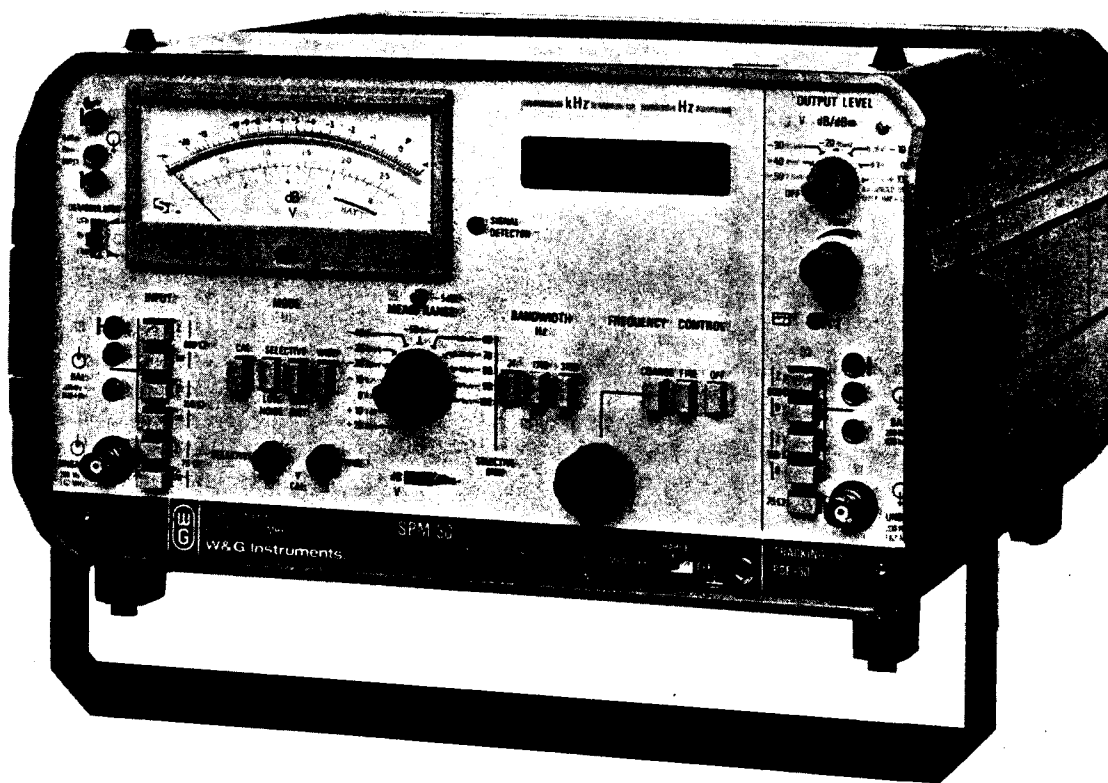


# Appendix



## Selective Level Meter

with Tracking Oscillator PSE-30

## SPM-30

with wideband section

Frequency range 200 Hz to 1620 kHz



SELECTIVE LEVEL METER    SPM-30  
with TRACKING OSCILLATOR    PSE-30

Appendix ..... BN/4502/00.87

RV/ALK

Subject to change without notice  
Printed in the United Kingdom

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**W & G Instruments Ltd.**

*A member of the Wandel & Goltermann group of companies*

PRECISION ELECTRONIC  
MEASURING INSTRUMENTS

Series Status of the Diagrams forming the  
Appendix to the Service Manual for the  
SPM-30/PSE-30

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All circuit and component layout diagrams  
are applicable to instruments of Series K.

# CONTENTS

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## INTRODUCTION TO APPENDIX

Pin arrangements of Semi-conductor Devices used in SPM-30/PSE-30

## COMPONENTS LISTS

Parts Mounted on or Forming Part of Front Panel

Rear Panel

Complete Chassis Assembly

Cable Assemblies

A81 Interconnection Board

Spares and Accessories

Note. All other Lists for individual units will be found adjacent or near to the relevant Circuit and Component Layout diagram.

## ILLUSTRATIONS & COMPONENTS LISTS

- Fig. 1 Block Diagram of Complete Instrument, SPM-30/PSE-30
- Fig. 2 Block Diagram of Synthesiser Assembly, (12)
- Fig. 3 Interconnections Diagram
- Fig. 4 Location of units within Instrument
- Fig. 5 Circuit Diagram, Power Supply (104)
- Fig. 6 Component Layout, Power Supply (104)
- Fig. 7 Circuit Diagram, Input Matching unit, (82) and Pre-amplifier/Attenuator (22)
- Fig. 8 Component Layout, Input Matching unit, (82)
- Fig. 9 Component Layout, Pre-amplifier/Attenuator, (22)
- Fig. 10 Circuit Diagram, Mixer 1, (23) ; 4MHz B/P Filter, (24) and Mixer 2/3.1kHz Filter, (79)
- Fig. 11 Component Layout, Mixer 1, (23)
- Fig. 12 Component Layout, 4MHz B/P Filter, (24)
- Fig. 13 Component Layout, Mixer 2/3.1kHz Filter, (79)
- Fig. 14 Circuit Diagram, 24Hz and 1.74kHz Filters, (77)
- Fig. 15 Component Layout, 24Hz and 1.74kHz Filters, (77)
- Fig. 16 Circuit Diagram, I.F. Amplifier/EPRM, (27)
- Fig. 17 Component Layout, I.F. Amplifier/EPRM, (27)
- Fig. 18 Circuit Diagram, Meter and Demodulator, (83)
- Fig. 19 Component Layout, Meter and Demodulator, (83)
- Fig. 20 Component Layout, Frequency Control, (29)
- Fig. 21 Component Layout, Frequency Display, (32)
- Fig. 22 Circuit Diagram, Frequency Control, (29) and Frequency Display (32)

- Fig. 23 Circuit Diagram, Calibration unit, (30)
- Fig. 24 Component Layout, Calibration unit, (30)
- Fig. 25 Component Layout, Divider 2, (34)
- Fig. 26 Component Layout, Divider 1, (33)
- Fig. 27 Circuit Diagram, Divider 1, (33) and Divider 2, (34)
- Fig. 28 Circuit Diagram, Phase Detector, (35)
- Fig. 29 Component Layout, Phase Detector, (35)
- Fig. 30 Circuit Diagram, 4...5.62MHz V.C.O., (36) ; Buffer, (39) and Synthesiser Amplifier, (40)
- Fig. 31 Component Layout, 4...5.62MHz V.C.O., (36)
- Fig. 32 Component Layout, Buffer Amp., (39)
- Fig. 33 Component Layout, Synthesiser Amplifier, (40)
- Fig. 34 Circuit Diagram, 8MHz Crystal Oscillator, (38) and Divider 3, (37)
- Fig. 35 Component Layout, 8MHz Crystal Oscillator, (38)
- Fig. 36 Component Layout, Divider 3, (37)
- Fig. 37 Circuit Diagram, 8.02MHz V.C.O., (41) and 4.01MHz P.L.L., (42)
- Fig. 38 Component Layout, 8.02MHz V.C.O., (41)
- Fig. 39 Component Layout, 4.01MHz P.L.L., (42)
- Fig. 40 Component Layout, PSE-30 Tracking Oscillator, (10)
- Fig. 41 Circuit Diagram, PSE-30 Tracking Oscillator, (10)

## INTRODUCTION TO APPENDIX

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This Appendix has been produced as a separate publication to provide the service technician with essential information on the construction and circuitry of the instrument. Further servicing and permitted adjustment information is available in the Service Manual which may be obtained from your local W & G agent.

When used with the Service Manual, this Appendix may be conveniently opened at the page required and a circuit or other diagram may be referred to in conjunction with the text of the Service Manual.

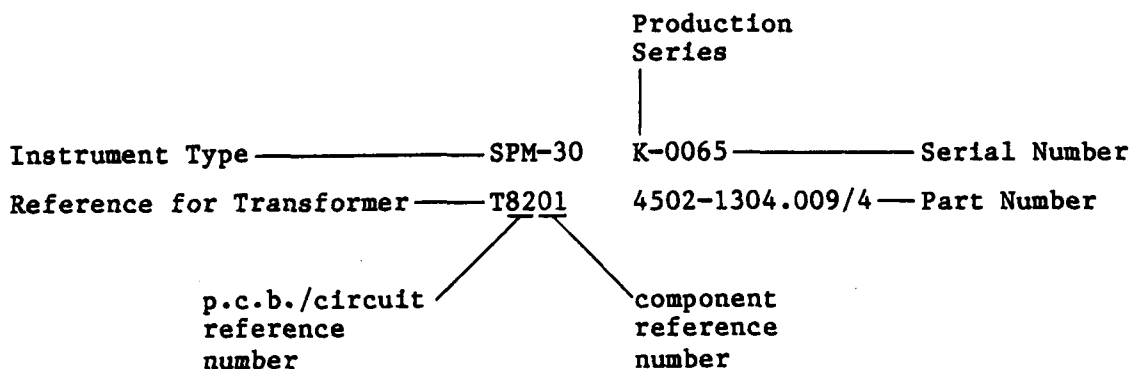
On the following pages will be found full circuit information for the SPM/PSE-30 Level Measuring Set, together with component layout diagrams and parts lists for all the units and sub-assemblies incorporated in a complete instrument.

### Component Identification


Users of this Appendix are reminded of the information regarding the identification of components which may be found in Section 6.2.1 of the Service Manual.

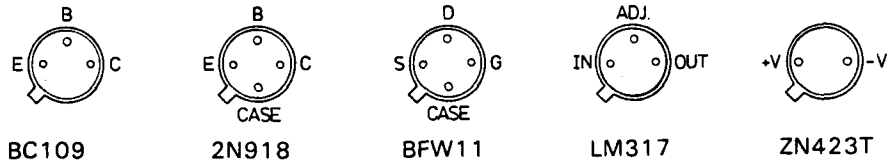
### Ordering Information

When ordering spare parts it is essential to quote the type of instrument and production series, together with the serial number as well as the circuit reference and part number of the particular component required, for example:

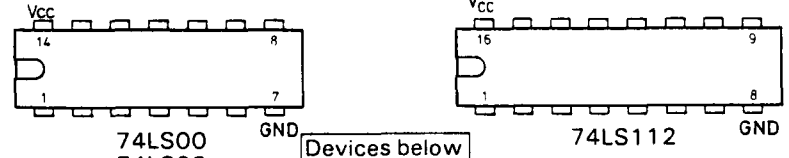
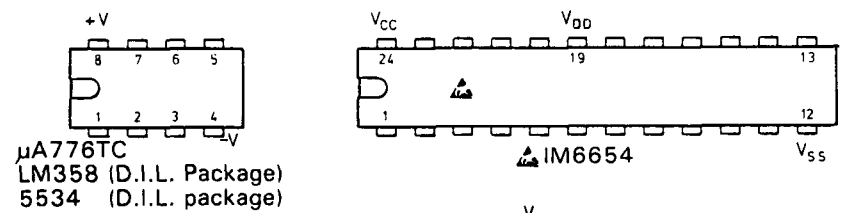
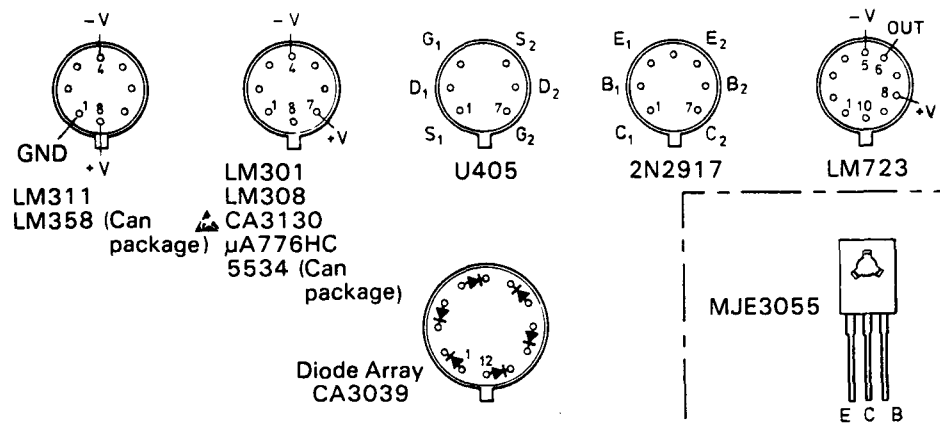
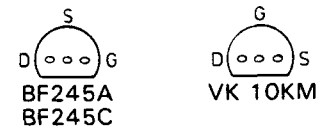


### Electrostatic Sensitive Devices

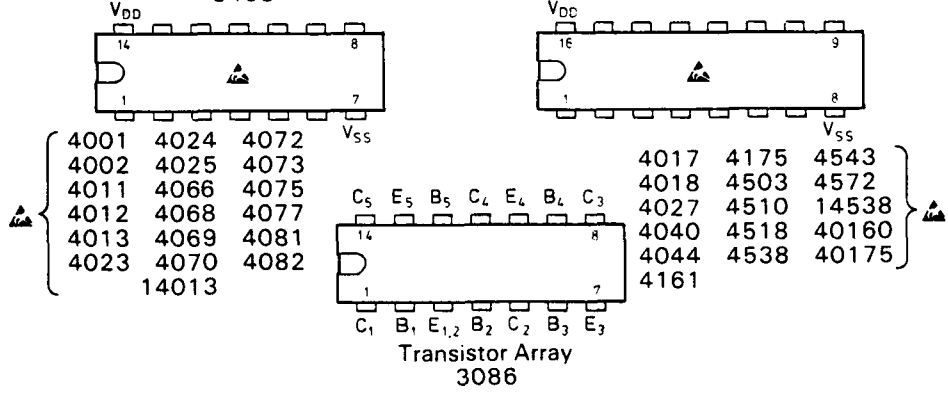
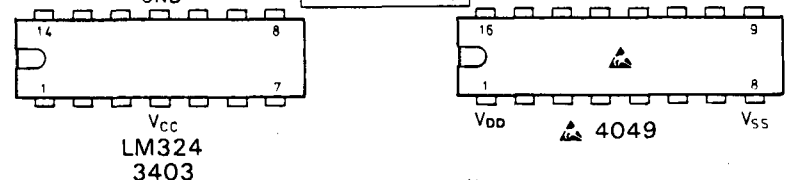
Certain semiconductor devices used within this instrument use CMOS technology and are therefore sensitive to pulses derived from discharges of static electricity. Units incorporating CMOS devices are marked with the symbol:  thus indicating that care should be taken when servicing these units. In the diagram showing the pin arrangements of the semiconductors this symbol has been added to the particular devices for which this warning applies. See Section 6.1.5 in the Service Manual for information regarding the handling of these devices.



