL FILTER TYPES MAY VARY TO SPECIFIC REQUIREMENTS.

Integrated Circuits

Ref	Type	Manufacturer	Description
2IC1	MC14016 BCP	Motorola	Quad Switch
2IC2	MC14016 BCP	Motorola	Quad Switch
2IC3	µA 757C	Fairchild	IF Amplifier
2IC4	SL1623C	Plessey	AM DET/AGC AMP/SSB DET.
2IC5	MC14016 BCP	Motorola	Quad Switch
2IC6	MC7812CT	Motorola	Voltage Regulator
2IC7	SL1625C	Plessey	AM DET/AGC AMP.
2IC8	CA3240E	RCA	FET DUAL OP. AMP.
2IC9	CA3240E	RCA	FET DUAL OP. AMP..
2IC10	MC14016 BCP	Motorola	Quad Switch
2IC11	SL1621 C	Plessey	AGC Generator
2IC12	TBA 810S	SGS	Audio Amp.
2IC13	TBA 810S	SGS	Audio Amp.

Diodes

Ref	Type	Manufacturer	Description
2D1	BZX 79 C6V2	Mullard	Zener
2D2	BAX13	Mullard	Silicon H/S Switching

Ref	Type	Manufacturer	Description
2D3	BZX 79C6V2	Mullard	Zener
2D4	BAX13	Mullard	Silicon H/S Switching
2D5	BAX13	Mullard	Silicon H/S Switching
2D6	BAX13	Mullard	Silicon H/S Switching
2D7	BAX13	Mullard	Silicon H/S Switching
2D8	BAX13	Mullard	Silicon H/S Switching
2D9	BAX13	Mullard	Silicon H/S Switching
2D10	BZX 79C6V2	Mullard	Zener
2D11	1N4004	Mullard	Silicon Rectifier
2D12	1N4004	Mullard	Silicon Rectifier
2D13	1N4004	Mullard	Silicon Rectifier
2D14	1N4004	Mullard	Silicon Rectifier
2D15	1N4004	Mullard	Silicon Rectifier
2D16	BAX13	Mullard	Silicon H/S Switching

Transistors

Ref	Type	Manufacturer	Description
2TR1	BFR54	Mullard	Silicon RF
2TR2	BFR54	Mullard	Silicon RF
2TR3	BFR54	Mullard	Silicon RF
2TR4	BC547B	Mullard	Silicon G/P
2TR5	BC547B	Mullard	Silicon G/P
2TR6	BFR54	Mullard	Silicon RF
2TR7	BFR54	Mullard	Silicon RF
2TR8	BFR54	Mullard	Silicon RF
2TR9	BC547B	Mullard	Silicon G/P
2TR10	BC547B	Mullard	Silicon G/P

Transformer

Ref	Type	Manufacturer
2T1	(600Ω) 8641P	Eddystone

Chokes

Ref	Value	Type	Manufacturer
2CH1	47µH	SC60 9492P	Sigma
2CH2	47µH	SC60 9492P	Sigma
2CH3	100mH	SC60 7350P	Sigma
2CH4	47µH	SC60 9492P	Sigma

Inductors

Ref	Type	Manufacturer
2L1	D5466	Eddystone
2L2	D5644	Eddystone

Miscellaneous

Printed Circuit Board 11137P

Capacitors

Ref.	Value	Tolerance	Voltage	Type
C1	100n	±10%	100V	Polyester
C2	100n	±10%	100V	Polyester
C3	100n	±10%	100V	Polyester
C4	100n	±10%	100V	Polyester
C5	2n2	±1%	160V	Polyestyrene
C6	110p	±1%	630V	Polystyrene
C7	120p	±1%	630V	Polystyrene
C8	3n	±1%	160V	Polystyrene
C9	120p	±1%	630V	Polystyrene
C10	220p	±1%	630V	Polystyrene
C11	180p	±1%	630V	Polystyrene
C12	1n8	±1%	160V	Polystyrene
C13	220n	±10%	100V	Polyester
C14	100n	±10%	100V	Polyester
C15				Not Allocated
C16	100n	±10%	100V	Polyester
C17	1n2	±1%	160V	Polystyrene
C18	150p	±1%	630V	Polystyrene
C19	100n	+80% -20%	50V	Multi-Layer Ceramic
C20	1n2	±1%	160V	Polystyrene
C21	100n	±10%	100V	Polyester
C22	100n	+80% -20%	50V	Multi-Layer Ceramic
C23	7-35p	-	-	Ceramic Trimmer
C24	18p	±2%	100V	Ceramic Plate
C25	100n	+80% -20%	50V	Multi-Layer Ceramic
C26	7-35p	-	-	Ceramic Trimmer
C27	18p	±2%	100V	Ceramic Plate
C28	100n	+80% -20%	50V	Multi-Layer Ceramic
C29	7-35p	-	-	Ceramic Trimmer
C30	18p	±2%	100V	Ceramic Plate
C31	100n	+80% -20%	50V	Multi-Layer Ceramic
C32	7-35p	-	-	Ceramic Trimmer
C33	18p	±2%	100V	Ceramic Plate
C34	100n	+80% -20%	50V	Multi-Layer Ceramic
C35	7-35p	-	-	Ceramic Trimmer
C36	18p	±2%	100V	Ceramic Plate
C37	100n	+80% -20%	50V	Multi-Layer Ceramic
C38	7-35p	-	-	Ceramic Trimmer
C39	18p	±2%	100V	Ceramic Plate
C40	100n	+80% -20%	50V	Multi-Layer Ceramic
C41	7-35p	-	-	Ceramic Trimmer
C42	18p	±2%	100V	Ceramic Plate
C43	100p	±2%	100V	Ceramic Plate

Capacitors continued.....

Ref.	Value	Tolerance	Voltage	Type
C44	100n	+80% -20%	50V	Multi-Layer Ceramic
C45	100p	±2%	100V	Ceramic Plate
C46	10n	+80% -20%	25V	Disc Ceramic
C47	100n	+80% -20%	50V	Multi-Layer Ceramic
C48	100n	+80% -20%	50V	Multi-Layer Ceramic
C49	10n	+80% -20%	25V	Disc Ceramic
C50	100n	+80% -20%	50V	Multi-Layer Ceramic
C51	100n	+80% -20%	50V	Multi-Layer Ceramic
C52	150p	±1%	630V	Polystyrene
C53	27p	±2%	160V	Polystyrene
C54	150p	±1%	630V	Polystyrene
C55	100n	+80% -20%	50V	Multi-Layer Ceramic
C56	10n	+50% -20%	50V	Electrolytic
C57	100n	±10%	100V	Polyester
C58	100n	±10%	100V	Polyester
C59	100p	±2%	100V	Ceramic Plate
C60	100p	±2%	100V	Ceramic Plate
C61	100n	±10%	100V	Polyester
C62	100n	±10%	100V	Polyester
C63	100n	±10%	100V	Polyester
C64	100n	±10%	100V	Polyester
C65	100n	±10%	100V	Polyester
C66	1n6	±1%	160V	Polystyrene
C67	1n6	±1%	160V	Polystyrene
C68	15p	±2%	100V	Ceramic Plate
C69	2n	±1%	160V	Polystyrene
C70	8n2	±5%	160V	Polystyrene
C71	100p	±2%	100V	Ceramic Plate
C72	100n	±10%	100V	Polyester
C73	10n	+80% -20%	25V	Disc Ceramic
C74	10n	+80% -20%	25V	Disc Ceramic
C75	10n	+80% -20%	25V	Disc Ceramic
C76	10n	+80% -20%	25V	Disc Ceramic
C77	10n	+80% -20%	25V	Disc Ceramic
C78	220n	±10%	100V	Polyester
C79	100n	±10%	100V	Polyester
C80	10n	+80% -20%	25V	Disc Ceramic
C81	10n	+80% -20%	25V	Disc Ceramic
C82	10n	+80% -20%	25V	Disc Ceramic
C83	10n	+80% -20%	25V	Disc Ceramic
C84	10n	+80% -20%	25V	Disc Ceramic
C85	10n	+80% -20%	25V	Disc Ceramic
C86	10n	+80% -20%	25V	Disc Ceramic
C87	10n	+80% -20%	25V	Disc Ceramic

Capacitors continued.....

