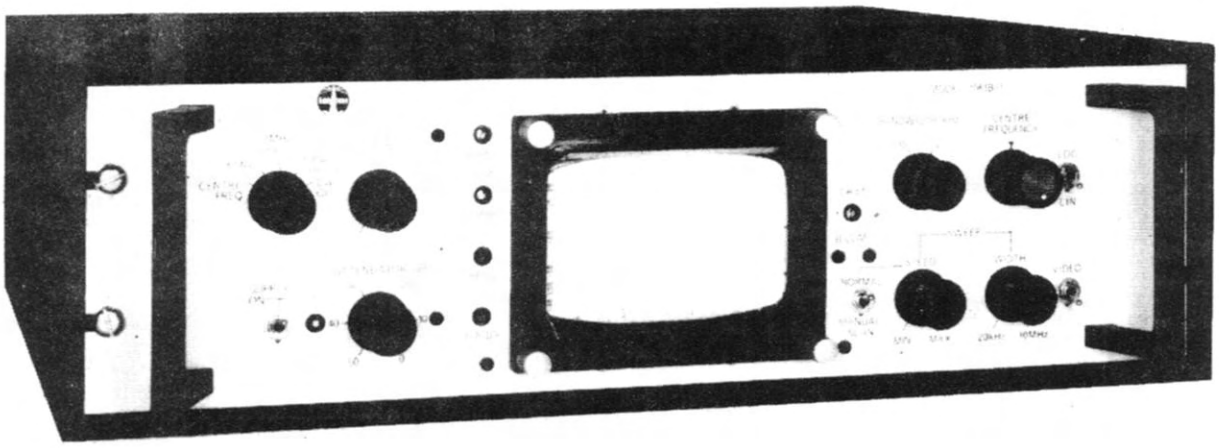
Eddystone

PANORAMIC DISPLAY UNIT

MODEL EP 1061B



MODEL 1061B/1

Manufactured in England by

EDDYSTONE RADIO LIMITED
MEMBER OF MARCONI COMMUNICATION SYSTEMS LIMITED
ALVECHURCH ROAD, BIRMINGHAM B31 3PP
Telephone: 021-475 2231 Telex: 337081

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CONTENTS

ILLUSTRATIONS:-

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AMENDMENT RECORD (APPENDIX A refers)

Amend No.	Pages subject to change	Amended by	Date
1	1-2; 2-2 et seq; 5-16/5-17	Eddystone Radio	JUNE 79
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The Manufacturer reserves the right to modify the content of this publication as necessary to accommodate modifications, design improvements etc. Relevant Amendment Sheets will be incorporated at date of issue.

SECTION 1

INTRODUCTION

This handbook provides comprehensive instructions for the installation, operation and maintenance of the Eddystone Model EP 1061B PANORAMIC DISPLAY UNIT.

The unit is suitable for use with the Eddystone 1990R series of communication receivers in frequency measuring or frequency monitoring applications, and will display the signals received within the selected bandwidth of the receiver up to a maximum bandwidth of 10MHz. Other receivers with an IF of 21.4MHz are also suitable, and a converter is available to facilitate use with equipments which utilize a 36.5MHz IF.

The EP1061B is a fully solid state double conversion receiver utilizing a 10cm x 6cm long persistance C.R.T. The unit is available in either rack-mounting form, for installation in standard 483mm (19 in) racking, or in a cabinet-housing suitable for bench mounting. When fitted with the appropriate shock absorbent mountings, the relevant MPT standards are met.

GUARANTEE

The Eddystone Model EP1061B PANORAMIC DISPLAY UNIT is suitable for use under arduous operating conditions and should require very little routine maintenance over long periods of operation. With the exception of the semiconductors, all components are guaranteed by the Manufacturer for a period of twelve months from the date of purchase. The semiconductor devices are covered by a separate guarantee.

SERVICING

Spares for user servicing can be supplied and advice will be freely given when required. Any enquiries relating to service matters should be directed to the "Sales and Service Department" at our usual address, quoting the Model Number and Serial Number in all communications.

Should major servicing become necessary the unit can, by prior arrangement, be returned to the Manufacturer for attention. Extreme care should be taken to ensure that the unit is well protected against possible damage during transit.

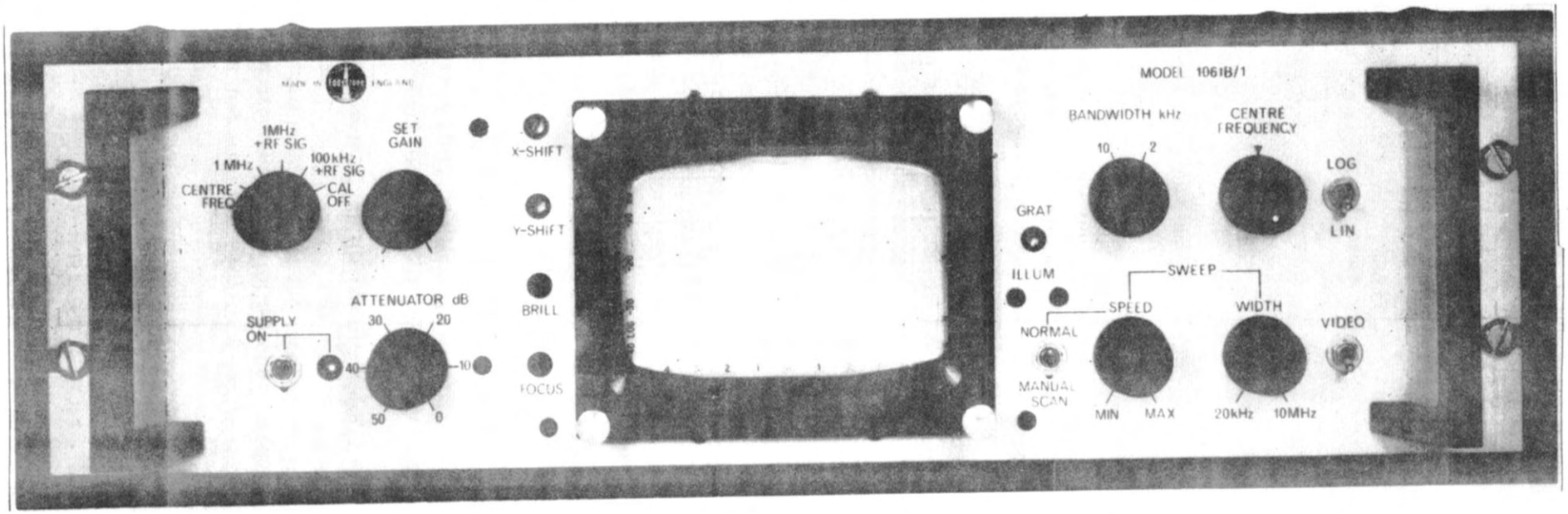


Fig. 1.1 FRONT PANEL CONTROLS

SECTION 2

INSTALLATION AND OPERATING INSTRUCTIONS

Installation

1. Check that the voltage taps on the internal power supply transformer are correctly set to suit the local source of AC power.

2. Check that the two 1 amp supply fuses (on rear panel) are serviceable.
   NOTE: if operating from supplies between 100V and 125V fit 2 amp fuses.

3. Install the unit in rack or cabinet.

4. Connect the supply lead to local source of AC supply.

5. Connect the IF output of the receiver to the 50 ohm BNC input socket on the rear panel.

6. Connect the earth terminal on the rear panel to the rack or system earth.

Function of Controls

1. SUPPLY ON. The main supply switch is located bottom left of the front panel. The adjacent LED indicates the presence of the internal DC supply.

2. INPUT. A 50 ohm BNC socket located on the rear panel.

3. SCAN NORMAL/INVERT. Operation of the Scan normal/invert switch on the rear panel enables the tuning action of the main receiver to shift the display to either left or right for the same direction of tuning. The resultant scan may thus always maintain the higher frequency at the righthand side of the screen, regardless of any frequency inversion that may occur on the main receiver.

   NOTE: the 1MHz and 100kHz markers are centred on 21.4MHz.

4. CALIBRATOR. In the extreme counter clockwise position marked 'Centre Frequency' a calibration marker is provided at 21.4MHz enabling the centre of the frequency band to be located.

   In the '1MHz' position a spectrum of markers at 1MHz spacing is displayed.

   In the '1MHz' + signal position the 1MHz markers are displayed superimposed on the signal being received.

   In the '100kHz' + signal position a spectrum of markers at a spacing of 100kHz are displayed superimposed on the signal being received.

   In the final position 'Cal Off' signals being received only are displayed.

5. CENTRE FREQUENCY. This control allows accurate setting of the display in conjunction with the calibrator marker.

6. ATTENUATOR. A 50 ohm attenuator is positioned directly at the input to the unit. The scale settings are 0-50dB in 10dB steps.

   NOTE: There is an intermediate clicker position between the 10dB steps which should be ignored as the attenuator is in an open circuit condition at these points.

7. SET GAIN. Provides manual gain control of the IF amplifier over a 10dB range.

8. SWEEPWIDTH. A sweep range of 20kHz to 10MHz is obtainable.

9. BANDWIDTH. Two bandwidths are provided, 2kHz at 6dB and 10kHz at 6dB.

10. NORMAL/MANUAL SCAN. With the switch at 'Normal', X deflection is by means of the internal sweep generator while with the switch at 'Manual Scan', X deflection is obtained manually by operation of the 'Sweep Speed Control'.

11. SWEEP SPEED. This control allows the operator to optimise the sweep speed to suit the selected sweep width and bandwidth used with the 'Manual Scan/Normal' switch at 'Normal' or with the switch at 'Manual Scan' enables any part of the scan to be examined at length under control of the operator.

12. VIDEO ON. When using a slow sweep speed together with narrow bandwidth or a high sweep speed together with a low sweep width the trace may be improved by setting this switch to 'ON'.

13. LOG/LIN. The Y deflection may be displayed in two modes either linear (LIN) or logarithmic (LOG). In the latter case a range of greater than 40dB is obtainable.

14. X SHIFT)
)
15. Y SHIFT) These are pre-set screwdriver controls located on the front panel
) and function as normal oscilloscope controls.
16. BRILLIANCE)
)
17. FOCUS)

18. DISTORTION) These are pre-set screwdriver controls located on the rear panel.
) These should not normally require adjustment and are provided
19. ASTIGMATISM) with screw-on covers.

20. GRATICULE ILLUMINATION. This is a pre-set control located on the front panel.

    NOTE: Two graticules are available Light Green - standard
    Orange - filter.

Setting-Up and Operating Procedures

1. Set 'Supply' switch to 'On' and allow two minutes for cathode ray tube heater to warm up.
2. Adjust 'Brilliance' to suit existing ambient light conditions.
3. Adjust 'Focus' for optimum spot definition.
4. Allow 30 minutes warm-up to enable equipment to stabilise and attain maximum accuracy.
5. Set 'Bandwidth' to 10kHz.
6. Set 'Calibrator' switch to 'Centre Freq' position.
7. Adjust 'Y Shift' to position trace on graticule line 5mm above base.
8. Set 'Attenuator' to 0dB and set 'Gain' at mid position.
9. Set 'Scan/Normal' switch to 'Normal'.
10. Set 'Sweep Width' to 20kHz.
11. Set 'Sweep Speed' to mid position.
12. Adjust 'Centre Frequency' controls to centralize calibration marker.
13. Set 'Sweep Width' to 10MHz and adjust 'X Shift' to centralize calibration marker.
14. Switch 'Calibrator' switch to 'Cal Off'.
15. Tune main receiver to give trace in display centre.
16. Adjust 'Attenuator' to provide correct amplitude of signal.
17. Trace may now be expanded about centre by turning 'Sweep Width' control anti-clockwise. Width of scan may be measured by turning 'Calibrator' switch to '1MHz + signal' or '100kHz + signal' and using calibration markers.
18. Resolution may be adjusted as required with 'Bandwidth' switch.

GRATICULE

To change graticule remove the four knurled screws securing the CRT escutcheon frame. Change graticule and refit escutcheon.

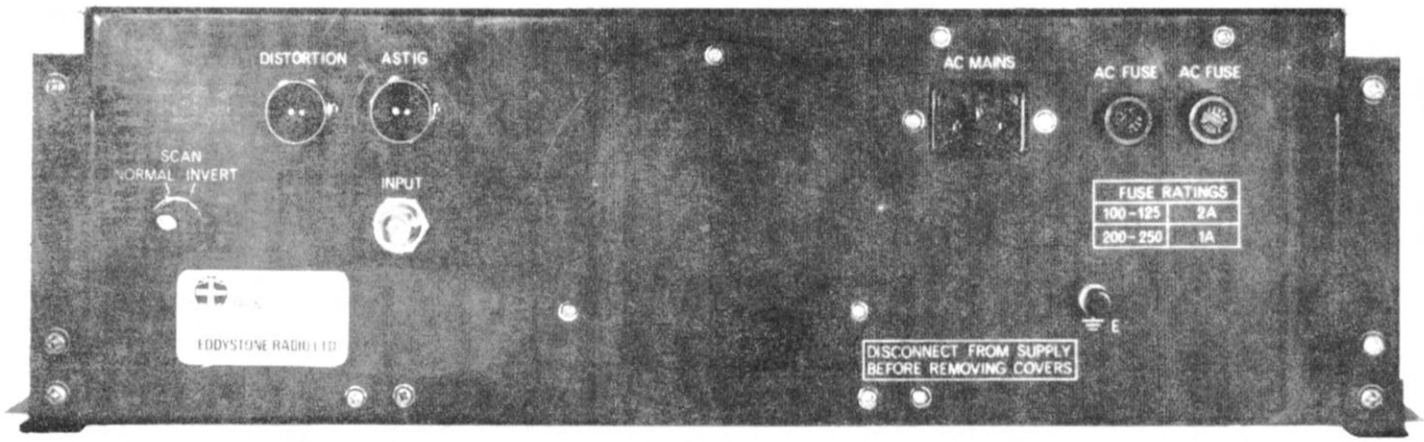


Fig 2-1 REAR PANEL VIEW

SECTION 3

TECHNICAL DATA AND CIRCUIT DESCRIPTION

EP 1061B PANORAMIC DISPLAY UNIT

TECHNICAL SPECIFICATION

Input Frequency		: :	21.4MHz
Input Impedance		: :	50 ohms unbalanced
Intermediate Frequencies		: :	55MHz and 455kHz
Sensitivity		: :	20μV emf per cm at minimum speed and bandwidth.
Spurious Response		: :	Better than -40dB
Resolution		: :	2kHz maximum for 6dB separation
Sweep Width		: :	20kHz to 10MHz continuously variable
Calibration Markers		: :	Centre frequency 100kHz and 1MHz combs.
Tube		: :	10cm x 6cm long persistance
Display		: :	Vertical scaling:- Log:- 0-40dB in 10dB steps Lin:- 0-100% in 25% steps Frequency base:- Linear with 10 divisions.
Bandwidth		: :	10kHz and 2kHz at 6dB switched
Sweep Speed		: :	200mS - 20 sec., or manual
Centre Frequency Shift		: :	±500kHz continuously variable
Power Supplies		: :	100-125V 200-250V 40-60 Hz AC internally selected
Consumption		: :	27 Watts (approximate)
Weight	Cabinet Model	: :	19.3kg
	Rack Mounting	: :	14.1kg

Dimensions	: :	Rack-mounting style:- Panel 483mm x 133mm Rack intrusion 411mm Cabinet Model:- Width 502mm Height 165mm including feet Depth 457mm
Environmental Conditions	: :	-10°C to +50°C (-20°C to +70°C storage). Relative humidity 95% at 40°C.
Controls Front panel	: :	Supply on/off with LED indicator Calibrator switch Set gain control Attenuator switch Bandwidth switch Sweep width control Sweep speed control Normal/Manual scan switch Log/Lin switch.
Pre-set Controls (Front panel):-	: :	X Shift Y Shift Brilliance Focus Graticule illumination
Controls Rear Panel	: :	Scan Normal/Invert switch Astigmatism (pre-set control) Distortion (pre-set control) Signal Input socket 50 ohms BNC

GENERAL DESCRIPTION

Introduction

The EP 1061B Panoramic Display Unit is a fully solid state double conversion receiver utilizing a 10cm x 6cm long persistance display tube.

The unit is suitable for use with the Eddystone 1990R series of communication receivers in frequency measuring or frequency monitoring applications, and will display the signals received within the selected bandwidth of the receiver up to a maximum bandwidth of 10MHz.

Other receivers with an IF of 21.4MHz are also suitable, and a converter is available to facilitate use with equipments which utilize a 36.5MHz IF.

Brief Technical Description

The following description should be read in conjunction with the block diagram which, together with the main circuit diagram is contained at the rear section of this manual. For a more detailed technical description reference should be made to the relevant section headed "Circuit Description".

The 21.4MHz input signal from the receiver (or converter) is applied to the 0-50dB switched attenuator (variable in 10dB steps) situated on the front panel. The attenuated signal is then fed via a low pass filter to the first mixer stage.

The second input to the first mixer stage is derived from a voltage controlled oscillator (VCO). The output frequency of the VCO is centred at 76.4MHz and is controlled by the output of the sweep generator which may be adjusted by the appropriate front panel control to provide the desired sweep width (between 20kHz and 10MHz).

The resulting intermediate frequency (IF) centred at 55MHz is applied via the crystal filter (10kHz bandwidth) to the second mixer stage. The second input to this mixer is derived from the crystal controlled oscillator at a frequency of 55.455MHz. The 455kHz IF signal output from this mixer stage is passed through a switched ceramic filter network and is then applied to the first IF amplifier stage.

The output from the first IF amplifier is passed to a further IF amplifier which incorporates a 0-10dB gain control (adjustable from front panel) and is then fed via a diode detector to the linear and logarithmic amplifier stages.

The signal derived from the linear or logarithmic amplifier is then passed to the "Y" amplifier stage. The "X" amplifier stage input is derived from the sweep generator and both the "X" and "Y" output signals are applied to the respective X and Y plates of the cathode ray tube.

Circuit Description

The circuit description given in this section should be read in conjunction with the circuit and block diagrams. The circuitry employed is described by reference to the sub-units and follows the conventional signal path.

1) Input Attenuator

The input attenuator is a six position 0-50dB T-pad attenuator of 50Ω nominal impedance. The attenuator resistors are mounted directly across the tags of the switch wafers SW1a and SW1f and to an earth ring. The whole unit is enclosed in a silver plate brass box and mounted directly on the front panel.

2) Voltage Controlled Oscillator

The VCO is located in an aluminium diecast box to the rear right hand side of the equipment. It comprises a Colpitts oscillator employing a single gate MOSFET at a centre frequency of 76.4MHz which is swept over a maximum range of ±5MHz by variable capacitance diodes. Linearity of swept frequency is corrected by diode 4D2 and preset linearity control 4RV1. The output from the oscillator is fed to a junction FET buffer stage and thence to emitter follower stages feeding the 1st mixer stage and calibrator.

3) Low pass Filter

The low pass filter is contained in a screening box mounted on the right hand side plate. The filter has a nominal impedance of 50Ω and a cut off frequency of 26.4MHz and is of the 'M' derived type. The input of the filter is fed from the attenuator unit and its output passes to the 1st mixer stage.

4) 1st Mixer and IF Pre-amplifier

Input from the low pass filter is fed to the first gate of a dual gate MOSFET (3TR1), the second gate being supplied by the VCO. Output at 55MHz is taken from the mixer drain via a bandpass circuit to a transistor amplifier 3TR2. The unit is mounted in an aluminium diecast box adjacent to the VCO unit.

5) Sweep Generator

The sweep generator board is located at the rear right hand side of the unit and performs two functions, it generates a sawtooth waveform which is applied to the VCO and to the deflection amplifier and it also provides a mixing facility whereby a variable DC potential may be added to the sawtooth before final application to the variable capacitance diodes in the VCO unit. This enables the centre frequency of the sweep to be adjusted from the front panel by means of RV3 (coarse) and RV4 (fine). A preset centre frequency control is also provided on the printed circuit board.

A further provision allows the sawtooth generator to be switched off and the scan manually controlled by a variable DC voltage obtained from a front panel control.

The operation of the sweep generator is as follows:-

2IC1 is a Miller integrator.

2IC2 operates as a trigger to invert the charging potential to the Miller integrator when its run down is complete. A square pulse thus appears at the output (pin 6 of IC2). This voltage provides the integrating current to 2IC1 and is adjusted by preset sweep speed 2RV2 and also by the panel control (SWEEP SPEED). The sweep width is varied by means of preset 2RV1 and also by panel control (SWEEP WIDTH), and the attenuated sawtooth and the DC potential (centre frequency derived from 1RV3/1RV4) are mixed in the virtual earth amplifier 2IC3 and then applied to the voltage controlled oscillator. A preset centre frequency control (2RV3) is also provided on the board for initial setting of panel control range.

By use of the above technique no interaction between sweep width and centre frequency can occur. The flyback time is governed by the discharge path 2R2 and 1D3. The flyback diode connections may be reversed by means of the scan normal/invert switch on the rear panel thus providing a positive or negative going sawtooth which enables signals higher or lower in frequency than the centre frequency to be displayed to left or right of mid-screen as required. Flyback suppression pulses are also derived from this board and applied to 9TR1 located on the power supply and deflection amplifier board.

The full sawtooth output from 2IC1 is applied to the X deflection amplifier 9TR3.

6) HF Calibrator Board

The HF calibrator board is located at the left hand front of the unit and is provided with top and bottom screening covers.

The calibrator provides a centre frequency marker at 21.4MHz a comb of 1MHz markers and a comb of 100kHz markers both centred on 21.4MHz.

The 1MHz markers are generated by a crystal oscillator (IC1) and the 100kHz markers are derived from the 1MHz markers by a ÷10 circuit IC2 and are selected as required by a relay operated from the front panel control and then fed to a double balanced mixer IC5 where they are mixed with a signal derived from a crystal oscillator and buffer (TR1 & TR2) operating at 60.7MHz.

The second harmonic of the 60.7MHz signal is selected and amplified by TR3 and the resultant 121.4MHz (modulated by either 1MHz or 100kHz) is passed to the signal gate of a dual gate MOSFET mixer stage, the second gate being supplied with an input from the VCO unit at a centre frequency of 76.4MHz. If a centre frequency marker only is required the 1MHz oscillator is switched off. The mixer produces an intermediate frequency of 45MHz which is passed through a crystal filter with a 10kHz bandwidth. As the VCO is swept by the time base a signal is generated at each 1MHz or 100kHz interval or centre frequency only and this signal at 45MHz is amplified by IC6 and IC7 and rectified by diode D3 and then fed to the LF calibrator unit.

7) LF Calibrator Board

This board is located on the left hand side plate and provided with a screening cover.

The output from the HF calibrator board is amplified by IC8 and fed via a trigger circuit IC7 to a dual monostable IC6 which serves to generate an output pulse of fixed duration which is triggered from the leading edge of the input signal.