Devices above dotted line  
viewed on bases



Devices below dotted line  
viewed on top



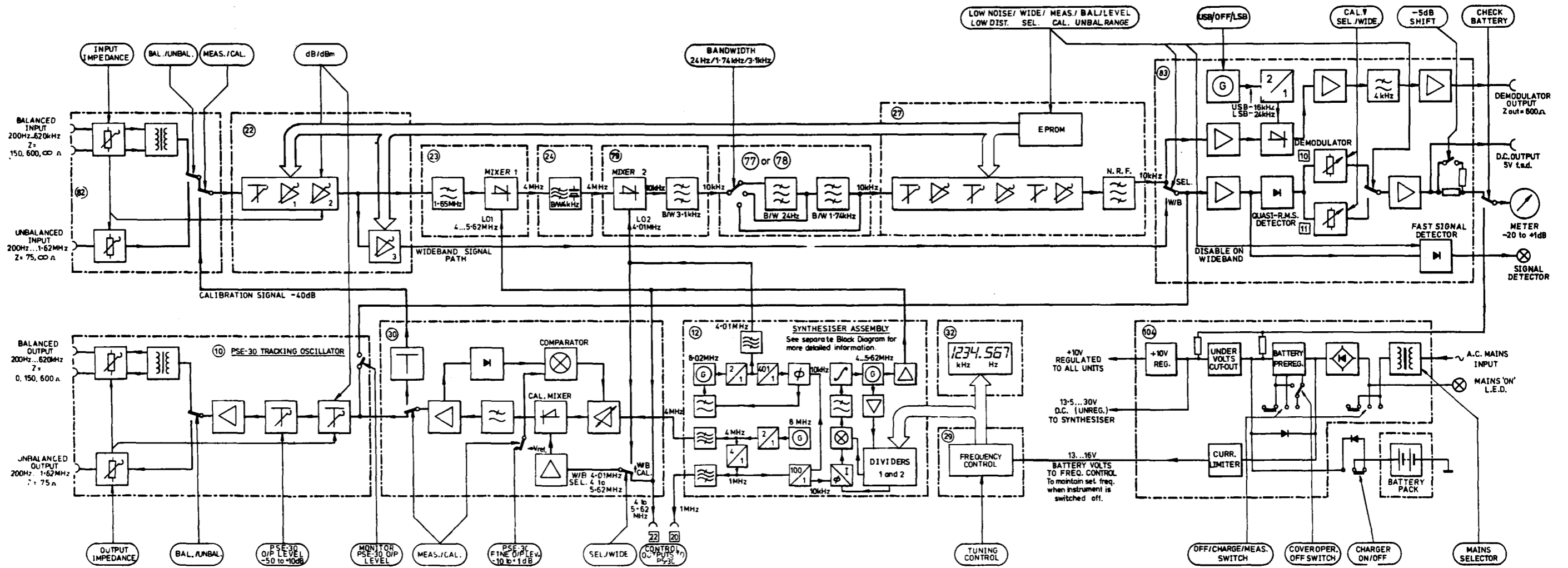


Fig. 1 Block Diagram of Complete Instrument, SPM-30/PSE-30

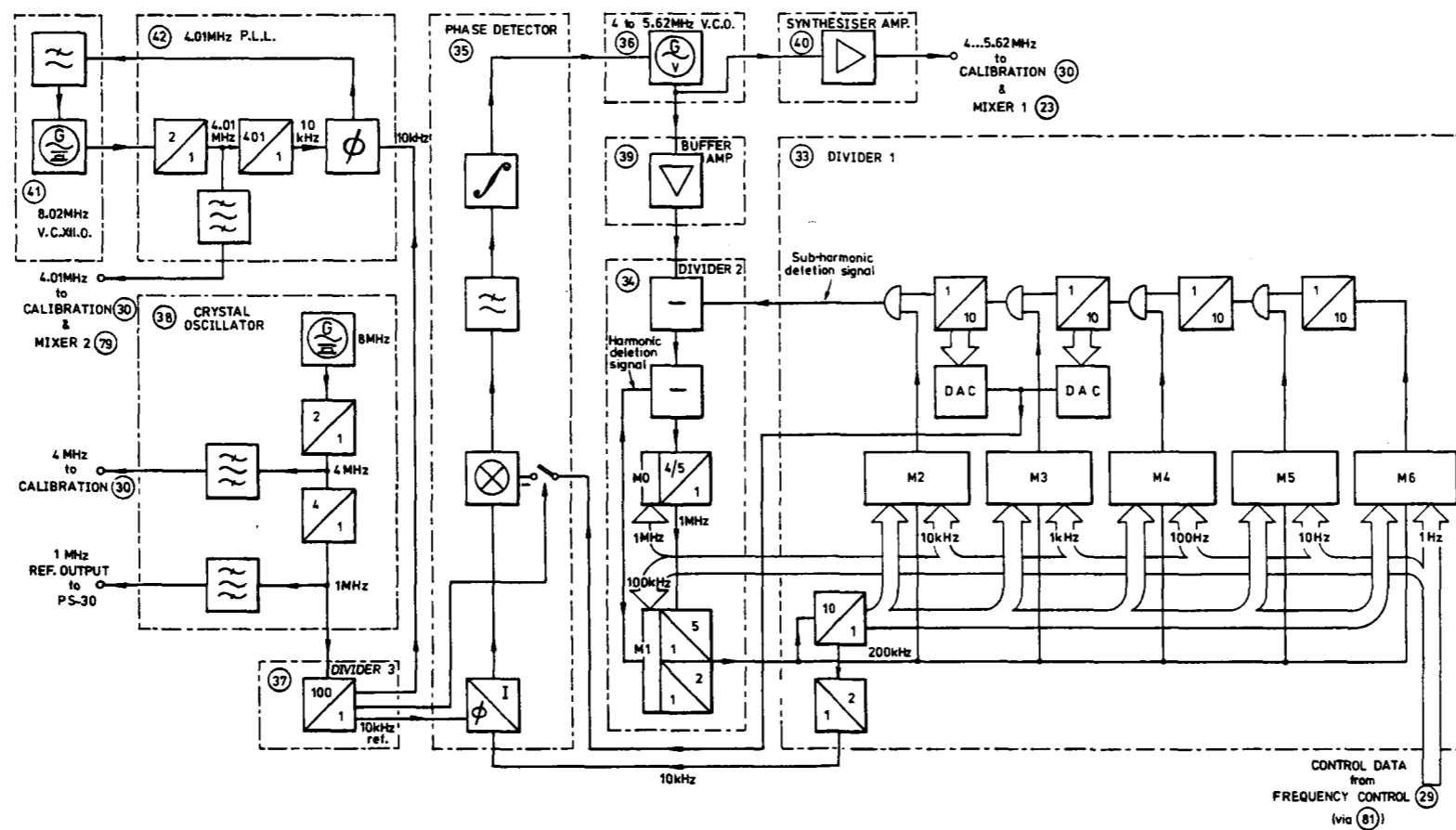


Fig. 2 Block Diagram of Synthesiser Assembly, (12)



(Used on the Parts Lists throughout this Appendix)

- MF Metal Film
- Tant. Tantalum
- Cer. Ceramic
- PE Polyester
- PF Polystyrene Film
- CF Carbon Film
- W/W Wirewound
- Elec. Electrolytic
- Var. Variable
- Al. Ox. Aluminium Oxide

Key to Component Type Abbreviations



## PARTS MOUNTED ON OR FORMING PART OF FRONT PANEL

TYPE	PART NO.
METER, DS 48 SIFAM (with VOLTAGE SCALE)	4999-0000.045/-
C.F. SOCKET, 3-pole (BALANCED INPUTS)	0000-3713.006/4
SWITCH, SLIDE D.P.S.T. (dB/dBm SWITCH)	0001-7604.409/-
VERSACON BODY	0000-1681.004/5
VERSACON LOCKING RING (UNBALANCED INPUT)	0000-1672.055/5
RESISTOR, VARIABLE (CAL. $\nabla$ /WIDE) 10k, 1W	0000-7545.270/-
RESISTOR, VARIABLE (CAL. $\nabla$ /SELECTIVE) 10k, 1W	0000-7545.270/-
SWITCH, ROTARY (MEAS. RANGE)	0000-7602.469/4
SOCKET, EARTHING	0000-3004.045/4
SWITCH BUTTON (CHECK BATT. and  )	
PSE-30 O/P LEVEL)	0000-3705.425/5
SWITCH, MICRO (CHECK BATT. and  )	
PSE-30 O/P LEVEL)	0001-0034.176/-
L.E.D., RED (MAINS ON)	0001-0064.036/-
TACHO. GENERATOR (TUNING CONTROL)	0829-7036.821/5
SWITCH, SLIDE D.P.D.T. (MEAS./CHARGE/OFF)	0001-0069.439/-
VERSACON BNC ADAPTOR	0000-1674.008/5
KNOB (O/P LEVEL)	0000-7500.383/-
CAP, KNOB (O/P LEVEL)	0000-7500.396/-
KNOB (FINE)	0001-0063.396/-
CAP, KNOB (FINE)	0001-0063.707/-
KNOB (FREQUENCY CONTROL)	0001-0063.422/-
CAP, KNOB (FREQUENCY CONTROL)	0001-0063.710/-
KNOB (MEAS. RANGE)	0001-0063.493/-
CAP, KNOB (MEAS. RANGE)	0001-0063.749/-
KNOB (CAL. $\nabla$ WIDE and SELECTIVE)	0001-0063.354/-
CAP, KNOB (CAL. $\nabla$ WIDE and SELECTIVE)	0001-0063.684/-

## REAR PANEL

VALUE	RATING	TYPE	PART NO.
		SWITCH, (BATT CHARGER ON/OFF)	0001-7604.409/-
		SOCKET, BNC	0000-7598.696/-
T315mA	250V	FUSELINK, BELLING-LEE 2080A/0.315A	0001-0020.601/-
		OR	
T630mA	115V	FUSELINK, BELLING-LEE 2080A/0.63A	
		FUSEHOLDER, BELLING-LEE L2006A (20m x 5mm)	0000-7602.236/-
		BATTERIES, BEREC NCC400 SIZE D (12 used)	0000-7594.849/-
T1A	BATT.	FUSELINK, ANTI-SURGE	0001-0020.711/-



## COMPLETE CHASSIS ASSEMBLY

REF.	TYPE	PART NO.
A10	ASSEMBLY, TRACKING OSCILLATOR PSE-30 Includes ASSEMBLY, P.C.B. A80, PSE-30	4502-1110.002/2 4502-1080.006/2
A104	ASSEMBLY, POWER UNIT Includes ASSEMBLY, P.C.B. A84, POWER SUPPLY	4502-1189.004/2 4502-1084.002/3
A22	ASSEMBLY, PRE-AMPLIFIER	4502-1122.006/3
A23	ASSEMBLY, MIXER 1	4502-1123.005/3
A27	ASSEMBLY, I.F. AMPLIFIER & PROM	4502-1027.001/3
A29	ASSEMBLY, FREQUENCY CONTROL	4502-1029.009/3
A30	ASSEMBLY, CALIBRATION	4502-1030.001/3
A32	ASSEMBLY, DISPLAY	4502-1032.009/3
A33	ASSEMBLY, DIVIDER 1	4502-1033.008/3
A34	ASSEMBLY, DIVIDER 2	4502-1034.007/3
A35	ASSEMBLY, PHASE DETECTOR	4502-1035.006/3
A36	ASSEMBLY, 4...5.62MHz V.C.O.	4502-1036.005/3
A37	ASSEMBLY, DIVIDER 3	4502-1037.004/3
A38	ASSEMBLY, 8MHz CRYSTAL OSC	4502-1038.003/3
A39	ASSEMBLY, BUFFER AMP.	4502-1039.002/3
A40	ASSEMBLY, SYNTHESISER AMPLIFIER	4502-1040.004/3
A41	ASSEMBLY, 8.02MHz V.C.O.	4502-1041.003/3
A42	ASSEMBLY, 4.01MHz P.L.L.	4502-1042.002/3
A66	ASSEMBLY, 4MHz B/P FILTER UNIT Includes ASSEMBLY, P.C.B. A24	4502-1166.000/3 4502-1024.004/3
A77	ASSEMBLY, 24Hz FILTER	4502-1077.006/3
A79	ASSEMBLY, MIXER 2	4502-1079.004/3
A81	ASSEMBLY, INTERCONNECTION	4502-1081.005/3
A82	ASSEMBLY, MATCHING UNIT	4502-1082.004/3
A83	ASSEMBLY, METER AND DEMODULATOR	4502-1083.003/3

## A81 INTERCONNECTION BOARD

REF.	VALUE	TOL. $\pm$ %	RATING	TYPE	PART NO.
SK1				SOCKET, DIL 16-WAY	0000-7518.391/-
SK2				SOCKET, EDGE	
				CONNECTOR 10-WAY	0000-7602.317/-
SK3				SOCKET, EDGE CONNECTOR	
				10 + 10-WAY	0000-7602.304/-
SK4				SOCKET, EDGE CONNECTOR	
				36-WAY	0000-7602.333/-
SK5				SOCKET, EDGE CONNECTOR	
				36-WAY	0000-7602.294/-
SK6				SOCKET, EDGE CONNECTOR	
				20-WAY	0000-7602.320/-
SK7				SOCKET, DIL 16-WAY	0000-7518.391/-
SK8				SOCKET, DIL 16-WAY	0000-7518.391/-
SK10				SOCKET, DIL 16-WAY	0000-7518.391/-
S1				SWITCH, 4-PUSHBUTTON (MODE)	0000-7602.427/4
S2				SWITCH, 3-PUSHBUTTON (BANDWIDTH)	0000-7602.456/-
S3				SWITCH, 3-PUSHBUTTON (FREQUENCY CONTROL)	0000-7602.430/4
A81				P.C.B., INTERCONNECTION	4502-1081.005/3
R1	12k1	1	0W35	MF	0001-0002.218/-
C1	220 $\mu$		10V		0001-0041.842/-
C2	22n		10V		0001-0006.416/-

