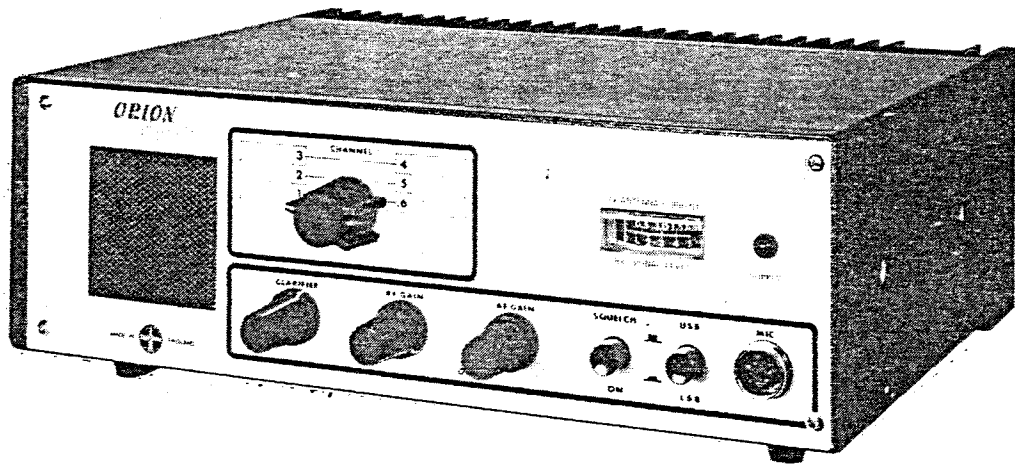


Eddystone

5000 SERIES

HF SSB TRANSCEIVER ORION



Eddystone Radio



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AMENDMENT RECORD

Amend No.	Pages subject to change	Amended by	Date
1			
2			
3			
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6			
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8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
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.

5,000 Channelising Instructions SupplementChanneling

When setting up the 5000 to operate on extra channels, it will be necessary to fit coils to the Receiver RF board Reference 3, the Receiver Mixer board Reference 5, the Transmitter Mixer board Reference 4 and the Transmitter Pre-amplifier board Reference 6.

Table 1 below shows the coils to be fitted for the frequency range required.

The same type of coil is fitted to all four boards for a particular range.

TABLE 1

RANGE	FREQUENCY	PART NUMBER
1	2-3MHz	D5926
2	3-5MHz	D5927
3	5-8MHz	D5928
4	8-12MHz	D5929
5	12-16MHz	D5930

Coils and capacitors will also have to be fitted to the PA output filter board Reference 10 for the appropriate range, but if frequencies for several channels fall within one coil range links can be arranged on the switch wafers 10SW1 and 10SW2 to employ the one filter coil and capacitors for more than one channel.

Filter coils and capacitors for different ranges are shown in Table 2 below:

Capacitors are silver mica 350V working with $\pm 2\%$ tolerance.

TABLE 2

RANGE	FREQUENCY	C1	C2	C3	INDUCTOR PART NUMBER
1	2-3MHz	1000p	2000p	1000p	D5957
2	3-5MHz	470p	1200p	470p	D5958
3	5-8MHz	200p	750p	200p	D5959
4	8-12MHz	-	470p	-	D5960
5	12-16MHz	-	470p	-	D5961

When removing any of the five plug in boards, it is first necessary to remove the switch shaft passing through the boards by loosening the grub screw on the shaft coupler and withdrawing the shaft to the rear through the hole provided in the heatsink.

Due to the tolerance in ferrite material it may be necessary, when operating at the extreme HF end of each filter coil, to remove turns to enable full power to be transmitted.

Oscillator

Crystals should be ordered against the following specification:

Quartz Crystal type HC42/U Parallel Resonance
±25 PPM Initial Tolerance at 25°C
±5 PPM Frequency Variation over 0°C to 40°C. To tune with
30pf.

The oscillator circuits are optimised over the range 3.4MHz to 17.4MHz. If low activity crystals are fitted at the extreme ends of the range, oscillations may be unreliable and Capacitors C6/7, C9/10, C12/13, C15/16, C18/19 or C21/22 (according to channel fitted) should be changed from 270pf to 150pf at high frequency end and 330pf at low frequency end.

Coil Adjustment

After fitting coils and crystals for additional ranges, or when changing existing ranges, carry out test procedure. Coil core location and crystal trimmer locations will be found on Pages 5 and 6.

Squelch Adjustment

Final adjustment to squelch level (8RV1) should be made under normal working conditions such that the squelch lifts when receiving the required transmission.

Test Procedure

1) Test Equipment Required:-

DC Power Supply 13.6V at 20 amp rating
Output Power Meter 8 ohm impedance (e.g. Marconi Instruments TF893A)
Signal Generator 2MHz to 16MHz (e.g. Marconi Instruments 2002 or similar)
50 ohm RF load resistor (100 watt rating)
Oscilloscope (50MHz bandwidth) with high impedance probe
Distortion Factor Meter (e.g. Marconi Instruments TF2331 or similar)
Spectrum Analyser (if available) (e.g. Marconi Instruments TF2370)
Frequency Counter (to 16MHz)
AVO 8 Multi-meter or similar

- 2) Connect DC Power Supply (set to 13.6V) to 5000 terminals (if using internal AC power supply all tests can be carried out, except that measurement of full output power on transmit cannot be made).

- 3) Receiver Section Alignment

- a) Connect output power meter to ancillary socket 8 ohm audio output, pin 8 and pin 7 (earth).
- b) Set 5000 to channel required and connect Signal Generator to aerial socket. Set Signal Generator to channel frequency $\pm 1\text{kHz}$ and at a suitable output level below AGC threshold.
- c) Tune 3L1-3L6 as appropriate on receiver RF amplifier and 5L1-5L6 as appropriate on receiver mixer printed circuit board for maximum output taking care to keep the input level below AGC threshold.
- d) Set 7RV1 on lowest gain channel to give a 5uV (emf) AGC threshold.
- e) Remove Signal Generator and short pins 1 and 2 on 1SK3 (Microphone input) or change (s-u) link to (s-t).

Connect Frequency Counter to pin 52 on interconnection board 2 and adjust 2C1 to 2C6 on channels 1 to 6 respectively (where fitted) to give correct frequency.

Replace (s-u) link and check clarifier range on each channel (approximately $\pm 100\text{Hz}$ at 3MHz to $\pm 1\text{kHz}$ at 16MHz).

- f) Reconnect Signal Generator to aerial socket. With Signal Generator set for 0.5uV p.d. output check that the signal to noise ratio is better than 20dB on each channel fitted.
- g) Set squelch control 8RV1 to mid-position and with a steady state signal input of approximately 100uV check that receiver is muted.

Vary the input frequency with generator or clarifier and check that muting lifts.

A final setting of the squelch control 8RV1 should be made when receiving a speech signal in normal use.

- 4) Transmitter Section Test

- a) Set microphone gain control 2RV1 to mid-position and connect 50 ohm 100 watt load resistor to aerial socket.

Connect oscilloscope across load.

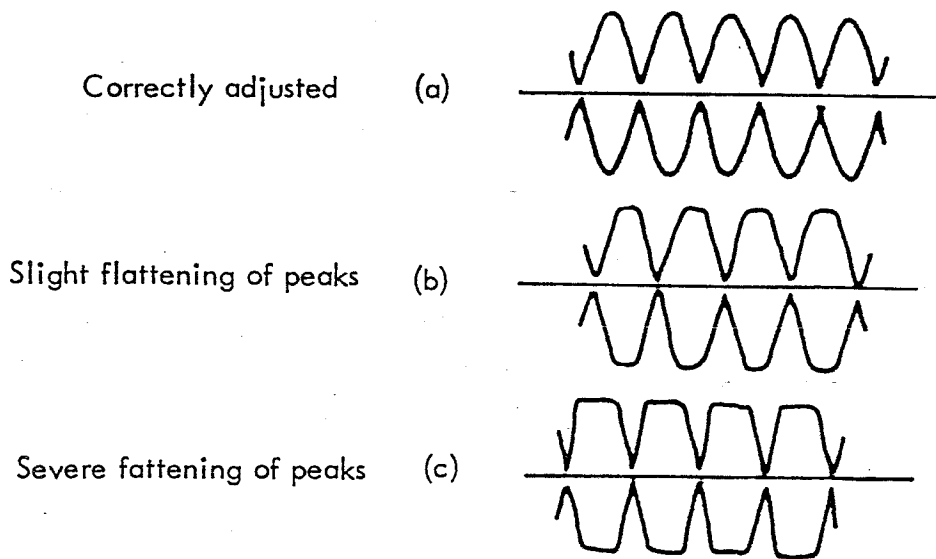
- b) Select channel required. Apply audio input to pins 4 and 5 of 1SK3, then short pins 1 and 2 of 1SK3 together.

Tune 4L1-4L6 as appropriate for maximum output, reducing audio level to keep output level below 100V peak to peak on the oscilloscope. Always start with coils at maximum inductance (core inside former) and turn core anti-clockwise for first peak, otherwise it would be possible to tune at incorrect suprious frequencies.

- c) Turn ALC control 10RV1 fully anti-clockwise and apply 1kHz and 1.6kHz to audio input (pins 4 and 5 of 1SK3). Increase audio input level until output no longer increases, i.e. transmitter ALC is working. Turn ALC control in clockwise direction (increasing audio level if necessary) until 'unflattened' output level on oscilloscope is reached (see figure 1 below).

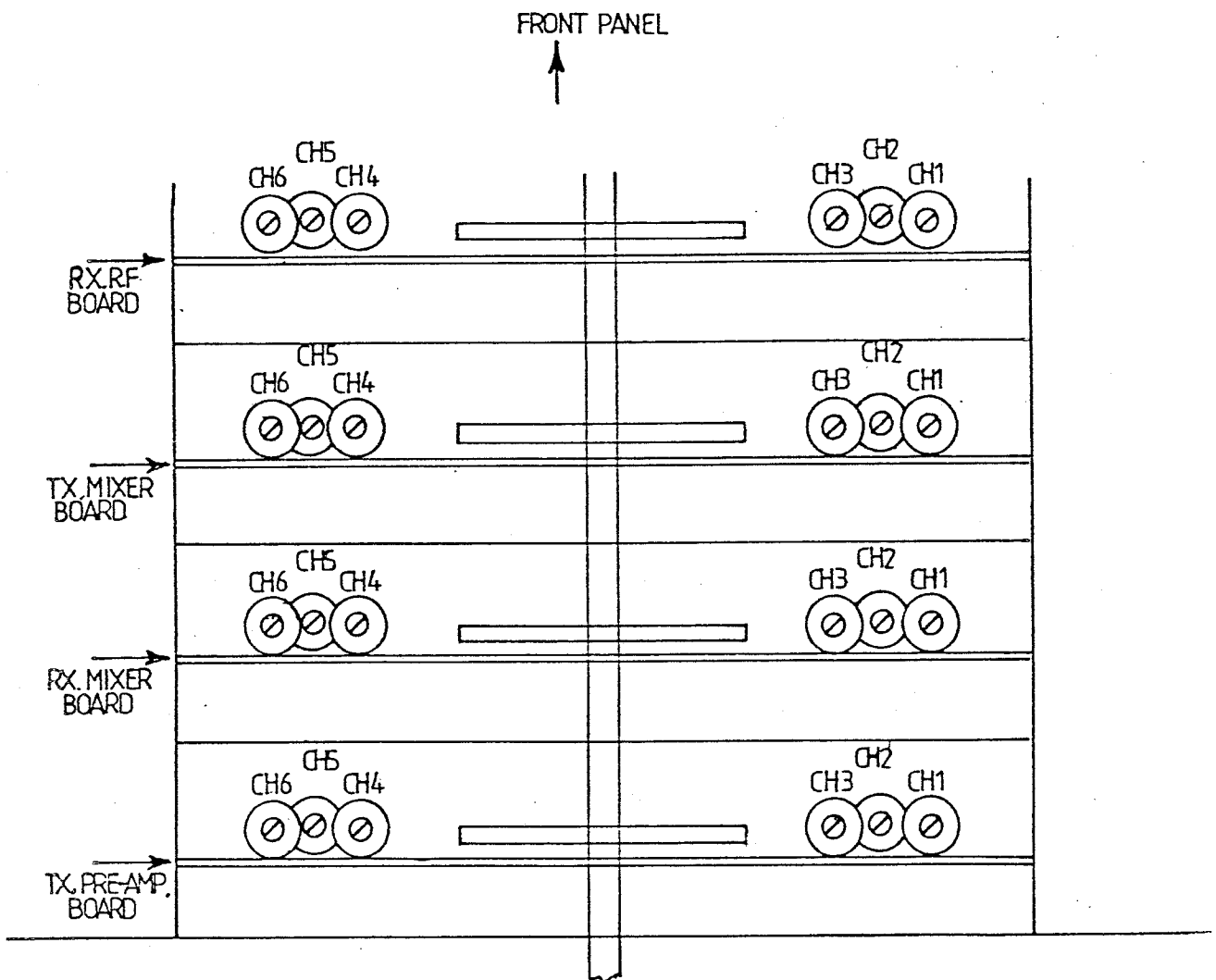
Output should be between 200V peak to peak and 250V peak to peak (150 watts PEP). If a Spectrum Analyser is available check that Intermodulation Distortion is better than -25dB.

- d) Check other channels for 'unflattened' output and adjust ALC control if necessary (and audio input level if necessary to ensure transmitter ALC is working).
- e) Remove short circuits on 1SK3 and connect microphone and adjust Microphone Gain 2RV1 so that talking normally into the microphone causes peaks to reach maximum output level without undue clipping.
- f) NOTE Full 2 tone output cannot be achieved with internal AC PSU (AC/DC Models). The AC Power Supply Unit is suitable for SSB where current drawn by speech waveform is not as high as steady state 2 tone output. This does not imply that transmitter does not give 150 watts PEP output with normal speech operation.



Two Tone Patterns

Figure 7

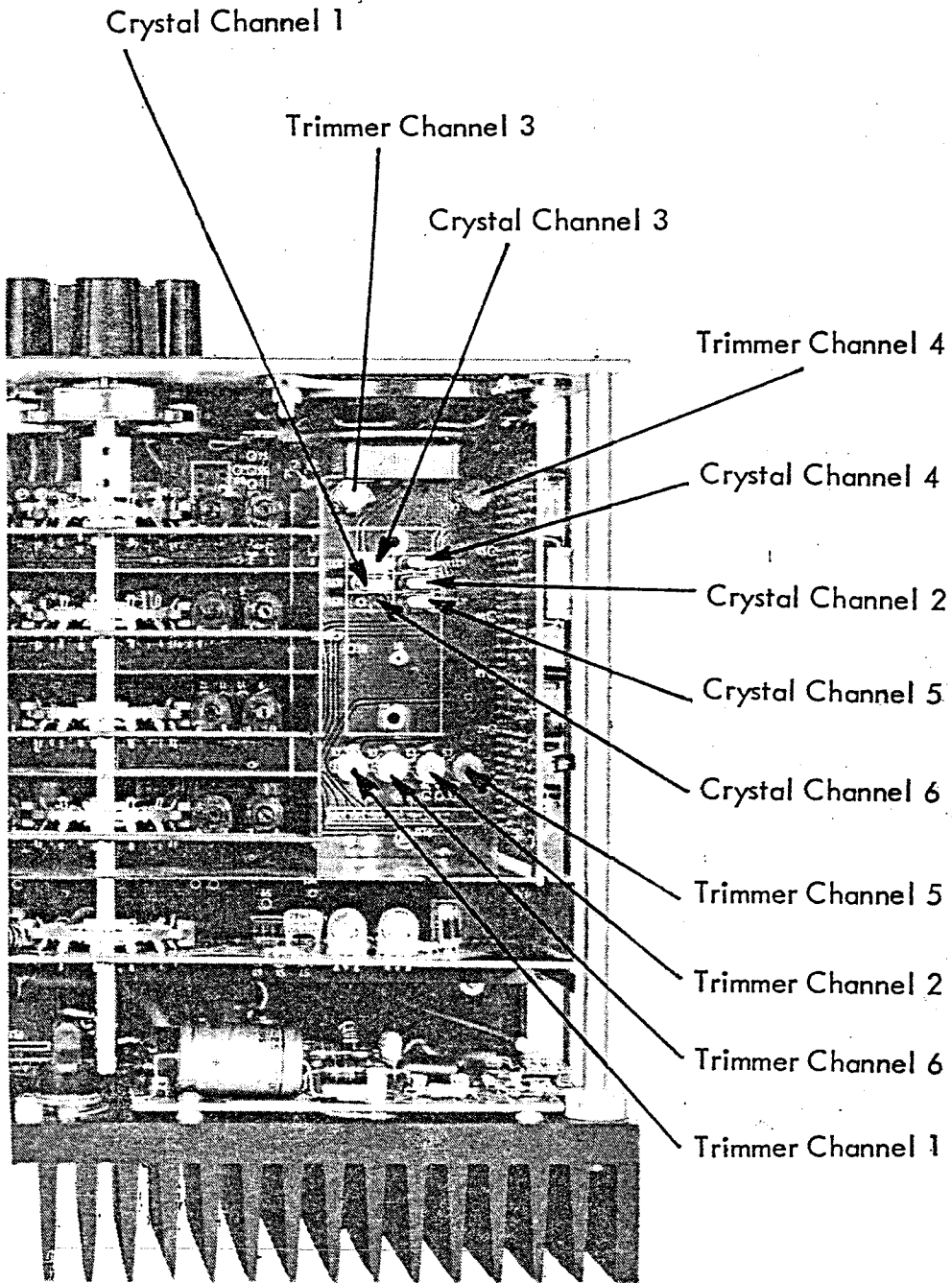


5000 SERIES CORE TUNING LOCATION

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EDDYSTONE RADIO LTD
 BIRMINGHAM B31 3PP
 ENGLAND.

DRG No BP1820



Series 5000
Crystal Positions & Associated Trimmers

5000 Supplement Number One

The VSWR protection circuit is modified to allow higher RF output into mis-matched loads, whilst maintaining protection to the power amplifier transistors against open and short circuit load conditions.

A 47k (10RV3) variable resistor is fitted in series with 10R5 on the power amplifier output filter printed circuit board, situated at the lower centre of the board under the channel switch. On initial installation 10RV3 should be set fully clockwise (zero resistance), and the transceiver installed as detailed in Section 4.

If a good VSWR match is not possible due to the antenna impedance or limitations in the aerial tuner unit the forward power obtained from the transceiver may be limited by the VSWR protection circuit. Under these circumstances 10RV3 can be turned in an anti-clockwise direction to increase the output power to the required level.

10RV3 should be set at the minimum level consistent with the required output power to maintain optimum protection against antenna open circuit and short circuit conditions.

Variations of the 5000 Series

		DC	AC/DC	USB	USB/ LSB	TABLE/ VEHICLE	RACK	DUPLEX
Model Number 5000/1	1CH	*		*		*		
Model Number 5000/1A	1CH	*			*	*		
Model Number 5000/2	1CH		*	*		*		
Model Number 5000/2A	1CH		*		*	*		
Model Number 5000/1R	1CH	*		*			*	
Model Number 5000/1AR	1CH	*			*		*	
Model Number 5000/2R	1CH		*	*			*	
Model Number 5000/2AR	1CH		*		*		*	
Model Number 5000/1B	1CH	*		*		*		*
Model Number 5000/1AB	1CH	*			*	*		*
Model Number 5000/2B	1CH		*	*		*		*
Model Number 5000/2AB	1CH		*		*	*		*
Model Number 5000/1BR	1CH	*		*			*	*
Model Number 5000/1ABR	1CH	*			*		*	*
Model Number 5000/2BR	1CH		*	*			*	*
Model Number 5000/2ABR	1CH		*		*		*	*

Index 5000 Series

Section 1	Introduction & General Description		Page 1 of 1
Section 2	Specification		Pages 1-3
Section 3	Circuit Description		Pages 1-6
Section 4	Installation		Pages 1-11
Section 5	Operation		Pages 1-5
Section 6	Maintenance (Voltage Analysis)		Pages 1-10
Section 7	Spares:-		Pages 1-28
	Chassis components Board	Reference 1	Pages 1-2
	Interconnection Board	Reference 2	Pages 2-3
	Receiver RF Amp. Board	Reference 3	Pages 4-5
	Transmitter Mixer Board	Reference 4	Pages 5-7
	Receiver Mixer Board	Reference 5	Pages 8-9
	Transmitter Driver Board	Reference 6	Pages 9-11
	IF Board Assembly	Reference 7	Pages 11-15
	Audio Board	Reference 8	Pages 15-18
	Oscillator Board	Reference 9	Pages 19-21
	Output Filter Board	Reference 10	Pages 22-24
	PA Module Board	Reference 11	Pages 25-27
	AC-PSU Board	Reference 14	Pages 27-28

Diagrams:

Figure 1	DC Plug (View from wiring side of free connector)	Page 1 of Sec. 4
Figure 2	DC Plug (AC/DC Version) (View from wiring side of free connector)	Page 2 of Sec. 4
Figure 3	AC connections (AC/DC Version) (View from wiring side of free connector)	Page 2 of Sec. 4
Figure 4	Mains Tappings	Page 3 of Sec. 4
Figure 5	Mobile Antenna Mounting Bracket	Page 5 of Sec. 4
Figure 6	Co-Axial cable connection to Mobile Antenna	Page 6 of Sec. 4
Figure 7	Two Tone Patterns	Page 3 of Sec. 6
	Ancillaries Connections	Page 3 of Sec. 4
	Accessories Kit	Page 11 of Sec. 4

Illustrations:

Front View	Page 4 of Sec. 5
Rear View	Page 5 of Sec. 5
Internal View AC Version	Page 5 of Sec. 6
Internal View DC Version	Page 6 of Sec. 6
Core Tuning Location BP1820	Page 7 of Sec. 6
Crystal Positions & Associated Trimmers	Page 8 of Sec. 6

Bound at Rear:

Appendix A - Component Handling

Page A1

Appendix B -

Noise Suppression

Page B1-B12

Microphone

Base Station Microphone S1791

Page B1

Hand Mobile Microphone S1790

Page B1

Antennas

Page B2

Series Mobile Whip S1781

Page B3

Multi-Frequency Trap Dipole Antennas
S1782/3/4

Page B4

Aluminium Masts S1786/7/8

Page B5-B6

HF Dipole Antennas S1785

Page B7-B8

Broadband Dipole S1780

Page B9-B10

Page B11-B12

Printed Circuit Boards:

Interconnection	Reference 2	11769P
Transmitter Mixer	Reference 4	11931P
Transmitter Pre-Amp	Reference 6	11934P
Receiver Mixer	Reference 5	11932P
Receiver RF Amp	Reference 3	11935P
IF Amp	Reference 7	11760P
Audio	Reference 8	11768P
Oscillator	Reference 9	11767P
PA Output Filter	Reference 10	11933P
Power Amp	Reference 11	11761P
AC PSU	Reference 14	12276P

Circuits:

BP1779 Issue 2	Receiver Mixer	Reference 5
BP1776 Issue 3	Interconnection Diagram	Reference
BP1781 Issue 2	Oscillator	Reference 9
BP1778 Issue 2	Audio	Reference 8
BP1780 Issue 2	Transmitter Pre-Amp	Reference 6
BP1777 Issue 2	IF Amp	Reference 7
BP1783 Issue 2	Power Amp	Reference 11
BP1782 Issue 2	PA Output Filter	Reference 10
BP1816 Issue 2	AC Power Unit	Reference 14

Section 1

INTRODUCTION & GENERAL DESCRIPTION

The Eddystone ORION 5000 is a compact transceiver operating over the frequency range 2MHz to 16MHz with a maximum output of 150 watts P.E.P. Up to six crystal controlled channels are available as required.

In basic form the ORION 5000 operates in simplex mode on USB (A3J) from a 13.6V DC source with negative ground. Optional features available are LSB operation, operation on both LSB and USB, AM (A3H) on one pre-selected channel, semi-duplex operation on two channels only, and a further two channels within 1% of existing channel frequencies.

An AC/DC version with built in AC power supply unit allows operation from either 13.6V DC with negative ground or 115V/230V 50Hz/60Hz AC.

The ORION 5000 is ruggedly constructed with modular plug-in units to allow rapid servicing and maintenance.

The rack mounting version with a standard 483mm (19") panel is also available for base station use.

Section 2

SPECIFICATION

General

Frequency Range:	Continuous coverage 2MHz - 16MHz
Channels:	1 (standard) no restriction on frequency. Extra channels to maximum of 6 (optional). Further 2 channels within $\pm 1\%$ of other channels.
Mode of Operation:	Simplex USB (A3J) standard. USB and LSB optional.
Optional Facilities:	Semi-duplex available on 2 channels only. AM (A3H) programmed on 1 pre-selected transmit channel.
Operational Temperature:	-10°C to $+55^{\circ}\text{C}$
Humidity:	95% relative, suitable for marine and tropical service.
Altitude:	5000m
Controls:	Front panel - Audio gain with supply switch, RF gain, squelch on/off, clarifier, channel selector. USB/LSB and simplex/duplex when fitted. Internal - microphone gain, ALC level.
Connectors:	Front panel - microphone or handset. Rear panel - power connector, antenna connector, and ancillary connector for external loud-speaker and antenna tuner control.
Indicators:	Power on LED. Transmitter antenna current meter. (Reads signal strength on receive).
Power Supplies:	DC Model - 13.6V DC negative ground; AC/DC model 115V/230V, 50Hz/60Hz or 13.6V DC.
Power Consumption:	DC Model - Receiver - 100mA/300mA: Transmit - 12A average, voice operation.

Circuit: Single conversion, 1400kHz IF, all solid state.
Final amplifier broadband 2MHz to 16MHz.

Receiver

Sensitivity: 0.5 μ V p.d. for 20dB S-N/N

Selectivity: -6dB, 2.4kHz
-60dB, 3.8kHz

AGC: Less than 3dB change in AF output from 5 μ V -
100mV signal input.
20mSec attack and 2sec decay, optimised for
SSB operation, with pedestal action.

Clarifier: Incremental receiver tuning, connected only in
receive mode.

Image Rejection: -55dB typical

Netting: Internal connection for netting transmitter fre-
quency while in the receive mode.

IF Rejection: 70dB to 90dB

Squelch: Operates from syllabic change, optimised for
SSB operation.

Audio Output: 3W at less than 5% distortion.

Loudspeaker: 8cm internal or 8 Ω external via ancillary con-
nector.

Circuit: Single conversion all solid STATE, 1400kHz IF.

Cross Modulation: With a wanted carrier 60dB above 1 μ V adjusted
to give standard output at an audio frequency
of 1400Hz, an unwanted signal 10kHz off-tune
and modulated 30% at 1000Hz must be of a
level exceeding 90dB above 1 μ V to produce an
audio output greater than 30dB below standard
output.

Section 3

CIRCUIT DESCRIPTION

(Receive Mode)

1) RF Amplifier - Module 3

Signals from the aerial socket pass via Transmit/Receive relay 2RLA to gate 1 of the RF amplifier 3TR1. (Dual gate MOSFET).

Protection against high induced aerial voltages is afforded by diodes 3D1-3D4.

3L1-3L6 are switched preset tuned circuits across the input to gate 1 of 3TR1. (Tuned circuits are fitted as required for the frequency range specified). Gain of the RF stage is controlled by AGC voltage applied to gate 2.

2) Receiver Mixer - Module 5

Amplified signals from 3TR1 are applied to gate 1 of mixer transistor 5TR1 (Dual gate MOSFET) with switched preset tuned circuits across the input (fitted as required for the frequency range specified).

Oscillator injection from Module 9 (oscillator) is applied to gate 2.

5CH2 forms the drain load for the resultant 1.4MHz output.

3) IF Amplifier - Module 7

Output from 5TR1 is passed through SSB filter 7FL2 (1400kHz) which may be either USB or LSB according to requirements.

If both USB and LSB filters are required the additional filter is fitted in 7FL1 position and switching between filters is by means of diodes 7D1-7D4.

Output from the SSB filter feeds gate 1 of the 1st IF amplifier 7TR1 (Dual gate MOSFET) and tuned circuit 7L1/7C16 forms the drain load.

The gain of 7TR1 is varied by AGC voltage applied to gate 2.

7TR2 is the second IF amplifier with 7L2/7C17 forming the collector load.

Output from 7TR2 feeds the input of 7IC1, an integrated circuit which combines the functions of AM detector, AM AGC generator and SSB demodulator. Carrier insertion to 7IC1 on SSB is from 1.4MHz crystal oscillator 7TR6.

7TR2 also feeds the optional IF output stage 7TR3 which provides a low impedance output at 1.4MHz on a rear panel socket.

SSB AF output from 7IC1 is applied to 7IC3 an integrated circuit functioning as a generator of AGC developed from the detected SSB audio waveform.

AM and SSB AGC outputs from 7IC1/7IC3 are combined and amplified by 7IC2 before being applied to IF amplifier 7TR1 and RF amplifier 3TR1. The larger of the two AGC voltages developed controls the AGC action.

AGC output from 7IC1/7IC3 also operates the front panel signal strength meter.

AM and SSB audio outputs are routed to the audio amplifier (Module 8).

4) Oscillator - Module 9

Injection to receiver mixer 5TR1 is provided by one of six crystal oscillator circuits 9TR2 - 9TR7, the required circuit being selected by diodes 9D7, 9D13, 9D19, 9D25, 9D31 and 9D37 respectively.

A vari-cap diode is connected across each oscillator circuit and with variable reverse bias from a front panel clarifier control, provides a small change of oscillator frequency.

Output from each crystal oscillator is routed via buffer stage 9TR1.

5) Audio Amplifier - Module 8

AM or SSB audio output from Module 7 is taken via the squelch circuit and a front panel AF gain control, to audio amplifier 8IC3 which feeds the internal loudspeaker and provides output for an external loudspeaker via the ancillary connector.

8TR1 forms an audio gate in series with the feed to the AF gain control.

Audio from Module 7 is also fed to amplifiers 8IC1a/8IC1b whose gain is high enough to allow clipping on the input noise.

The clipped output of 8IC1a/b is of sufficient amplitude to continuously trigger the mono-stable multivibrator 8IC2a/8IC2b.

Output pulses from the multivibrator are filtered by high pass filter 8C8, 8C9 and 8R18), rectified by 8D1 and passed through low pass filter circuit 8R20, 8C10, 8R21 and 8C11.

At the output of the filter the varying DC level is proportional to the frequency of the output pulses from the multivibrator 8IC2a/b.

This variation in DC level corresponds to the change in frequency of the voice being received. The DC level is now fed into amplifier 8IC1d which responds to frequencies in the region of 1Hz.

The output of 8IC1d now passes to 8IC1c, whose output will cause diode 8D3 to conduct if any positive or negative going voltages appear at 8D4/8D5 with an amplitude of 1V or greater. This allows detection of the first syllabic change appearing at the input of 8IC1a.

When 8D3 conducts, the input of 8IC2d goes low, and the output goes high allowing audio gate transistor 8TR1 to conduct and pass audio signals to the audio output stage.

8IC2c and 8C3 keep the gate of 8TR1 high for a short period, allowing the audio path to remain open for 1 to 2 seconds after speech ceases.

8D3 is also connected to a front panel squelch ON-OFF switch, and when 8R9 is connected to earth, the squelch circuit is disabled.

8RV1 adjusts to the threshold at which the squelch circuit operates.

Transmit Mode

6) Audio Amplifier - Module 8

Microphone output via preset internal gain control 2RV1, is amplified by 8TR2 and 8TR3 before being fed to the signal input of double balanced modulator 8IC4. 1.4MHz oscillator input to 8IC4 is derived from the IF amplifier Module 7.

Double sideband suppressed carrier output from 8IC4 passes to Module 7.

Preset balance control 8RV2 allows optimum carrier suppression in 8IC4 to be achieved.

7) IF Amplifier - Module 7

DSB output from the balanced mixer 8IC4 is filtered by 7FL2 (or 7FL1 if fitted) USB or LSB 1.4MHz filter, and the resultant SSB signal is amplified by 7TR1, whose gain is controlled by the ALC voltage developed from the transmitter output.

From 7TR1 the SSB signal passes to the transmitter mixer Module 4, via emitter follower stage 7TR4. The 1.4MHz crystal oscillator is held at constant level by 7TR7 and its associated components. Output from 7TR6 passes to audio Module 8. When AM is required (optional extra), 7TR5 is fitted to insert a 1.4MHz carrier to the SSB signal after the SSB filter.

The level of carrier insertion on AM is adjusted by preset control 7RV2.

8) Transmitter Mixer - Module 4

SSB Signals at 1.4MHz are fed to the signal input of double balanced modulator 4IC1, with the carrier input derived from the oscillator Module 9.

The output from 4IC1 at signal frequency passes to emitter follower stage 4TR1.

4L1 - 4L6 are preset tuned circuits across the input to 4TR1 and are adjusted to signal frequency.

The coils fitted will vary according to the frequency bands required.

9) Oscillator - Module 9

Six crystal oscillator circuits are employed 9TR2 - 9TR7, the one in use being selected by earthing diodes 9D13, 9D19, 9D25, 9D31 or 9D37 respectively.

As all oscillator circuits are identical only 9TR2 is described.

In transmit mode, the vari-cap 9D3 diode across the oscillator circuit is switched out of circuit by reverse biasing switching diodes 9D2 and 9D4. The vari-cap diode is replaced by a fixed capacitor 9C5 switched into circuit by forward biasing switching diodes 9D5 and 9D6.

The output from each oscillator is fed to emitter follower stage 9TR1 providing a low impedance output.