Ref.	Value	Tolerance	Voltage	Type
C88	220n	±10%	100V	Polyester
C89	100n	±10%	100V	Polyester
C90	10n	+80% -20%	25V	Disc Ceramic
C91	10n	+80% -20%	25V	Disc Ceramic
C92	10n	+80% -20%	25V	Disc Ceramic
C93	10n	+80% -20%	25V	Disc Ceramic
C94	10n	+80% -20%	25V	Disc Ceramic
C95	100µ	+50% -20%	25V	Electrolytic
C96	10n	+80% -20%	25V	Disc Ceramic
C97	10n	+80% -20%	25V	Disc Ceramic
C98	10n	+80% -20%	25V	Disc Ceramic
C99	10n	+80% -20%	25V	Disc Ceramic
C100	10n	+80% -20%	25V	Disc Ceramic
C101	10µ	+50% -20%	50V	Electrolytic
C102	1µ	+50% -20%	100V	Electrolytic
C103	10µ	+50% -20%	50V	Electrolytic
C104	100n	±10%	100V	Polyester
C105	100n	+80% -20%	50V	Multi-Layer Ceramic

Ref.	Value
R1	33R
R2	10k
R3	68R
R4	18R
R5	68R
R6	68R
R7	18R
R8	68R
R9	47R
R10	470R
R11	470R
R12	390R
R13	270R
R14	470R
R15	39k
R16	22k
R17	1k
R18	100R
R19	10k
R20	10k

Ref.	Value
R21	100R
R22	4k7
R23	100R
R24	100k
R25	120R
R26	120R
R27	680R
R28	150R
R29	10R
R30	100k
R31	100k
R32	100k
R33	100R
R34	100k
R35	22k
R36	470k
R37	100R
R38	22R
R39	330R
R40	330R

All Resistors ±5% 0.4W Standard Film unless otherwise specified.

Resistors continued.....

Ref.	Value	Tolerance	Power Rating	Type
R41	47R			
R42	8 x 10k	±5%	1W Total	Resistor Pack
R43	100k			
R44	100k			
R45	100k			
R46	1k			
R47	8 x 10k	±5%	1W Total	Resistor Pack
R48	100k			
R49	100k			
R50	100k			
R51	1k			
R52	1k			
R53	100R			
R54	8 x 10k	±5%	1W Total	Resistor Pack
R55	10k			
R56	10k			
R57	100k			
R58	1k			
R59	10k			
R60	10k			
R61	1k			
R62	10k			
R63	10k			
R64	1k2			
R65	1k			

All Resistors ±5% 0.4W Standard Film unless otherwise specified.

Variable Resistors

Ref.	Value	Tolerance	Power Rating	Type
RV1	100R	±20%	0.5W	Preset Cermet
RV2	1k	±20%	0.5W	Preset Cermet
RV3	10k	±20%	0.5W	Preset Cermet
RV4	10k	±20%	0.5W	Preset Cermet
RV5	470k	±20%	0.5W	Preset Cermet
RV6	10k	±20%	0.5W	Preset Cermet
RV7	470k	±20%	0.5W	Preset Cermet

Chokes

Ref.	Value	Manufacturer	Type
CH1	100µH	Sigma	Miniature RF Choke
CH2	10mH	Sigma	Miniature RF Choke
CH3	68µH	Sigma	Miniature RF Choke
CH4	1mH	Sigma	Miniature RF Choke
CH5	1mH	Sigma	Miniature RF Choke
CH6	1mH	Sigma	Miniature RF Choke
CH7	1mH	Sigma	Miniature RF Choke
CH8	1mH	Sigma	Miniature RF Choke
CH9	1mH	Sigma	Miniature RF Choke
CH10	1mH	Sigma	Miniature RF Choke

Inductors

Ref.	Type	Manufacturer
L1	D5661	Eddystone
L2	D5662	Eddystone
L3	D5662	Eddystone
L4	D5663	Eddystone
L5	D5662	Eddystone
L6	D5664	Eddystone
L7	D5665	Eddystone
L8	D5399	Eddystone
L9	D5652	Eddystone
L10	D5399	Eddystone

Transformers

Ref.	Type	Manufacturer
T1	D5656	Eddystone
T2	D5657	Eddystone

Ref.	Type	Manufacturer	Description
D1	BAV10	Mullard	H/S Silicon Diode
D2	BAV10	Mullard	H/S Silicon Diode
D3	BAV10	Mullard	H/S Silicon Diode
D4	BAV10	Mullard	H/S Silicon Diode
D5	BAV10	Mullard	H/S Silicon Diode
D6	BAV10	Mullard	H/S Silicon Diode
D7	BAV10	Mullard	H/S Silicon Diode
D8	BAV10	Mullard	H/S Silicon Diode
D9	BAX13	Mullard	H/S Silicon Diode
D10	BAX13	Mullard	H/S Silicon Diode
D11	BAX13	Mullard	H/S Silicon Diode
D12	BAX13	Mullard	H/S Silicon Diode
D13	BAX13	Mullard	H/S Silicon Diode
D14	BAX13	Mullard	H/S Silicon Diode
D15	BAX13	Mullard	H/S Silicon Diode
D16	BAX13	Mullard	H/S Silicon Diode
D17	BAX13	Mullard	H/S Silicon Diode
D18	BAX13	Mullard	H/S Silicon Diode
D19	BAX13	Mullard	H/S Silicon Diode
D20	BAX13	Mullard	H/S Silicon Diode
D21	BAX13	Mullard	H/S Silicon Diode
D22	BAX13	Mullard	H/S Silicon Diode
D23	BZX79C7V5	Mullard	Zener Diode
D24	BAX13	Mullard	H/S Silicon Diode
D25	BAX13	Mullard	H/S Silicon Diode
D26	BAX13	Mullard	H/S Silicon Diode
D27	BAX13	Mullard	H/S Silicon Diode
D28	BAX13	Mullard	H/S Silicon Diode
D29	BAX13	Mullard	H/S Silicon Diode
D30	BAX13	Mullard	H/S Silicon Diode
D31	BAX13	Mullard	H/S Silicon Diode
D32	BAX13	Mullard	H/S Silicon Diode
D33	BAX13	Mullard	H/S Silicon Diode
D34	BAX13	Mullard	H/S Silicon Diode
D35	BAX13	Mullard	H/S Silicon Diode
D36	BAX13	Mullard	H/S Silicon Diode
D37	BAX13	Mullard	H/S Silicon Diode
D38	BZX79C12	Mullard	Zener Diode

Integrated Circuits

Ref.	Type	Manufacturer	Description
IC1	MC14049CP	Motorola	Hex Inv/Buffer
IC2	MC14027BCP	Motorola	Dual JK Flip-Flop
IC3	SL6440C	Plessey	High Level Mixer
IC4	CA3140E	RCA	CMOS OP Amp.
IC5	ZN425E	Ferranti	D/A Converter
IC6	ZN425E	Ferranti	D/A Converter
IC7	CA3240E	RCA	Dual CMOS OP Amp.
IC8	MC14051BCP	Motorola	8 Channel Analog Multiplexer
IC9	MC14502BCP	Motorola	Strobed Hex Inv/Buffer
IC10	MC14502BCP	Motorola	Strobed Hex Inv/Buffer
IC11	MC7805CT	Motorola	Voltage Regulator
IC12	MC7815CT	Motorola	Voltage Regulator

Transistors

Ref.	Type	Manufacturer	Description
TR1	BFW17A	Mullard	NPN RF Amp.
TR2	3SK51	Hitachi	Dual Gate Mosfet
TR3	BFR54	Mullard	NPN RF Amp.
TR4	3SK51	Hitachi	Dual Gate Mosfet
TR5	BC547B	Mullard	NPN GP Amp.
TR6	BC547B	Mullard	NPN GP Amp.
TR7	BC547B	Mullard	NPN GP Amp.
TR8	BC547B	Mullard	NPN GP Amp.
TR9	BC547B	Mullard	NPN GP Amp.

Miscellaneous

RLA	SPCO Relay HE321C1200 - Hamlin
RLB	SPCO Relay HE321C1200 - Hamlin
RLC	SPCO Relay HE321C1200 - Hamlin
RLD	SPCO Relay HE321C1200 - Hamlin
	Printed Circuit Board 11193P

Capacitors

Ref	Value	Tolerance	Voltage Wkg.	Type
5C1	*10n	+80% -20%	25V	Ceramic Disc
5C2	*10n	+80% -20%	25V	Ceramic Disc
5C3	*1n8	±1%	160V	Polystyrene
5C4	*10n	+80% -20%	25V	Ceramic Disc
5C5	*470n	±20%	35V	Tantalum
5C6	7-35p	-	-	Ceramic Trimmer
5C7	18p	±2%	100V	Ceramic Plate
5C8	330p	±2%	100V	Ceramic Plate
5C9	10n	+80% -20%	25V	Ceramic Disc
5C10	330p	±2%	100V	Ceramic Plate
5C11	470n	±20%	35V	Tantalum
5C12	10n	+80% -20%	25V	Ceramic Disc

*Used when BFO fitted only.

