Eddystone

Model
1680/3T

INSTALLATION NOTES
OPERATING INSTRUCTIONS
AND
SERVICE DATA

Eddystone Radio

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FIRST AID IN CASE OF ELECTRIC SHOCK

The Royal Life Saving Society recommends the **Expired Air** *method of artificial respiration for use in any case of electric shock.* **It is comparatively simple and produces the best and quickest results when correctly applied.** *It also has an important advantage over the accepted manual methods in that* **it can be carried out in awkward situations in confined spaces,** *such as might well be encountered at sea.*

However, where there is a facial injury, or if the patient is trapped in a face downwards position, *it might be necessary to use a manual method of artificial respiration: of this type the* **Holger Nielson** *method is considered the most satisfactory*

Directions for applying both methods are therefore given.

EXPIRED AIR METHOD OF ARTIFICIAL RESPIRATION

It is essential to commence artificial respiration without delay.

DO NOT TOUCH THE VICTIM WITH YOUR BARE HANDS until the circuit is broken.

SWITCH OFF. If this is not possible, **PROTECT YOURSELF** with dry insulating material and pull the victim clear of the conductor.

1. **Lay the patient on his back** and, if on a slope, have the stomach slightly lower than the chest.

2. **Make a brief inspection of the mouth and throat** to ensure that they are clear of obvious obstruction.

3. **Give the patient's head the maximum backwards tilt** so that the chin is prominent, the mouth closed and the neck stretched to give a clear airway—Fig. A.

4. **Open your mouth wide, make an airtight seal over the nose of the patient and blow.** The operator's cheek or the hand supporting the chin can be used to seal the patient's lips—Fig. B, **or if the nose is blocked,** open the patient's mouth using the hand supporting the chin; open your mouth wide and make an airtight seal over his mouth and blow—Fig. C. This may also be used as an alternative to the mouth-to-nose technique.

5. **After exhaling, turn your head to watch for chest movement** whilst inhaling deeply in readiness for blowing again—Fig. D.

6. If the chest does not rise, check that the patient's mouth and throat are free of obstruction and the head is tilted backwards as far as possible. Blow again.

Send for medical assistance if possible.

HOLGER NIELSON METHOD OF ARTIFICIAL RESPIRATION

It is essential to commence artificial respiration without delay.

DO NOT TOUCH THE VICTIM WITH YOUR BARE HANDS until the circuit is broken.

SWITCH OFF. If this is not possible, **PROTECT YOURSELF** with dry insulating material and pull the victim clear of the conductor.

1. **Lay patient face downwards** with the forehead resting on the hands, placed one above the other.

2. **Remove false teeth, tobacco or gum** from patient's mouth; make sure the **tongue is free** by firm blows between the shoulders with the flat of the hand.

3. **Kneel on one knee at patient's head,** one foot by the patient's elbow.

4. **Place palms of your hands on patient's shoulder blades**—Fig. A.

5. **Rock forward until arms are vertical,** the pressure should be light and without force (22–30 lb. is sufficient); this should take 2½ seconds—Fig. B.

6. **Release the pressure** by allowing the hands to slide down the arms to the patient's elbow (approximately 1 second) then raise the patient's arms and shoulders slightly pulling at the same time by swinging backwards (approximately 2½ seconds)—Fig. C, lower the patient's arms—Fig.D, and return your hands to the patient's shoulder blades.

7. **Repeat the movements** taking 7 seconds for each complete respiration.

8. **While artificial respiration is continued, have someone else—**

   (*a*) Loosen patient's clothing.

   (*b*) Keep patient warm.

9. **If patient stops breathing, continue artificial respiration.** Four hours or more may be required.

10. **Do not give liquids until patient is conscious.**

Send for medical assistance if possible.

HEALTH & SAFETY AT WORK ACT 1974 (UNITED KINGDOM)

The objective of this Act is to maintain or improve standards of health, safety and welfare of persons at work, and to protect persons at work and others, against risks to health, safety and welfare.

To the best of current knowledge, there is no risk to health or safety when Eddystone equipment is installed and operated properly, provided it has been properly maintained.

Precautions have been taken during the design and manufacture of this equipment to reduce the risks involved when repairing or maintaining the equipment but a certain degree of risk must always be present, particularly under fault conditions. The list below has been prepared to draw attention to the general risks envisaged; further information is available from Eddystone Radio Limited, at any time.

1. **Electric Shock**
   Beware mains voltage and induced aerial voltages, ensure metal chassis is properly bonded to earth. Some units generate a high voltage even when the equipment is operated from a battery supply. Circuitry operating at low voltage is not necessarily at or near earth potential.

2. **Physical Strain**
   Obtain assistance if a heavy unit is to be lifted or removed from an equipment rack.

3. **Explosion and Implosion**
   Cathode ray tubes may implode if carelessly handled or dropped.
   Use protective masks and gloves.
   Electrolytic capacitors may explode if subjected to excessive voltage or voltage of incorrect polarity, and toxic materials may be released.

4. **Burns**
   Resistors and power transistors (for example) may attain a high temperature. Avoid contact with these.

5. **X-Rays**
   Cathode ray tubes operated at excessive voltage may generate harmful X-rays.

6. **Soldering**
   Beware of flying droplets of molten solder and careless use of soldering irons (place in a proper stand when not in use). Avoid fumes. Do not handle food or drink, cigarettes, etc., without washing hands (risk from lead poisoning).

7. **Cleaning Solutions**
   Certain solutions give off flammable or toxic fumes, e.g., trichloroethylene and its derivatives. Do not smoke and avoid inhalation of vapours.

8. **Disposal of Faulty Components**
   Certain components contain toxic materials which may be released if the component is broken or disposed of carelessly, e.g., semi conductor devices containing poisonous metallic compounds; electrolytic capacitors containing poisonous organic compounds.

TREATMENT FOR BURNS

1. No attempt should be made to remove clothing adhering to the burn.

2. If other help is available, or as soon as artificial respiration is no longer required, cover the burn with a **dry** dressing.

3. Oil or grease in any form should **not** be applied.

4. Warm, weak, sweet tea may be given when the patient is able to swallow.

These instructions are approved by The Royal Life Saving Society. A handbook and charts dealing with Artificial Respiration can be obtained from the Society at 14 Devonshire Street, London, W.1.

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.

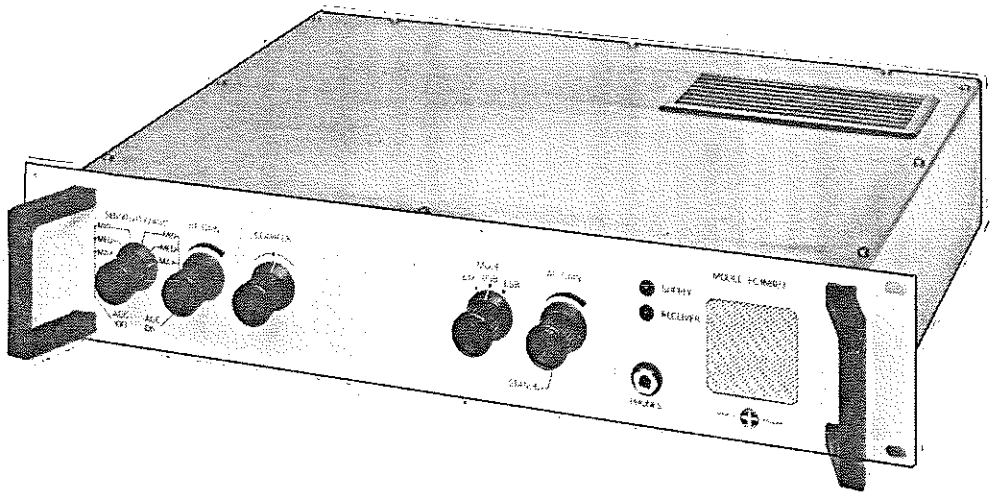
4. If a 13 amp (BS1363) FUSED PLUG is used to facilitate connection to the supply outlet, the plug MUST be protected by a 3 AMP FUSE unless expressly declared otherwise (see para. 5 below). If another type of plug is used, a fuse of the appropriate rating must be fitted either in the plug, or the adaptor,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

MODEL 1680/3T
Single Channel
1·6Mhz to 30Mhz
AM/SSB Receiver



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ISSUE NUMBER ONE
MAY, 1986

AMENDMENT RECORD

Amend No.	Pages subject to change	Amended by	Date
1			
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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.

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Printed Circuit Boards:

1st Oscillator Board	11204P	Reference 6
CIO Board	11208P	Reference 5
RF Tuner Board	11215PA	Reference 4
RF/Remote Board	11214PA	Reference 3
Main Board	11137PB	Reference 2
Audio Attenuator/Relay Board	12608P	Reference 22

1680/3T Index Continued...

Eddystone Radio Limited July, 1986

1680/3T Supplement for LSB Operation

Operation on this receiver is either AM or LSB with USB position inoperative.

Component Change

Filter type BP4706/30 is fitted at 2FL3, and filter type BP4727-10 at 2FL2 is omitted.

Wiring Change

Additional wiring connects 3/33 to LSB position on mode switch and to 2PL1/3. Wire connecting 3/37 to 3/40 is rewired connecting 3/37 to 3/41.

Section 1

GENERAL DESCRIPTION AND PERFORMANCE SUMMARY

The Eddystone 1680/3T model is a compact low cost receiver for operation on one channel in the frequency range 1.6MHz to 30MHz with reception facilities for AM and USB. The receiver meets the requirements of Specification IT4660 over the range 1.6MHz to 3.8MHz.

Power supply arrangements can be chosen to suit the customer's installation requirements. The standard receiver operates from AC 40Hz-60Hz supplies in the range 100V/130V and 200V/260V or from a 24V DC supply (negative earth). For 12V or floating earth supplies an external converter can be supplied.

A single conversion circuit design is employed, with a rear panel output at the intermediate frequency of 1.4MHz to facilitate connection to ancillary equipment. Operation in dual diversity is also possible.

Remote control of all functions is available. Audio derived AGC is used for SSB reception and IF derived AGC for AM. A manual RF gain is provided which can be used in conjunction with or instead of the AGC.

Audio outputs are provided for connection to standard 600 ohm circuits, headset reception and 2 watts to an external loudspeaker in addition to 2 watts to an internal loudspeaker. Remote control of an audio attenuator provides up to 20dB attenuation of the 600 ohm output level.

GENERAL SPECIFICATION

Frequency

One channel in the range 1.6MHz to 30MHz

Intermediate Frequency

1400kHz

Reception Modes

AM
SSB in upper sideband

Aerial Input

50 ohm 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	:	$-10^{o}C$ to $+55^{o}C$
Storage	:	$-40^{o}C$ to $+70^{o}C$
Humidity	:	95% at $+40^{o}C$
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

Clarifier	:	Provides fine tune control of nominal ±300Hz.
Aerial Attenuator	:	3 position (nominal 0dB, -20dB and -40dB).
AGC	:	ON/OFF switch combined with the aerial attenuator.
RF Gain	:	Can be used with AGC 'ON' or 'OFF'.
Mode	:	Selects AM or SSB.
AF Gain	:	Adjusts audio output to headset and loudspeaker.
Standby	:	Combined with AF gain removes HT from receiver leaving power applied to ovens.
Line Level	:	Preset control situated on rear panel adjusts 600 ohm audio level. (Not affected by AF gain control setting).
Indicator LED's	:	Power applied. Receiver On.

Remote Operation

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

Clarifier	:	8 lines
RF Gain	:	5 lines
Mode	:	1 line
AGC ON/OFF	:	1 line
Aerial Attenuator	:	2 lines
Remote Selection	:	1 line to select local/remote
		1 line to provide indication of correct selection.
Audio Attenuator	:	1 line (analog voltage)

PERFORMANCE SPECIFICATION

Sensitivity

2uV for 16dB SINAD on SSB.

Selectivity

SSB (USB)	-6dB	+350Hz to +2700Hz
	-60dB	-400Hz and +3400Hz
AM	-6dB	±3.0kHz
	-60dB	±7.5kHz

Image Rejection

Greater than 50dB above 20MHz
Greater than 70dB below 20MHz
Greater than 80dB below 10MHz

IF Rejection

Greater than 90dB.

Audio Output

Line	:	600 ohm balanced or unbalanced (Preset to +6dBm maximum).
Headset	:	600 ohm nominal, output adjusted by AF gain control to +10dBm maximum.
Loudspeaker	:	2 watts maximum.
External Loudspeaker	:	2 watts maximum into 8 ohm.

Overall Response

Level within 6dB over 300Hz to 2.7kHz. Distortion better than 2%.

Blocking

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

Cross Modulation

With a wanted carrier 60dB above 1uV 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 100dB above 1uV to produce an audio output greater than 30dB below standard output.

Intermodulation (In Band)

The third order intermodulation products at 400Hz and 2200Hz produced by two carriers of level 80dB above 1uV tuned to produce outputs of 1000Hz and 1600Hz will be greater than 35dB below standard output when the individual carriers each provide an output equal to standard output.

Intermodulation (Out Of Band)

With a wanted signal of +6dBuV 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 90dB above 1uV to produce standard output when neither signal is closer than 20kHz to the wanted frequency.

AGC Characteristic

SSB	:	Output level changes by less than 5dB for 100dB increase in input from 2uV.
AM	:	Output level changes by less than 3dB for 90dB increase in input from 5uV.

Stability

Within 10Hz over temperature range $10^{o}C$ to $30^{o}C$ for frequency range 1.6MHz-3.8MHz.

CIRCUIT DESCRIPTION

Aerial Attenuator

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 4L1. 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 3RLC, 3RLD and 3RLE.

Protection against high induced aerial voltages is afforded by diodes 3D7-3D14 connected between aerial input and earth.

A further relay 3RLB 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 via 3SKA to a plug in RF amplifier board, reference 4, and then via 4PLA to a coupling coil on 4L1. 4L1 with 4L2 forms a high Q bandpass tuned circuit, and signals are then amplified by 4TR1. A further tuned circuit 4L3 forms the collector load of 4TR1. From 4TR1 the signal is then fed to the mixer via 4PLC/3SKC.

Mixer

Input to the high level double balanced mixer 3IC9 is via a toroid input transformer 3T1 and output is via a toroid output transformer 3T2. A potentiometer 3RV8 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 3TR5 before passing to the AM filter 2FL1.

1st Oscillator Module (Reference 6)

This circuit consists of a crystal oscillator 6TR1 with level control 6TR2 and emitter follower output 6TR3. The frequency of the crystal oscillator can be varied over a small range from the front panel 'CLARIFIER' control 1RV5 via capacity diode 6D1.

The complete oscillator module is oven controlled, the transistor 6TR4 being used as the heating element and temperature control is by bridge circuit 6IC2, thermistor 6TH1 and associated components.

1.4MHz IF Amplifier

1.4MHz IF signals from IF pre amplifier 3TR5 are fed to 2FL1. After filtering and amplification, signals from 2TR1 then pass to the LSB filter 2FL2 via a quad analog switch 2IC1. 2IC1 selects LSB or passes on the AM signals via tuned circuit 2L1 to a second quad analog switch 2IC2. 2IC2 selects either the output of the LSB filter or the AM filter (via 2L1). Signals from 2IC2 are fed to the main IF amplifier formed by 2IC14 and 2IC15.

The IF signal from 2IC15 further amplified in 2TR2 and 2TR3 before passing to the SSB and AM detectors in 2IC4 which also generates carrier derived AGC used in AM mode. Carrier insertion to 2IC4 for SSB reception is from the CIO module, reference 5.

SSB or AM audio output from 2IC4 is selected via 1SW4, ('MODE') quad analog switch 2IC5.

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.

IF Pre Amplifier AGC

Output from analog switch 2IC2 is 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 (SSB), is generated by 2IC11 which takes its input from 2IC4 via emitter follower 2TR4. Carrier AGC (AM), 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 2IC14. The AGC voltage applied to 2IC14 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 2R120, 2RV8, and front panel control 1RV1. When AGC is switched to 'ON' whichever voltage is the greater controls the gain of IF amplifier 2IC14.

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) and line audio attenuator. 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.

Line Attenuator

Audio output from the line level potentiometer 1RV3 is passed to the line attenuator 22TR3 via 22PL3. For local operation, 22TR3 operates at maximum gain with the output connected to 2IC12 (Line Amplifier). For remote operation, analog gate 22IC2 is turned on allowing the voltage on pin 2 of 22PL3 to be applied to gate 2 of 22TR3 thus reducing the gain.

Remote Interface

All control functions (with the exception of audio gain level to loudspeaker and phones) can be remotely controlled via the internal circuitry on RF/remote board, reference 3.

With no connections made to remote connector 1PL2, the receiver is automatically set for local operation with relays 22RLA, 22RLB and 22RLC energised. When pin 21 of 1PL2 is grounded, remote control is selected via 22TR1 with relays 22RLA, 22RLB and 22RLC unenergised.

RF Gain

Remote control of the RF gain is via D/A converter 3IC1. Five input lines are provided giving 32 steps of gain control. The output of 3IC1 is applied to one input of 3IC3a, the output of which is connected via the REMOTE/LOCAL relay 22RLB to 2R123. 22RLB disconnects the normal input to 2R123 from the RF gain control 1RV1. Presets 3RV1 and 3RV2 adjust the range of DC voltage applied to 2R123.

Clarifier

Remote control of the clarifier is via D/A converter 3IC4. Eight input lines are provided giving 256 steps of frequency swing. The output of 3IC4 is applied to amplifier 3IC2a, the output of which feeds 3IC3b. The output of 3IC3b is connected via REMOTE/LOCAL relay 22RLA to pin 'F' of the 1st oscillator module. 22RLA also disconnects the normal input to pin 'F' from the 'CLARIFIER' control 1RV5. Presets 3RV3 and 3RV4 adjust the range of DC voltage applied to the 1st oscillator module (pin 'F').

Aerial Attenuator

Under remote control, aerial attenuator relays 2RLC, 2RLD and 2RLE are disconnected from the front panel switch 1SW2 via remote/local relays 22RLB and 22RLC, and connected to 3TR1 and 3TR2.

With Remote Plug 1PL2 pins 14 and 15 earthed, 3TR1 and 3TR2 will be cut off. Relays 2RLC, 2RLD and 2RLE will now be unenergised giving 0dB attenuation.

With 1PL2 pin 14 earthed and pin 15 o/c, TR1 will be cut off and TR2 will conduct. Relays 2RLC and 2RLD will now be energised and 2RLE unenergised giving nominal 20dB attenuation.

With 1Pl2 pin 14 o/c and pin 15 earthed, TR1 will conduct and TR2 will be cut off. Relays 2RLC and 2RLE will now be energised and 2RLD unenergised giving nominal 40dB attenuation.

Mode

With remote plug 1PL2 pin 17 earthed AM mode is selected by 3IC5 pin 14 going 'high' allowing 3TR3 to conduct, thus removing the positive supply to the CIO module. Also pins 5 and 6 of analog switch 2IC10 will go 'high' thus selecting the AM detector and Carrier AGC. Pin 5 of 2IC1 and pin 13 of 2IC2 will also go 'high' bypassing the SSB filters and leaving only the AM filter 2FL1 in circuit. Pin 2 of 3IC5 will be 'low', selecting the audio output from the AM detector via 2IC5 and disabling the audio AGC via 2IC10.

With remote plug 1PL2 pin 17 open circuit, SSB mode is selected. 3IC5 pin 14 going 'low' turns off 3TR3 which results in the positive supply being applied to the CIO module. Pin 2 of 3IC5 will be 'high' selecting the audio from the SSB detector via 2IC5 and enabling the audio AGC via 2IC10. The LSB filter 2FL2 is selected by pin 6 of 2IC1 and pins 5 and 6 of 2IC2 going 'high'.

AGC

With pin 19 on remote plug 1PL2 earthed, pin 5 of 3IC5 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'.

Power Supply

The power input requirements 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 CIO 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'.