The output of the first half of the monostable is buffered by IC2 and then used to synchronise an astable IC1. The astable operates at approximately 10kHz and is used to switch two FET gates TR1 and TR2 to feed the Y amplifier when calibrator plus signal is required.

The gates are fed via unity gain buffers IC3 and IC5 and their outputs combined in a virtual earth stage IC4 before being passed to the Y amplifier.

The purpose of synchronisation of the astable is to prevent jitter of the trace due to spurious triggering. The multiplexing action from IC1 allows the display of both signal and markers simultaneously without interaction, operation of gain and attenuator controls not affecting height of markers signals.

In "CAL OFF" mode the multiplexer and marker amplifiers are switched off and signal only passed through the FET gate TR2.

SECTION 4

MAINTENANCE

PRELIMINARY NOTES

(1) Metric thread cross-head screws fitted to this equipment are of the "POZIDRIV" type. "Phillips" type and "Pozidriv" type screwdrivers are NOT interchangeable and use of the wrong screwdriver will cause head damage.

(2) With few exceptions, ISO METRIC hardware is used throughout this equipment. Where these exceptions apply, the IMPERIAL hardware will be marked with RED DYE.

(3) Use of hardware of the wrong size or pitch will cause thread damage.

SECTION 4

MAINTENANCE

(1) Test Equipment

The following test equipment will be required:

Signal Generator covering the range 440kHz to 30MHz.
General purpose oscilloscope with low capacity probe.
Frequency counter covering range up to 100MHz.
Multimeter (Avo Model 8 or similar).

(2) Warning

Lethal voltages are used in this equipment and extreme caution is essential. When working on the equipment it may be necessary for power to be connected and normal precautions for safety under these conditions should be observed.

In particular be aware of the following voltages:

Mains - Power supply, Mains input connector, Fuses and switch.
±200V DC. Power supply and deflection amplifiers, scan switch, tube control and tube connections.
-1.3KV DC E.H.T. Unit, tube controls, tube connections, tube heater and transformer heater winding.
+5KV DC E.H.T. Unit and tube anode.

Also beware of capacitors (including tube anode) which may be charged to any of the above voltages and discharge if necessary.

(3) Performance Check

The performance figures quoted are typical only and should not be interpreted as a test specification.

Check that the brilliance control varies the intensity of trace from zero to maximum without affecting position of baseline by more than 5mm.

Check operation of focus and astigmatism controls. Check that trace is not curved, adjust distortion control if necessary.

Check shift controls, X shift should move the trace by at least 30mm in each horizontal direction. The Y shift should move trace upwards by at least 30mm and off the screen downwards.

With sweep switch set to normal, check that sweep speed can be varied from 5Hz (0.2secs) to 0.05Hz (20 secs). With sweep switch set to manual check that spot traverses the screen completely with rotation of the sweep speed control.

Switch to 1MHz calibrator and check that 11 markers are visible at maximum sweep width.

Switch to 100kHz calibrator and check that all markers except centre marker move off screen at minimum sweep width.

Switch to Centre frequency calibrator and at maximum sweep width check that by using the Centre frequency controls the marker can be set to mid position on the screen with controls near mechanical centre. Check that at extreme positions of the controls centre frequency marker is shifted by at least ±0.5MHz. Set sweep width to minimum and adjust centre frequency controls to centre marker at mid screen position, then increase sweep width to maximum and check that marker stays at mid screen position. If movement of markers to left or right occurs, correct with adjustment of X shift control.

Check sensitivity as follows:

Set controls,	Y shift	Set trace on baseline
	LOG/LIN switch	LIN
	Gain control	Mid position
	Attenuator	0dB
	Width control	Approx 100kHz
	Speed control	Mid position
	Bandwidth switch	10kHz
	Calibrator switch	CAL OFF

Connect signal generator to input with a 10μV P.d. signal at 21.4MHz. Check that response on screen is approx. 1cm.

Check attenuator action. Increase signal generator output to give mid screen height response.

Set attenuator to 10dB and increase signal generator output to restore mid screen response. Generator increase should be approx. 10dB (±1.5dB). Repeat for each attenuator setting (tolerance for 50dB setting is ±3dB).

Note. The Attenuator has extra clicker positions between 10dB steps, these should be ignored as the switches are open-circuit in the intermediate positions. Set width at maximum, LOG/LIN to LOG and reset attenuator to 0dB.

Set generator output to give full screen height response. Reduce generator output by 40dB in 10dB steps and check that response falls by 1 division of graticule (with a tolerance of ±3dB) for each step.

Check video filters by adjusting gain control to maximum and noting that noise level reduces by approximately 6dB.

(4) Fault Finding Procedure

a) Check that the Power Supply is available and connected, mains fuses intact and supply switch is on. LED 'ON' indicator shows the presence of the +15V supply rail and the graticule illumination lamps indicate presence of the -15V supply rail.

b) Follow the instructions under "Setting up and Operations Procedures" (Section 2).

Ensure Brilliance control is adequately advanced and that Shift controls are correctly set. Check Calibrator control.

c) If there is a trace but no signal, check input lead, Attenuator, Log/Lin switch and filter switch. Set Mode switch to 1MHz cal markers and check for marker signals on screen.

d) If fault is still present it will be necessary to remove the unit from rack or cabinet.

e) Remove dust covers and inspect for obvious faults, i.e. broken wires, burnt components, etc.

f) Check presence of all power supplies:-

+ 15V at pin 92)
- 15V at pin 95)
+ 8V at pin 94)
- 8V at pin 96)
+200V at pin 106)
-200V across 9C2)

-1.3KV at anti-clockwise end of RV7 (Brilliance control)
+ 5KV at Tube Anode Cap.

g) Remove the tube end cover plate (on rear panel, three screws) and check the 6.3V heater supply on pins 3 and 4 of the tube base.

NOTE The heater supply floats at a DC potential of -1.3KV relative to earth!

h) If there is no trace, check para. m. then test P.S.U. and Deflection module according to the instructions in para. (l).

i) If there is a trace but no signal, disconnect the lead to pin 5 on the IF Log/Lin board and introduce at pin 5 a 455kHz carrier signal at approximately 16mV Pd from 50Ω.

j) If this has no effect continue with para. k. If it has the effect of lifting the trace to approx. full scale height (with gain control at mid position) continue with para. L.

k) Using an oscilloscope check the outputs at pin 12 (log) and pin 14 (lin) on the IF Log/Lin board. If there is no signal the fault lies in the IF, Log/Lin amplifier module. If there is no signal on Log the fault lies in the log convertor. If signals are present at both points check for signal at pin 18 with MODE switch at "CAL OFF" check pin 6, then pin 11 on LF Calibrator module.

l) If no signal present check LF calibrator module. If signal present check at pin 102 (PSU/Deflection module) and then tube "Y" plates.

m) Reconnect the lead at pin 5 (IF Log/Lin amplifier) and inject a 55MHz signal at pin 2 of the 2nd mixer/selectivity module. An input of 300µV P.d. from 50Ω should lift trace to approx. full screen height. If no effect, check 2nd mixer/Selectivity module.

If satisfactory change the input signal to 15µV P.d. at 21.4MHz and apply to pin 7 of the 1st Mixer/IF preamplifier module. This should give a signal of approx. full screen height. If no signal observed check VCO module. If signal present check low pass filter and input attenuator unit.

n) If there is no trace, set to manual scan. If trace returns check sweep generator and blanking.

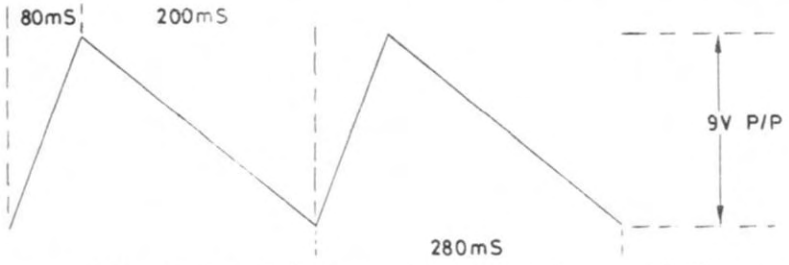
(5) Sweep Generator

a) Check +8V to pin 17 and +15V to pin 9
Check -8V to pin 16 and -15V to pin 8
Check earth to pin 18.

b) Set Manual Sweep switch to "Normal" and set Centre frequency controls to mid position.

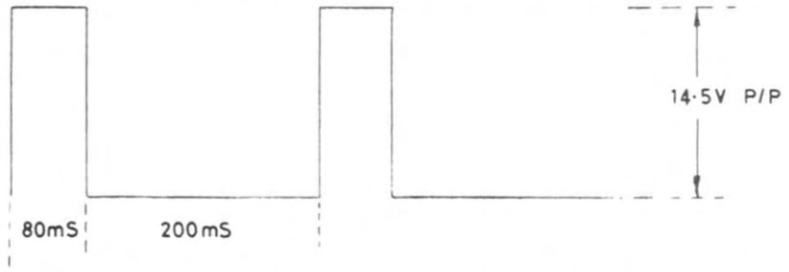
c) Connect oscilloscope to pin 19 and check that a sawtooth waveform is present with a peak to peak amplitude of 9V.

d) Set sweep speed to maximum and adjust 2RV1 so that the fall time of the sawtooth is 200mS as shown below.



e) Set sweep speed to minimum and check that fall time of sawtooth is now 19-24 seconds.

f) Connect oscilloscope to pin 20, reset sweep speed to maximum and check that the waveform is as shown below.



g) Connect oscilloscope to pin 6 and set sweep width to maximum. Adjust 2RV2 to give the sawtooth waveform as shown at para. d. but with an amplitude of 11V peak to peak.

Reset sweep width to minimum and check that amplitude is now approx. 20mV peak to peak

h) Reset sweep width to maximum and check that adjustment of 2RV3 enables the sawtooth amplitude to be centred on +6V with centre frequency controls at mid position.

(6) Voltage Controlled Oscillator

a) Check +15V supply to pin 5 and earth to pin 4.

b) Set sweep switch to manual and adjust Sweep speed control to give a spot at the centre of the graticule base line.

c) Connect frequency counter to pin 1 and adjust core of L1 to give a frequency of 76.4MHz.

d) Replace the counter with an oscilloscope and check that the waveform is a sinewave with no apparent distortion at an amplitude of 1.1-1.7V peak to peak.

e) Connect the oscilloscope to pin 3 and check that the same waveform is present with an amplitude of approx. 700mV peak to peak.

f) Reconnect the counter to pin 1 and adjust the sweep control to move the spot to left and right side of the graticule. Check that frequency changes by greater than ±5MHz and that frequency change is linear with respect to calibrated graticule. If not linear adjust 4RV1.

(7) HF Calibrator Unit

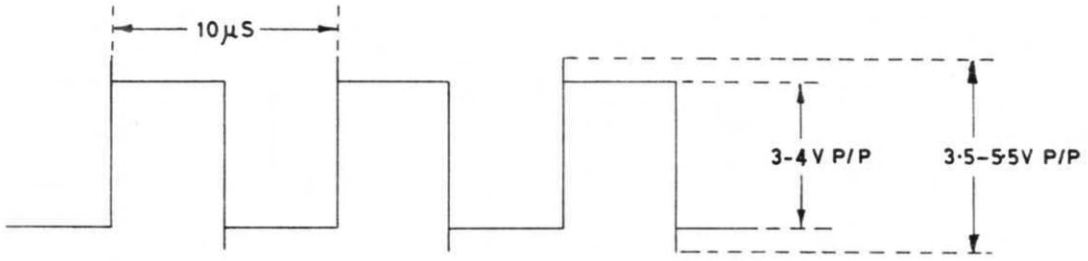
a) With 'CAL' switch in all positions except 'CAL OFF' check for +15V on pin 8 and earth on pin 3.

b) With 'CAL' switch set to '1MHz' and '1MHz + SIGNAL' check for +15V on pin 1.

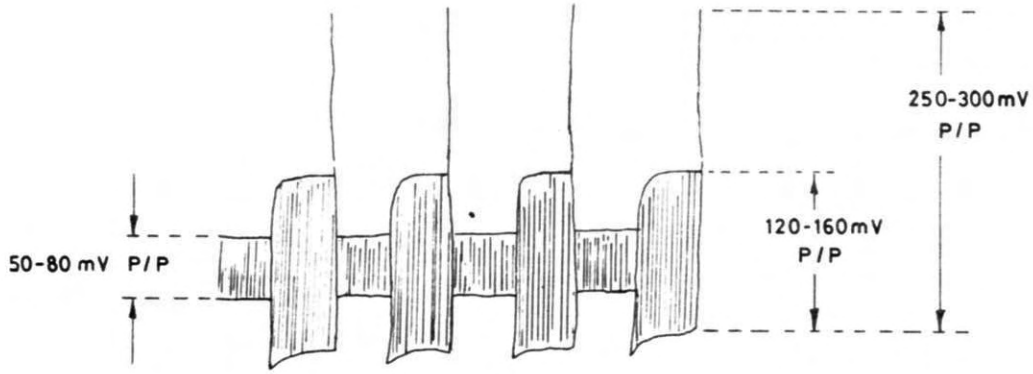
c) With 'CAL' switch set to '100kHz + SIGNAL' check for +15V on pin 2.

d) Set 'CAL' switch to '1MHz' and connect a frequency counter to 'Test Point A'. Adjust trimmer C1 until frequency is 1MHz ± 10Hz. Replace counter with oscilloscope and check that waveform is as shown below:

e) Connect oscilloscope to 'Test Point B' and set 'CAL' switch to '100kHz + SIGNAL'. Check that waveform is as shown below:

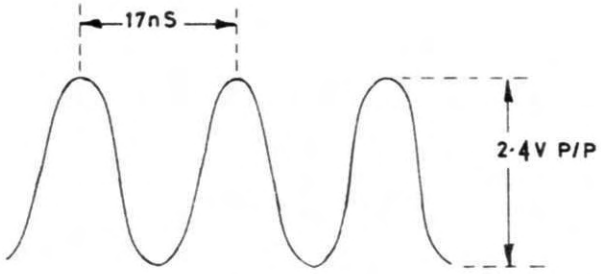


f) Connect oscilloscope to 'Test Point C' and with 'CAL' switch set to '100kHz + SIGNAL'. Check that waveform is as shown below:



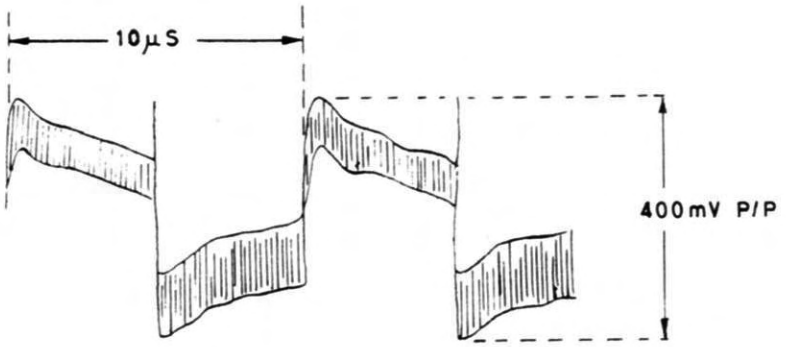
g) Connect oscilloscope to 'Test Point D' and with 'CAL' switch in any position except 'CAL OFF'. Check that waveform is as shown below:

Adjust amplitude if necessary with RV2.

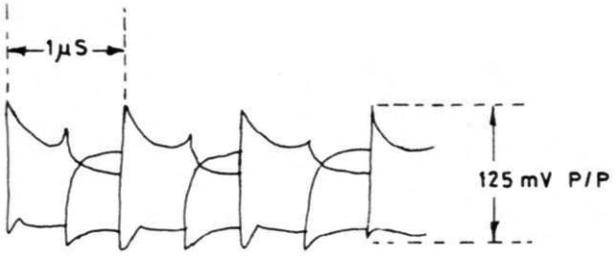


NOTE: oscilloscope must have a bandwidth of greater than 60MHz for this measurement.

h) Connect oscilloscope to 'Test Point E' and with 'CAL' switch set to '100kHz + SIGNAL'. Check that waveform is as shown below:

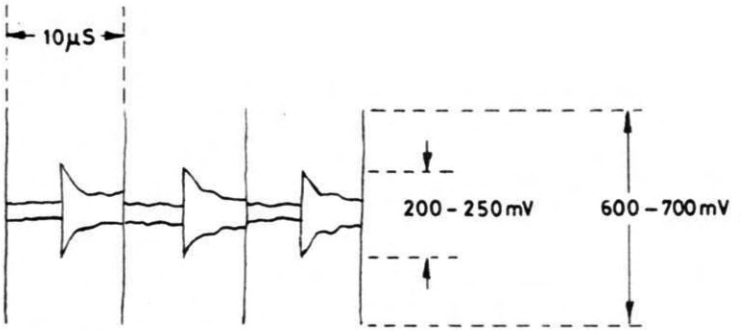


and with 'CAL' switch set to 1MHz.

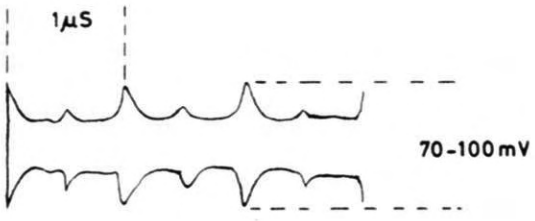


i) Connect oscilloscope to 'Test Point F' and with 'CAL' switch set to '100kHz + SIGNAL'. Check that waveform is as shown below:

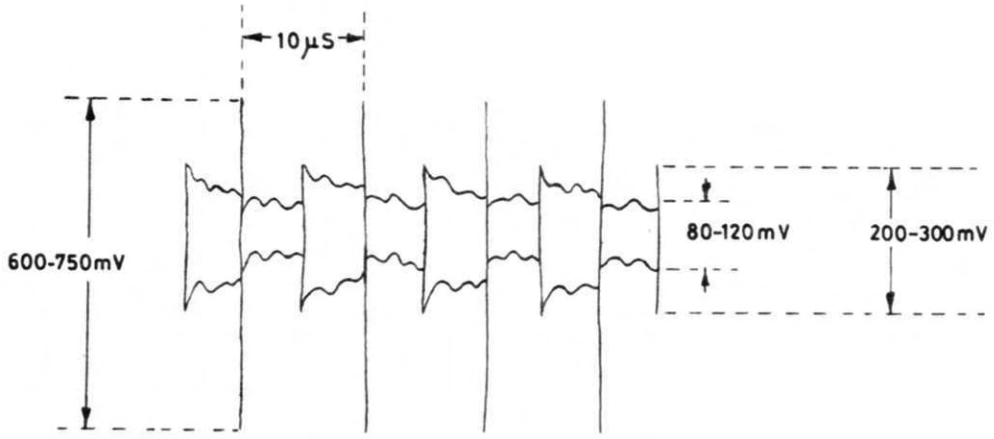
Adjust optimum balance if necessary with RV1.



and with 'CAL' switch set to 1MHz.



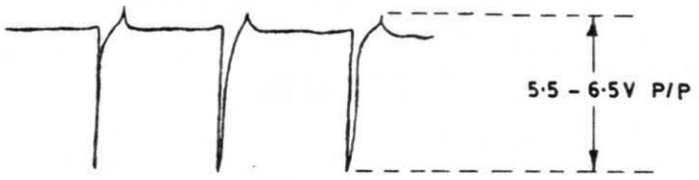
j) Connect oscilloscope to 'Test Point G' and with 'CAL' switch set to '100kHz + SIGNAL'. Check that waveform is as shown below:



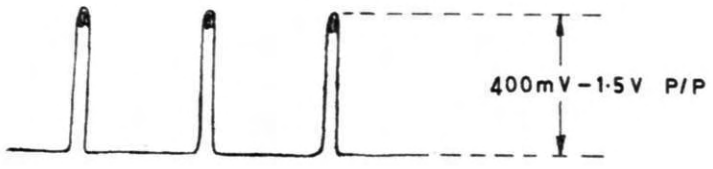
k) Connect oscilloscope to 'Test Point H' and with 'CAL' switch set to '100kHz + SIGNAL'. Adjust RV3 for maximum spike amplitude of 200mV p/p.

(8) LF Calibrator Unit

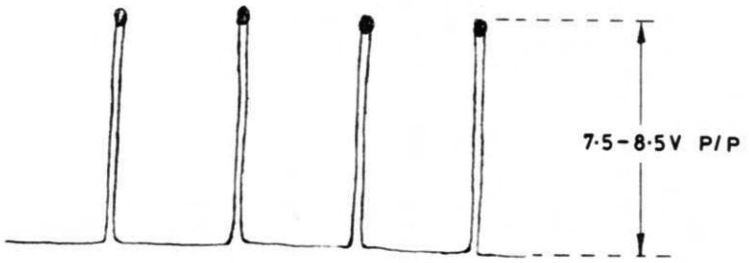
a) Connect oscilloscope to 'Test Point A' and with 'CAL' switch set to '100kHz + SIGNAL'. Check that waveform is as shown below:



b) Connect oscilloscope to 'Test Point B' and with switching as 'a' check that waveform is as shown below:

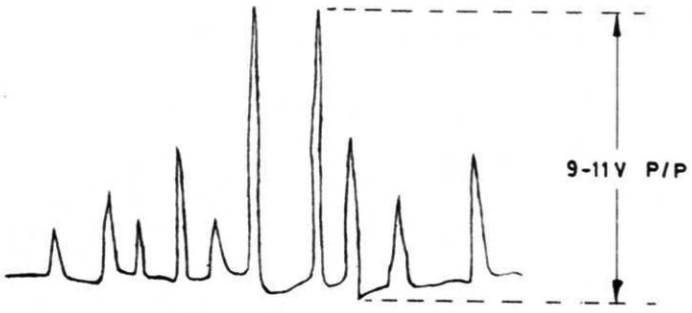


c) Connect oscilloscope to 'Test Point C' and with switching as 'a' check that waveform is as shown below:.



Adjust RV2 for correct triggering.

d) Connect oscilloscope to 'Test Point D' and with switching as 'a' check that waveform is as shown below:



(9). P.S.U. & Deflection Module

a) Check presence of +15V at pin 92, -15V at pin 95, earth at pin 93.

b) Check presence of +8V at pin 94, adjust RV2 if necessary for exactly 8V. Check presence of -8V at pin 96 (-7.6 to 8.2V).

c) Check voltage at pin 91 (+1.5 to +1.7V).

d) Check voltage at pin 90 (3V to 9V according to setting of RV1).

e) Check voltage at pin 106 (+190 to 220V).

f) Check voltage across C2 (-190 to -220V).

g) Disconnect the lead to pin 102. To pin 102 connect an audio signal generator (earth to pin 101) and set to give an output of 420mV rms. at 30Hz. Set RV4 to give a peak-to-peak deflection on the screen of 60 mm (full screen), adjusting Y-shift as necessary. Set the generator to 100kHz and check that the response has not fallen by more than 6dB. Reconnect the lead pin 102.

h) Disconnect the lead to pin 100. To pin 100 connect an audio signal generator (earth to pin 101) and set to give an output of 2.7V rms. at 30Hz. Set RV3 to give a peak-to-peak deflection on the screen of 100 mm (full screen), adjusting X-shift as necessary. Set the generator to 100kHz and check that the response has not fallen by more than 6dB.

i) Reconnect the lead to pin 100 and check that the trace is blanked during the flyback period (check with scan normal/invert switch in both positions).