10) Transmitter Pre-amplifier - Module 6

Output from 4TR1 is amplified by transistor amplifier 6TR1 with the collector load formed by one of six preset switched tuned circuits 6L1 - 6L6. These circuits are at signal frequency and appropriate coils will have been fitted to suit the bands required.

Further amplification is performed by 6TR2 which is a broadband amplifier with matching transformer 6T1 as its collector load.

6T1 matches the output impedance of 6TR2 to the input impedance of the Power Amplifier Module 11. Switch section SW2 selects the appropriate oscillator circuit for the channel desired, and also selects antenna tuner unit channel (if fitted).

11) Power Amplifier - Module 11

The power amplifier is a broadband unit with driver transistor 11TR1 coupled by matching transformer 11T1 to push-pull power amplifiers 11TR3 and 11TR4.

11T2 matches the output impedance of 11TR3/4 to the Output Filter Module 10.

11TR2, 11D1 and 11D2 provide a temperature compensated constant voltage bias supply for 11TR3/4 with RV1 preset control setting the quiescent current.

12) Output Filter - Module 10

Five low pass filter sections are provided with cut off frequencies of approximately 3MHz, 5MHz, 8MHz, 12MHz and 16MHz to attenuate harmonic components in the output of the transmitter.

These filters are fitted as required by the channel frequencies. If more than one frequency is required in any of the five ranges, links are fitted on 10SW1 and 10SW2 to select the appropriate output filter.

Transformer 10T1 provides a sample of the output power to operate the aerial current meter and ALC circuits.

The RF output from 10T1 secondary is rectified by 10D1 and 10D2.

The DC output from 10D1 proportional to forward power, is fed via meter level preset control 10RV2 to the front panel aerial current meter.

The DC output from 10D2 proportional to reverse power is added to the DC output from 10D1 and amplified by 10TR1 filtered by CH1 and used to control the gain of IF amplifier 7TR1. Adjustment of ALC level is by means of 10RV1 preset.

The ALC circuit is also arranged to reduce the output of the power amplifiers in the event of excessive heat sink temperature.

A thermal switch mounted on the heat sink normally shorts out 10R8, but if the temperature rises above 70°C, the thermal switch allows 10R8 to increase the ALC level thus reducing the gain of IF amplifier 7TR1.

Section 4

INSTALLATION

General DC Model

1a) Power Connector

The DC power is connected to the transceiver via a 6 way power socket located on the rear panel. A matching 6 way plug is supplied in the installation kit and this should be wired as shown below in Figure 1.

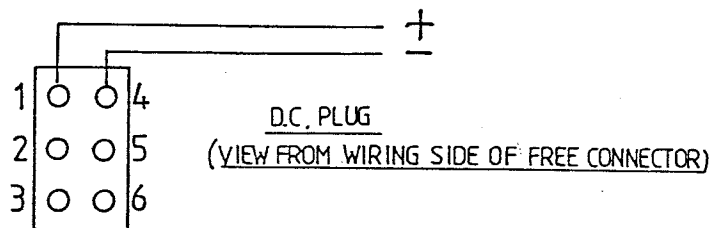


Figure 1

The DC supply should be connected by a pair of heavy duty cables.

Multicore cable consisting of 51 strands of 0.25mm wire is recommended unless long runs are required, when heavier cable should be used.

The connections to the plug should be soldered or crimped securely to ensure a low resistance joint.

The power cable should take the shortest route possible to the DC source to ensure minimum power loss.

Connections should be made directly to the DC source and not by existing wiring which in many cases will not carry sufficient current.

No external fuse is necessary, as a supply fuse is fitted inside the transceiver.

1b) AC/DC Model (DC Supply)

The DC connections are as below in Figure 2.

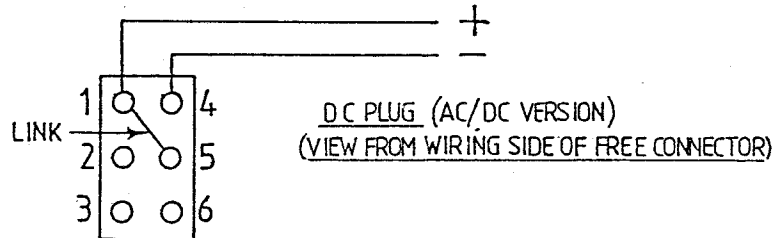


Figure 2

The wiring should be carried out as for the DC model.

1c) AC/DC Model (AC Supply)

The AC mains connections are as below in Figure 3.

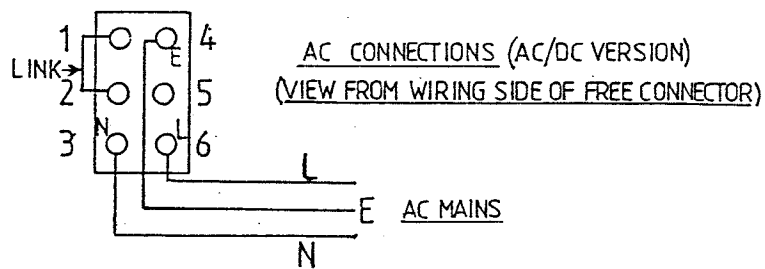


Figure 3

AC cable supplied ready wired as shown in Figure 3. Connect other end to supply as follows:

- | | | |
|--------------|---|---------|
| BROWN | - | LINE |
| BLUE | - | NEUTRAL |
| GREEN/YELLOW | - | EARTH |

1d) AC/DC Model (Adjustment of mains voltage tap)

Remove top cover of transceiver and remove cover plate over mains transformer.

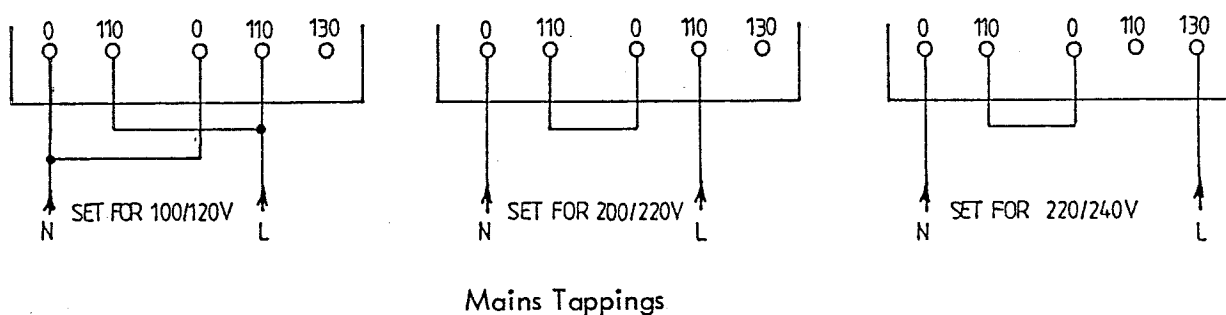


Figure 4

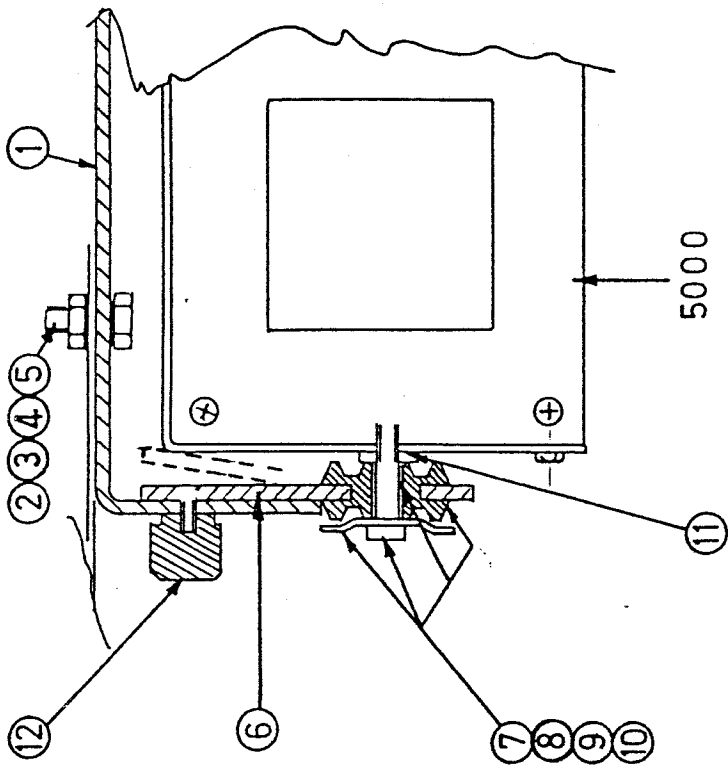
Connect taps as shown in Figure 4 to suit local mains supply voltage.

1e) Ancillaries Connector

Pin 1	-	Earth Contact Channel 1)	
Pin 2	-	Earth Contact Channel 2)	
Pin 3	-	Earth Contact Channel 3)	
Pin 4	-	Earth Contact Channel 4)	Antenna Tuner Unit
Pin 5	-	Earth Contact Channel 5)	
Pin 6	-	Earth Contact Channel 6)	
Pin 7	-	Earth return for external LS and antenna tuner unit		
Pin 8	-	External LS		
Pin 9	-	+ supply (V1) for antenna tuner unit		

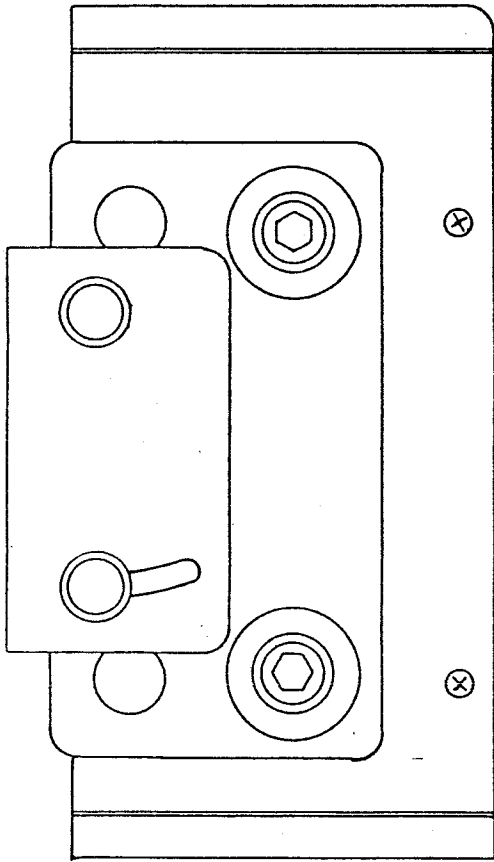
2) Transceiver Mounting (Mobile)

In order to assess the most suitable position for mounting the transceiver inside a vehicle, the mobile cradle/shock tray should first be assembled and attached to the transceiver as shown in the assembly drawing BP1803, (see Page 4 of Sec. 4).

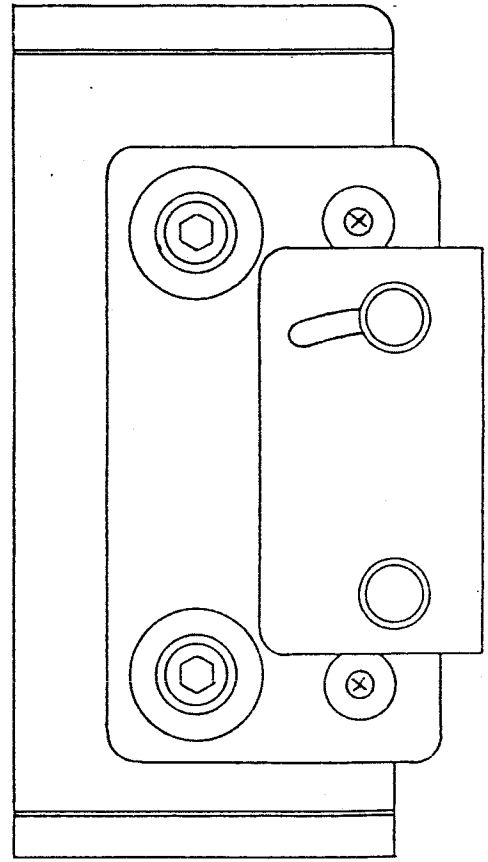


ASSEMBLY SEQUENCE

1. Secure mounting bracket (1) to vehicle using M6 x 16 hex head bolts, nut and washers (2) (3) (4) & (5) supplied. The position of the radiused slot is important, this should be to the rear for pendant mounting, and to the front for pedestal mounting.
2. Fasten mounting plates (6) (2 off) complete with shock absorbers (10) and spacers (9) using the M5 hex head screws (8). The dish washer (7) is fitted under the head of the screw and the plain washer (11) between the shock absorber and top cover. The two studs in the mounting plate (6) should be facing outwards and must be positioned uppermost for pendant mounting and down for pedestal mounting.
3. Compress the mounting plates inwards against the top cover of the unit (see dotted line). It will then be found possible to engage studs in the holes and slots in the mounting bracket.
4. Release the compression on the mounting plates and fit knurled nuts (12) loosely on studs. Set unit to required angle and tighten knurled nuts to retain.



PENDANT MOUNTING



PEDESTAL MOUNTING

BP1803

The cradle/shock tray can be mounted in two ways:-

- (a) To allow the transceiver to be mounted under a dashboard.
- (b) To allow the transceiver to be mounted above a dashboard or on the centre tunnel.

Angular adjustments are facilitated by radial slots in the rear of the cradle. Carefully position the transceiver and cradle to allow adequate ventilation to the rear heat sink, and to allow mounting on a sound metal surface.

Note the position for mounting and remove the transceiver from the cradle. Position the cradle and drill four 5.5mm holes, taking care not to damage any wiring or instrumentation behind the metal panel being drilled.

Fit the cradle/shock mount to the vehicle with the four screws nuts and washers provided and then reassemble the transceiver and shock mounting plates in the cradle as shown in BP1803, see page 4 of Section 4.

If a microphone has been supplied with the transceiver, it will be provided with a mounting clip which should be fixed to a suitable surface close to the operating position with the screws supplied.

3) Transceiver Mounting (Base Station)

The ORION 5000 should be placed in a suitable position on a horizontal flat surface, allowing adequate space for ventilation all round the equipment.

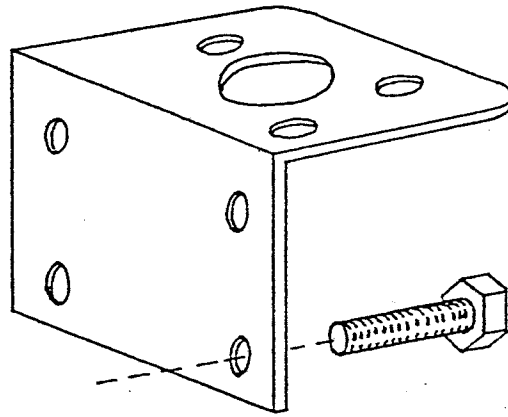
Care should be taken not to place books or other materials on top of the transceiver as this may cause excessive overheating. Rack mounted transceivers should be fixed with four 6mm screws through the front panel, ensuring that there is adequate ventilation with the rack round the equipment.

4) Antenna Installation (Mobile)

The antenna is of rugged, heavy duty design, and therefore requires a solid mounting surface.

If a flat bumper surface, such as that found on a Land Rover is not available, then an angle bracket must be made using steel plate of a minimum 4mm thickness, or by using Eddystone mounting plate kit, type S1801.

The dimensions and position of the antenna base mounting holes can be determined by using the metal plate attached to the base, as a template. Adequate clearance must be allowed for the base centre connector bolt, as shown in Figure 5.



Mobile Antenna Mounting Bracket

Figure 5

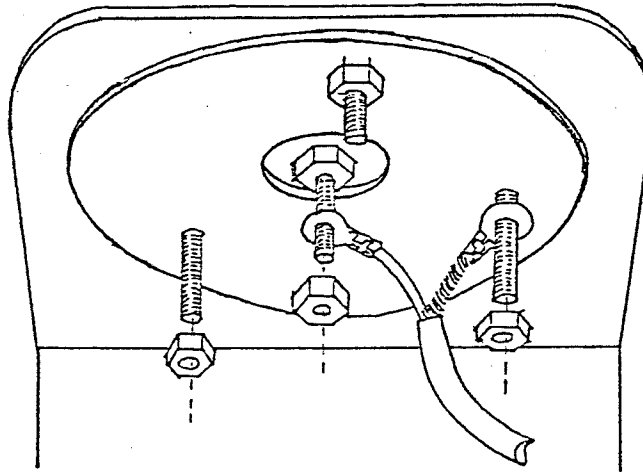
The bracket can then be bolted to a suitable surface.

Mounting the antenna directly onto vehicle wings or roofs should be avoided as excessive movement in the antenna during motion will cause metal fatigue and eventual fracturing, resulting in the antenna breaking away.

Having mounted the antenna as described above, and securing the base with the three 6mm countersunk screws supplied, the co-axial cable should be routed through the vehicle body from the antenna base to the rear of the transceiver, with the attached PL259 connector at the transceiver end.

To ensure maximum efficiency the shortest route should be taken.

The co-axial cable at the antenna base should be bared and the terminal connectors fitted as shown in Figure 6.



Co-Axial Cable Connections To Mobile Antenna

Figure 6

The outer (braid) connector is fitted under one of the antenna securing nuts and the inner conductor is connected to the centre connector.

For base station antennas, see separate instructions.

5) Tuning The Antenna

The antenna has been factory pre-tuned to the designated frequencies, but will require a small amount of adjustment to take into account individual vehicle proximity effects.

The PL259 on the 'free' end of the patch lead should be connected to the antenna socket on the rear of the transceiver, and hand tightened securely.

The PL259 on the end of the antenna feeder coax should be connected to the vacant socket (antenna) on a suitable VSWR meter. The DC supply connector can now be fitted to the socket on the rear of the transceiver. The microphone plug should also be fitted to the microphone socket on the front panel of the transceiver. Switch on the transceiver, and the red LED indicator should illuminate. Place the VSWR meter in a position where the dial can be clearly seen, and depress the microphone switch.

By whistling or by voice, call into the microphone in a constant manner, and adjust the 'Set' control on the VSWR meter until the needle reaches the 'Set' mark on the dial. Now switch the VSWR meter to read the SWR. This will probably read between 2 and 3. Release the

microphone switch, remove the top whip section from the antenna using hexagon key supplied.

A hacksaw should be used to remove 1 inch (25mm) from the thick end of the steel whip. When this is removed, replace the whip and re-tighten. Repeat the VSWR test and note the dial readings, which should be slightly reduced.

Repeat the whole antenna cutting and testing procedure until a reading of between 1 and 1.5 is observed on the SWR dial. Final small adjustment can be made by loosening the hexagon screw holding the whip section of the antenna, and sliding the whip up and down to achieve minimum SWR reading.

When the lowest reading possible has been reached, the transceiver should be switched off. The plug should be removed from the transceiver antenna socket, and the antenna feeder cable plug removed from the VSWR meter.

The antenna feeder cable connector should then be fitted to the transceiver antenna socket, and hand tightened securely. (Remember, badly fitted RF connectors can cause damage to the equipment).

6) Testing

The installation is now complete, and ready for testing. Again, switch on the transceiver. With the 'Squelch' control in the 'off' position, advance the volume control. A loud hiss will be heard in the loudspeaker. Switching the 'Squelch' to the 'on' position will cause the hiss to disappear. This indicates normal receiver operation.

Select an appropriate channel, and depress the microphone switch. Holding the microphone approximately 2 inches (50mm) from the mouth and speak in a normal clear manner. The 'Antenna Current' meter will be seen to 'kick' towards the right hand side of the scale, indicating normal and correct transmitter operation.

After a short identification call, release the microphone switch. A reply should be heard in the loudspeaker, and the correct voice 'tone' can be obtained by adjustment of the clarifier control. Adjustment of the 'RF Gain' control will ensure the receiver is not overloaded, and a clear signal is received.

Channeling

When setting up the 5000 to operate on extra channels, it will be necessary to fit coils to the Receiver RF board Reference 3, the Receiver Mixer board Reference 5, the Transmitter Mixer board Reference 4 and the Transmitter Pre-amplifier board Reference 6.

Table 1 below shows the coils to be fitted for the frequency range required.

The same type of coil is fitted to all four boards for a particular range.

	RANGE	FREQUENCY	PART NUMBER	
	1	2-3MHz	D5926	
	2	3-5MHz	D5927	
	3	5-8MHz	D5928	
	4	8-12MHz	D5929	
	5	12-16MHz	D5930	

Coils and capacitors will also have to be fitted to the PA output filter board Reference 10 for the appropriate range, but if frequencies for several channels fall within one coil range links can be arranged on the switch wafers 10SW1 and 10SW2 to employ the one filter coil and capacitors for more than one channel.

Filter coils and capacitors for different ranges are shown in Table 2 below:

Capacitors are silver mica 350V working with $\pm 2\%$ tolerance.

Table 2

RANGE	FREQUENCY	C1	C2	C3	INDUCTOR PART NUMBER
1	2-3MHz	1000p	2000p	1000p	D5957
2	3-5MHz	470p	1200p	470p	D5958
3	5-8MHz	200p	750p	200p	D5959
4	8-12MHz	-	470p	-	D5960
5	12-16MHz	-	470p	-	D5961

When removing any of the five plug in boards, it is first necessary to remove the switch shaft passing through the boards by loosening the grub screw on the shaft coupler and withdrawing the shaft to the rear through the hole provided in the heatsink.

Due to the tolerance in ferrite material it may be necessary, when operating at the extreme HF end of each filter coil, to remove turns to enable full power to be transmitted.

Oscillator

Crystals should be ordered against the following specification:

Quartz Crystal Style HC42/U Parallel Resonance
 ± 25 PPM Initial Tolerance at 25°C
 ± 5 PPM Frequency Variation over 0°C to $+40^{\circ}\text{C}$. To tune with 30pf.

The oscillator circuits are optimised over the range 3.4MHz to 17.4MHz. If low activity crystals are fitted at the extreme ends of the range, oscillations may be unreliable and Capacitors C6/7, C9/10, C12/13, C15/16, C18/19 or C21/22 (according to channel fitted) should be changed from 270pf to 150pf at high frequency end and 330pf at low frequency end.

Coil Adjustment

After fitting coils and crystals for additional ranges, or when changing existing ranges, carry out test procedure Pages 1-4 of Section 6 for each range. Coil core location and crystal trimmer locations will be found on Pages 7 and 8 of Section 6.

Squelch Adjustment

Final adjustment to squelch level (8RV1) should be made under normal working conditions such that the squelch lifts when receiving the required transmission.

Duty Cycle

The Orion 5000 allows a duty cycle of at least 50% transmit/receive (typically continuous on DC model) when used at 25°C with normal voice transmission. It should be noted that the heat sink and associated components may operate at up to 70°C, and that this temperature is quite normal for this type of equipment. At 70°C, a thermal trip operates which reduces the power output by 10dB, resetting automatically when the temperature reduces.

Kit of Accessories Spares for 5000/1

1	6way Receptacle Housing	12359P
3	Crimp Female Connectors	12360P
1	9 way Plug Housing	12358P
9	Crimp Male Connectors	12361P
1	UHF Co-Axial Plug	12357P
1	20 amp 1¼" Fuse	12329P

Mains Version - Kit of Accessories Spares for 5000/2

1	6 way Receptacle Housing	12359P
3	Crimp Female Connectors	12360P
1	9 way Plug Housing	12358P
9	Crimp Male Connectors	12361P
1	UHF Co-Axial Plug	12357P
1	20 amp 1¼" Fuse	12329P
1	Mains Lead	D5993
1	3.15 amp Anti-Surge Fuse	12332P
1	3.15 amp Fuse	11967P

Section 5

OPERATION

Controls

1a) AF Gain/On-Off Switch

This switch controls the power to the transceiver. There is no warm up period, and the equipment will function immediately once the knob has been turned in a clockwise direction.

The red LED lamp will illuminate, indicating that the equipment is operating.

Rotating the knob further in a clockwise direction will increase the output from the loudspeaker.

1b) Squelch On-Off Switch

In the 'ON' position, no noise will be heard from the loudspeaker, regardless of the position of the volume control unless speech is being received on the channel selected.

With the squelch 'OFF', background noise will be heard at all times in the loudspeaker except when a signal is being received.

Except when listening to exceptionally weak signals, it is usually more comfortable to set the squelch switch to 'ON'.

1c) Channel Selector Switch

If the transceiver is fitted with more than one channel, the appropriate channel can be selected by rotation of this control.

The frequency indicated will be applicable on both transmit and receive unless the transceiver is equipped for semi-duplex mode (see separate heading).

1d) USB/LSB Switch (when fitted)

If the transceiver has been supplied with USB and LSB filter option, the individual sidebands can be selected by the USB/LSB switch.

Unless the operator has been given specific instructions regarding the use of the USB/LSB modes, the USB mode should first be selected when attempting to receive a signal on the ORION 5000.

1e) Clarifier Control

The clarifier, which is operational on receive mode only, allows the operator to adjust the frequency being received over small limits.

When a signal is heard the clarifier control should be adjusted to produce the most realistic and acceptable voice.

If, however, an intelligible signal cannot be resolved the LSB filter (when fitted) should be selected and the clarifier control re-adjusted for maximum clarity.

1f) RF Gain Control

The RF gain control adjusts the sensitivity of the receiver section, and is used to prevent very strong signals from overloading the receiver. A strong signal will be seen to deflect the signal strength meter needle hard to the right of the scale.

The RF gain control should initially be set fully clockwise, and once a signal is received, the control should be turned anti-clockwise to produce the clearest reception.

With very weak signals the control should be kept fully clockwise.

1g) Simplex/Semi-duplex Switch (when fitted)

This option provides semi-duplex operation on channels 1 and 6 of the transceiver, enabling the operator to use the equipment on split frequencies, one for receive and another for transmit with any spacing of the two frequencies.

If the frequency spacing on channels 1 and 6 is within 1%, then simplex or semi-duplex operation on these channels is possible.

1h) Microphone

The Microphone supplied with the ORION 5000 will have a suitable plug fitted to the cable, and this should be inserted into the microphone socket on the front panel. The locking ring should be securely hand tightened to prevent the plug working loose.

Depressing a button on the side of the microphone actuates the transmitter section of the equipment, (or a lever in the case of the base station microphone).

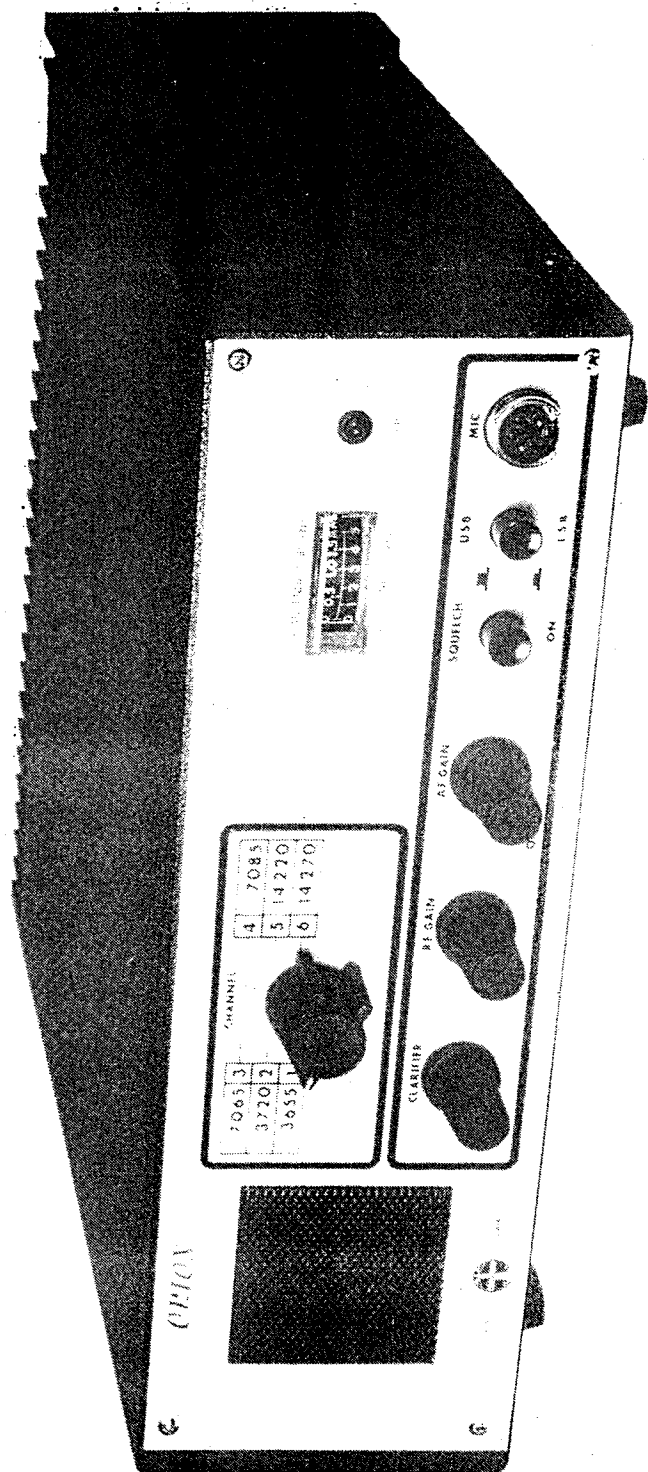
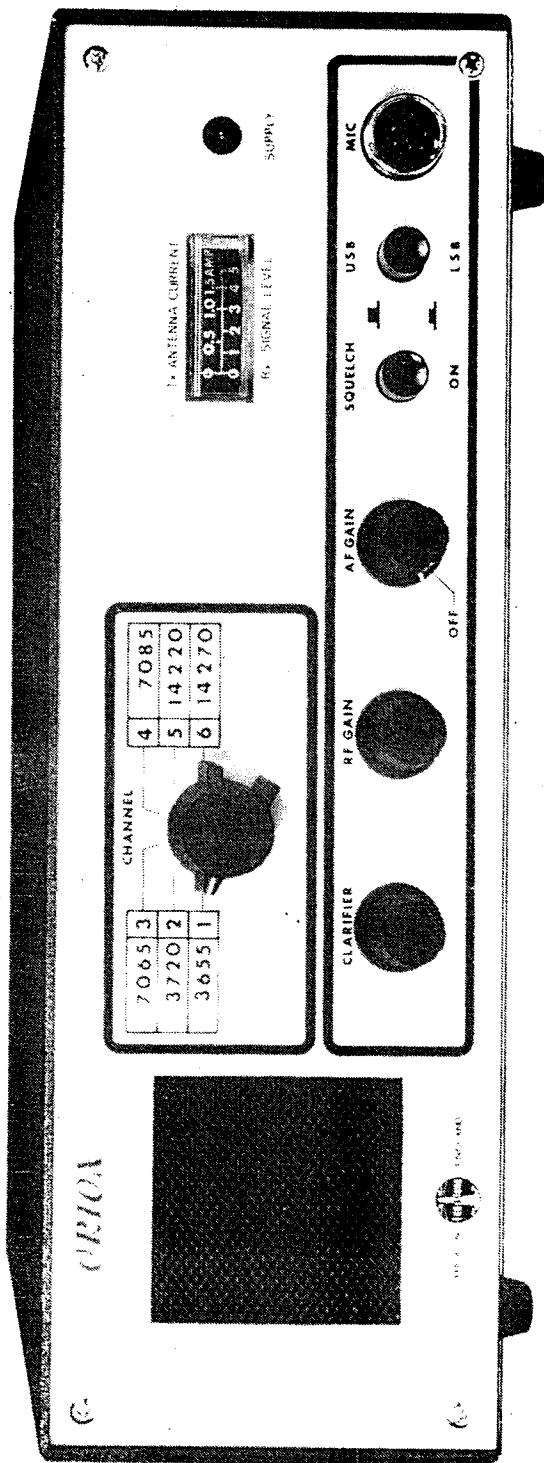
When ready to transmit, the microphone should be placed approximately 1-2 inches from the operator's mouth, and to one side, so that when speaking, the operator speaks across the face of the microphone. This prevents bursts of air blowing into the microphone and causing distorted speech peaks. Unless under very difficult communication conditions, the operator should always speak in a normal voice level.

When using the equipment on AC mains whistling into the microphone should be avoided, as the heavy current drawn from the power supply will cause a voltage drop in the equipment on a sustained note. While no damage will occur from this practice it should be avoided.

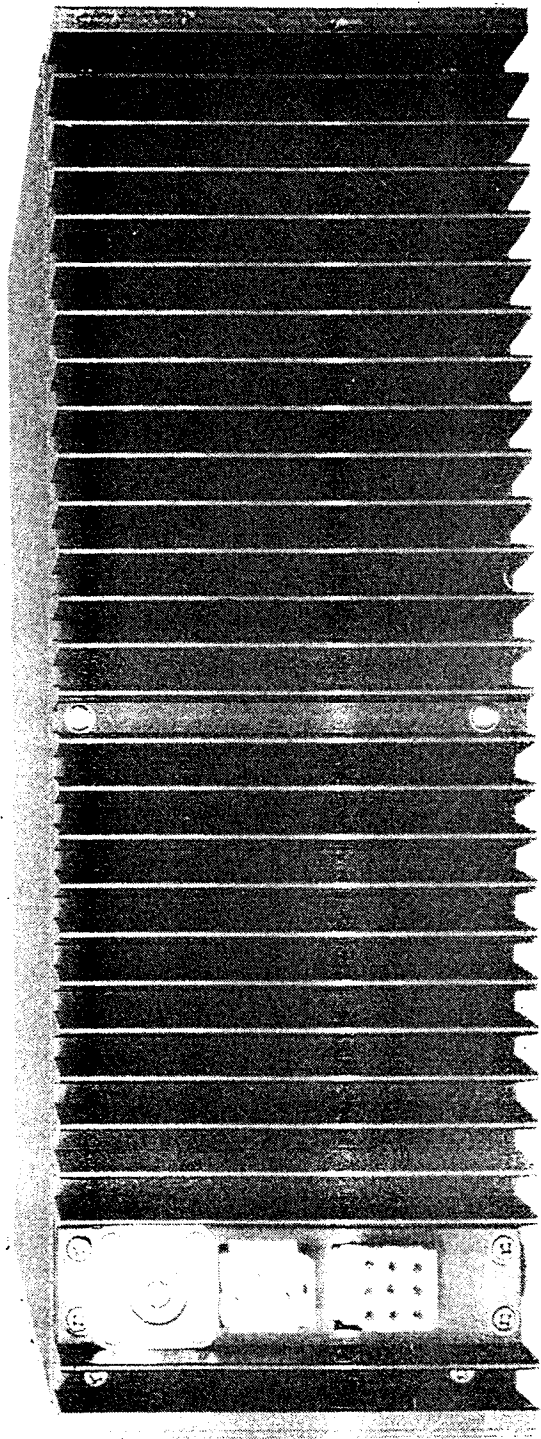
No voltage drop in the AC mains power unit occurs on normal speech transmission.