Section 3

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 One 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

Three printed circuit boards are used for the 1680 circuitry. One board, reference 3, contains the RF circuit, 1st oscillator module and the remote interface circuits. The second board, reference 2, contains IF circuits, AM and SSB filters BFO/CIO module, audio amplifiers, AGC amplifiers etc. The third board contains the line audio attenuator and local/remote relay switching. 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 50 ohm) (1PL4)	8012P
1	IF output connector (BNC plug 50 ohm) (1PL5)	8012P
1	Box key for control knobs	9057P

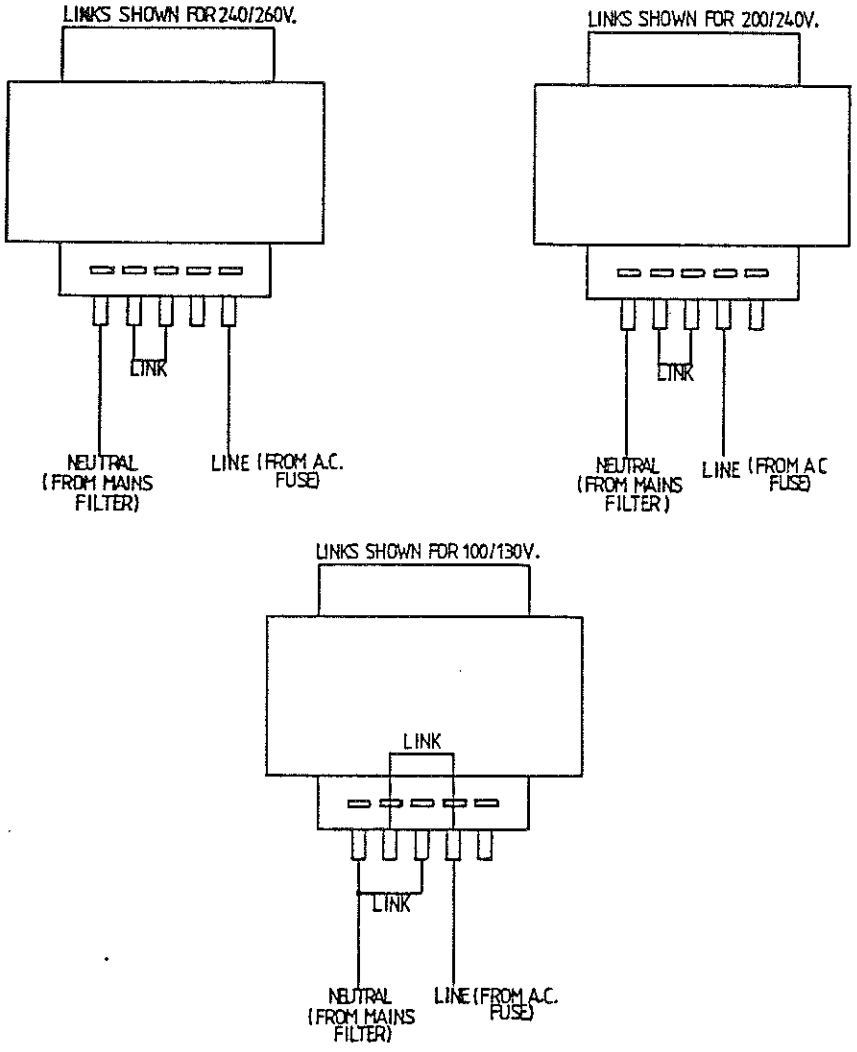
Mains Transformer Voltage Adjustment (See figure 4.1)

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

Mains Transformer Voltage Adjustment



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 (50 ohm 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 600 ohm 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 +6dBm 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, or separately by applying +12V to pin 11.

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 receiver can be connected to permit remote control operation. All circuity is internal and access is via 25 way remote connector socket 1SK2. (See figure 4.3).

Table 4.2

Remote Operation Requirements

Function	Requirements	Pin Number
Clarifier	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) Maximum gain with all lines o/c.	9 to 13
Remote Aerial Attenuator	o/c for maximum attenuation (40dB) o/c for medium attenuation (20dB) (14 and 15 earthed = 0dB attenuation).	14 15 14 and 15
Earth Return To Receiver	----------	16
Remote Mode AM	Earth for AM. o/c for SSB.	17
Remote Selected	Output available to indicate remote selected	18
Remote AGC	o/c for AGC 'OFF' Earth or AGC 'ON'	19
Analog AF Gain	Control AF line output level	20
Remote Select	Earth for remote operation	21
Supply	+15V supply to remote interface adapter	25

Figure 4.2

ANCILLARIES CONNECTOR (1PL1)

VIEWED ON WIRING SIDE

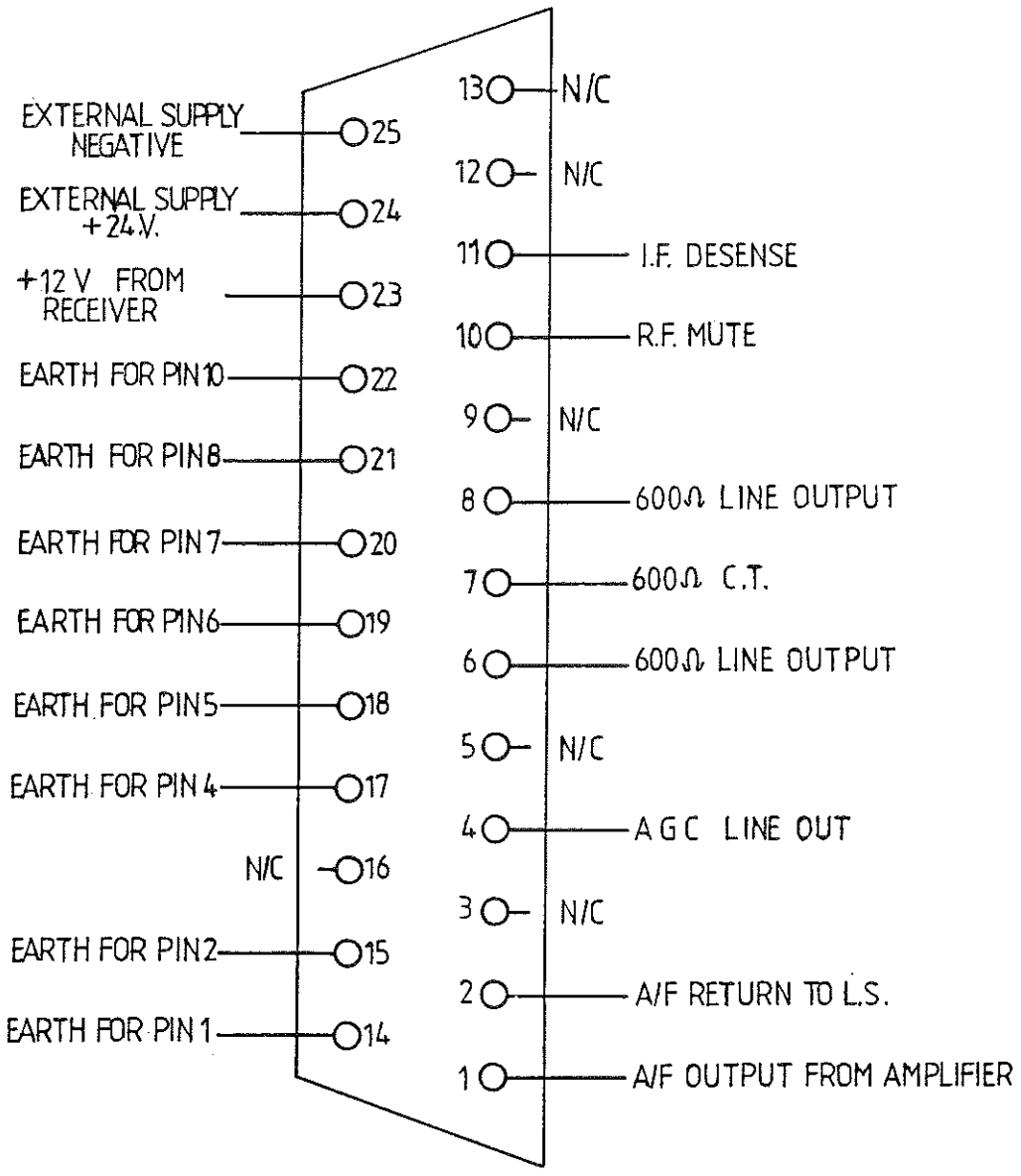
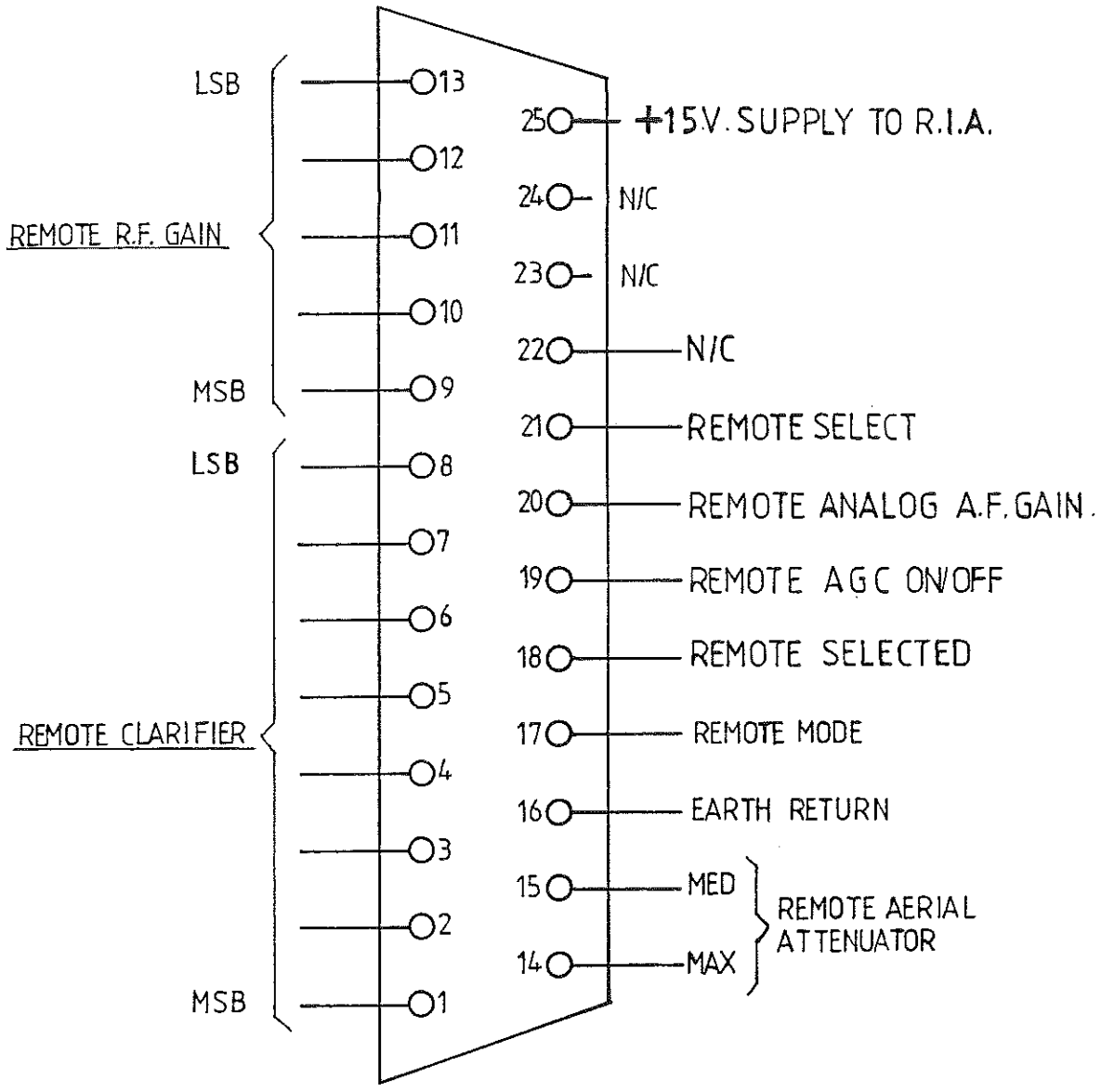


Figure 4.3

REMOTE CONNECTOR (1SK2)

VIEWED ON WIRING SIDE



Section 5

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.

Clarifier : Changes reception frequency by approximately 300Hz either side of the 1st oscillator centre frequency by varying the bias on a varactor-tuned circuit. Adjust for optimum signal reception.

Mode : Two position switch which selects the appropriate circuitry to receive AM or USB.

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 ovens to minimise receiver setting time.

Line level (on rear panel) controls audio output to 600 ohm lines (maximum +6dBm).

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
Clarifier Control	:	Mid-position
Mode	:	Desired reception mode

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 the clarifier control for optimum reception.

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.

8 For remote control operation, make necessary connections from 1SK2 to remote interface adapter or controller, and check functions as above.

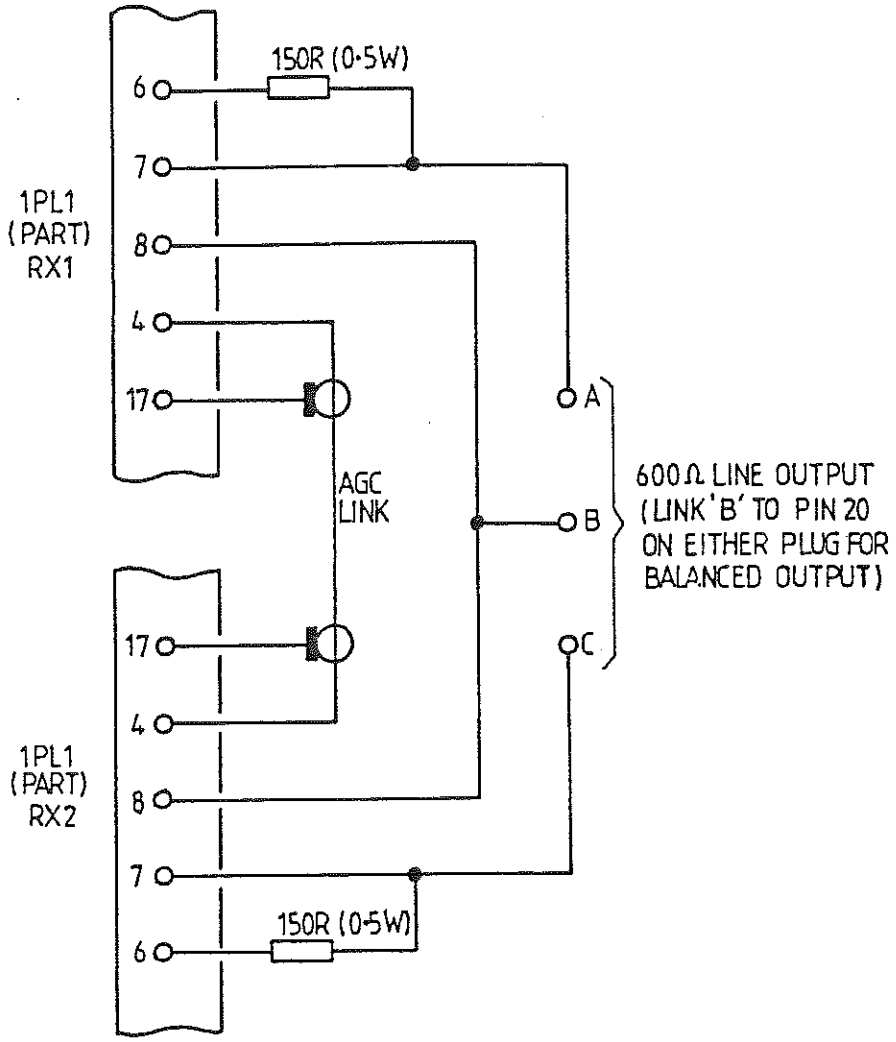
Dual-Diversity Operation

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

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

Figure 5.1

Dual-Diversity Operation



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.

A comprehensive analysis of all circuit voltages for reference when carrying out fault-finding, is included at the end of section 6, 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.

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

Audio Attenuator Board

Removal of three M3 pillars allows the board to move away from the rear panel. Complete removal of the board is possible by further unplugging the connectors on this board.

RF/Remote Board

Unsolder leads to pins 59, 62, 63 and 64 on the RF/remote board. Remove seven 3mm screws, the board can now be hinged upwards to the right of the receiver for access to the printed track. Carefully note lead colours and positions to facilitate correct replacement.

Main Board

Unplug PL1 and PL2 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.

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 Module

Access to the CIO 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.

1st Oscillator Module

Access to the 1st oscillator module is by the same means as the CIO module except that the outer screening cover is retained by two spring clips. As previous unit, any component replacement requires the complete unit to be unsoldered from the RF/remote board.

RF Tuner Board

The RF tuner board is plugged into two sockets on the RF/remote board. Printed circuit board guides are fitted to facilitate insertion of the board and to provide support. A screening box surrounds the RF tuner 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.

TF2022 MF/HF AM/FM Signal Generator

Frequency range: 10kHz to 1000MHz

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 2.5 ohm to 20 kohm 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 (1SKA) using BNC connector.

b) Connect AF power meter (matched to 600 ohm) 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)
Clarifier	-	Middle Position
Mode	-	USB
AF Gain	-	Middle Position
Line Level (Rear Panel)	-	Normally preset to +6dBm output for 1mV at aerial socket.

d) Tune RF signal generator to the appropriate carrier frequency +1kHz, 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 1uV.

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 600 ohm) to pins 6 and 8 of ancillaries connector 1PL1.

b) Connect the output lead from the signal generator to pins 1 and 2 (earth). Set generator frequency to 1399kHz. (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 2uV 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 been 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 'AGC' to 'OFF', 'MODE' to 'AM' and 'RF GAIN' to 'MAXIMUM'. Adjust 2RV6 fully anti-clockwise, 2RV2 mid-position, 2RV4 mid-position, 2RV7 mid-position. Set 2RV8 to give 3.0 volts on slider of RF gain when set at maximum.

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 10uV, adjust L1 and L2 for maximum output, reducing RF carrier input if necessary to prevent overloading. Turn off modulation, and adjust 2RV7 to give 230mV RMS on the coax link adjacent to 2L2 for a generator output level of 10uV.

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

e) Change signal generator frequency to 1.399MHz and remove modulation. Change 'MODE' to 'USB' and adjust 2RV1 to give same audio level.

f) Check that S/N for 2uV input (SSB) is of the order 10dB.

g) Set 'MODE' to 'AM' and 'AGC' to 'OFF'. Adjust signal generator to 1.4MHz, 30% modulation at 1kHz, and connect to the secondary of T2 on RF printed circuit board (reference 3).

h) Adjust L1, L2 and L3 for maximum output. Re-adjust signal generator to 1.399MHz, remove modulation, set receiver 'MODE' to 'USB' and check that the S/N with 2uV 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).

Channel Re-Alignment

a) Check injection voltage to 3IC9 at terminations 51 and 52 (earth) is between 100mV and 500mV RMS. The normal injection voltage is 300mV but because of the wide tuning range this may fall at the higher frequencies, and the mixer is designed to operate satisfactorily between 100mV and 500mV.

b) Connect signal generator to 'AERIAL INPUT' socket, tuned to signal frequency (crystal frequency minus 1.4MHz), and set the generator outut to give audible output.

c) Tune 4C2, 4C4 and 4C9 for maximum output (adjust 4L1, 4L2 and 4L3 if necessary for trimmers to tune).

d) Set 4RV1 on coil board to give a 12dB SINAD on SSB with 1uV input to aerial socket.

e) Adjust 2RV7 to give an AGC threshold of 1uV. Range of RF gain control should be of the order of 70dB and can be adjusted with 2RV6. Adjustment of 2RV6 may require slight re-adjustment of 2RV7.

f) Adjust 2RV2 to give a front end AGC threshold of +47dB/uV when measured on Gate 2 of 3TR5.

g) Adjust 3RV9 and 3RV11 to give a clarifier range of ±300Hz.

h) If using 'REMOTE' working, select 'REMOTE' and adjust 3RV3 and 3RV4 to give a clarifier range of ±300Hz. Adjust 3RV1 and 3RV2 to give the same RF gain control range as 'LOCAL'.

Changing Channel Frequency

a) Remove lids from 1st oscillator module and fit crystal for required frequency (signal frequency plus 1.4MHz).

b) Fit appropriate plug-in RF coil board for frequency required (see table 1).

c) Check injection voltage to 3IC9 at terminations 51 and 52 (earth) is between 100mV and 500mV.

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

e) Tune 4C2, 4C4 and 4C9 for maximum output, reducing signal generator level to luV. (Adjust 4L1, 4L2 and 4L3 if necessary to enable trimmers to tune).

f) Adjust 4RV1 to give a 12dB SINAD on SSB with luV input.