## CABLE ASSEMBLIES

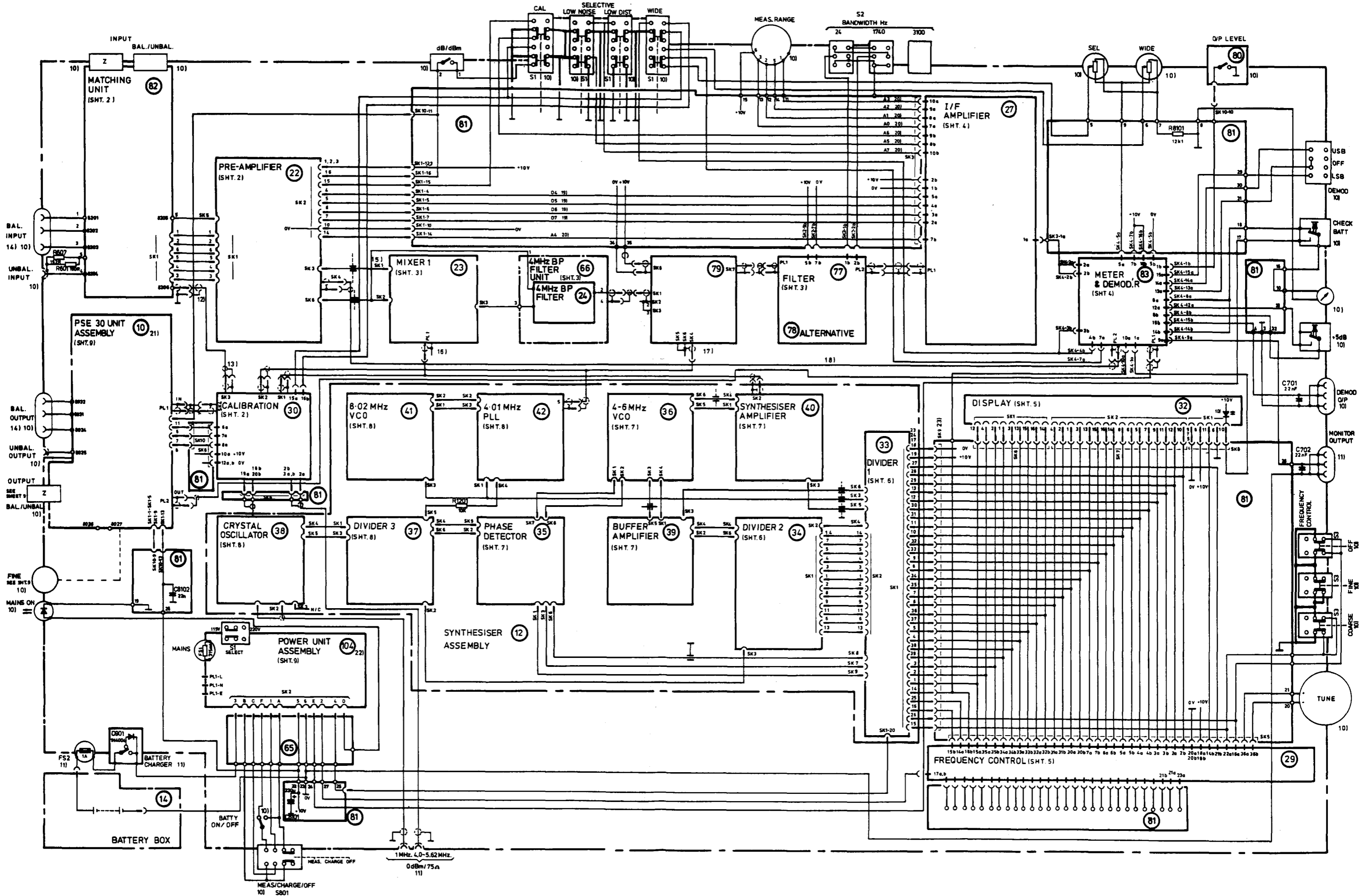
TYPE	PART NO.
CABLE ASSEMBLY, INTERCONNECTION TO DISPLAY 75mm Long	4502-1060.013/4
CABLE ASSEMBLY, INTERCONNECTION TO DISPLAY 90mm Long	4502-1060.026/4
CABLE ASSEMBLY, PRE-AMPLIFIER TO INTERCONNECTION	4502-1062.008/4
CABLE ASSEMBLY, PSE-30 TO INTERCONNECTION	4502-1063.007/4
CABLE ASSEMBLY, PART OF INTERCONNECTION, 40-way	4502-1064.006/4
CABLE ASSEMBLY, DIVIDER 1 TO DIVIDER 2, 14-way	4502-1067.016/4
CABLE ASSEMBLY, MATCHING UNIT TO PRE-AMPLIFIER, 14-way	4502-1067.029/4
CABLE ASSEMBLY, CONNECTING CALIBRATION TO MIXER 1 and SYN. AMP., and CALIBRATION TO MIXER 2 and 4.01MHz P.L.L., COAXIAL	4502-1069.001/3
CABLE ASSEMBLY, from SOCKET  on REAR PANEL TO INTERCONNECTION, COAXIAL	4502-1071.001/4
CABLE ASSEMBLY, from SOCKET  on REAR PANEL TO CRYSTAL OSCILLATOR, COAXIAL	4502-1072.001/4
CABLE ASSEMBLY, 24Hz FILTER TO I/F AMPLIFIER, COAXIAL	4502-1051.019/4
CABLE ASSEMBLY, PSE-30 TO METER, COAXIAL	4502-1051.022/4
CABLE ASSEMBLY, CALIBRATION TO MATCHING UNIT, COAXIAL with Fe BEADS	4502-1053.004/4
CABLE ASSEMBLY, 24Hz FILTER TO MIXER 2, COAXIAL	4502-1054.016/4
CABLE ASSEMBLY, MIXER 1 TO MIXER 2, COAXIAL	4502-1054.029/4
CABLE ASSEMBLY, PSE-30 TO CALIBRATION, COAXIAL with Fe BEADS	4502-1056.001/4
CABLE ASSEMBLY, METER TO PRE-AMPLIFIER, COAXIAL	4502-1057.000/4
CABLE ASSEMBLY, 4MHz FILTER TO INTERCONNECTION, COAXIAL	4502-1058.009/4
CABLE ASSEMBLY, POWER SUPPLY TO MIXER 2 (+10V)	4502-1073.000/4
CABLE ASSEMBLY, POWER SUPPLY TO REST OF INSTRUMENT includes P.C.B. A46	4502-1065.005/1 4502-0146.006/3

## SPARES

VALUE	RATING	TYPE	PART NO.
TO.315A	250V	FUSELINK, BELLING-LEE 2080A/0.315A ANTI-SURGE	0001-0020.601/-
T1A	BATT.	FUSE LINK, ANTI-SURGE	0001-0020.711/-
		BATTERIES, BEREC NCC400 SIZE D (12 used)	0000-7594.849/-

## ACCESSORIES

CABLE ASSEMBLY, MAINS  
2 metres long, 3-core  
L1949 BELLING-LEE



- |                             |                       |  |
|-----------------------------|-----------------------|--|
| 10) ON FRONT PANEL          | 14) 200 Hz - 1.64 MHz | 19) DATA LINES D4 - D7.                        |
| 11) ON REAR PANEL           | 15) -20 dB            | 20) ADDRESS LINES A0 - A7.                     |
| 12) -40 dB                  | 16) 4 - 5.64 MHz      | 21) INCORPORATING ASSEMBLY AB0                 |
| 13) SEL: 200 Hz - 1.64 MHz. | 17) 4.01 MHz          | 22) INCORPORATING ASSEMBLY AB4.                |
| WIDE BAND: 10 KHz.          | 18) 200 Hz - 1.64 MHz | 23) SK9 REPRESENTED BY PLATED THRU HOLES ONLY. |

Fig. 3 Interconnections Diagram

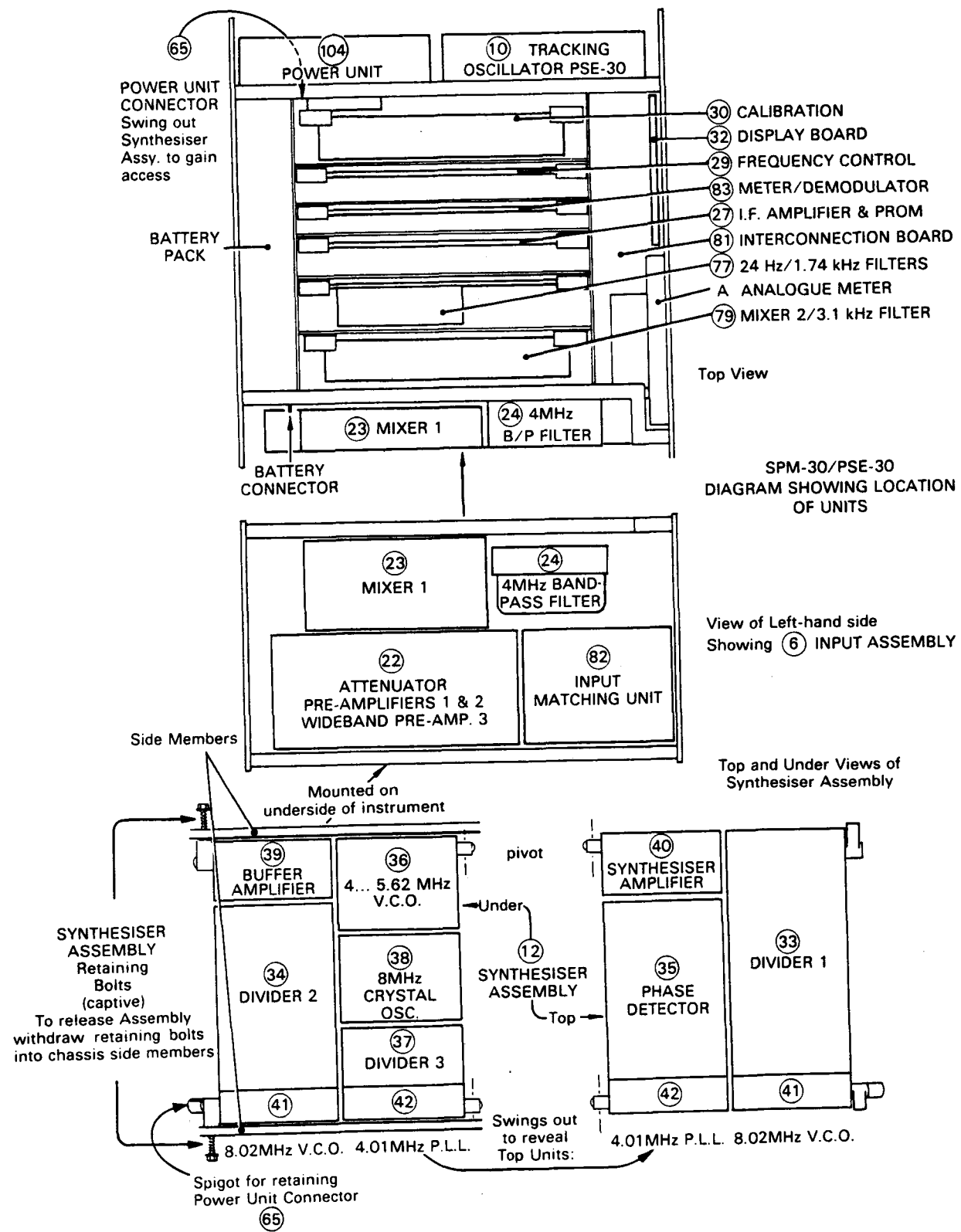
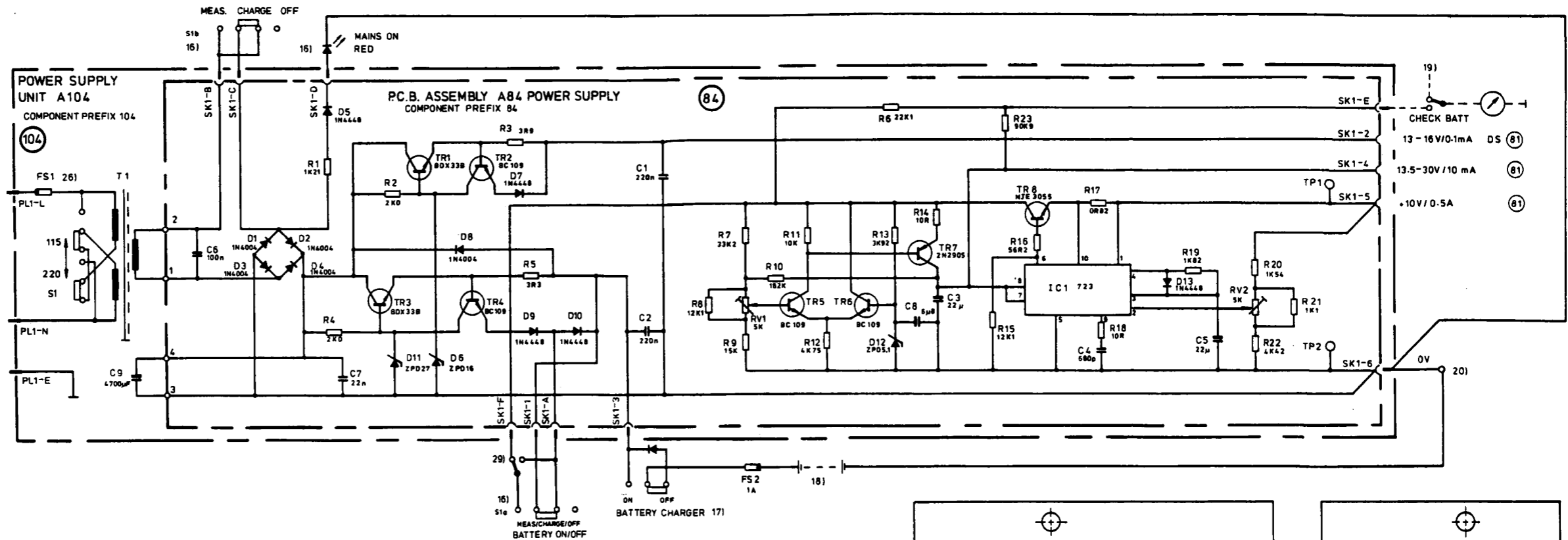