1i) Meter

On transmit, the meter indicates the average aerial current supplied from the ORION 5000. Because of the waveform of speech, the average current is very low, and gives a reading in the region of 0.5 amp when using a microphone for normal 150W PEP operation. A current of 1.2 amp corresponds to 150W PEP from a steady two tone signal.



FRONT VIEW



REAR VIEW

Section 6

MAINTENANCE

Test Procedure

1) Test Equipment Required:-

DC Power Supply 13.6V at 20 amp rating

Output Power Meter 8 Ω impedance (e.g. Marconi Instruments TF893A)

Signal Generator 2MHz to 16MHz (e.g. Marconi Instruments 2002 or similar)

50 Ω RF load resistor (100 watt rating)

Oscilloscope (50MHz bandwidth) with high impedance probe

Distortion Factor Meter (e.g. Marconi Instruments TF2331 or similar)

Spectrum Analyser (if available) (e.g. Marconi Instruments TF2370)

Frequency Counter (to 16MHz)

AVO 8 Multi-meter or similar

2) Connect DC Power Supply (set to 13.6V) to 5000 terminals (if using internal AC power supply all tests can be carried out, except that measurement of full output power on transmit cannot be made).

3) Receiver Section Alignment

a) Connect output power meter to ancillary socket 8 Ω audio output, pin 8 and pin 7 (earth).

b) Set 5000 to channel 1 and connect Signal Generator to aerial socket. Set Signal Generator to channel 1 frequency +1kHz and at a suitable output level below AGC threshold.

c) Tune 7L1 and 7L2 on IF printed circuit board for maximum output.

Tune 3L1 on receiver RF amplifier and 5L1 on receiver mixer printed circuit board for maximum output taking care to keep the input level below AGC threshold.

d) Tune RF amplifier and mixer coils on all other channels fitted.

e) Set 7RV1 on lowest gain channel to give a 5 μ V (emf) AGC threshold.

- f) Increase input from Signal Generator to 100mV (emf) and set 2RV2 to give a reading of '5' on the signal strength meter.
- g) Connect Frequency Counter to pin 29 on interconnection board 2 and adjust 7C42 to give 1,400,000Hz.
- h) Remove Signal Generator and short pins 1 and 2 on 1SK3 (Microphone input) or change (s-u) link to (s-t).

Connect Frequency Counter to pin 52 on interconnection board 2 and adjust 2C1 to 2C6 on channels 1 to 6 respectively (where fitted) to give correct frequency.

Replace (s-u) link and check clarifier range on each channel (approximately $\pm 100\text{Hz}$ at 3MHz to $\pm 1\text{kHz}$ at 16MHz).

- i) Reconnect Signal Generator to aerial socket and select channel 1. Check selectivity at -6dB and -60dB (keeping input from signal generator below AGC threshold). -6dB should be of the order 300Hz and 2700Hz and -60dB of the order, -400Hz and +3400Hz. Repeat for other sideband if both USB and LSB filters are fitted.
- j) Check that RF gain range is greater than 40dB.
- k) Connect Distortion Factor Meter to the audio output and check that distortion at 1 watt output is less than 5%.
Check that maximum AF output is 3 watts.
- l) With Signal Generator set for 0.5 μV p.d. output check that the signal to noise ratio is better than 20dB.
- m) Set squelch control 8RV1 to mid-position and with a steady state signal input of approximately 100 μV check that receiver is muted.

Vary the input frequency with generator or clarifier and check that muting lifts.

A final setting of the squelch control 8RV1 should be made when receiving a speech signal in normal use.

4) Transmitter Section Tests

- a) Set microphone gain control 2RV1 to mid-position and connect 50Ω 100 watt load resistor to aerial socket.

Connect oscilloscope across load.

- b) Connect Avo Meter on 1 amp range in main HT lead to PA and short pins 1 and 2 together on 1SK3. Adjust PA bias control 11RV1 to give 300mA standing current with no output.

- c) o/c pins 1 and 2 on 1SK3 and remove Avo Meter from PA HT lead.

- d) Select channel 1. Apply audio input to pins 4 and 5 of 1SK3, then short pins 1 and 2 of 1SK3 together.

Tune 4L1 and 6LT for maximum output, reducing audio level to keep output level below 100V peak to peak on the oscilloscope. Always start with coils at maximum inductance (core inside former) and turn core anti-clockwise for first peak, otherwise it would be possible to tune at incorrect spurious frequencies.

- e) Repeat (d) for any other channels fitted.

- f) Remove audio input and adjust 8RV2 for minimum output (carrier balance).

- g) Apply 1kHz and 1.6kHz to audio input (pins 4 and 5 of 1SK3) and increase level to 'unflattened' output on oscilloscope (see Figure 7 page 4 of Sec. 6).

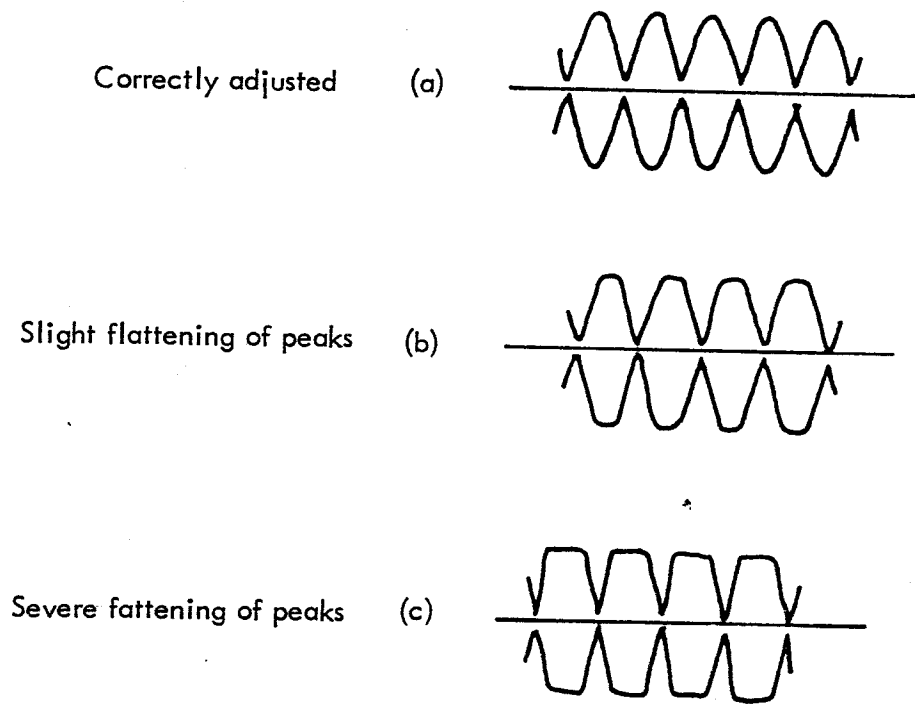
Output should be between 200V peak to peak and 250V peak to peak (150 watts PEP). If a Spectrum Analyser is available check that Intermodulation Distortion is better than -25dB.

- h) Adjust ALC control 10RV1 to give maximum 'unflattened' output on all channels with audio level driving into ALC.

- i) At maximum output 150 watts PEP adjust 10RV2 to give 1.2 amps on Antenna Current Meter.

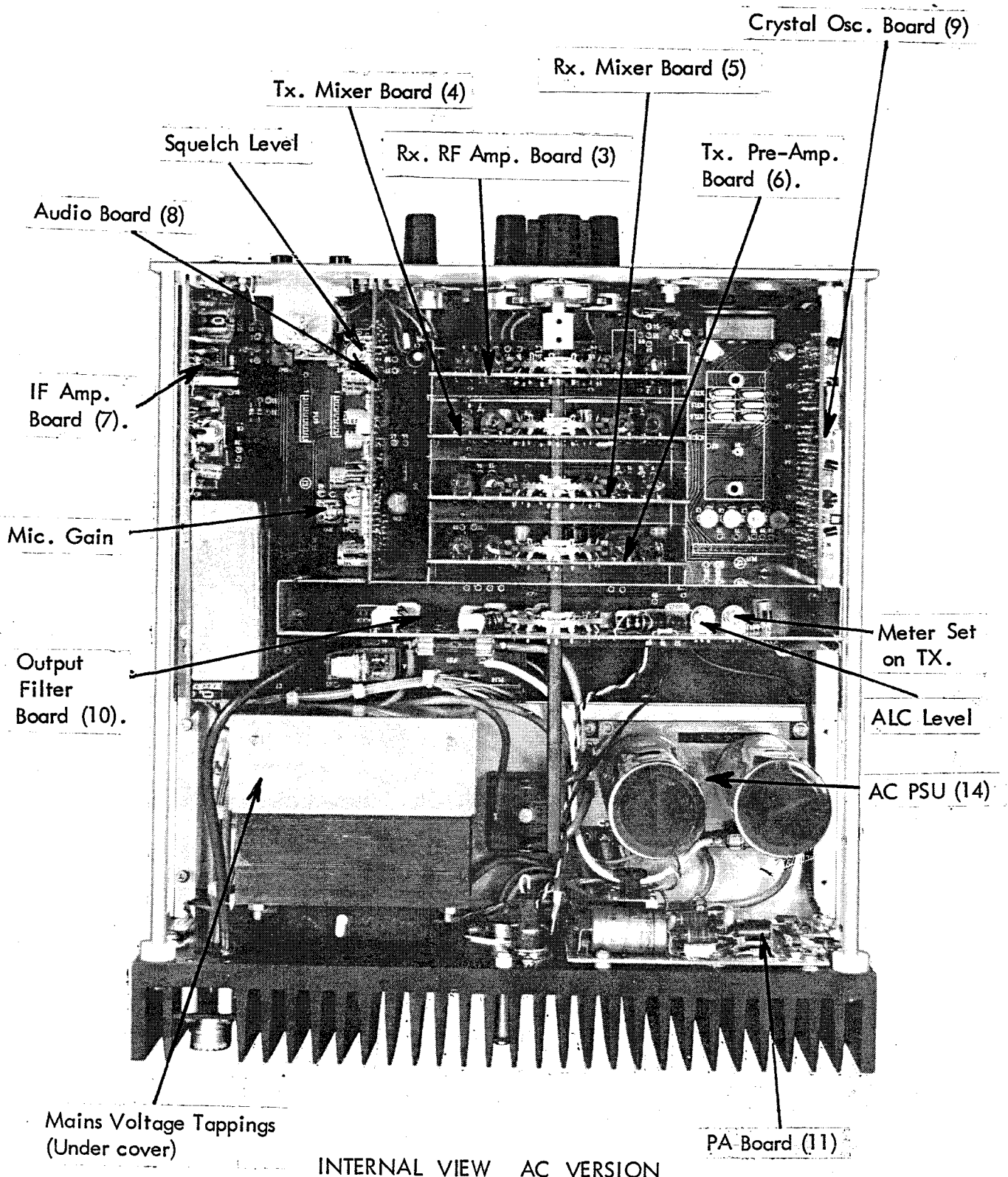
- j) Remove short circuits on 1SK3 and connect microphone and adjust Microphone Gain 2RV1 so that talking normally into the microphone causes peaks to reach maximum output level without undue clipping.

- 1) **NOTE** Full 2 tone output cannot be achieved with internal AC PSU (AC/DC Models). The AC Power Supply Unit is suitable for SSB where current drawn by speech waveform is not as high as steady state 2 tone output. This does not imply that transmitter does not give 150 watts PEP output with normal speech operation.

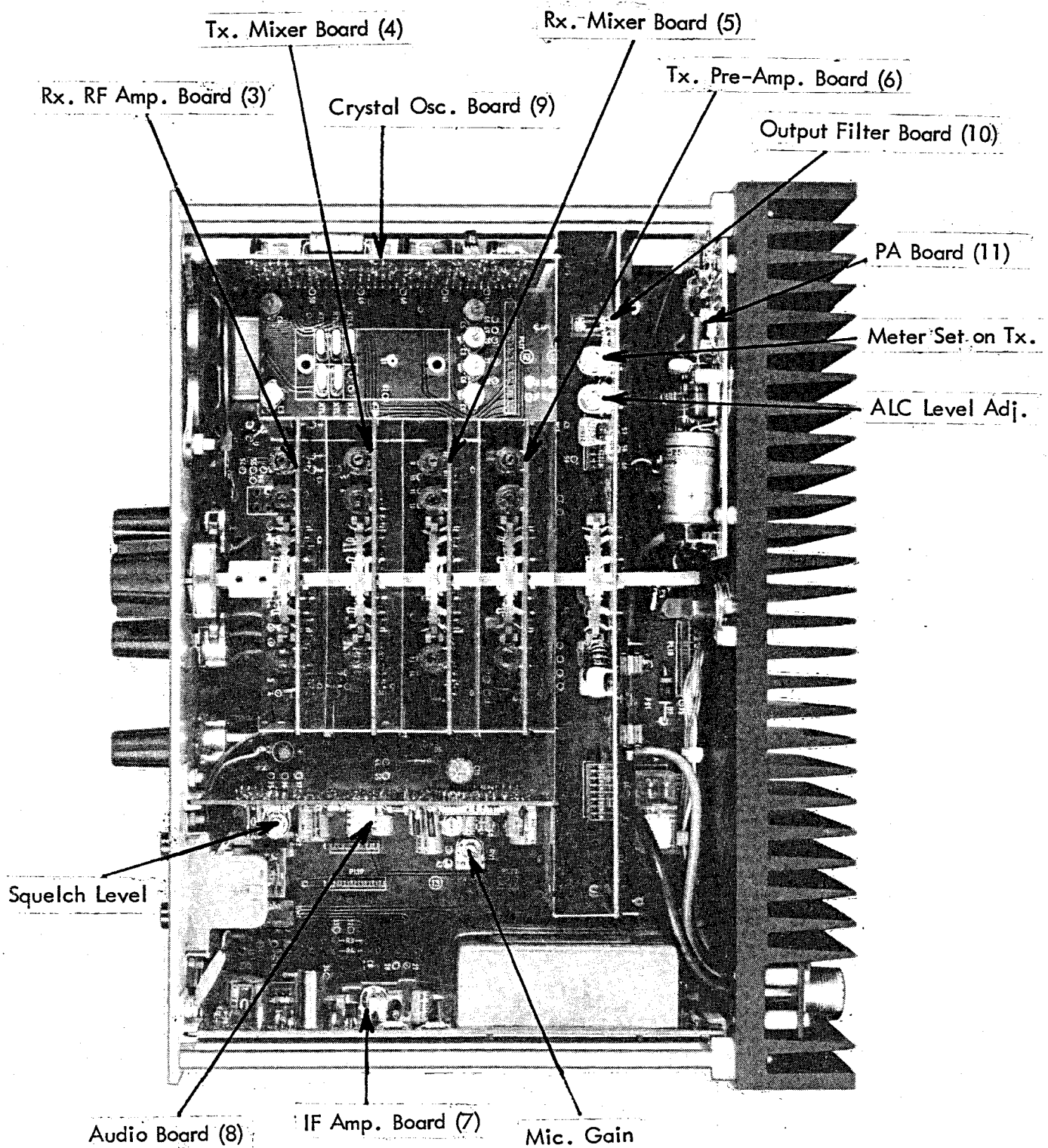


Two Tone Patterns

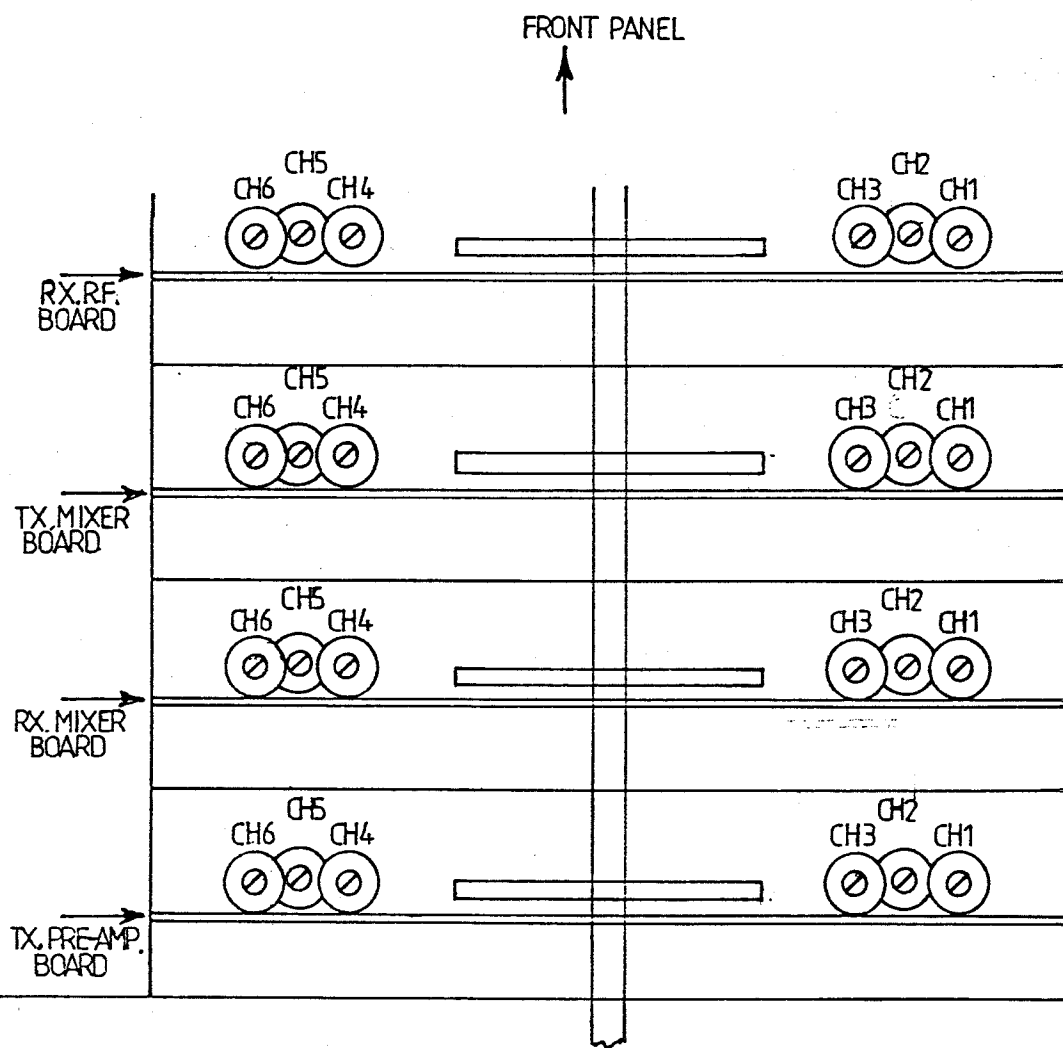
Figure 7



INTERNAL VIEW AC VERSION



INTERNAL VIEW DC VERSION

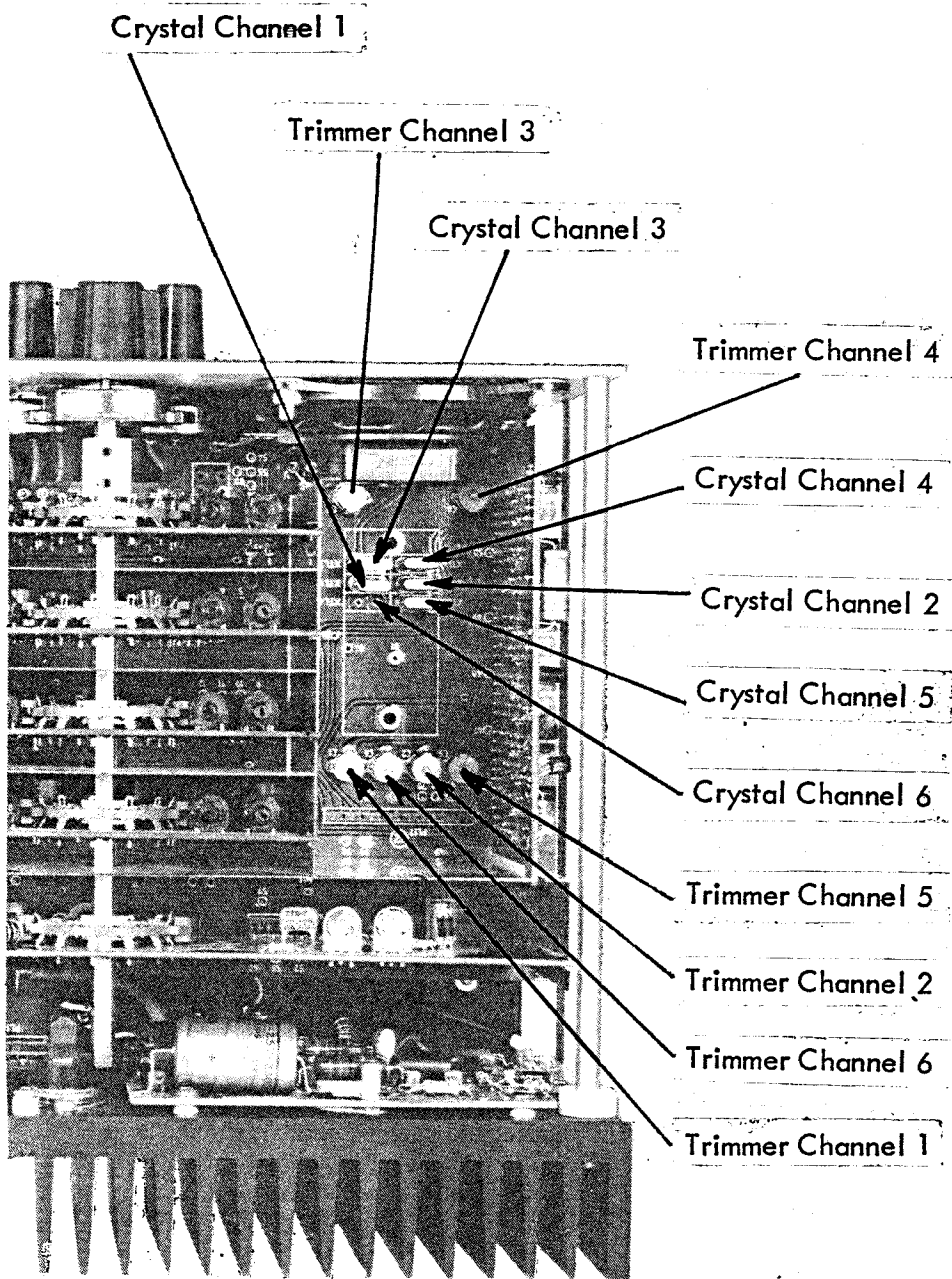


5000 SERIES CORE TUNING LOCATION

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EDDYSTONE RADIO LTD
BIRMINGHAM B31 3PP
ENGLAND.

DRG No | BP1820



Series 5000
 Crystal Positions & Associated Trimmers

Voltage Analysis

Unless otherwise stated, figures taken in receive mode with AF Gain half travel, RF Gain maximum, clarifier centre, squelch off, with no signal applied. Figures measured with AVO meter number 8 (10,000 Ω /volt) on 25 volt range, with ORION powered from external 13.5 volt DC supply.

Pin No.	G1	G2	S	D
3TR1	1.2	4.75	2.8	13.5
5TR1	1.8	0.9	0.8	13.5

Pin No.	E	B	C
4TR1*	1.5	2.1	13.5
6TR1*	6.5	7.0	12.0
6TR2*	1.4	2.0	13.5

Pin No.	G1	G2	S	D
7TR1	1.6	4.5	2.2	10

Pin No.	E	B	C
7TR2	4.5	5.0	10
7TR3	5.5	6.0	10
7TR4	3.75	4.5	10
7TR5	4.5	5.0	10
7TR6	1.75	1.25	8.5
7TR7	0	0.5	10.5
7TR8	3.5	4.25	6.0

Pin No.	D	G	S
8TR1	1.5	0	1.5

Pin No.	E	B	C
8TR2*	0	0.5	6.5
8TR3*	6.0	6.5	8.0

Pin No.	e	b	c
9TR1	3.0	3.6	10.0
9TR2	1.7	2.6	3.7
9TR3	1.7	2.6	3.7
9TR4	1.7	2.6	3.7
9TR5	1.7	2.6	3.7
9TR6	1.7	2.6	3.7
9TR7	1.7	2.6	3.7
10TR1*	0	0	9.8
11TR1*	1.25	2.0	13.5
11TR2*	0.5	1.25	13.5
11TR3*	0	0.5	13.5
11TR4*	0	0.5	13.5

Pin No.	Input	Gnd	O/P
11C1 †	18.5	0	13.5
11C2 †	18.5	0	13.0

Pin No.	IN	E	OUT
7IC4	13.5	0	6.0
8IC5*	13.0	0	7.0

Pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
4IC1*	0	3.0	3.0	6.0	5.0	0	3.0	0	-	-	-	-	-	-
7IC1	0	0.6	0.8	0	0.6	3	6.0	4.1	1.25	0	-	-	-	-
7IC2	-	2.2	3.0	0	-	8.6	9.8	9.2	-	-	-	-	-	-
7IC3	1.0	0	1.0	6.0	1.0	0.5	-	0	-	-	-	-	-	-
8IC1	6.5	2.0	4.0	12.5	6.0	1.5	6.0	6.0	6.0	3.6	0	6.0	6.0	11.0
8IC2	7.0	7.0	6.0	5.5	6.0	6	0	12.5	12.5	3.6	12.5	0	0	12.5
8IC3	13.5	0	0	13.5	0.6	1.3	6.8	0	0	0	0	7.0	-	-
8IC4*	2.3	1.5	1.5	2.25	1.0	5.5	-	4.5	-	4.5	-	5.5	-	0

* Figures taken in transmit mode with no audio input.
† Orion powered from AC supply.

Section 7

SPARESChassis Components (Reference 1)

Capacitors

Circuit Ref.	Value	Tolerance	Voltage Wkg.	Type
C1	100n	+80% -20%	100V	Multi-Layer Ceramic
C2	100n	+80% -20%	100V	Multi-Layer Ceramic

Variable Resistors

Circuit Ref.	Description	Part Number
RV1		Not Allocated
RV2	10k Log/2 pole switch	12142P
RV3	10k Lin	12141P
RV4	10k Lin	12141P

Integrated Circuits

Circuit Ref.	Type	Manufacturer	Description
IC1			Not Allocated
IC2	LM350T	National Semi	Voltage Regulator

Transistors

Circuit Ref.	Type	Manufacturer	Description
TR1	BDX69	Mullard	NPN Power

Diodes

Circuit Ref.	Type	Manufacturer	Description
D1	V168P	Telefunken	LED (Red)
D2	BYW21	Motorola	Bridge Rectifier

Miscellaneous:

T1	Mains Transformer	15V at 6.6A	15V at 6.6A	12327P
M1	Meter			12144P
	Switch Clicker	6W		12232P
	3" LS Unit			12270P
SK3	5 way socket			11077P
SK1	GE40063/C10HBN	Co-axial socket		12328P
SK4	9 way socket			12325P
PL1	6 way plug			12324P

Chassis Components (Reference 1) continued....

Miscellaneous continued.....

FS1	Thermal switch	12323P
	20mm fuse holder	12320P
	20mm fuse 3.15 amp	11967P
	Heat sink	12116P

Interconnection printed circuit board (Reference 2)

Capacitors

Circuit Ref.	Value	Tolerance	Voltage Wkg.	Type
C1	2-27p	-	300V	Film Dielectric Trimmer
C2	2-27p	-	300V	Film Dielectric Trimmer
C3	2-27p	-	300V	Film Dielectric Trimmer
C4	2-27p	-	300V	Film Dielectric Trimmer
C5	2-27p	-	300V	Film Dielectric Trimmer
C6	2-27p	-	300V	Film Dielectric Trimmer
C7	3300 μ	+50% -20%	25V	Electrolytic
C8				Not fitted
C9	1 μ	+50% -20%	100V	Electrolytic
C10	220 μ	+50% -20%	16V	Electrolytic
C11	100p	\pm 2%	100V	Ceramic Plate

Resistors

Circuit Ref.	Value	Tolerance	Power Rating	Type
R1				Not fitted
R2	560R	\pm 5%	0.33W	Standard Film
R3				Not fitted
R4				Not fitted
R5	4k7	\pm 5%	0.33W	Standard Film
R6	6R8	\pm 5%	3W	Wire Wound

Interconnection printed circuit board (Reference 2) continued.....

Diodes

Circuit Ref.	Type	Manufacturer	Description
D1	1N4004	Mullard	NPN Rectifier Diode
D2	1N4004	Mullard	NPN Rectifier Diode
D3	1N4004	Mullard	NPN Rectifier Diode
D4	BAX13	Mullard	NPN H/S Switching
D5	BAX13	Mullard	NPN H/S Switching
D6	BAX13	Mullard	NPN H/S Switching
D7	54 1N4001	Mullard	Rectifier Diode
D8	BAX13	Mullard	NPN H/S Switching
D9	BZX79C6V2	Mullard	Zener Diode
D10	BZX79C4V7	Mullard	Zener Diode

Variable Resistors

Circuit Ref.	Value	Tolerance	Power Rating	Type
RV1	10k	±20%	0.5W	Cermet Preset
RV2	10k	±20%	0.5W	Cermet Preset

Miscellaneous:

Printed Circuit Board		11769P
RLA	D/P Co Relay	12303P
PL9	3 way plug	12305P
PL1-6	4 way plug	12306P
PL7/8/12	6 way plug	12307P
PL10/11/15/16	8 way plug	12308P
PL13	10 way plug	12309P
PL18	11 way plug	12310P
PL14	20 way plug	12311P
SW1*	2 pole 2 way switch	12304P
SW2	2 pole 2 way switch	12304P
SW3**	2 pole 2 way switch	12304P
FS1	20A 1½" Fuse	12329P
	Fuseholder	12330P

*SW1 USB/LSB Version Only
 **SW3 Simplex/duplex Only

Receiver RF Amplifier (Reference 3)

Capacitors

Circuit Ref.	Value	Tolerance	Voltage Wkg.	Type
C1	2n2	±10%	63V	Ceramic Plate
C2	180p	±2%	100V	Ceramic Plate
C3	220p	±2%	100V	Ceramic Plate
C4	100n	+80% -20%	100V	Multi-Layer Ceramic
C5	100n	+80% -20%	100V	Multi-Layer Ceramic
C6	100n	+80% -20%	100V	Multi-Layer Ceramic
C7	100n	+80% -20%	100V	Multi-Layer Ceramic
C8	100n	+80% -20%	100V	Multi-Layer Ceramic

Resistors

Circuit Ref.	Value	Tolerance	Power Rating	Type
R1	470k	±5%	0.33W	Standard Film
R2	22k	±5%	0.33W	Standard Film
R3	100k	±5%	0.33W	Standard Film
R4	330R	±5%	0.33W	Standard Film

Transistors

Circuit Ref.	Type	Manufacturer	Description
TR1	3SK51	Hitachi	Dual Gate Mosfet

Receiver RF Amplifier (Reference 3) continued.....

Chokes

Circuit Ref.	Value	Tolerance	Type
CH1	100 μ H	\pm 20%	Miniature RF Choke

Diodes

Circuit Ref.	Type	Manufacturer	Description
D1	BAV10	Mullard	NPN H/S Switching
D2	BAV10	Mullard	NPN H/S Switching
D3	BAV10	Mullard	NPN H/S Switching
D4	BAV10	Mullard	NPN H/S Switching

Miscellaneous:

Printed Circuit Board	11935P
SW1 2 pole 6 way wafer	12231P
SK1/SK2 Right angle 4 way socket	12312P

Transmitter Mixer (Reference 4)

Capacitors

Circuit Ref.	Value	Tolerance	Voltage Wkg.	Type
C1	10n	+80% -20%	25V	Ceramic Disc
C2	100 μ	+50% -20%	10V	Electrolytic
C3	100n	+80% -20%	100V	Multi-Layer Ceramic
C4	100n	+80% -20%	100V	Multi-Layer Ceramic
C5	39p	\pm 2%	100V	Ceramic Plate
C6	100n	+80% -20%	100V	Multi-Layer Ceramic

Transmitter Mixer (Reference 4) continued.....

Capacitors continued.....