Table 6.1

Plug-In Coil Board Frequency Ranges

Frequency Range	RF Coil Board Number
400kHz to 535kHz	LP3768/12
1.6MHz to 3.0MHz	LP3768/13
3.0MHz to 5.7MHz	LP3768/14
5.7MHz to 10.8MHz	LP3768/15
10.8MHz to 20.0MHz	LP3768/16
20.0MHz to 30.0MHz	LP3768/17

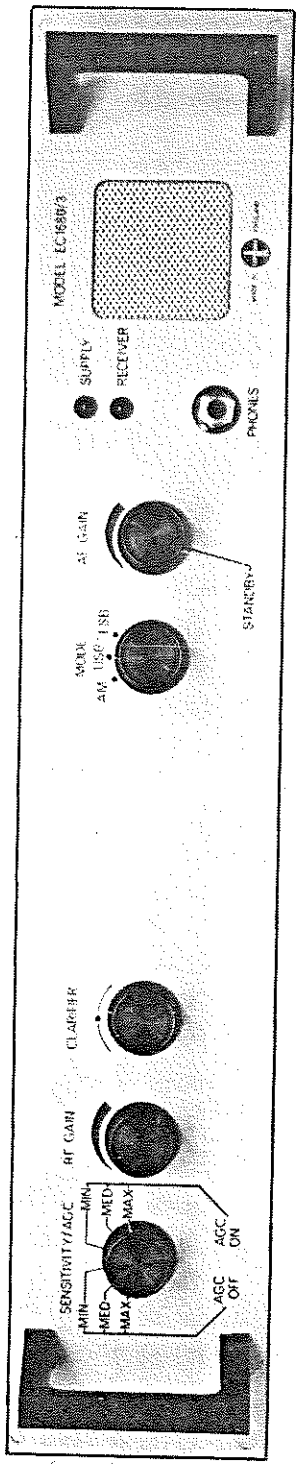
1680/3T Crystal Specification

Style HC36/U
AT CUT
Fundamental Mode
Initial Tolerance ±10 PPM at 65°C
Frequency Variation ±0.5 PPM over 65°C ±2°C
Drive Level 1mW
To tune with 15pf for crystal frequencies less than 8MHz
To tune with 20pf for crystal frequencies above 8MHz
For frequencies above 20MHz style HC42/U
may be used with Eddystone crystal adaptor LP3768/18
(Fundamental crystals in HC36/U not readily available above 20MHz)
Crystal frequency = signal frequency + 1.4MHz.

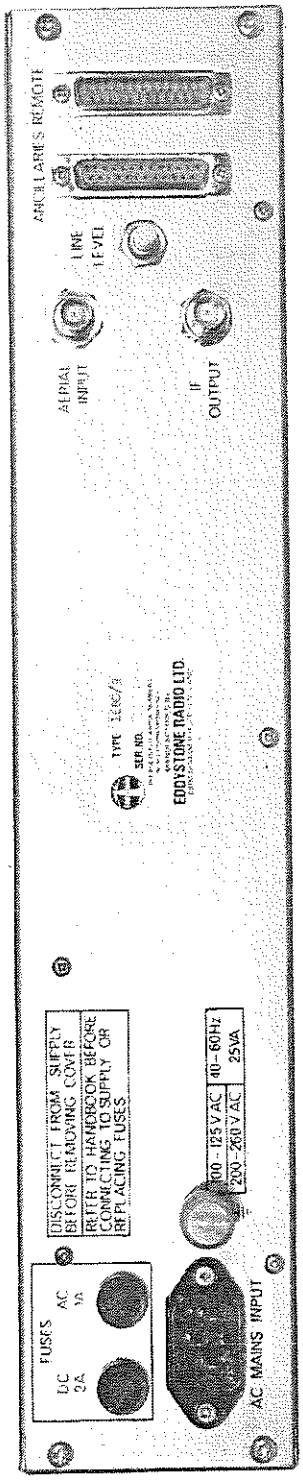
1680/3 Crystal Specification
Carrier Insertion Oscillator)

Style D
AT CUT
Fundamental Mode
Initial tolerance ±10 PPM at 65°C
Frequency variation. Better than ±5 PPM over 65°C ±7°C
Drive level 1mW
Tuning capacity 30pf
Frequency 1400.0kHz

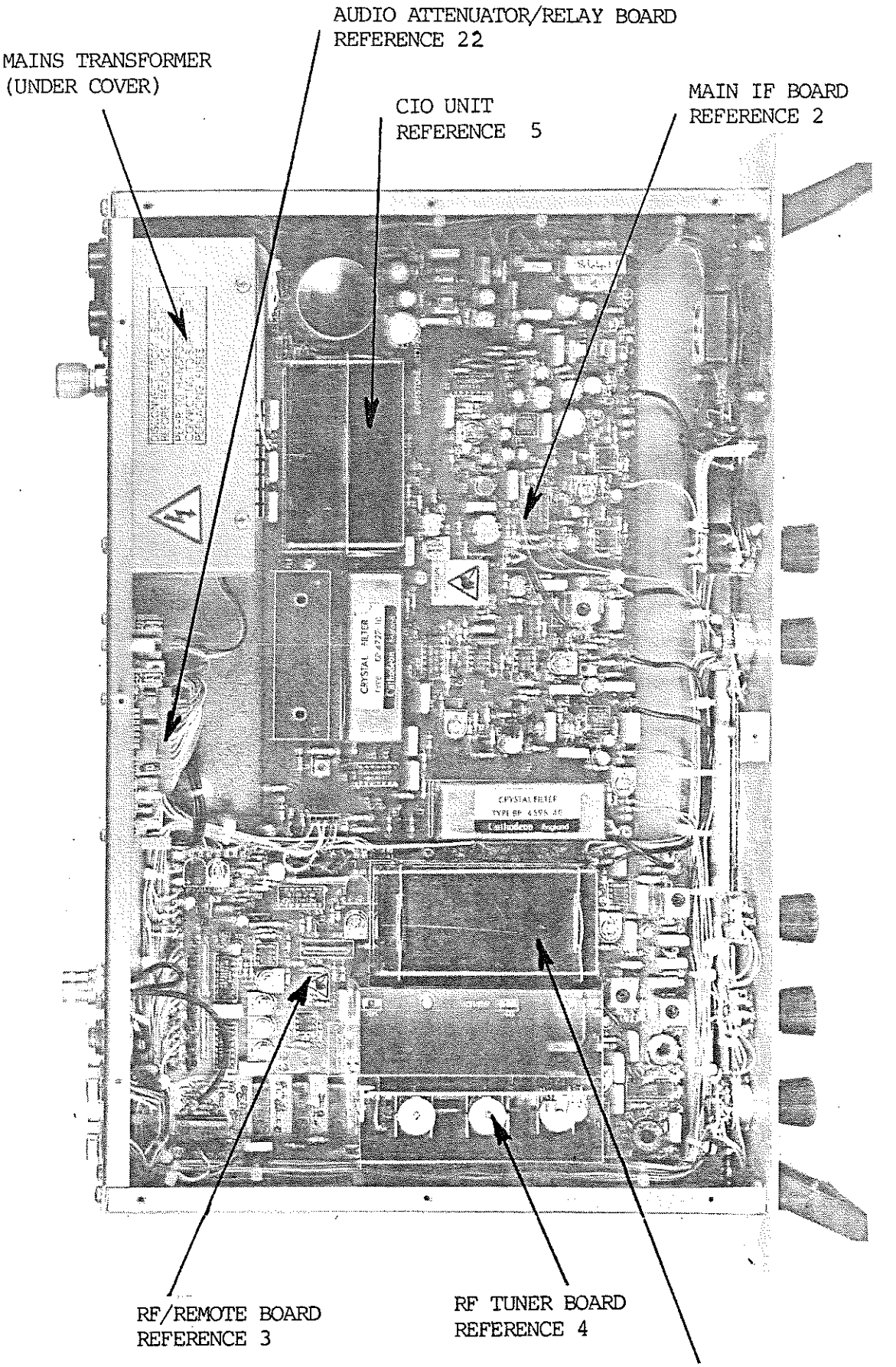
1680/3T RECEIVER FRONT VIEW



1680/3T SERIES RECEIVER REAR VIEW



1680/3T RECEIVER TOP INTERNAL VIEW



VOLTAGE TABLES

Chassis Reference 1

Integrated Circuits

Pin	Input	Output
IC1	23.5	18.0V

Main Board Reference 2

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	11.86	
TR3	1.68	2.39	11.63	
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	11.23	
TR8	2.72	3.4	8.3	
TR9	0	0.6	7.88	
TR11	0	0	14.8	
	0	0.68	0	(With Remote ON)

Main Board Reference 2 Continued....

Integrated Circuits

Pin	1	2	3	4	5	6	7	8	9	10	11	12	13	14
IC1	5.01	5.0	0 (5.0)[1]	5.0	0 (10.15)[1]	10.4	0	5.01	5.01	0	5.01	0 (10.4)[2]	0 (10.42)[2]	11.95
IC2	0 (3.73)[1]	3.73	3.73	3.73	10.19 (0)[1]	10.4 (0)[1]	0	3.73 (0)[1]	3.73	3.73	0 (3.73)[2]	0 (10.4)[2]	0 (10.15)[1]	11.92
IC4	0.7	0.96	0.25	0.7	0	0	0	3.11	6.23	3.57	0	1.33	0	0.7
IC5	3.59 (0)[1]	3.59	3.59	0 (3.59)[1]	0 (11.41)[1]	9.87 (0)[1]	0	0	0 (11.41)[1]	3.59	3.59	9.97	9.87 (0)[1]	11.53
IC7	0	0.74	0.72	0.95	0.34	0.7	6.25	1.35	-	-	-	-	-	-
IC8	5.94	3.75	3.75	0	3.81	3.84	1.73	11.96	-	-	-	-	-	-
IC9	1.57	1.57	1.57	0	9.84	1.9	9.96	11.97	-	-	-	-	-	-
IC10	0.48 (0)[1]	0.5 (0.9)[1]	0.5 (0.9)[1]	0.86	0 (10.15)[1]	0 (10.15)[1]	0	0.87	0 (0.87)[1]	0.5 (0.9)[1]	0.5 (0.9)[1]	10.46 (10.26)[1]	9.87 (0)[1]	11.96
IC11	1.15	0.43 (0)[1]	0.98	6.54	1.09	0.64	0	0	-	-	-	-	-	-
IC12	10.1	0	0	9.81	0.73	1.39	5.09	0	0	0	0	5.23	-	-
IC13	18.0	0	0	17.61	0.72	1.49	8.92	0.14	0	0	0	9.37	-	-
IC14	10.5	10.5	0	3.5	5.2	3.5	0	10.5	-	-	-	-	-	-
IC15	10.5	10.5	0	3.5	5.2	3.5	0	10.5	-	-	-	-	-	-

( )[1] MODE 'AM'
( )[2] MODE 'LSB'

RF/Remote Board Reference 3

Integrated Circuits

Pin	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
IC1	0	0	1.62	1.77	0	0	0	4.81	4.77	4.77	4.77	4.74	4.77	2.49	2.6	2.6
IC2	1.63	3.59	3.57	0	2.21	2.22	1.92	14.77	-	-	-	-	-	-	-	-
IC3	2.01	3.6	3.68	0	2.53	2.53	5.08	14.77	-	-	-	-	-	-	-	-
IC4	0	0	1.6	1.74	4.78	4.78	4.78	4.81	4.78	4.78	4.78	4.78	4.78	2.53	2.53	2.53
IC5	11.6 (11.45)	0	11.6 (11.45)	11.96 (0)	10.46 (0)	11.6 (11.45)	10.33 (0)	0	10.4 (0)	11.6 (11.45)	0	0	11.6 (11.45)	0	11.6 (11.45)	11.6 (11.45,
IC8	-	2.14	2.12	0	-	3.94	10.98	-	-	-	-	-	-	-	-	-
IC9	-	-	11.44	7.8	2.0	-	-	-	-	-	2.99	5.23	5.23	11.44	-	-

( ) REMOTE (LOCAL SWITCHED TO 'REMOTE')

RF/Remote Board Reference 3 Continued...

Transistors

Pin	e	b	c	
TR1	0	0.67 (0.75)	0 (0.13)	
TR2	0	0.67 (0.75)	0 (0.11)	
TR3	0	0	18.04	
TR4	9.81	0	0	
Pin	s	g^1	g^2	d
TR5	2.19	1.87	3.94	10.74

( ) Remote (Local switched to 'Remote')

RF Unit Reference 4

Transistors

Pin	e	b	c
TR1	3.04	3.77	11.89

CIO Module Reference 5

Transistors

Pin	e	b	c
TR2	0.79	1.12	7.48
TR3	0	will vary with temperature	18.03

Integrated Circuits

Pin	1	2	3	4	5	6	7	8
IC1	-	Will vary with temperature	3.93	0	-	Will vary with temperature	18.03	-

1st Oscillator Module Reference 6

Transistors

Pin	e	b	c
TR1	0.53	0.93	12.4
TR2	0	0.64	5.7
TR3	6.6	7.3	14.8
TR4	0	will vary with temperature	18.03

Integrated Circuits

Pin	1	2	3	4	5	6	7	8
IC1	-	will vary with temperature	3.92	0	-	will vary with temperature	18.03	-

Audio Attenuator Board

Transistors

	LOCAL				REMOTE		
Pin	e	b	c		e	b	c
TR1	0	0.66	0		0	0	14
TR2	0	0.66	0		0	0	14.2

	Source	G1	G2	Drain
TR3	2.45	2.5	4	8

Integrated Circuits

Pin	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Remote IC2	0	0	0	0	0	0	0	0	0	4.0	4.0	14.2	14.2	14.3
Local IC2	0	0	0	0	0	0	0	0	0	3.9	0	0	14.2	14.1

Pin	Input	Output
IC1	23	15

ALL VOLTAGES TAKEN ON FLUKE DIGITAL VOLTMETER

CONTROLS SET AS FOLLOWS: (UNLESS OTHERWISE STATED IN NOTES)

Sensitivity AGC	-	Maximum/AGC ON	NO SIGNAL INPUT
RF Gain	-	Maximum (Clockwise)	
Clarifier	-	Middle Position	
Mode	-	USB	
AF Gain	-	Middle Position	

SPARES 1680/3T RECEIVER

Spares for Chassis Assembly Module Prefix 1

Variable Resistors

Circuit Ref.	Value	Tolerance	Voltage Wkg.	Type
1RV1	10k	20%	0.5W	Lin Carbon
1RV2	10k	20%	0.5W	Lin Carbon
1RV3	10k	20%	0.25W	Log Carbon
1RV4	10k	20%	0.25W	Log Carbon*
1RV5	10k	20%	0.5W	Lin Carbon

*Ganged with 1SW1a and 1SW1b.

Integrated Circuits

Circuit Ref.	Type	Manufacturer	Description
1IC1	MC7818CT	Motorola	Voltage Regulator

Diodes

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

Capacitors

Circuit Ref.	Value	Tolerance	Voltage Wkg.	Type
IC1	1u	+50% -20%	100V	Electrolytic

Resistors

Circuit Ref.	Value	Tolerance	Power Rating.	Type
1R1	1k	5%	0.33W	Standard Film
1R2	1k	5%	0.33W	Standard Film
1R3				Not fitted
1R4	8R2	5%	2.5W	Wirewound

Switches

Type	Description	Part Number
1SW1	2P/2W (Ganged with RV4)	11342P
1SW2	Switch Spindle/Clicker 2P 6W	11268P*
1SW3	Switch Spindle/Clicker 1P 3W	11266P*

*Adjustable Stop Clicker.

Transformer

Circuit Ref.	Description	Part Number
1T1	Mains Transformer	11341P

Miscellaneous

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

Main Board Module Prefix 2

Capacitors

Circuit 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				Not Allocated
2C20				Not Allocated
2C21				Not Allocated
2C22				Not Allocated
2C23				Not Allocated
2C24				Not Allocated
2C25				Not Allocated
2C26				Not Allocated
2C27				Not Allocated
2C28				Not Allocated
2C29				Not Allocated
2C30				Not Allocated
2C31	100n	20%	100V	Polyester
2C32	100n	20%	100V	Polyester
2C33	1n6	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	100u	+50% -20%	10V	Electrolytic
2C39	1u	+50% -20%	100V	Electrolytic
2C40	47u	+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

Main Board Prefix 2 Spares Continued....

Capacitors Continued.....

Circuit Ref.	Value	Tolerance	Voltage Wkg.	Type
2C45	1u	+50% -20%	100V	Electrolytic
2C46	10u	+50% -20%	50V	Electrolytic
2C47	100n	20%	100V	Polyester
2C48	100n	+80% -20%	50V	Ceramic Multi-Layer
2C49	100u	+50% -20%	25V	Electrolytic
2C50	100u	+50% -20%	10V	Electrolytic
2C51	10u	+50% -20%	50V	Electrolytic
2C52	100n	20%	100V	Polyester
2C53	1u	+50% -20%	100V	Electrolytic
2C54	4n7	1%	160V	Polystyrene
2C55	100n	20%	100V	Polyester
2C56	100n	20%	100V	Polyester
2C56A	470n	20%	63V	Polyester
2C57	100u	+50% -20%	10V	Electrolytic
2C58	10n	+80% -20%	25V	Ceramic Disc
2C59	10n	+80% -20%	25V	Ceramic Disc
2C60	1u	+50% -20%	100V	Electrolytic
2C61	100u	+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	100u	+50% -20%	25V	Electrolytic
2C74	1u	+50% -20%	100V	Electrolytic
2C75	10u	+50% -20%	50V	Electrolytic
2C76	1u	+50% -20%	100V	Electrolytic
2C77	10n	+80% -20%	25V	Ceramic Disc
2C78	10n	+80% -20%	25V	Ceramic Disc
2C79	10n	+80% -20%	25V	Ceramic Disc
2C80	100u	+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	220u	+50% -20%	16V	Electrolytic
2C87	1000u	+50% -20%	10V	Electrolytic
2C88	10n	+80% -20%	25V	Ceramic Disc
2C89	220u	+50% -20%	16V	Electrolytic
2C90	100u	+50% -20%	10V	Electrolytic
2C91	100u	+50% -20%	10V	Electrolytic
2C92	100n	20%	100V	Polyester
2C93	10u	+50% -20%	50V	Electrolytic

Capacitors Continued.....

Circuit Ref.	Value	Tolerance	Voltage Wkg.	Type
2C94	6800u	+50% -20%	40V	Electrolytic
2C95				Not Allocated
2C96	100n	20%	100V	Polyester
2C97	220u	+50% -20%	25V	Electrolytic
2C98	100n	20%	100V	Polyester
2C99	220u	+50% -20%	25V	Electrolytic
2C100	100u	+50% -20%	25V	Electrolytic
2C101	4n7	10%	100V	Ceramic Plate
2C102	820p	10%	100V	Ceramic Plate
2C103	22u	+50% -20%	35V	Electrolytic
2C104	100n	20%	100V	Polyester
2C105	100u	+50% -20%	25V	Electrolytic
2C106	1000u	+50% -20%	25V	Electrolytic
2C107	100n	20%	100V	Polyester
2C108	100u	+50% -20%	25V	Electrolytic
2C109	220u	+50% -20%	25V	Electrolytic
2C110	820p	10%	100V	Ceramic Plate
2C111	100n	20%	100V	Polyester
2C112	4n7	10%	100V	Ceramic Plate
2C113	100u	+50% -20%	25V	Electrolytic
2C114	100n	20%	100V	Polyester
2C115	220u	+50% -20%	25V	Electrolytic
2C116	100n	+80% -20%	50V	Ceramic Multi-Layer
2C117	10n	+80% -20%	25V	Ceramic Disc
2C118	10n	+80% -20%	25V	Ceramic Disc
2C119	1n3	1%	160V	Polystyrene
2C120	100n	+80% -20%	50V	Ceramic Multi-Layer
2C121	100n	+80% -20%	50V	Ceramic Multi-Layer
2C122	100n	+80% -20%	50V	Ceramic Multi-Layer
2C123	10n	+80% -20%	25V	Ceramic Disc
2C124	10n	+80% -20%	25V	Ceramic Disc
2C125	100n	+80% -20%	50V	Ceramic Multi-Layer
2C126	10n	+80% -20%	25V	Ceramic Disc
2C127	1n3	1%	160V	Polystyrene
2C128	100n	+80% -20%	50V	Ceramic Multi-Layer
2C129	10u	+50% -20%	50V	Electrolytic
2C130	100u	+50% -20%	25V	Electrolytic

Resistors

Circuit 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	Not allocated
2R14	Not allocated
2R15	Not allocated
2R16	Not allocated
2R17	Not allocated
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	(wire link fitted)
2R37	22k
2R38	47R
2R39	100k
2R40	10k
2R41	330R
2R42	100R
2R43	180R
2R44	330R
2R45	1k5
2R46	220R

Circuit Ref.	Value
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	2k2
2R65	Not allocated
2R66	100R
2R67	Not allocated
2R68	Not allocated
2R69	Not allocated
2R70	Not allocated
2R71	10k
2R72	Not allocated
2R73	10k
2R74	4k7
2R75	Not allocated
2R76	470k
2R77	10k
2R78	3M9
2R78A	1M
2R79	100k
2R80	10k
2R81	Not allocated
2R82	Not allocated
2R83	Not allocated
2R84	470k
2R85	47k
2R86	10k
2R87	100k
2R88	100k
2R89	100k
2R90	100k
2R91	560R

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

Resistors Continued....