Resistors

Ref	Value	Tolerance	Power Rating	Type
5R1	*1M	±5%	0.33W	Standard Film
5R2	*1K	±5%	0.33W	Standard Film
5R3	*270k	±5%	0.33W	Standard Film
5R4	2k7	±5%	0.33W	Standard Film
5R5	470R	±5%	0.33W	Standard Film
5R6	470k	±5%	0.33W	Standard Film
5R7	1k	+5% -5%	0.33W	Standard Film
5R8	27k	±1%	0.4W	Metal Film
5R9	4k7	±1%	0.4W	Metal Film
5R10	7k5	±1%	0.4W	Metal Film
5R11	33k	±5%	0.33W	Standard Film

*Used when BFO fitted only.

Potentiometers

Ref	Value	Tolerance	Power Rating	Type
5RV1	47k	±20%	0.5W	Horizontal Cermet Preset

Integrated Circuits

Ref	Type	Manufacturer	Description
5IC1	MC1741CP	Motorola	Operational Amplifier

Diodes

Ref	Type	Manufacturer	Description
5D1	*MV209	Motorola	Varicap Diode
5D2	BAX13	Mullard	Silicon H/S Switching
5D3	BAX13	Mullard	Silicon H/S Switching

*Used only when BFO fitted

Coils

Ref	Description	Type	Manufacturer
L1	*BFO Coil	D5645	Eddystone

*Used only when BFO fitted.

Transistors

Ref	Type	Manufacturer	Description
5TR1	*UC734B	Union Carbide	Junction FET
5TR2	BFR 54	Mullard	Silicon RF
5TR3	BD438	Mullard	Silicon NPN Power

*Used only when BFO fitted.

Thermistor

Ref	Type	Manufacturer	Description
5TH1	VA1066S	Mullard	Thermistor

Miscellaneous

XTL1 Frequency to customer requirement

Printed Circuit Board 11208P

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

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.

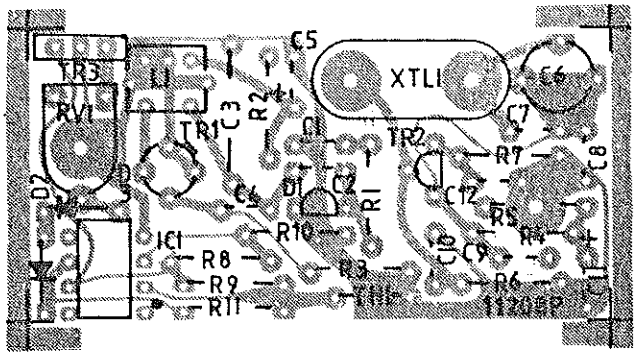
Soldering. A soldering iron having a bit temperature not exceeding 245°C may be used. The soldered joint should be completed within 5 seconds. Overheating may damage the component.

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:

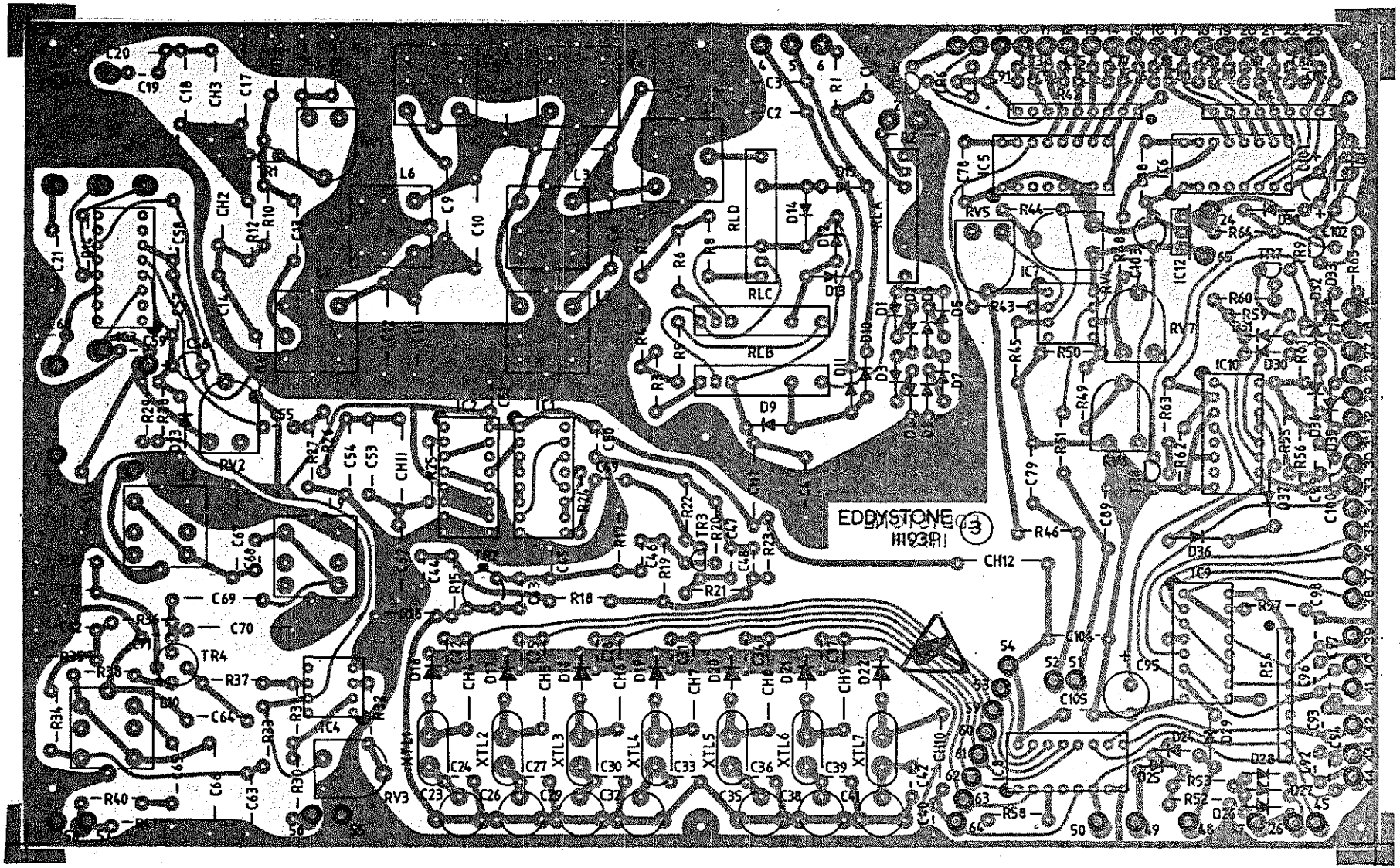
1. Devices should be stored and transported in contact with a conductive material.
2. Soldering iron, bench surface, tools etc., should all be earthed. The operator should be earthed using a 1MΩ series resistor.
3. The equipment should be switched off when devices or boards are inserted or removed.
4.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