Circuit Ref.	Value	Tolerance	Voltage Wkg.	Type
C7	100 μ	+50% -20%	25V	Electrolytic
C8	120p	\pm 2%	100V	Ceramic Plate
C9	820p	\pm 1%	350V	Polystyrene
C10	100n	+80% -20%	100V	Multi-Layer Ceramic
C11	100n	+80% -20%	100V	Multi-Layer Ceramic
C12	47 μ	+80% -20%	25V	Electrolytic
C13	100n	+80% -20%	100V	Multi-Layer Ceramic
C14	47 μ	+80% -20%	25V	Electrolytic
C15	100n	+80% -20%	100V	Multi-Layer Ceramic
C16	10n	+80% -20%	25V	Ceramic Disc

Resistors

Circuit Ref.	Value	Tolerance	Power Rating	Type
R1	4k7	\pm 5%	0.33W	Standard Film
R2	1k	\pm 5%	0.33W	Standard Film
R3	270R	\pm 5%	0.33W	Standard Film
R4	330R	\pm 5%	0.33W	Standard Film
R5	1k8	\pm 5%	0.33W	Standard Film
R6	6k8	\pm 5%	0.33W	Standard Film
R7	2k2	\pm 5%	0.33W	Standard Film
R8	100R	\pm 5%	0.33W	Standard Film
R9	220R	\pm 5%	0.33W	Standard Film
R10	1k	\pm 5%	0.33W	Standard Film

Transistors

Circuit Ref.	Type	Manufacturer	Description
TR1	BFR54	Mullard	NPN RF Amplifier

Transmitter Mixer (Reference 4) continued.....

Chokes

Circuit Ref.	Value	Tolerance	Type
CH1	100 μ H	\pm 20%	Miniature RF Choke

Diodes

Circuit Ref.	Type	Manufacturer	Description
D1	BZX79C6V2	Mullard	Zener Diode
D2	BZX79C9V1	Mullard	Zener Diode

Integrated Circuits

Circuit Ref.	Type	Manufacturer	Description
IC1	SL1641C	Plessey	Balanced Mixer

Miscellaneous:

SW1	2 pole 6 way switch wafer	12231P
SK1/SK2	Right Angle 4 way socket	12312P
Printed Circuit Board		11931P

Receiver Mixer (Reference 5)

Capacitors

Circuit Ref.	Value	Tolerance	Voltage Wkg.	Type
C1	2p2	±2%	100V	Ceramic Plate
C2	100n	+80% -20%	100V	Multi-Layer Ceramic
C3	180p	±2%	100V	Ceramic Plate
C4	180p	±2%	100V	Ceramic Plate
C5	10n	+80% -20%	25V	Ceramic Disc
C6	100n	+80% -20%	100V	Multi-Layer Ceramic
C7	100n	+80% -20%	100V	Multi-Layer Ceramic
C8	100n	+80% -20%	100V	Multi-Layer Ceramic
C9	100n	+80% -20%	100V	Multi-Layer Ceramic

Resistors

Circuit Ref.	Value	Tolerance	Power Rating	Type
R1	270R	±5%	0.33W	Standard Film
R2	200k	±5%	0.33W	Standard Film
R3	4k7	±5%	0.33W	Standard Film
R4	270k	±5%	0.33W	Standard Film
R5	33k	±5%	0.33W	Standard Film
R6	100R	±5%	0.33W	Standard Film
R7				Not Allocated
R8	390R	±5%	0.33W	Standard Film
R9	100R	±5%	0.33W	Standard Film

Chokes

Circuit Ref.	Value	Manufacturer	Description
CH1	150µH	Sigma	Miniature RF Choke
CH2	4m7	Sigma	Miniature RF Choke

Receiver Mixer (Reference 5) continued.....

Transistors

Circuit Ref.	Type	Manufacturer	Description
TR1	3SK51	Hitachi	Dual Gate Mosfet

Diodes

Circuit Ref.	Type	Manufacturer	Description
D1	BAX13	Mullard	NPN H/S Switching

Miscellaneous:

SK1/SK2	Right Angle 4 way socket	12312P
SW1	2 pole 6 way wafer	12231P
Printed Circuit Board		11932P

Transmitter Driver (Reference 6)

Capacitors

Circuit Ref.	Value	Tolerance	Voltage Wkg.	Type
C1	100n	+80% -20%	100V	Multi-Layer Ceramic
C2	100μ	+50% -20%	25V	Electrolytic
C3	100p	±2%	100V	Ceramic Plate
C4	1n	±5%	160V	Polystyrene
C5	100μ	+50% -20%	25V	Electrolytic
C6	100n	+80% -20%	100V	Multi-Layer Ceramic
C7	100n	+80% -20%	100V	Multi-Layer Ceramic
C8	1n	±10%	100V	Ceramic Plate
C9	100n	+80% -20%	100V	Multi-Layer Ceramic

Transmitter Driver (Reference 6) continued.....

Resistors

Circuit Ref.	Value	Tolerance	Power Rating	Type
R1	10k	±5%	0.33W	Standard Film
R2	2k2	±5%	0.33W	Standard Film
R3	100R	±5%	0.33W	Standard Film
R4	10k	±5%	0.33W	Standard Film
R5	220R	±5%	0.33W	Standard Film
R6	1k2	±5%	0.33W	Standard Film
R7	220R	±5%	0.33W	Standard Film
R8	10R	±5%	0.33W	Standard Film

Transistors

Circuit Ref.	Type	Manufacturer	Description
TR1	BFR54	Mullard	NPN RF Amplifier
TR2	2N3866	Mullard	NPN RF Amplifier

Chokes

Circuit Ref.	Value	Type	Number
CH1	-	Output choke	D5943

Transformers

Circuit Ref.	Type	Number
T1	Output Transformer	D5944

Miscellaneous:

Printed Circuit Board	11934P
SW1 2 pole 6 way switch wafer	12231P
SK1/SK2 Right Angle 6 way socket	12313P

IF Board Assembly (Reference 7)

Capacitors

Circuit Ref.	Value	Tolerance	Voltage Wkg.	Type
C1	10n	+80% -20%	25V	Ceramic Disc
C2	10n*	+80% -20%	25V	Ceramic Disc
C3	10n	+80% -20%	25V	Ceramic Disc
C4	100n*	+80% -20%	100V	Multi-Layer Ceramic
C5	100μ*	+50% -20%	25V	Electrolytic
C6	100n	+80% -20%	100V	Multi-Layer Ceramic
C7	100μ	+80% -20%	25V	Electrolytic
C8	10n*	+80% -20%	25V	Ceramic Disc
C9	10n	+80% -20%	25V	Ceramic Disc
C10	10n	+80% -20%	25V	Ceramic Disc
C11	10n	+80% -20%	25V	Ceramic Disc
C12	100n	+80% -20%	100V	Multi-Layer Ceramic
C13				Not Allocated
C14	100n	+80% -20%	100V	Multi-Layer Ceramic
C15	10n	+80% -20%	25V	Ceramic Disc
C16	270p	±2%	100V	Ceramic Plate
C17	270p	±2%	100V	Ceramic Plate
C18	100n	+80% -20%	100V	Multi-Layer Ceramic
C19	100n	+80% -20%	100V	Multi-Layer Ceramic
C20 †	10n	+80% -20%	100V	Ceramic Disc
C21	10n	+80% -20%	25V	Ceramic Disc
C22	100n	+80% -20%	100V	Multi-Layer Ceramic
C23	1μ	+50% -20%	100V	Electrolytic
C24	220μ	+50% -20%	10V	Electrolytic
C25	10n	+80% -20%	25V	Ceramic Disc
C26	47μ	+50% -20%	25V	Electrolytic
C27	10n	+80% -20%	25V	Ceramic Disc
C28	1μ	+50% -20%	100V	Electrolytic
C29	10n	+80% -20%	25V	Ceramic Disc
C30	100n	+80% -20%	100V	Multi-Layer Ceramic
C31	100μ	+50% -20%	10V	Electrolytic
C32	100μ	+50% -20%	10V	Electrolytic
C33	220μ	+50% -20%	10V	Electrolytic
C34 ‡	100μ	+50% -20%	10V	Electrolytic

* ONLY FITTED WITH USB/LSB VERSION
 † ONLY FITTED WITH IF OUTPUT VERSION
 ‡ ONLY FITTED WITH AM ON TRANSMIT VERSION

Capacitors continued.....

Circuit Ref.	Value	Tolerance	Voltage Wkg.	Type
C35 ‡	100n	+80% -20%	100V	Multi-Layer Ceramic
C36 ‡	10n	+80% -20%	25V	Ceramic Disc
C37 ‡	10n	+80% -20%	25V	Ceramic Disc
C38	100n	+80% -20%	100V	Multi-Layer Ceramic
C39 †	10n	+80% -20%	25V	Ceramic Disc
C40	100µ	+50% -20%	25V	Electrolytic
C41	22p	±2%	100V	Ceramic Plate
C42	2-27p	-	300V	Film Dielectric Trimmer
C43	330p	±2%	100V	Ceramic Plate
C44	330p	±2%	100V	Ceramic Plate
C45	100n	+80% -20%	100V	Multi-Layer Ceramic
C46	10n	+80% -20%	25V	Ceramic Disc
C47	10n	+80% -20%	25V	Ceramic Disc
C48	100µ	+50% -20%	10V	Electrolytic
C49	100n	+80% -20%	100V	Multi-Layer Ceramic
C50	10n	+80% -20%	25V	Ceramic Disc
C51	10n	+80% -20%	25V	Ceramic Disc

* ONLY FITTED WITH USB/LSB VERSION

† ONLY FITTED WITH IF OUTPUT VERSION

‡ ONLY FITTED WITH AM ON TRANSMIT VERSION

Resistors

Circuit Ref.	Value		Circuit Ref.	Value	
R1	5k6		R13	330R	
R2	3k3		R14	22k	
R3	100R*		R15	22k	
R4	3k3*		R16	100R	
R5	100R		R17	100R	
R6	3k3		R18 †	10k	
R7	3k3*		R19 †	2k2	
R8	3k3		R20	560R	
R9	3k3		R21	1k5	
R10	100k		R22	100R	
R11	22k		R23	100R	
R12	100k		R24	1k	

All Resistors ±5% 0.33W Standard Film

* ONLY FITTED WITH USB/LSB VERSION
 † ONLY FITTED WITH IF OUTPUT VERSION

IF Board Assembly (Reference 7) continued.....

Resistors continued....

Circuit Ref.	Value
R25	330R
R26	220k
R27	100k
R28	47k
R29	1k
R30	100R
R31	100R
R32	2k2
R33 †	100R
R33A †	1k5
R34 †	2k2
R35 †	100R
R36 †	1k2
R37 †	22k
R38 †	22k

Circuit Ref.	Value
R39	470k
R40	2k7
R41	1k
R42	47k
R43	2k2
R44	470k
R45	100R
R46	100k
R47	22k
R48	22k
R49	10k*
R50	10k
R51	3k9

* ONLY FITTED WITH USB/LSB VERSION
 † ONLY FITTED WITH IF OUTPUT VERSION
 ‡ ONLY FITTED WITH AM ON TRANSMIT VERSION

All Resistors ±5% 0.33W Standard Film

Variable Resistors

Circuit Ref.	Value	Tolerance	Power Rating	Type
RV1	470R	±20%	0.5W	Cermet Preset
RV2 ‡	47k	±20%	0.5W	Cermet Preset

‡ ONLY FITTED WITH AM ON TRANSMIT VERSION

Inductors

Circuit Ref.	Type	Part Number
L1)	Interstage	D5466
L2)	Tuning Coils	D5466

Diodes

Circuit Ref.	Type	Manufacturer	Description
D1	BAX13	Mullard	H/S Switching
D2	BAX13*	Mullard	H/S Switching
D3	BAX13*	Mullard	H/S Switching
D4	BAX13	Mullard	H/S Switching
D5	BZX79C10	Mullard	Zener Diode
D6	BZX79C10	Mullard	Zener Diode
D7	BAX13	Mullard	H/S Switching
D8 †	BAX13	Mullard	H/S Switching
D9 †	BAX13	Mullard	H/S Switching
D10 †	BAX13	Mullard	H/S Switching
D11	BAX13	Mullard	H/S Switching
D12	BAX13	Mullard	H/S Switching

*ONLY FITTED ON USB/LSB VERSION

† ONLY FITTED WITH AM ON TRANSMIT VERSION

Transistors

Circuit Ref.	Type	Manufacturer	Description
TR1	3SK51	Hitachi	Dual Gate Mosfet
TR2	BFR54	Mullard	NPN RF Amplifier
TR3 †	BFR54	Mullard	NPN RF Amplifier
TR4	BFR54	Mullard	NPN RF Amplifier
TR5 †	BFR54	Mullard	NPN RF Amplifier
TR6	BFR54	Mullard	NPN RF Amplifier
TR7	BC547B	Mullard	NPN GP Amplifier
TR8	BC547B	u	u

† ONLY FITTED WITH IF OUTPUT VERSION

‡ ONLY FITTED WITH AM ON TRANSMIT VERSION

IF Board Assembly (Reference 7) continued....

Integrated Circuits

Circuit Ref.	Type	Manufacturer	Description
IC1	SL623C	Plessey	Det/AM AGC
IC2	CA3140E	RCA	Fet Op Amp.
IC3	SL1621C	Plessey	AGC Generator
IC4	μ A78L62/AWC	Fairchild	Voltage Regulator

Miscellaneous:

Printed Circuit Board		11760P
XTL1	1400kHz crystal	12316P
FL2	LSB crystal filter 1400kHz	11961P
SK9	Right Angle 3 way socket	12317P
SK10/SK11	Right Angle 8 way socket	12314P
FL1*	USB crystal filter 1400kHz	11963P

*ONLY FITTED ON USB/LSB VERSION

Audio Board (Reference 8)

Capacitors

Circuit Ref.	Value	Tolerance	Voltage Wkg.	Type
C1	1 μ	+50% -20%	100V	Electrolytic
C2	10n	+80% -20%	25V	Ceramic Disc
C3	10 μ	+50% -20%	50V	Electrolytic
C4	10 μ	+50% -20%	50V	Electrolytic
C5	100n	+80% -20%	100V	Ceramic Multi-Layer
C6	100n	+80% -20%	100V	Ceramic Multi-Layer
C7	10n	+80% -20%	25V	Ceramic Disc
C8	22n	+80% -20%	63V	Plate Ceramic
C9	22n	+80% -20%	63V	Plate Ceramic
C10	10n	+80% -20%	25V	Ceramic Disc
C11	10n	+80% -20%	25V	Ceramic Disc
C12	220 μ	+50% -20%	16V	Electrolytic

Audio Board (Reference 8) continued....

Capacitors continued....

Circuit Ref.	Value	Tolerance	Voltage Wkg.	Type
C13	100 μ	+50% -20%	10V	Electrolytic
C14	2 μ 2	+50% -20%	63V	Electrolytic
C15	22n	+80% -20%	63V	Plate Ceramic
C16	1 μ	+50% -20%	100V	Electrolytic
C17	100n	+80% -20%	100V	Ceramic Multi-Layer
C18	220 μ	+50% -20%	10V	Electrolytic
C19	470 μ	+50% -20%	16V	Electrolytic
C20	100n	+80% -20%	100V	Ceramic Multi-Layer
C21	100 μ	+50% -20%	25V	Electrolytic
C22	820p	\pm 10%	100V	Ceramic Plate
C23	100 μ	+50% -20%	25V	Electrolytic
C24	4n7	+80% -20%	63V	Plate Ceramic
C25	100n	+80% -20%	100V	Multi-Layer Ceramic
C26	2 μ 2	+50% -20%	63V	Electrolytic
C27	10n	+80% -20%	25V	Ceramic Disc
C28	10n	+80% -20%	25V	Ceramic Disc
C29	10 μ	+50% -20%	50V	Electrolytic
C30	100 μ	+50% -20%	10V	Electrolytic
C31	22 μ	+50% -20%	35V	Electrolytic
C32	100n	+80% -20%	100V	Ceramic Multi-Layer
C33	10n	+80% -20%	25V	Ceramic Disc
C34	220 μ	+50% -20%	16V	Electrolytic

Resistors

Circuit Ref.	Value		Circuit Ref.	Value	
R1	3k3		R11	1M	
R2	3M3		R12	10k	
R3	3k3		R13	10k	
R4	120k		R14	1M	
R5	3M3		R15	3M3	
R6	3M3		R16	330k	
R7	330k		R17	270k	
R8	47k		R18	100k	
R9	100R		R19	100k	
R10	330k		R20	100k	

All Resistors \pm 5% 0.33W Standard Film

Audio Board (Reference 8) continued....

Resistors continued.....

Circuit Ref.	Value		Circuit Ref.	Value	
R21	100k		R33	3k3	
R22	1k		R34	1k	
R23	1k		R35	100R	
R24	150R		R36	320R	
R25	100k		R37	1k	
R26	12R		R38	100R	
R27	100R		R39	1k2	
R28	2R2		R40	390R	
R29	1k		R41	3k3	
R30	10k		R42	3k3	
R31	100k		R43	10k	
R32	2k2		R44	100R	

All Resistors $\pm 5\%$ 0.33W Standard Film

Variable Resistors

Circuit Ref.	Value	Tolerance	Power Rating	Type
RV1	10k	$\pm 20\%$	0.5W	Cermet Preset
RV2	47k	$\pm 20\%$	0.5W	Cermet Preset

Chokes

Circuit Ref.	Value	Tolerance	Type
CH1	4m7	$\pm 20\%$	Miniature RF Choke

Audio Board (Reference 8) continued....

Integrated Circuits

Circuit Ref.	Type	Manufacturer	Description
IC1	LM324N	National Semi	Quad Op Amp.
IC2	MC14001BCP	Motorola	Quad 2 Input Nor Gate
IC3	TBA810S	SGS	Audio Power
IC4	MC1496P	Motorola	Balanced Modulator
IC5	MC78L08CP	Motorola	Voltage Regulator

Transistors

Circuit Ref.	Type	Manufacturer	Description
TR1	2N4393	Mullard	FET Amp.
TR2	BC547B	Mullard	NPN GP Amp.
TR3	BC547B	Mullard	NPN GP Amp.

Diodes

Circuit Ref.	Type	Manufacturer	Description
D1	BAX13	Mullard	H/S Switching
D2	BAX13	Mullard	H/S Switching
D3	BAX13	Mullard	H/S Switching
D4	BAX13	Mullard	H/S Switching
D5	BAX13	Mullard	H/S Switching
D6	BAX13	Mullard	H/S Switching

Miscellaneous:

Printed Circuit Board	11768P
SK1 Right Angle 10 way socket	12318P
SK2 Right Angle 6 way socket	12313P

Oscillator Board (Reference 9)

Capacitors

Circuit Ref.	Value	Tolerance	Voltage Wkg.	Type
C1	10n	+80% -20%	100V	Ceramic Disc
C2	10n	+80% -20%	100V	Ceramic Disc
C3	220 μ	+50% -20%	16V	Electrolytic
C4	100n	+80% -20%	100V	Multi-Layer Ceramic
C5	18p	\pm 2%	100V	Ceramic Plate
C6	270p	\pm 2%	100V	Ceramic Plate
C7	270p	\pm 2%	100V	Ceramic Plate
C8	18p	\pm 2%	100V	Ceramic Plate
C9	270p	\pm 2%	100V	Ceramic Plate
C10	270p	\pm 2%	100V	Ceramic Plate
C11	18p	\pm 2%	100V	Ceramic Plate
C12	270p	\pm 2%	100V	Ceramic Plate
C13	270p	\pm 2%	100V	Ceramic Plate
C14	18p	\pm 2%	100V	Ceramic Plate
C15	270p	\pm 2%	100V	Ceramic Plate
C16	270p	\pm 2%	100V	Ceramic Plate
C17	18p	\pm 2%	100V	Ceramic Plate
C18	270p	\pm 2%	100V	Ceramic Plate
C19	270p	\pm 2%	100V	Ceramic Plate
C20	18p	\pm 2%	100V	Ceramic Plate
C21	270p	\pm 2%	100V	Ceramic Plate
C22	270p	\pm 2%	100V	Ceramic Plate

Resistors

Circuit Ref.	Value		Circuit Ref.	Value	
R1	470R		R11	2k2	
R2	6k8		R12	100k	
R3	10k		R13	10k	
R4	100R		R14	3k9	
R5	2k2		R15	470R	
R6	100k		R16	2k2	
R7	10k		R17	100k	
R8	3k9		R18	10k	
R9	2k2		R19	3k9	
R10	470R		R20	470R	

All Resistors \pm 5% 0.33W Standard Film

Oscillator Board (Reference 9) continued....

Resistors continued...

Circuit Ref.	Value		Circuit Ref.	Value	
R21	2k2		R28	10k	
R22	100k		R29	3k9	
R23	10k		R30	470R	
R24	3k9		R31	2k2	
R25	470R		R32	100k	
R26	2k2		R33	10k	
R27	100k		R34	3k9	
			R35	470R	

All Resistors $\pm 5\%$ 0.33W Standard Film

Transistors

Circuit Ref.	Type	Manufacturer	Description
TR1	BFR54	Mullard	NPN RF Amp.
TR2	BFR54	Mullard	NPN RF Amp.
TR3	BFR54	Mullard	NPN RF Amp.
TR4	BFR54	Mullard	NPN RF Amp.
TR5	BFR54	Mullard	NPN RF Amp.
TR6	BFR54	Mullard	NPN RF Amp.
TR7	BFR54	Mullard	NPN RF Amp.

Diodes

Circuit Ref.	Type	Manufacturer	Description
D1	BZX79C10	Mullard	Zener Diode
D2	1N4151	Mullard	NPN H/S Switching
D3	MV209	Motorola	Vari-Cap Diode
D4	1N4151	Mullard	NPN H/S Switching
D5	1N4151	Mullard	NPN H/S Switching
D6	1N4151	Mullard	NPN H/S Switching

Oscillator Board (Reference 9) continued.....

Diodes continued....

Circuit Ref.	Type	Manufacturer	Description
D7	1N4151	Mullard	NPN H/S Switching
D8	1N4151	Mullard	NPN H/S Switching
D9	MV209	Motorola	Vari-Cap Diode
D10	1N4151	Mullard	NPN H/S Switching
D11	1N4151	Mullard	NPN H/S Switching
D12	1N4151	Mullard	NPN H/S Switching
D13	1N4151	Mullard	NPN H/S Switching
D14	1N4151	Mullard	NPN H/S Switching
C15	MV209	Motorola	Vari-Cap Diode
C16	1N4151	Mullard	NPN H/S Switching
C17	1N4151	Mullard	NPN H/S Switching
C18	1N4151	Mullard	NPN H/S Switching
C19	1N4151	Mullard	NPN H/S Switching
C20	1N4151	Mullard	NPN H/S Switching
C21	MV209	Motorola	Vari-Cap Diode
C22	1N4151	Mullard	NPN H/S Switching
C23	1N4151	Mullard	NPN H/S Switching
C24	1N4151	Mullard	NPN H/S Switching
C25	1N4151	Mullard	NPN H/S Switching
C26	1N4151	Mullard	NPN H/S Switching
C27	MV209	Motorola	Vari-Cap Diode
C28	1N4151	Mullard	NPN H/S Switching
C29	1N4151	Mullard	NPN H/S Switching
C30	1N4151	Mullard	NPN H/S Switching
C31	1N4151	Mullard	NPN H/S Switching
C32	1N4151	Mullard	NPN H/S Switching
C33	MV209	Motorola	Vari-Cap Diode
C34	1N4151	Mullard	NPN H/S Switching
C35	1N4151	Mullard	NPN H/S Switching
C36	1N4151	Mullard	NPN H/S Switching
C37	1N4151	Mullard	NPN H/S Switching

Miscellaneous:

Printed Circuit Board SK1/SK2 Right Angle 20 way socket	11767P 12315P
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Output Filter (Reference 10)

Capacitors

Circuit Ref.	Value	Tolerance	Voltage Wkg.	Type
C1) C2) C3)				Values as required for range, see table at the end of this section.
C4	270p	±2%	350V	Silver Mica
C5	270p	±2%	350V	Silver Mica
C6	100n	+80% -20%	100V	Multi-Layer Ceramic
C7	100n	+80% -20%	100V	Multi-Layer Ceramic
C8	100n	+80% -20%	100V	Multi-Layer Ceramic
C9	100n	+80% -20%	100V	Multi-Layer Ceramic
C10	100n	+80% -20%	100V	Multi-Layer Ceramic
C11	100n	+80% -20%	100V	Multi-Layer Ceramic
C12	100μ	+50% -20%	25V	Electrolytic
C13	47μ	+50% -20%	25V	Electrolytic
C14	10n	+80% -20%	25V	Ceramic Disc
C15	100n	+80% -20%	100V	Multi-Layer Ceramic
C16	10n	+80% -20%	25V	Ceramic Disc
C17	100n	+80% -20%	100V	Multi-Layer Ceramic

Resistors

Circuit Ref.	Value		Circuit Ref.	Value
R1	5k6		R7	2k2
R2	27R		R8	470R
R3	27R		R9	100R
R4	330R		R10	8k2
R5	2k2		R11	100R
R6	2k2		R12	100k
			R13	220R

All Resistors ±5% 0.33W Standard Film

Output Filter (Reference 10) continued...

Variable Resistors

Circuit Ref.	Value	Tolerance	Power Rating	Type
RV1	470R	±20%	0.5W	Cermet Preset
RV2	47k	±20%	0.5W	Cermet Preset

Inductors

Circuit Ref.	Value	Tolerance	Power Rating	Type
L1) L2)				Values as required for range, see table at the end of this section.

Chokes

Circuit Ref.	Value	Tolerance	Type	
CH1	100µH	±20%	Miniature RF Choke	

Diodes

Circuit Ref.	Type	Manufacturer	Description
D1	BAX13	Mullard	NPN H/S Switching
D2	BAX13	Mullard	NPN H/S Switching
D3	BZX79C10	Mullard	Zener Diode
D4	BAX13	Mullard	NPN H/S Switching

Transistor

Circuit Ref.	Type	Manufacturer	Description
TR1	BC547B	Mullard	NPN GP Amp.

Transformers

Circuit Ref.	Type	Part Number	
T1	VSWR	D5941	

Miscellaneous:

Printed Circuit Board		11933P
SW1	Switch wafer	12231P
SK1/SK2	Right Angle 8 way socket	12314P

Output Filter (Reference 10) TABLE

RANGE	L1/L2	C1	C2	C3	
1	D5957	1000p	2000p	1000p	
2	D5958	470p	1200p	470p	
3	D5959	200p	750p	200p	
4	D5960	-	470p	-	
5	D5961	-	470p	-	

All Capacitors $\pm 2\%$ 350V working Silver Mica.

PA Module (Reference 11)

Capacitors

Circuit Ref.	Value	Tolerance	Voltage Wkg.	Type
C1	100n	+80% -20%	50V	Ceramic Multi-Layer
C2	100n	+80% -20%	50V	Ceramic Multi-Layer
C3	100n	+80% -20%	50V	Ceramic Multi-Layer
C4	100n	+80% -20%	50V	Ceramic Multi-Layer
C5	100n	+80% -20%	50V	Ceramic Multi-Layer
C6	100n	+80% -20%	50V	Ceramic Multi-Layer
C7	100n	+80% -20%	50V	Ceramic Multi-Layer
C8	100n	+80% -20%	50V	Ceramic Multi-Layer
C9	100n	+80% -20%	50V	Ceramic Multi-Layer
C10	330 μ f	+50% -20%	25V	Electrolytic
C11	100n	+80% -20%	50V	Ceramic Multi-Layer
C12	100n	+80% -20%	50V	Ceramic Multi-Layer
C13	2n	\pm 2%	350V	Silver Mica
C14	100n	+80% -20%	50V	Ceramic Multi-Layer
C15	1n8	\pm 2%	350V	Silver Mica

Resistors

Circuit Ref.	Value	Tolerance	Power Rating	Type
R1	100R	\pm 5%	0.33W	Standard Film
R2	2R2	\pm 5%	0.5W	Standard Film
R3	2R2	\pm 5%	0.5W	Standard Film
R4	100R	\pm 5%	1.6W	Metal Film
R5	220R	\pm 5%	0.33W	Standard Film
R6	390R	\pm 5%	0.5W	Standard Film
R7	56R	\pm 5%	1W	Carbon Film
R8	2R2	\pm 5%	0.5W	Standard Film
R9	2R2	\pm 5%	0.5W	Standard Film
R10	56R	\pm 5%	1W	Carbon Film
R11	10R	\pm 5%	0.33W	Standard Film

PA Module (Reference 11) continued...

Variable Resistors

Circuit Ref.	Value	Tolerance	Power Rating	Type
RV1	470R	±20%	2W	Wirewound Preset

Chokes

Circuit Ref.	Value	Tolerance	Type
CH1	1μH	±20%	Miniature RF Choke

Transistors

Circuit Ref.	Type	Manufacturer	Description
TR1	SD1285	Thompson CSF	Driver Transistor
TR2	TIP31A	Texas Inst.	NPN Power
TR3	SD1487	Thompson CSF	PA Transistor
TR4	SD1487	Thompson CSF	PA Transistor
) Matched Pair

Diodes

Circuit Ref.	Type	Manufacturer	Description
D1	1N4004	Mullard	GP Diode
D2	1N4004	Mullard	GP Diode

PA Module (Reference 11) continued....

Transformer

Circuit Ref.	Type	Part Number
T1	Coupling Transformer	D5924
T2	Output Transformer	D5925

Inductors

Circuit Ref.	Type	Part Number
L1	Driver Choke PA Choke	Not Allocated
L2		D5946
L3		D5945

Miscellaneous:

Printed Circuit Board 11761P	
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AC - PSU Board (Reference 14)

Capacitors

Circuit Ref.	Value	Tolerance	Voltage Wkg.	Type
C1	22000 μ	+30% -10%	25V	Electrolytic
C2	22000 μ	+30% -10%	25V	Electrolytic
C3	47 μ	+50% -20%	25V	Electrolytic
C4	22 μ	+50% -20%	35V	Electrolytic

AC - PSU Board (Reference 14) continued.....

Resistors

Circuit Ref.	Value	Tolerance	Power Rating	Type
R1	1k2	±5%	0.33W	Standard Film
R2				Not Allocated
R3	2k2	±5%	0.33W	Standard Film
R4	2k2	±5%	0.33W	Standard Film
R5	120R	±5%	0.33W	Standard Film

Diodes

Circuit Ref.	Type	Manufacturer	Description
D1	1N4004	Mullard	Rectifier Diode
D2	1N4004	Mullard	Rectifier Diode
D3	1N4004	Mullard	Rectifier Diode

Integrated Circuits

Circuit Ref.	Type	Manufacturer	Description
IC1	MC7815	Motorola	Voltage Regulator

Miscellaneous:

Printed Circuit Board		12267P
PL1	3 way plug	12305P
FS1	20mm fuseholder	12320P
	20mm fuse 3.15A anti surge	12332P

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 receiver 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

APPENDIX A

Component Handling

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

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

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

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

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

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

Appendix B

Noise Suppression

A kit for suppressing vehicle electrical interference is available S1795 and comprises the following items.

LT Coil Capacitor (1)	ASB100/LS627
Distribution Suppressors (5)	ASB636/LS636
Alternator Suppressor (1)	ASB102/LS720
Instrument Regulator Choke (2)	ASB301/LS639
Bonnet or Engine Bording Strap (2)	ASB500/LS642
Instruction manual on Radio Interference Suppression.	

Microphone

Two types of microphone can be supplied the S1790 Hand Mobile Microphone and the S1791 Base Station Microphone.

S1791

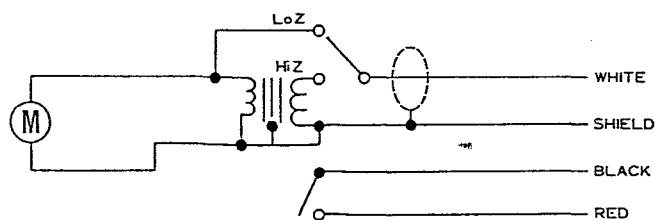
FEATURES

- *Rugged die-cast body.
- *Easy adjustable goose-neck.
- *Locking push-talk switch.
- *Dual impedance; Hi/Lo switchable.

SPECIFICATIONS

Type: Dynamic type
Impedance: 500 Ω /50K Ω switchable
Sensitivity: -78dB(500 Ω)/-58dB(50K Ω)
Frequency Response: 200 - 10,000Hz

INTERNAL CONNECTION



Note: Set the switch at Hi or Lo position at the bottom.

S1790

The Eddystone S1790 noise cancelling microphone comes equipped with a five-pin connector and a flexible, coiled cord.

SPECIFICATIONS

Frequency response: 200 Hz—4000 Hz (direct)
300 Hz—7000 Hz (noise cancelling mode)
Microphone impedance: 600 ohms
Output level: -75 dB (direct)
-80 dB (noise cancelling mode)
(0 dB = 1V/ μ bar, d = 2 cm at 1000 Hz)
Weight: 180 g
Enclosures: Microphone hanger, 1 pc.
Screws, 2 pcs.
Tapping screws, 2 pcs.
Washers, 2 pcs.

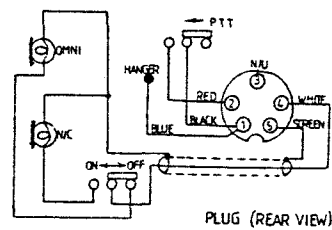
INSTALLATION

The microphone hanger may be installed wherever convenient for easy access to the microphone. Use the screws and washers enclosed for quick installation.

OPERATION

For normal operation, close the PTT switch and speak into the microphone in a normal voice. For high noise suppression, place the switch on the rear of the cartridge in the NOISE CANCEL ON position, and speak from a distance of 2 cm or less from the microphone.

Mic plug connections



Antennas

The following section illustrates the range of antennas and masts available.

When siting base station antennas the surrounding area should be as clear as possible of buildings or other obstructions, and the antenna should be as high as possible for best results.