(10) EHT Unit

a) WARNING: This unit develops high voltages. Ensure safety at all times when working on the unit. Switch off and discharge all capacitors before attempting any adjustments.

b) Disconnect EHT lead from tube anode and connect to AV0 8 fitted with 10kV multiplier. Disconnect lead from pin 116 (-1.3kV) and connect a load of 4.4M ohm (2 x 2.2M ohm in series) between pin 116 and earth.

c) Switch on and check for +15V at pin 117, earth at pin 115. Check EHT voltage is within the limits 4.6kV to 5.6kV. Check -1.3kV line is within the limits 1.3kV to 1.45kV. Check oscillator frequency (use pick-up from vicinity of transformer core) is between 11kHz and 16kHz.

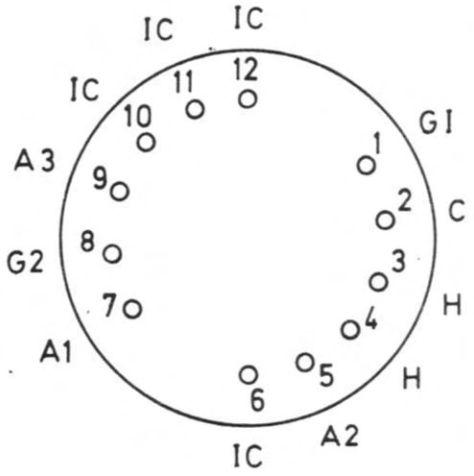
d) Connect an additional load of 2.2M ohm in parallel with the 4.4M ohm and check that the output voltages have changed by less than 300V on 5kV line and less than 150V on -1.5kV line. Check the oscillator is still working in the same mode. Switch on and off a few times and ensure oscillator starts and works correctly each time.

e) Reconnect EHT lead, remove loads and reconnect lead to pin 116.

VOLTAGE ANALYSIS

The readings given were taken with a 20K ohm/V multimeter (e.g. AVO 8) using the lowest available range unless marked (*), in which case the 25V range was used. A 20% variation should be allowed to cover component tolerances. All voltages are measured with respect to earth unless stated otherwise.

Cathode Ray Tube



Tube Valveholder Connections viewed onto pins.

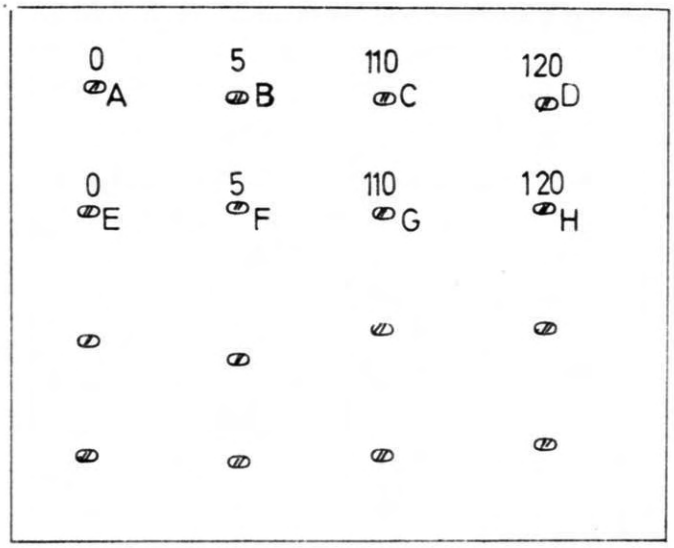
Base Type B12F

Pin	Electrode	Voltage	Notes
1	G1	-1200	
2	K	-1160	
3	H	-1160	) 6.3V A.C. across
4	H	-1160	) pins 3 and 4.
5	A2	-900	
7	A1	0	
8	G2	-70	When blanked.
9	A3	+210	
Y1		145	) Depends on base-
Y2		110	) line position.
S		100	
X1		130	) Depends on
X2		130	) sweep position.
A4		5000	

1061B TRANSISTOR VOLTAGES

Circuit Ref	e/s	b/g(1)	g(2)	c/d	Notes
3TR1	2.4	2.1	3.4	14.3	
3TR2	3.0	3.7	-	8.2	
4TR1	0.9	0	-	12.0	
4TR2	2.2	0	-	14.5	
4TR3	6.0	6.6	-	13.0	
4TR4	6.0	6.6	-	13.0	
5TR1	11.0	9.5	-	14.5	
5TR2	6.2	6.7	-	14.8	
5TR3	3.2	3.8	-	15.0	
6TR1	2.1	2.0	3.1	14.2	
6TR2	4.0	4.15	-	13.3	
6TR3	4.2	4.7	-	12.7	
6TR4	1.85	2.55	-	6.3	2kHz SEL
6TR5	1.8	2.5	-	7.2	10kHz SEL
6TR6	4.85	4.9	-	14.3	
6TR7	4.55	5.15	-	14.1	
7TR1	2.1	2.6	-	15.0	
7TR2	7.4	3.4	-	14.3	
7TR3	0	0.7	-	15.0	
7TR4	2.7	2.3	3.4	14.8	
7TR5	1.0	1.8	-	14.5	
8TR1	0	-2.4	-	0	
8TR2	0	-3.2	-	0	CAL (1MHz + SIG) -7.6 CAL (CF & 1MHz)
9TR1 (	0	0	-	0	Blanked
9TR1 (	-0.65	0	-	-70	Normal Scan)
9TR1 (	0	-0.65	-	-0.6	Inverted Scan) Unblanked
9TR2	-8.4	-9.1	-	-14.7	
9TR3	-0.5	-0.4	-	+130)	No signal, Baseline normal
9TR4	-1.0	-0.5	-	+130)	
9TR5	-0.6	-0.1	-	+145	
9TR6	-0.2	-0.4	-	+110	
10TR1	0	-0.8	-	14.8	
10TR2	0	-3.0	-	14.8	

Supply



Mains Transformer T1

Brown	Blue	Link	Nominal Voltage	Notes
B	C	B-F, C-G	105	± 5V Variation Allowable 2A Fuse
A	C	A-E, C-G	110	
B	D	B-F, D-H	115	
A	D	A-E, D-H	120	
B	G	C-F	210	± 10V Variation Allowable 1A Fuse
B	G	C-E	215	
A	G	C-E	220	
B	H	C-E	225	
B	H	D-F	230	
B	H	D-E	235	
A	H	D-E	240	

Supply Lead colour code:

BROWN - LINE
BLUE - NEUTRAL
GREEN/YELLOW - EARTH

IC No.	PIN 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1IC1	+21.3	0	+15													
1IC2	+21.3	0	+15													
1IC3	-22.5	0	-14.8													
2IC1	0	0	0	-7.7	0	-4 to +3.3 *	+8	0				* WITH SWEEP OF TIME BASE				
2IC2	-7.8	0	+0.3 to +4.3*	-8	-7.8	+6.6	+8									
2IC3	-14	0	0	-14	-14	+6.7	+14.3	0								
5IC1	-14.8	0	0	-15	-14.6	0	+15	0								
5IC2	-14.6	0	0	-14.8	0	0	+15	0								
5IC3	-14.9	0	0	-14.8	0	-0.4	+15	0								
5IC4	-14.6	0	0	-15	-14.9	0	+15	0								
7IC1	+1.40	+1.40	+1.40	+1.40	+1.40	+1.65	0	+1.8	+1.6	+1.6	+1.7	+1.80	+1.85	+4.8		
7IC2	+1.75	0	+0.3	0	+4.8	0	+0.3	+1.6	+1.5	0	+0.85	+1.8	0	+1.85		
7IC3	+15	0	+4.85													
7IC4	+15	0	+4.9													
7IC5	0	+15	+12.2	+7.3	+5	0	0	0	+4.9	+7.3	+7.3	+7.3	+12.6	0		
7IC6	+0.65	+1.2	0	+0.5	+8.1	+12.1	+3.45	+0.65								
7IC7	+0.3	+4.0	0	+3.3	+8.1	+12.1	+12.1	+0.3								
8IC1	-0.1	-4.65	-4.65	-3.5	-4.65	-4.65	-8	-3.5	-3.5	-4.6	0	-8	-8	0		
8IC2	-7.8	+0.1	0	-8	-7.8	-1.35	+8	0								
8IC3	-7.8	0	0	-8	-7.8	-0.15	+8	0								
8IC4	-7.8	0	0	-8	-7.8	0	+8	0								
8IC5	-7.8	0	0	-8	-7.8	0	+8	0								
8IC6	0	+5.1	+8	+3.2	+6.25	+0.9	+7.1	0	+6.25	+1.65	+8	+3.25	+8	+4.85	0	+8
8IC7	-15	+0.6	+0.3	-15	-15	+4.3	+15	0								
8IC8	-15	0	0	-15	+14.5	+0.8	+15	0								
9IC1	0	+8.2	+8.0	+7.2	+7.2	+7.2	0	0								
9IC2	-15	0	0	-15	-15	-9	+8	0								

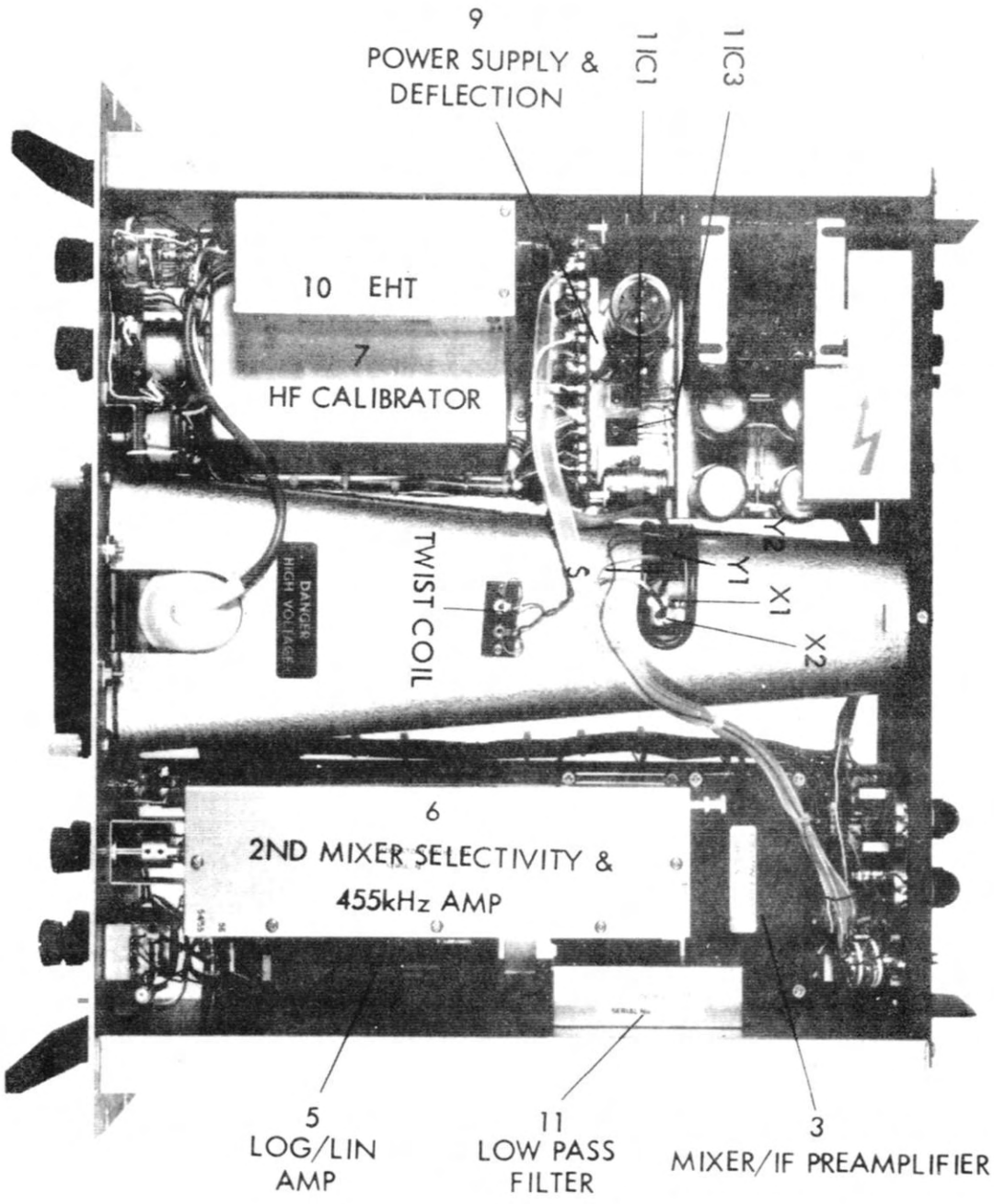


Fig. 4 - 1 INTERNAL VIEW (TOP)

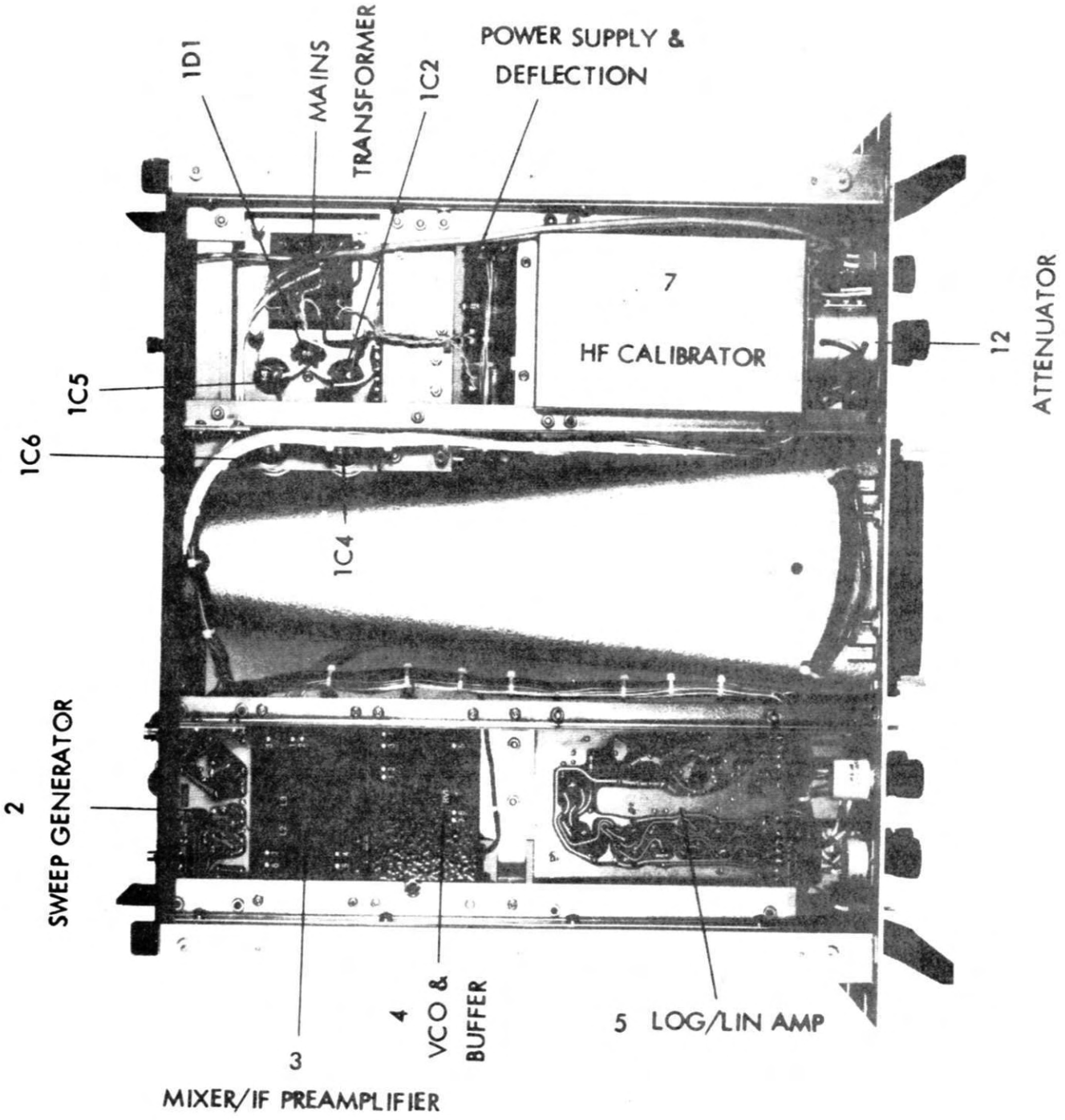
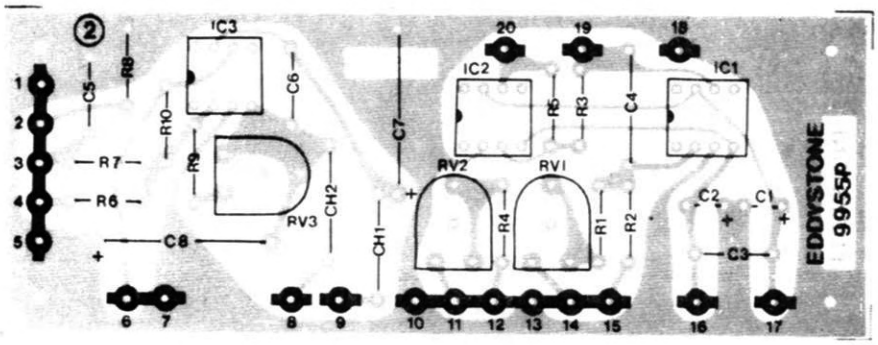
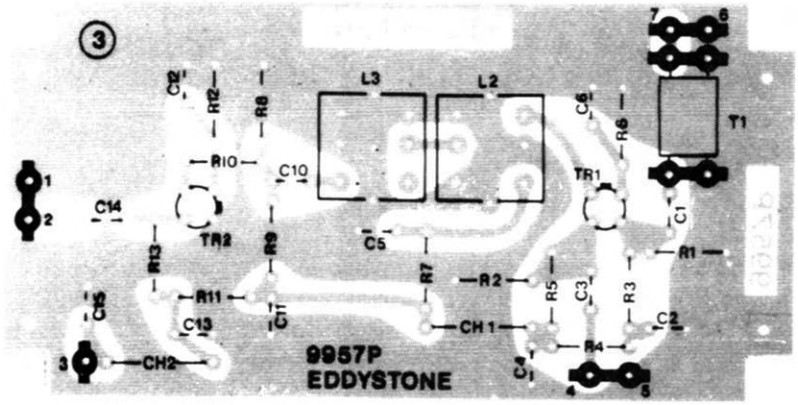


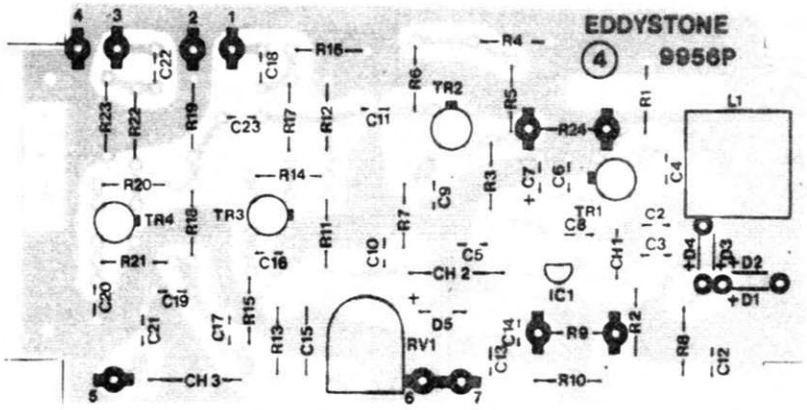
Fig. 4 - 2 INTERNAL VIEW (BOTTOM)