Fig. 4 Location of units within Instrument

**Fig. 5 Circuit Diagram, Power Supply (104)**



- 15) OUTPUT LEVEL MONITOR FACILITY
- 16) ON FRONT PANEL MAINS ON
- 17) ON BACK PANEL
- 18) BATTERY BOX
- 19) FROM METER BOARD VIA INTERCONNECTION BOARD.
- 20) TO INTERCONNECTION BOARD PIN 23
- 21) 220V - 315mA 115V - 630mA
- 22) FINE LEVEL CONTROL
- 23) RESISTORS NOT FITTED ON STD SERIES
- 24) COVER OPERATED OFF SWITCH

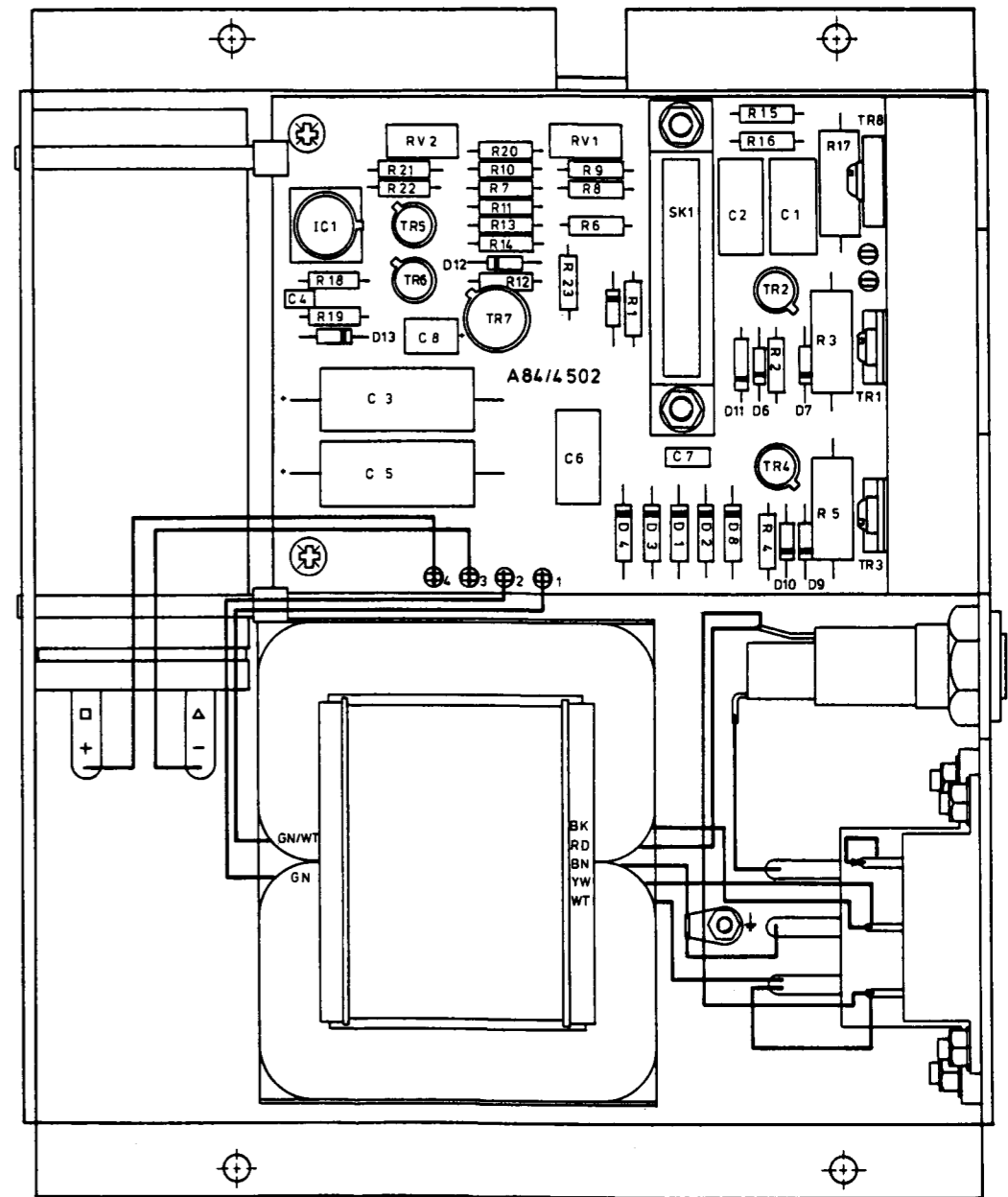
**ASSEMBLY A104 POWER SUPPLY**

REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.
C9	4700µ		40V		0000-7602.799/-
S1				SELECTOR SWITCH 115V/220V	0000-7598.706/-
T1				MAINS TRANSFORMER	4502-1308.005/4
PL1				PLUG, MAINS INPUT	0001-0033.245/-
FS1			250V	FUSELINK, T 315mA	0001-0020.601/-
FS2			115V	FUSELINK, T 630mA	0001-0020.711/-
A84			Batt.	FUSELINK, T 1A	0001-0020.711/-
				P.C.B. POWER SUPPLY UNIT	4502-1084.002/3

**ASSEMBLY P.C.B. A84, used on A104 POWER SUPPLY**

REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.
R1	1k21	1	0W35	MF	0001-0001.277/-
R2	2k	1	0W35	MF	0001-0001.455/-
R3	3R9	5	1W6	W/W	0000-7601.583/-
R4	2k	1	0W35	MF	0001-0001.455/-
R5	3R3	5	1W6	W/W	0000-7601.570/-
R6	22k1	1	0W35	MF	0001-0002.441/-
R7	33k2	1	0W35	MF	0001-0002.603/-
R8	12k1	1	0W35	MF	0001-0002.218/-
R9	15k	1	0W35	MF	0001-0002.289/-
R10	182k	1	0W35	MF	0001-0003.165/-
R11	10k	1	0W35	MF	0001-0002.137/-
R12	4k75	1	0W35	MF	0001-0001.824/-
R13	3k92	1	0W35	MF	0001-0001.730/-
R14	10R	1	0W35	MF	0001-0000.074/-
R15	12k1	1	0W35	MF	0001-0002.218/-
R16	56R2	1	0W35	MF	0001-0000.346/-
R17	OR82	5	2W	W/W	0000-7601.596/-
R18	10R	1	0W35	MF	0001-0000.074/-
R19	1k82	1	0W35	MF	0001-0001.413/-
R20	1k54	1	0W35	MF	0001-0001.361/-
R21	1k1	1	0W35	MF	0001-0001.235/-
R22	4k42	1	0W35	MF	0001-0001.785/-
R23	90k9	1	0W35	MF	0001-0002.975/-

REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.
RV1	5k	20	0W5 Lin.	Variable	0000-7574.283/-
C1	220n		100V		0001-0010.404/-
C2	220n		100V		0001-0010.404/-
C3	22µ		40V	Elec.	0001-0041.716/-
C4	680p	10	63V	Cer.	0001-0004.685/-
C5	22µ		40V	Elec.	0001-0041.716/-
C6	100n	10	100V		0001-0010.365/-
C7	22n	10	40V		0001-0006.418/-
C8	6µ8		35V	Elec.	0001-0040.856/-
TR1				BDX 33B	0000-7591.059/-
TR2				BC109	0000-7602.029/-
TR3				BDX 33B	0000-7591.059/-
TR4				BC109	0000-7602.029/-
TR5				BC109	0000-7602.029/-
TR6				BC109	0000-7602.029/-
TR7				2N2905	0001-0017.287/-
TR8				MJE 3055	0001-0017.148/-
D1				1N4004	0000-7605.026/-
D2				1N4004	0000-7605.026/-
D3				1N4004	0000-7605.026/-
D4				1N4004	0000-7605.026/-
D5				1N4448	0001-0018.493/-
D6				BZY88/C16	0001-0019.159/-
D7				1N4448	0001-0018.493/-
D8				1N4004	0000-7605.026/-
D9				1N4448	0001-0018.493/-
D10				1N4448	0001-0018.493/-
D11				BZY88/C27	0000-7594.687/-
D12				ZPD 5.1	0001-0018.833/-
D13				1N4448	0001-0018.493/-
IC1				µA 723	0001-0015.852/-
SK1				EDGE CONNECTOR, 12-WAY	0000-7606.054/-
A84				P.C.B. POWER SUPPLY UNIT (less components)	4502-0284.007/3



CIRCUIT REFERENCES TO BE PRECEDED BY BOARD ASSEMBLY NUMBER e.g. IC1 BECOMES IC8401 T1 " " T10401

**Fig. 6 Component Layout, Power Supply (104)**

**ASSEMBLY FOR P.C.B. A82 MATCHING UNIT**

REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.
R2	150R	0.25	1W	MF	0000-7604.111/-
R3	604R	0.25	1W	MF	0000-7604.108/-
R4	523R	1	0W35	MF	0001-0000.993/-
R5	75R5	0.1	0W125	MF	0000-7601.567/-
R6	8k25	2	0W35	MF	0001-0002.056/-
R7	152R	0.25	1W	MF	0000-7549.616/-
R8	432R	1	0W35	MF	0001-0000.935/-
R109	10k	1	0W35	MF	0001-0002.137/-
R110	56k2	2	0W35	MF	0001-0002.797/-
RV1	500R	20	0W5	Var.	0000-7601.651/-
C1	47u	+50-10%		B42190-C8476-T	0001-7520.460/-
C3	100p	2			0001-0004.517/-
C80	10n	10	40V	Cer.	0001-0004.818/-
C81	1u	20	35V	Tant.	0001-0040.704/-
TR20				BCY71	0001-0016.534/-
D22				1N914 or 1N4448	0001-0018.493/-
D31				1N914 or 1N4448	0001-0018.493/-
VCI	2 - 18p			809-05003	0000-7598.463/-
S1 to S6				INPUT IMPEDANCE	
				SWITCHING	0000-7602.414/4
L1	470uH			INDUCTOR	0000-7598.683/-
T1				TRANSFORMER	4502-1304.009/4
SK1				SOCKET, D.I.L. 14-WAY	0000-7518.388/-
RL1				RSD - 12V	0001-0069.620/-
RL2				RSD - 12V	0001-0069.620/-
A82				P.C.B., MATCHING UNIT	4502-0260.005/3

REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.
R35	324R	1	0W35	MF	0001-0000.825/-
R36	301R	1	0W35	MF	0001-0000.799/-
R37	71R5	1	0W35	MF	0001-0000.443/-
R38	150R	1	0W35	MF	0001-0000.618/-
R39	619R	1	0W35	MF	0001-0001.044/-
R40	5k62	1	0W35	MF	0001-0001.895/-
R41	4k7	2	0W25	MF	0001-0001.811/-
R42	22k1	1	0W35	MF	0001-0002.441/-
R43	100R	1	0W35	MF	0001-0000.537/-
R50	22k1	1	0W35	MF	0001-0002.441/-
R51	33k	2	0W25	MF	4980-0000.009/-
R52	68R1	1	0W35	MF	0001-0000.427/-
R53	3k16	1	0W35	MF	0001-0001.646/-
R54	1k65	1	0W35	MF	0001-0059.232/-
R55	330R	2	0W25	MF	0000-7601.389/-
R56	68R1	1	0W35	MF	0001-0000.427/-
R57	100R	1	0W35	MF	0001-0000.537/-
R58	845R	1	0W35	MF	0001-0018.587/-
R59	1k1	1	0W35	MF	0001-0001.235/-
R60	68R1	1	0W35	MF	0001-0000.427/-
R61	2k67	1	0W35	MF	0001-0001.578/-
R62	681R	1	0W35	MF	0001-0001.086/-
R63	4k7	2	0W25	MF	0001-0001.811/-
R64	68R1	1	0W35	MF	0001-0000.427/-
R65	1k0	1	0W35	MF	0001-0001.219/-
R66	750R	1	0W35	MF	0001-0001.125/-
R67	100R	1	0W35	MF	0001-0000.537/-
R68	470R	2	0W25	MF	0000-7560.608/-
R69	732R	1	0W35	MF	0001-0001.112/-
R70	402R	1	0W35	MF	0001-0000.906/-
R71	243R	2	0W25	MF	0001-0000.731/-
R72	68R1	1	0W35	MF	0001-0000.427/-
R73	2k21	1	0W35	MF	0001-0001.497/-
R75	2k0	1	0W35	MF	0001-0001.455/-
R80	22k1	1	0W35	MF	0001-0002.441/-
R81	15k	1	0W35	MF	0001-0002.289/-
R82	15k	1	0W35	MF	0001-0002.289/-
R83	68R1	1	0W35	MF	0001-0000.427/-
R84	68R1	1	0W35	MF	0001-0000.427/-
R85	698R	1	0W35	MF	0001-0001.099/-
R86	75R	1	0W35	MF	0001-0000.456/-
R87	330R	2	0W25	MF	0000-7601.389/-
R88	68R1	1	0W35	MF	0001-0000.427/-
R89	18k	2	0W25	MF	0001-0027.484/-
R90	47k	2	0W25	MF	0000-7558.393/-
R91	47R	2	0W25	MF	0000-7601.321/-
R92	432R	1	0W35	MF	0001-0000.935/-
R94	33k	2	0W25	MF	4980-0000.009/-
R95	22k1	1	0W35	MF	0001-0002.441/-
R96	68R1	1	0W35	MF	0001-0000.427/-
R97	1k5	1	0W35	MF	0001-0001.358/-
R98	75R	1	0W35	MF	0001-0000.456/-
R99	4k7	2	0W25	MF	0001-0001.811/-
R100	22R1	1	0W35	MF	0001-0000.184/-
R102	33R	2	0W25	MF	0000-7601.347/-
R112	22k1	1	0W35	MF	0001-0002.441/-
R113	56k2	1	0W35	MF	0001-0002.797/-

REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.
R114	22k1	1	0W35	MF	0001-0002.441/-
R115	56k2	1	0W35	MF	0001-0002.797/-
R116	56k2	1	0W35	MF	0001-0002.797/-
R117	22k1	1	0W35	MF	0001-0002.441/-
R118	56k2	1	0W35	MF	0001-0002.797/-
R119	22k1	1	0W35	MF	0001-0002.441/-
R120	56k2	1	0W35	MF	0001-0002.797/-
R121	22k1	1	0W35	MF	0001-0002.441/-
R122	9 x 100k	2	0W2	RESISTOR PACK	0000-7604.441/-
R123	1k5	1	0W35	MF	0001-0001.358/-
C5	4p7	0p25	63	Cer.	0001-0004.083/-
C6	15p	2	63	Cer.	0001-0004.229/-
C7	4p7	0p25	63	Cer.	0001-0004.083/-
C8	22p	2	63	Cer.	0001-0004.290/-
C10	220n	10	100	PE	0001-0010.404/-
C11	33p	2	63	Cer.	0001-0004.342/-
C12	33u	20	10	Tant.	0001-0040.995/-
C13	22p	2	63	Cer.	0001-0004.290/-
C14	33p	2	63	Cer.	0001-0004.342/-
C15	220u	20	10	Tant.	0001-0041.208/-
C16	330u	20	6.3	Tant.	0001-0041.211/-
C17	68p	2	63	Cer.	0001-0004.452/-
C18	220p	2	63	Cer.	0001-0004.601/-
C19	10n	20	100	Cer.	0001-0004.818/-
C20	1u	20	35	Tant.	0001-0040.704/-
C30	1u	20	35	Tant.	0001-0040.704/-
C31	33p	2	63	Cer.	0001-0004.342/-
C32	33u	20	10	Tant.	0001-0040.995/-
C33	22p	2	63	Cer.	0001-0004.290/-
C34	33p	2	63	Cer.	0001-0004.342/-
C35	100u	20	10	Tant.	0001-0041.156/-
C36	330u	20	6.3	Tant.	0001-0041.211/-
C37	47p	2	63	Cer.	0001-0004.397/-
C38	82p	2	63	Cer.	0001-0004.481/-
C40	47p	2	63	Cer.	0001-0004.397/-
C41	47p	2	63	Cer.	0001-0004.397/-
C42	100n	20	100	Cer.	0000-7598.450/-
C43	100n	20	100	Cer.	0000-7598.450/-
C44	100n	20	100	Cer.	0000-7598.450/-
C45	100n	20	100	Cer.	0000-7598.450/-
C46	100n	20	100	Cer.	0000-7598.450/-
C47	100n	20	100	Cer.	0000-7598.450/-
C50	6u8	20	6.3	Tant.	0001-0040.830/-
C51	1u	20	35	Tant.	0001-0040.704/-
C52	220u	20	10	Tant.	0001-0041.208/-
C53	1u	20	35	Tant.	0001-0040.704/-
C54	1u	20	35	Tant.	0001-0040.704/-
C55	220u	20	10	Tant.	0001-0041.208/-
C60	100n	20	100	Cer.	0000-7598.450/-
C82	10n	20	100	Cer.	0001-0004.818/-
C83	10n	20	100	Cer.	0001-0004.818/-
C84	10n	20	100	Cer.	0001-0004.818/-
C85	10n	20	100	Cer.	0001-0004.818/-
C86	10n	20	100	Cer.	0001-0004.818/-
C87	10p	2	63	Cer.	0001-0004.177/-
C88	1u	20	35	Tant.	0001-0040.704/-
TR1				2N2369A	4975-0000.007/-

**ASSEMBLY P.C.B. A22 PRE-AMPLIFIER & ATTENUATOR**

REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.
R7	9k	0.1	0W125	MF	0000-7601.512/-
R8	1k11	0.1	0W125	MF	0000-7601.402/-
R9	9k	0.1	0W125	MF	0000-7601.512/-
R10	1k11	0.1	0W125	MF	0000-7601.402/-
R11	11k	0.1	0W125	MF	0000-7598.277/-
R15	100k	1	0W35	MF	0001-0002.991/-
R16	22k1	1	0W35	MF	0001-0002.441/-
R17	33k	2	0W25	MF	4980-0000.009/-
R18	68R1	1	0W35	MF	0001-0000.427/-
R19	162R	1	0W35	MF	0001-0003.958/-
R20	3k16	1	0W35	MF	0001-0001.646/-
R21	1k65	1	0W35	MF	0001-0059.232/-
R22	68R1	1	0W35	MF	0001-0000.427/-
R23	100R	1	0W35	MF	0001-0000.537/-
R24	845R	1	0W35	MF	0001-0017.587/-
R25	1k1	1	0W35	MF	0001-0001.235/-
R26	68R1	1	0W35	MF	0001-0000.427/-
R27	2k67	1	0W35	MF	0001-0001.578/-
R28	681R	1	0W35	MF	0001-0001.086/-
R29	4k7	2	0W25	MF	0001-0000.811/-
R30	68R1	1	0W35	MF	0001-0000.427/-
R31	619R	1	0W35	MF	0001-0001.044/-
R32	750R	1	0W35	MF	0001-0001.125/-
R33	221R	1	0W35	MF	0001-0000.715/-
R34	2k67	1	0W35	MF	0001-0001.578/-

REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.
TR2				2N3251	0001-0017.342/-
TR3				2N2369A	0000-7542.066/-
TR4				2N2369A	0000-7542.066/-
TR5				BCY71	0001-0016.534/-
TR6				BCY71	0001-0016.534/-
TR8				2N2369A (LOW NOISE)	4975-0000.007/-
TR9				2N3251	0001-0017.342/-
TR10				2N2369A	0000-7542.066/-
TR11				2N2369A	0000-7542.066/-
TR12				2N2369A	0000-7542.066/-
TR13				2N2369A	0000-7542.066/-
TR14				2N2369A	0000-7542.066/-
TR15				2N2369A	0000-7542.066/-
TR16				2N2369A	0000-7542.066/-
TR21				BC109	0000-7602.029/-
TR22				BC109	0000-7602.029/-
TR23				BCY71	0001-0016.534/-
TR24				BCY71	0001-0016.534/-
TR25				BCY71	0001-0016.534/-
D3				1N914 or 1N4448	0001-0018.493/-
D4				1N914 or 1N4448	0001-0018.493/-
D5				1N914 or 1N4448	0001-0018.493/-
D6				1N914 or 1N4448	0001-0018.493/-
D18				1N914 or 1N4448	0001-0018.493/-
D19				1N914 or 1N4448	0001-0018.493/-
D20				1N914 or 1N4448	0001-0018.493/-
D21				1N914 or 1N4448	0001-0018.493/-
D23				1N914 or 1N4448	0001-0018.493/-
D24				1N914 or 1N4448	0001-0018.493/-
D25				1N914 or 1N4448	0001-0018.493/-
D26				1N914 or 1N4448	0001-0018.493/-
D27				1N914 or 1N4448	0001-0018.493/-
D28				1N914 or 1N4448	0001-0018.493/-
D29				1N914 or 1N4448	0001-0018.493/-
D30				1N914 or 1N4448	0001-0018.493/-
D38				1N914 or 1N4448	0001-0018.493/-
L1	10μH			INDUCTOR	0000-7556.175/-
RV1	100R			Var.	0000-7601.648/-
VC1	2 - 18p			809-05003	0000-7598.463/-
VC2	2 - 18p			809-05003	0000-7598.463/-
ICI				4001	0001-0015.962/-
SK1				SOCKET D.I.L. 14-WAY	0000-7518.388/-
SK2				SOCKET D.I.L. 16-WAY	0000-8518.391/-
RL3				RSD - 12V	0001-0069.620/-
RL4				RSD - 12V	0001-0069.620/-
RL5				RSD - 12V	0001-0069.620/-
RL6				RSD - 12V	0001-0069.620/-
RL7				RSD - 12V	0001-0069.620/-
A22				P.C.B. PRE-AMPLIFIER	4502-0122.004/2

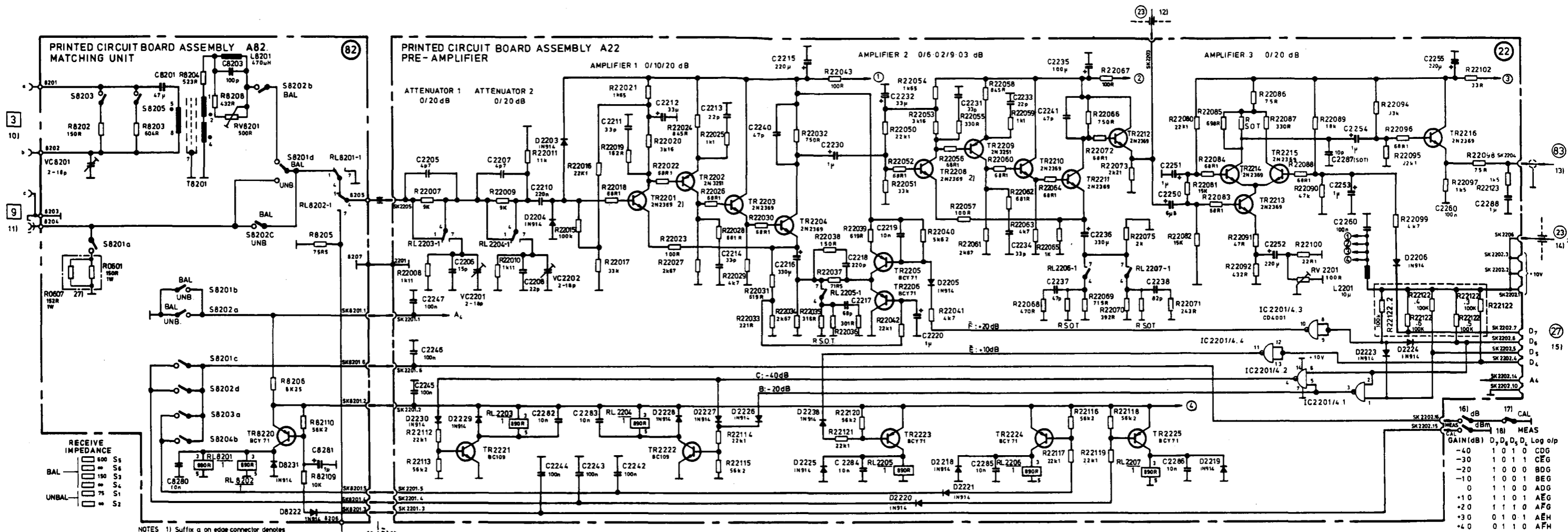
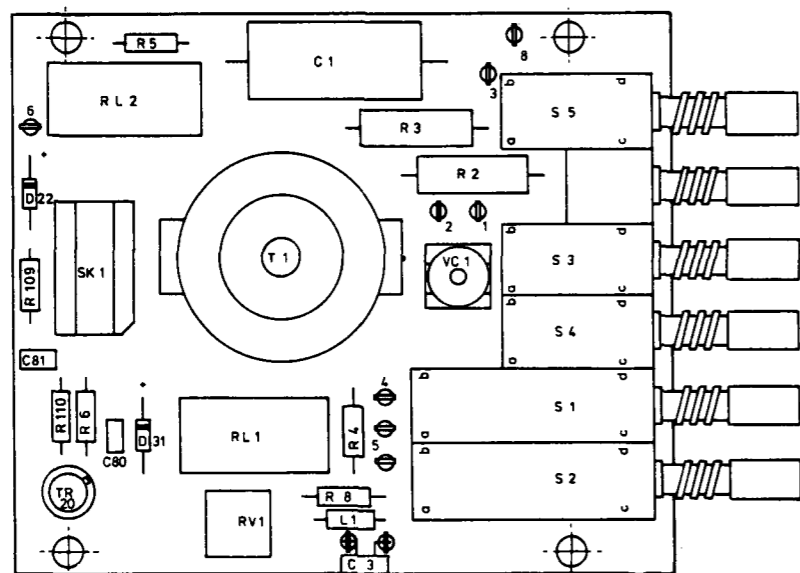
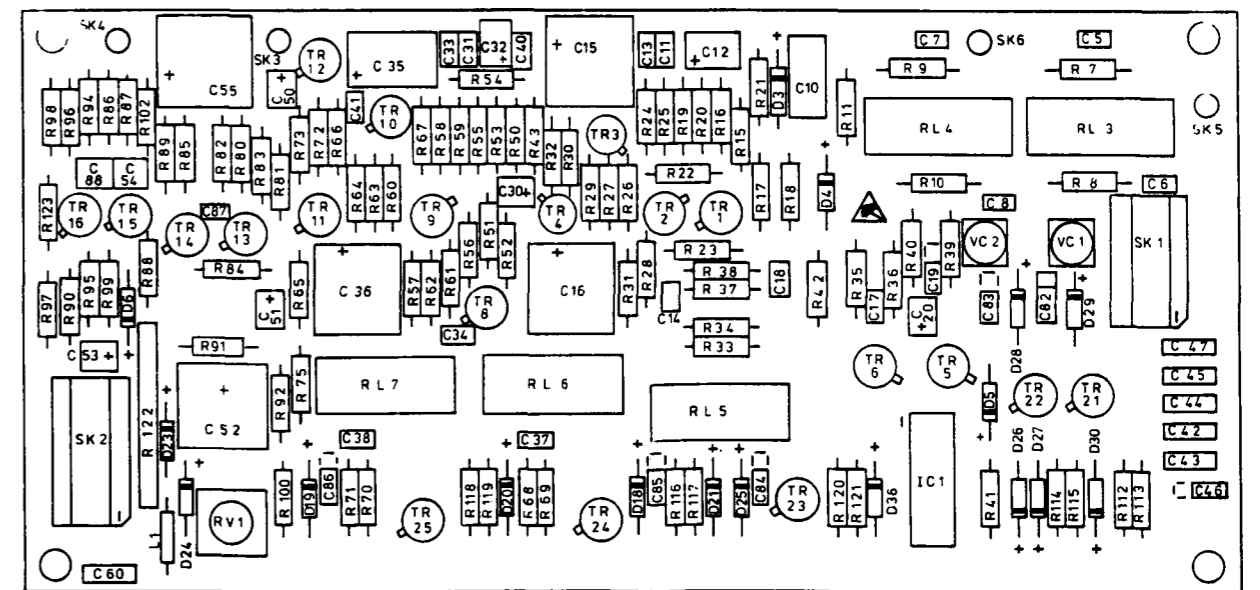