The siting of the antenna is extremely important, as it plays a big part in obtaining reliable and interference free long distance communication.

S1781

Series Mobile Whip

Antennas supplied to customer specified fixed frequencies, to change frequency just unscrew resonator/whip combinations. Medium power capability permits an unobtrusive slim-line format for wing mounting on any vehicle to provide reliable HF communication under the most arduous conditions.

The antenna comprises four component parts, the vehicle spring base mount, 25" (630mm) inductively loaded mast section, resonator with attached whip section.

The resonator and whip section being individually made and calibrated to your specified frequency, additional frequency allocations need only a new resonator and whip section which can be supplied quickly.

ELECTRICAL SPECIFICATION

Maximum Power Capability 100 watts to 1.8MHz to 3.0MHz 150 watts 3.0MHz to 30.0MHz rated SSB duty cycle.	Impedance Nominal 50 ohm. (Somewhat less at lowest frequencies.)
VSWR Typical less than 1.7:1 at resonance.	Bandwidth More than adequate for single frequency working under all conditions.

TECHNICAL SPECIFICATION

Power Input: 150w, SSB PEP	Frequency range:
Impedance: 50Ω nominal	Spot between 2MHz & 30MHz

MECHANICAL SPECIFICATION

Mast Section

Fibreglass with non-ferrous fittings; $\frac{3}{8}$ " UNF stainless steel screw fitting for base-mount. Partial inductive loading on mast with whole enclosed in tough black PVC heat shrunk sleeve.

Resonator/Whip Section

Non-ferrous metal fittings on high impact resist formers. Former lengths vary from 13" at 1.5MHz to 6" at 30MHz.

Individually wound and calibrated, coated 100% polyurethane, finished with tough black PVC sleeve.

Resonator supplied with 40" stainless steel whip section.

The resonators are supplied to a specific frequency; adjacent frequency working may be used as follows:

Typical bandwidth of antenna for 2:1 VSWR:

20KHz at 1.5MHz
40KHz at 3.0MHz
80KHz at 7.0MHz
150KHz at 10MHz
300KHz at 22MHz
500KHz at 30MHz

Spring Base Unit

SPRING

This model is a double tapered stainless steel spring for heavy duty HF whips:

Gauge: 7mm (No.2)

Overall Height: 110mm (4 $\frac{1}{2}$ ")

Min. Width: 38mm. (1 $\frac{1}{2}$ ")

Max. Width: 51mm (2")

Thread: $\frac{3}{8}$ " UNF

BALL MOUNT

This ball mount has proved very satisfactory as a swivel base for even the heaviest HF whips used in mobile applications. The material is heavy cast alloy in two semispheres and tightened with an allen key provided.

The base is ABS.

Centre hole: 34mm (1 $\frac{1}{2}$ ")

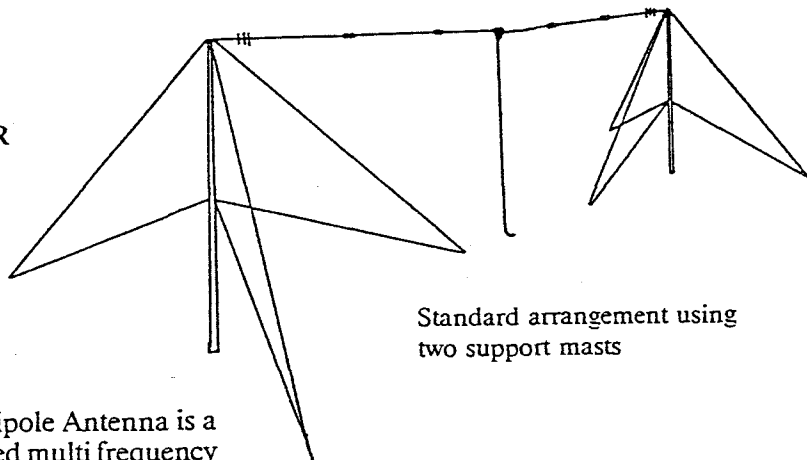
Fixing holes: 4 holes 7mm equispaced or 70mm PCD ($\frac{3}{4}$ " on 2 $\frac{1}{2}$ ")

S 1782/3/4

Multi-Frequency

Trap Dipole Antennas

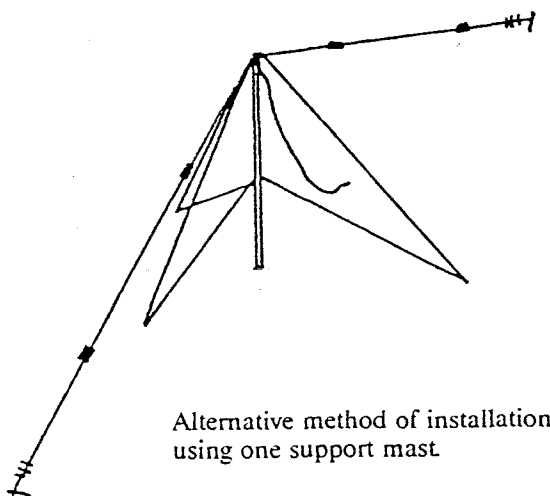
- ★ UP TO 6 SPOT FREQUENCIES
- ★ TRANSPORTABLE OR FIXED STATION
- ★ POWER UP TO 1 kW



Standard arrangement using two support masts

The Trapped Wire Dipole Antenna is a compact and simply operated multi frequency antenna, designed to provide up to 6 spot frequencies, (dependent upon channel spacing) with bi- or omni-directional coverage in the HF band. The antenna may be used as shown, with two support units (preferred method) or more economically using a single support structure.

The construction reflects our policy of ensuring long trouble free use, utilising only best quality components. Each antenna is supplied complete with 30 metres or low loss coaxial feeder incorporating a strain relief arrangement, and fitted with one PL259 UHF connector. The Dipole Centre Junction is formed by a balun unit to ensure matching is achieved.



Alternative method of installation using one support mast

The elements are constructed of hard drawn cadmium copper multi-strand for durability and high resistance to corrosion.

The most important components of this antenna are the Traps. These are installed in the antenna elements, and provide the means by which multi frequency operation is achieved. The Trap components are fully encapsulated in epoxy resin, providing a non Hygrascopic and very strong unit, with proven durability.

Antenna installation kits are available incorporating such items as element end "T" anchors, extension halyards (element end), and continuous halyards for use in the central support mode.

Although this antenna is offered as a standard product, variations of construction, coaxial cable, connector combinations, or various insulation combinations for hostile environments may be accommodated.

We generally recommend the use of our PA series lightweight mast to support the Trapped Dipole antennas. This provides a compact support structure, of ultra light weight, supplied complete with transport holdall and erection tools.

GENERAL SPECIFICATIONS

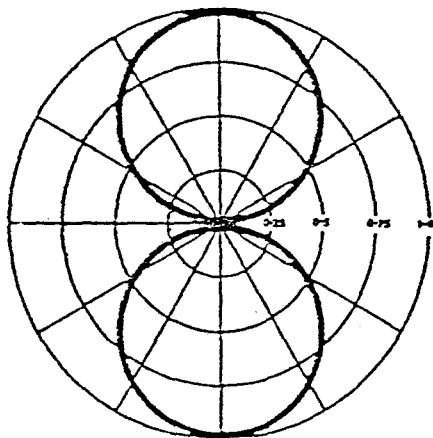
Technical Specification

FREQUENCY RANGE:	2 - 30 MHz 2 to 6 spot frequencies (depends on frequency spacing).
POWER:	Normally up to 250 watts. (Up to 1 kW). Typically as polar diagrams.
POLARISATION:	Horizontal.
AZIMUTH RADIATION:	Depends on frequency and height of antenna. Typically as polar diagrams.
INPUT IMPEDANCE:	50 - 70 ohms depending on design height.
VSWR:	Normally better than 1.5 : 1.

Mechanical Specification

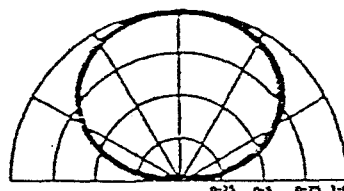
ANTENNA ELEMENTS:	7/0.914mm (7/036") or 7/1.18mm (7/044") hard drawn copper strand.
INSULATORS:	Carbon loaded ultra violet resistant polypropelene or Frequelex porcelain.
COAXIAL CABLE:	Centre Balun Unit with built-in halyard eye and cable suspension unit.
JUNCTION:	Encapsulated in high grade epoxy resin.
METALWORK:	Stainless steel or plated brass.
COAXIAL CABLE:	Normally 30 metres UR67 low loss.

POLAR DIAGRAMS

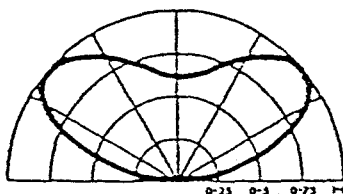


1-0.5λ

TYPICAL AZIMUTH
GROUND WAVE PATTERN

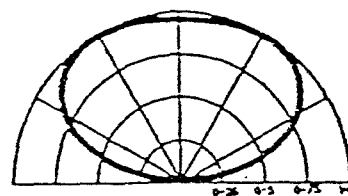


h=0.25λ

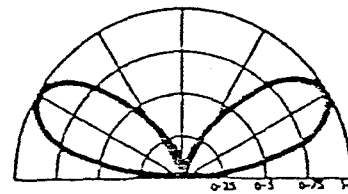


h=0.40λ

TYPICAL ELEVATION



h=0.30λ

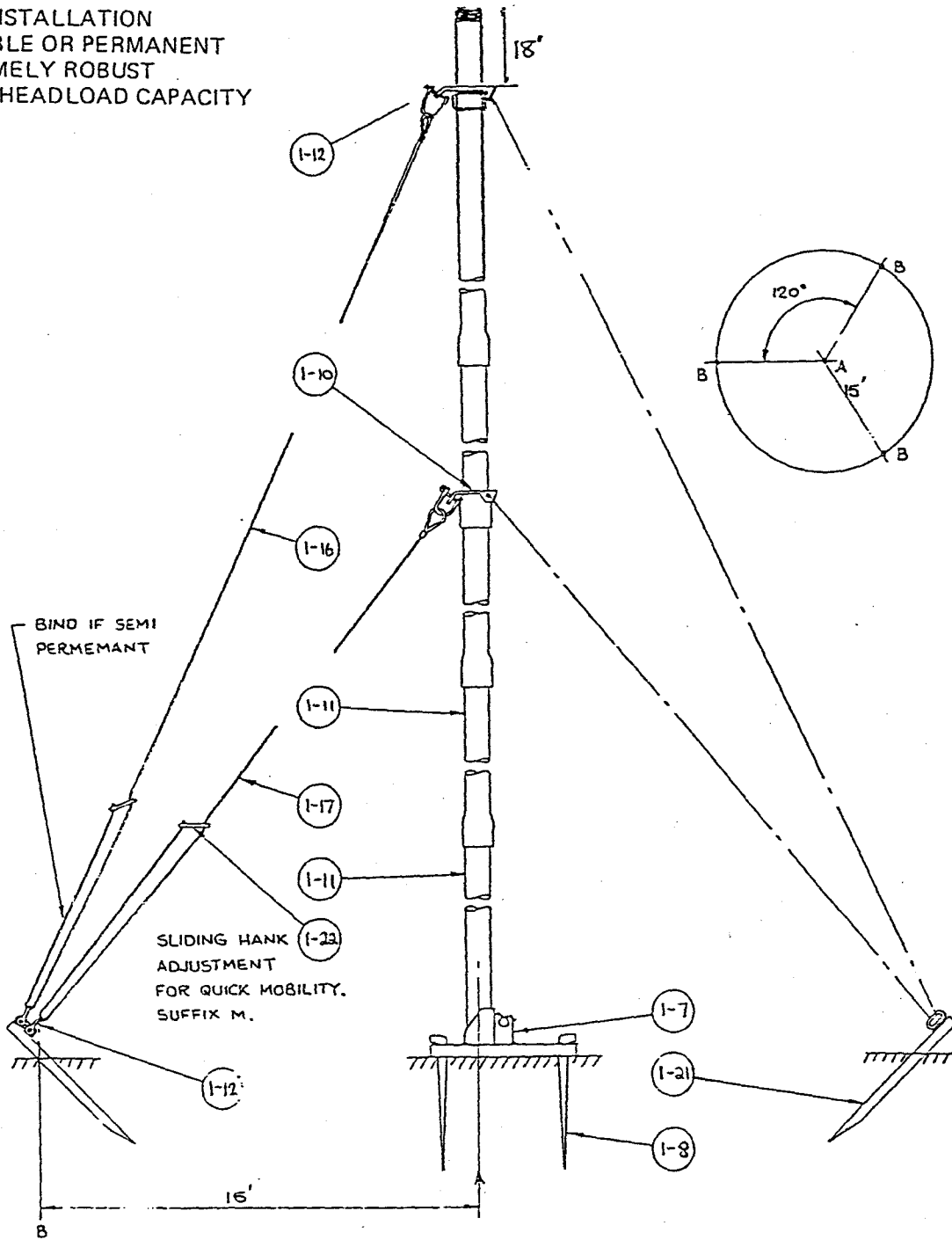


h=0.50λ

RADIATION PATTERNS

S1786/7/8 Aluminium Masts

- *LIGHTWEIGHT
- *EASY INSTALLATION
- *PORTABLE OR PERMANENT
- *EXTREMELY ROBUST
- *LARGE HEADLOAD CAPACITY

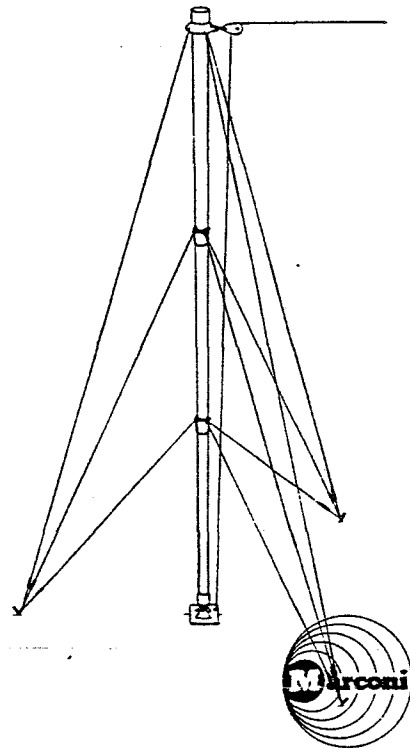


Mast sections have a belled end ensuring easy assembly and quick erection by unskilled staff. For example, a 3 man team can erect the 48 ft. or 60 ft. mast in less than half an hour, following our practical installation instructions. Each section is 48.4 mm O.D. and can be supplied in 6, 10 or 12 ft. (1.8, 3.04 and 3.65m) lengths for mast heights from 30 to 60 ft. (6.1 and 30.5m). Stays can be either 3 or 4 point fixing at each level, depending upon customers' requirements.

From a wide selection of stock components, masts can be supplied to suit customers' requirements, from a transportable mast complete with canvas carrying bags and all necessary hardware for erection, to installations for mounting permanently, complete with masthead and intermediate halyards, masthead lighting to ICAO standards, erection kit and all ground anchors.

Although we recommend the standard sections, should customers require special lengths or lighter gauge sections, we are able to supply modified designs to suit requirements and still maintain a quick delivery service.

Canvas holdalls for mast sections.
Mast head lighting available to I.C.A.O. recommendations.
Full erection kits available for 36 ft.—60ft. masts.
Thinner gauge sections, different lengths, special designs or variations to customers' requirements undertaken, and quick deliveries provided.
Further details upon application.



S1785

HF Dipole Antennas

These antennas are most suited for short to medium range working. When suspended about a quarter wave above ground level, radiation is predominantly upwards, giving omnidirectional coverage using skywaves. As the height above ground level is increased to a half wave, the radiation pattern tends to a figure of eight.

Half-Wave Centre-Fed Dipoles

2 - 30 MHz Series CFD/1

The 1785 half wave dipole is probably the most popular single frequency antenna world wide. Our design is inherently robust using our moulded coaxial cable junction unit CCJ/1 which assures safe feeder cable suspension. Antennas can be supplied in kit form or made up for specific frequencies.

General Specification

Bandwidth: +2% of centre frequency
VSWR: Better than 1.5 : 1
Power: Up to 2kW
Impedance: 50-75 ohms
Polarisation: Horizontal

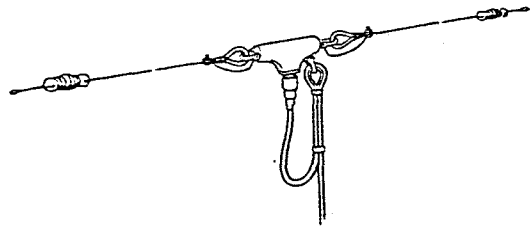
Delta Matched Dipoles

2-30 MHz Series DMD/1

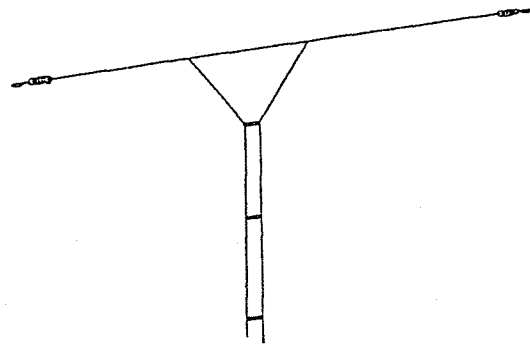
The delta matched dipole has similar characteristics to the half wave dipole, both in robust design and reliability, however it will accept higher transmitter power due to the open wire 600 ohm feeder. Baluns can be supplied for alternative feed impedances.

General Specification

Bandwidth: +2% of centre frequency
VSWR: Better than 1.5 : 1
Power: Up to 5 kW
Impedance: 600 ohms
Polarisation: Horizontal



HALF-WAVE CENTRE-FED DIPOLE

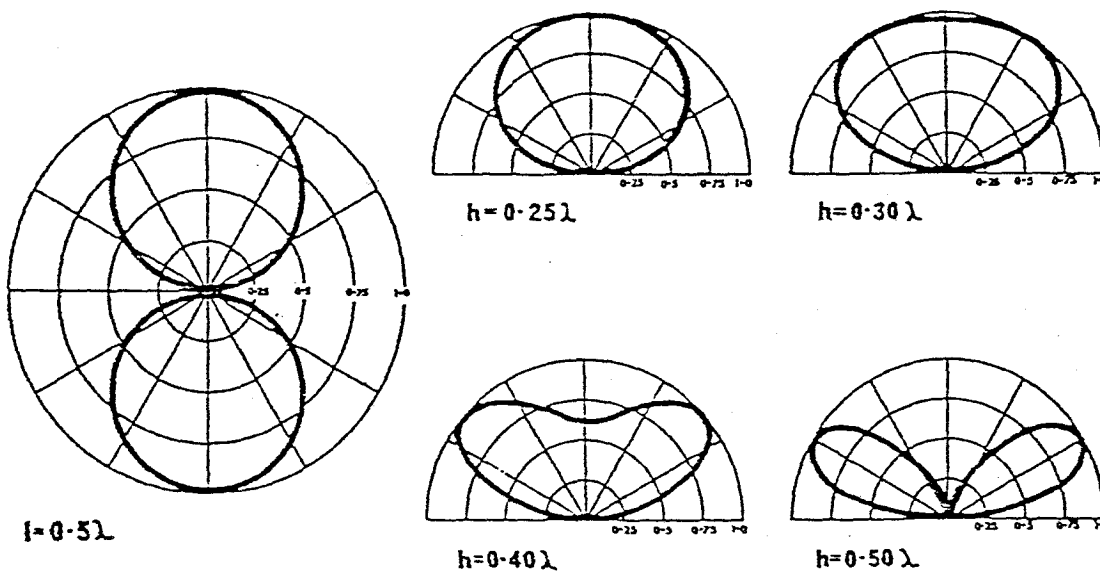


DELTA MATCHED DIPOLE

Mechanical Specification

- ANTENNA ELEMENTS:** 7/0.44" (7/1.118mm) or 7/0.36" (7/0.914mm) hard drawn cadmium copper strand.
- INSULATORS:** Frequelex, porcelain, or carbon loaded polypropelene. CCJ/1 used on centre-fed dipole is moulded epoxy resin.
- SPREADERS:** Antenna spreaders used on FDA/1 are fibre-glass. Feed line spreaders are porcelain or fibre-glass as appropriate.
- BALUNS:** We can supply a wide range of matching balun transformers for all combinations of input impedances and powers.

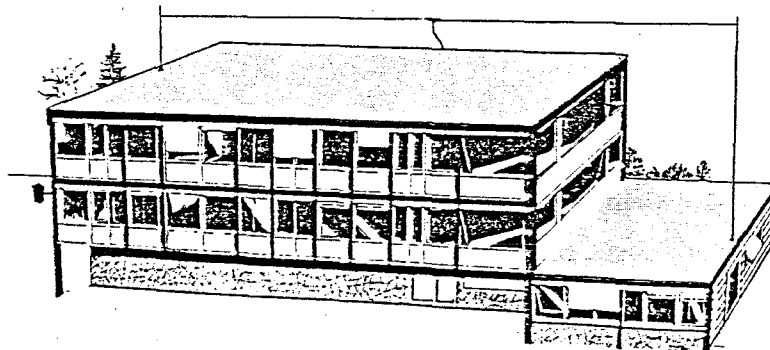
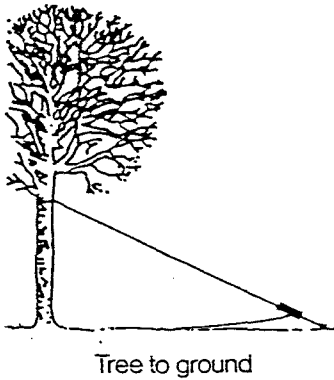
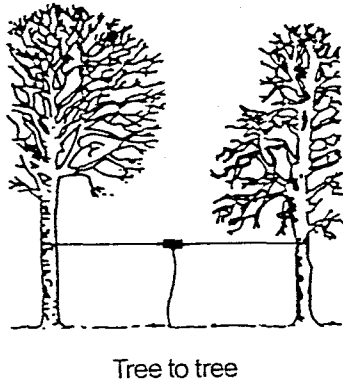
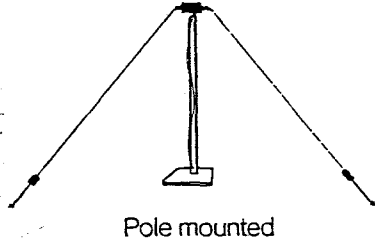
NOTE. All antennas are supplied with 1 metre galvanised wire strops with eyes for halyard attachment. Type CFD/1 antennas can be supplied with connectors and coaxial cable made up to customers requirements.



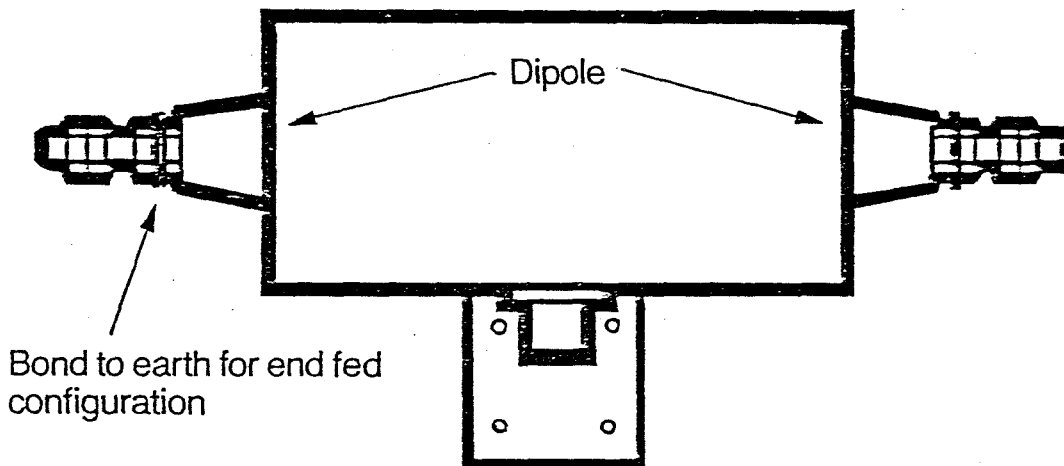
NOTE. Four point to point circuits, the addition of a parasitic reflector screen will give an additional gain of 3 dB and will also limit radiation in the unwanted direction.

S1780

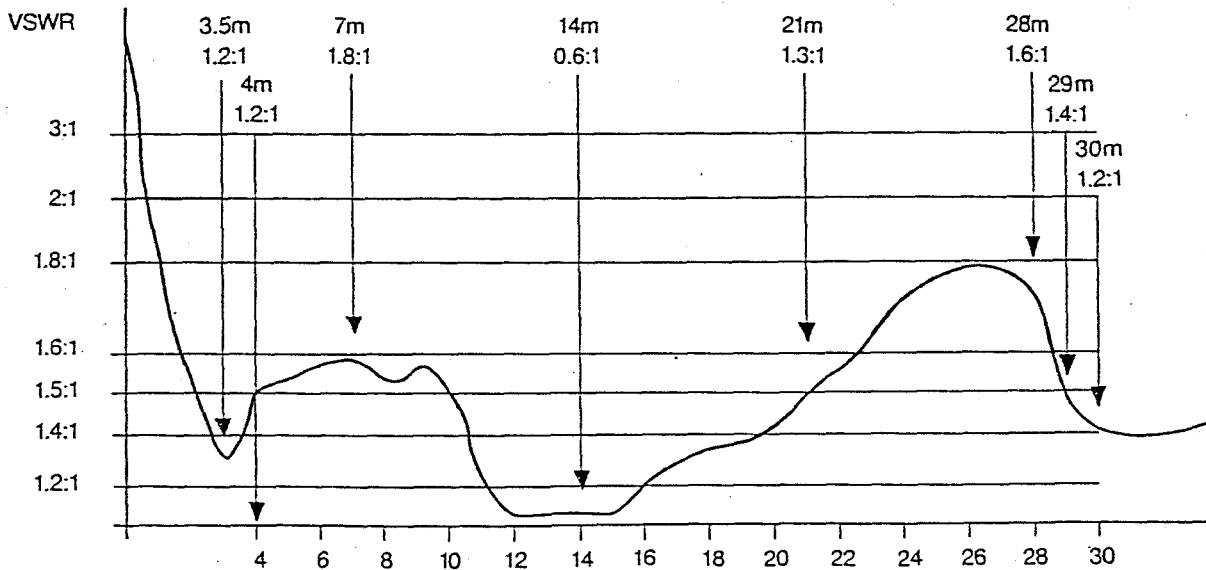
BROAD BAND DIPOLE



- Ideal for all HF communications
- Matches any wire over 7 metres long in end fed or dipole configurations
- Eliminates needs for ATU
- Easily deployed for tactical applications or for permanent installation
- Supplied with two radiators with ceramic insulators as standard
- Can be supplied with rigid fibreglass radiators
- Ideal for use with frequency agile equipment
- Can be supplied in Manpack form with temporary mast
- Special low frequency (200 khz-2 MHz) version available for beacon applications
- Fitted with 'N' Type socket as standard



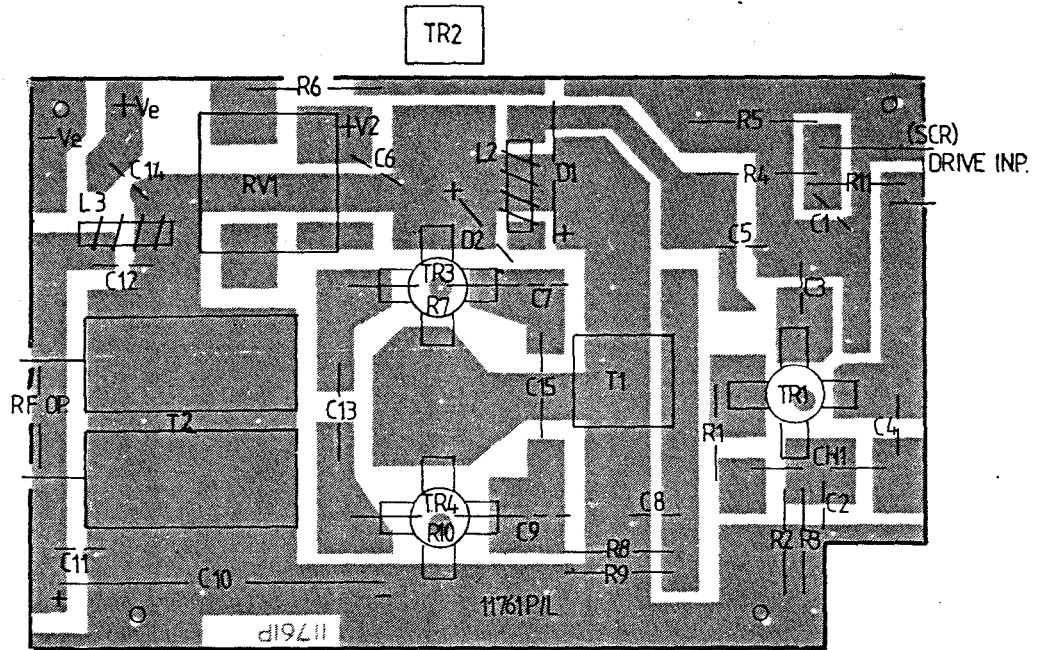
The figures above arrows are the reflectometer reading at frequency stated. The graph readings are taken from the Sweeper Test. Mismatches used are telonic labs calibrated, and were used to Calibrate the Sweeper/Ind.



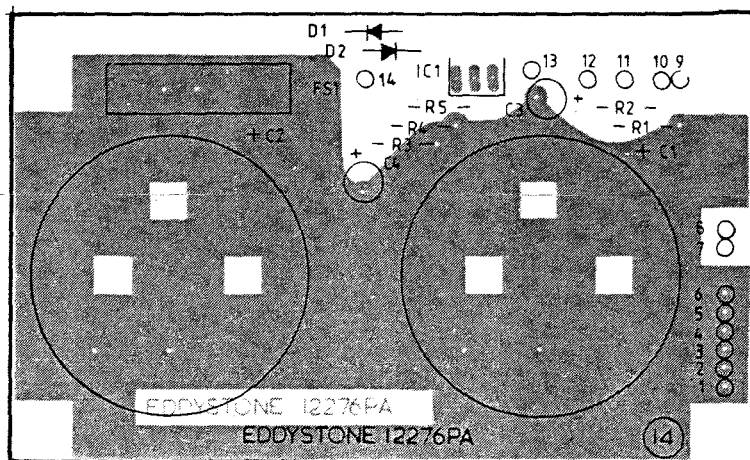
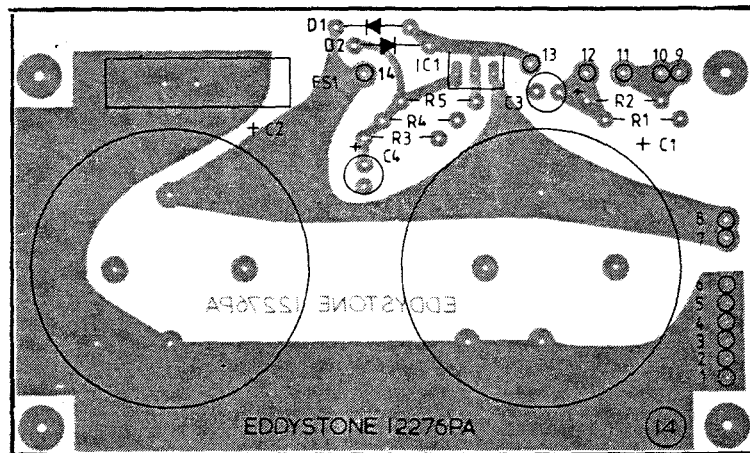
Matches any wire dipole or wire over 7 metres long over frequency range 1.5-30 MHz/z. The ZS Unimatch permits centre fed wire dipoles or end fed wires to be fed without the conventional ATU. Fully wideband over stated frequency range and available in 150, 400 or 2000W p.e.p. rating. Based on the world famous XWBDA series of antennas this device will find wide acceptance with frequency agility equipment ideal for field use and licensing to original equipment manufacturer's for inclusion in their radio's.

Freq Range: 1.5 to 30.0 MHz
VSWR: Better than 2.1 across band
Impedance: 50 ohms nominal
Power Rating: 150W p.e.p.
Mass (inc wires): 2kg approx.