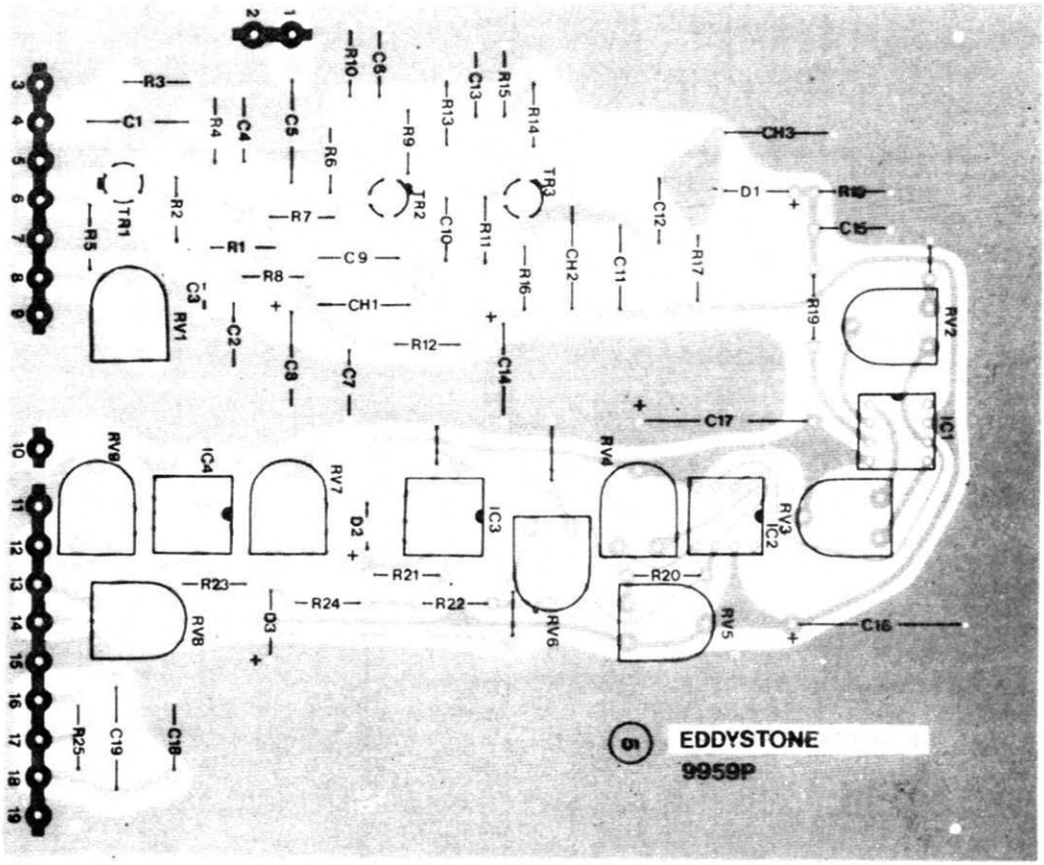
2 SWEEP GENERATOR



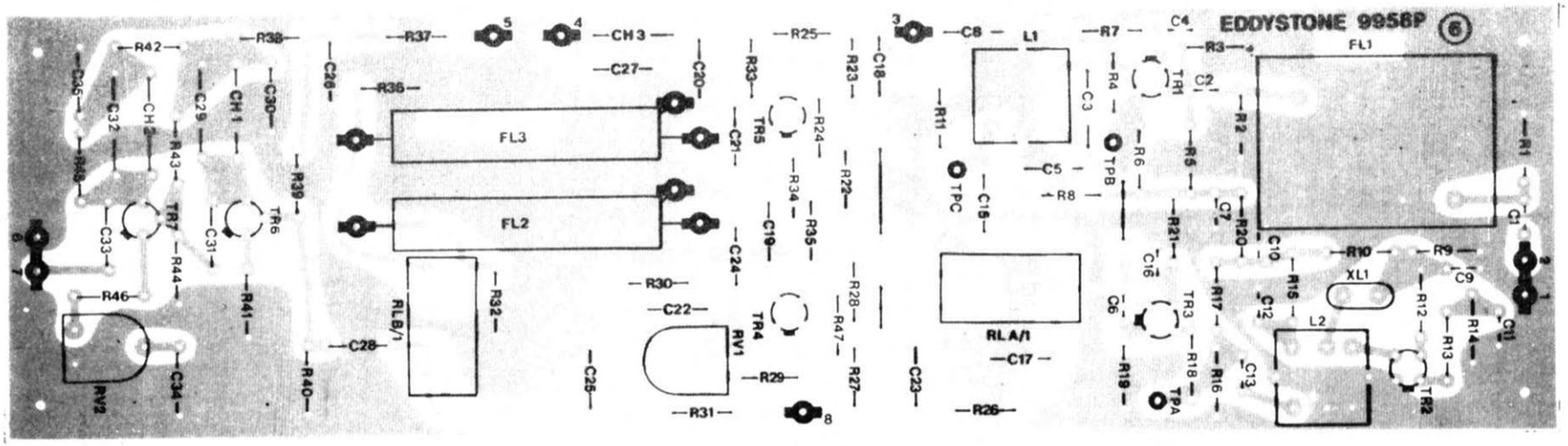
3 MIXER/IF AMPLIFIERS



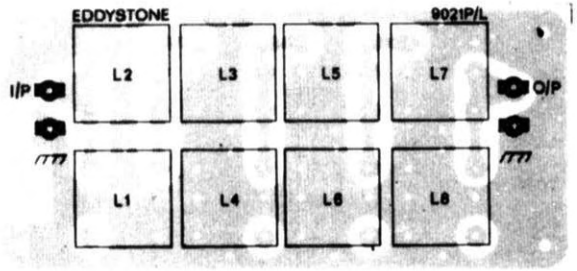
4 VCO and BUFFERS



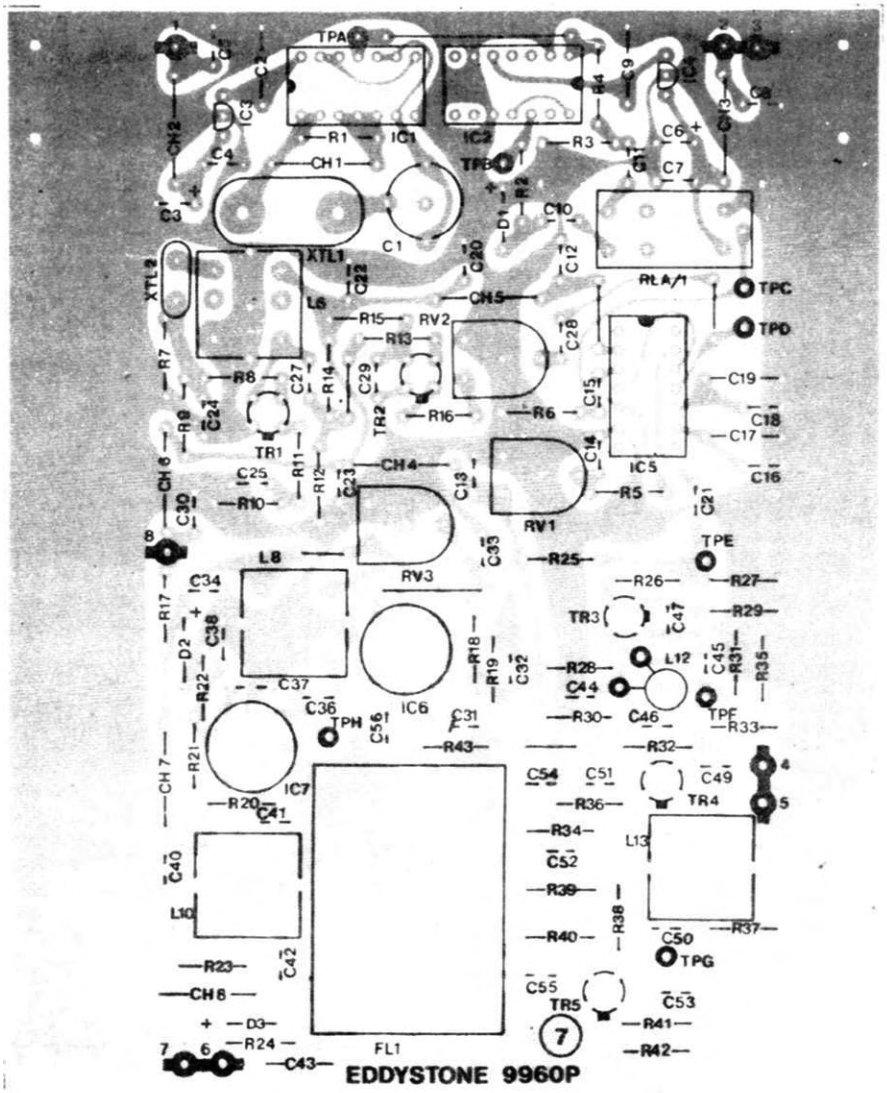
5 IF AMP./LOG-LIN AMPLIFIERS



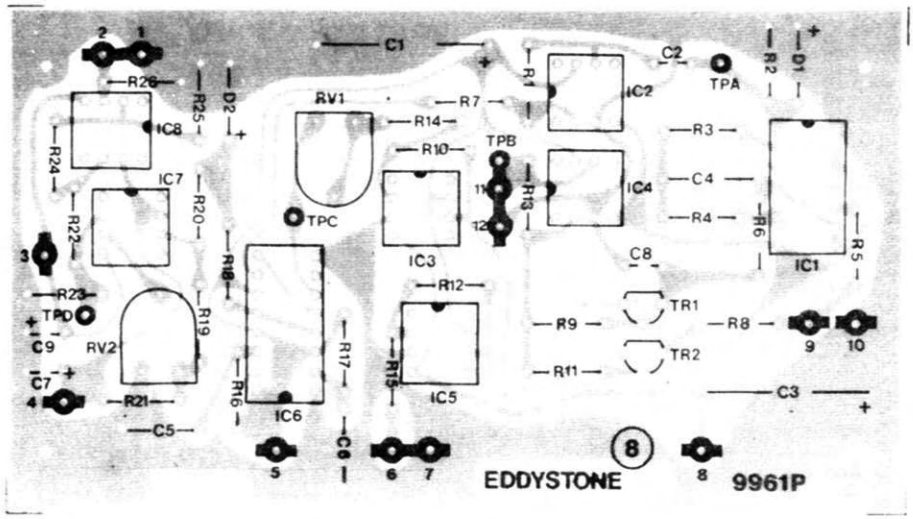
6 2ND MIXER SELECTIVITY and 455kHz AMPLIFIER



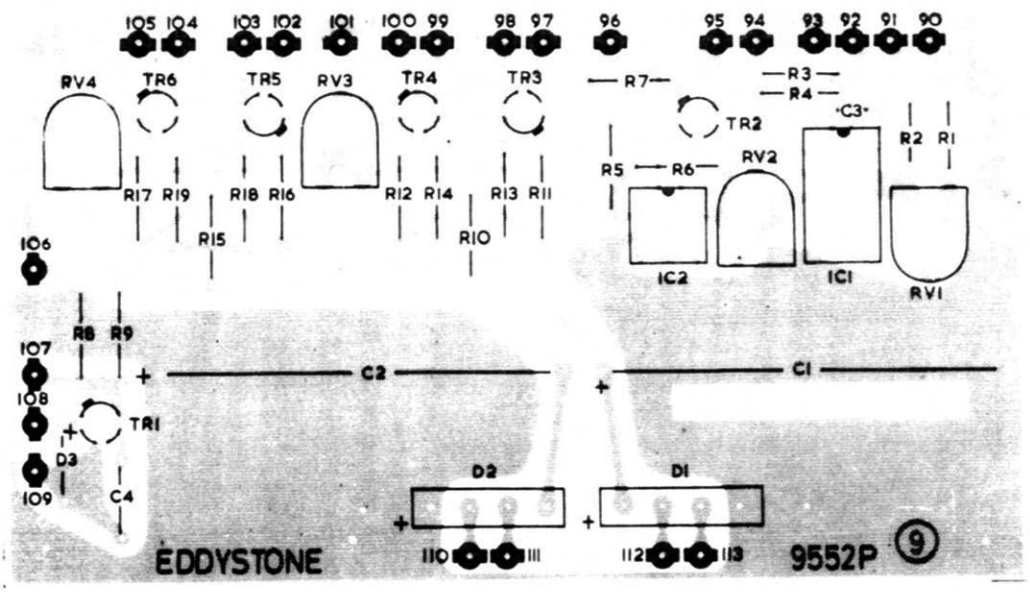
11 LOW-PASS FILTER



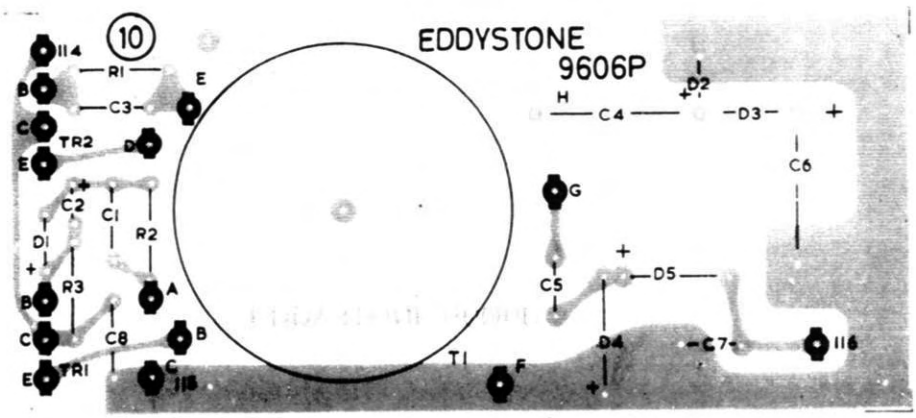
7 HF CALIBRATOR BOARD



8 LF CALIBRATOR BOARD



9 PSU and DEFLECTION AMPLIFIERS



10 EHT INVERTOR BOARD

SECTION 5

COMPONENTS LIST

LOCATION CODE:

Each component reference in the Tables that follow is prefixed by a number which will assist in the location of the component. All components for a particular circuit module are uniquely identified by the prefix number which corresponds with the individual module code number.

The Coding is as follows:

1. CHASSIS & MISCELLANEOUS
2. SWEEP GENERATOR
3. MIXER/IF PRE-AMPLIFIER
4. V.C.O. & BUFFERS
5. IF AMP/LOG-LIN AMPLIFIERS
6. 2ND. MIXER, SELECTIVITY & 455kHz AMPLIFIER
7. H.F. CALIBRATOR BOARD
8. L.F. CALIBRATOR BOARD
9. P.S.U. & DEFLECTION AMPLIFIERS
10. E.H.T. SUPPLY UNIT
11. LOW-PASS FILTER
12. 0-50dB ATTENUATOR.

REPLACEMENT SPARES:

Spares should be ordered by quoting the complete circuit reference, including the module prefix (where applicable), the component description and the part number where this is given in the lists.

From time to time, components of the type specified may be unavailable and in such circumstances equivalent types may be fitted or supplied as replacements. All orders and enquiries should be directed to the address below, quoting the Type and Serial Numbers of the Equipment in all communications.

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

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

Ref	Value	Type	Tolerance	Wkg Voltage
1C 1	4700µ	Electrolytic	+50%-10%	40V
1C 2	2200µ	Electrolytic	+50%-10%	40V
1C 3	680µ	Electrolytic	+50%-10%	40V
1C 4	4700µ	Electrolytic	+50%-10%	16V
1C 5	2200µ	Electrolytic	+50%-10%	40V
1C 6	4700µ	Electrolytic	+50%-10%	16V
1C 7	100n	Polycarbonate	20%	100V
1C 8	100n	Polycarbonate	20%	100V
1C 9	22µ	Electrolytic	+50%-10%	25V
1C10	150µ	Electrolytic	+50%-10%	16V
1C11	10n	Disc Ceramic	+80%-20%	2KV
1C12	10n	Disc Ceramic	+80%-20%	2KV
1C13	10n	Disc Ceramic	+80%-20%	2KV
1C14	1000µ	Electrolytic	+80%-20%	16V
1C15	1000µ	Electrolytic	+80%-20%	16V
2C 1	22µ	Tantalum	20%	16V
2C 2	22µ	Tantalum	20%	16V
2C 3	100n	Polycarbonate	20%	100V
2C 4	470n	Polycarbonate	20%	100V
2C 5	100n	Polycarbonate	20%	100V
2C 6	100n	Polycarbonate	20%	100V
2C 7	150µ	Electrolytic	+50%-10%	16V
2C 8	150µ	Electrolytic	+50%-10%	16V
3C 1	1n	Disc Ceramic	20%	500V
3C 2	1n	Disc Ceramic	20%	500V
3C 3	1n	Disc Ceramic	20%	500V
3C 4	1n	Disc Ceramic	20%	500V
3C 5	1n	Disc Ceramic	20%	500V
3C 6	1n	Disc Ceramic	20%	500V
3C 7	27p	Tubular Ceramic	10%	200V
3C 8	1p8	Disc Ceramic	±.25p	100V
3C 9	27p	Tubular Ceramic	10%	200V
3C10	1n	Disc Ceramic	20%	500V
3C11	1n	Disc Ceramic	20%	500V
3C12	1n	Disc Ceramic	20%	500V
3C13	1n	Disc Ceramic	20%	500V
3C14	1n	Disc Ceramic	20%	500V
3C15	10n	Disc Ceramic	+80%-20%	250V

Capacitors continued.....

Ref	Value	Type	Tolerance	Wkg Voltage
4C 1	5p6	Tubular Ceramic	±.5p	200V
4C 2	3p3	Tubular Ceramic	±.5p	200V
4C 3	8p2	Tubular Ceramic	±.5p	200V
4C 4	10p	Polystyrene	5%	200V
4C 5	10n	Disc Ceramic	+80%-20%	250V
4C 6	1n	Disc Ceramic	20%	500V
4C 7	22µ	Tantalum	20%	16V
4C 8	47p	Polystyrene	5%	200V
4C 9	1n	Disc Ceramic	20%	500V
4C10	1n	Disc Ceramic	20%	500V
4C11	1n	Disc Ceramic	20%	500V
4C12	1n	Disc Ceramic	20%	500V
4C13	1n	Disc Ceramic	20%	500V
4C14	1n	Disc Ceramic	20%	500V
4C15	100n	Polycarbonate	20%	100V
4C16	1n	Disc Ceramic	20%	500V
4C17	1n	Disc Ceramic	20%	500V
4C18	1n	Disc Ceramic	20%	500V
4C19	1n	Disc Ceramic	20%	500V
4C20	1n	Disc Ceramic	20%	500V
4C21	10n	Disc Ceramic	+80%-20%	250V
4C22	1n	Disc Ceramic	20%	500V
4C23	1n	Disc Ceramic	20%	500V
5C 1	470n	Polycarbonate	20%	100V
5C 2	100n	Polycarbonate	20%	100V
5C 3	10n	Disc Ceramic	+80%-20%	250V
5C 4	100n	Polycarbonate	20%	100V
5C 5	470n	Polycarbonate	20%	100V
5C 6	100n	Polycarbonate	20%	100V
5C 7	100n	Polycarbonate	20%	100V
5C 8	10µ	Electrolytic	+50%-20%	25V
5C 9	560p	Polystyrene	2%	125V
5C10	100n	Polycarbonate	20%	100V
5C11	560p	Polystyrene	2%	125V
5C12	100n	Polycarbonate	20%	100V
5C13	100n	Polycarbonate	20%	100V
5C14	10µ	Electrolytic	+50%-20%	25V
5C15	100n	Polycarbonate	20%	100V
5C16	220µ	Electrolytic	+50%-20%	16V
5C17	220µ	Electrolytic	+50%-20%	16V
5C18	100n	Polycarbonate	20%	100V
5C19	470n	Polycarbonate	20%	100V

Capacitors continued....

Ref	Value	Type	Tolerance	Wkg Voltage
6C 1	1n	Disc Ceramic	20%	500V
6C 2	1n	Disc Ceramic	20%	500V
6C 3	820p	Polystyrene	5%	125V
6C 4	10n	Disc Ceramic	+80%-20%	250V
6C 5	100n	Polycarbonate	20%	100V
6C 6	1n	Disc Ceramic	20%	500V
6C 7	1n	Disc Ceramic	20%	500V
6C 8	100n	Polycarbonate	20%	100V
6C 9	82p	Polystyrene	5%	125V
6C10	1n	Disc Ceramic	20%	500V
6C11	1n	Disc Ceramic	20%	500V
6C12	1n	Disc Ceramic	20%	500V
6C13	1n	Disc Ceramic	20%	500V
6C14	33p	Polystyrene	5%	125V
6C15	100n	Polycarbonate	20%	100V
6C16	1n	Disc Ceramic	20%	500V
6C17	100n	Polycarbonate	20%	100V
6C18	100n	Polycarbonate	20%	100V
6C19	100n	Polycarbonate	20%	100V
6C20	100n	Polycarbonate	20%	100V
6C21	100n	Polycarbonate	20%	100V
6C22	100n	Polycarbonate	20%	100V
6C23	100n	Polycarbonate	20%	100V
6C24	100n	Polycarbonate	20%	100V
6C25	100n	Polycarbonate	20%	100V
6C26	100n	Polycarbonate	20%	100V
6C27	100n	Polycarbonate	20%	100V
6C28	100n	Polycarbonate	20%	100V
6C29	560p	Polystyrene	5%	125V
6C30	100n	Polycarbonate	20%	100V
6C31	100n	Polycarbonate	20%	100V
6C32	560p	Polystyrene	5%	125V
6C33	100n	Polycarbonate	20%	100V
6C34	100n	Polycarbonate	20%	100V
6C35	100n	Polycarbonate	20%	100V
7C 1	10-60p	Trimmer Ceramic		50V
7C 2	100n	Polycarbonate	20%	100V
7C 3	680n	Tantalum	20%	35V
7C 4	10n	Disc Ceramic	+80%-20%	250V
7C 5	10n	Disc Ceramic	+80%-20%	250V
7C 6	680n	Tantalum	20%	35V
7C 7	10n	Polycarbonate	20%	100V
7C 8	10n	Polycarbonate	20%	100V
7C 9	100n	Polycarbonate	20%	100V
7C10	470p	Polystyrene	2%	125V
7C11	470p	Ceramic	10%	250V

Capacitors continued.....

Ref	Value	Type	Tolerance	Wkg Voltage
7C12	10n	Polycarbonate	20%	400V
7C13	1n	Ceramic	20%	200V
7C14	10n	Polycarbonate	20%	400V
7C15	1n	Ceramic	20%	200V
7C16	1n	Ceramic	20%	200V
7C17	100n	Polycarbonate	20%	100V
7C18	1n	Ceramic	20%	200V
7C19	100n	Polycarbonate	20%	100V
7C20	1n	Ceramic	20%	200V
7C21	1n	Ceramic	20%	200V
7C22	10n	Polycarbonate	20%	400V
7C23	1n	Ceramic	20%	200V
7C24	82p	Polystyrene	5%	125V
7C25	1n	Ceramic	20%	200V
7C26	33p	Polystyrene	5%	125V
7C27	1n	Ceramic	20%	200V
7C28	1n	Ceramic	20%	200V
7C29	1n	Ceramic	20%	200V
7C30	1n	Ceramic	20%	200V
7C31	1n	Ceramic	20%	200V
7C32	1n	Ceramic	20%	200V
7C33	1n	Ceramic	20%	200V
7C34	10n	Polycarbonate	20%	400V
7C35	8p2	Polystyrene	5%	125V
7C36	1n	Ceramic	20%	200V
7C37	1n	Ceramic	20%	200V
7C38	1n	Ceramic	20%	200V
7C39	18p	Polystyrene	5%	125V
7C40	10n	Polycarbonate	20%	
7C41	1n	Ceramic	20%	200V
7C42	100p	Ceramic	10%	250V
7C43	47n	Polycarbonate	20%	100V
7C44	1n	Ceramic	20%	200V
7C45	33p	Tubular Ceramic	5%	200V
7C46	33p	Tubular Ceramic	5%	200V
7C47	1n	Ceramic	20%	200V
7C48	8p2	Tubular Ceramic	5%	200V
7C49	1n	Ceramic	20%	200V
7C50	1n	Ceramic	20%	200V
7C51	1n	Ceramic	20%	200V
7C52	1n	Ceramic	20%	200V
7C53	1n	Ceramic	20%	200V
7C54	1n	Ceramic	20%	200V
7C55	1n	Ceramic	20%	200V
7C56	1n	Ceramic	20%	200V

Capacitors continued.....