Circuit Ref.	Value
2R92	560R
2R93	2k2
2R94	4k7
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
2R108	100k
2R109	47R

Circuit Ref.	Value
2R110	47R
2R111	470R
2R112	1k2
2R113	47R
2R114	47R
2R115	560R
2R116	10k
2R117	10k
2R118	1k
2R119	8k2
2R120	Not allocated
2R121	47R
2R122	10k
2R123	100R
2R124	820R
2R125	10k
2R126	22k
2R127	Not allocated
2R128	22R

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

*±5% 0.5W Carbon Film

Potentiometers

Circuit Ref.	Value	Power Rating	Tolerance.	Type
2RV1	1k	0.5W	20%	Horizontal Cermet Preset
2RV2	10k	0.5W	20%	Horizontal Cermet Preset
2RV3				Not allocated
2RV4	4k7	0.5W	20%	Horizontal Cermet Preset
2RV5				Not allocated
2RV6	47k	0.5W	20%	Horizontal Cermet Preset
2RV7	2k2	0.5W	20%	Horizontal Cermet Preset
2RV8	47k	0.5W	20%	Horizontal Cermet Preset

Filters

Circuit Ref.	Type	Manufacturer	Description
2FL1	BP4598-40	Cathodeon	AM
2FL2	BP4727-10	Cathodeon	LSB for USB reception

Integrated Circuits

Circuit Ref.	Type	Manufacturer	Description
2IC1	MC14016 BCP	Motorola	Quad Switch
2IC2	MC14016 BCP	Motorola	Quad Switch
2IC3			Not allocated
2IC4	SL623C	Plessey	AM DET/AGC AMP/SSB Detector
2IC5	MC14016 BCP	Motorola	Quad Switch
2IC6	MC7812CT	Motorola	Voltage Regulator
2IC7	SL1625C	Plessey	AM DET/AGC Amplifier
2IC8	CA3240E	RCA	FET DUAL Op. Amp
2IC9	CA3240E	RCA	FET DUAL Op. Amp
2IC10	MC14016 BCP	Motorola	Quad Switch
2IC11	SL1621C	Plessey	AGC Generator
2IC12	TBA810S	SGS	Audio Amplifier
2IC13	TBA810S	SGS	Audio Amplifier
2IC14	MC1350P	Motorola	IF Amplifier
2IC15	MC1350P	Motorola	IF Amplifier

Diodes

Circuit Ref.	Type	Manufacturer	Description
2D1	BZX79C6V2	Mullard	Zener
2D2	BAX13	Mullard	Silicon H/S Switching
2D3	BZX79C6V2	Mullard	Zener
2D4	BAX13	Mullard	Silicon H/S Switching
2D5	BAX13	Mullard	Silicon H/S Switching
2D6			Not allocated
2D7	BAX13	Mullard	Silicon H/S Switching
2D8	BAX13	Mullard	Silicon H/S Switching
2D9	BAX13	Mullard	Silicon H/S Switching
2D10	BZX79C6V2	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	BZX91	Mullard	Voltage Reference

Transistors

Circuit Ref.	Type	Manufacturer	Description
2TR1	BFR54	Mullard	Silicon RF
2TR2	BFR54	Mullard	Silicon RF
2TR3	BFR54	Mullard	Silicon RF

Transistors Continued...

Circuit Ref.	Type	Manufacturer	Description
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			Not fitted
2TR11	BC547B	Mullard	Silicon G/P
2TR12			Not fitted

Transformer

Circuit Ref.	Type	Manufacturer
2T1	(600 ohm) 8641P	Eddystone

Chokes

Circuit Ref.	Value	Type	Manufacturer
2CH1			Not allocated
2CH2			Not allocated
2CH3	100mH	SC60 7350P	Sigma
2CH4	47uH	SC60 9492P	Sigma
2CH5	10uH	SC60 9379P	Sigma
2CH6	10uH	SC60 9379P	Sigma

Inductors

Circuit Ref.	Type	Manufacturer
2L1	D5466	Eddystone
2L2	D5644	Eddystone

Miscellaneous

Printed Circuit Board 11137PB

Spares for RF Board Module Prefix 3

Capacitors

Circuit Ref.	Value	Tolerance	Voltage Wkg.	Type
3C1	10n	+80% -20%	25V	Ceramic Disc
3C2	10n	+80% -20%	25V	Ceramic Disc
3C3	10n	+80% -20%	25V	Ceramic Disc
3C4	10n	+80% -20%	25V	Ceramic Disc
3C5	10n	+80% -20%	25V	Ceramic Disc
3C6	220n	20%	100V	Polyester
3C7				Not allocated
3C8	10n	+80% -20%	25V	Ceramic Disc
3C9	10n	+80% -20%	25V	Ceramic Disc
3C10	10n	+80% -20%	25V	Ceramic Disc
3C11	10n	+80% -20%	25V	Ceramic Disc
3C12	10n	+80% -20%	25V	Ceramic Disc
3C13	10n	+80% -20%	25V	Ceramic Disc
3C14	10n	+80% -20%	25V	Ceramic Disc
3C15	10n	+80% -20%	25V	Ceramic Disc
3C16	220n	20%	100V	Polyester
3C17	10n	+80% -20%	25V	Ceramic Disc
3C18	10n	+80% -20%	25V	Ceramic Disc
3C19	10n	+80% -20%	25V	Ceramic Disc
3C20	10n	+80% -20%	25V	Ceramic Disc
3C21	10n	+80% -20%	25V	Ceramic Disc
3C22	10n	+80% -20%	25V	Ceramic Disc
3C23	10n	+80% -20%	25V	Ceramic Disc
3C24	10n	+80% -20%	25V	Ceramic Disc
3C25	100u	+50% -20%	25V	Electrolytic
3C26	10u	+50% -20%	50V	Electrolytic
3C27	1u	+50% -20%	100V	Electrolytic
3C28	1u	+50% -20%	100V	Electrolytic
3C29	10n	+80% -20%	25V	Ceramic Disc
3C30	100n	20%	100V	Polycarbonate
3C31	10n	+80% -20%	25V	Ceramic Disc
3C32	100n	20%	100V	Polycarbonate
3C33	10n	+80% -20%	25V	Ceramic Disc
3C34	100n	20%	100V	Polycarbonate
3C35	10n	+80% -20%	25V	Ceramic Disc
3C36	100n	20%	100V	Polycarbonate
3C37	10n	+80% -20%	25V	Ceramic Disc
3C38	100n	20%	100V	Polycarbonate
3C39	100n	20%	100V	Polycarbonate
3C40	10n	+80% -20%	25V	Ceramic Disc
3C41	100n	20%	100V	Polycarbonate
3C42	100p	2%	100V	Ceramic Plate
3C43	100n	20%	100V	Polycarbonate
3C44	100p	2%	100V	Ceramic Plate
3C45	10u	+50% -20%	50V	Electrolytic
3C46	100n	20%	100V	Polycarbonate
3C47	15p	2%	100V	Ceramic Plate
3C48	1n6	1%	160V	Polystyrene
3C49	8n2	5%	160V	Polystyrene

Capacitors Continued....

Circuit Ref.	Value	Tolerance	Voltage Wkg.	Type
3C50	2n	1%	160V	Polystyrene
3C51	100n	20%	100V	Polycarbonate
3C52	100p	2%	100V	Ceramic Plate
3C53	100n	20%	100V	Polycarbonate
3C54	1n6	1%	160V	Polystyrene
3C55	10u	20%	25V	Tantalum
3C56	100n	20%	100V	Polycarbonate
3C57	10u	20%	25V	Tantalum
3C58	100n	20%	100V	Polycarbonate
3C59	100n	20%	100V	Polycarbonate

Resistors

Circuit Ref.	Value	Tolerance	Power Rating	Type
3R1a-h	10k (x8)	2%	180mW (Each Resistor)	Resistor Network
3R2a-h	10k (x8)	2%	180mW (Each Resistor)	Resistor Network
3R3				Not allocated
3R4				Not allocated
3R5	100k			
3R6	1k			
3R7	100k			
3R8	100k			
3R9	18k			
3R10	18k			
3R11	100k			
3R12	100k			
3R13	100k			
3R14	100k			
3R15	1k			
3R16	100k			
3R17	100k			
3R18	1k			
3R19a-h	10k (x8)	2%	180mW (Each Resistor)	Resistor Network
3R20	390R			
3R21	10k			
3R22	1k			
3R23	22k			
3R24	100k			
3R25	22k			
3R26	100k			
3R27	82R			

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

Resistors Continued...

Circuit Ref.	Value	Tolerance	Power Rating	Type
3R28	100R			
3R29				Not allocated
3R30	33R			
3R31	10k			
3R32	68R			
3R33	18R			
3R34	68R			
3R35	68R			
3R36	18R			
3R37	68R			
3R38	22R			
3R39	470R			
3R40	150R			
3R41	10R			
3R42	100k			
3R43	100k			
3R44	100k			
3R45	100k			
3R46	100R			
3R47	470k			
3R48	22k			
3R49	22R			
3R50	330R			
3R51	100R			
3R52	330R			
3R53	47R			
3R54	Not fitted			
3R55	Not fitted			
3R56	1k			

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

Potentiometers

Circuit Ref.	Value	Tolerance	Power Rating	Type
3RV1	10k	20%	0.5W	Horizontal Cermet Preset
3RV2	470k	20%	0.5W	Horizontal Cermet Preset
3RV3	470k	20%	0.5W	Horizontal Cermet Preset
3RV4	10k	20%	0.5W	Horizontal Cermet Preset
3RV5				Not fitted
3RV6				Not fitted
3RV7	10k	20%	0.5W	Horizontal Cermet Preset
3RV8	1k	20%	0.5W	Horizontal Cermet Preset
3RV9	100k	20%	0.5W	Horizontal Cermet Preset
3RV10				Not fitted
3RV11				Not fitted
3RV12	100k	20%	0.5W	Horizontal Cermet Preset

Integrated Circuits

Circuit Ref.	Type	Manufacturer	Description
3IC1	ZN425E-8	Ferranti	D/A Converter
3IC2	CA3240E	RCA	FET Dual OP Amp.
3IC3	CA3240E	RCA	FET Dual OP Amp.
3IC4	ZN425E-8	Ferranti	D/A Converter
3IC5	MC14502 BCP	Motorola	Strobed Hex Inverter/Buffer
3IC6	MC7805 CT	Motorola	Voltage Regulator
3IC7	MC7815 CT	Motorola	Voltage Regulator
3IC8	CA3140E	RCA	FET OP Amp.
3IC9	SL6440C	Plessey	Balanced Mixer

Diodes

Circuit Ref.	Type	Manufacturer	Description
3D1	BAX13	Mullard	Silicon H/S Switching
3D2	BAX13	Mullard	Silicon H/S Switching
3D3	BAX13	Mullard	Silicon H/S Switching
3D4	BAX13	Mullard	Silicon H/S Switching
3D5	BAX13	Mullard	Silicon H/S Switching
3D6	BAX13	Mullard	Silicon H/S Switching
3D7	BAV10	Mullard	Silicon H/S Switching
3D8	BAV10	Mullard	Silicon H/S Switching
3D9	BAV10	Mullard	Silicon H/S Switching
3D10	BAV10	Mullard	Silicon H/S Switching
3D11	BAV10	Mullard	Silicon H/S Switching
3D12	BAV10	Mullard	Silicon H/S Switching
3D13	BAV10	Mullard	Silicon H/S Switching
3D14	BAV10	Mullard	Silicon H/S Switching
3D15	BAX13	Mullard	Silicon H/S Switching
3D16	BAX13	Mullard	Silicon H/S Switching
3D17	BAX13	Mullard	Silicon H/S Switching
3D18	BAX13	Mullard	Silicon H/S Switching
3D19	BAX13	Mullard	Silicon H/S Switching
3D20	BAX13	Mullard	Silicon H/S Switching
3D21	BAX13	Mullard	Silicon H/S Switching
3D22	BAX13	Mullard	Silicon H/S Switching
3D23	BZX79C7V5	Mullard	Zener

Transistors

Circuit Ref.	Type	Manufacturer	Description
3TR1	BC547B	Mullard	Silicon G/P
3TR2	BC547B	Mullard	Silicon G/P
3TR3	BC547B	Mullard	Silicon G/P
3TR4	BC547B	Mullard	Silicon G/P
3TR5	40673 or 3SK51	RCA/Hitachi	Dual Gate MOS FET

Sockets

Description	Number
SKA 3 Way Top Entry Connector	11338P
SKB 3 Way Top Entry Connector	11338P
SKC 3 Way Top Entry Connector	11338P

Transformers

Circuit Ref.	Type	Manufacturer
3T1	D5656	Eddystone
3T2	D5657	Eddystone

Coils

Circuit Ref.	Type	Manufacturer
3L1	D5399	Eddystone
3L2	D5652	Eddystone
3L3	D5399	Eddystone

Choke

Circuit Ref.	Value	Manufacturer	Type
3CH1	100uH	Sigma	SC60 9491P

Relays

Circuit Ref.	Type	Manufacturer
3RLA		Not fitted
3RLB	HE321C1200	Hamlin
3RLC	HE321C1200	Hamlin
3RLD	HE321C1200	Hamlin
3RLE	HE321C1200	Hamlin
3RLF	HE321C1200	Hamlin
3RLG		Not fitted

Miscellaneous

Printed Circuit Board	11214PA

Spares for CIO Board Module Prefix 5

Capacitors

Circuit Ref.	Value	Tolerance	Voltage Wkg.	Type
5C1				Not fitted
5C2				Not fitted
5C3				Not fitted
5C4				Not fitted
5C5				Not fitted
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

Resistors

Circuit Ref.	Value	Tolerance	Power Rating	Type
5R1				Not fitted
5R2				Not fitted
5R3				Not fitted
5R4	2k7	5%	0.33W	Standard Film
5R5	470R	5%	0.33W	Standard Film
5R6	470k	5%	0.33W	Standard Film
5R7	1k	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

Potentiometers

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

Integrated Circuits

Circuit Ref.	Type	Manufacturer	Description
5IC1	MC1741CP	Motorola	Operational Amplifier

Diodes

Circuit Ref.	Type	Manufacturer	Description
5D1			Not fitted
5D2	BAX13	Mullard	Silicon H/S Switching
5D3	BAX13	Mullard	Silicon H/S Switching

Transistors

Circuit Ref.	Type	Manufacturer	Description
5TR1			Not fitted
5TR2	BFR54	Mullard	Silicon RF
5TR3	BD438	Mullard	Silicon NPN Power

Thermistor

Circuit Ref.	Type	Manufacturer	Description
5TH1	VA1066S	Mullard	Thermistor

Miscellaneous

XTL1 1400kHz 8665P
Printed Circuit Board 11208P

Spares for 1st Oscillator Module Prefix 6

Capacitors

Circuit Ref.	Value	Tolerance	Voltage Wkg.	Type
6C1	10n	+80% -20%	25V	Ceramic Disc
6C2	120p	2%	100V	Plate Ceramic
6C3	120p	2%	100V	Plate Ceramic
6C4	10n	+80% -20%	25V	Ceramic Disc
6C5	10n	+80% -20%	25V	Ceramic Disc
6C6	10n	+80% -20%	25V	Ceramic Disc
6C7	10n	+80% -20%	25V	Ceramic Disc
6C8	100u	+50% -20%	25V	Electrolytic
6C9	10n	+80% -20%	25V	Ceramic Disc
6C10	470n	20%	35V	Tantalum
6C11	1u	+50% -20%	100V	Electrolytic

Resistors

Circuit Ref.	Value	Tolerance	Power Rating	Type
6R1	1M			
6R2	1M			
6R3	470k			
6R4	2k7			
6R5	1k			
6R6	47k			
6R7	2k2			
6R8	470k			
6R9	10k			
6R10	10k			
6R11	4k7			
6R12	27k	1%	0.4W	Metal Film
6R13	7k5	1%	0.4W	Metal Film
6R14	4k7	1%	0.4W	Metal Film
6R15	33k			

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

Variable Resistors

Circuit Ref.	Value	Tolerance	Power Rating	Type
6RV1	47k	20%	0.5W	Horizontal Preset Cermet

Integrated Circuits

Circuit Ref.	Type	Manufacturer	Description
6IC1	MC7815CT	Motorola	Voltage Regulator
6IC2	MC1741CP1	Motorola	OP Amp.

Diodes

Circuit Ref.	Type	Manufacturer	Description
6D1	MV209	Motorola	Varicap Diode
6D2	BAX13	Mullard	Silicon H/S Switching
6D3	BAX13	Mullard	Silicon H/S Switching
6D4	BAX13	Mullard	Silicon H/S Switching
6D5	BAX13	Mullard	Silicon H/S Switching

Transistors

Circuit Ref.	Type	Manufacturer	Description
6TR1	BFR54	Mullard	Silicon RF
6TR2	BC547B	Mullard	Silicon Op Amp.
6TR3	BFR54	Mullard	Silicon RF
6TR4	BD438	Mullard	Silicon Power

Miscellaneous

TH1 VA1066S Thermistor Mullard
Printed Circuit Board Oscillator and Oven Control 11204P

Spares-for RF Tuner Module Prefix 4

Capacitors

Circuit Ref.	Value	Tolerance	Voltage Wkg.	Type
4C1	33p	2p	160V	Polystyrene
4C2	8-135p	-	250V	Film Dielectric Trimmer
4C3	33p	2p	160V	Polystyrene
4C4	8-135p	-	250V	Film Dielectric Trimmer
4C5	10n	+80% -20%	25V	Ceramic Disc
4C6	100n	20%	100V	Polycarbonate
4C7	10n	+80% -20%	25V	Ceramic Disc
4C8	33p	2%	100V	Plate Ceramic
4C9	8-135p	-	250V	Film Dielectric Trimmer

Resistors

Circuit Ref.	Value	Tolerance	Power Rating	Type
4R1	1k	5%	0.33W	Carbon Film
4R2	470R	5%	0.33W	Carbon Film
4R3	220R	5%	0.33W	Carbon Film

Variable Resistors

Circuit Ref.	Value	Tolerance	Power Rating	Type
4RV1	220R	20%	0.5W	Cermet Preset (Vertical)

Chokes

Circuit Ref.	Value	Type	Manufacturer	Part Number
4CH1	22uH	SC60	SIGMA	1276OP

Spares for RF Tuner Module Prefix 4 Continued...

Transistors

Circuit Ref.	Type	Manufacturer	Description
4TR1	BFW30	Mullard	RF Amp.

Inductors

Circuit Ref.	Type	Part Number
4L1/2	Range 1 RF	D5681
4L1/2	Range 2 RF	D5683
4L1/2	Range 3 RF	D5685
4L1/2	Range 4 RF	D5687
4L1/2	Range 5 RF	D5689
4L3	Range 1 Mixer	D5682
4L3	Range 2 Mixer	D5684
4L3	Range 3 Mixer	D5686
4L3	Range 4 Mixer	D5688
4L3	Range 5 Mixer	D5690

Miscellaneous

Printed Circuit Board 11215PA

Audio Attenuator/Relay Module Prefix 22

Capacitors

Circuit Ref.	Value	Tolerance	Voltage Wkg.	Type
22C1	1u	+50% -20%	100V	Electrolytic
22C2	100u	+50% -20%	25V	Electrolytic
22C3	1u	+50% -20%	100V	Electrolytic
22C4	100u	+50% -20%	25V	Electrolytic
22C5	100u	+50% -20%	10V	Electrolytic
22C6	47u	+50% -20%	25V	Electrolytic
22C7	100n	+80% -20%	50V	Multi-Layer Ceramic
22C8	100u	+50% -20%	10V	Electrolytic
22C9	10n	+80% -20%	25V	Disc Ceramic

Resistors

Circuit Ref.	Value
22R1	2k2
22R2	22R
22R3	10k
22R4	100R
22R5	820R
22R6	330R
22R7	10k
22R8	22k
22R9	100k
22R10	39k
22R11	100k
22R12	1k

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

Transistors

Circuit Ref.	Type	Manufacturer	Description
22TR1	BD437	Mullard	NPN GP Amp
22TR2	BC547B	Mullard	NPN GP Amp
22TR3	40673	RCA	Dual Gate Mosfet

Diodes

Circuit Ref.	Type	Manufacturer	Description
22D1	BAX13	Mullard	H/S Switching
22D2	BAX13	Mullard	H/S Switching
22D3	BAX13	Mullard	H/S Switching

Integated Circuits

Circuit Ref.	Type	Manufacturer	Description
22IC1	MC7815CT	Motorola	Voltage Regulator
22IC2	MC14016BCP	Motorola	Quad Analogue Gate

Miscellaneous

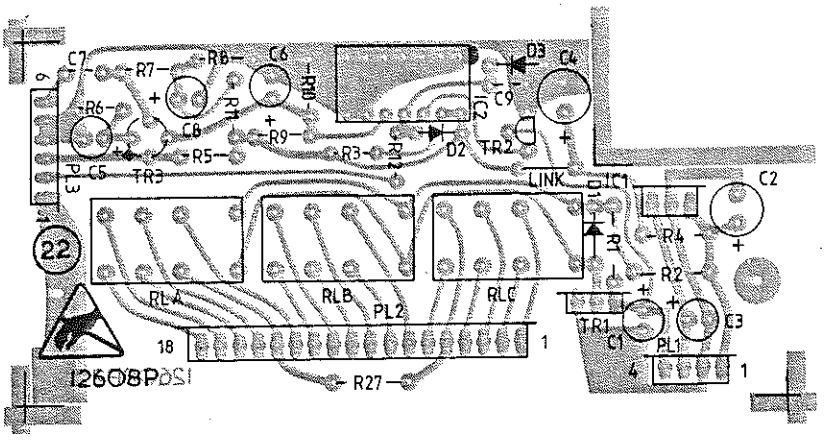
PL1	4 way connector plug	12306P
PL2	6 way connector plug	12307P
PL3	18 way connector plug	12658P
RLA	Relay	12659P
RLB	Relay	12659P
RLC	Relay	12659P
Printed Circuit Board		12608P

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 Number of the equipment in all communications.