Fig. 7 Circuit Diagram, Input Matching unit, 82 and Pre-amplifier/Attenuator 22



CIRCUIT REFERENCES TO BE PRECEDED BY ASSEMBLY NUMBER  
 eg S1 BECOMES S8201  
 C81 BECOMES C8281

Fig. 8 Component Layout, Input Matching unit, 82



CIRCUIT REFERENCES TO BE PRECEDED BY BOARD ASSEMBLY NUMBER  
 eg C60 BECOMES C2260  
 TR4 BECOMES TR2204

Fig. 9 Component Layout, Pre-amplifier/Attenuator, 22

**ASSEMBLY FOR P.C.B. A23 MIXER 1**

REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.
R1	267R	1	0W35	MF	0001-0003.576/-
R2	267R	1	0W35	MF	0001-0003.576/-
R3	33k	2	0W25	MF	4980-0000.009/-
R4	56k2	1	0W35	MF	0001-0002.797/-
R5	68R1	1	0W35	MF	0001-0000.427/-
R6	511R	1	0W35	MF	0001-0003.770/-
R7	68R1	1	0W35	MF	0001-0000.427/-
R8	100R	1	0W35	MF	0001-0000.537/-
R9	1k	1	0W35	MF	0001-0001.219/-
R10	100R	1	0W35	MF	0001-0000.537/-
R11	56R2	1	0W35	MF	0001-0000.346/-
R12	470R	2	0W25	MF	0000-7560.608/-
R13	56k2	1	0W35	MF	0001-0002.797/-
R14	33k	2	0W25	MF	4980-0000.009/-
R15	68R1	1	0W35	MF	0001-0000.427/-
R16	1k	1	0W35	MF	0001-0001.219/-
R17	68R1	1	0W35	MF	0001-0000.427/-
R18	100R	1	0W35	MF	0001-0000.537/-
R19	2k21	1	0W35	MF	0001-0001.497/-
R20	150R(A66/1)1	1	0W35	MF	0001-0000.618/-
	or 100R(A66/2)1	1	0W35	MF	0001-0000.537/-
R21	100R	1	0W35	MF	0001-0000.537/-
R30	82R5	1	0W35	MF	0001-0000.472/-
R31	56k2	1	0W35	MF	0001-0002.797/-
R32	33k	2	0W25	MF	4980-0000.009/-
R33	68R1	1	0W35	MF	0001-0000.427/-
R34	1k	1	0W35	MF	0001-0001.219/-
R35	68R1	1	0W35	MF	0001-0000.427/-
R36	1k5	1	0W35	MF	0001-0001.358/-
R37	56R2	1	0W35	MF	0001-0000.346/-
R38	100R	1	0W35	MF	0001-0000.537/-
R39	10k	1	0W35	MF	0001-0002.137/-
R40	10k	1	0W35	MF	0001-0002.137/-
R41	1k8	2	0W25	MF	0001-0014.510/-
R42	22k1	1	0W35	MF	0001-0002.441/-
R43	100R	2	0W35	MF	0001-0000.537/-
R44	10k	2	0W35	MF	0001-0002.137/-
R45	8k25	1	0W35	MF	0001-0002.056/-
R46	2k21	1	0W35	MF	0001-0001.497/-
R47	357R	1	0W35	MF	0001-0000.867/-
R51	56R2	1	0W35	MF	0001-0000.346/-
R55	68R1	1	0W35	MF	0001-0000.427/-
R56	68R1	1	0W35	MF	0001-0000.427/-
R57	68R1	1	0W35	MF	0001-0000.427/-
R58	68R1	1	0W35	MF	0001-0000.427/-
C1	191p	2	63	PF	0000-7598.382/-
C2	12p	5	100	Cer.	0001-0004.203/-
C3	392p	2	63	PF	0000-7598.395/-
C4	39p	5	100	Cer.	0001-0004.371/-
C5	393p	2	63	PF	0000-7598.405/-
C6	27p	5	100	Cer.	0001-0004.326/-
C7	169p	2	63	PF	0000-7598.418/-
C8	47μ	20	6.3	Tant.	0001-0041.059/-
C9	330μ	20	6.3	Tant.	0001-0041.211/-
C10	100μ	20	6.3	Tant.	0001-0041.156/-
C11	1n	10	63	Cer.	0001-0004.698/-
C12	100n	20	100	Cer.	0000-7598.450/-
C13	100n	20	100	Cer.	0000-7598.450/-
C14	100n	20	100	Cer.	0000-7598.450/-

REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.
C20	10n	20	100	Cer.	0001-0004.818/-
C21	10n	20	100	Cer.	0001-0004.818/-
C22	100n	20	100	Cer.	0000-7598.450/-
C23	100n	20	100	Cer.	0000-7587.450/-
C24	100n	20	100	Cer.	0000-7587.450/-
C26	100n	20	100	Cer.	0000-7587.450/-
C27	100n	20	100	Cer.	0000-7587.450/-
C28	33p	2	63	Cer.	0001-0004.342/-
C29	12p	2	63	Cer.	0001-0004.203/-
C30	15p(A66/1)2		63	Cer.	0001-0004.229/-
	or 22p(A66/2)2		63	Cer.	0001-0004.290/-
C31	4p7	0.25	63	Cer.	0001-0004.083/-
C32	4p7	0.25	63	Cer.	0001-0004.083/-
C33	12p	2	63	Cer.	0001-0004.203/-
TR1				2N2369A	0000-7542.066/-
TR2				2N3251	0001-0017.342/-
TR3				2N2369A	0000-7542.066/-
TR4				2N3251	0001-0017.342/-
TR5				2N2369A	0000-7542.066/-
TR6				2N3251	0001-0017.342/-
TR7				2N2369A	0000-7542.066/-
TR8				2N2369A	0000-7542.066/-
TR9				2N918	0001-0016.738/-
TR10				2N918	0001-0016.738/-
T1				TRANSFORMER	4502-1301.002/4
T2				TRANSFORMER	4502-1302.001/4
T3				TRANSFORMER	4502-1307.006/4
L1	27μH			INDUCTOR	4502-1420.006/4
L2	25μH			INDUCTOR	4502-1421.005/4
L3	27μH			INDUCTOR	4502-1420.006/4
L4	39μH			INDUCTOR	0000-7556.243/-
X1				MIXER	1769-1000.004/2
PL1				HOUSING WN 119/8/3	0000-2687.065/6
				PLUG, BULKHEAD	WN 119/8/3
				RING	0000-2687.078/5
				SCREW	0000-1637.058/5
A23				P.C.B. MIXER 1	4502-0123.003/3

**ASSEMBLY P.C.B. A66/1 or A66/2 FILTER UNIT**

REF.	TYPE	PART NO.
SK1	COAX. CONNECTOR	0000-2686.008/5
X1	CRYSTAL FILTER SK1592/D (used on A66/1)	0000-7602.731/-
	or alternative	
X1	CRYSTAL FILTER SK1607/D (used on A66/2)	0000-7602.728/-
A24	P.C.B. 4MHz FILTER, (Complete with components)	4502-1024.004/3

**ASSEMBLY P.C.B. A24 4MHz BANDPASS FILTER (used on A66/1 or /2)**

REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.
R1	150R(A66/1)1		0W35	MF	0001-0000.618/-
	or 100R(A66/2)1		0W35	MF	0001-0000.537/-
R2	56k2	1	0W35	MF	0001-0002.797/-
R3	33k	2	0W25	MF	4980-0000.009/-
R4	68R1	1	0W35	MF	0001-0000.427/-

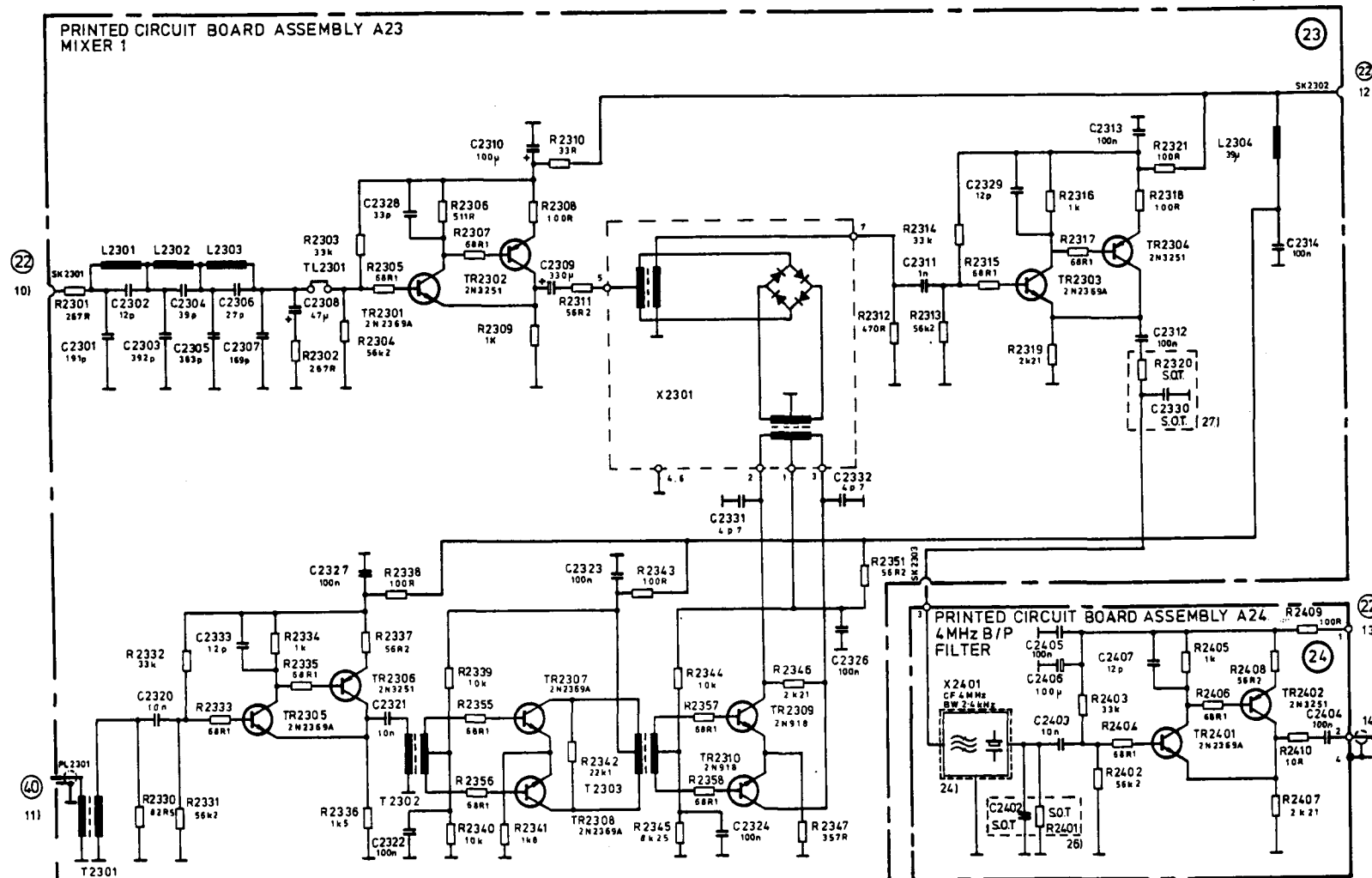
REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.
R5	1k	1	0W35	MF	0001-0001.219/-
R6	68R1	1	0W35	MF	0001-0000.427/-
R7	2k21	1	0W35	MF	0001-0001.497/-
R8	56R2	1	0W35	MF	0001-0000.346/-
R9	100R	1	0W35	MF	0001-0000.537/-
R10	10R	1	0W35	MF	0001-0000.074/-
C2	15p(A66/1)2		63	Cer.	0001-0004.229/-
	or 22p(A66/2)5		100	Cer.	0001-0004.290/-
C3	10n	20	100	Cer.	0001-0004.818/-
C4	100n	20	100	Cer.	0000-7598.450/-
C5	100n	20	100	Cer.	0000-7598.450/-
C6	100μ	20	6.3	Tant.	0001-0041.156/-
C7	12p	2	63	Cer.	0001-0004.203/-
TR1				2N2369A	0000-7542.066/-
TR2				2N3251	0001-0017.342/-
A24				P.C.B. 4MHz BANDPASS FILTER (less components)	4502-0124.002/3