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

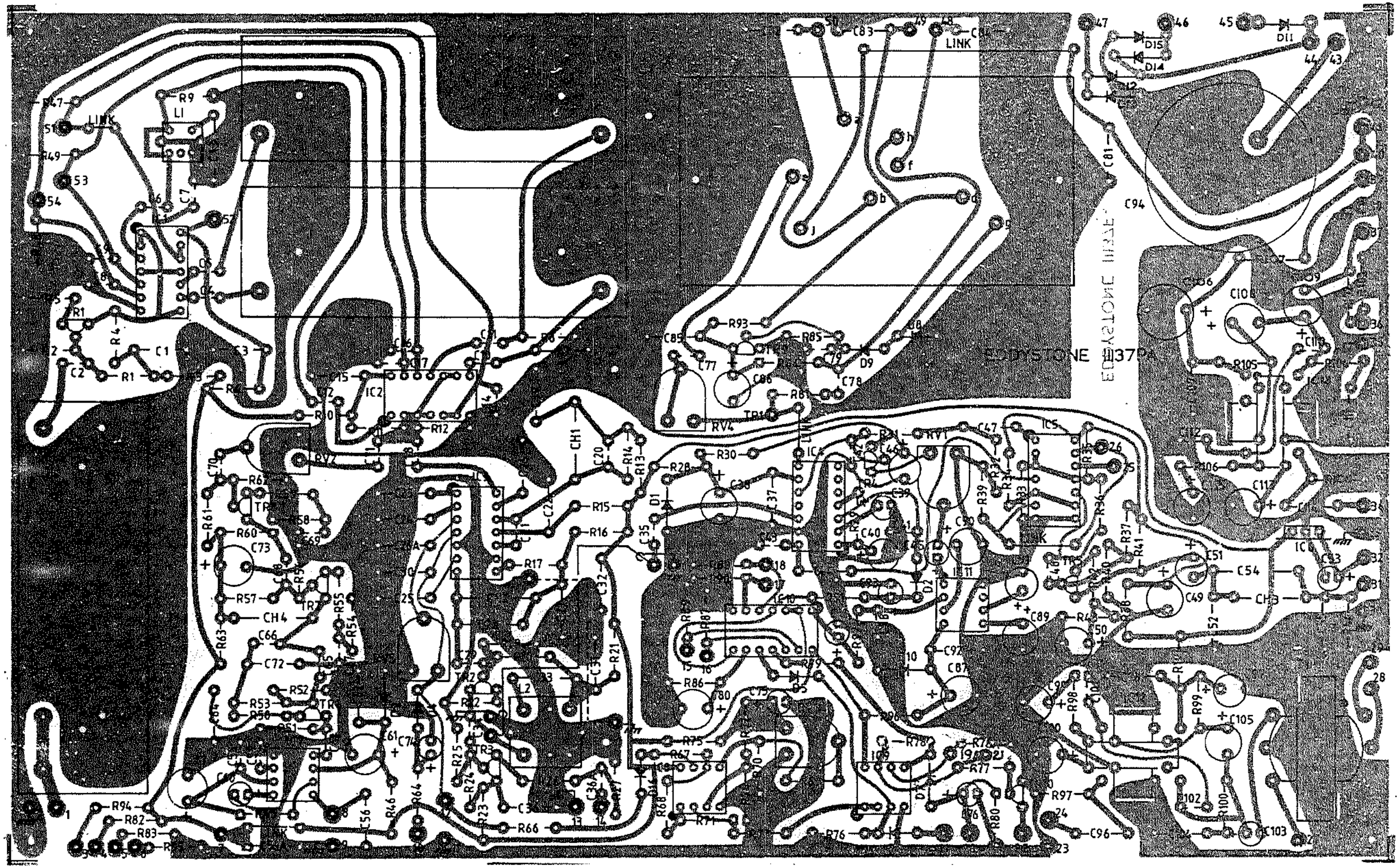

C5
XTL1
C6
TR3
L1
RV1
C3
R2
TR1
C4
C1
TR2
C7
R7
C8
D2
D1
C2
R1
C12
R5
R4
R10
IC1
C10
C9
R8
R3
R9
R6
R11
11206P

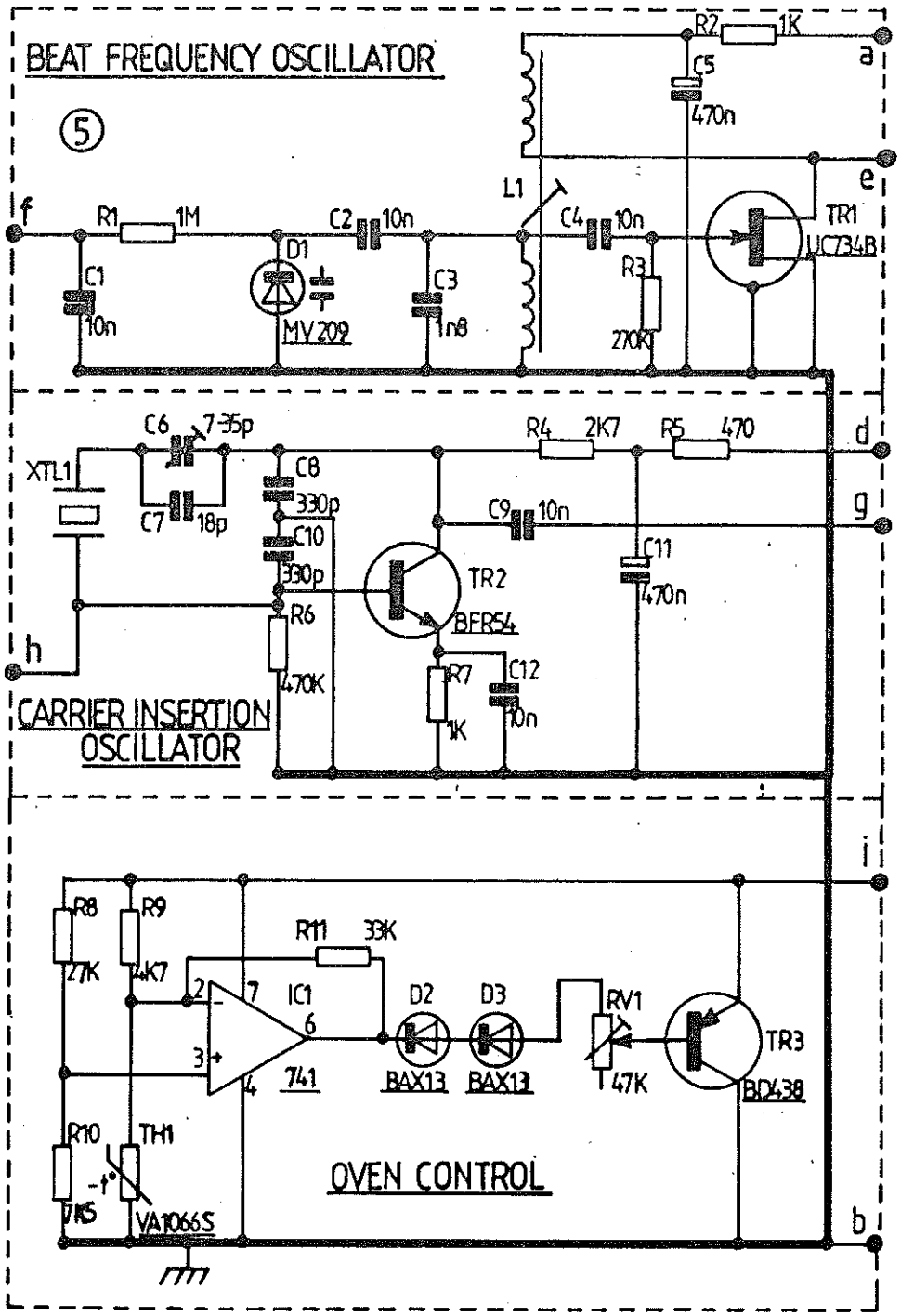
CIO Board

RF/Remote Board



Main Board



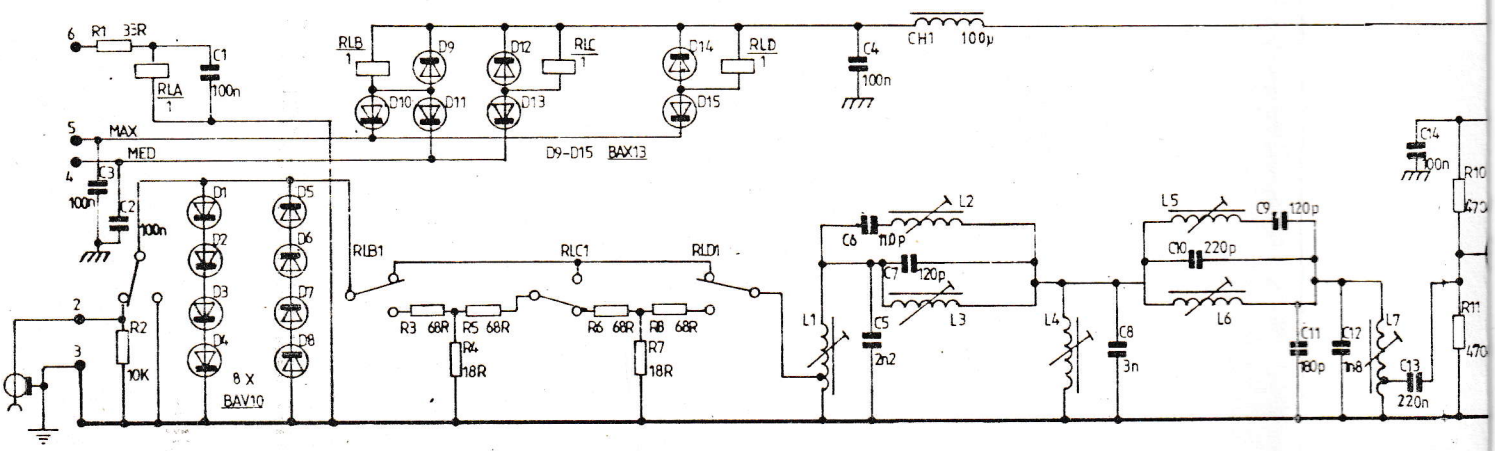


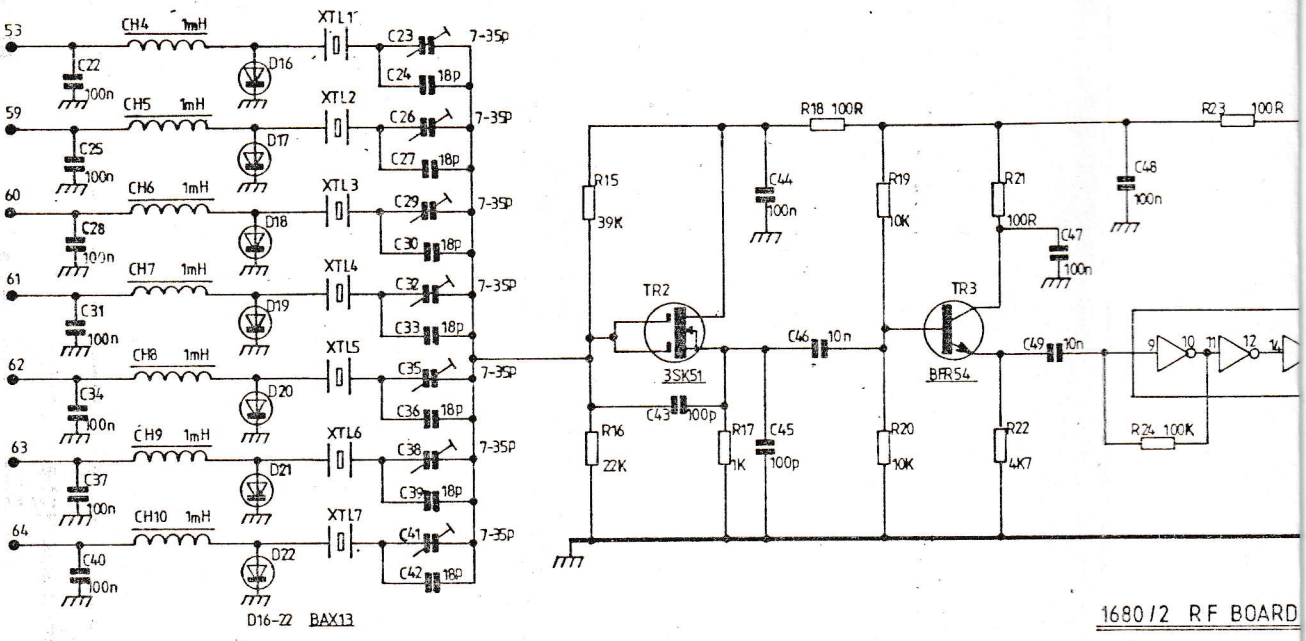
1680 B.F.O./C.I.O. MODULE REF.5.

EDDYSTONE RADIO LTD
BIRMINGHAM B31 3PP
ENGLAND.