Ref	Value	Type	Tolerance	Wkg Voltage
8C 1	220µ	Electrolytic	+50%-20%	25V
8C 2	1n	Disc Ceramic	20%	500V
8C 3	220µ	Electrolytic	+50%-20%	25V
8C 4	2n7	Polystyrene	2%	125V
8C 5	22n	Polycarbonate	20%	100V
8C 6	10n	Disc Ceramic	+80%-20%	250V
8C 7	22µ	Tantalum	20%	16V
8C 8		NOT FITTED		
8C 9	22µ	Tantalum	20%	16V
9C 1	100µ	Electrolytic	+50%-20%	315V
9C 2	100µ	Electrolytic	+50%-20%	315V
9C 3	1n	Disc Ceramic	20%	500V
9C 4	150p	Silvered Mica	5%	350V
10C1	47n	Polycarbonate	20%	250V
10C2	22µ	Tantalum	20%	20V
10C3	47n	Polycarbonate	20%	250V
10C4	4n7	Ceramic	+50%-20%	12.5KV
10C5	4n7	Ceramic	+80%-20%	2KV
10C6	4n7	Ceramic	+50%-20%	12.5KV
10C7	4n7	Ceramic	+80%-20%	2KV
10C8	10n	Disc Ceramic	+80%-20%	250V
11C1	82p	Ceramic	20%	200V
11C2	250p	Silvered Mica	2%	250V
11C3	82p	Ceramic	20%	200V
11C4	82p	Ceramic	20%	200V
11C5	82p	Ceramic	20%	200V

Resistors

All resistors are 5% tolerance 0.3W rating CR25 unless otherwise stated.

Ref.	Value Ohms	Rating W
1R 1	1K	
1R 2	18Ω	
1R 3	4K7	
1R 4	1M	
1R 5	1M	
1R 6	1M	
1R 7	270K	
1R 8	15K	
1R 9	6K8	
1R10	12K	
1R11	8K2	
1R12	10K	
1R13	100K	
1R14	470Ω	
1R15	470Ω	
1R16	100K	
1R17	100K	
1R18	10K	
1R19	10K	
2R 1	220K	
2R 2	220K	
2R 3	10K	
2R 4	22K	
2R 5	15K	
2R 6	47K	
2R 7	470K	
2R 8	150Ω	
2R 9	150K	
2R10	100K	
3R 1	10K	
3R 2	12K	
3R 3	56K	
3R 4	1K	
3R 5	39K	
3R 6	470Ω	
3R 7	47Ω	
3R 8	5K6	
3R 9	10K	
3R10	47Ω	
3R11	47Ω	
3R12	100Ω	
3R13	220Ω	

Ref.	Value Ohms	Rating W
4R 1	100K	
4R 2	220Ω	
4R 3	100Ω	
4R 4	560Ω	
4R 5	100K	
4R 6	220Ω	
4R 7	47Ω	
4R 8	100K	
4R 9	100K	A.O.T.
4R10	100K	A.O.T.
4R11	5K6	
4R12	6K8	
4R13	22Ω	
4R14	47Ω	
4R15	100Ω	
4R16	270Ω	
4R17	39Ω	
4R18	5K6	
4R19	6K8	
4R20	47Ω	
4R21	100Ω	
4R22	39Ω	
4R23	270Ω	
4R24	1K	A.O.T.
5R 1	47K	
5R 2	47K	
5R 3	47K	
5R 4	220K	
5R 5	5K6	
5R 6	15K	
5R 7	15K	
5R 8	22Ω	
5R 9	220Ω	
5R10	390Ω	
5R11	15K	
5R12	22Ω	
5R13	5K6	
5R14	120Ω	
5R15	150Ω	
5R16	1K2	
5R17	15K	
5R18	10K	
5R19	1K	

Ref.	Value Ohms	Rating W
5R20	1K	
5R21	10K	
5R22	100K	
5R23	100K	
5R24	10K	
5R25	47K	
6R 1	68Ω	
6R 2	47Ω	
6R 3	10K	
6R 4	12K	
6R 5	56K	
6R 6	39K	
6R 7	470Ω	
6R 8	22Ω	
6R 9	15K	
6R10	22K	
6R11	39Ω	
6R12	47Ω	
6R13	10Ω	
6R14	820Ω	
6R15	100Ω	
6R16	15K	
6R17	15K	
6R18	47Ω	
6R19	330Ω	
6R20	22Ω	
6R21	100Ω	
6R22	4K7	
6R23	22K	
6R24	47Ω	
6R25	22Ω	
6R26	22Ω	
6R27	22K	
6R28	4K7	
6R29	82Ω	
6R30	2K7	
6R31	22Ω	
6R32	2K7	
6R33	2K7	
6R34	390Ω	
6R35	220Ω	
6R36	2K7	
6R37	22Ω	
6R38	47Ω	
6R39	68K	
6R40	47K	
6R41	1K	
6R42	47Ω	
6R43	8K2	
6R44	4K7	
6R45	2K2	
6R46	150Ω	
6R47	47Ω	
7R 1	560Ω	
7R 2	2K2	
7R 3	100Ω	
7R 4	4K7	
7R 5	27K	
7R 6	80Ω	
7R 7	27K	
7R 8	47Ω	
7R 9	47Ω	
7R10	330Ω	
7R11	10Ω	
7R12	15K	
7R13	47Ω	
7R14	15K	
7R15	100Ω	
7R16	220Ω	
7R17	150Ω	
7R18	1K	
7R19	2K2	
7R20	100Ω	
7R21	1K	
7R22	2K2	
7R23	2K2	
7R24	3K9	
7R25	150K	
7R26	47Ω	
7R27	6K8	
7R28	100Ω	
7R29	220Ω	
7R30	2K7	
7R31	470Ω	
7R32	39K	
7R33	12K	
7R34	100Ω	
7R35	47Ω	
7R36	1KΩ	
7R37	1KΩ	
7R38	47Ω	
7R39	47K	

Ref.	Value Ohms	Rating W
7R40	100Ω	
7R41	100Ω	
7R42	68Ω	
7R43	47Ω	
8R 1	10K	
8R 2	100K	
8R 3	100K	
8R 4	10K	
8R 5	10K	
8R 6	12K	
8R 7	10K	
8R 8	1K8	
8R 9	10K	
8R10	10K	
8R11	10K	
8R12	10K	
8R13	10K	
8R14	47K	
8R15	10K	
8R16	100K	
8R17	100K	
8R18	22K	
8R19	2K7	
8R20	1K	
8R21	220Ω	
8R22	1K	
8R23	2K2	
8R24	10K	
8R25	1K	
8R26	10K	
9R 1	220Ω A.O.T.	
9R 2	1K	
9R 3	10Ω	
9R 4	10Ω	
9R 5	10K	
9R 6	10K	
9R 7	22Ω	
9R 8	100K	
9R 9	220K	
9R10	47K	
9R11	27K	
9R12	27K	
9R13	47K	
9R14	47K	
9R15	47K	
9R16	27K	
9R17	27K	
9R18	47K	
9R19	47K	
10R1	330Ω	
10R2	330Ω	
10R3	2K7	
10R4	1M	
11R1	47Ω	
12R1	68Ω	0.25
12R2	33Ω	0.25
12R3	100Ω	0.25
12R4	33Ω	0.25
12R5	100Ω	0.25
12R6	33Ω	0.25
12R7	100Ω	0.25
12R8	33Ω	0.25
12R9	100Ω	0.25
12R10	33Ω	0.25
12R11	33Ω	0.25
12R12	100Ω	0.25
12R13	33Ω	0.25
12R14	100Ω	0.25
12R15	33Ω	0.25
12R16	100Ω	0.25
12R17	33Ω	0.25
12R18	100Ω	0.25
12R19	33Ω	0.25
12R20	100Ω	0.25
12R21	68Ω	0.25

Potentiometers

Ref	Value	Law	Type	Function
1RV 1	100K	Lin.	Ganged Pot) Carbon	Sweep speed)
1RV 2	100K	Lin.	Ganged Pot)	Manual sweep)
1RV 3	100Ω	Lin.	W.W. pre-set	Graticule illumination
1RV 4	250K	Lin.	Carbon pre-set	Astigmatism
1RV 5	250K	Lin.	Carbon pre-set	Geometry
1RV 6	1M	Lin.	Carbon pre-set	Focus
1RV 7	470K	Lin.	Carbon pre-set	Brilliance
1RV 8	10K	Lin.	Carbon pre-set	X Shift
1RV 9	10K	Lin.	Carbon pre-set	Y Shift
1RV10	1K	Lin.	Dual concentric) Carbon	Centre frequency Coarse
1RV11	1K	Lin.	Dual concentric)	Centre frequency Fine
1RV12	100K	Lin.	Carbon	Sweep width
1RV13	10K	Lin.	Carbon	Gain
2RV 1	100K	Lin.	Cermet Horiz pre-set	Pre-set speed
2RV 2	47K	Lin.	Cermet Horiz pre-set	Pre-set width
2RV 3	47K	Lin.	Cermet Horiz pre-set	Pre-set centre frequency
4RV 1	10K	Lin.	Cermet Horiz pre-set	Sweep lin
5RV 1	10K	Lin.	Cermet Horiz pre-set	Set gain control range
5RV 2	10K	Lin.	Cermet Horiz pre-set	LOG/LIN gain
5RV 3	10K	Lin.	Cermet Horiz pre-set	Offset balance
5RV 4	10K	Lin.	Cermet Horiz pre-set	Offset balance
5RV 5	470K	Lin.	Cermet Horiz pre-set	Set log law
5RV 6	47K	Lin.	Cermet Horiz pre-set	Set log gain
5RV 7	10K	Lin.	Cermet Horiz pre-set	Offset balance
5RV 8	10K	Lin.	Cermet Horiz pre-set	Set log zero
5RV 9	470K	Lin.	Cermet Horiz pre-set	Set log gain
6RV 1	470Ω	Lin.	Cermet Horiz pre-set	Filter amp. balance
6RV 2	1K	Lin.	Cermet Horiz pre-set	Filter amp. gain
7RV 1	10K	Lin.	Cermet Horiz pre-set	Carrier balance
7RV 2	470Ω	Lin.	Cermet Horiz pre-set	Oscillator inj. level
7RV 3	10K	Lin.	Cermet Horiz pre-set	Amp. gain
8RV 1	220K	Lin.	Cermet Horiz pre-set	Marker amplitude
8RV 2	4K7	Lin.	Cermet Horiz pre-set	Trigger level
9RV 1	1K	Lin.	Cermet Horiz pre-set	Twist coil adjust
9RV 2	10K	Lin.	Cermet Horiz pre-set	Pre-set 8V line
9RV 3	100K	Lin.	Cermet Horiz pre-set	X Gain
9RV 4	10K	Lin.	Cermet Horiz pre-set	Y Gain

Diodes

Ref	Type	Manufacturer
1D 1	OSH01A Bridge Rectifier	Mullard
1D 2	4082-4850 (LED PSU ON)	H. Packard
1D 3	IN4148	Mullard
4D 1	BB106	Mullard
4D 2	BB106	Mullard
4D 3	BB106	Mullard
4D 4	BB106	Mullard
4D 5	IN918	Motorola
5D 1	5082-2800	H. Packard
5D 2	IN4004	Motorola
5D 3	IN4004	Motorola
7D 1	BAX13	Mullard
7D 2	BZX79-C12 (Zener)	Mullard
7D 3	OA47	Mullard
8D 1	BZX79C6V2 (Zener)	Mullard
8D 2	BZX79C6V2 (Zener)	Mullard
9D 1	BY179) Bridge Rectifier	Mullard
9D 2	BY179)	Mullard
9D 3	IN4148	Mullard
10D1	IN4004	Motorola
10D2	BY187 or BY409	Mullard
10D3	BY187 or BY409	Mullard
10D4	BY187 or BY409	Mullard
10D5	BY187 or BY409	Mullard

Transistors

Ref	Type	Manufacturer
3TR1	3N200 Dual Gate Fet	RCA
3TR2	BFW30	Mullard
4TR1	BFR29	Mullard
4TR2	UC734B	Union Carbide
4TR3	BFX89	Mullard
4TR4	BFX89	Mullard

Transistors continued.....

Ref	Type	Manufacturer
5TR1	UC734B	Union carbide
5TR2	BC107B	Mullard
5TR3	BC107B	Mullard
6TR1	3N200 Dual Gate Fet	RCA
6TR2	BFX89	Mullard
6TR3	BFX89	Mullard
6TR4	BFX89	Mullard
6TR5	BFX89	Mullard
6TR6	BC107B	Mullard
6TR7	BC107B	Mullard
7TR1	BFX89	Mullard
7TR2	BFX89	Mullard
7TR3	BFX89	Mullard
7TR4	3N200 Dual Gate Fet	RCA
7TR5	BFX89	Mullard
8TR1	BF245B	Mullard
8TR2	BF245B	Mullard
9TR1	BFW44	SGS
9TR2	BFX88	Mullard
9TR3	BF 338	Mullard
9TR4	BF 338	Mullard
9TR5	BF 338	Mullard
9TR6	BF 338	Mullard
10TR1	2N3055	RCA
10TR2	2N3055	RCA

Integrated Circuits

Ref	Type	Manufacturer
1IC1	MC 7815CT	Motorola
1IC2	MC 7815CT	Motorola
1IC3	MC 7915CT	Motorola
2IC1	MLM 207G	Motorola
2IC2	MC 1741CP	Fairchild
2IC3	MC 1741CP	Fairchild

Integrated Circuits continued.....

Ref	Type	Manufacturer
4IC1	MC78L12CP	Motorola
5IC1	MC0741CP	Motorola
5IC2	MC1741CP	Motorola
5IC3	MC1741CP	Motorola
5IC4	MC1741CP	Motorola
7IC1	SN7400N	Signetics
7IC2	SN7490N	Signetics
7IC3	MC78L05A CP	Motorola
7IC4	MC78L05A CP	Motorola
7IC5	TL442CN	Texas
7IC6	CA3028A	RCA
7IC7	CA3028A	RCA
8IC1	MC14011P	Motorola
8IC2	MC1741CP	Motorola
8IC3	MC1741CP	Motorola
8IC4	MC1741CP	Motorola
8IC5	MC1741CP	Motorola
8IC6	MC14528CP	Motorola
8IC7	MC1741CP	Motorola
8IC8	MC1741CP	Motorola
9IC1	µA723CN	Fairchild
9IC2	MC1741CP	Motorola

Inductors

Ref	Description	Type	Manufacturer
1L1	CRT Twist Coil	D4101	Eddystone
3L1	Tuning Coil	D5294	Eddystone
3L2	Tuning Coil	D5295	Eddystone
4L1	Oscillator Coil	D5296	Eddystone
6L1	Tuning Coil	D5297	Eddystone
6L2	Tuning Coil	D5298	Eddystone

Inductors continued.....

Ref	Description	Type	Manufacturer
7L1	Tuning Coil	D5299	Eddystone
7L2	Tuning Coil	D5300	Eddystone
7L3	Tuning Coil	D5301	Eddystone
7L4	Tuning Coil	D5302	Eddystone
7L5	Tuning Coil	D5303	Eddystone
11L1	Filter Coil	D5304	Eddystone
11L2	Filter Coil	D5305	Eddystone
11L3	Filter Coil	D5306	Eddystone
11L4	Filter Coil	D5307	Eddystone
11L5	Filter Coil	D5308	Eddystone
11L6	Filter Coil	D5309	Eddystone
11L7	Filter Coil	D5310	Eddystone
11L8	Filter Coil	D5319	Eddystone

Chokes

Ref	Description	Type	Manufacturer
1CH1	4mH Toroid	D5344	Eddystone
1CH2	4mH Toroid	D5344	Eddystone
2CH1	100mH	SC60	Sigma
2CH2	100mH	SC60	Sigma
3CH1	10µH	SC60	Sigma
3CH2	10µH	SC60	Sigma
4CH1	14µH	D4919	Eddystone
4CH2	10µH	SC60	Sigma
4CH3	10µH	SC60	Sigma
5CH1	220µH	SC60	Sigma
5CH2	220µH	SC60	Sigma
5CH3	10mH	SC60	Sigma
6CH1	220µH	SC60	Sigma
6CH2	220µH	SC60	Sigma
6CH3	1mH	SC60	Sigma
7CH1	1mH	SC60	Sigma
7CH2	1mH	SC60	Sigma
7CH3	1mH	SC60	Sigma
7CH4	10µH	SC60	Sigma
7CH5	10µH	SC60	Sigma
7CH6	10µH	SC60	Sigma

Chokes continued.....

Ref	Description	Type	Manufacturer
7CH7	10µH	SC60	Sigma
7CH8	100µH	SC60	Sigma
10CH1	1mH Toroid	D5096	Eddystone

Major Spares

Ref	Description	Part No.
	MODULES AND UNITS:-	
2	Sweep generator (PCB ONLY)	NO MODULE
3	Mixer/IF Pre-amplifiers	LP3604
4	VCO and Buffers	LP3605
5	IF Amp/Log-Lin Amps (PCB ONLY)	NO MODULE
6	2nd. Mixer Selectivity) and 455kHz Amplifier)	LP3603
7	HF Calibrator board (PCB ONLY)	NO MODULE
8	LF Calibrator board (PCB ONLY)	NO MODULE
9	PSU and Deflection Amplifiers	LP3602
10	EHT Supply invertor unit	LP3526
11	Low-pass filter	LP3606
12	0-50dB Attenuator	LP3103/1
	PRINTED CIRCUIT BOARDS INCLUDING COMPONENTS:	
2	Sweep generator	LP3601/1
3	Mixer/IF Amplifiers	LP3601/2
4	VCO and Buffers	LP3601/3
5	IF Amp. /Log-Lin Amplifiers	LP3601/4
6	2nd. Mixer, Selectivity and) 455kHz Amplifier)	LP3601/5
7	HF Calibrator board	LP3601/6
8	LF Calibrator board	LP3601/7
9	PSU and Deflection Amplifiers	LP3503/6
10	EHT invertor board	LP3503/8
	SWITCHES:	
1S1	Mains On/Off	7201P
1S2	Scan Invert	9822P
1S3	Manual Sweep	98244P
1S4	Calibrator	9686P
1S5	Log/Lin	9760P

Ref	Description	Part No.
	SWITCHES continued....	
1S6	Video	6760P
6S1	Bandwidth	10178P
	TRIMMER CAPACITORS:	
7C1	10-60p Ceramic	7290P
	CONNECTORS:	
	AC supply connector complete with 3 core cable.	D4815
PL1	Mains IEC 2A filtered input	9872/1P
PL2	Signal Input BNC Plug	8012P
SK1	Signal Input 50Ω BNC Socket	7225P
	TRANSFORMERS:	
1T1	Mains Transformer	9541P
10T1	EHT Invertor Transformer	D5068
	CONTROL KNOBS:	
	* Sweep Speed)	
	* Manual Sweep) *dual ganged pot	LP3460
	Sweep Width	LP3460
	Centre Frequency course) dual	
	Centre Frequency fine) concentric	LP3462
	Calibrator switch	LP3460
	Attenuator switch	LP3460
	Bandwidth switch	LP3460
	CRYSTALS:	
2XL1	55.455MHz Style J	10272P
7XL1	1MHz Style D	10271P
7XL2	60.695MHz Style J	10273P

Major Spares continued.....

Ref	Description	Part No.
	MISCELLANEOUS:	
V1	CRT D13/33 GM	9827P
	CRT Mumetal shield	9828P
LP1	Graticule Lamp 12V 80mA	8448P
LP2	Graticule Lamp 12V 80mA	8448P
FS1 & FS2	Mains fuse 1 amp anti-surge (2 off)	7173P
	Fuse Holder (2 off)	8458P
	Earth terminal	6371P
	Top cover	9558P
	Bottom cover	9559P
	Shroud	9482P
	Box Spanner	9057P
	Trimming Tool	8333P
	Trimming Tool	8451P

APPENDIX A

1) ANCILLARIES CONNECTOR : : This facility is incorporated on all later Models as a standard item. The relevant connection data is clearly illustrated on the main circuit diagram (BP1432 ISSUE 1). Accordingly, the following items should be added to the Components list:-

Ancillaries Connector SK5	: :	9 way chassis mounted socket Part No. 8943P.
Ancillaries Connector (Free Plug)	: :	Part No. D4703.

2) ERRATA TO COMPONENTS LIST (SECTION 5) : : The following items have been omitted from the list of Major Spares (Page 5-16/5-17):-

CRYSTAL FILTERS

6FL1	55MHz	TYPE 312	PART NO. 10367P
6FL2	455 kHz	TYPE TL-2D54	PART NO. 10368P
6FL3	455 kHz	TYPE TL-10010A	PART NO. 10369P
7FL1	45MHz	TYPE QC 1062AP	PART NO. 10370P

3) FRONT PANEL MARKING/CONTROL LAYOUT MODIFICATION (SECTION 1 PAGE 1-2 & SECTION 2 PAGE 2-2 et-seq) : : To simplify long-term operating procedure, the following changes have been incorporated on all later models:-

a) X-SHIFT CONTROL; is now located internally on the side-panel assembly. Access is via the top panel (marked) aperture. Adjustment is made with a screwdriver. Note that the relevant "external" adjustment is now made via the "Centre Frequency Control".

b) LOG-SHIFT CONTROL; is now located via the front panel aperture (in place of the X-Shift Control) and adjustment is made with a screwdriver. *

c) FRONT PANEL MARKING : : Fig. 1-1.

Delete "X-SHIFT"
Add "LOG-SHIFT" (See * below).

* NOTE. The LOG-SHIFT adjustment is only effective when the LOG/LIN switch is set to the LOG position, as indicated by the red rectangular markings surrounding the respective control legends.

FRONT PANEL MARKING/CONTROL LAYOUT MODIFICATION (SECTION TECH. SPEC. 2 & SECTION 2 PAGE 2-3 et-seq) : : To simplify long-term operating procedure, the following changes have been incorporated on all later models:-

a) X-SHIFT CONTROL; is now located internally on the side-panel assembly. Access is via the top panel (marked) aperture. Adjustment is made with a screwdriver. Note that the relevant "external" adjustment is now made via the "Centre Frequency Control".

b) LOG-SHIFT CONTROL; is now located via the front panel aperture (in place of the X-Shift Control) and adjustment is made with a screwdriver. *

c) FRONT PANEL MARKING : : Fig. 1-1.

Delete "X-SHIFT"
Add "LOG-SHIFT" (See * below).

* NOTE. The LOG-SHIFT adjustment is only effective when the LOG/LIN switch is set to the LOG position, as indicated by the red rectangular markings surrounding the respective control legends.

APPENDIX B

MODEL VARIANT

1061B/2 SUPPLEMENT MARCH 1979

The Eddystone Model EP1061B/2 Panoramic Display Unit differs from the parent Model EP1061B/1 in the following respects.

SWEEP RANGE : : The sweep range has been modified to cover the frequency range of 30kHz to 2MHz.

SWEEP SPEED : : An extra range of sweep speed is provided covering the approximate range of 1.5Hz to 100Hz.

LOG/LIN AMP : : The 100n Capacitors have been removed from the detector load resistor and Log/Lin Output stage in order to improve the frequency response at the faster-time base speeds.

VIDEO FILTER : : The video filter capacitor has been reduced in value in order to replace the Log/Lin output capacitor and is accordingly used in the "ON" position (VIDEO FILTER SWITCH) when the "NORMAL" and "MANUAL" speed positions are selected.