**ASSEMBLY P.C.B. A79 MIXER 2**

REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.
R1	180R	2	0W25	MF	0000-7558.405/-
R2	56k2	1	0W35	MF	0001-0002.792/-
R3	33k	2	0W25	MF	4980-0000.009/-
R4	68R1	1	0W35	MF	0001-0000.427/-
R5	1k	1	0W35	MF	0001-0001.219/-
R6	68R1	1	0W35	MF	0001-0000.427/-
R7	56R2	1	0W35	MF	0001-0000.346/-
R8	1k5	1	0W35	MF	0001-0001.358/-
R9	330R	2	0W25	MF	0000-7601.389/-
R10	68R1	2	0W35	MF	0001-0000.427/-
R11	5k11	1	0W35	MF	0001-0001.853/-
R12	2k7	2	0W25	MF	0000-7558.380/-
R13	5k62	1	0W35	MF	0001-0001.895/-
R14	68R1	1	0W35	MF	0001-0000.427/-
R15	68R1	1	0W35	MF	0001-0000.427/-
R16	22R1	1	0W35	MF	0001-0000.184/-
R17	221R	1	0W35	MF	0001-0000.715/-
R20	180R	2	0W25	MF	0000-7558.403/-
R21	68R1	1	0W35	MF	0001-0000.427/-
R22	68R1	1	0W35	MF	0001-0000.427/-
R23	82R5	1	0W35	MF	0001-0000.472/-
R24	82R5	1	0W35	MF	0001-0000.472/-
R25	15k	1	0W35	MF	0001-0002.289/-
R26	3k57	1	0W35	MF	0001-0001.691/-
R28	301R	1	0W35	MF	0001-0000.799/-
R29	301R	1	0W35	MF	0001-0000.799/-
R30	47R	2	0W25	MF	0000-7601.321/-
R31	10R	1	0W35	MF	0001-0000.074/-
R32	121R	1	0W35	MF	0001-0000.566/-
R40	470R	2	0W25	MF	0000-7560.608/-
R41	121k	2	0W35	MF	0001-0003.042/-
R42	121k	2	0W35	MF	0001-0003.042/-
R43	3k16	1	1	MF	0001-0001.646/-
C1	10n	20	40	Cer.	0001-0004.818/-
C2	10n	20	40	Cer.	0001-0004.818/-
C3	22n	20	40	Cer.	0001-0006.418/-
C4	22n	20	40	Cer.	0001-0006.418/-
C5	22n	20	40	Cer.	0001-0006.418/-



REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.
C6	470p	2	63	PF	0000-7598.421/-
C7	470p	2	63	PF	0000-7598.421/-
C8	1u	20	35	Tant.	0001-0040.704/-
C9	1u	20	35	Tant.	0001-0040.704/-
C10	100u	20	10	Tant.	0001-0041.156/-
C18	1u	20	6.3	Tant.	0001-0040.704/-
C19	22p	2	63	Cer.	0001-0004.290/-
C20	10u	20	6.3	Tant.	0001-0040.885/-
C21	22n	20	40	Cer.	0001-0006.418/-
C22	22n	20	40	Cer.	0001-0006.418/-
C23	22n	20	40	Cer.	0001-0006.418/-
C24	33p	2	63	Cer.	0001-0004.342/-
C27	39p	2	63	Cer.	0001-0004.371/-
C28	39p	2	63	Cer.	0001-0004.371/-
C29	1u	20	35	Tant.	0001-0040.704/-
C30	3n79	1	63	PF	0000-7598.434/-
C31	6n49	1	63	PF	0000-7598.502/-
C32	10n9	1	63	PF	0000-7598.515/-
C33	3n24	1	63	PF	0000-7598.492/-
C34	2n8	1	63	PF	0000-7598.489/-
C35	4n22	1	63	PF	0000-7598.573/-
C36	6n57	1	63	PF	0000-7598.586/-
C37	8n66	1	63	PF	0000-7557.682/-
C38	3n61	1	63	PF	0000-7598.609/-
C39	9n31	1	63	PF	0000-7586.080/-
C40	9n65	1	63	PF	0000-7598.612/-
C41	2n1	1	63	PF	0000-7598.625/-
C42	4n99	1	63	PF	0000-7598.638/-
C43	1n87	1	63	PF	0000-7598.641/-
C44	8n16	1	63	PF	0000-7598.654/-
C45	18n9	1	63	PF	0000-7598.667/-
C46	2n43	1	63	PF	0000-7598.599/-
C47	13n2	1	63	PF	0000-7598.670/-
C50	22p	2	63	Cer.	0001-0004.290/-
C51	22p	2	63	Cer.	0001-0004.290/-
TR1				2N2369A	0000-7542.066/-
TR2				2N3251	0001-0017.342/-
TR3				BC 109	0000-7602.029/-
TR4				2N2369A	0000-7542.066/-
TR5				2N2369A	0000-7542.066/-
TR6				2N2369A Matched	} 4502-1000.002/-
TR7				2N2369A Pair	
D1				1N914 or 1N4448	0001-0019.493/-
RV1	200R	20	OW	Var.	0000-7579.013/-
IC1				5534	0000-7513.257/-
T1				TRANSFORMER	4502-1301.002/4
T2				TRANSFORMER	4502-1302.001/4
T3				TRANSFORMER	4502-1303.000/4
L1				INDUCTOR	4502-1438.001/4
L2				INDUCTOR	4502-1439.004/4
L3				INDUCTOR	4502-1440.002/4
L4				INDUCTOR	4502-1441.001/4
L5				INDUCTOR	4502-1442.000/4
L6				INDUCTOR	4502-1443.009/4
L7				INDUCTOR	4502-1444.008/4
L8				INDUCTOR	4502-1445.007/4
L9				INDUCTOR	4502-1446.006/4
L10				INDUCTOR	4502-1447.005/4
A79				P.C.B. MIXER 2	4502-0248.001/2

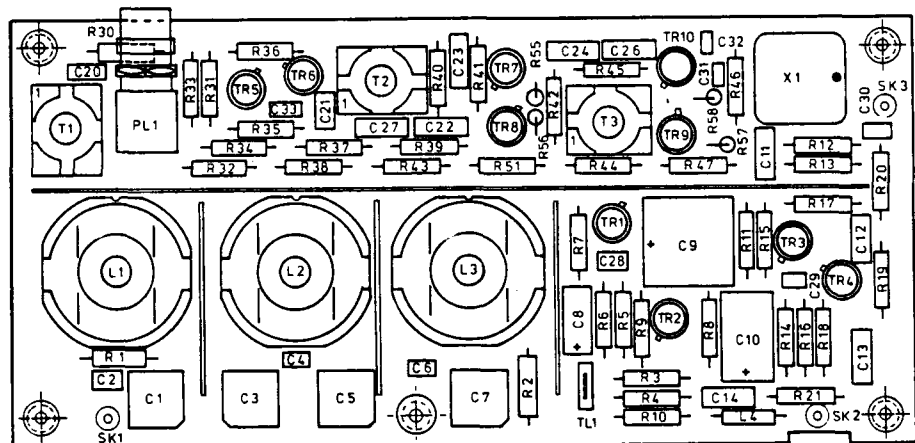


NOTES 1) Suffix a on edge connector denotes component side b denotes non-component side.

- 10) SIG i/p 200Hz - 1.6MHz (-40dB)
- 11) L.O. i/p 4 - 5.62 MHz
- 12) +10V from pre-amp
- 13) +10V
- 14) o/p 1st IF 4MHz (-57dB)
- 15) INPUT L.O. 4.01MHz
- 16) OUTPUT 2nd IF (-40dB)
- 17) +10V
- 18) BW 24Hz
- 19) BW 1.74 kHz

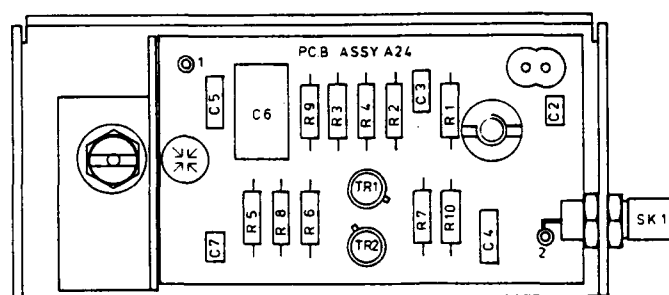
- 23) TR7906 & TR7907 TO BE MATCHED PAIR
- 24) X2401 FITTED TO A66 FILTER UNIT ASSEMBLY.
- 25) FILTER FITTED TO A77 MAY HAVE AN ALTERNATIVE AND WILL THEREFORE BE FITTED TO PCB ASS'Y KNOWN AS A78
- 26) R2401 AND C2401 FITTED TO A66 FILTER AY. R2401 WHEN SEI FILTER FITTED 100R C2402 " " " " " " 22p R2401 WHEN ITT FILTER FITTED 150R C2402 " " " " " " 15p

- 27) C2330 AND R2320 FITTED TO A6 INPUT AY. R2320 WHEN SEI FILTER FITTED 100R C2330 " " " " " " 22p R2320 WHEN ITT FILTER FITTED 150R C2330 " " " " " " 15p



CIRCUIT REFERENCES TO BE PRECEDED BY BOARD ASSEMBLY NUMBER  
e.g. R31 BECOMES R2331  
C28 BECOMES C2328

Fig. 11 Component Layout, Mixer 1, 23



CIRCUIT REFERENCES TO BE PRECEDED BY BOARD ASSEMBLY NUMBER eg C6 BECOMES C2406  
COMPONENT X1 BECOMES X6601  
AND SK1 BECOMES SK6601

Fig. 12 Component Layout, 4MHz B/P Filter, 24

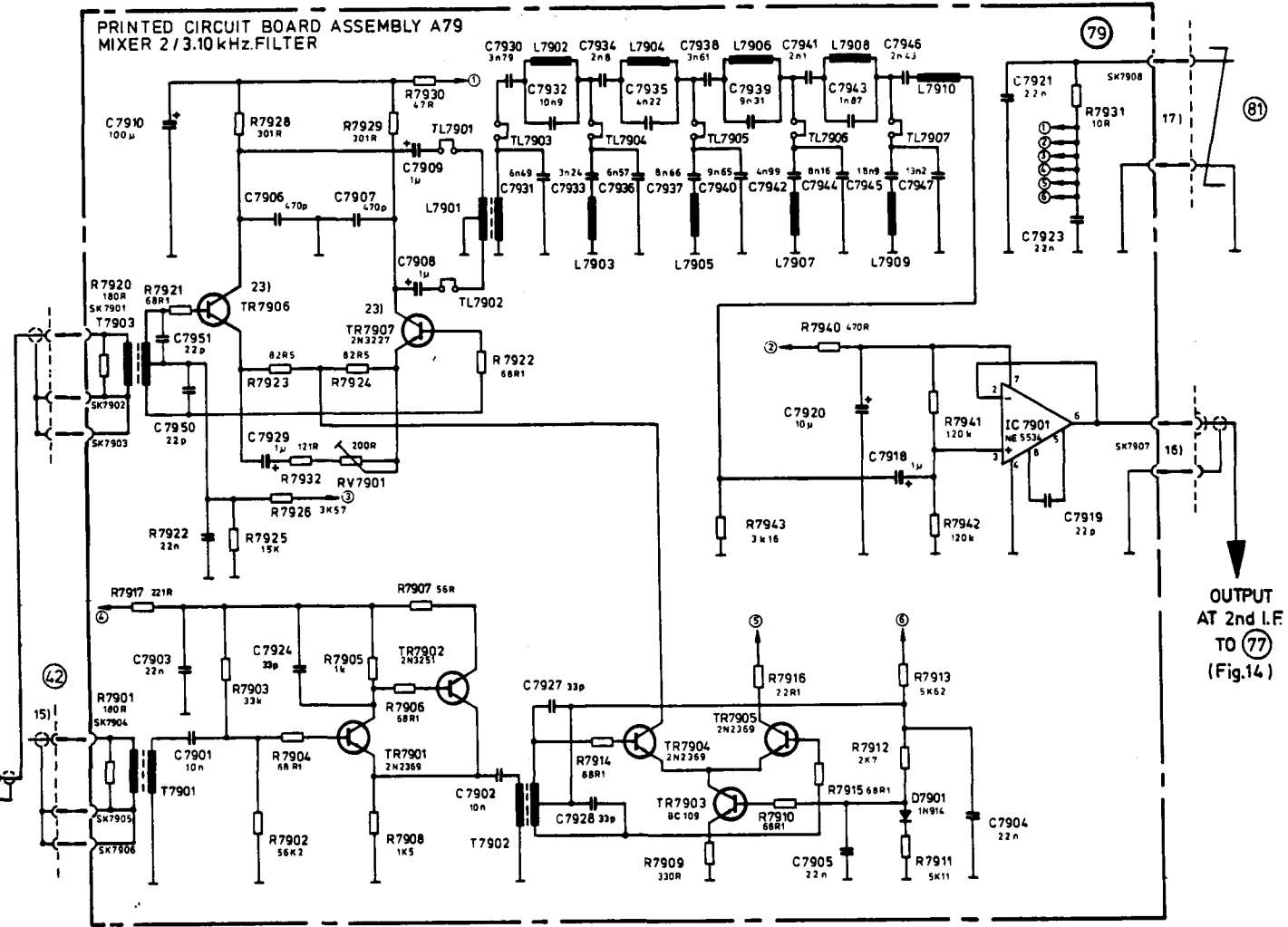
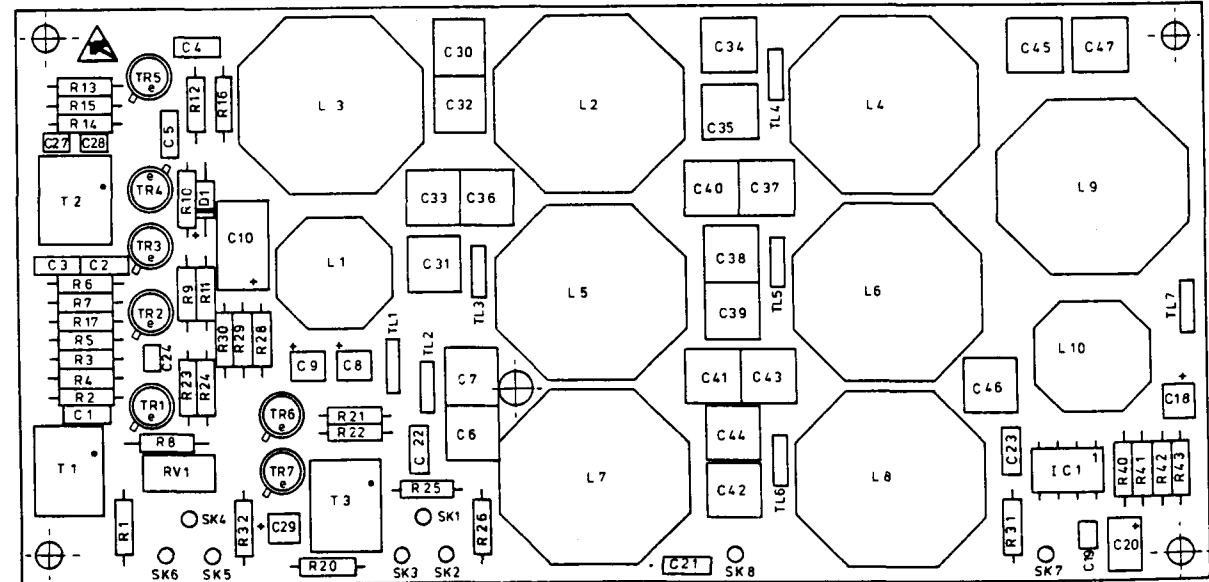
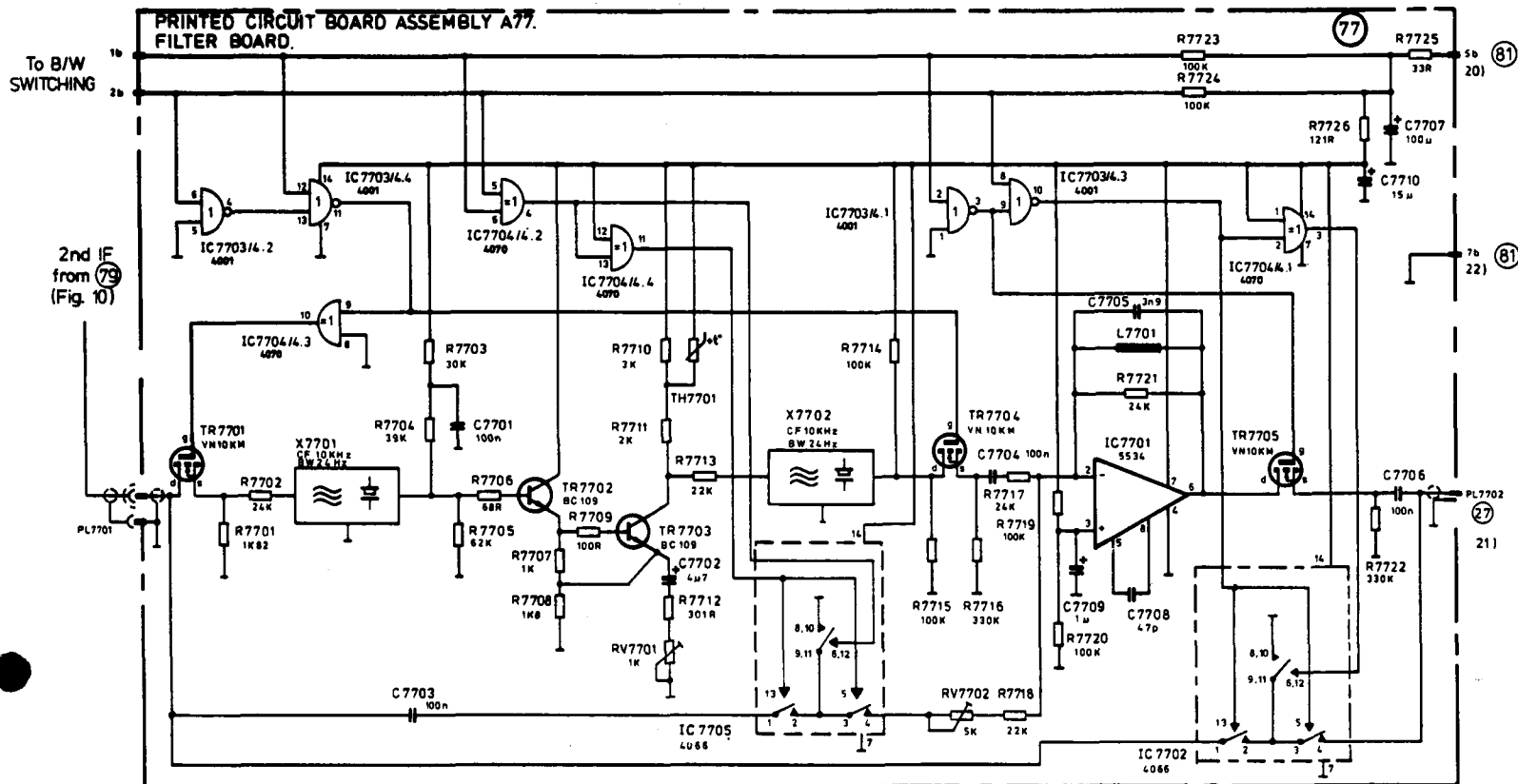