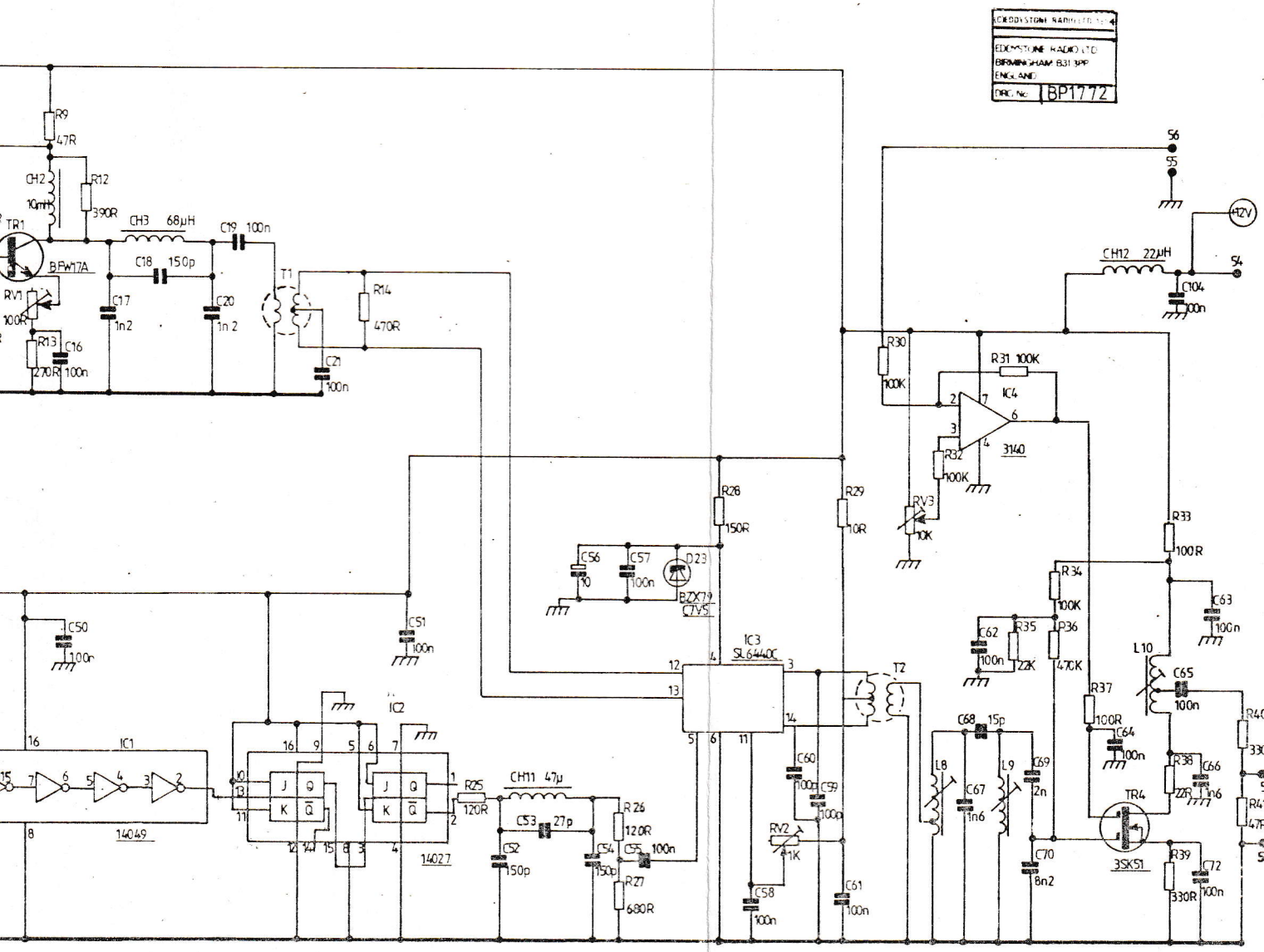
DRG No BP1539

PRINTED IN ENGLAND

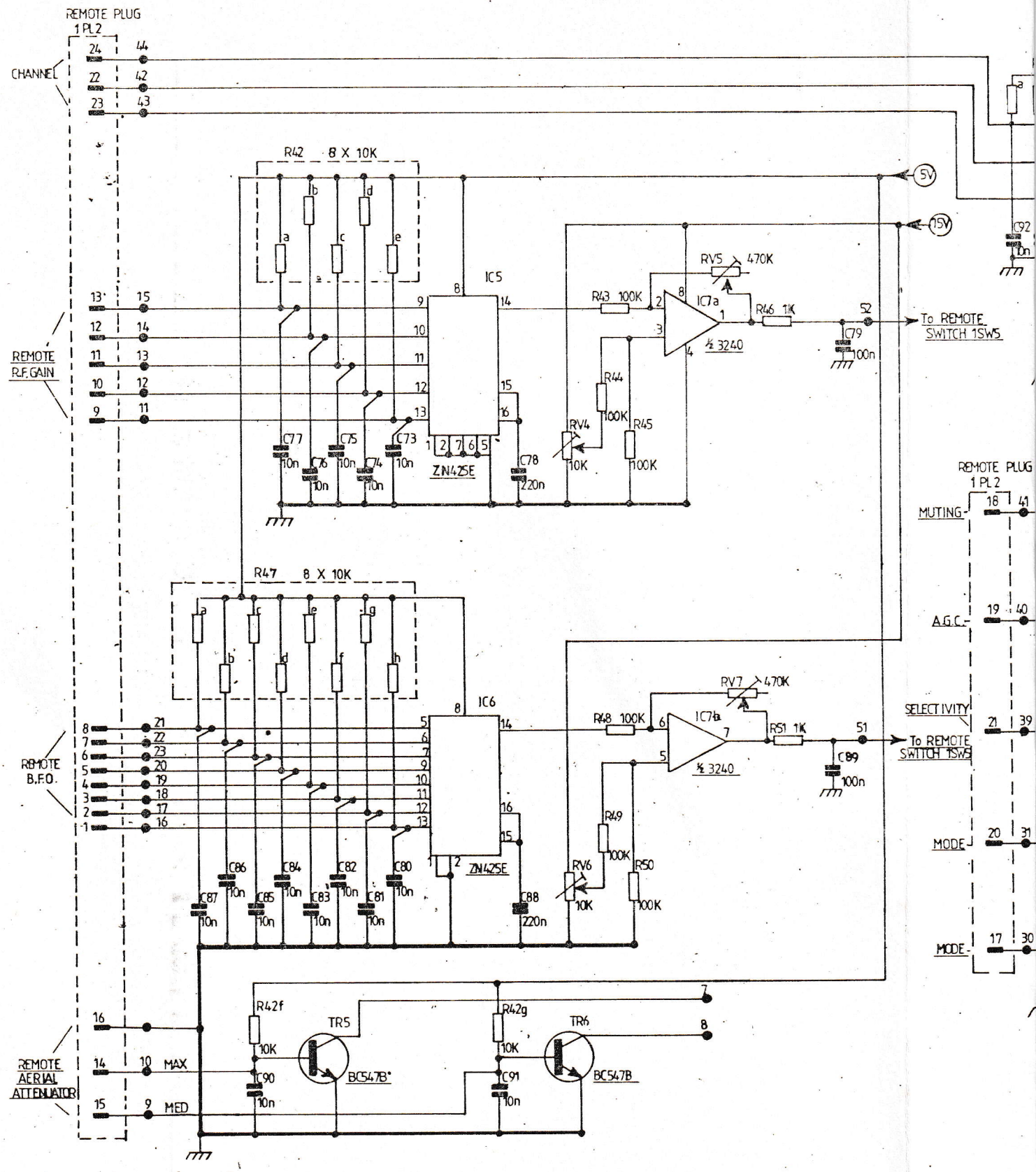




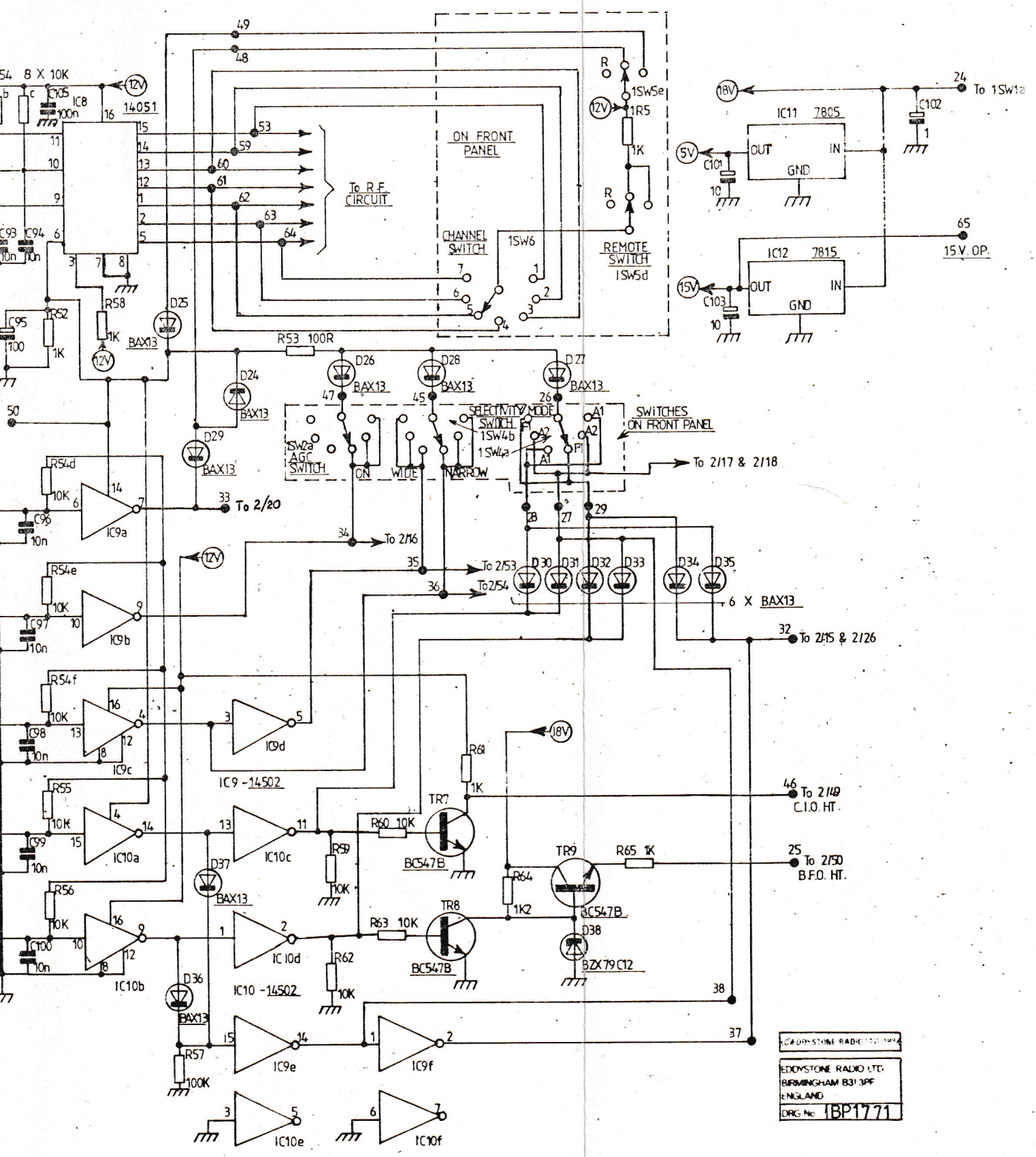
1680/2 RF BOARD


EDDYSTONE RADIO LTD
BIRMINGHAM B31 3PP
ENGLAND
DRG. No. BP1772
R9 47R
CH2 10mH
R12 390R
TR1
BFW17A
CH3 68µH
C19 100n
C18 150p
RV1 100R
C17 1n2
C20 1n2
T1
R14 470R
R13 270R
C16 100n
C21 100n
56
55
+12V
CH12 22µH
54
C104 100n
R30 100K
R31 100K
IC4
3140
R32 100K
RV3 10K
R26 150R