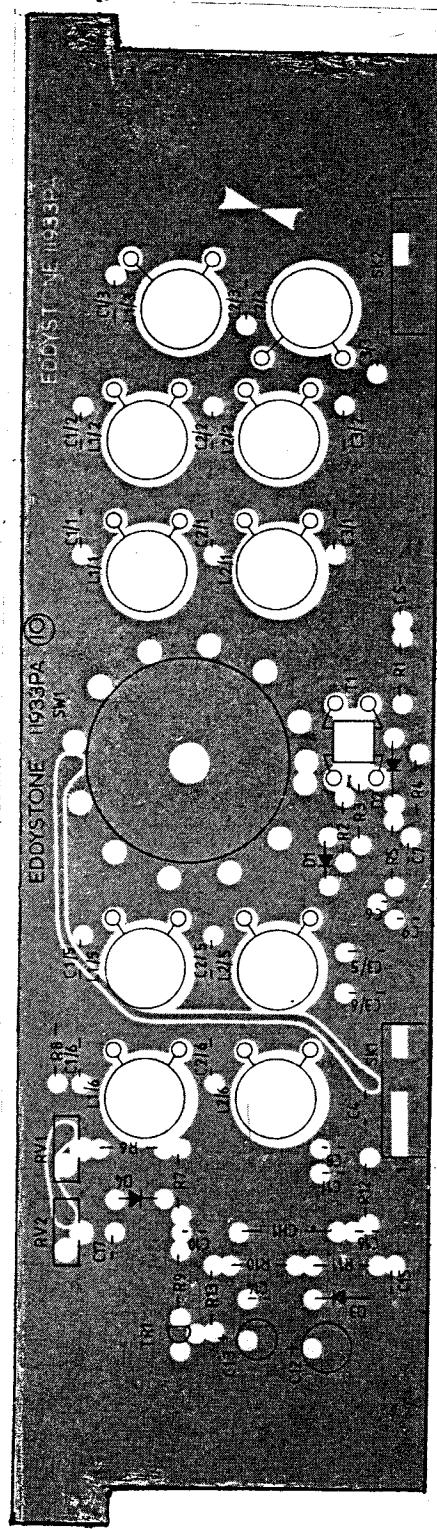
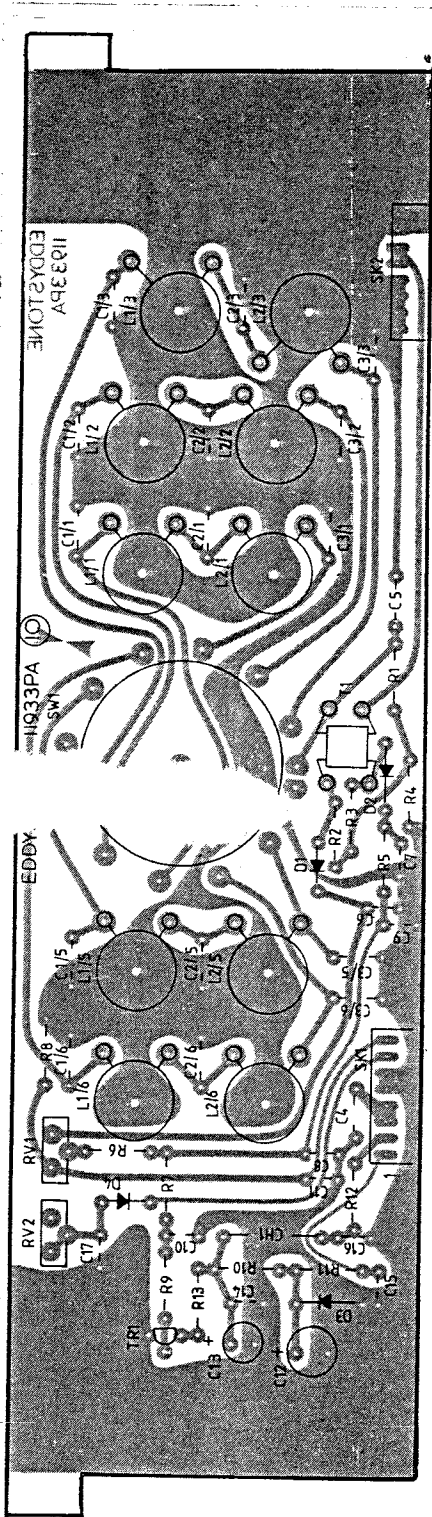
Power Amplifier Board (Reference 11)
11761P



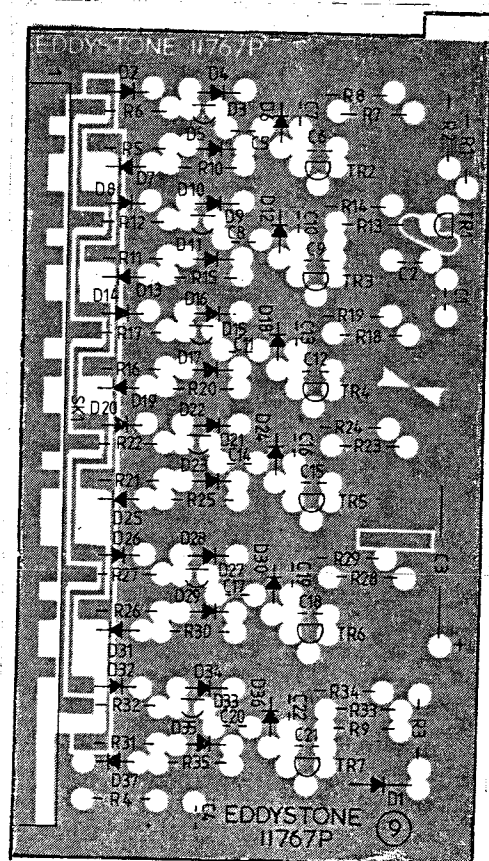
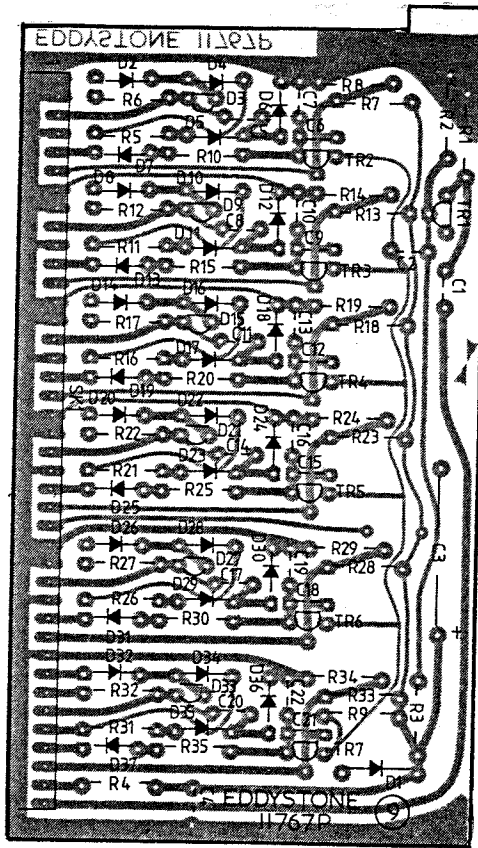
AC PSU Board (Reference 14)
12276P



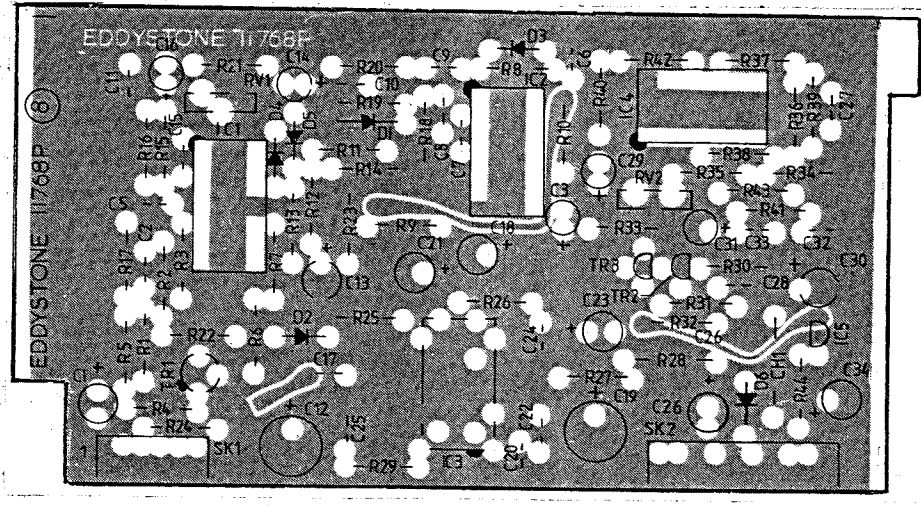
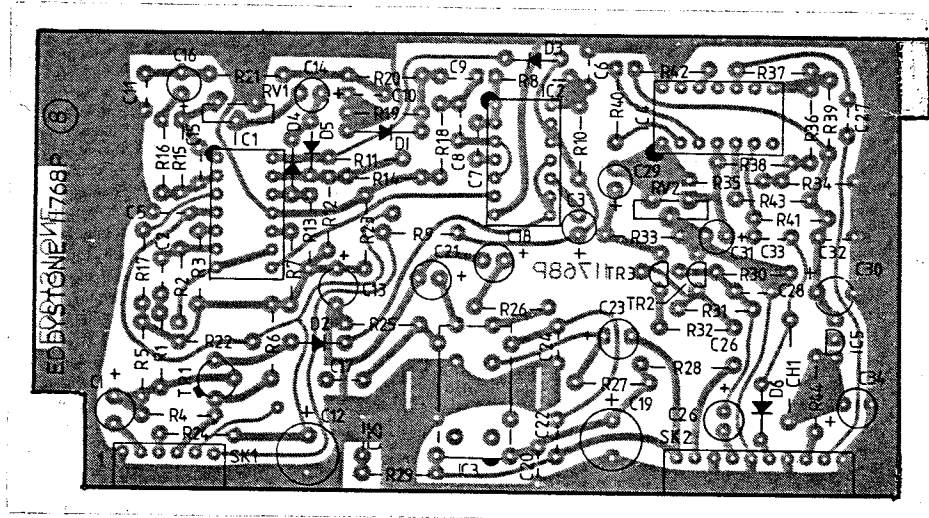
PA Output Filter Board (Reference 10)
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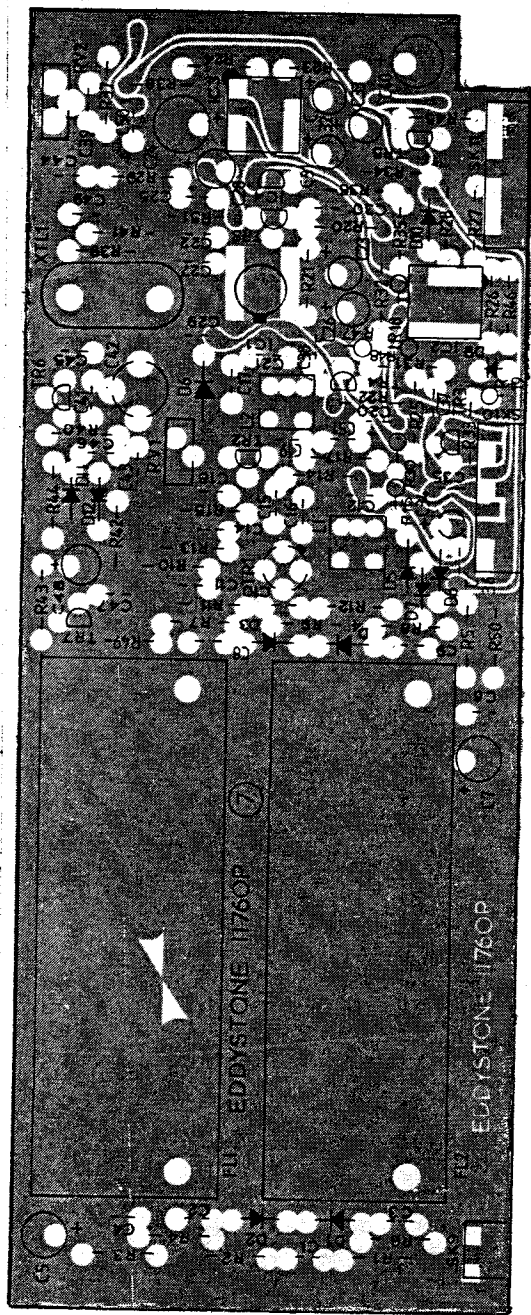
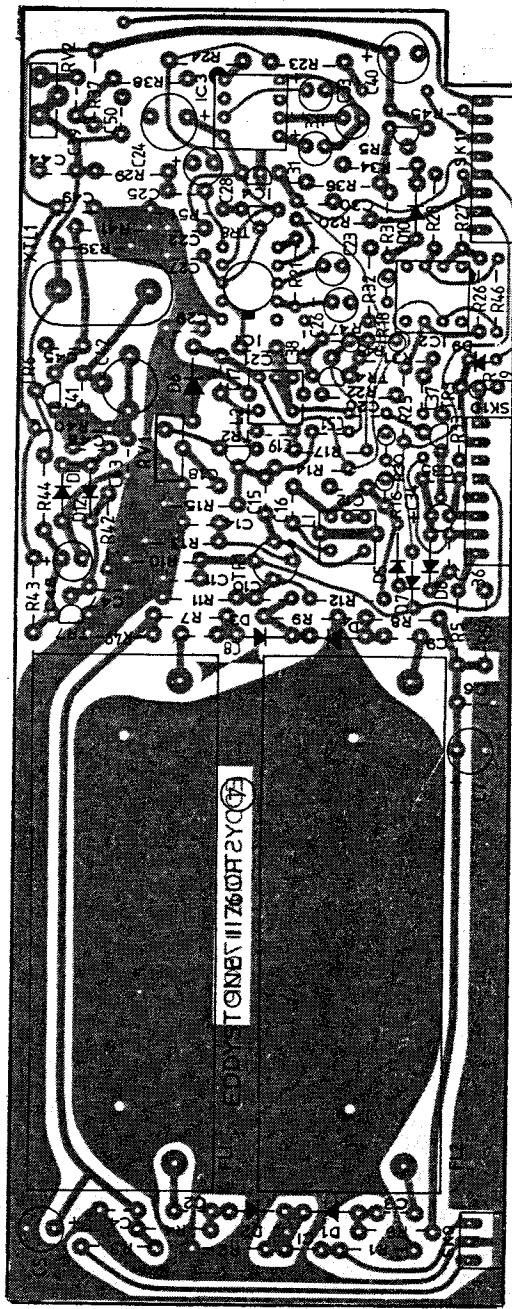
Oscillator Board (Reference 9)
11767P



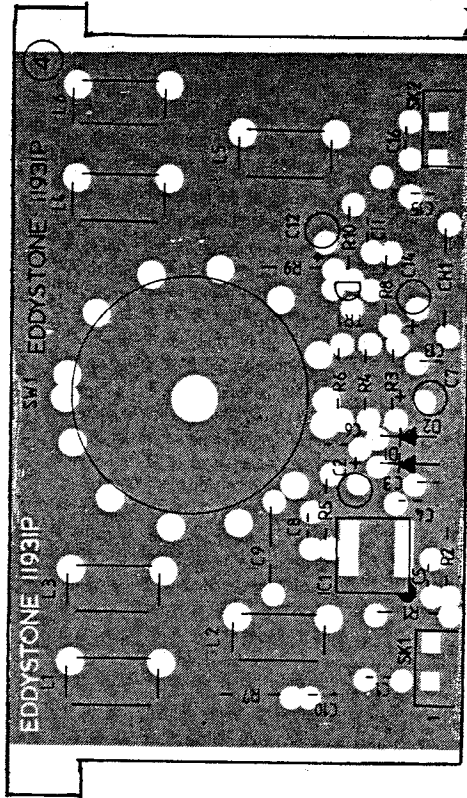
Audio Board (Reference 8)
11768P



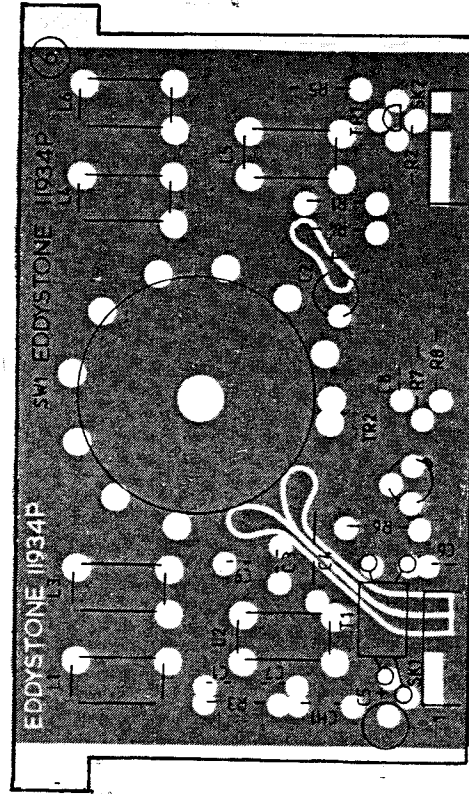
IF Amplifier Board (Reference 7)
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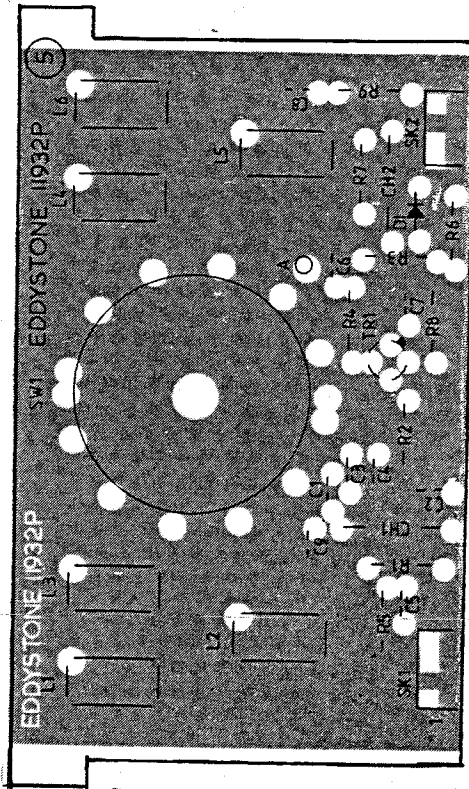
Transmitter Mixer Board (Reference 4)
11931P



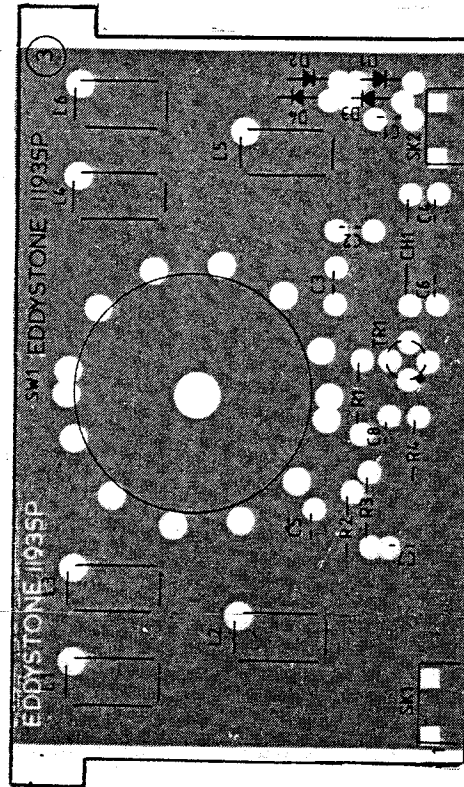
Transmitter Pre-Amplifier Board (Reference 6)
11934P



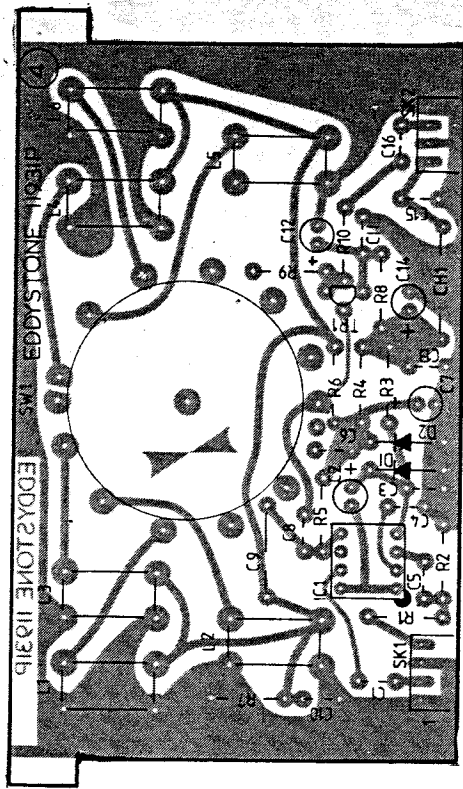
Receiver Mixer Board (Reference 5)
11932P



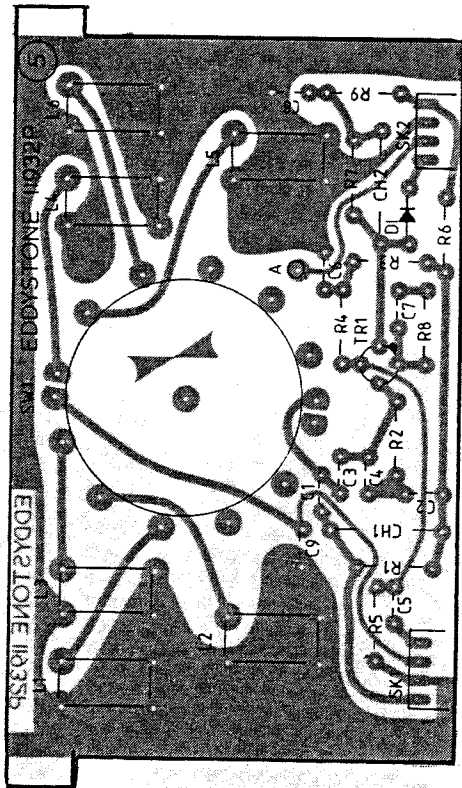
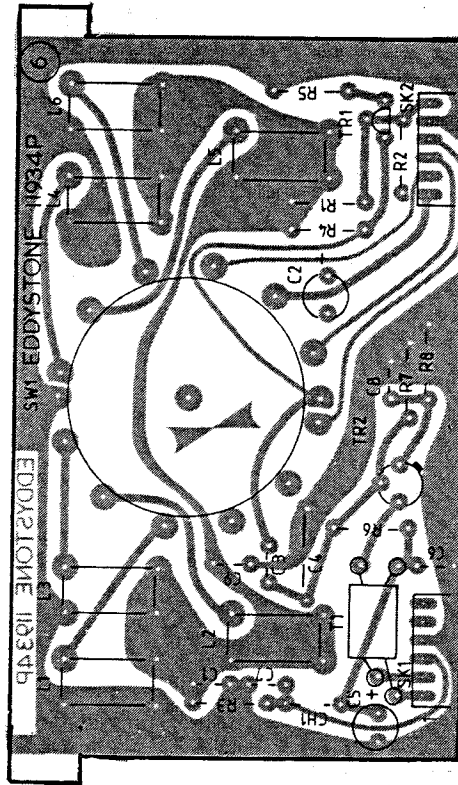
Receiver RF Amplifier Board (Reference 3)
11935P



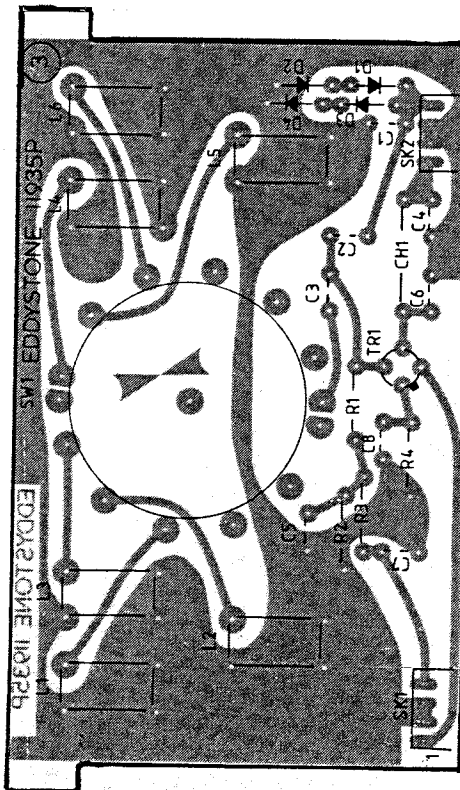
Transmitter Mixer Board (Reference 4)
11931P



Transmitter Pre-Amplifier Board (Reference 6)
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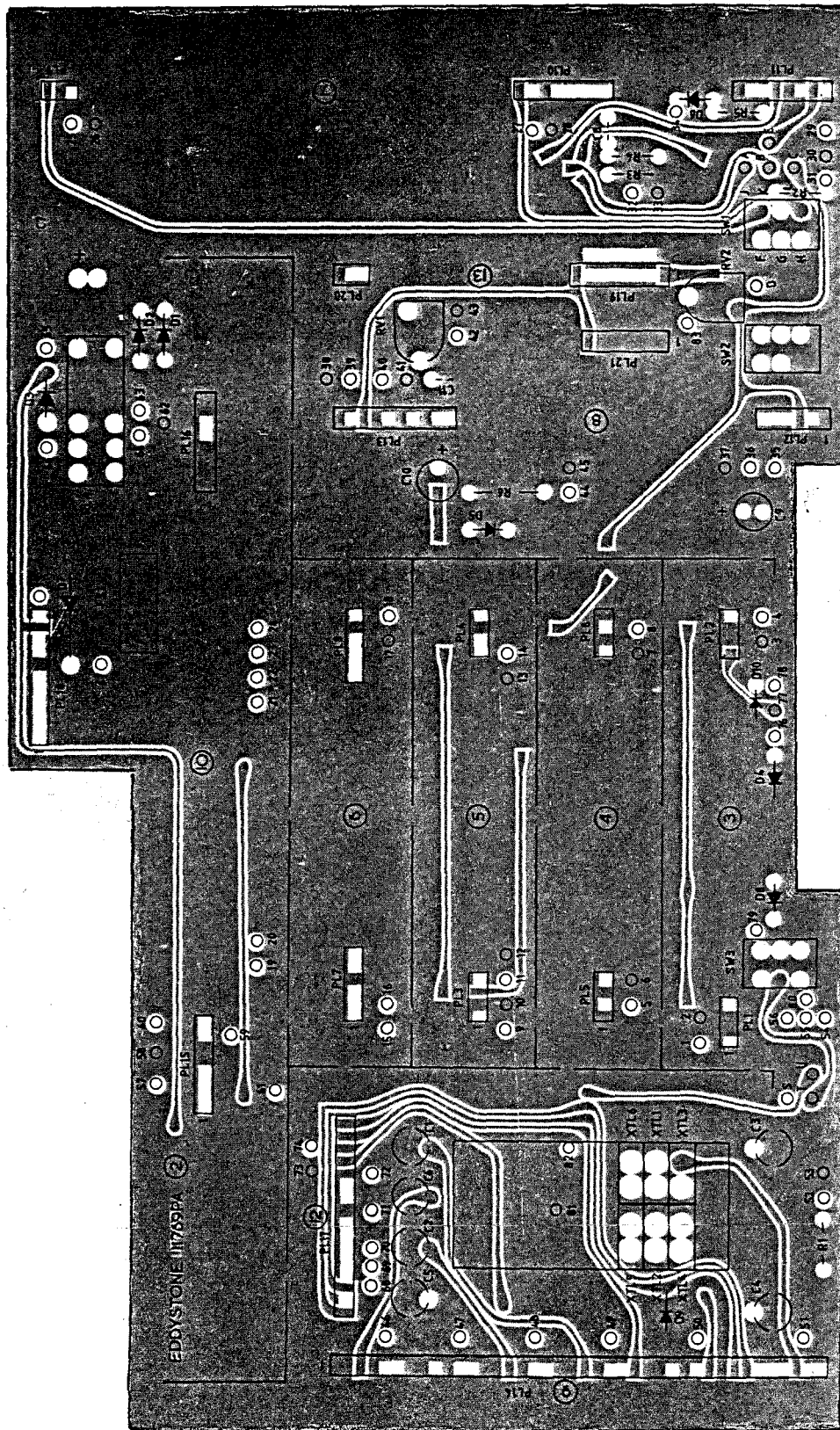


Receiver Mixer Board (Reference 5)
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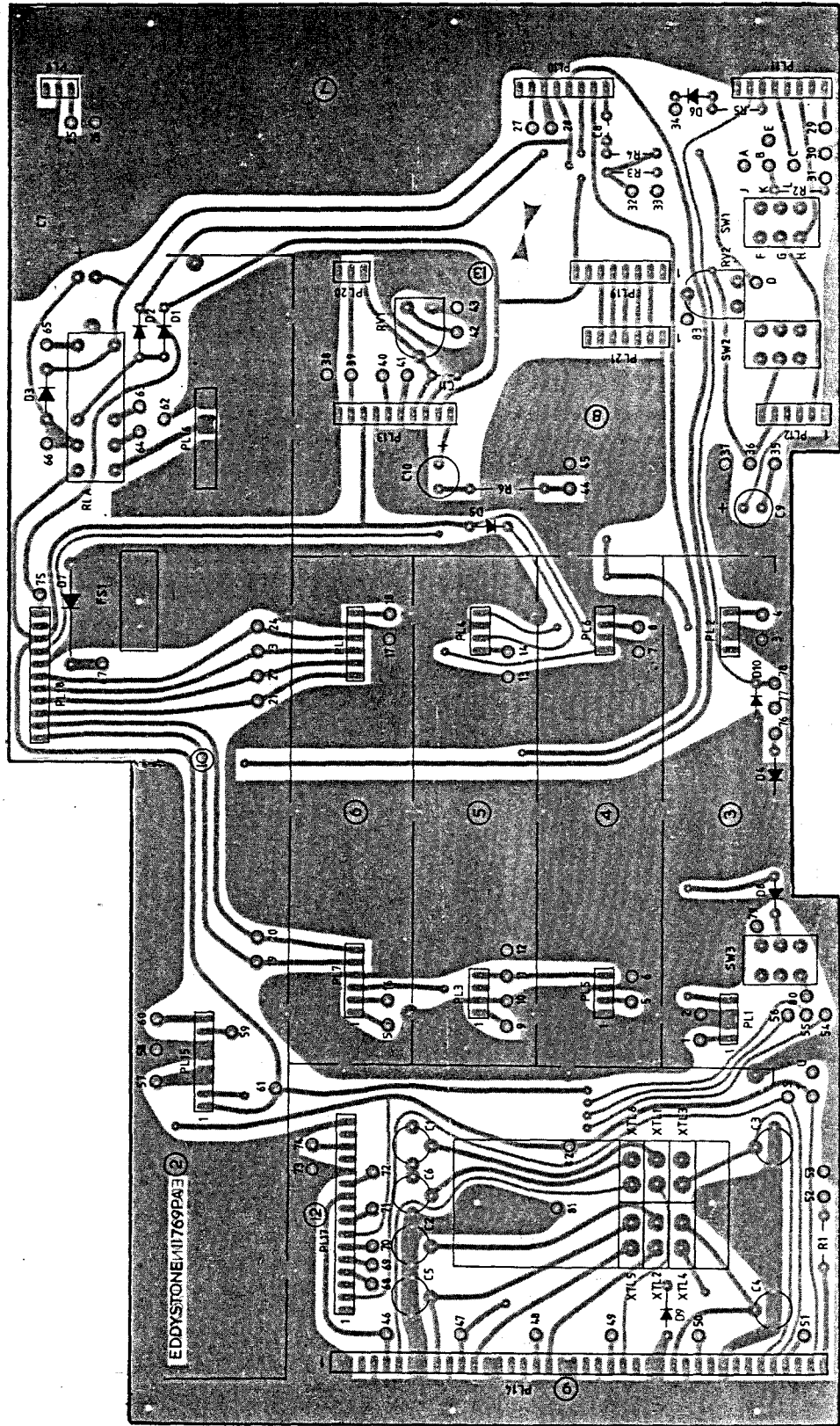
Receiver RF Amplifier Board (Reference 3)
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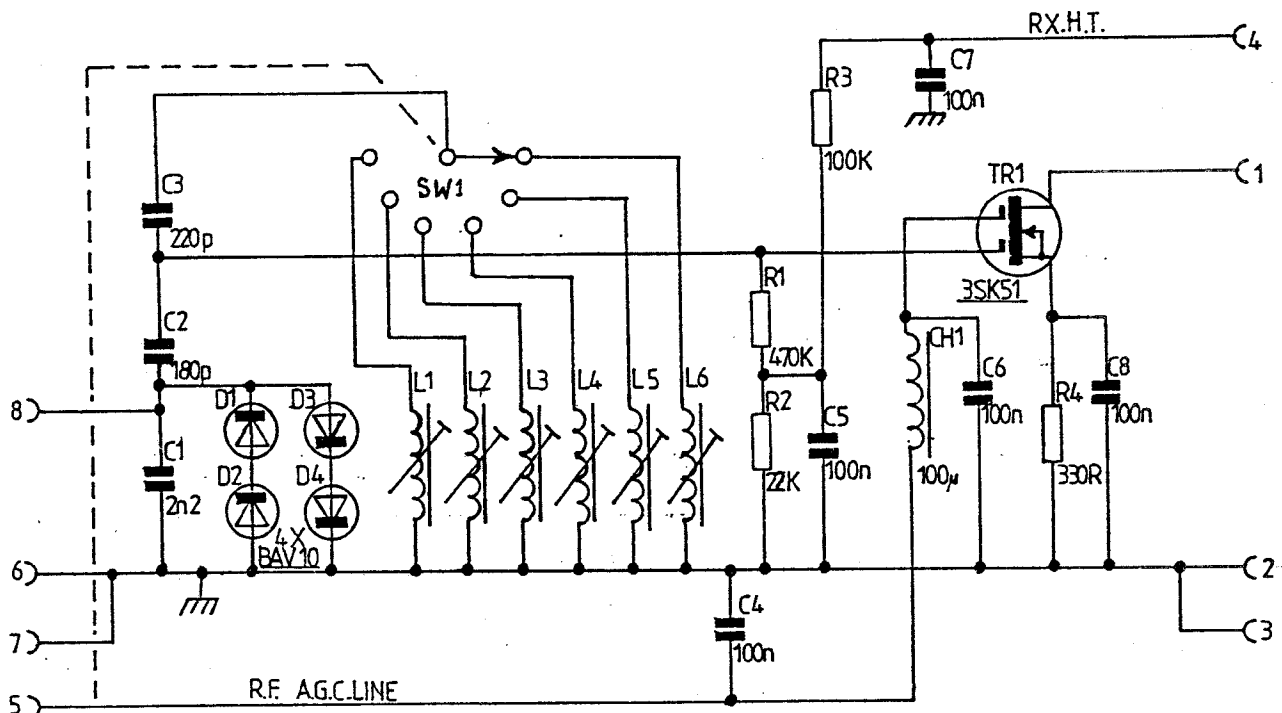
Interconnection Board (Reference 2)
11769P