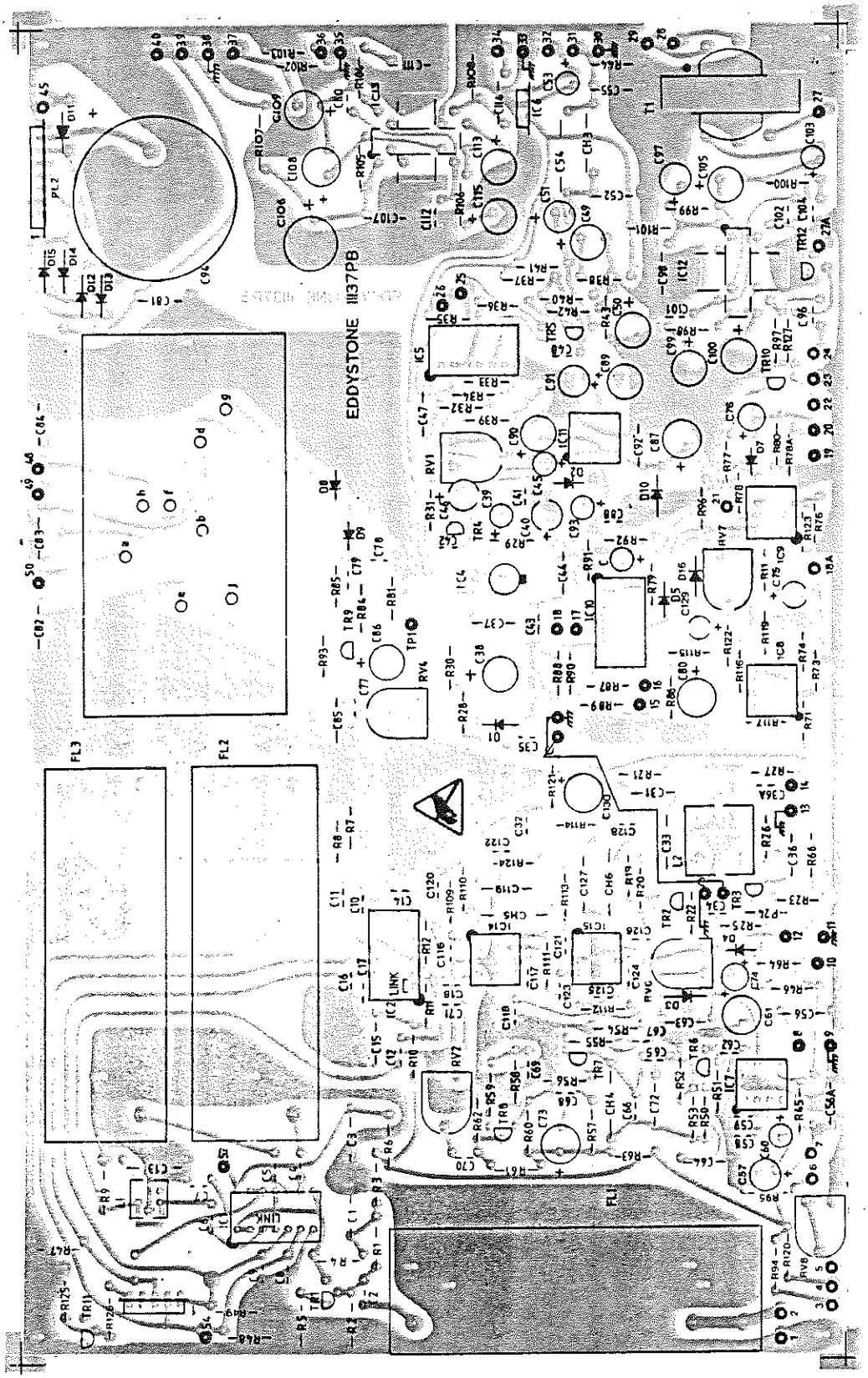
EDDYSTONE RADIO LIMITED,
SALES AND SERVICE DEPARTMENT,
ALVECHURCH ROAD,
BIRMINGHAM B31 3PP,
ENGLAND.

TELEPHONE: 021-475-2231
TELEX: 337081
CABLES: EDDYSTONE BIRMINGHAM
FAX: 021-477-5224

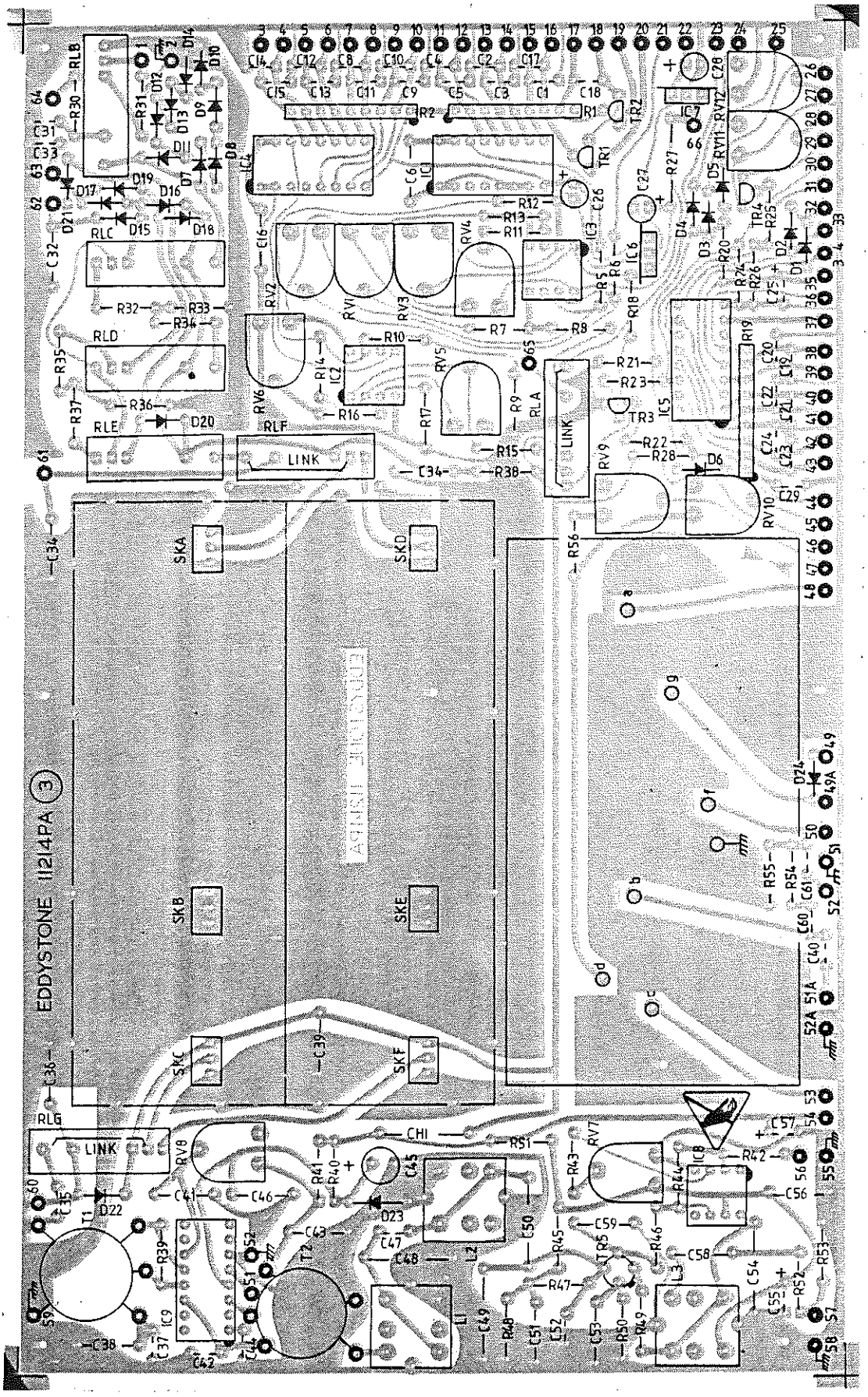
Audio Attenuator/Relay Board 12608P Reference 22



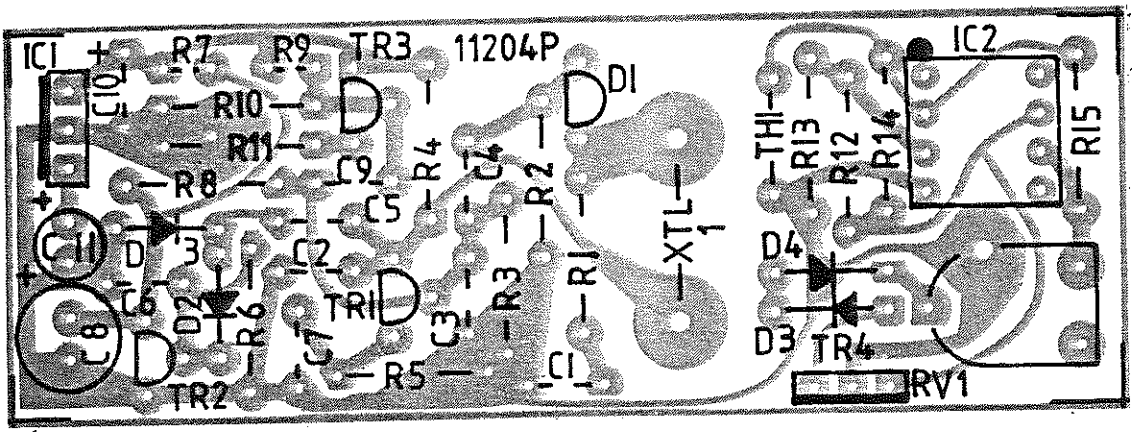
Main Board 11137PB Reference 2



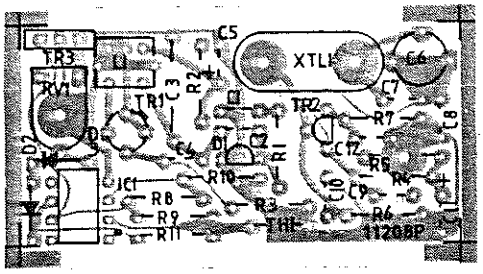
RF/Remote Board 11214PA Reference 3



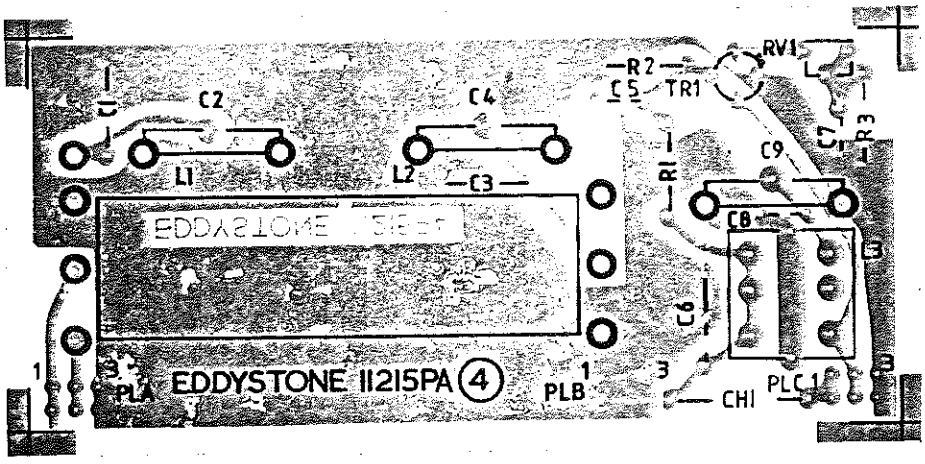
1st Oscillator Board 11204P Reference 6



CIO Board 11208P Reference 5



RF Tuner Board 11215PA Reference 4



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 (approximately 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 five 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 re-produced, e.g. 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 susceptiable 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.

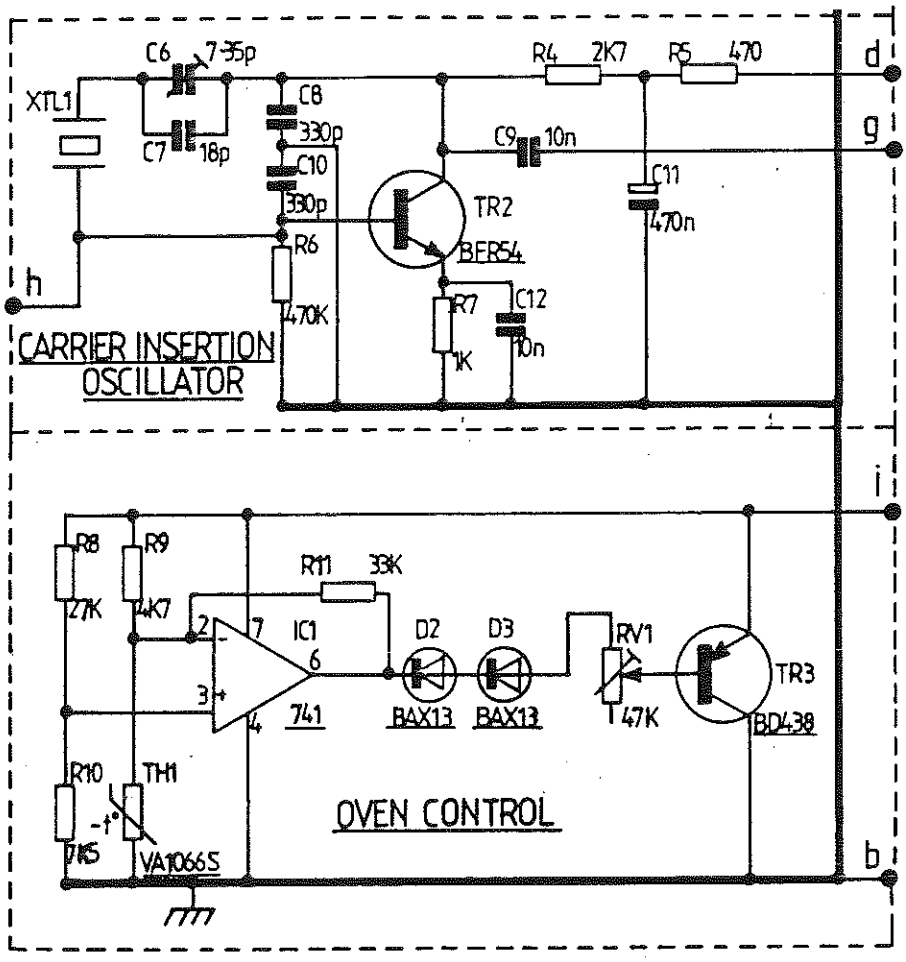
2. Soldering iron, bench surface, tools etc., should all be earthed. The operator should be earthed using a 1M ohm series resistor.

3. The equipment should be swiched 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%).

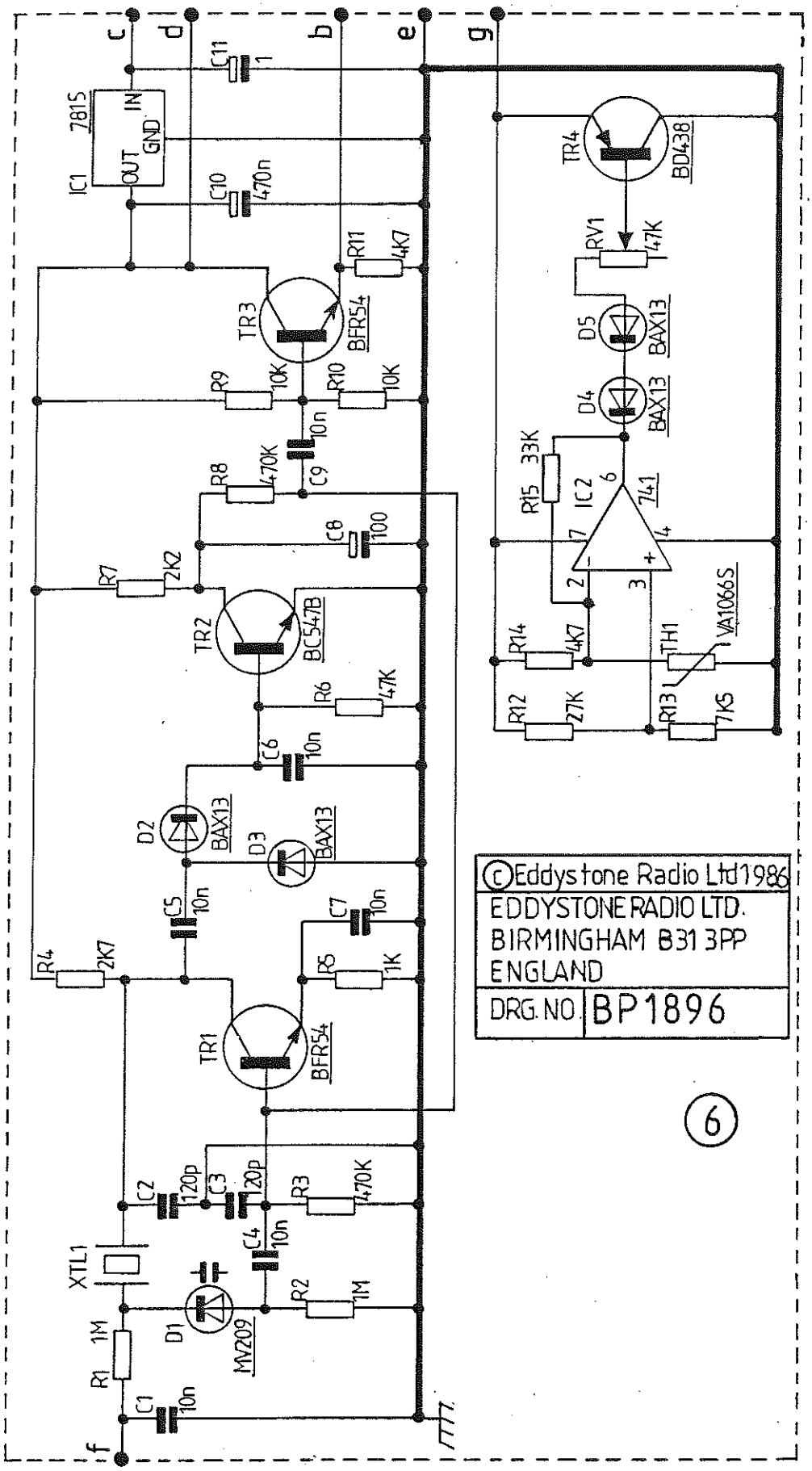
C10 MODULE REF.5.