R29 10R
C56 10
C57 100n
D23 BZX79 C7V5
R33 100R
R34 100K
C63 100n
C62 100n
R35 22K
R36 470K
L10
C65 100n
IC3 SL6440C
T2
C50 100n
C51 100n
IC2
IC1
14049
14027
R37 100R
C64 100n
R40 330R
C68 15p
L8
L9
C69 2n
C67 1n6
R38 22R
C66 1n6
TR4
3SK51
57
R41 47R
58
C70 8n2
R39 330R
C72 100n
C60 100n
C59 100p
RV2 1K
C58 100n
C61 100n
R25 120R
CH11 47µ
C53 27p
C52 150p
C54 150p
R26 120R
C55 100n
R27 680R

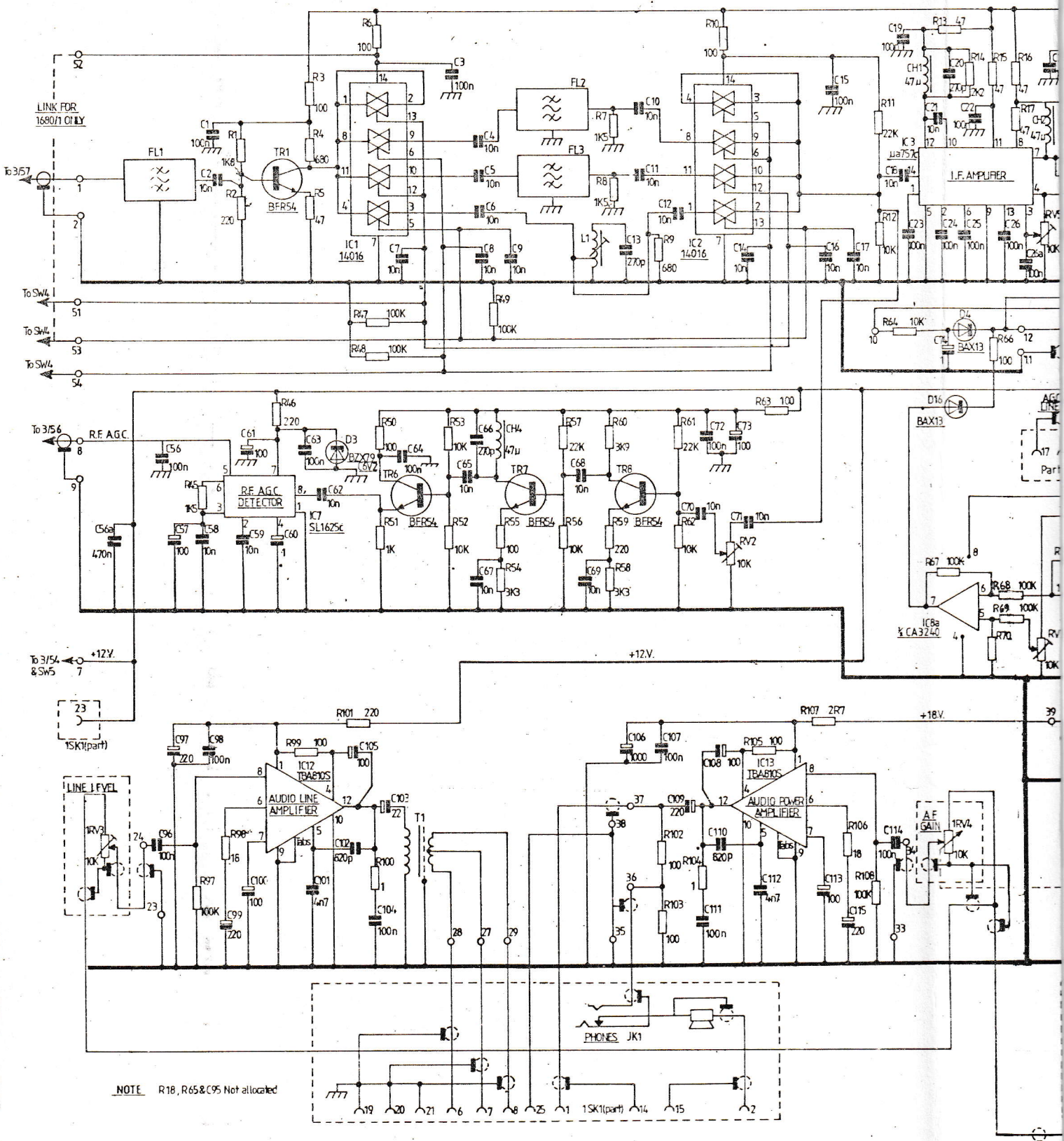
REF.3. (PART)