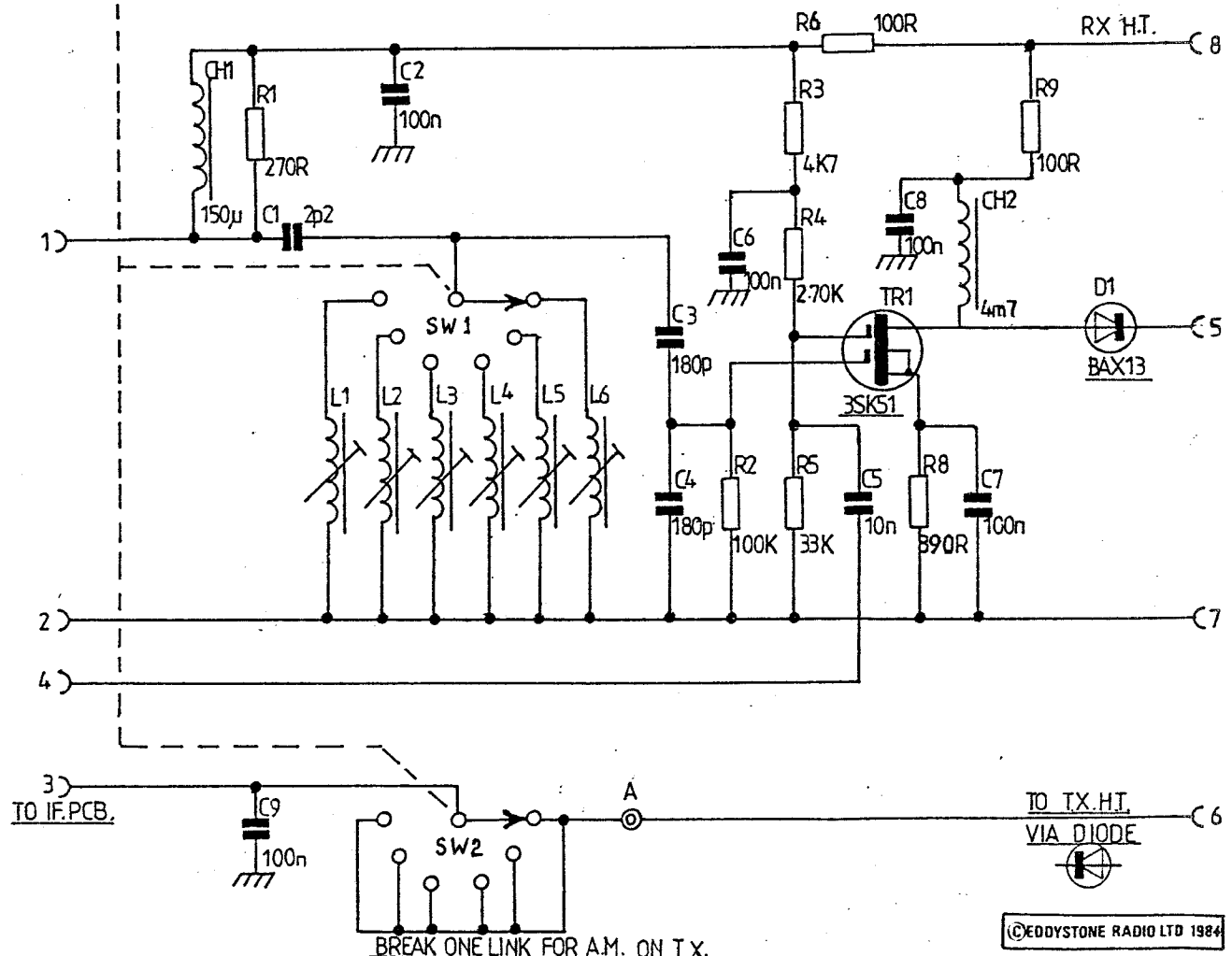
Interconnection Board (Reference 2)

11769P





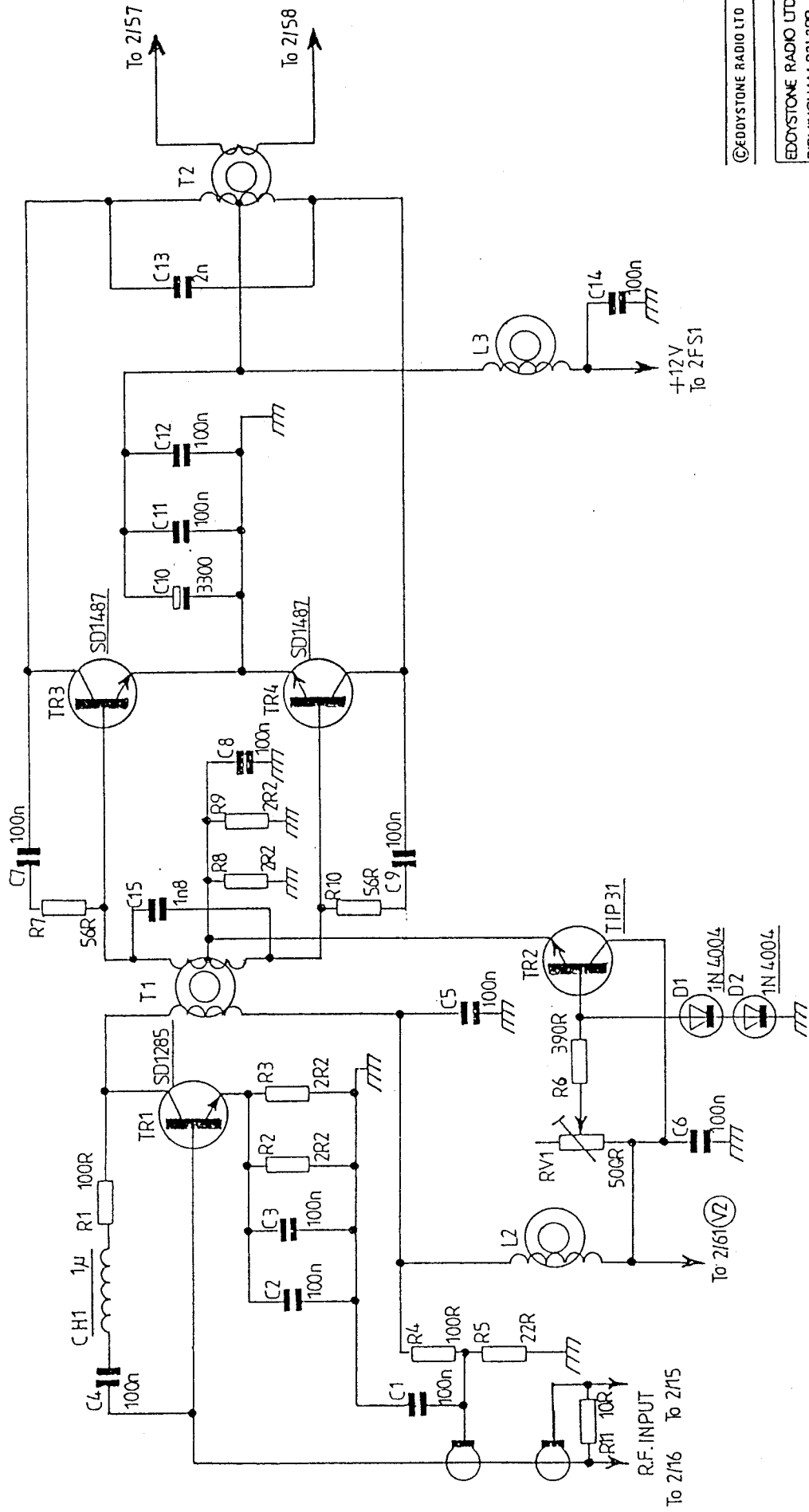
S 5000 SERIES RX. R.F. AMPLIFIER REF.3.



S 5000 SERIES RX. MIXER REF.5.

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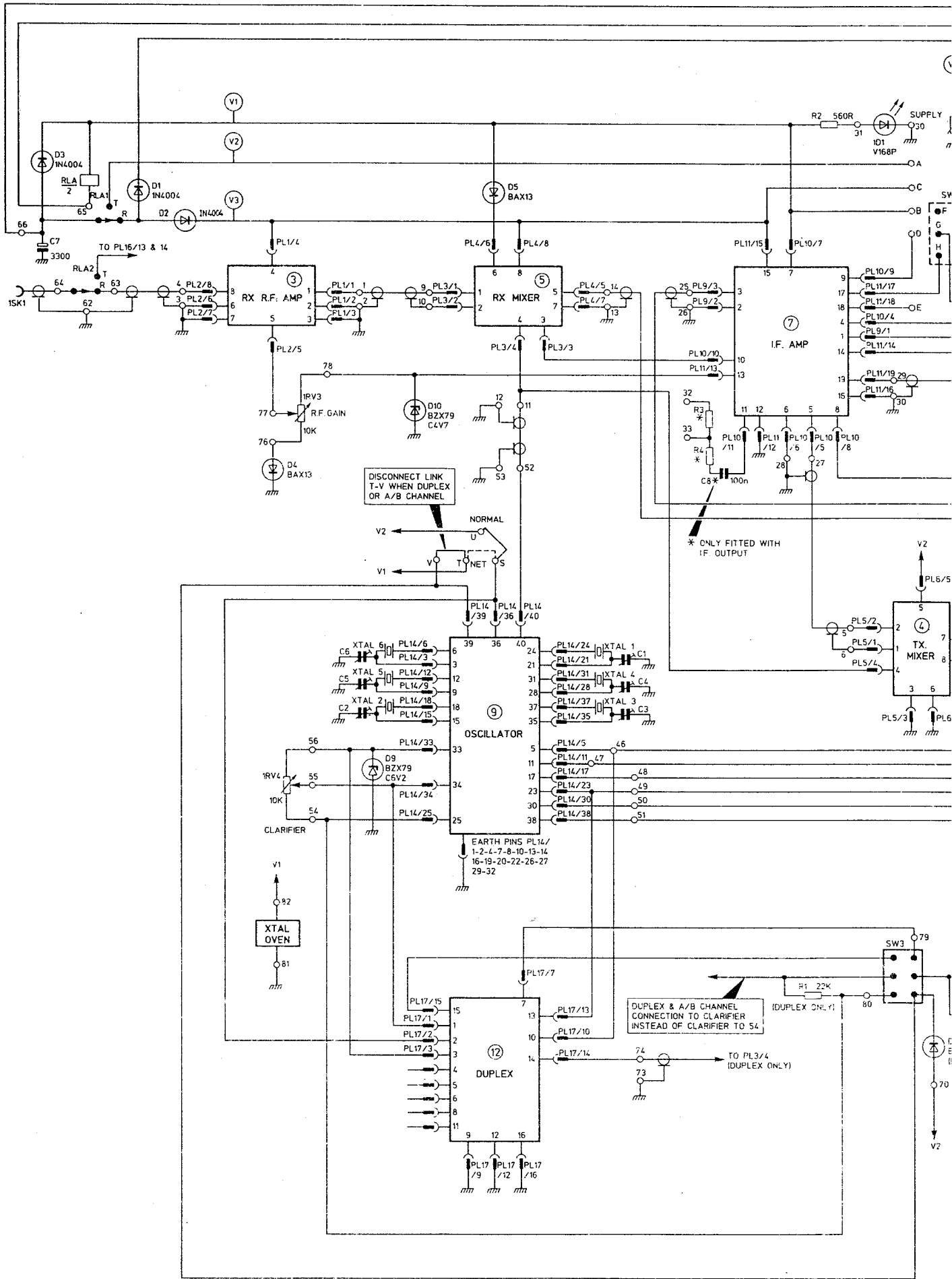


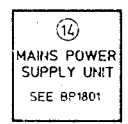
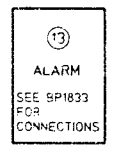
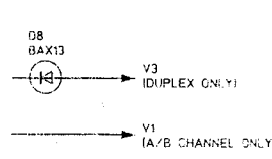
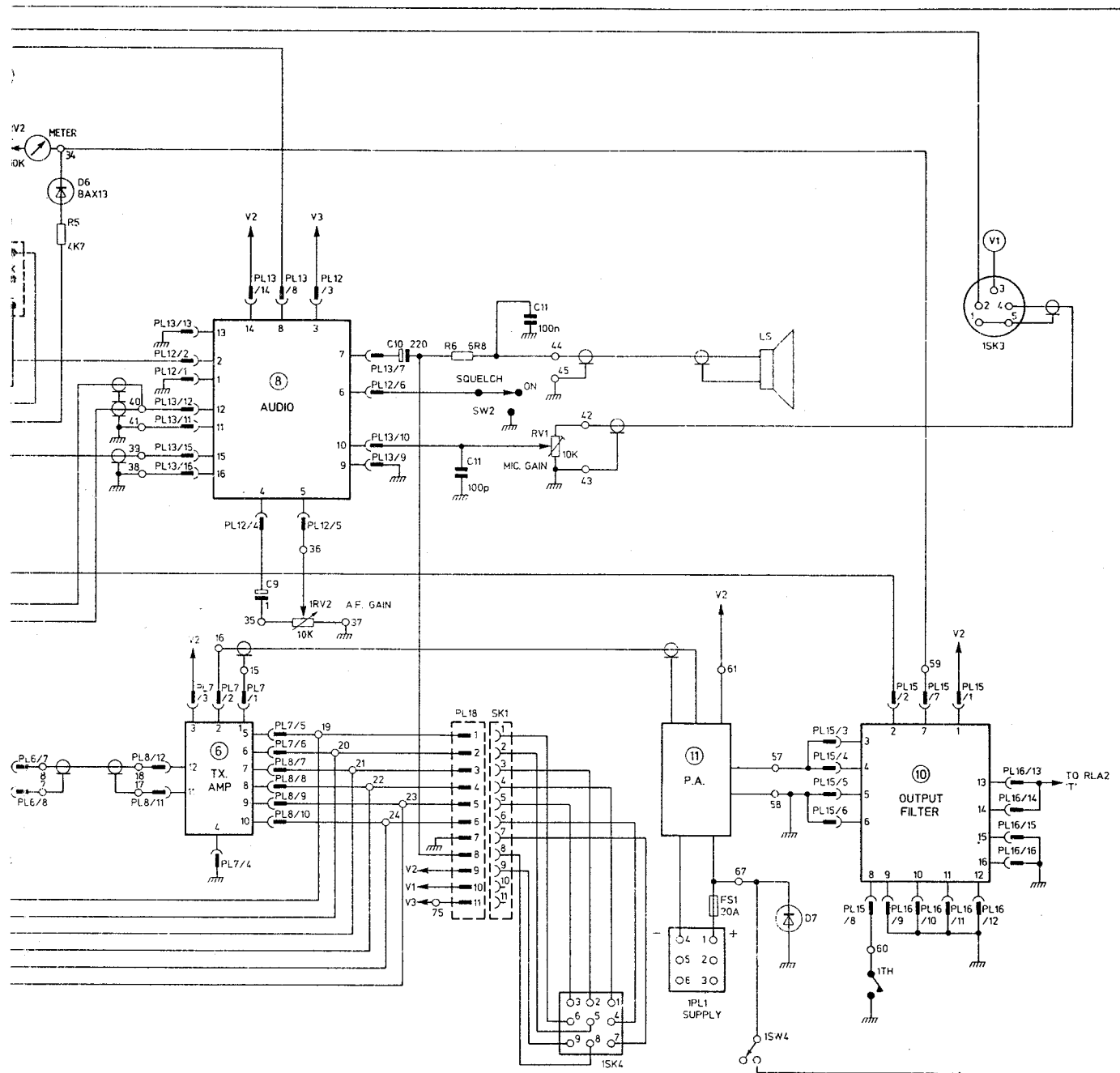
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S5000 SERIES, POWER AMPLIFIER, REF.11.

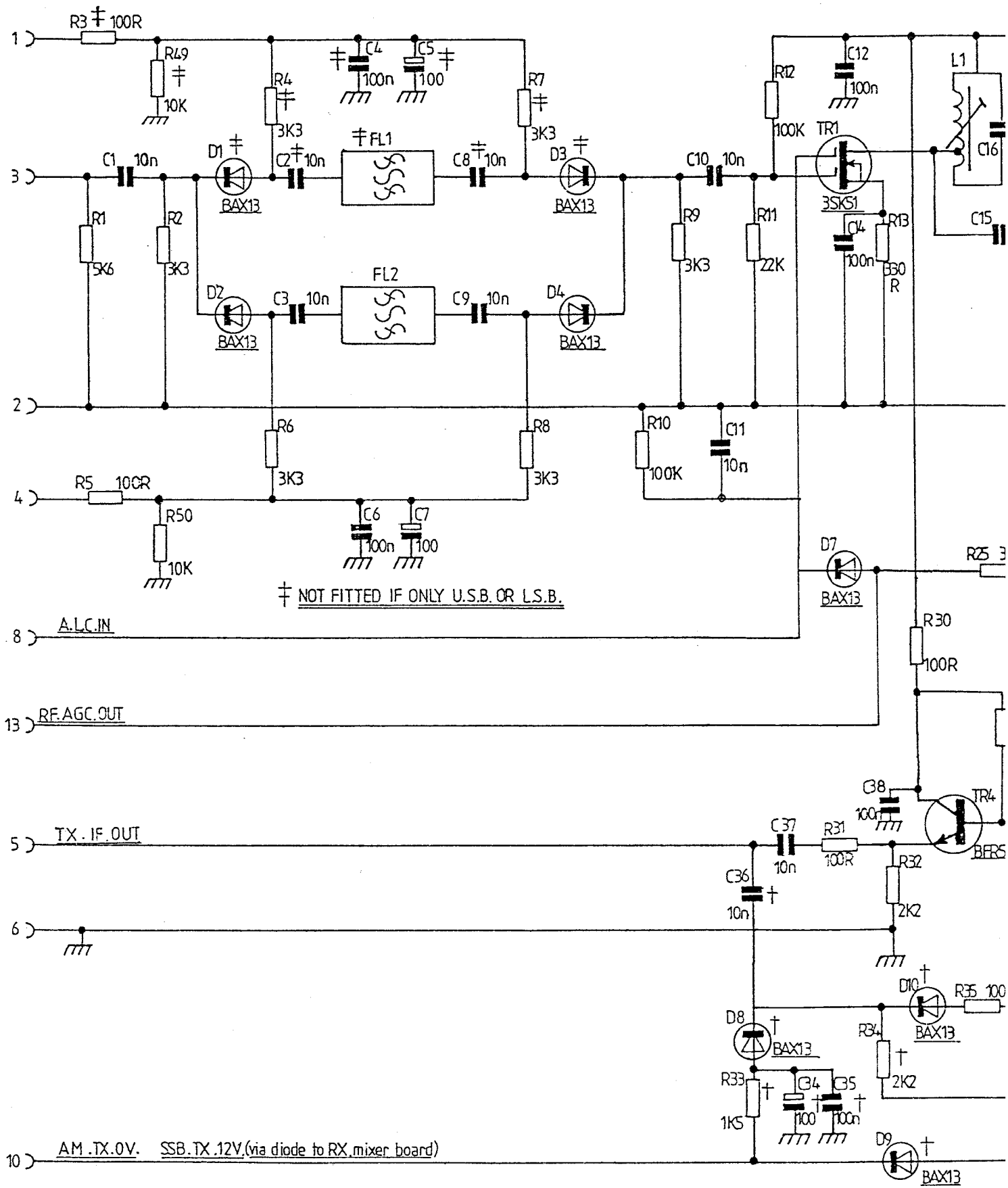




- | | |
|---|------------------|
| ① | CHASSIS MOUNTED |
| ② | INTERCONNECTION |
| ③ | RX. RF AMPLIFIER |
| ④ | TX MIXER |
| ⑤ | RX MIXER |
| ⑥ | TX AMPLIFIER |
| ⑦ | IF. AMPLIFIER |
| ⑧ | AUDIO |
| ⑨ | OSCILLATOR |
| ⑩ | OUTPUT FILTER |
| ⑪ | POWER AMPLIFIER |
| ⑫ | DUPLEX |
| ⑬ | ALARM |
| ⑭ | A.C. POWER UNIT |
-
- | | |
|----------|---------------|
| USB ONLY | |
| G | TO H |
| L | TO B |
| E | TO B |
| USB/LSB | |
| F | TO H |
| K | TO B |
| E | TO B |
| USB/AM | |
| D | TO F & E TO L |
| A | ⊖ L |
| C | ⊖ K |
| BAX 13 | |

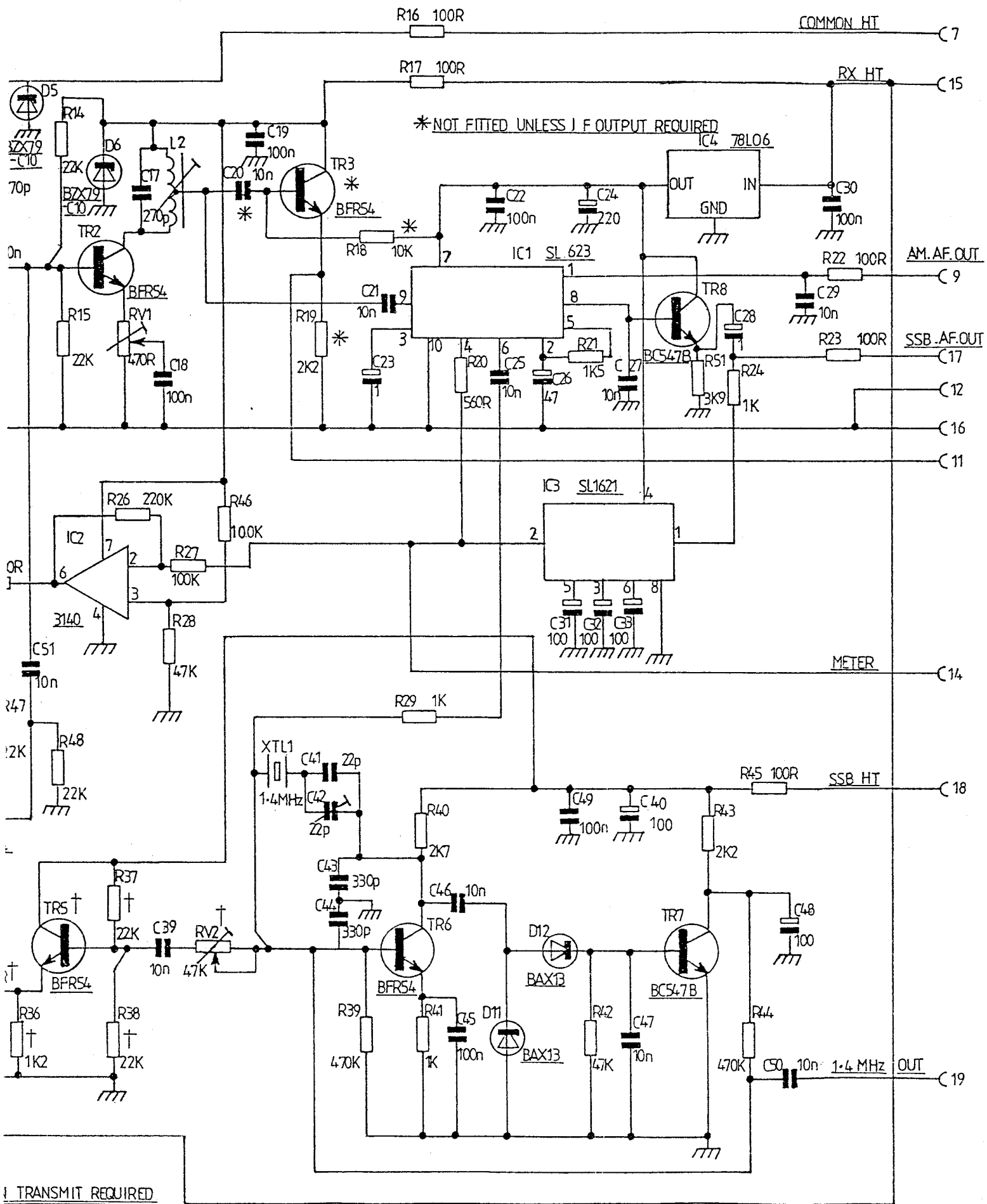
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† NOT FITTED UNLESS A.M. 0

S5000 SERIES I.F. AMPLI

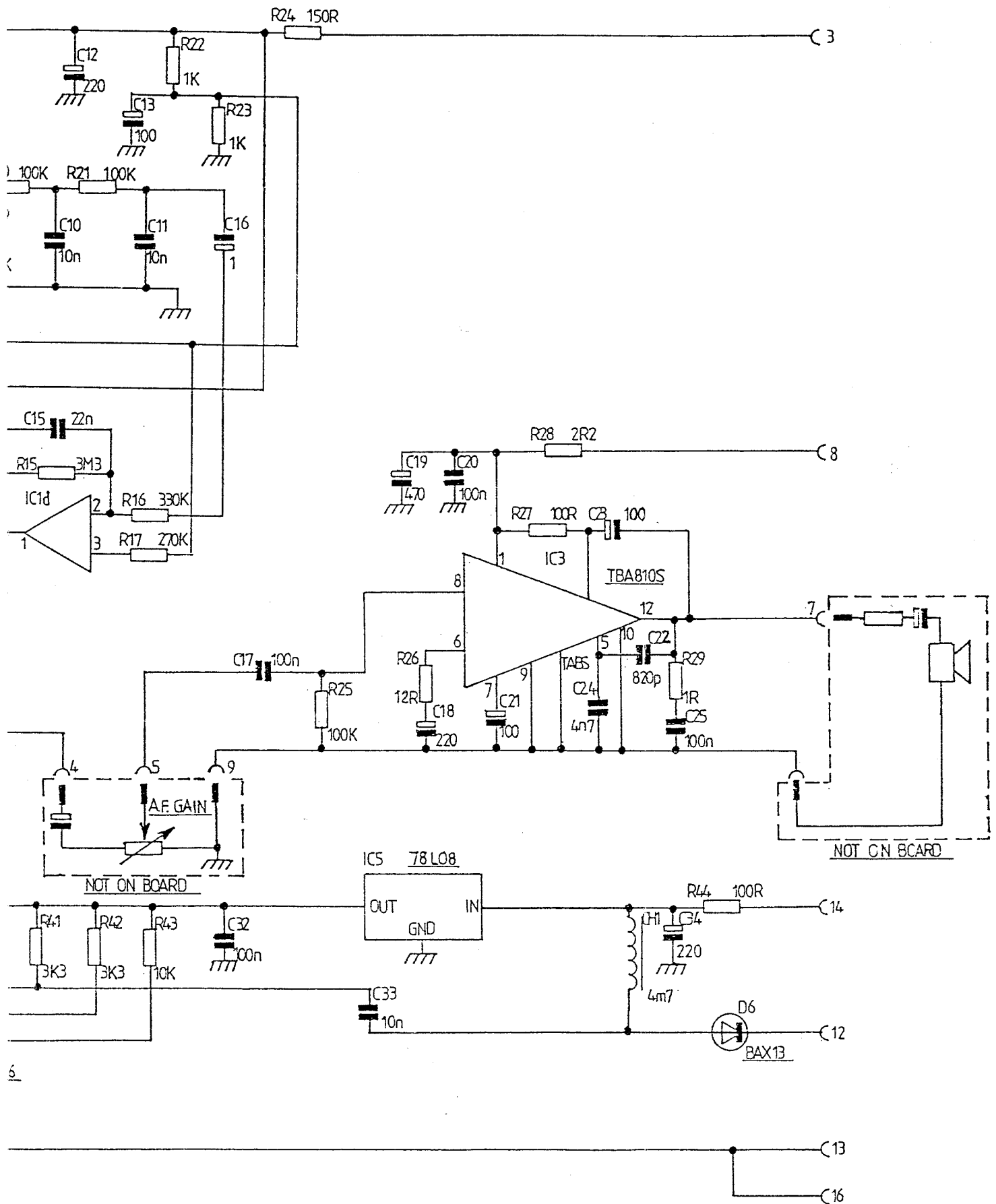


1 TRANSMIT REQUIRED

PIER REF.7.

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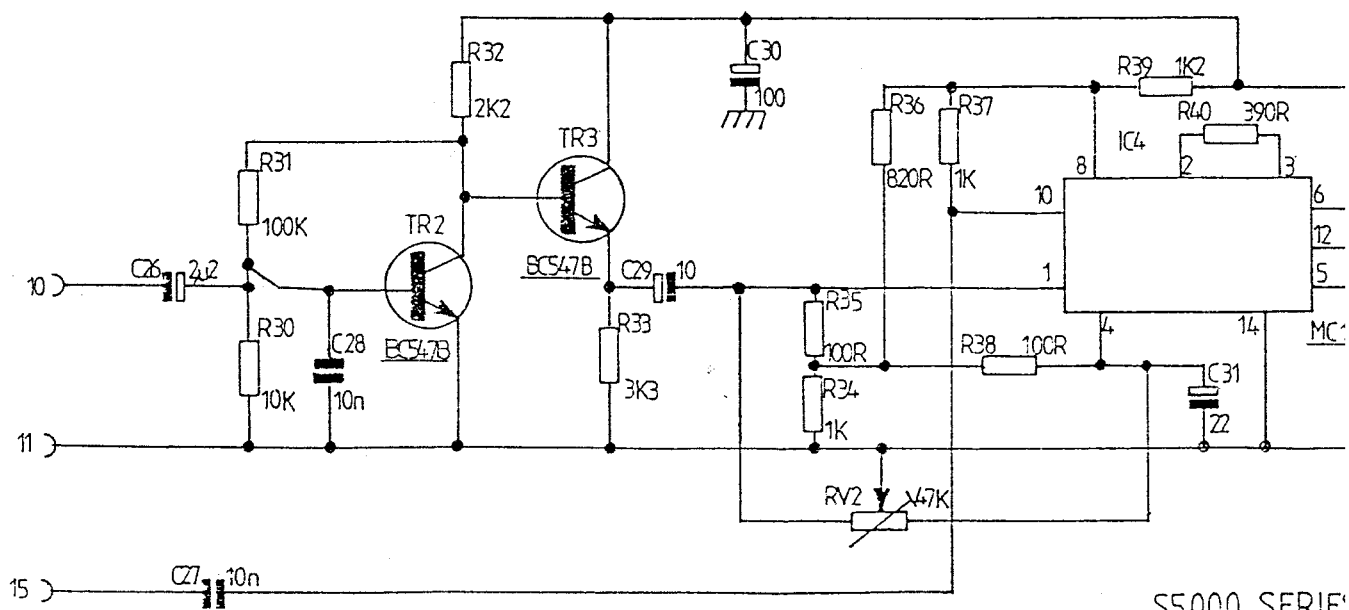
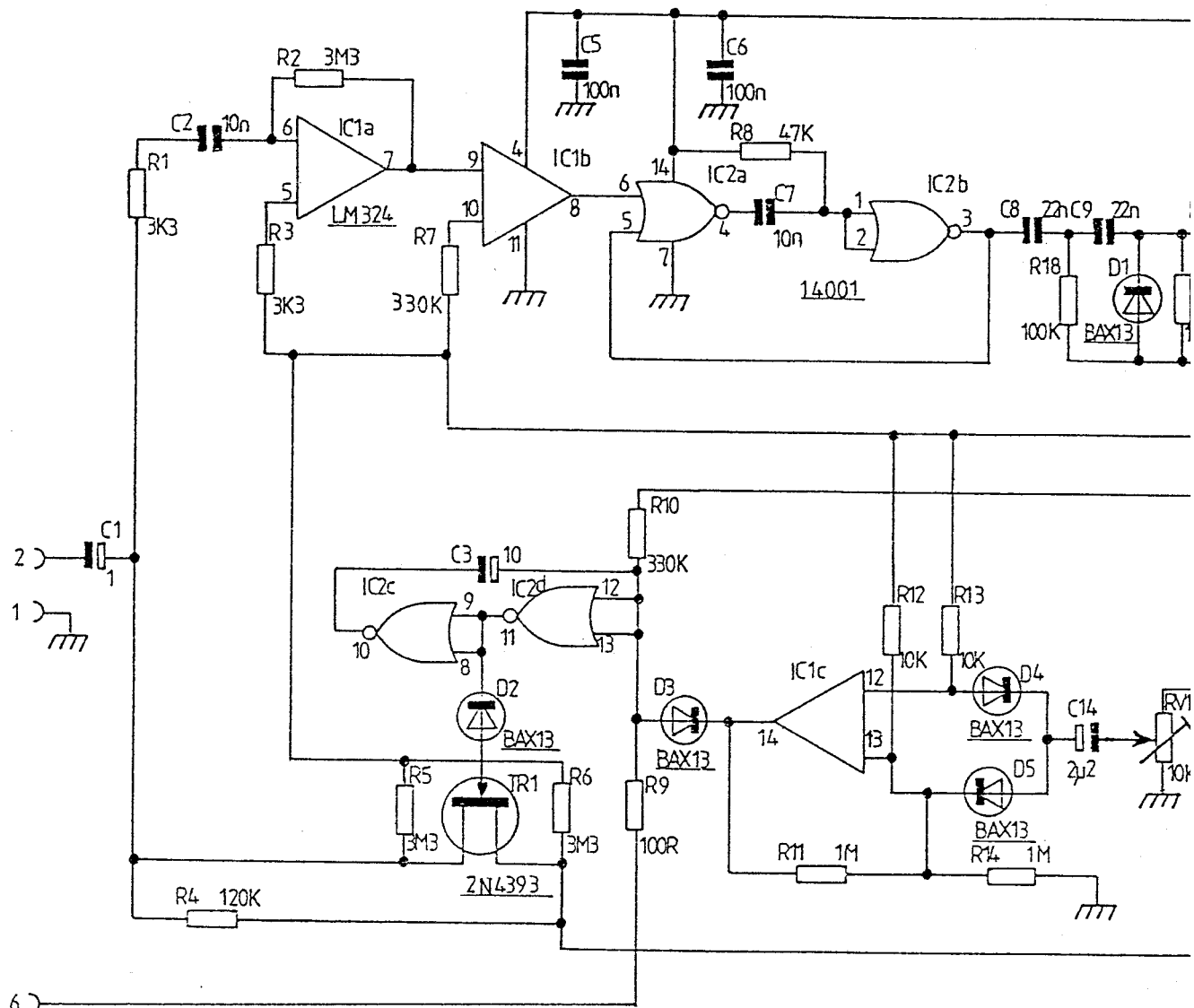
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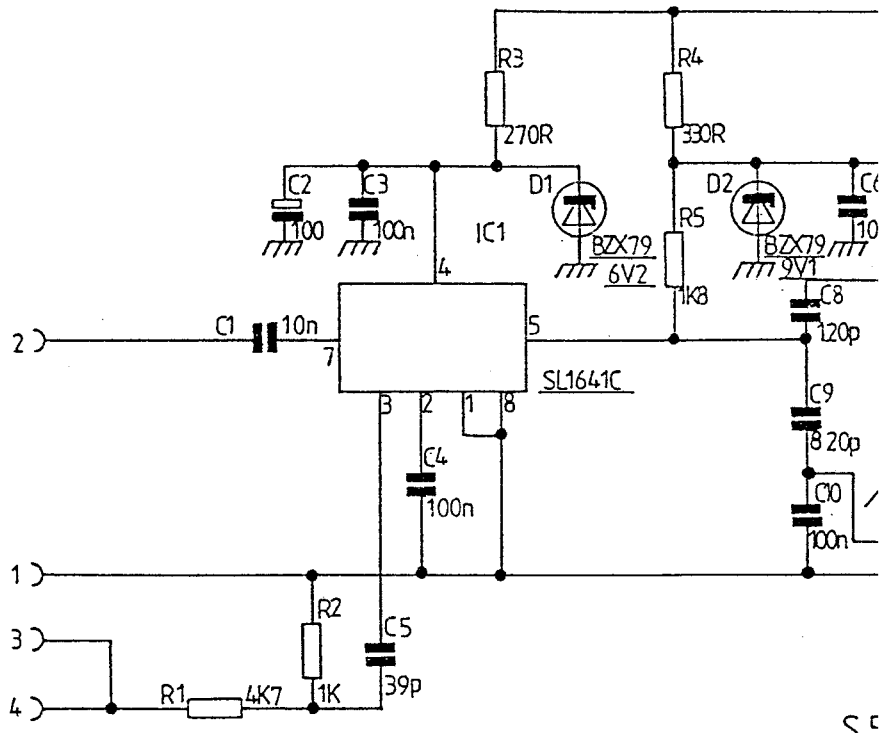
AUDIO BOARD REF 8