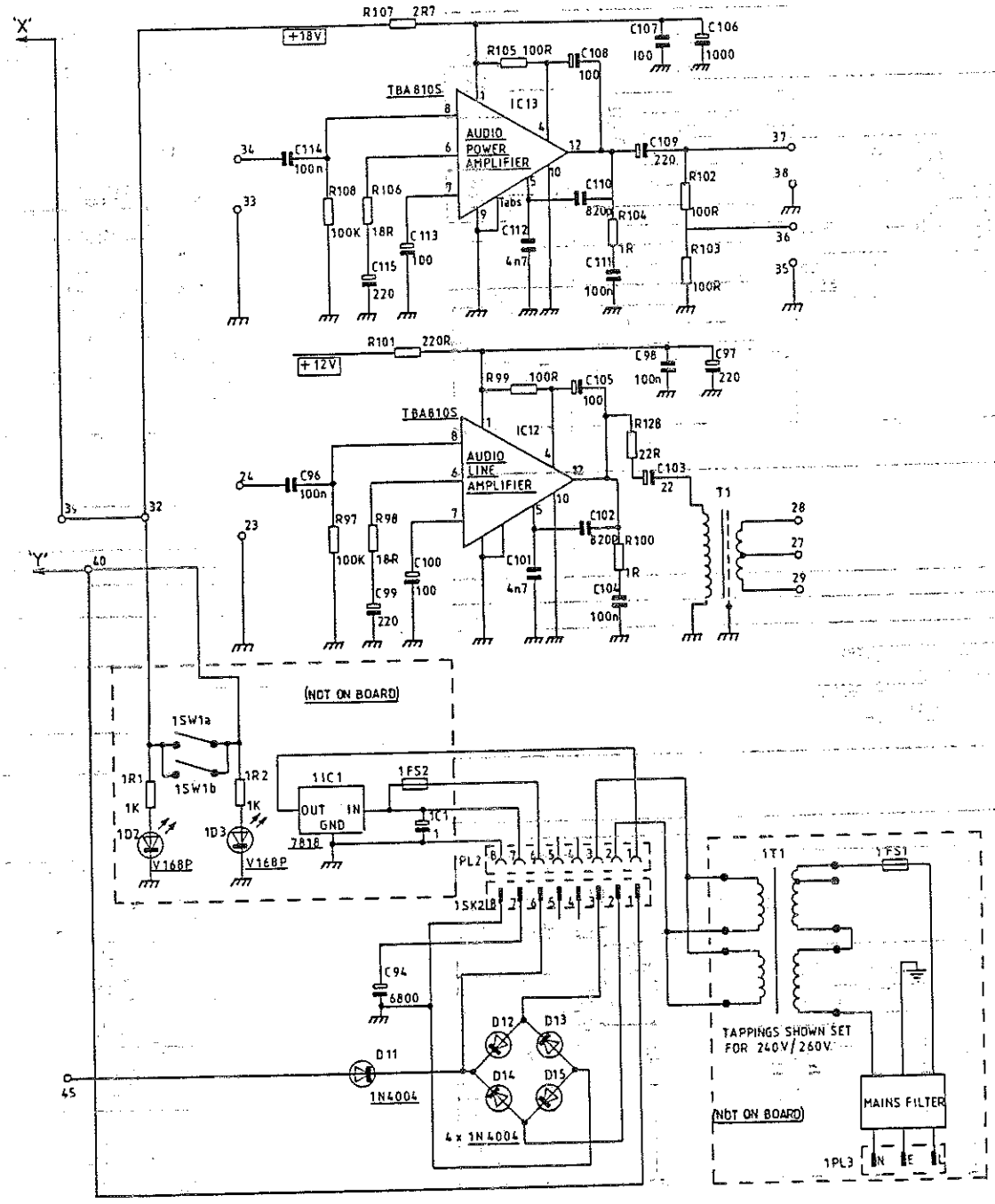


EDDYSTONE RADIO LTD.
BIRMINGHAM B31 3PP
ENGLAND

DRG. NO. BP1895

1st OSCILLATOR MODULE REF.6.



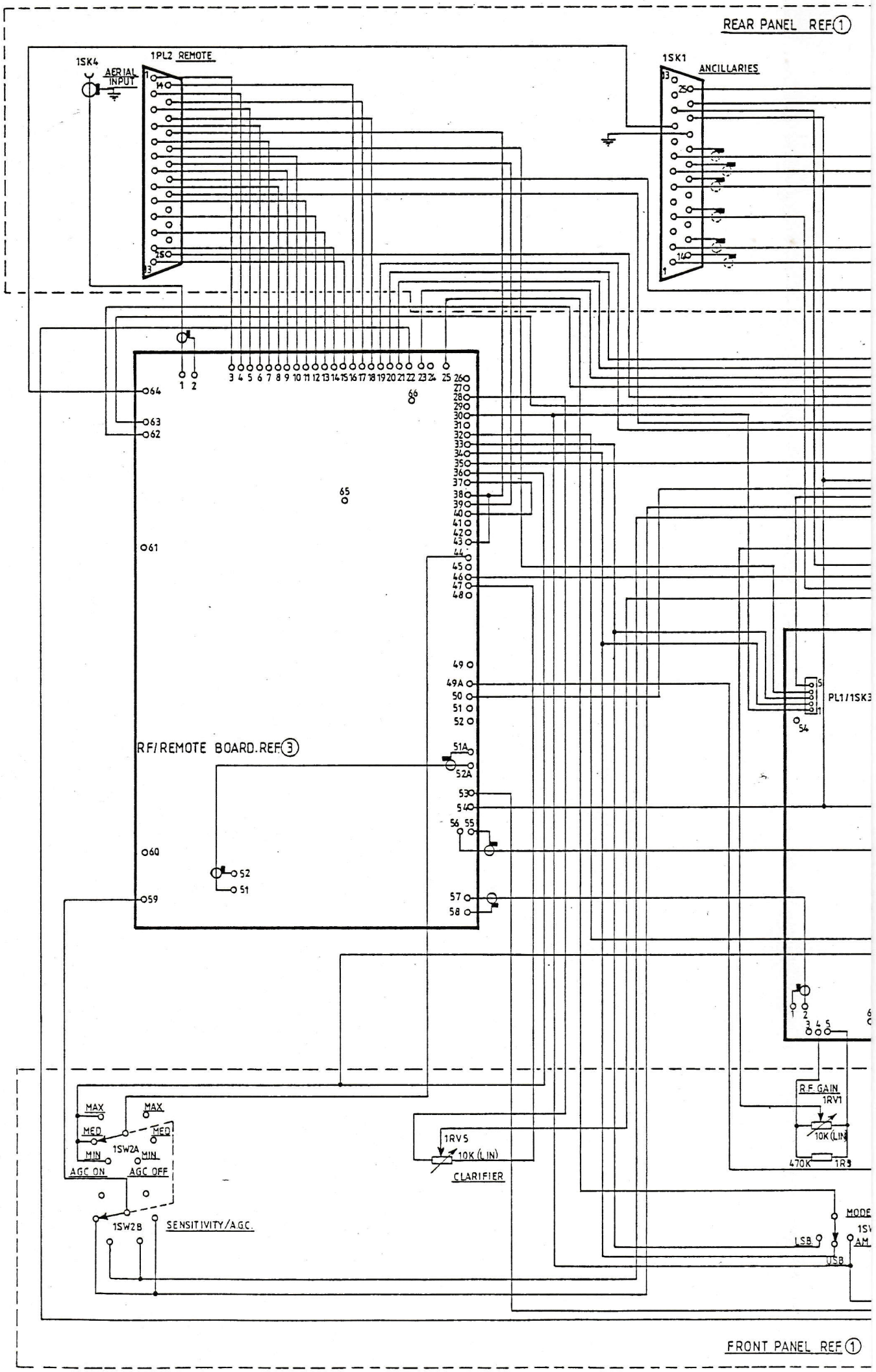


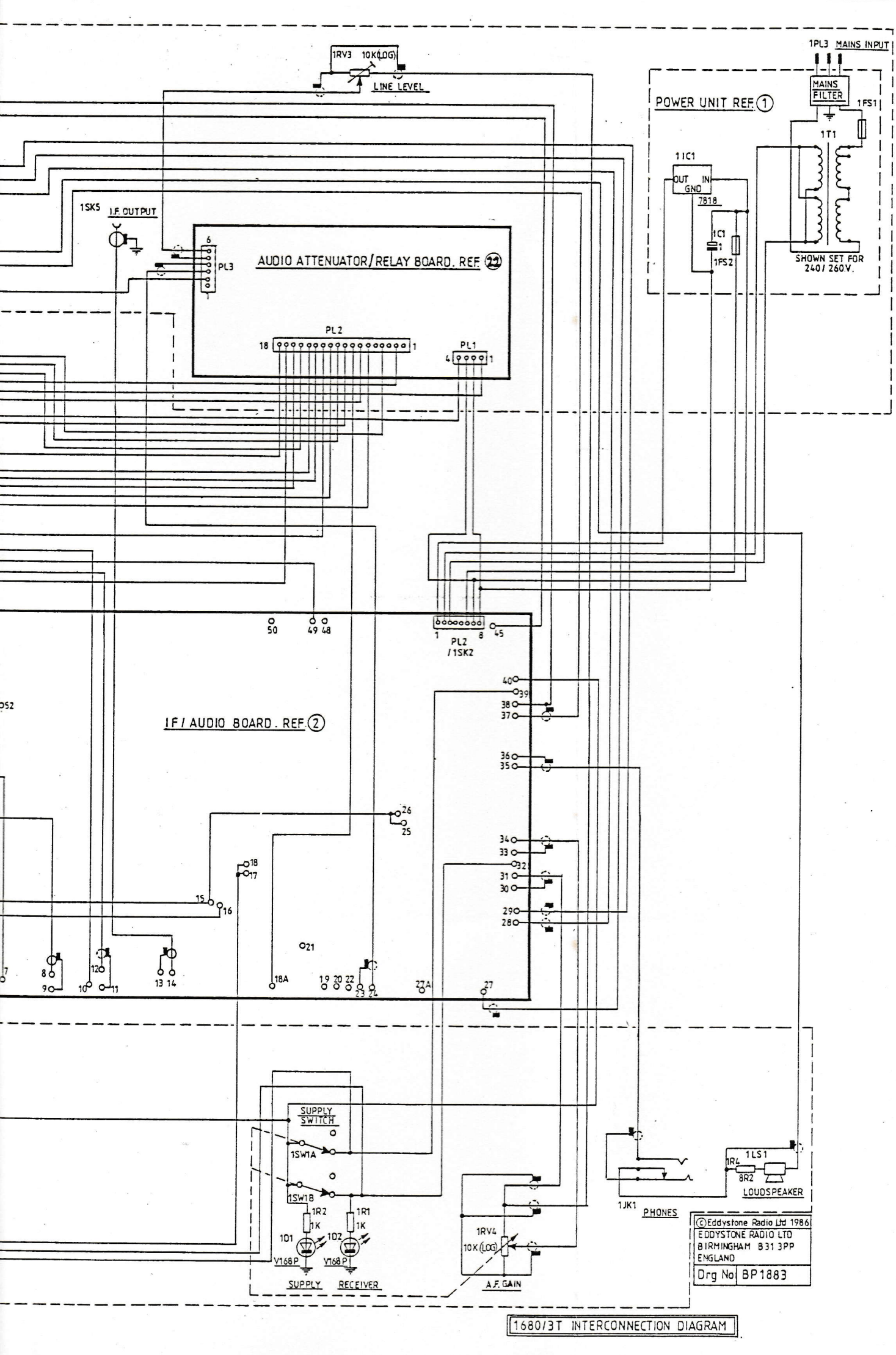
EDDYSTONE RADIO LTD
BIRMINGHAM B31 3PP
ENGLAND

DRG.No. BP 1874

Issue.1.

1680/3T & 5T MAIN BOARD REF.2 (PART.2)


REAR PANEL REF 1
1SK4
AERIAL INPUT
1PL2 REMOTE
1SK1
ANCILLARIES
RF/REMOTE BOARD. REF 3
PL1/1SK3
1SW2A
1SW2B
SENSITIVITY/AGC.
AGC ON
AGC OFF
MAX
MED
MIN
1RV5
10K (LIN)
CLARIFIER
R.F GAIN
1RV1
10K (LIN)
470K
MODE
LSB
USB
AM
FRONT PANEL REF 1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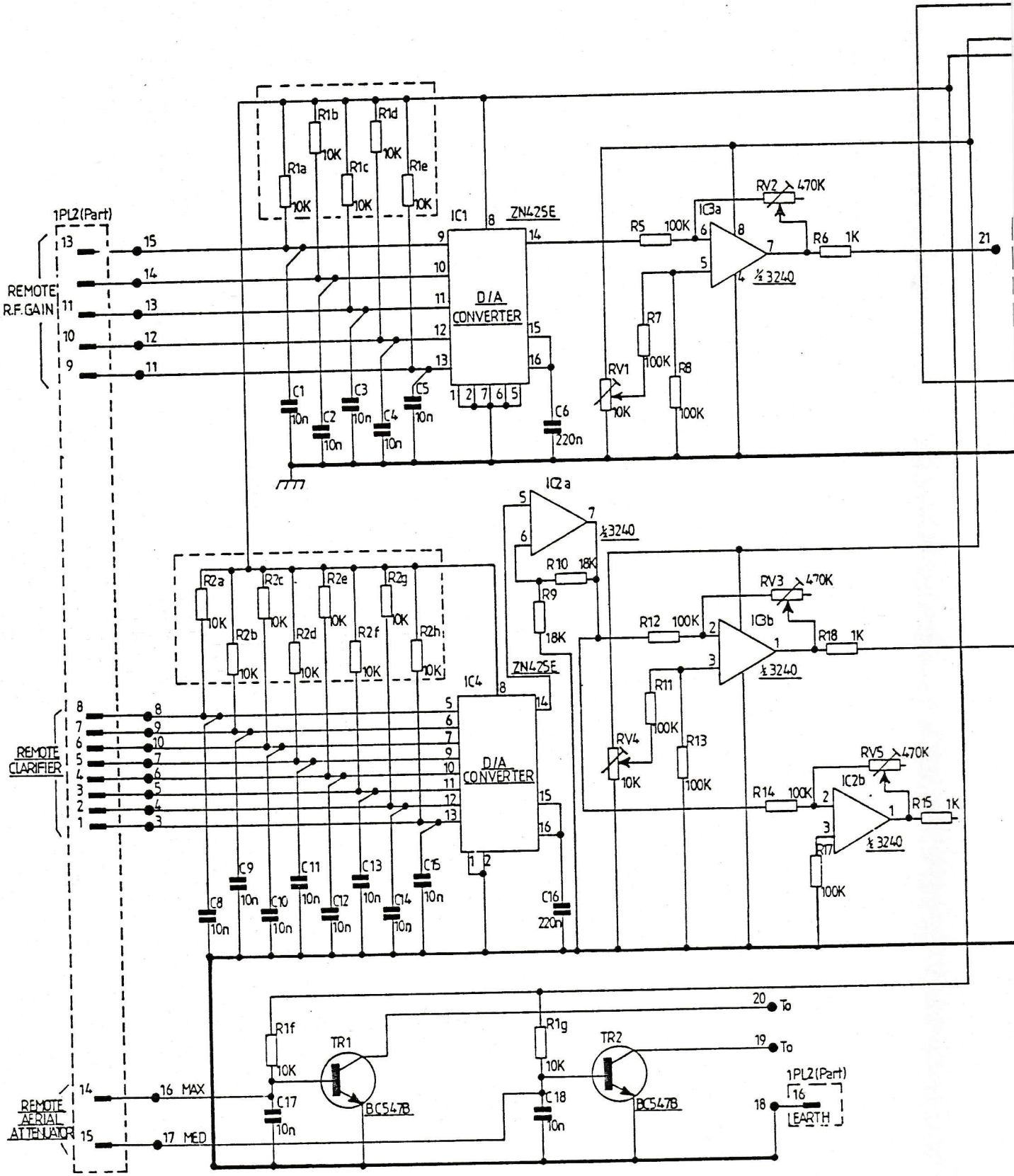
LINE LEVEL
1PL3 MAINS INPUT
POWER UNIT REF. (1)
MAINS FILTER
1FS1
1T1
1IC1
OUT IN GND
7818
1C1
1FS2
SHOWN SET FOR 240/260V.
1SK5 I.F. OUTPUT
PL3
AUDIO ATTENUATOR/RELAY BOARD. REF. (22)
PL2
PL1
I.F./AUDIO BOARD. REF. (2)
PL2 /1SK2
SUPPLY SWITCH
1SW1A
1SW1B
1R2 1K
1R1 1K
1D1
1D2
V168P
SUPPLY RECEIVER
1RV4 10K(LOG)
A.F. GAIN
1JK1
PHONES
1LS1
1R4 8R2
LOUDSPEAKER
©Eddystone Radio Ltd 1986
EDDYSTONE RADIO LTD
BIRMINGHAM B31 3PP
ENGLAND
Drg No BP1883
1680/3T INTERCONNECTION DIAGRAM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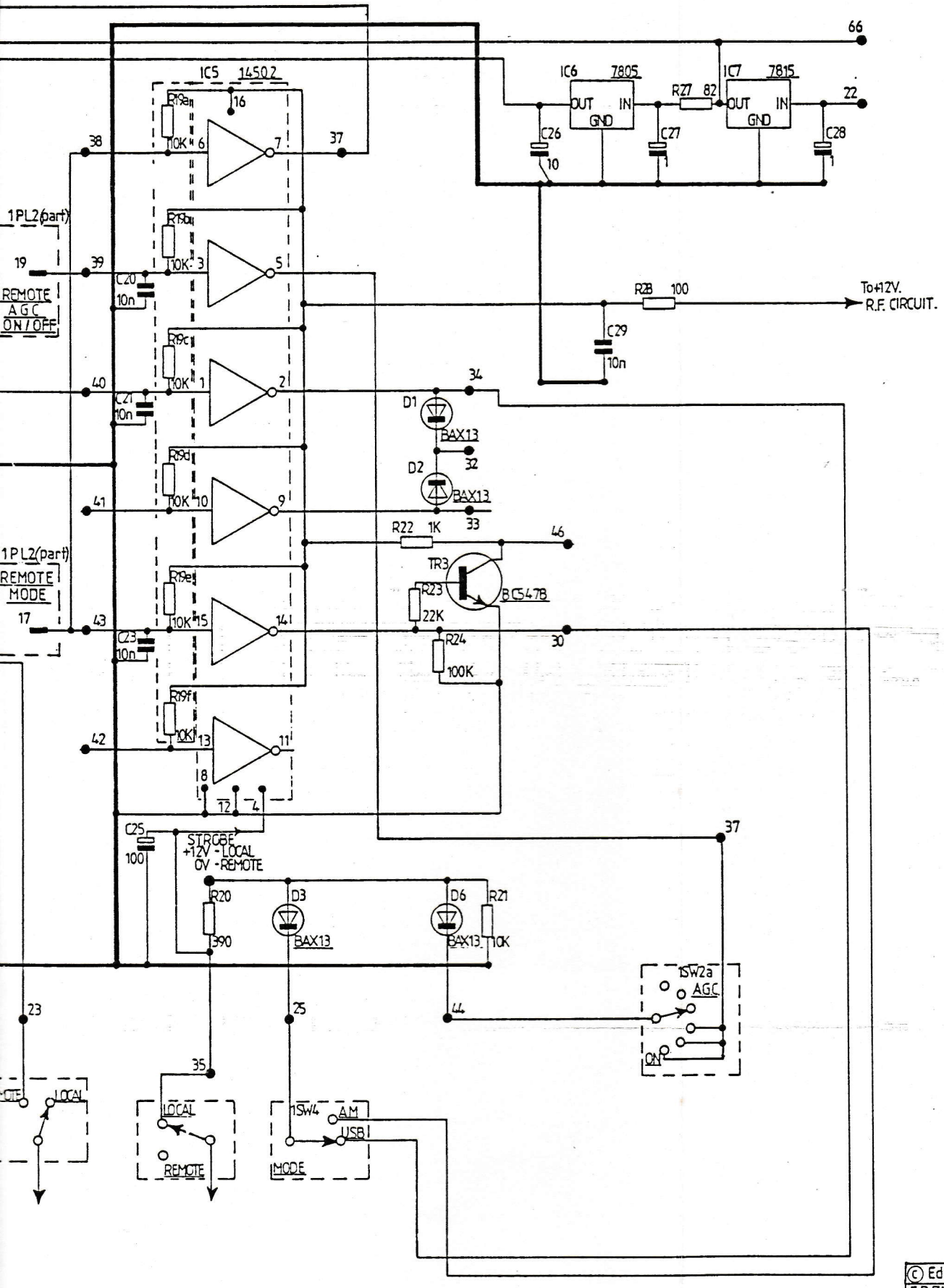
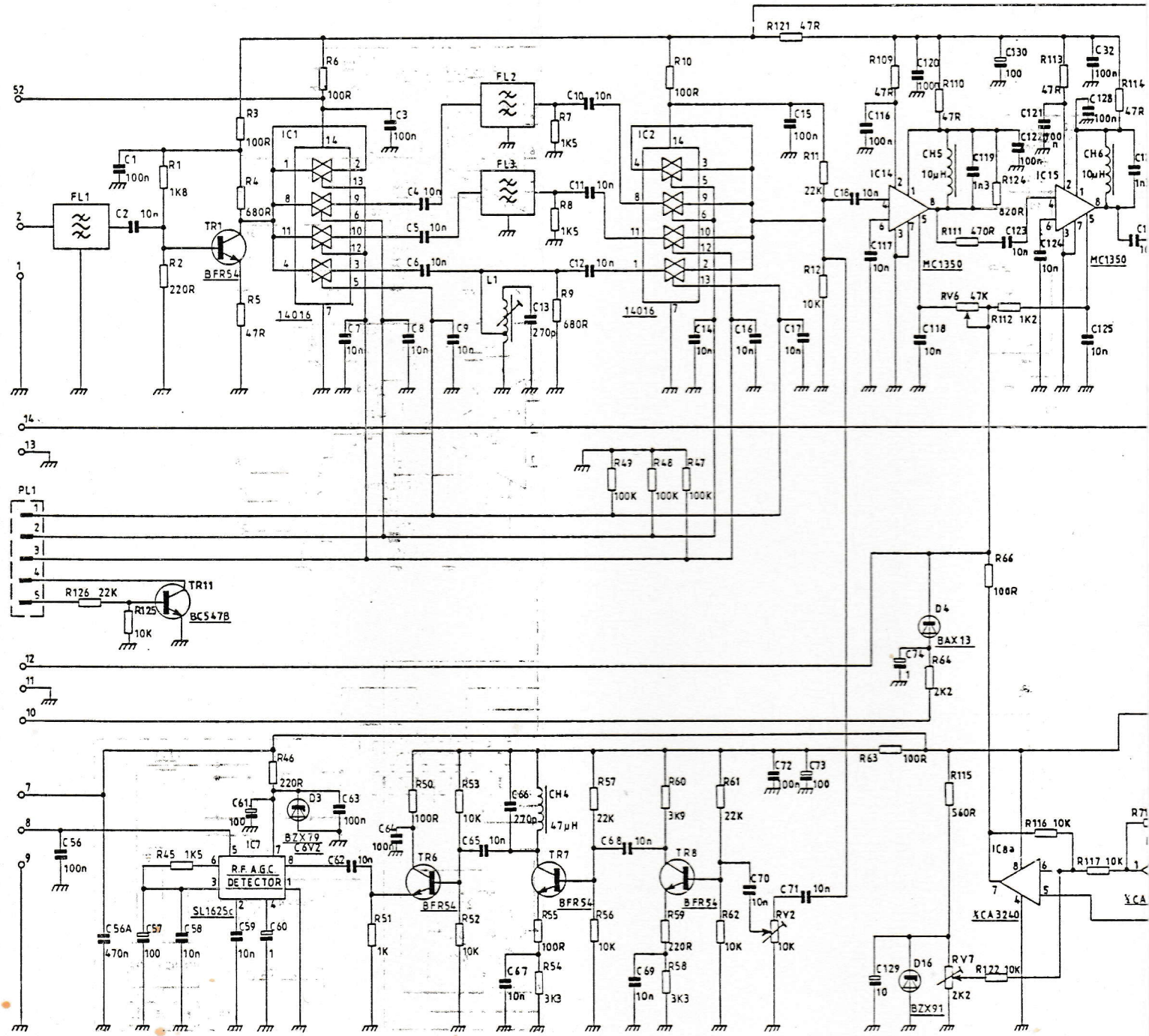
REMOTE R.F.GAIN
REMOTE CLARIFIER
REMOTE AERIAL ATTENUATOR
16 MAX
17 MED
IC1
ZN425E
D/A CONVERTER
IC4
IC2a
IC2b
IC3a
IC3b
½3240
R1a
R1b
R1c
R1d
R1e
R1f
R1g
R2a
R2b
R2c
R2d
R2e
R2f
R2g
R2h
10K
R5 100K
R6 1K
R7
R8
100K
RV1
10K
RV2 470K
R9
18K
R10 18K
R11
R12 100K
R13
RV3 470K
R14 100K
R15 1K
R17
RV4
RV5 470K
R18 1K
C1
C2
C3
C4
C5
10n
C6
220n
C8
C9
C10
C11
C12
C13
C14
C15
C16
C17
C18
TR1
TR2
BC547B
20 To
19 To
18
EARTH
21