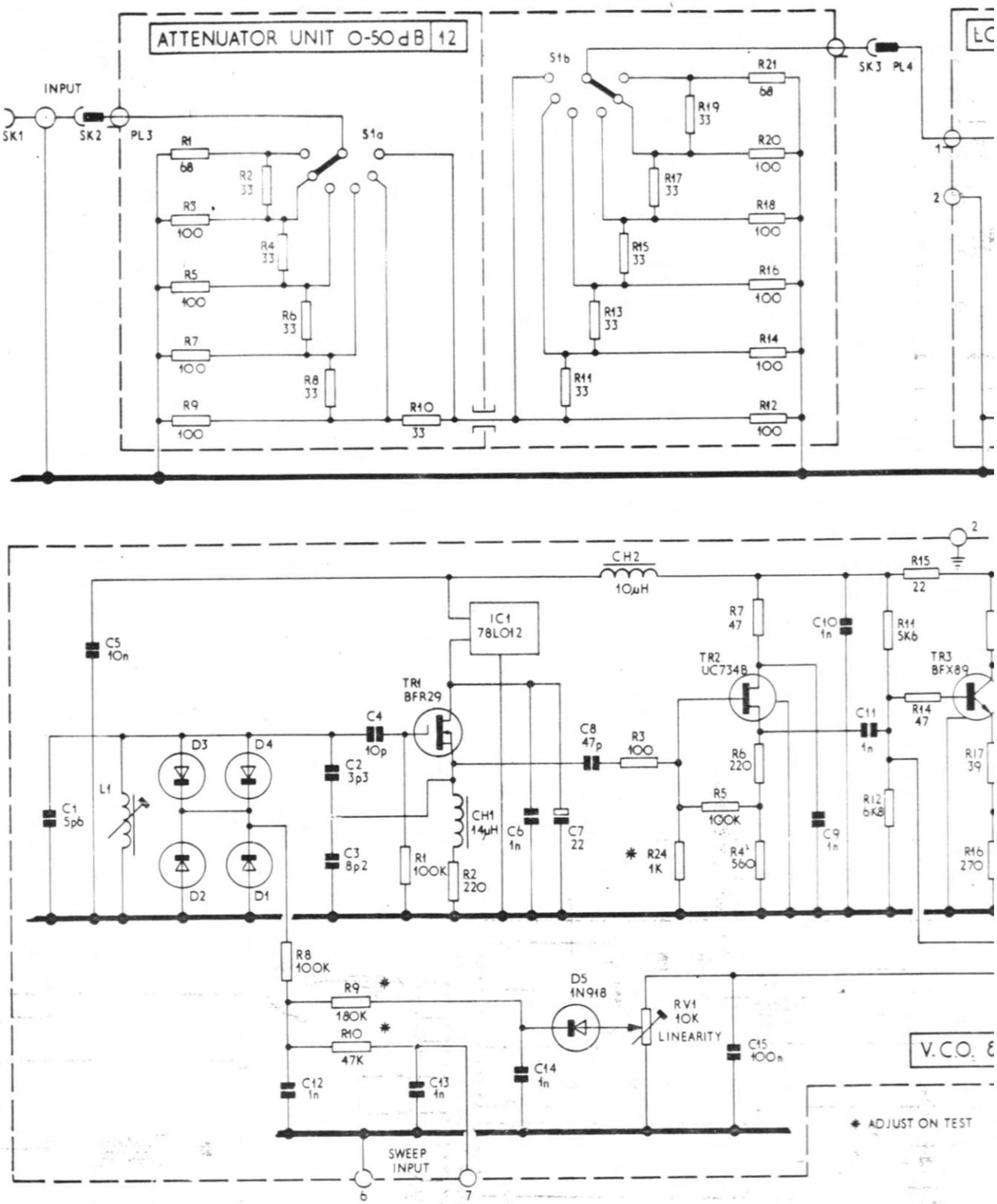
FREQUENCY MARKERS : : The 100kHz frequency markers can only be used at maximum sweep speed (100Hz) over a range of approximately 200kHz sweep width.

NOTE; at the speeds stated, the markers will appear wide with multiple responses.

Amend the components list and circuit diagram as follows:-

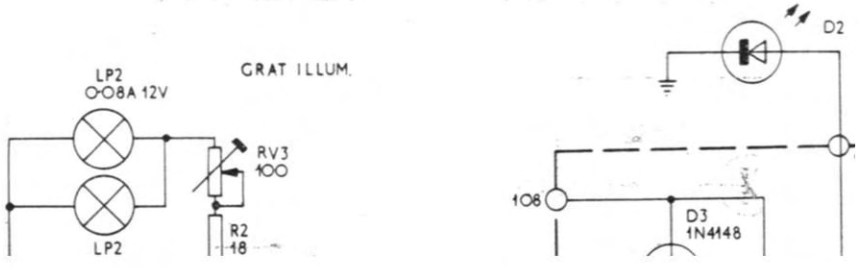
Change 8C6 to 4n7
Change 8R19 to 1k
Change 8R21 to 470Ω
Change 8RV2 to 10k
Add Capacitor 47n from R22/R23 to earth.
Note; 7R1 (1k nominal) A.O.T.