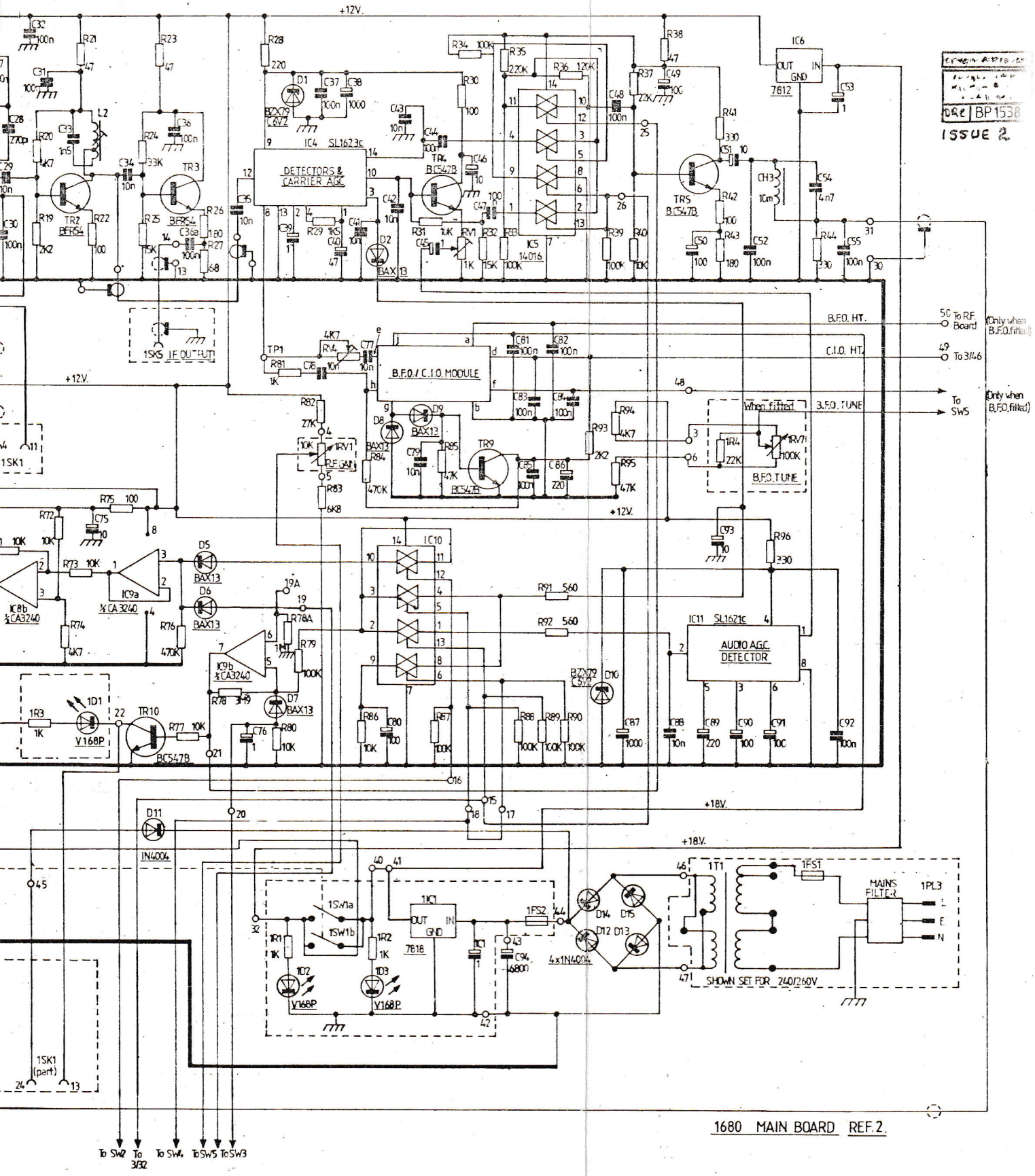


1680/2 REMOTE CONTROL BOA

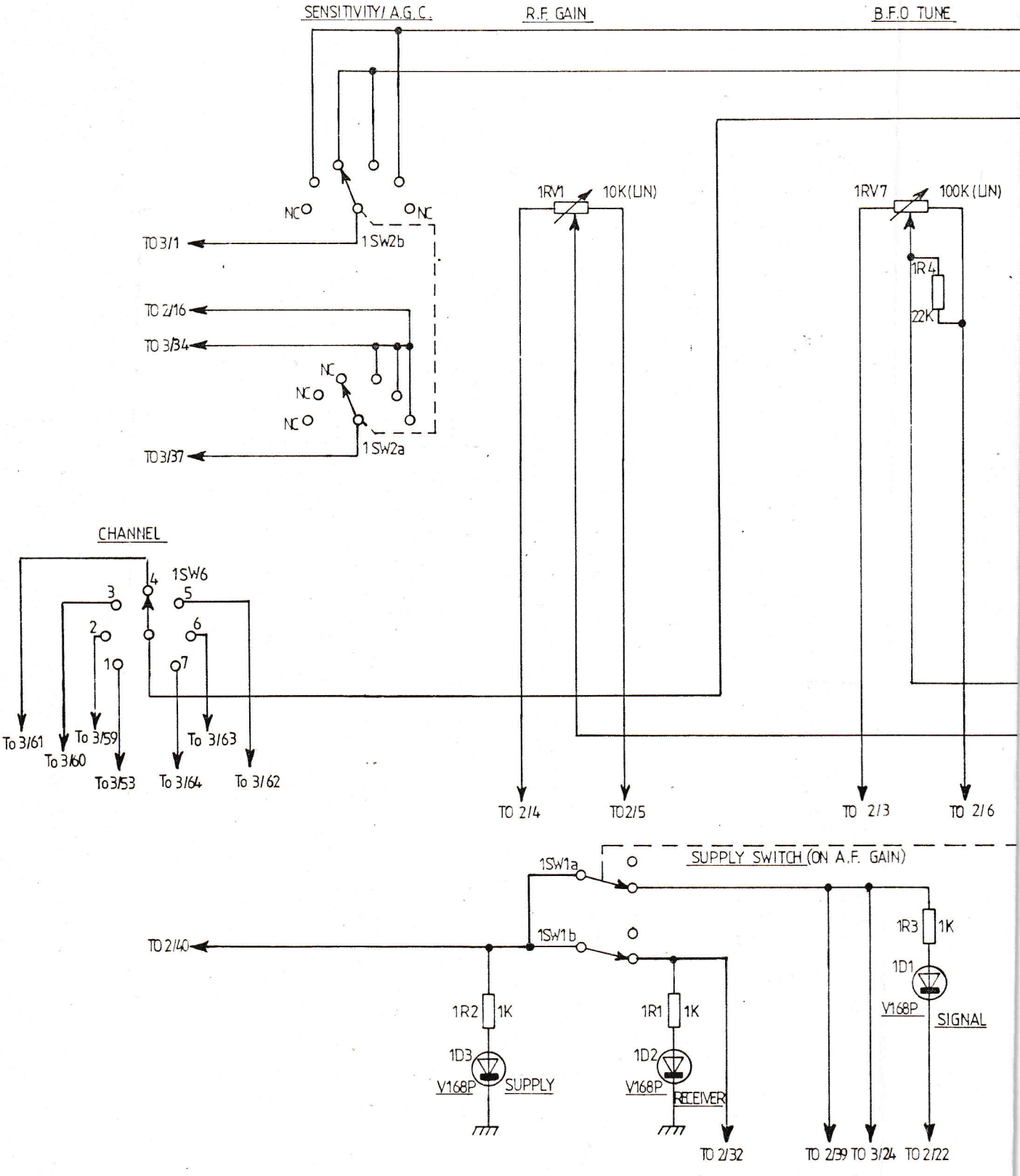

54 8 X 10K
12V
C105
IC8
100n
14051
16
15
11
14
10
13
9
12
1
2
5
3
7
8
C93
C94
10n
10n
R58
1K
D25
BAX13
C95
100
R52
1K
12V
49
48
53
59
60
61
62
63
64
To R.F. CIRCUIT
ON FRONT PANEL
CHANNEL SWITCH
1SW6
7
6
5
4
1
2
3
R
1SW5e
12V
1R5
1K
R
REMOTE SWITCH
1SW5d
18V
24
To 1SW12
IC11 7805
C102
1
5V
C101
10
OUT
IN
GND
65
15 V. OP.
IC12 7815
15V
C103
10
OUT
IN
GND
R53 100R
D26
BAX13
47
D28
BAX13
45
D27
BAX13
26
D24
BAX13
D29
BAX13
50
SELECTIVITY MODE SWITCH
1SW4b
1SW4a
SW2a AGC SWITCH
ON
WIDE
NARROW
F1
A2
A1
F1
A2
A1
SWITCHES ON FRONT PANEL
To 2/17 & 2/18
R54d
10K
C96
10n
IC9a
33
To 2/20
28
27
29
34
To 2/16
12V
35
To 2/53
36
To 2/54
D30
D31
D32
D33
D34
D35
6 X BAX13
R54e
10K
C97
10n
IC9b
32
To 2/15 & 2/26
R54f
10K
C98
10n
IC9c
IC9d
IC9 -14502
18V
R61
1K
46
To 2/19
C.I.O. HT.
R55
10K
C99
10n
IC10a
IC10c
R60 10K
TR7
BC547B
R59
10K
TR9
R65 1K
25
To 2/50
B.F.O. HT.
D37
BAX13
R64
1K2
BC547B
R56
10K
C100
10n
IC10b
IC10d
R63 10K
TR8
BC547B
D38
BZX79C12
R62
10K
D36
BAX13
IC10 -14502
38
37
R57
100K
IC9e