EDDYSTONE RADIO LTD.
BIRMINGHAM.B31 3PP,
ENGLAND.

DRG.NO. BP1872

1680/3T &/5T REMOTE CONTROL.REF:3(Part)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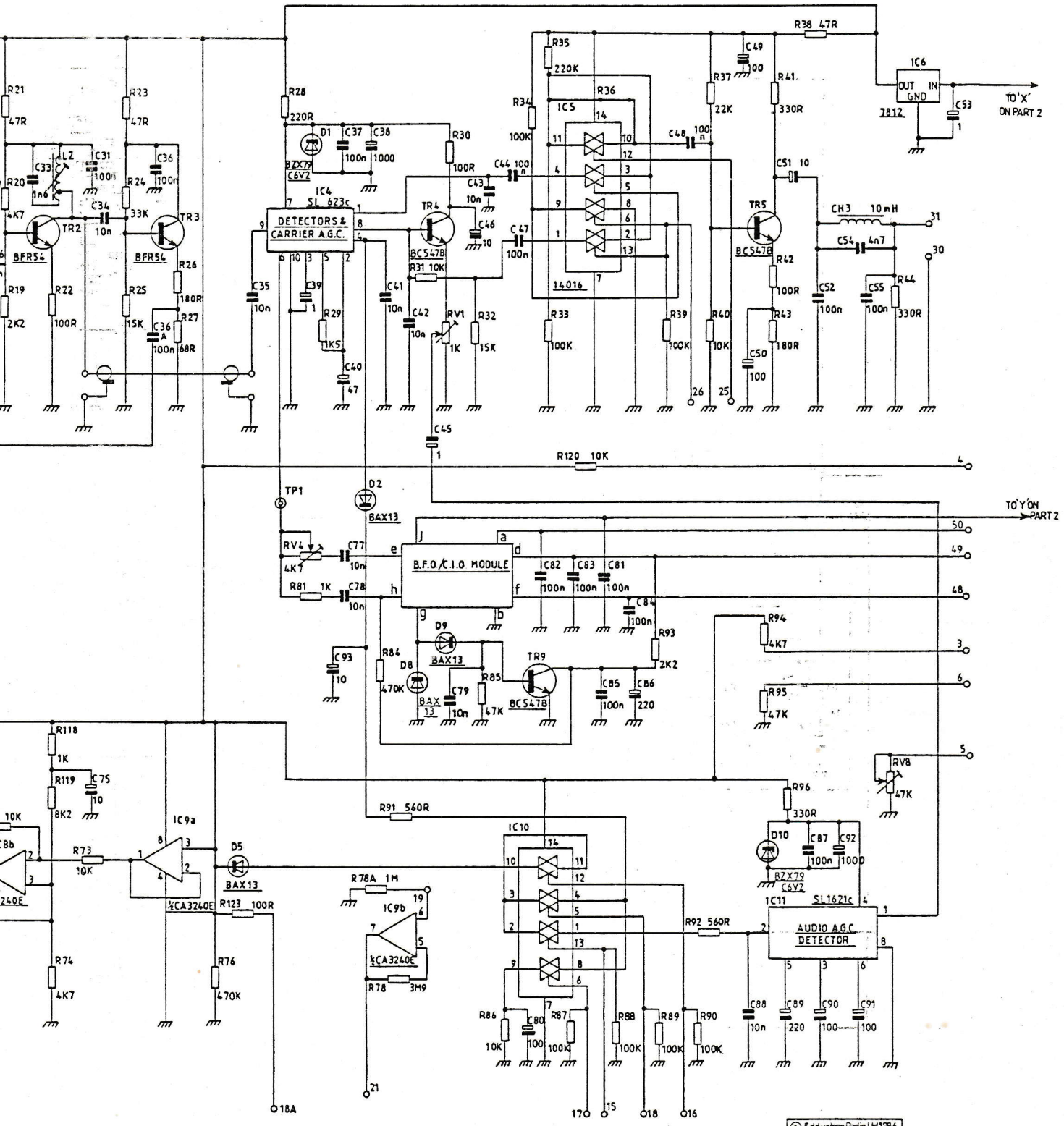
FL1
FL2
FL3
IC1
IC2
14016
TR1
BFR54
L1
MC1350
IC14
IC15
PL1
TR11
BC547B
R126 22K
R125 10K
D4
BAX13
R66 100R
R63 100R
R46 220R
D3
BZX79 C6V2
IC7
R.F. A.G.C. DETECTOR
SL1625C
TR6
TR7
TR8
BFR54
CH4 47µH
CH5 10µH
CH6 10µH
IC8a
XCA3240
D16
BZX91
RV6 47K
RV7 2K2
RV2 10K
R112 1K2
R122 10K
R116 10K
R117 10K

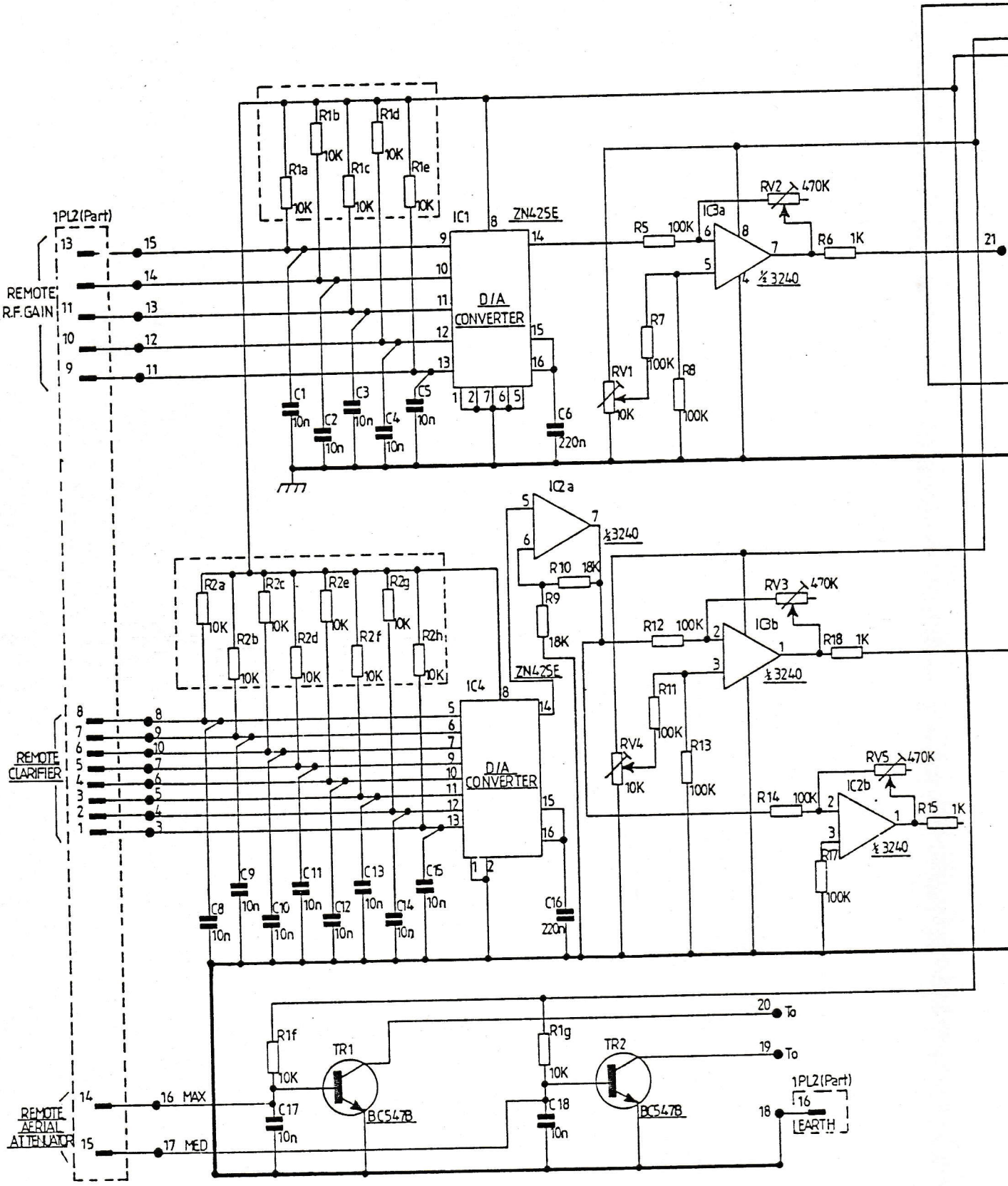


EDDYSTONE RADIO. LTD.
BIRMINGHAM. B31 3PP.
ENGLAND

DRG.No. BP 1874

Issue 1.

1680/3T & 5T MAIN BOARD. REF. 2. PART. 1.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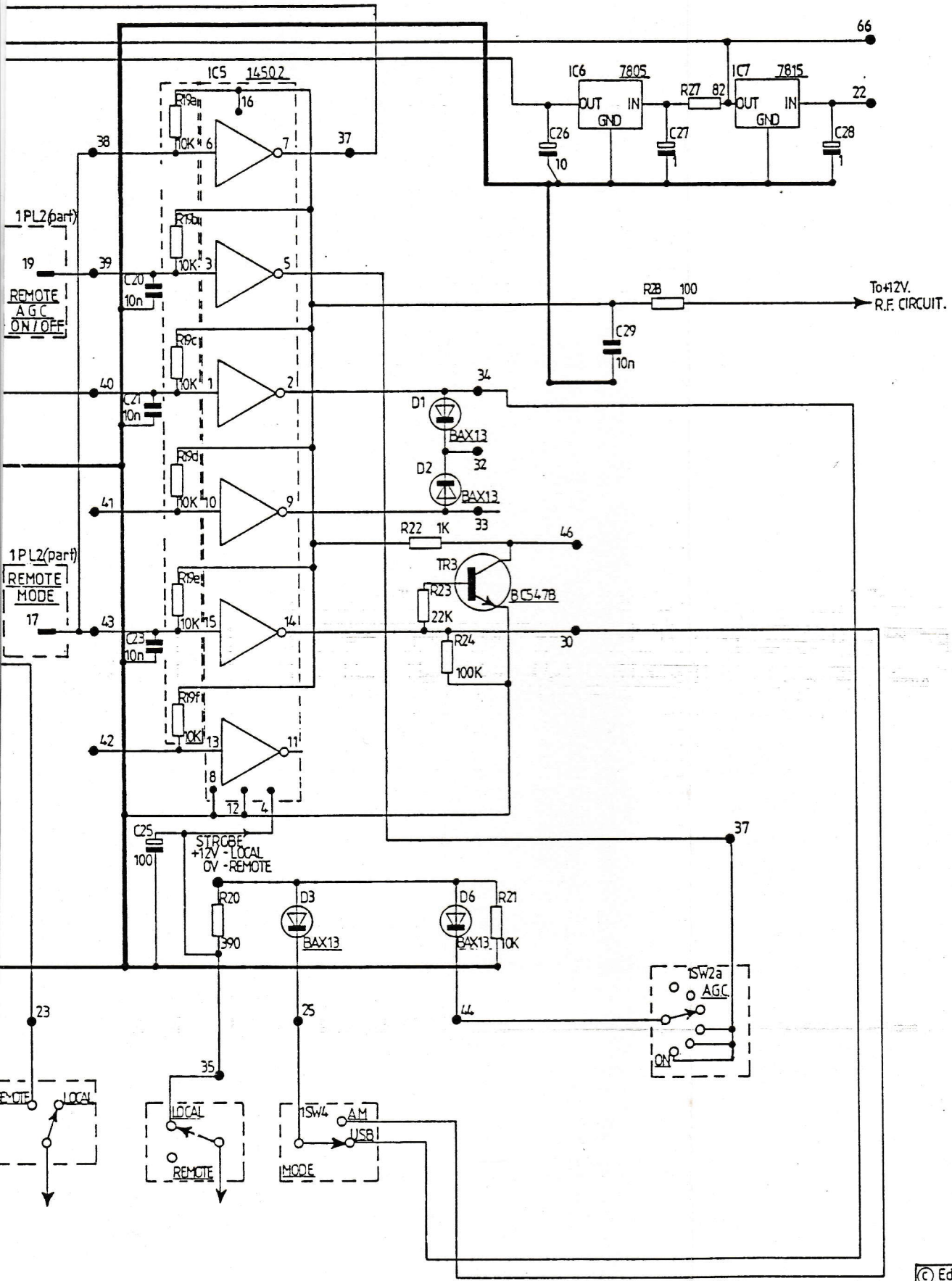
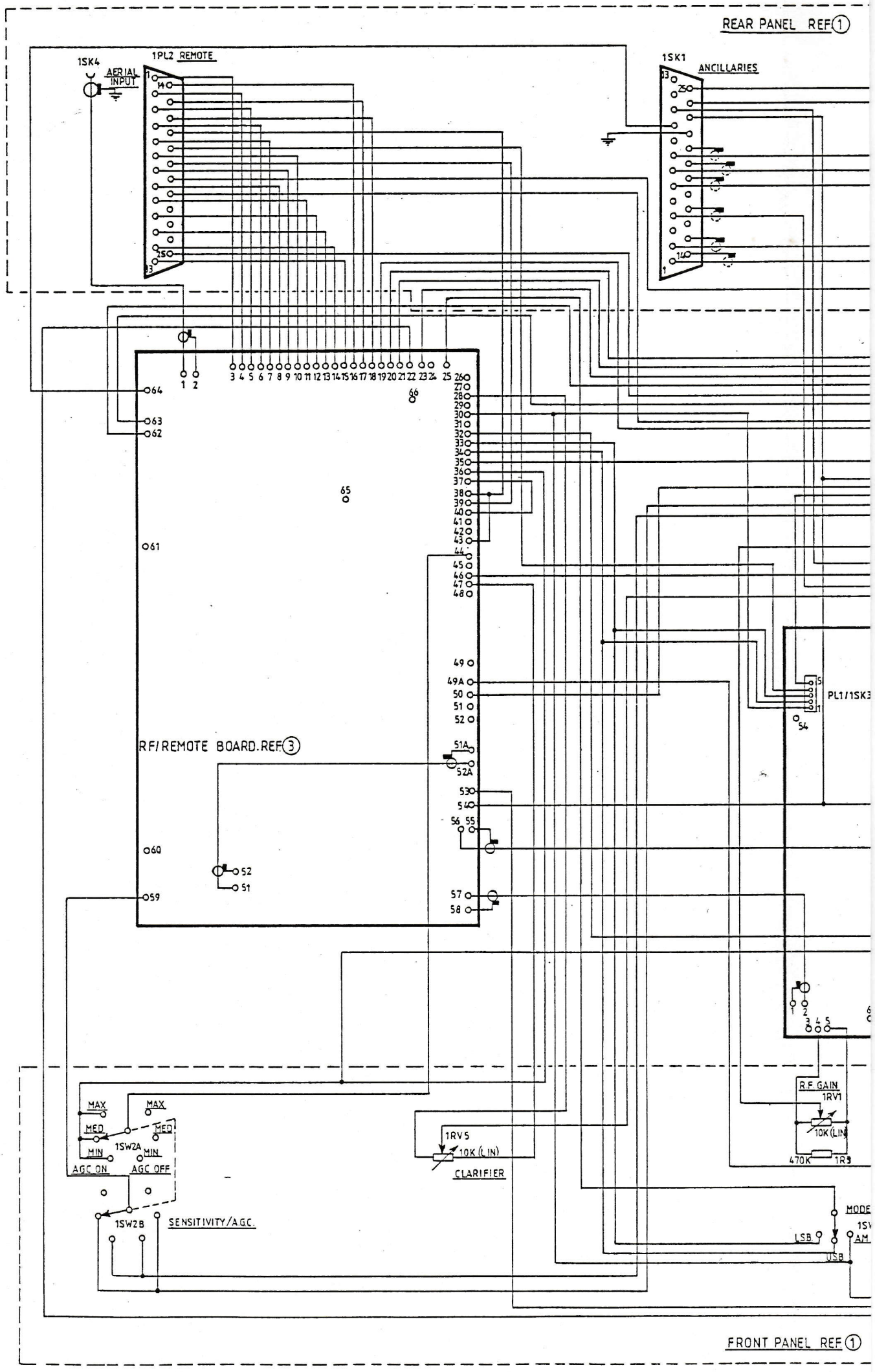
REMOTE R.F.GAIN
REMOTE CLARIFIER
REMOTE AERIAL ATTENUATOR
IC1
ZN425E
D/A CONVERTER
IC2a
IC2b
IC3a
IC3b
IC4
½3240
R1a
R1b
R1c
R1d
R1e
R1f
R1g
R2a
R2b
R2c
R2d
R2e
R2f
R2g
R2h
R5 100K
R6 1K
R7 100K
R8 100K
R9 18K
R10 18K
R11 100K
R12 100K
R13 100K
R14 100K
R15 1K
R17 100K
R18 1K
RV1 10K
RV2 470K
RV3 470K
RV4 10K
RV5 470K
C1 10n
C2 10n
C3 10n
C4 10n
C5 10n
C6 220n
C8 10n
C9 10n
C10 10n
C11 10n
C12 10n
C13 10n
C14 10n
C15 10n
C16 220n
C17 10n
C18 10n
TR1
TR2
BC547B
16 MAX
17 MED
20 To
19 To
18
1PL2(Part)
16
EARTH



EDDYSTONE RADIO LTD.
BIRMINGHAM.B31 3PP.
ENGLAND.