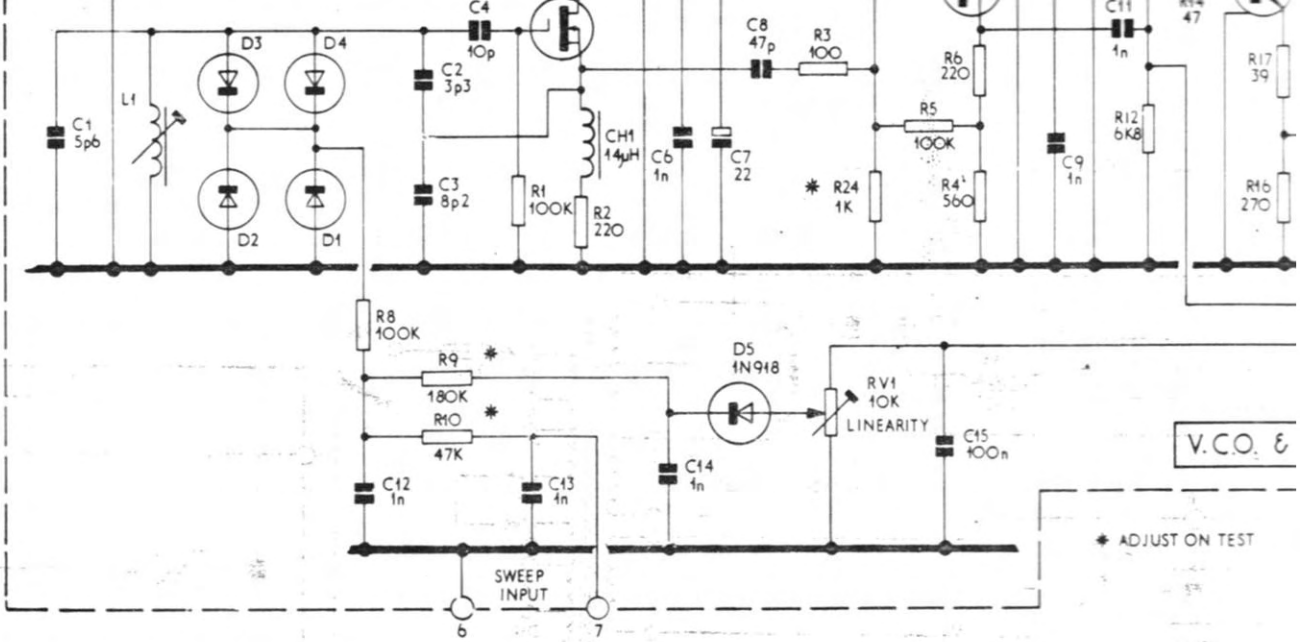
EDDYSTONE RADIO LIMITED



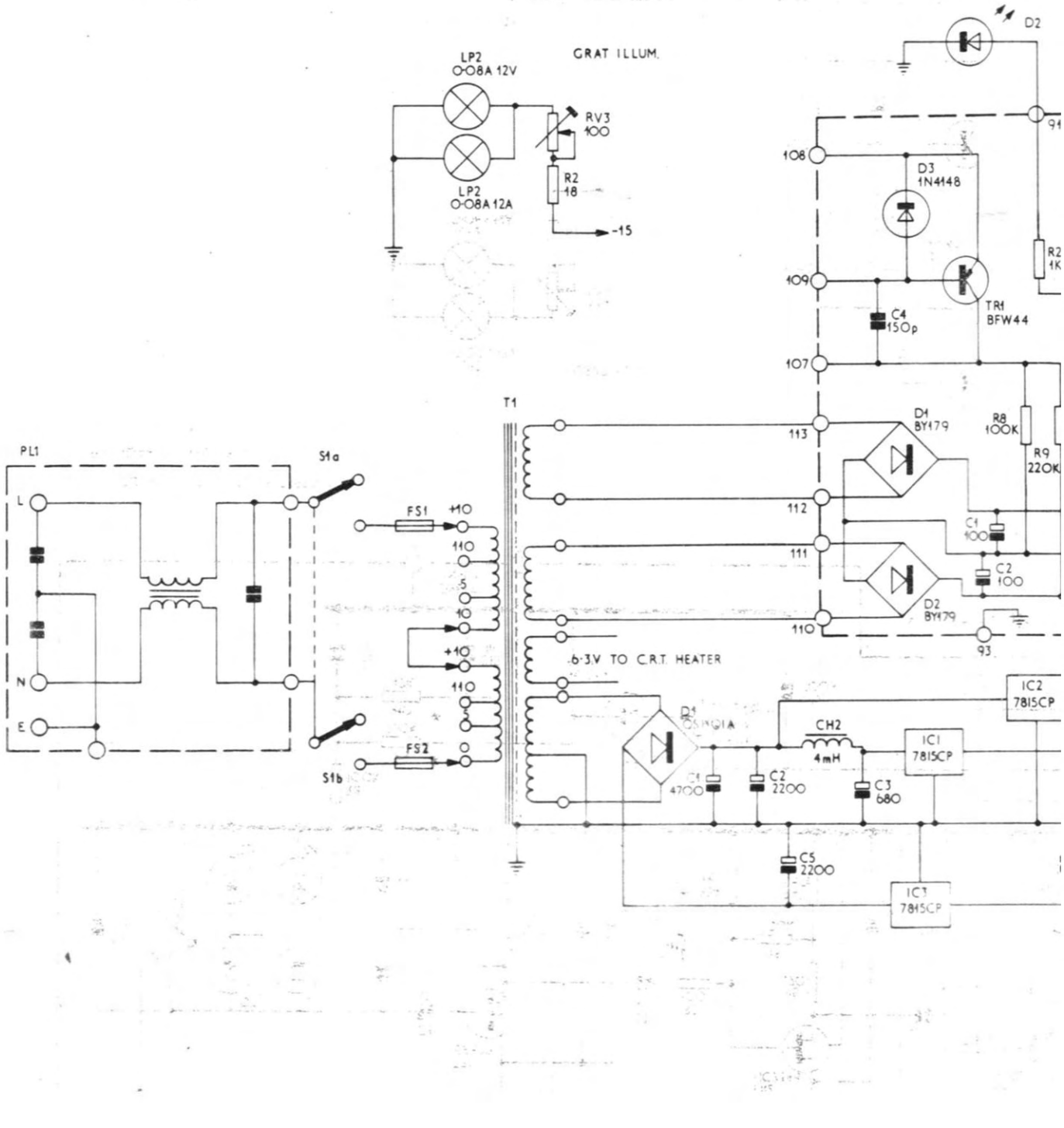
ALL COMPONENT OUTSIDE PREFIXED

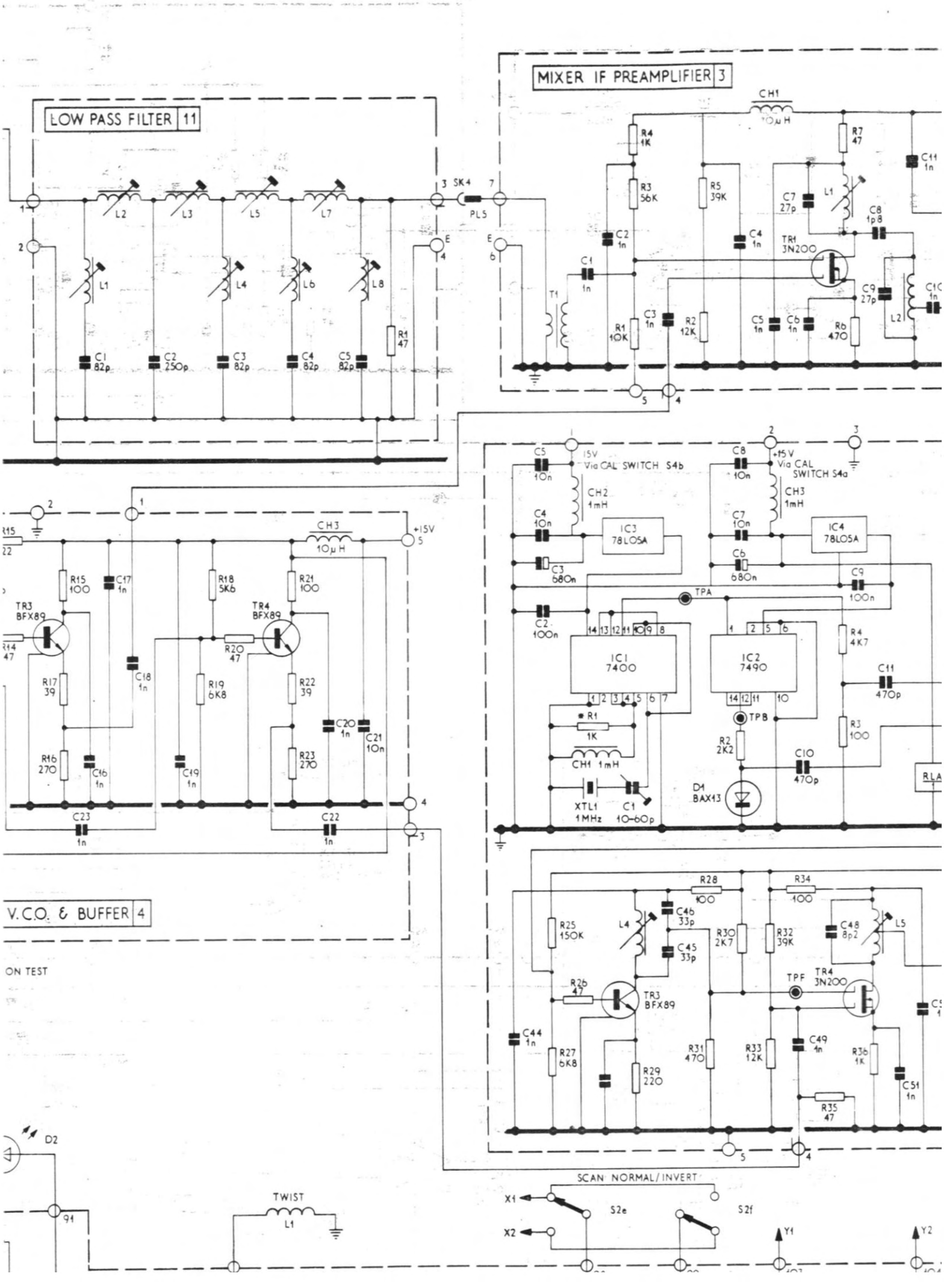
BOUNDARIES ARE REF1

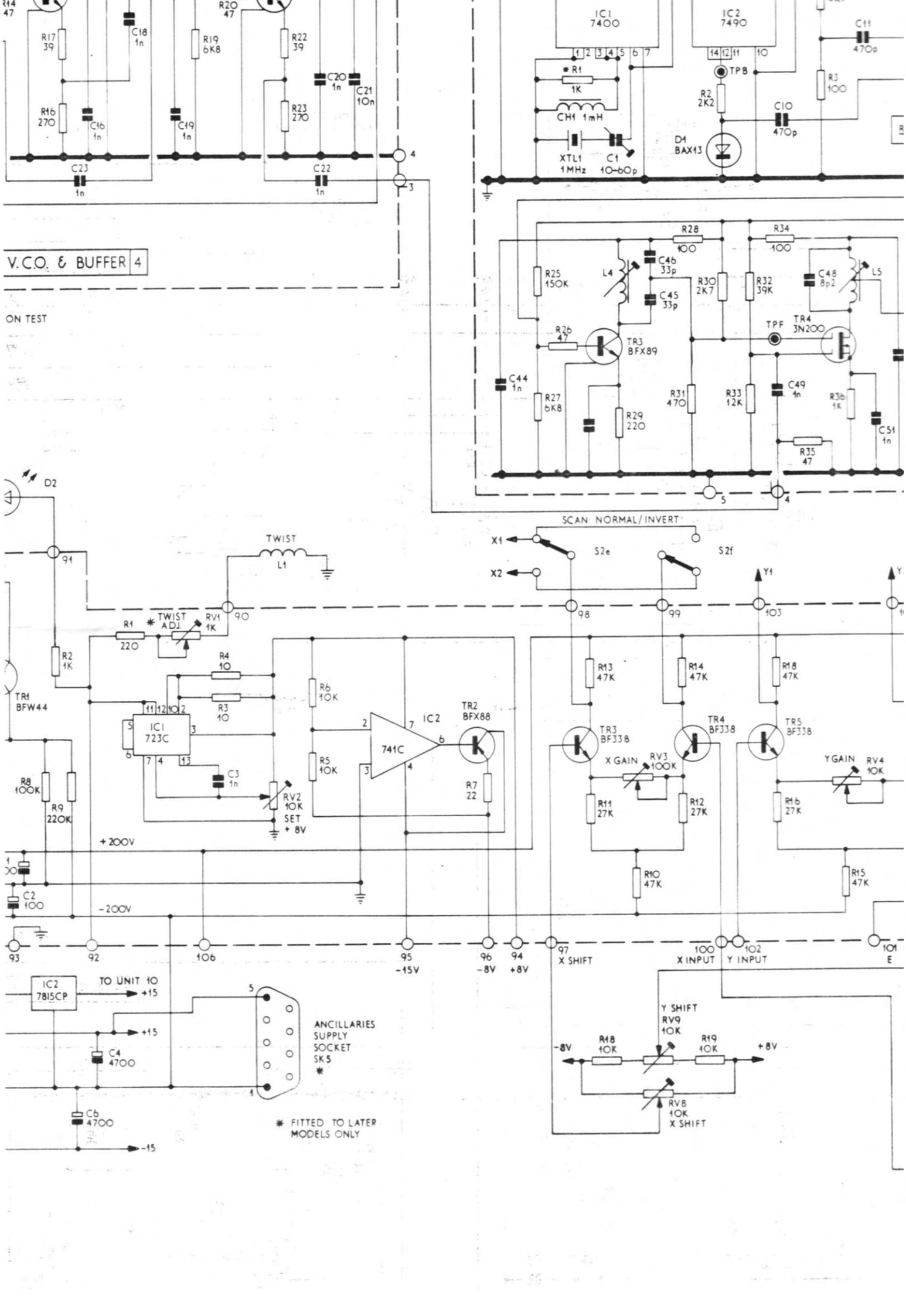


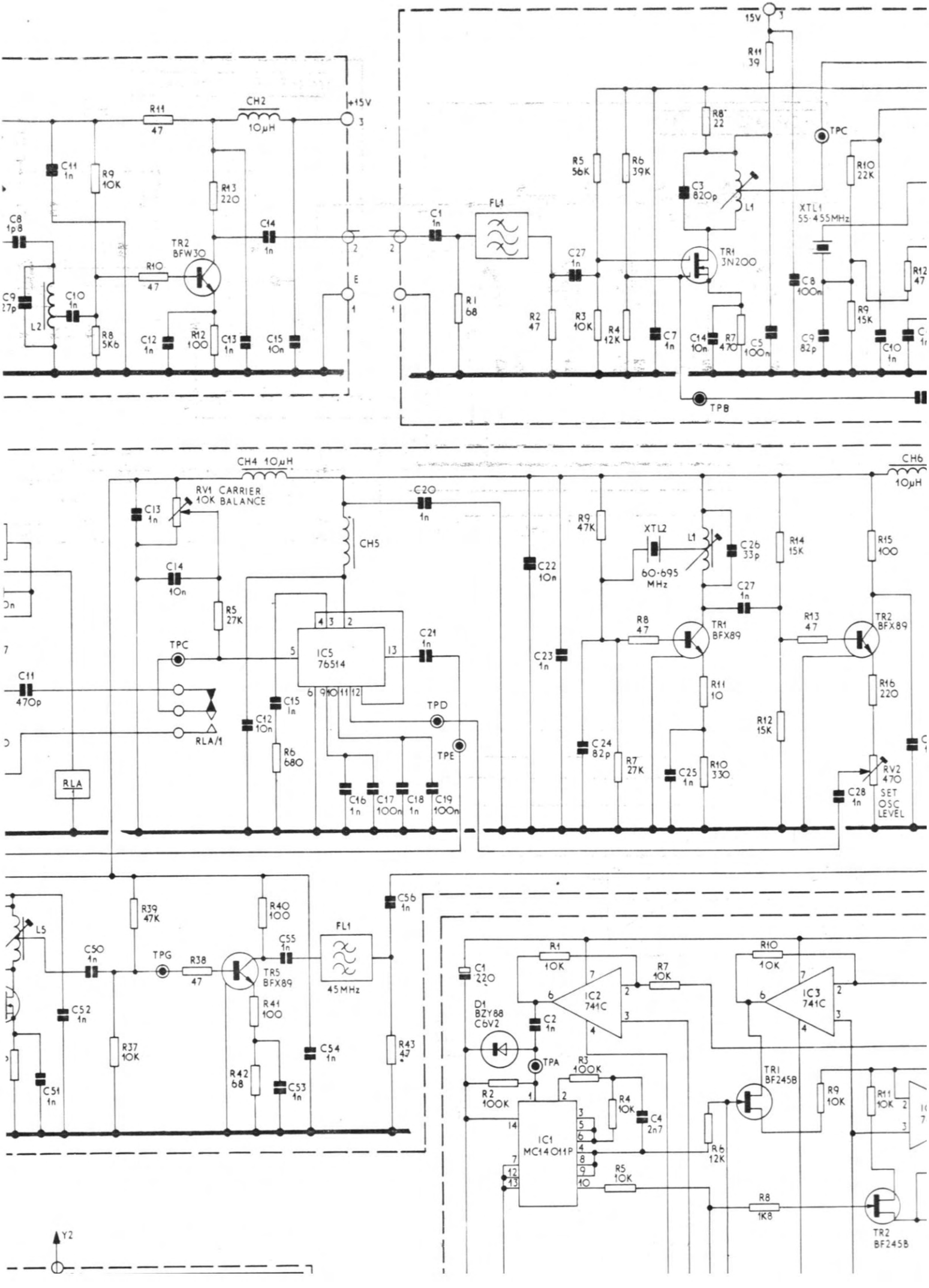


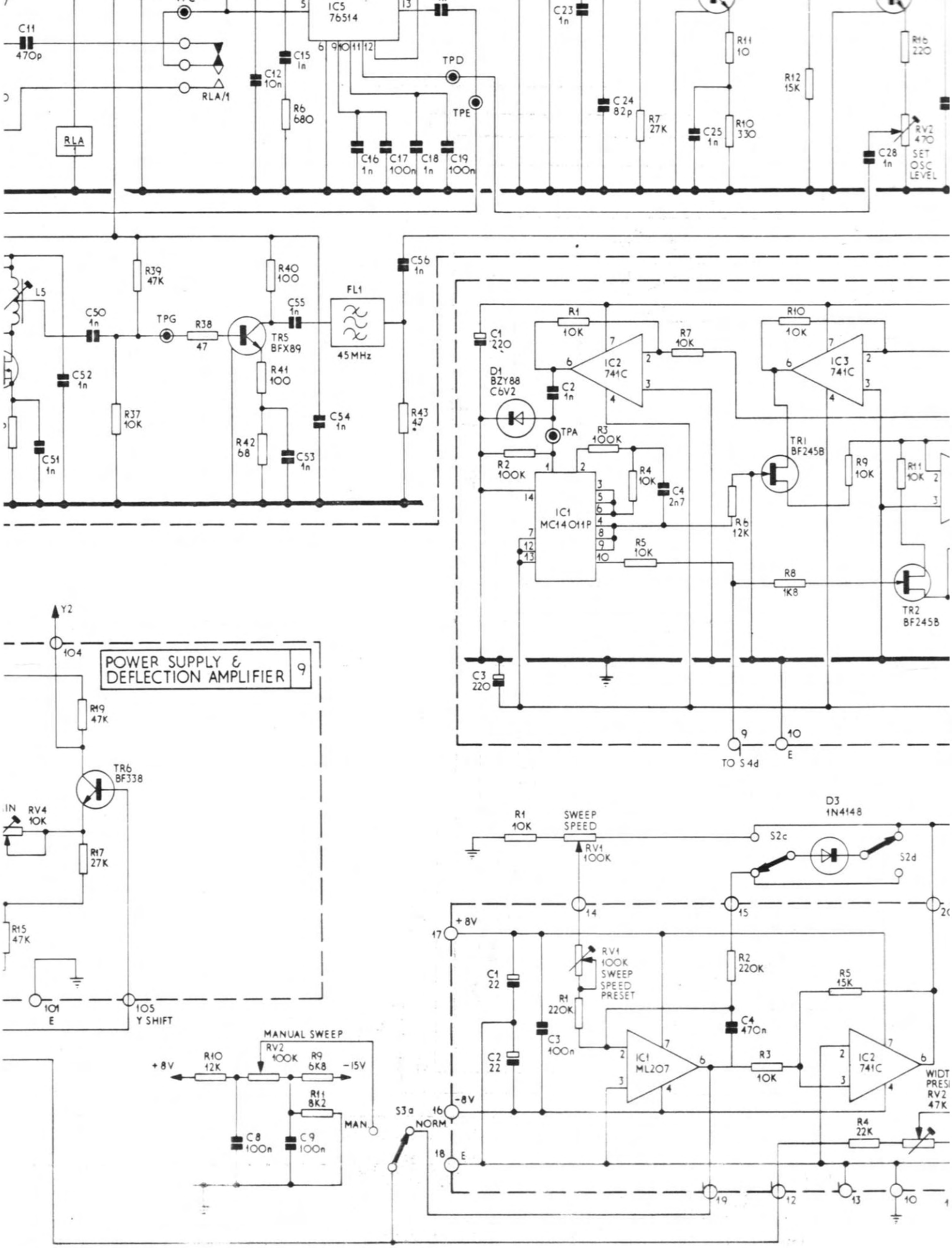
ALL COMPONENT OUTSIDE PREFIXED BOUNDARIES ARE REF1

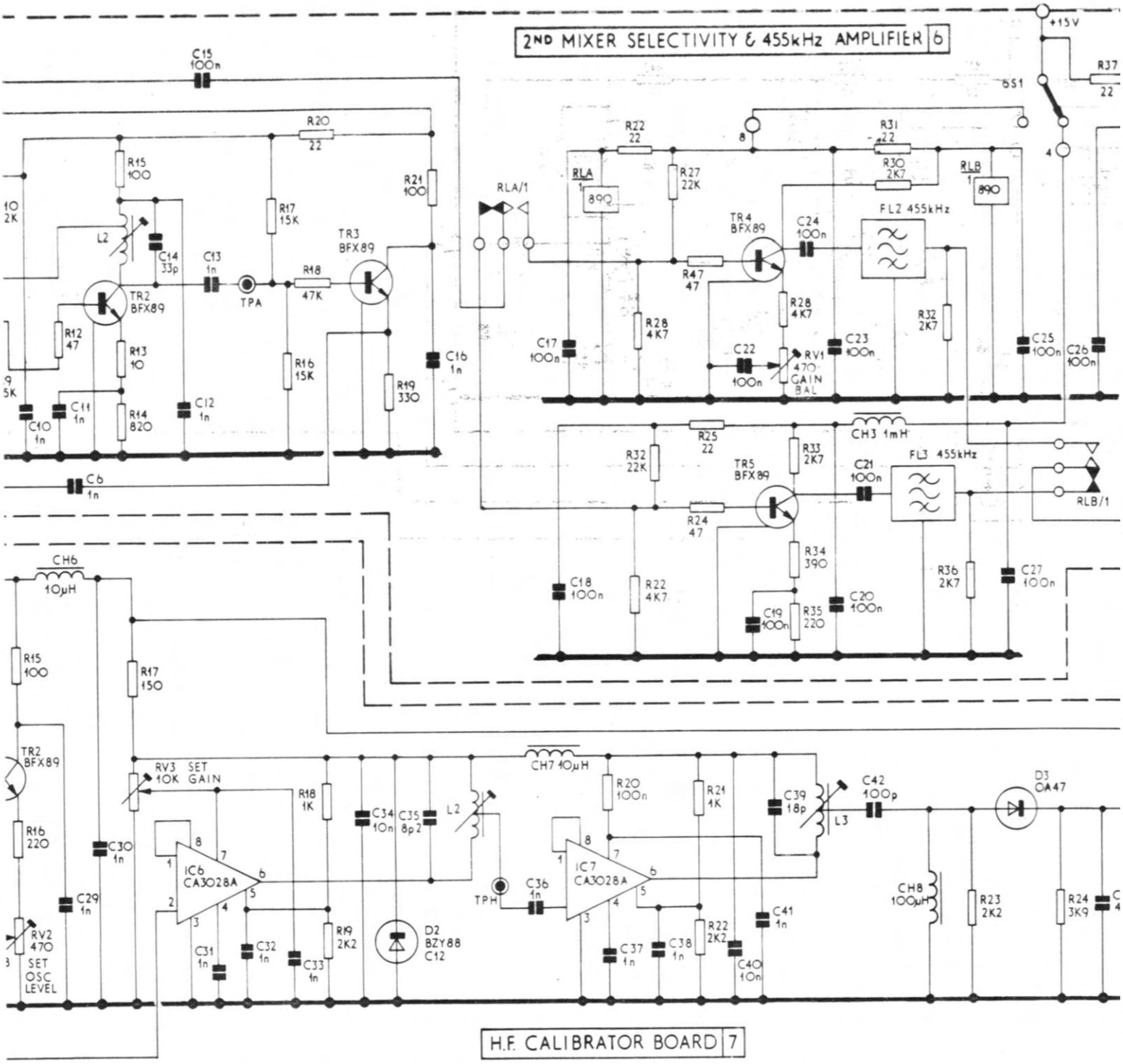



LOW PASS FILTER 11
L2
L3
L5
L7
L1
L4
L6
L8
C1 82p
C2 250p
C3 82p
C4 82p
C5 82p
R1 47
3 SK4 7
PL5
MIXER IF PREAMPLIFIER 3
CH1 10µH
R4 1K
R3 56K
R5 39K
R7 47
C11 1n
C7 27p
C8 1p8
C2 1n
C4 1n
TR1 3N200
C1 1n
T1
R1 10K
C3 1n
R2 12K
C5 1n
C6 1n
R6 470
C9 27p
C10 1n
CH2 1mH
CH3 1mH
15V Via CAL SWITCH S4b
+15V Via CAL SWITCH S4a
IC3 78L05A
IC4 78L05A
C3 680n
C6 680n
C9 100n
TPA
C2 100n
IC1 7400
IC2 7490
R4 4K7
C11 470p
* R1 1K
CH1 1mH
XTL1 1MHz
C1 10-60p
D1 BAX13
TPB
R2 2K2
C10 470p
R3 100
RLA
CH3 10µH
+15V
R15 100
C17 1n
R18 5K6
R21 100
TR3 BFX89
TR4 BFX89
R20 47
R17 39
C18 1n
R19 6K8
R22 39
C20 1n
C21 10n
R16 270
C16 1n
C19 1n
R23 270
C23 1n
C22 1n
V.C.O. & BUFFER 4
R28 100
R34 100
R25 150K
L4
C46 33p
C45 33p
R30 2K7
R32 39K
C48 8p2
L5
TPF
TR4 3N200
R26 47
TR3 BFX89
C44 1n
R27 6K8
R29 220
R31 470
R33 12K
C49 1n
R36 1K
C51 1n
R35 47
ON TEST
D2
91
TWIST
L1
SCAN NORMAL/INVERT
X1
X2
S2e
S2f
Y1
Y2


V.C.O. & BUFFER 4
ON TEST
IC1 7400
IC2 7490
R17 39
R16 270
C18 1n
C16 1n
R19 6K8
C19 1n
R22 39
R23 270
C20 1n
C21 10n
C22 1n
C23 1n
* R1 1K
CH1 1mH
XTL1 1MHz
C1 10-60p
TPB
R2 2K2
D1 BAX13
C10 470p
C11 470p
R3 100
R28 100
R34 100
R25 150K
L4
C46 33p
C45 33p
R30 2K7
R32 39K
C48 8p2
L5
R26 47
TR3 BFX89
TPF
TR4 3N200
C44 1n
R27 6K8
R29 220
R31 470
R33 12K
C49 1n
R36 1K
C51 1n
R35 47
D2
TWIST
L1
SCAN NORMAL/INVERT
X1
X2
S2e
S2f
Y1
R1 220
* TWIST ADJ
RV1 1K
R2 1K
R4 10
R3 10
TR1 BFW44
IC1 723C
C3 1n
RV2 10K SET + 8V
R6 10K
R5 10K
IC2 741C
TR2 BFX88
R7 22
R8 100K
R9 220K
+ 200V
- 200V
C2 100
R13 47K
R14 47K
R18 47K
TR3 BF338
TR4 BF338
TR5 BF338
X GAIN
RV3 100K
Y GAIN
RV4 10K
R11 27K
R12 27K
R16 27K
R10 47K
R15 47K
93
92
106
95 -15V
96 -8V
94 +8V
97 X SHIFT
100 X INPUT
102 Y INPUT
101
IC2 7815CP
TO UNIT 10 +15
+15
C4 4700
C6 4700
-15
ANCILLARIES SUPPLY SOCKET SK5 *
* FITTED TO LATER MODELS ONLY
Y SHIFT RV9 10K
-8V
R18 10K
R19 10K
+8V
RV8 10K X SHIFT


+15V
CH2
10µH
R11
47
C11
1n
R9
10K
R13
220
C8
1p8
C14
1n
TR2
BFW30
R10
47
C9
27p
C10
1n
L2
R8
5K6
C12
1n
R12
100
C13
1n
C15
10n
E
15V
R11
39
R8
22
TPC
R5
56K
R6
39K
C3
820p
L1
R10
22K
XTL1
55·455MHz
C1
1n
FL1
TR1
3N200
C27
1n
R1
68
R2
47
R3
10K
R4
12K
C7
1n
C14
10n
R7
470
C5
100n
C8
100n
R9
15K
C9
82p
C10
1n
R12
47
TPB
CH4 10µH
CH6
10µH
RV1 CARRIER
10K BALANCE
C13
1n
C20
1n
CH5
C14
10n
R5
27K
C11
470p
TPC
IC5
76514
C21
1n
C15
1n
C12
10n
R6
680
TPD
TPE
RLA/1
RLA
C16
1n
C17
100n
C18
1n
C19
100n
C22
10n
R9
47K
XTL2
60·695
MHz
L1
C26
33p
R14
15K
R15
100
C27
1n
R8
47
TR1
BFX89
R13
47
TR2
BFX89
C23
1n
R11
10
R16
220
R12
15K
C24
82p
R7
27K
C25
1n
R10
330
RV2
470
SET
OSC
LEVEL
C28
1n
L5
R39
47K
R40
100
C56
1n
C50
1n
TPG
R38
47
TR5
BFX89
C55
1n
FL1
45MHz
C52
1n
R41
100
R37
10K
C54
1n
R43
47
C51
1n
R42
68
C53
1n
R1
10K
R10
10K
C1
220
IC2
741C
R7
10K
IC3
741C
D1
BZY88
C6V2
C2
1n
TPA
R3
100K
TR1
BF245B
R9
10K
R2
100K
R4
10K
C4
2n7
IC1
MC14011P
R6
12K
R5
10K
R8
1K8
TR2
BF245B
Y2


POWER SUPPLY & DEFLECTION AMPLIFIER
9
IC5 76514
IC1 MC14011P
IC2 741C
IC3 741C
IC1 ML207
TR1 BF245B
TR2 BF245B
TR5 BFX89
TR6 BF338
D1 BZY88 C6V2
D3 1N4148
FL1
45MHz
TPA
TPD
TPE
TPG
RLA
RLA/1
SET OSC LEVEL
SWEEP SPEED
MANUAL SWEEP
NORM
MAN
TO S4d
Y SHIFT
WIDTH PRESET



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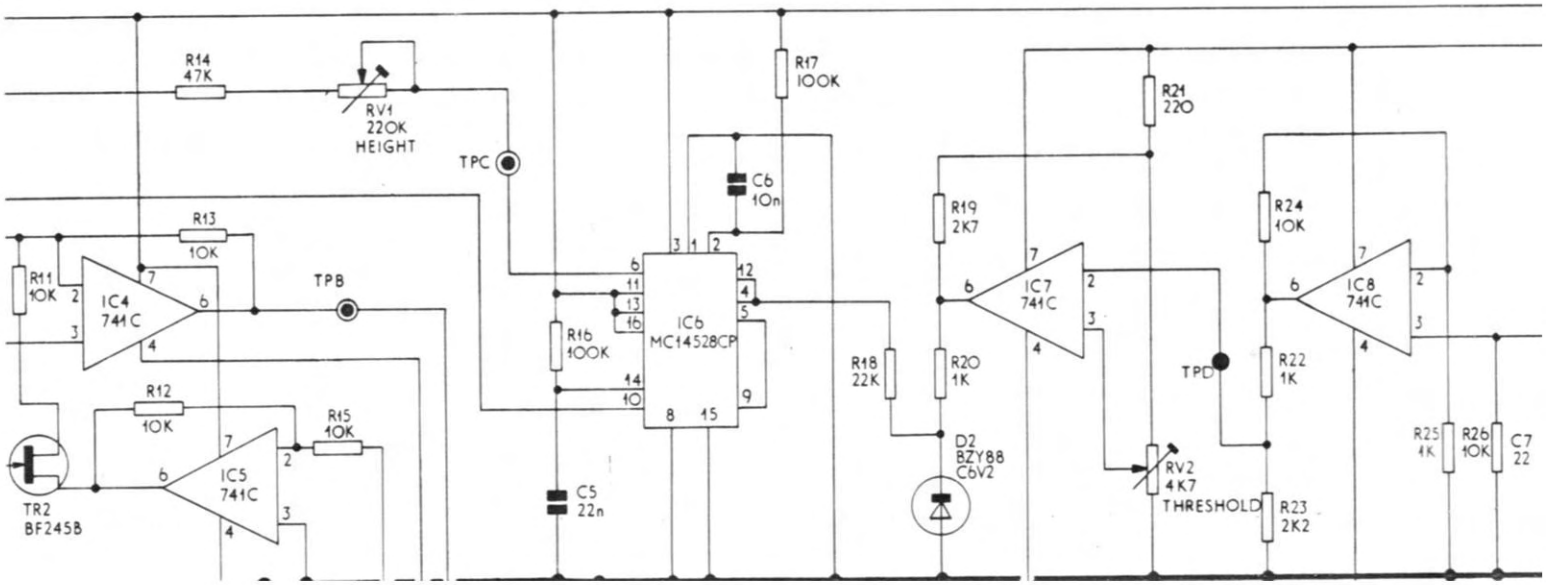

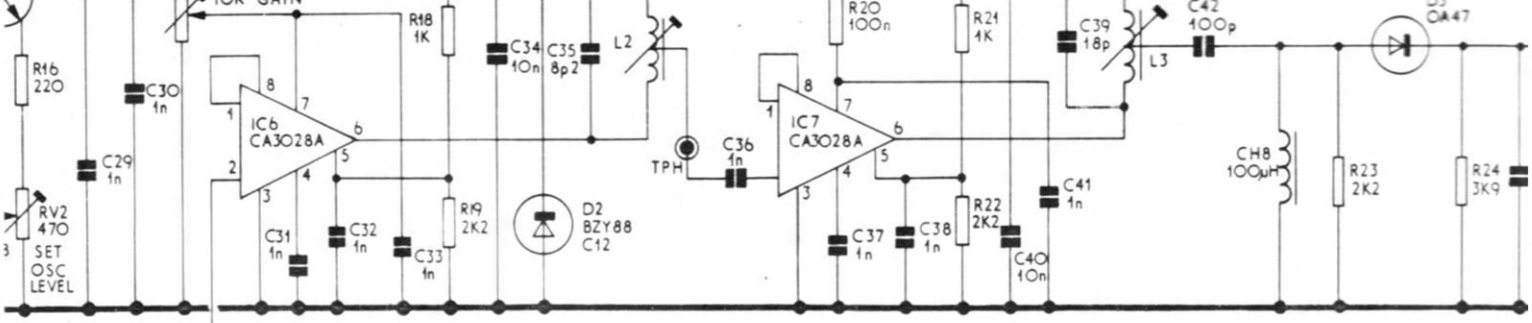

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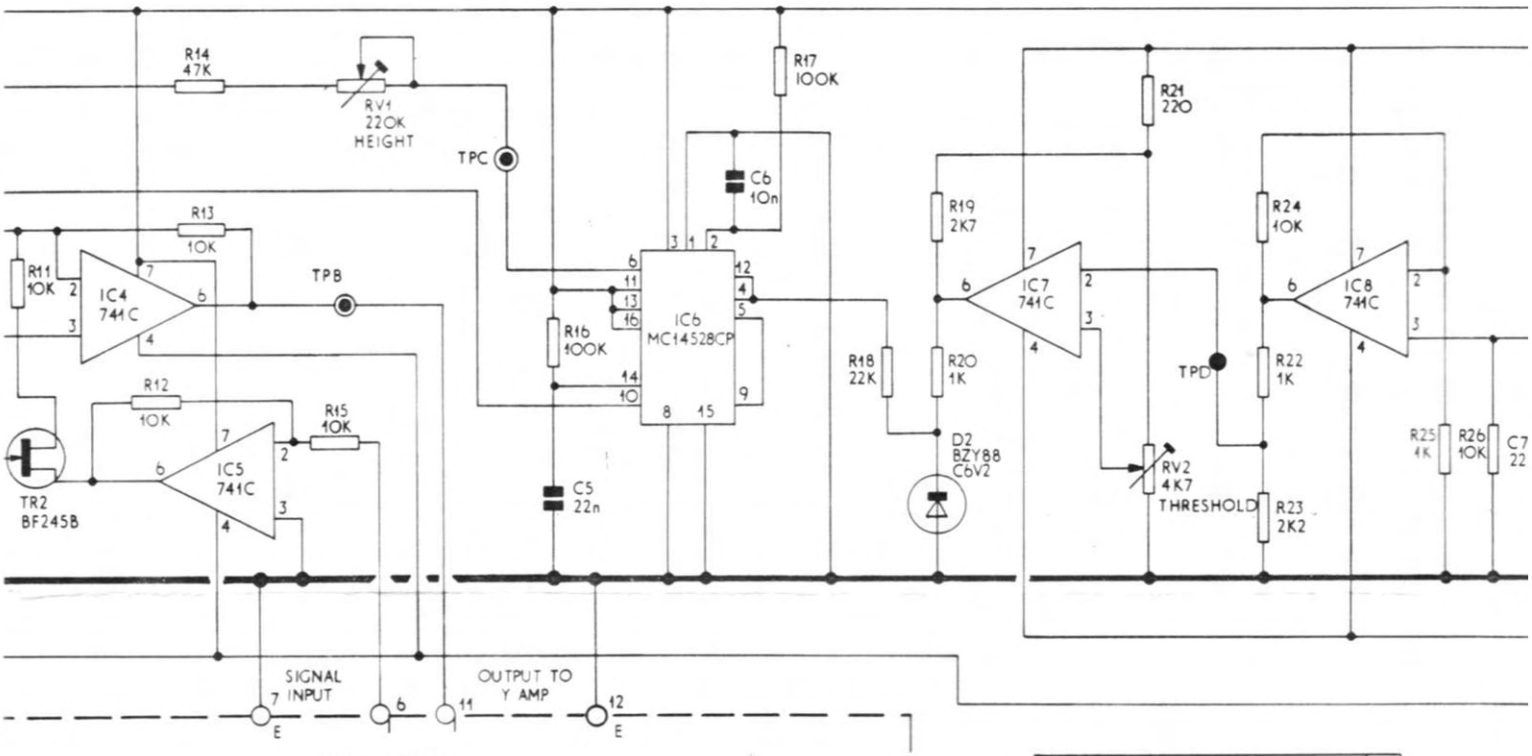