IC9f
IC10e
IC10f
EDDYSTONE RADIO LTD
BIRMINGHAM B31 3PF
ENGLAND
DRG No. BP1771

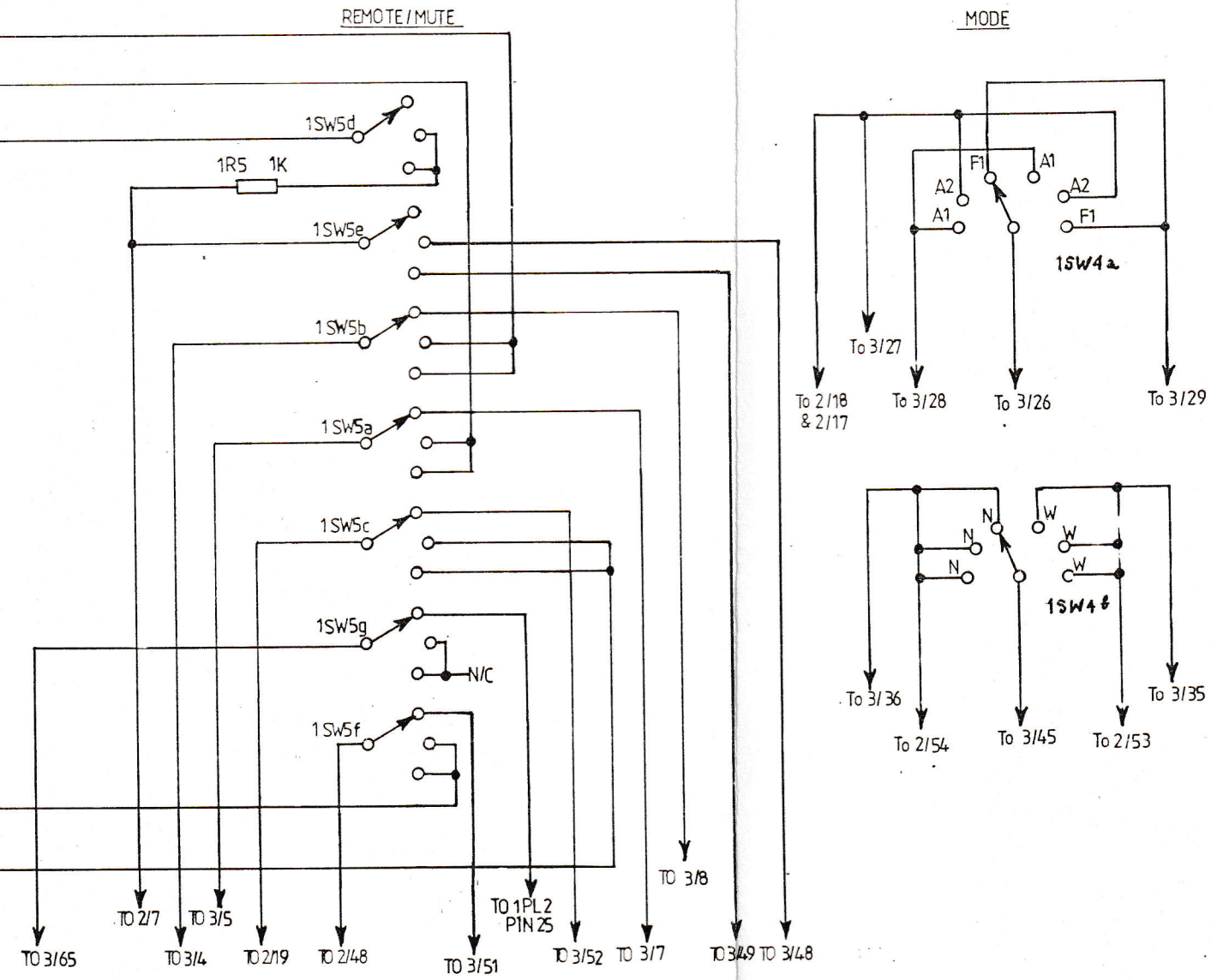
RD. REF.3. (PART)

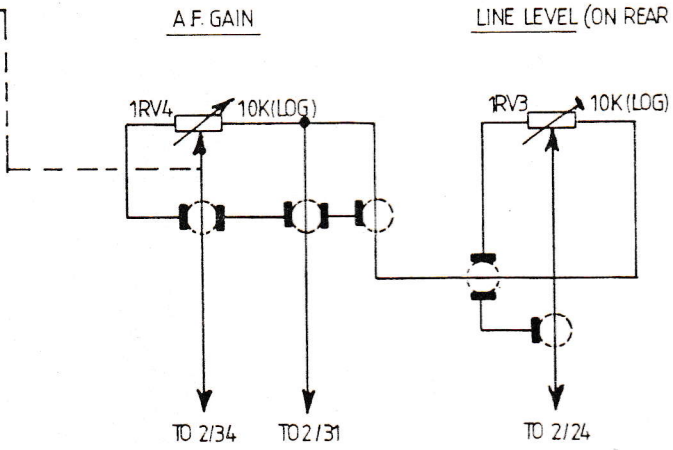

LINK FOR 1680/1 ONLY
To 3/57
To SW4
To SW4
To SW4
To 3/56
R.F. A.G.C.
To 3/54 & SW5
+12V.
1SK1(part)
LINE LEVEL
FL1
TR1
BFR54
IC1 14016
FL2
FL3
IC2 14016
L1
IC3 μa757c
I.F. AMPLIFIER
D4
BAX13
D16
BAX13
R.F. A.G.C. DETECTOR
IC7 SL1625c
D3 BZX79 6V2
TR6
TR7
TR6
IC8a ½ CA3240
AUDIO LINE AMPLIFIER
IC12 TBA810S
AUDIO POWER AMPLIFIER
IC13 TBA810S
A.F. GAIN
PHONES JK1
T1
NOTE R18, R65 & C95 Not allocated



1680 MAIN BOARD REF.2.


SENSITIVITY/ A.G.C.
R.F. GAIN
B.F.O TUNE
NC
NC
TO 3/1
1SW2b
TO 2/16
TO 3/34
NC
NC
NC
TO 3/37
1SW2a
1RV1
10K(LIN)
1RV7
100K(LIN)
1R4
22K
CHANNEL
1SW6
4
3
5
2
6
1
7
To 3/61
To 3/60
To 3/59
To 3/53
To 3/63
To 3/64
To 3/62
TO 2/4
TO 2/5
TO 2/3
TO 2/6
SUPPLY SWITCH (ON A.F. GAIN)
1SW1a
1SW1b
TO 2/40
1R2
1K
1D3
V168P
SUPPLY
1R1
1K
1D2
V168P
RECEIVER
TO 2/32
1R3
1K
1D1
V168P
SIGNAL
TO 2/39
TO 3/24
TO 2/22





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ENGLAND
DRG No BP1786

1680/2 SWITCH WIRING