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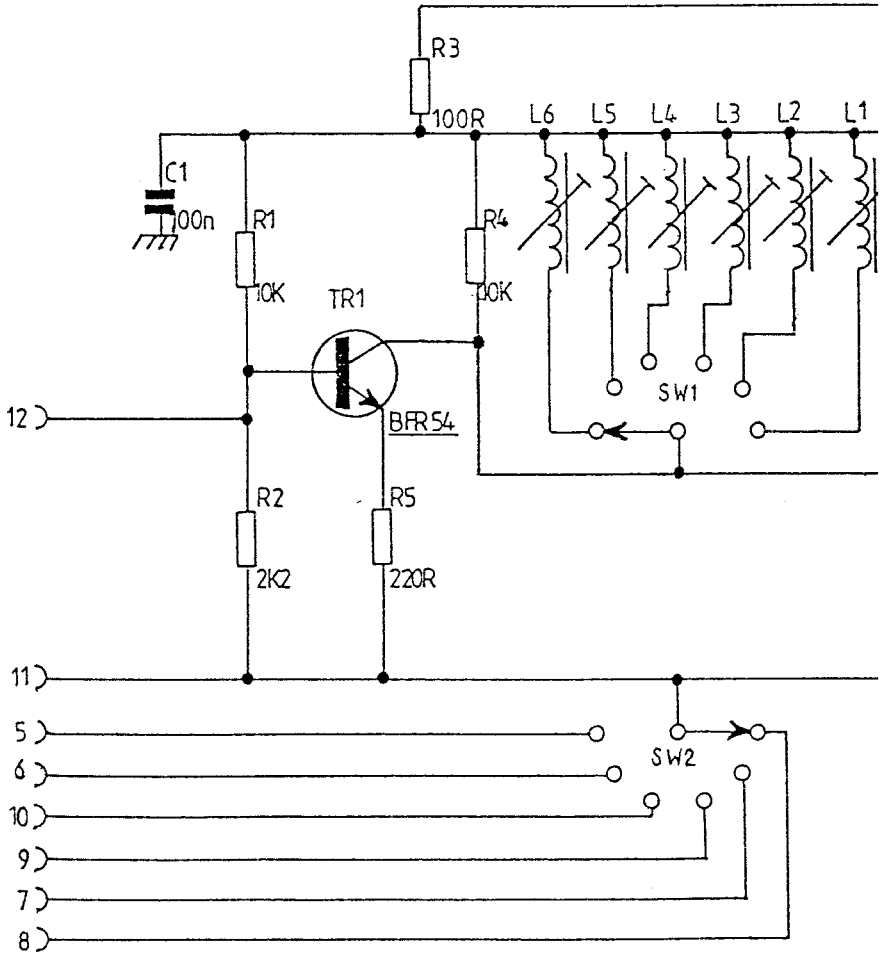
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 DRG No IBP1778
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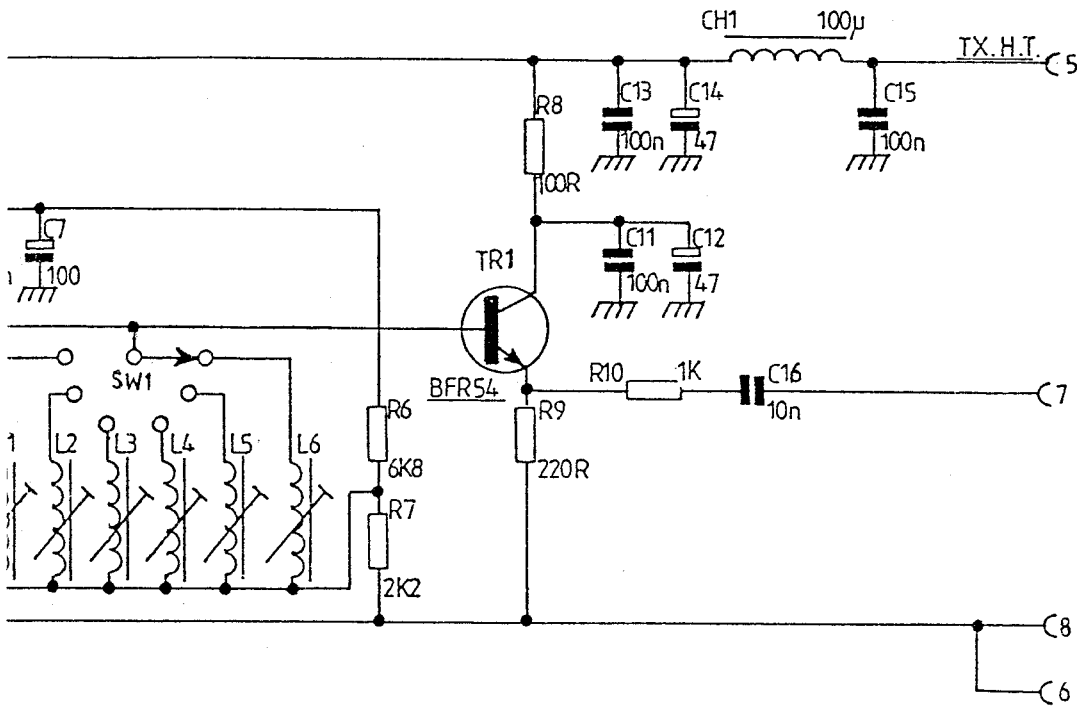
S5000 SERIES



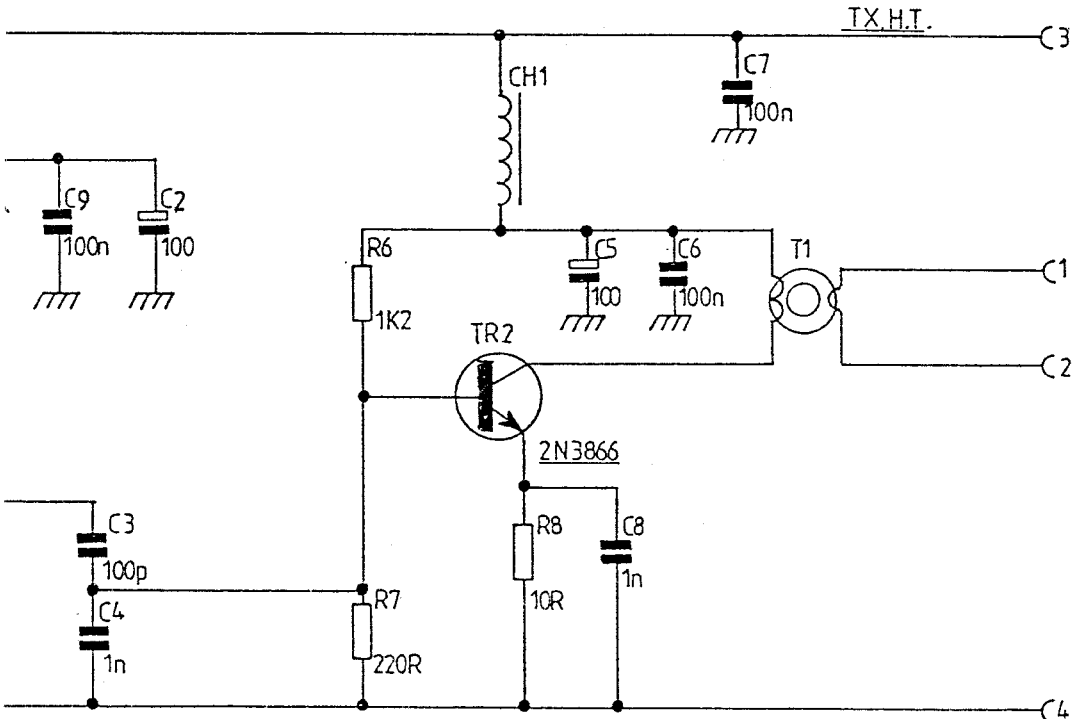
S 5



S

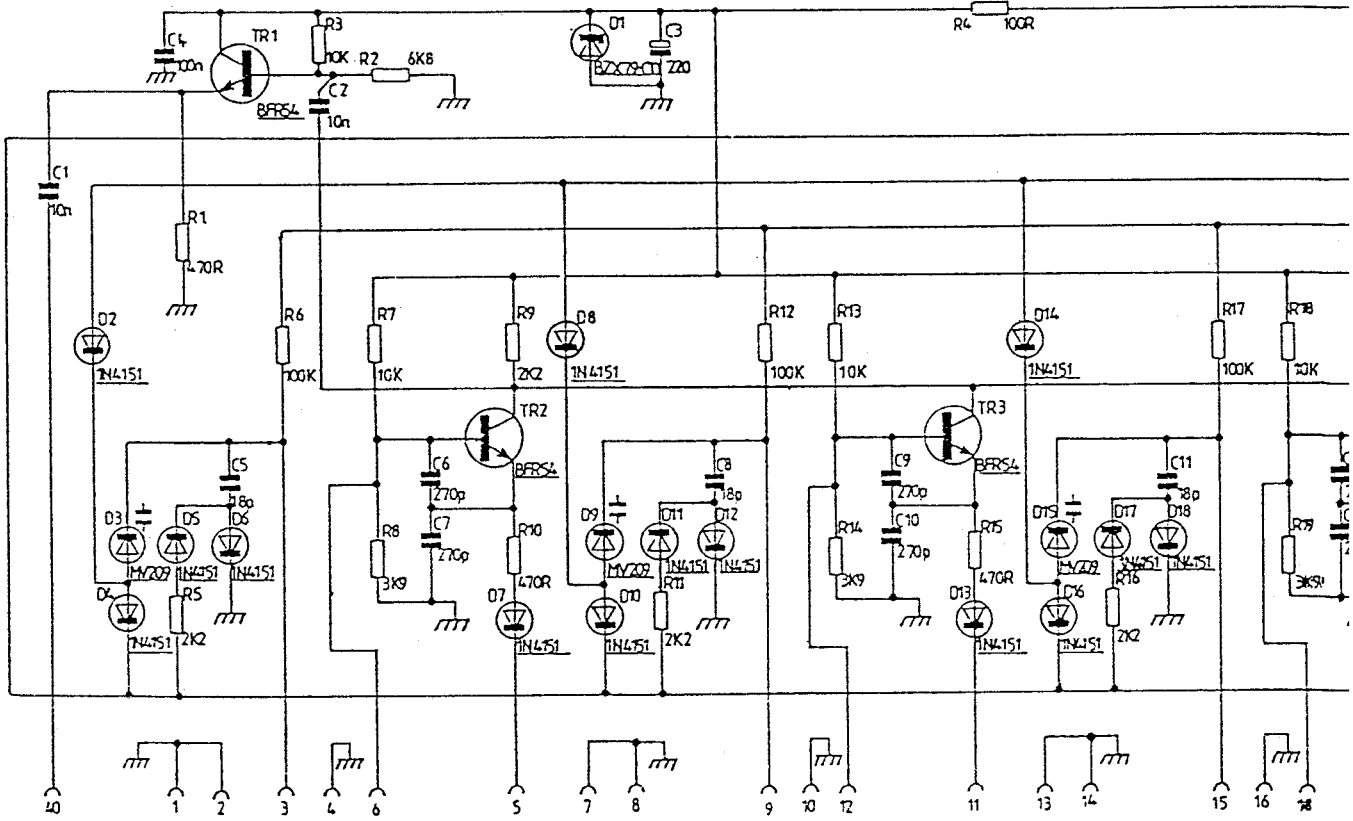


100 SERIES TX.MIXER REF.4.

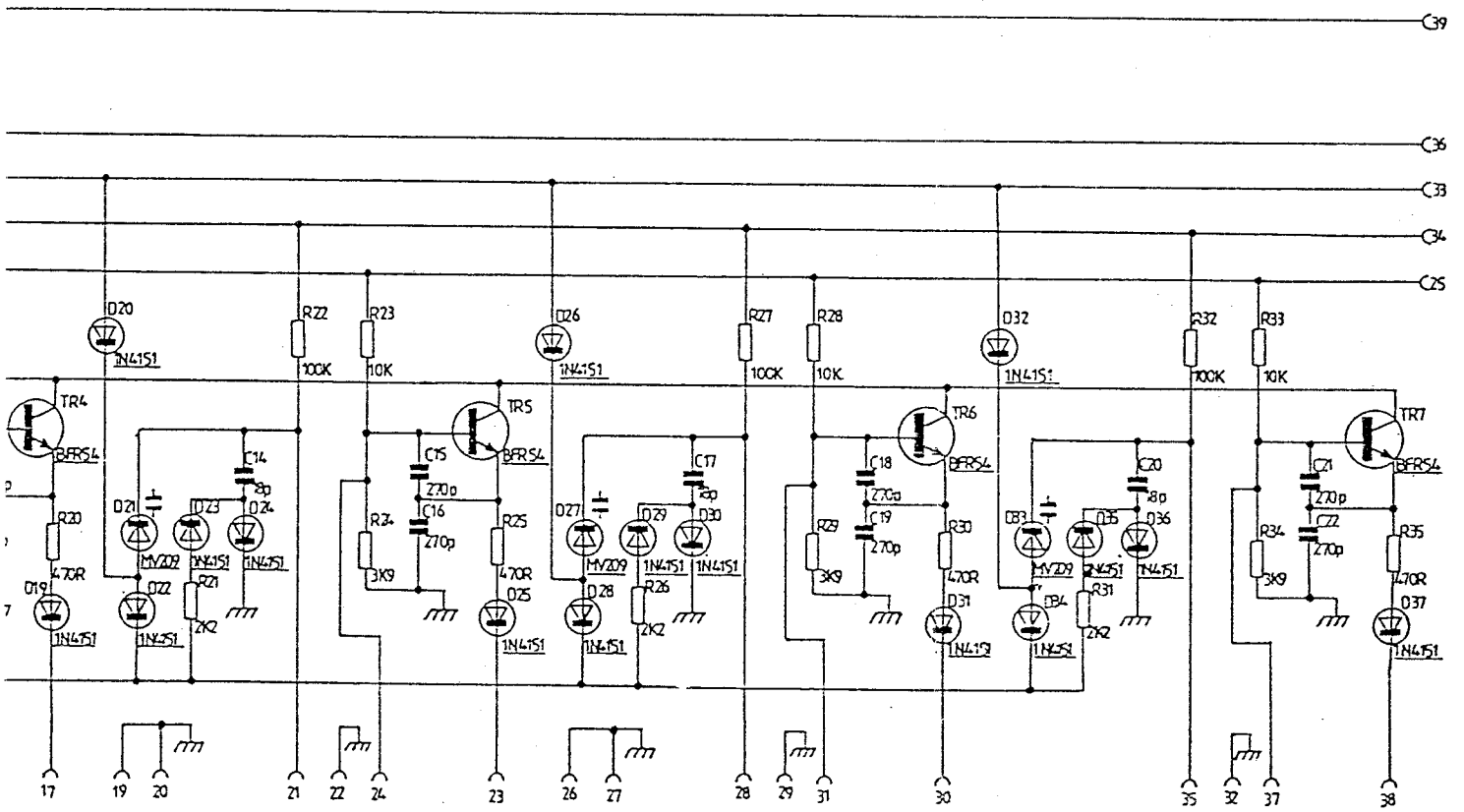


100 SERIES TX. PRE-AMPLIFIER REF 6

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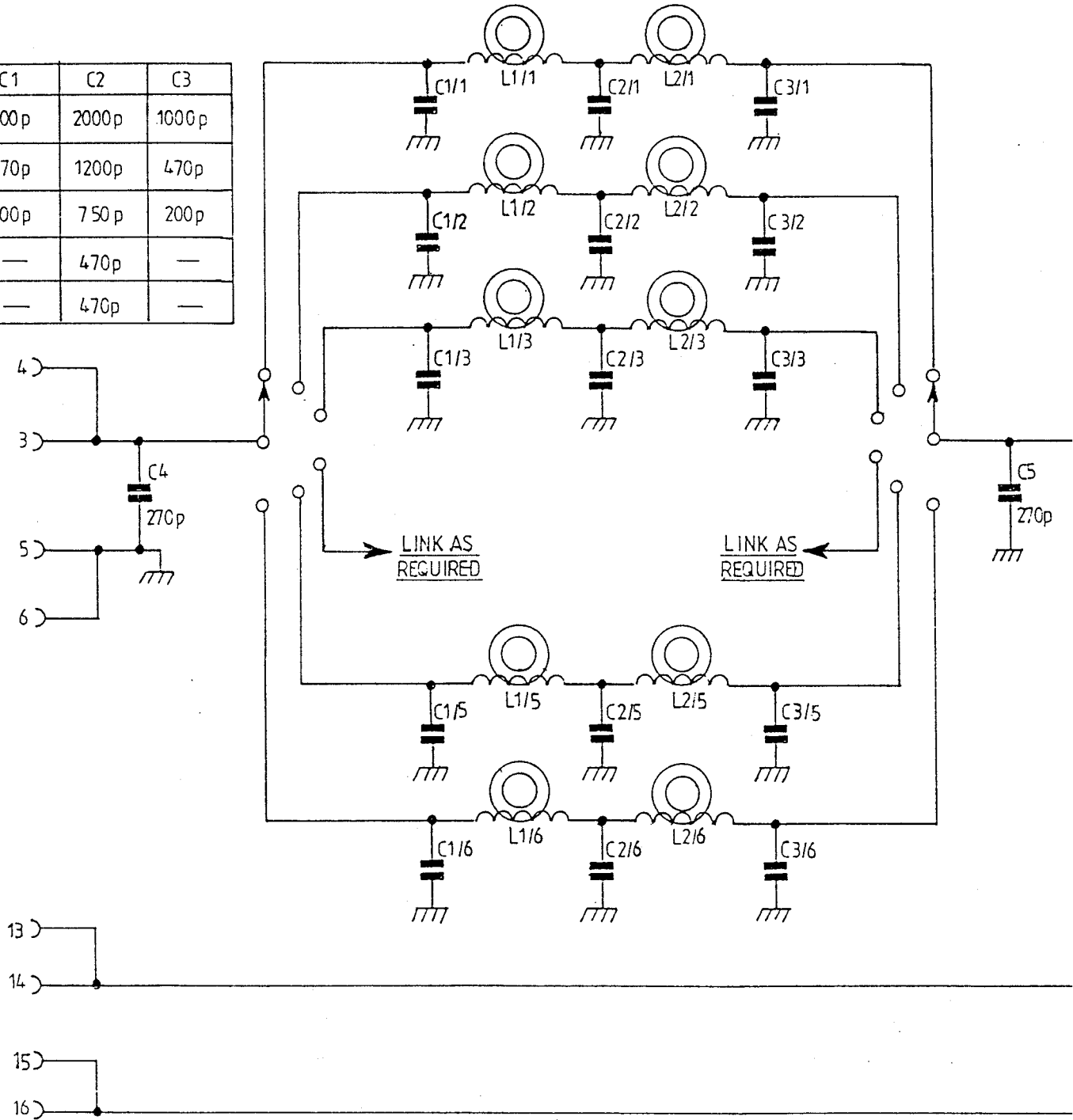
S5000 SERIES OSCILLA



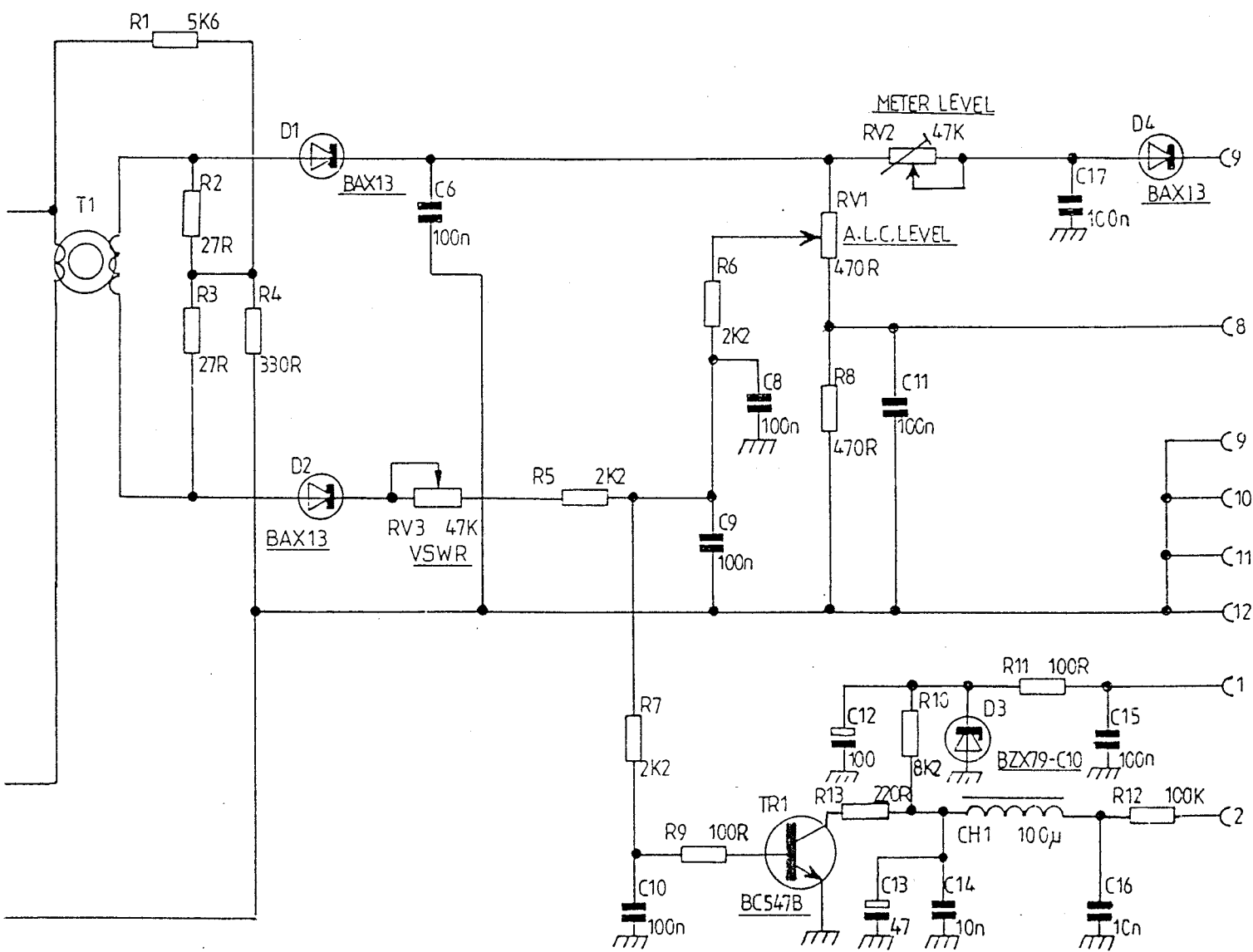
R. REF.9.

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	C1	C2	C3
R1	1000p	2000p	1000p
R2	470p	1200p	470p
R3	200p	750p	200p
R4	—	470p	—
R5	—	470p	—



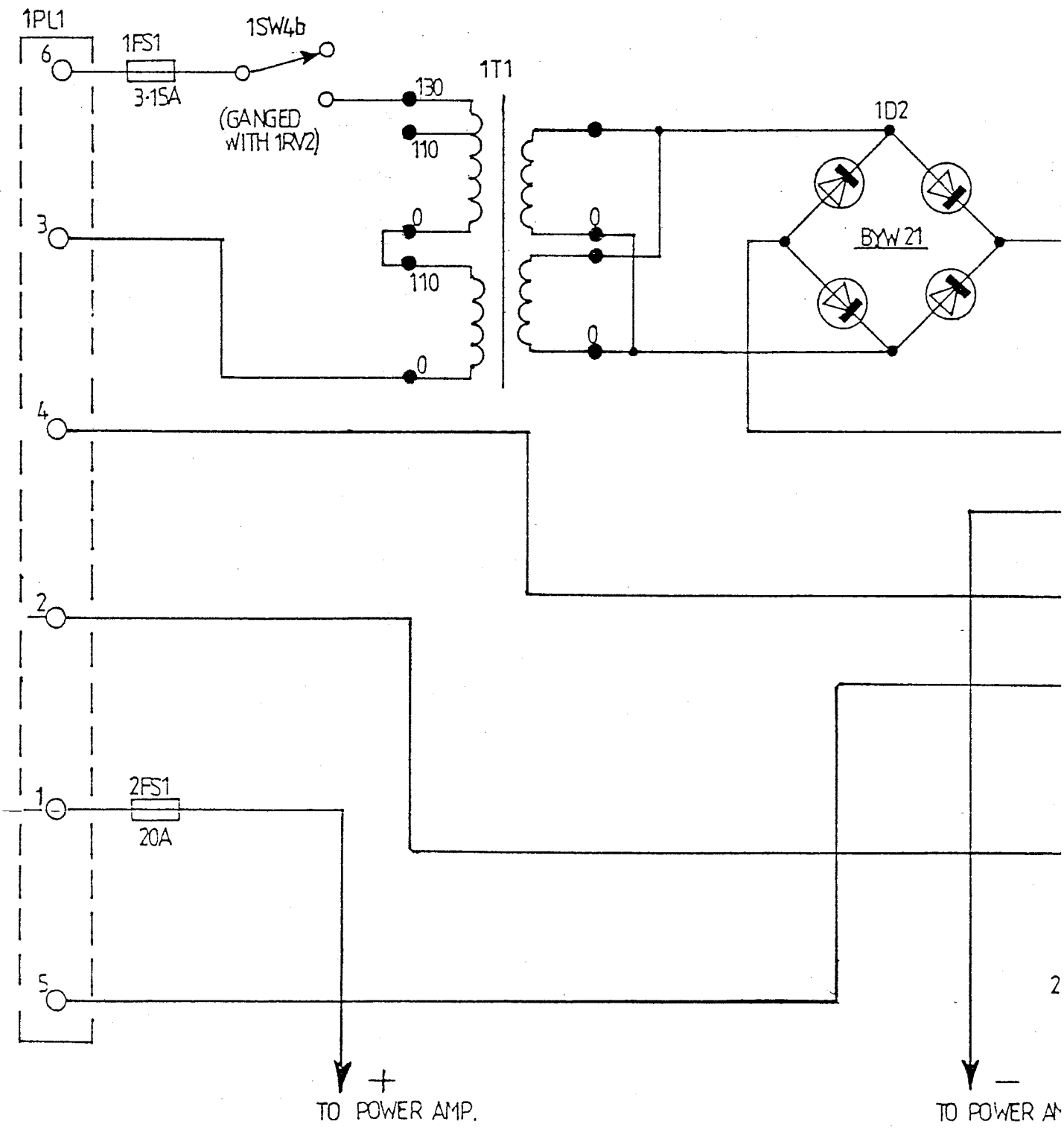
S5000 SERIES. P.A. OU

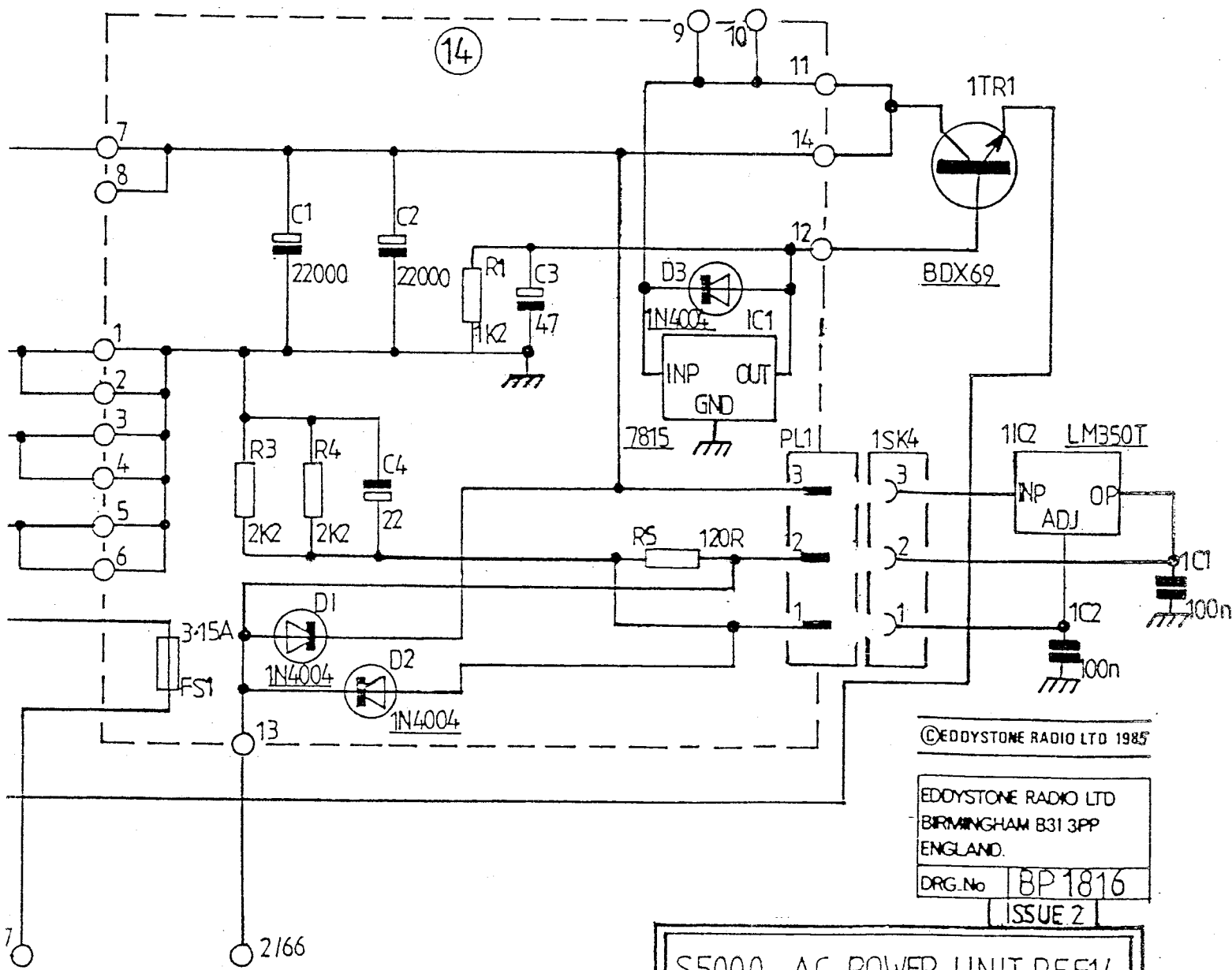


PUT FILTER REF 10

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DRG.No BP1816

ISSUE 2

S5000 AC POWER UNIT REF.14.