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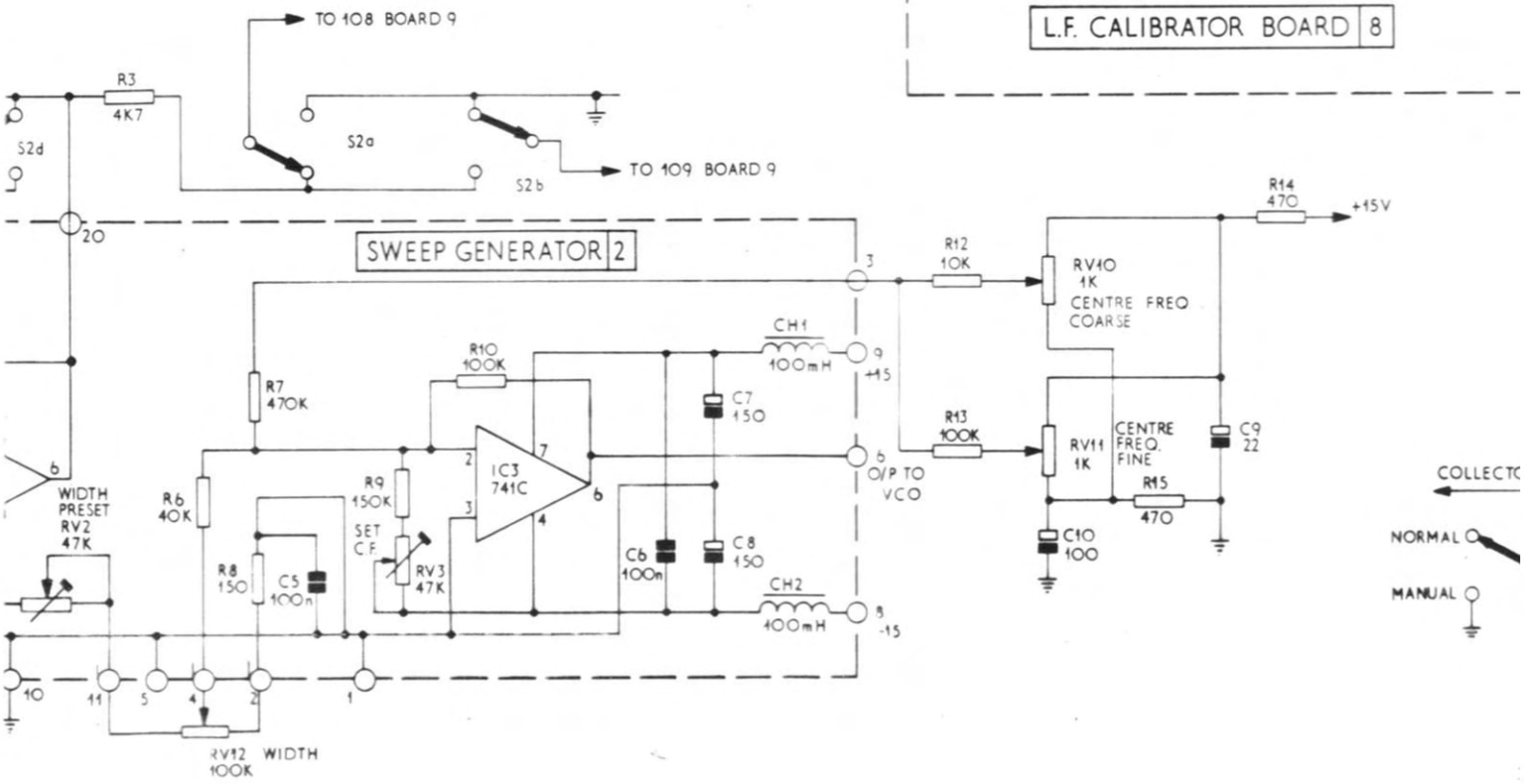
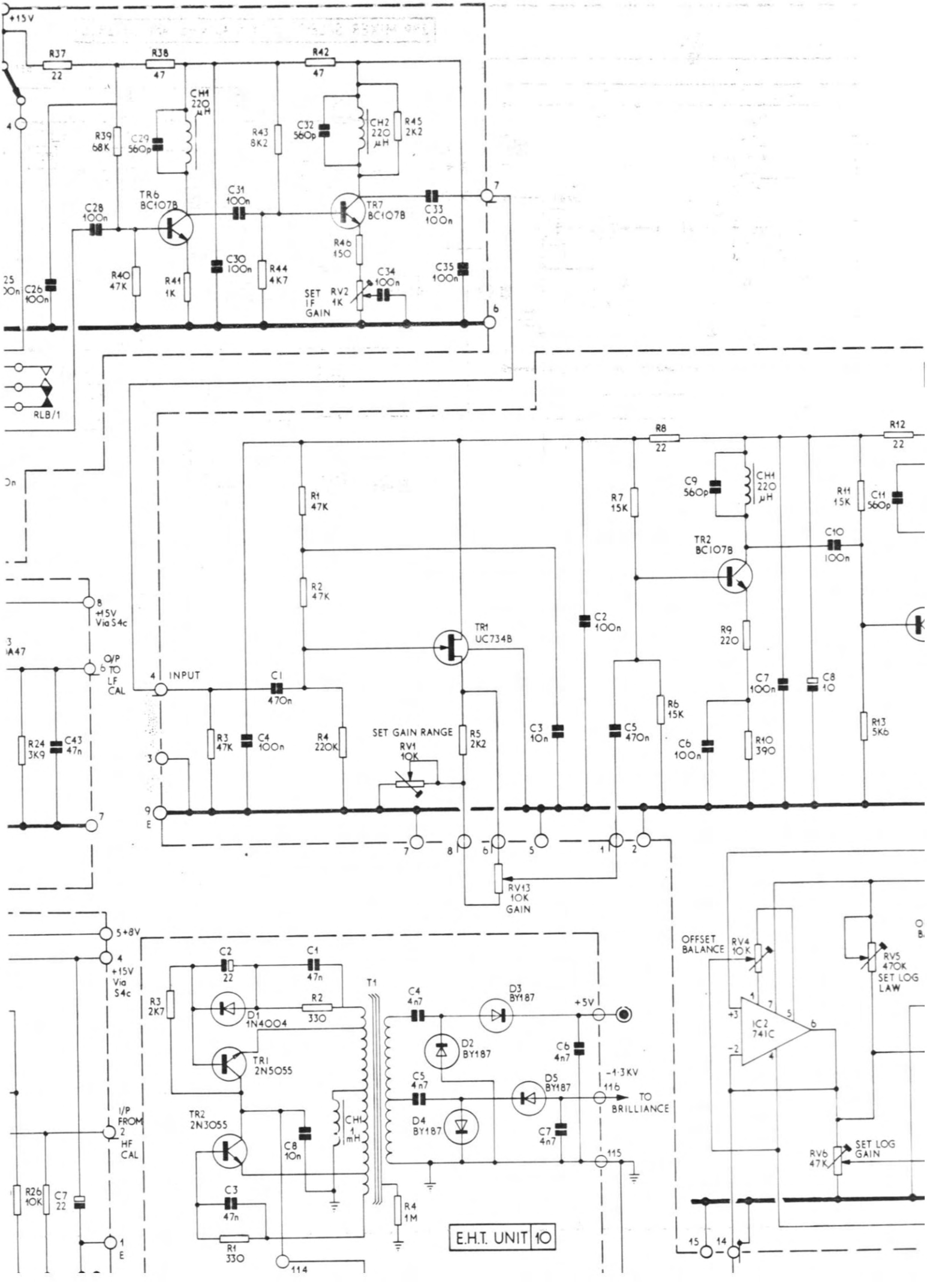
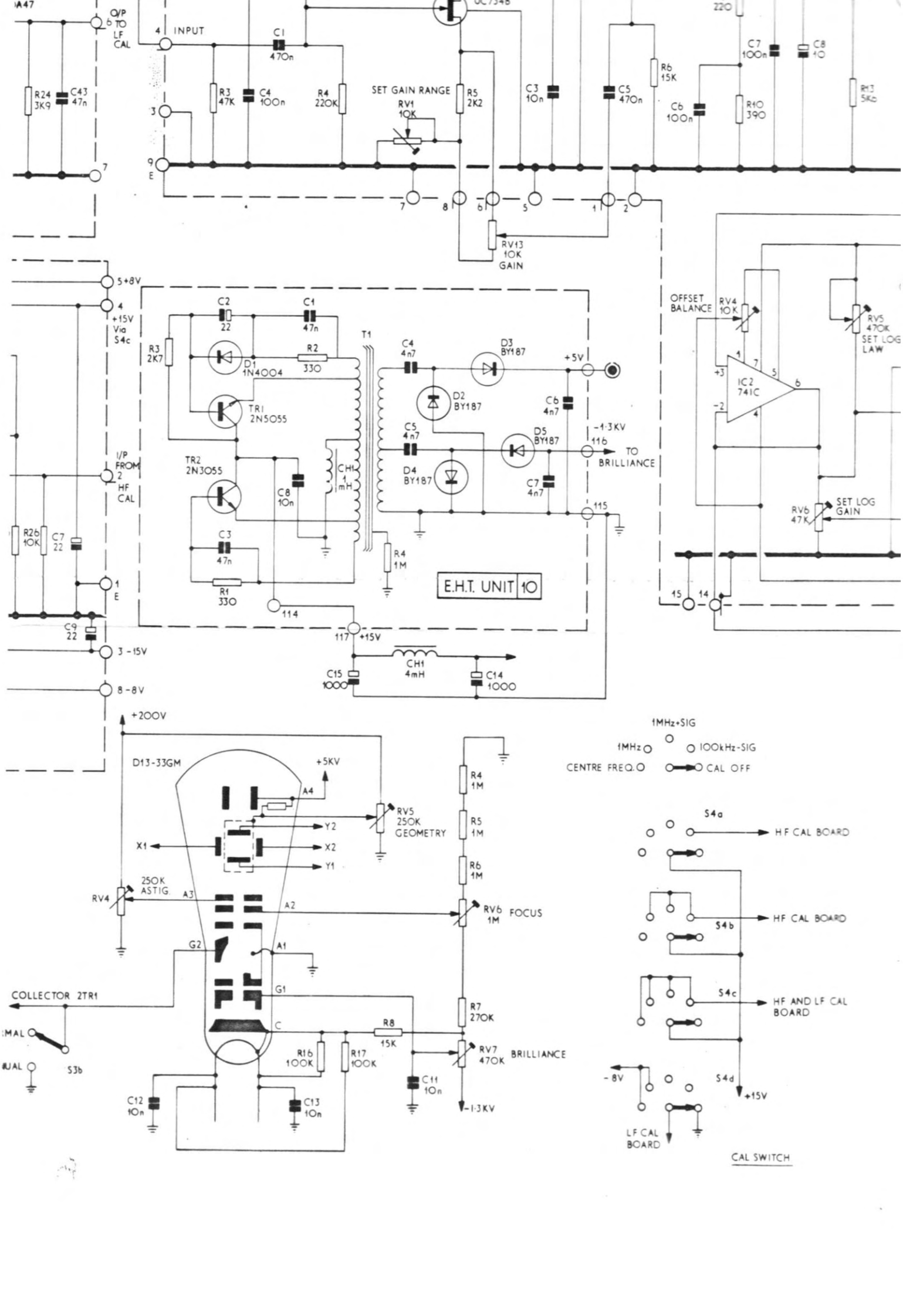
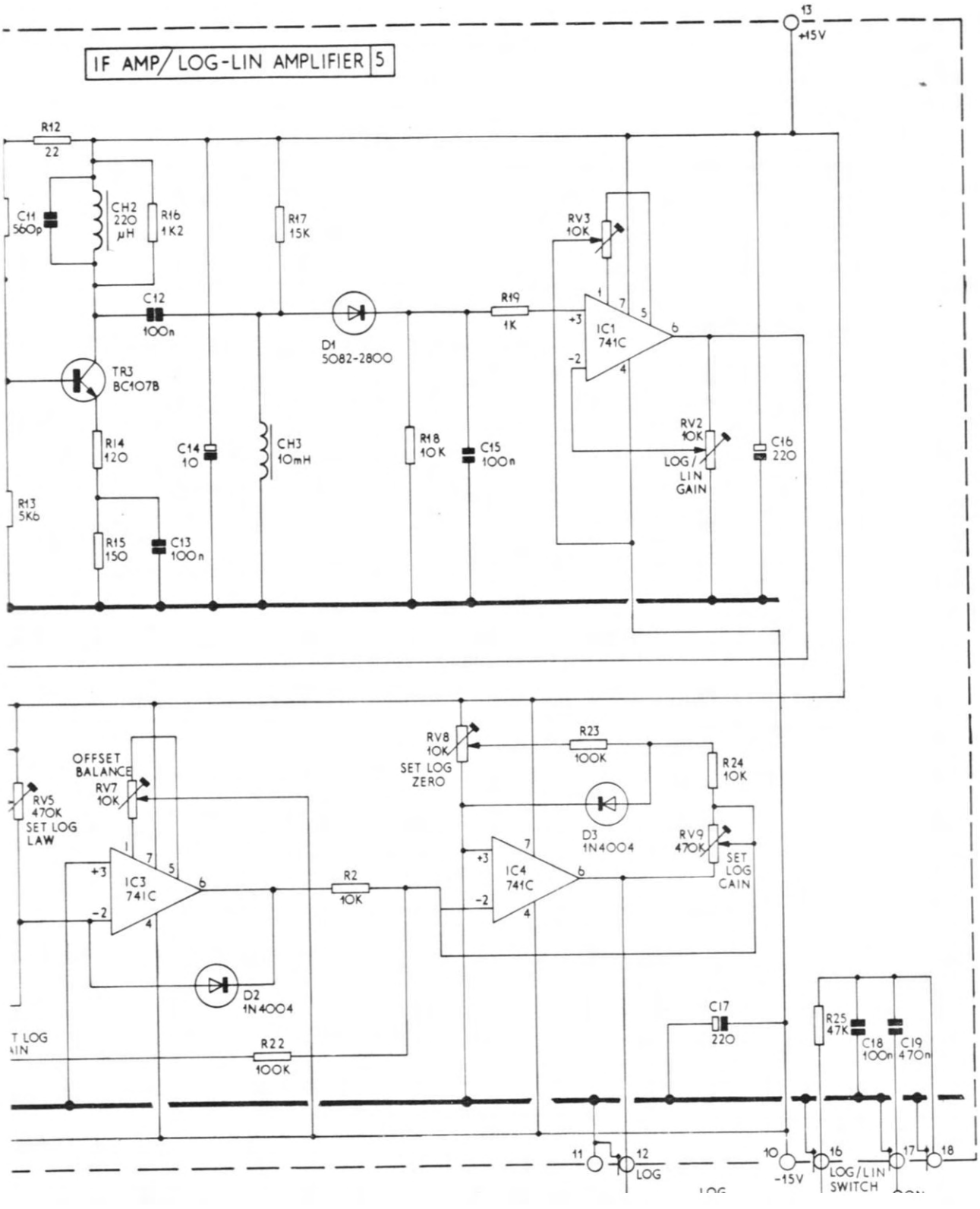
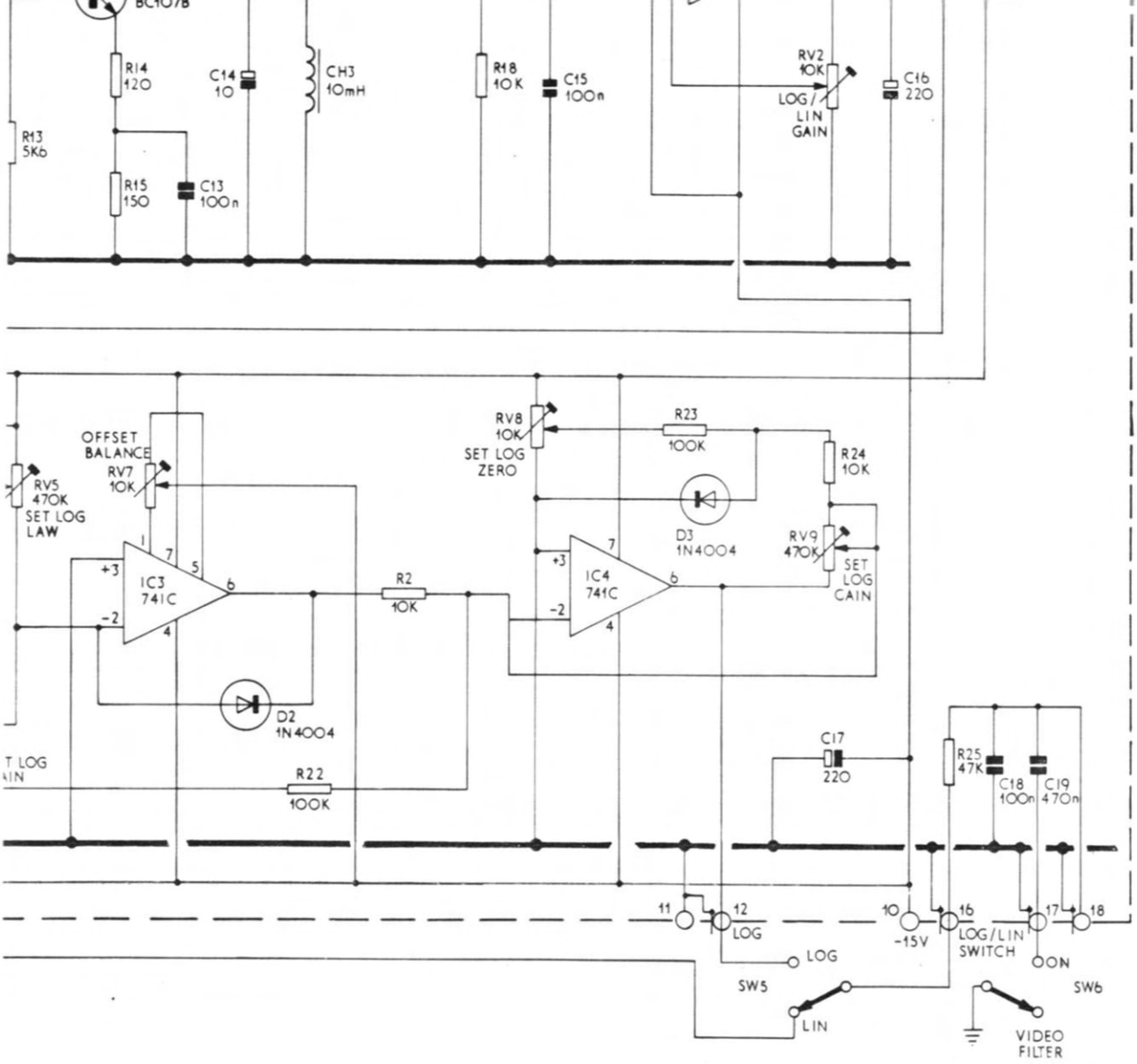



+15V
R37
22
R38
47
R42
47
CH1
220
µH
R39
68K
C29
560p
R43
8K2
C32
560p
CH2
220
µH
R45
2K2
TR6
BC107B
C31
100n
TR7
BC107B
C33
100n
C28
100n
R46
150
C30
100n
R44
4K7
C35
100n
R40
47K
R41
1K
C34
100n
SET
IF
GAIN
RV2
1K
C26
100n
RLB/1
R8
22
R12
22
R1
47K
R7
15K
C9
560p
CH1
220
µH
R11
15K
C11
560p
TR2
BC107B
C10
100n
R2
47K
C2
100n
TR1
UC734B
R9
220
8
+15V
Via S4c
O/P
6 TO
LF
CAL
4 INPUT
C1
470n
C7
100n
C8
10
R6
15K
R13
5K6
R24
3K9
C43
47n
R3
47K
C4
100n
R4
220K
SET GAIN RANGE
RV1
10K
R5
2K2
C3
10n
C5
470n
C6
100n
R10
390
3
9
E
7
8
6
5
1
2
RV13
10K
GAIN
5+8V
4
+15V
Via
S4c
C2
22
C1
47n
R3
2K7
R2
330
D1
1N4004
TR1
2N5055
T1
C4
4n7
D3
BY187
+5V
D2
BY187
C6
4n7
C5
4n7
D5
BY187
-1·3KV
116
TO
BRILLIANCE
D4
BY187
C7
4n7
TR2
2N3055
CH1
1
mH
C8
10n
115
C3
47n
R4
1M
R1
330
114
I/P
FROM
2
HF
CAL
R26
10K
C7
22
1
E
OFFSET
BALANCE
RV4
10K
RV5
470K
SET LOG
LAW
IC2
741C
SET LOG
GAIN
RV6
47K
15
14
E.H.T. UNIT 10


O/P TO LF CAL
INPUT
C1 470n
R24 3K9
C43 47n
R3 47K
C4 100n
R4 220K
SET GAIN RANGE
RV1 10K
R5 2K2
C3 10n
C5 470n
R6 15K
C6 100n
R10 390
C7 100n
C8 10
R13 5K6
RV13 10K GAIN
5 +8V
4 +15V Via S4c
I/P FROM 2 HF CAL
R26 10K
C7 22
1 E
C9 22
3 -15V
8 -8V
C2 22
C1 47n
R3 2K7
D1 1N4004
R2 330
TR1 2N5055
TR2 2N3055
C8 10n
CH1 1 mH
T1
C4 4n7
D3 BY187
+5V
D2 BY187
C6 4n7
C5 4n7
D5 BY187
-1·3KV
116
TO BRILLIANCE
D4 BY187
C7 4n7
115
C3 47n
R1 330
R4 1M
E.H.T. UNIT 10
114
117 +15V
CH1 4mH
C15 1000
C14 1000
OFFSET BALANCE
RV4 10K
IC2 741C
RV5 470K SET LOG LAW
RV6 47K SET LOG GAIN
15
14
+200V
D13-33GM
+5KV
A4
RV5 250K GEOMETRY
Y2
X1
X2
Y1
250K ASTIG.
RV4
A3
A2
RV6 1M FOCUS
G2
A1
G1
C
R8 15K
R4 1M
R5 1M
R6 1M
R7 270K
RV7 470K BRILLIANCE
-1·3KV
R16 100K
R17 100K
C11 10n
C12 10n
C13 10n
COLLECTOR 2TR1
S3b
1MHz+SIG
1MHz
100kHz-SIG
CENTRE FREQ.
CAL OFF
S4a
HF CAL BOARD
S4b
HF CAL BOARD
S4c
HF AND LF CAL BOARD
S4d
-8V
+15V
LF CAL BOARD
CAL SWITCH


IF AMP/ LOG-LIN AMPLIFIER 5
13
+15V
R12
22
C11
560p
CH2
220
µH
R16
1K2
R17
15K
RV3
10K
C12
100n
D1
5082-2800
R19
1K
IC1
741C
TR3
BC107B
R14
120
C14
10
CH3
10mH
R18
10K
C15
100n
RV2
10K
LOG/
LIN
GAIN
C16
220
R13
5K6
R15
150
C13
100n
OFFSET
BALANCE
RV7
10K
RV5
470K
SET LOG
LAW
IC3
741C
R2
10K
RV8
10K
SET LOG
ZERO
R23
100K
R24
10K
D3
1N4004
RV9
470K
SET
LOG
GAIN
IC4
741C
D2
1N4004
C17
220
R25
47K
C18
100n
C19
470n
R22
100K
T LOG
AIN
11
12
LOG
10
-15V
16
LOG/LIN
SWITCH
17
18



CIRCUIT DIAGRAM 1061B

BP 1432 ISSUE 1