DRG.NO. BP1872

1680/3T &/5T REMOTE CONTROL.REF:3(Part)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AERIAL INPUT
1PL2 REMOTE
1SK1
ANCILLARIES
RF/REMOTE BOARD. REF 3
PL1/1SK3
S4
R.F GAIN
1RV1
10K (LIN)
470K
1RV5
10K (LIN)
CLARIFIER
MAX
MED
MIN
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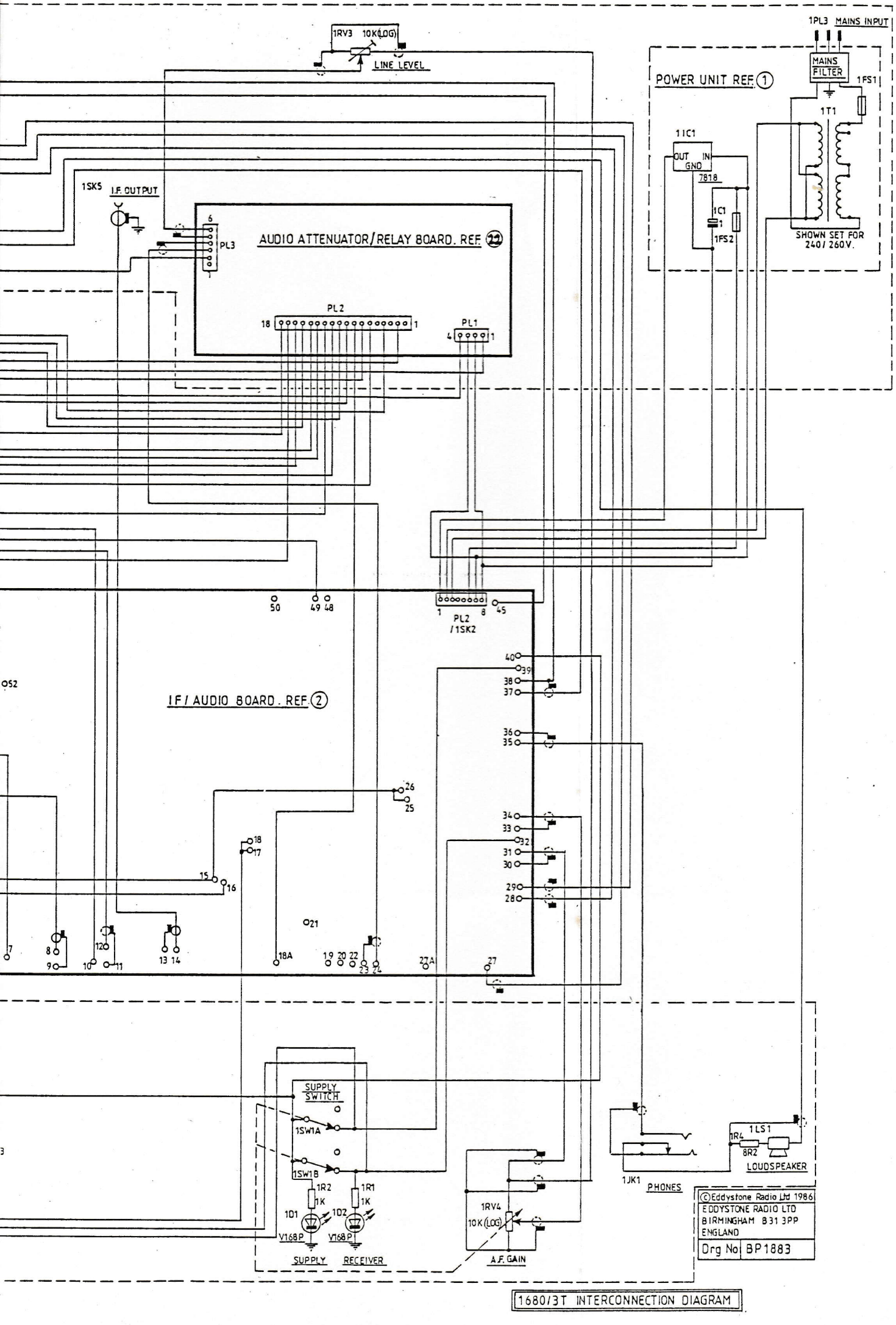
AGC ON
AGC OFF
1SW2B
SENSITIVITY/A.G.C.
MODE
LSB
USB
FRONT PANEL REF 1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POWER UNIT REF. 1
MAINS FILTER
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1T1
1IC1
OUT IN GND
7818
1C1
1FS2
SHOWN SET FOR 240/260V.
1SK5
I.F. OUTPUT
PL3
AUDIO ATTENUATOR/RELAY BOARD. REF. 22
PL2
PL1
PL2 /1SK2
IF/AUDIO BOARD. REF. 2
SUPPLY SWITCH
1SW1A
1SW1B
1R2 1K
1R1 1K
1D1
1D2
V168P
SUPPLY
RECEIVER
1RV4 10K(LOG)
A.F. GAIN
1JK1
PHONES
1LS1
1R4 8R2
LOUDSPEAKER
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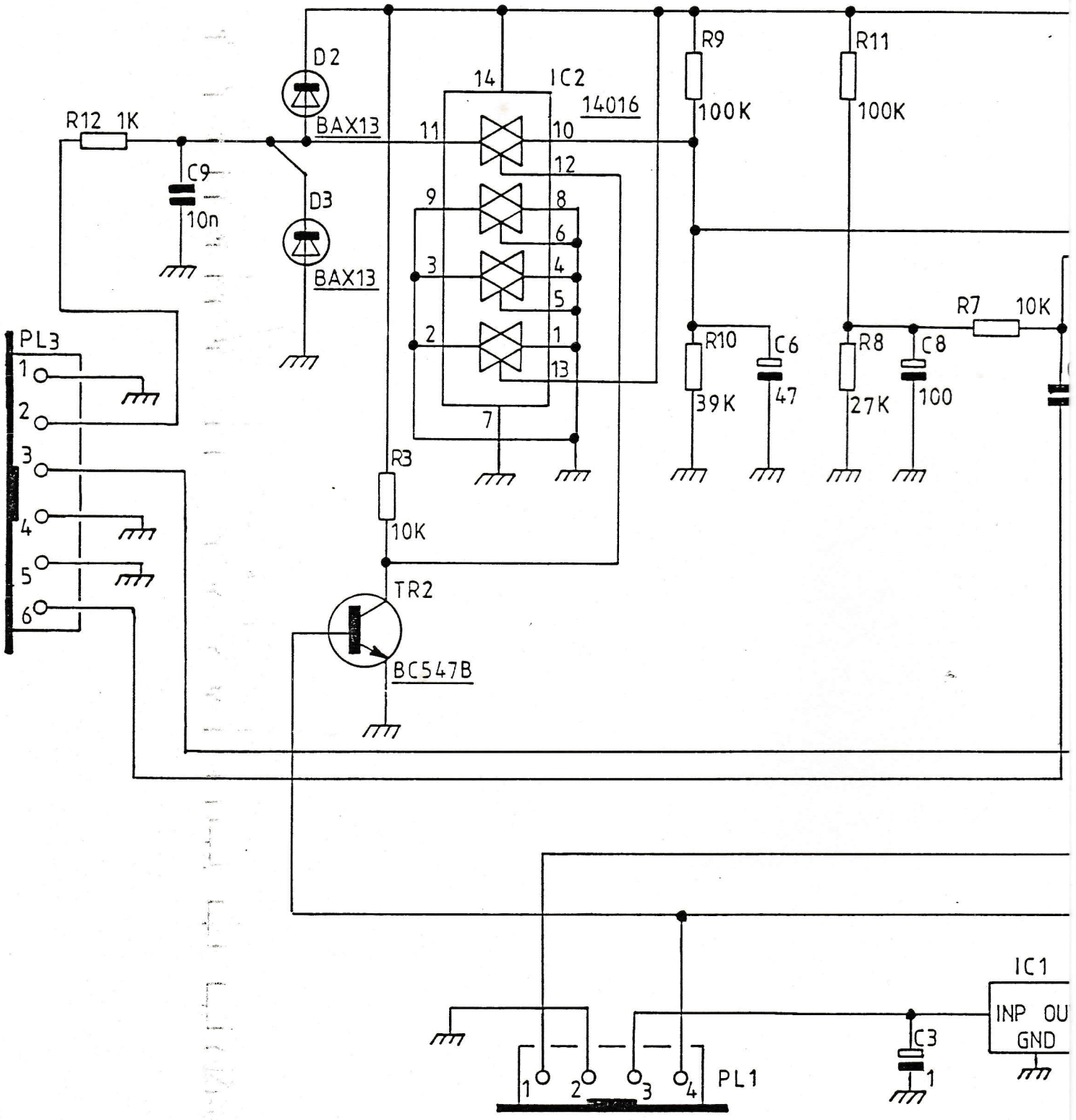
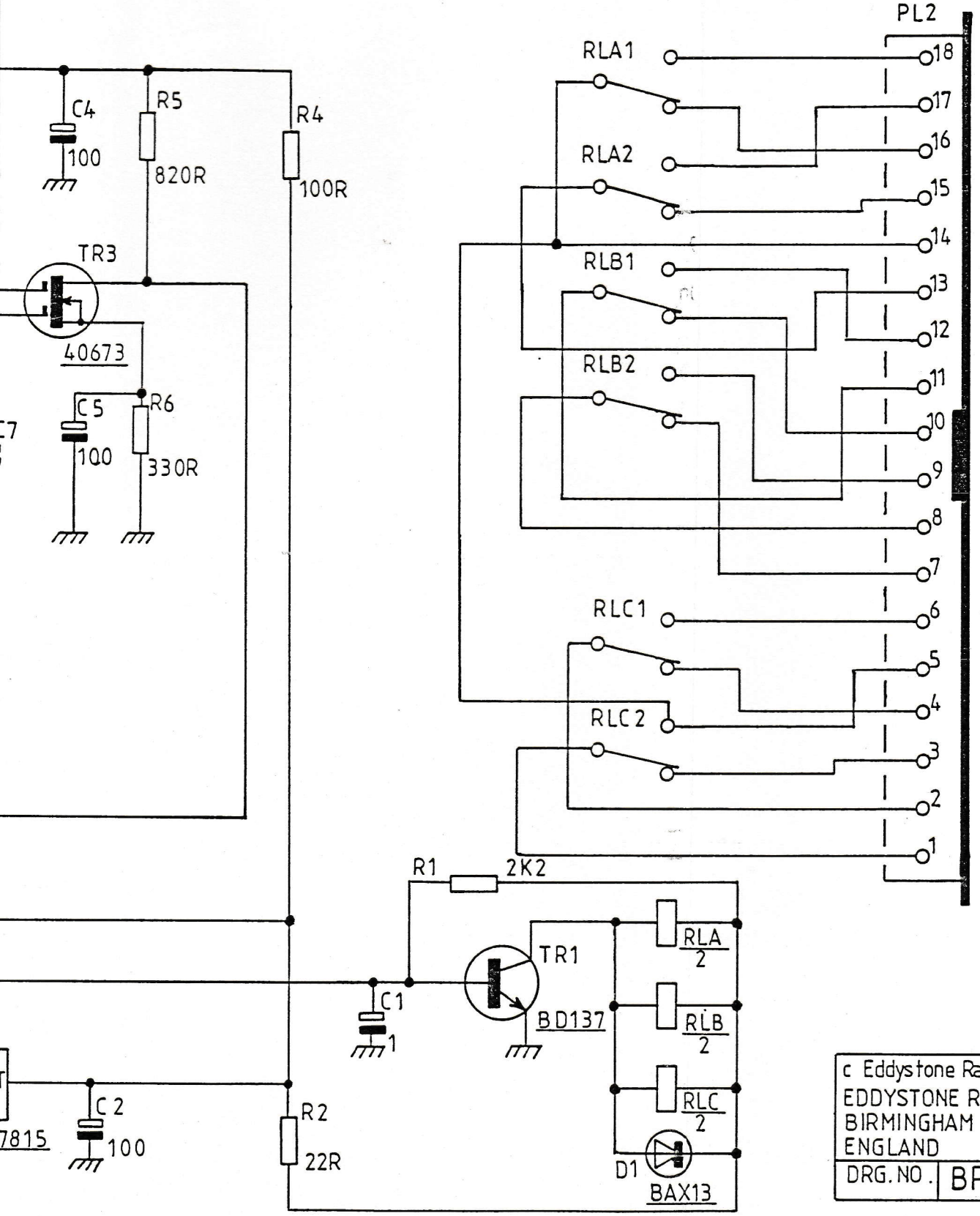
EDDYSTONE RADIO LTD
BIRMINGHAM B31 3PP
ENGLAND
Drg No BP1883
1680/3T INTERCONNECTION DIAGRAM


D2
BAX13
D3
BAX13
R12 1K
C9
10n
IC2
14016
14
11
10
12
9
8
6
3
4
5
2
1
13
7
R9
100K
R11
100K
R7 10K
R10
39K
C6
47
R8
27K
C8
100
R3
10K
TR2
BC547B
PL3
1
2
3
4
5
6
IC1
INP OU
GND
C3
1
PL1
1
2
3
4



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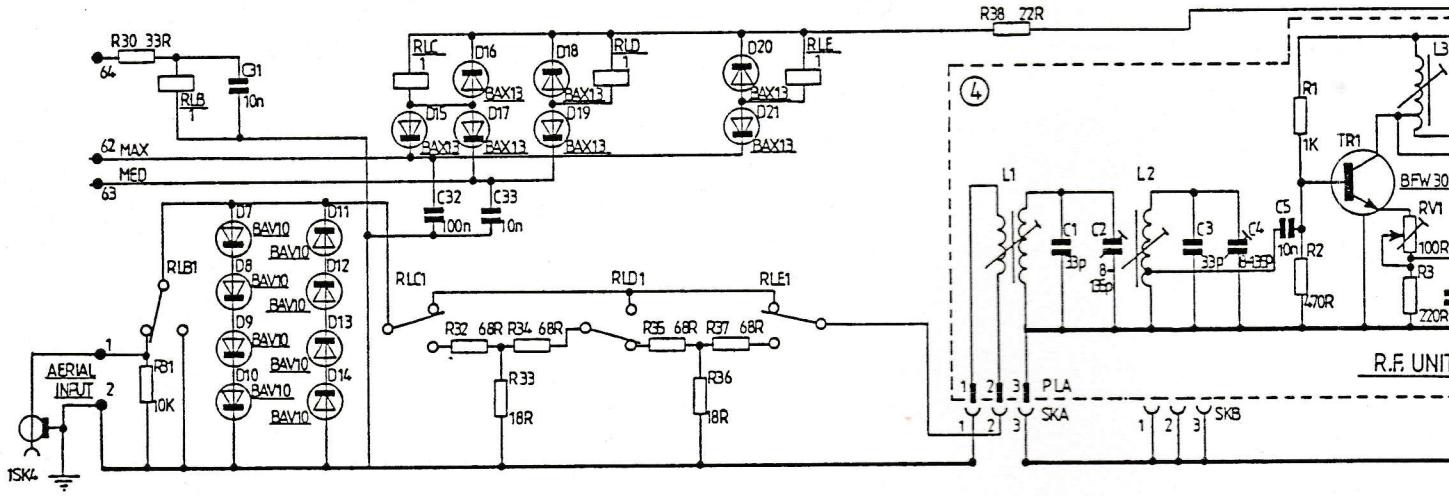
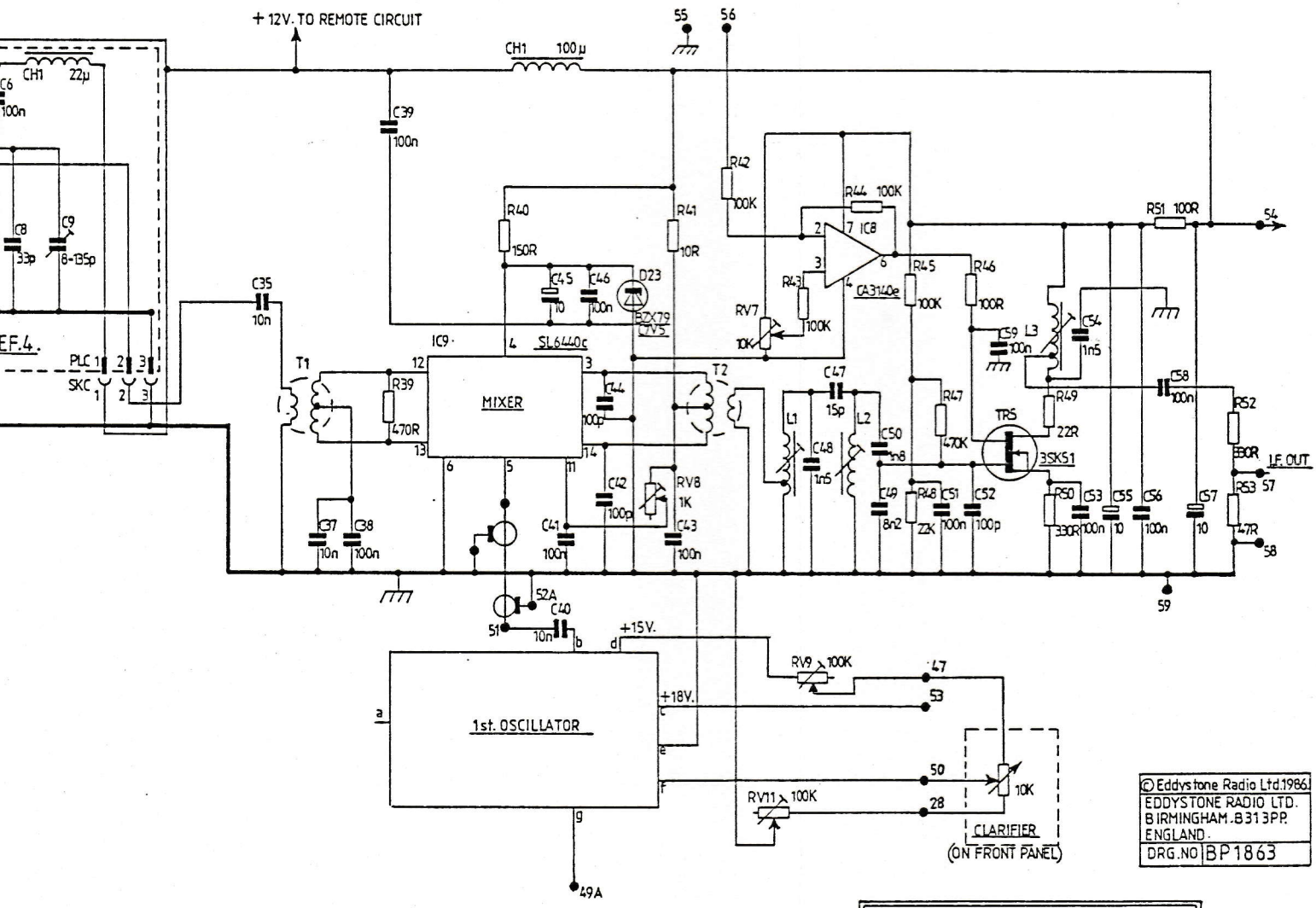
DRG. NO.	BP 1865

1680/3T &1680/5T AUDIO ATTENUATOR/RELAY BOARD REF.22.


R30 33R
64
C31
10n
RLB
62 MAX
MED
63
RLC
D16
D18
RLD
D20
RLE
BAX13
D15
D17
D19
D21
R38 22R
C32
100n
C33
10n
D7
D11
BAV10
D8
D12
D9
D13
D10
D14
RLB1
RLC1
RLD1
RLE1
R32 68R
R34 68R
R35 68R
R37 68R
R33
18R
R36
18R
AERIAL
INPUT
2
R31
10K
1SK4
4
L1
L2
L3
C1
33p
C2
8-
35p
C3
33p
C4
6-35p
C5
10n
R1
1K
TR1
BFW30
RV1
100R
R2
470R
R3
220R
R.F. UNIT
PLA
SKA
SKB



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ENGLAND.

DRG.NO BP1863

1680/3T R.F. BOARD. REF. 3. (Part)