Fig. 10 Circuit Diagram, Mixer 1, 23 ; 4MHz B/P Filter, 24 and Mixer 2/3.1kHz Filter, 79



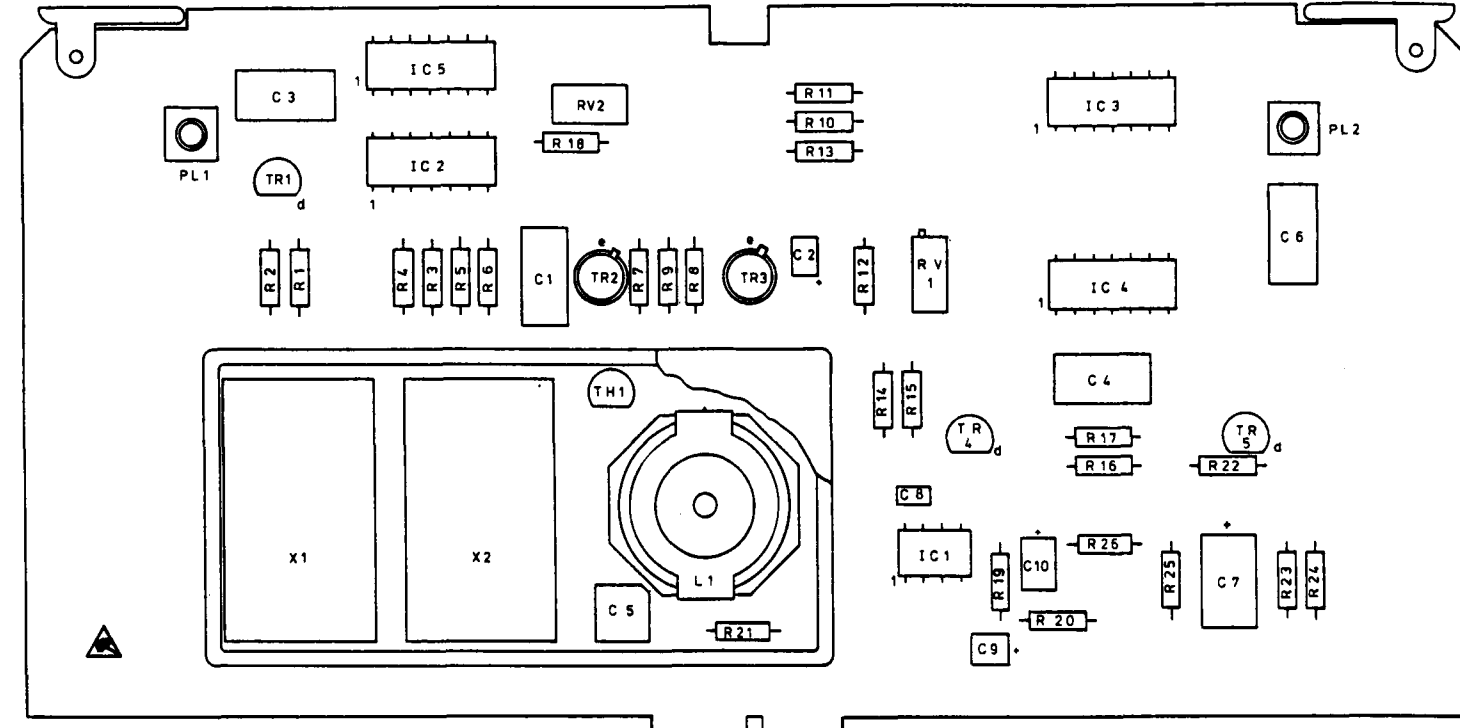
CIRCUIT REFERENCES TO BE PRECEDED BY BOARD ASSY NUMBER.  
e.g. C3 BECOMES C7903  
R25 BECOMES R7925

Fig. 13 Component Layout, Mixer 2/3.1kHz Filter, 79



NOTES 1) Suffix a on edge connector denotes component side. b denotes non-component side.  
 20) +10V  
 21) OUTPUT (to IAMP)  
 22) 0V

Fig. 14 Circuit Diagram, 24Hz and 1.74kHz Filters, 77



CIRCUIT REFERENCES TO BE PRECEDED BY BOARD ASSY NUMBER eg X1 BECOMES X7701 R21 BECOMES R7721

Fig. 15 Component Layout, 24Hz and 1.74kHz Filters, 77

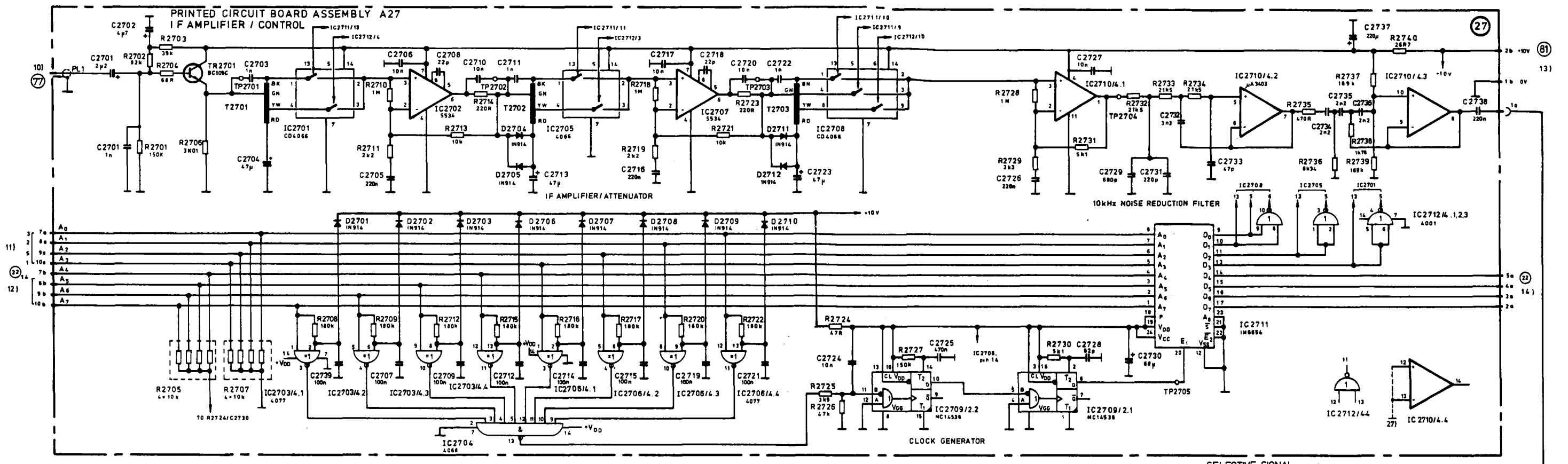
ASSEMBLY P.C.B. A77 24Hz and 1.74kHz FILTERS

REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.
R1	1k82	1	0W35	MF	0001-0001.413/-
R2	24k	2	0W25	MF	0000-7601.334/-
R3	30k1	1	0W35	MF	0001-0002.564/-
R4	39k2	1	0W35	MF	0001-0002.658/-
R5	61k9	1	0W35	MF	0001-0002.836/-
R6	68R1	1	0W35	MF	0001-0000.427/-
R7	1k	1	0W35	MF	0001-0001.219/-
R8	1k8	2	0W25	MF	0001-0014.510/-
R9	100R	1	0W35	MF	0001-0000.537/-
R10	3k01	1	0W35	MF	0001-0001.620/-
R11	2k	1	0W35	MF	0001-0001.455/-
R12	301R	1	0W35	MF	0001-0000.799/-
R13	22k1	1	0W35	MF	0001-0002.441/-
R14	100k	1	0W35	MF	0001-0002.991/-
R15	100k	1	0W35	MF	0001-0002.991/-
R16	330k	1	0W35	MF	0000-7601.350/-
R17	24k	2	0W25	MF	0000-7601.334/-
R18	22k1	1	0W35	MF	0001-0002.441/-
R19	100k	1	0W35	MF	0001-0002.991/-
R20	100k	1	0W35	MF	0001-0002.991/-
R21	24k	2	0W25	MF	0000-7601.334/-
R22	330k	2	0W25	MF	0000-7601.350/-
R23	100k	1	0W35	MF	0001-0002.991/-
R24	100k	1	0W35	MF	0001-0002.991/-
R25	33R	2	0W25	MF	0000-7601.347/-
R26	121R	1	0W35	MF	0001-0000.566/-
C1	100n	10	100	PE	0001-0010.365/-
C2	4u7	20	10	Tant.	0001-0040.801/-

REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.
C3	100n	10	100	PE	0001-0010.365/-
C4	100n	10	100	PE	0001-0010.365/-
C5	3n9	2	63	PF	0000-7598.447/-
C6	100n	10	100	PE	0001-0010.365/-
C7	100u	20	10	Tant.	0001-0041.156/-
C8	47p	2	63	Cer.	0001-0004.397/-
C9	1u	20	35	Tant.	0001-0040.704/-
C10	15u	20	16	Tant.	0001-0040.924/-
TR1				VN 10KM	0000-7591.224/-
TR2				BC109	0000-7602.029/-
TR3				BC109	0000-7602.029/-
TR4				VN 10KM	0000-7591.224/-
TR5				VN 10KM	0000-7591.224/-
RV1	1k	10	0W5	Var.	0000-7601.761/-
RV2	5k	20	0W5	Var.	0000-7574.283/-
IC1				5534	0000-7513.257/-
IC2				4066	0001-0067.554/-
IC3				4001	0001-0015.962/-
IC4				4070	0001-0071.029/-
IC5				4066	0001-0067.554/-
L1	164mH			INDUCTOR	4502-1449.003/4
X1				V42312-B22-A2-1	0829-9303.002/4
X2				V42312-B22-A2-1	0829-9303.002/4
TH1	1000Ω	5		TSP 102 J	0000-7605.013/-
PL1				PLUG COAX.	0000-2682.002/5
PL2				PLUG COAX.	0000-2682.002/5
A77				P.C.B. 24Hz and 1.74kHz FILTERS	4502-0246.003/2

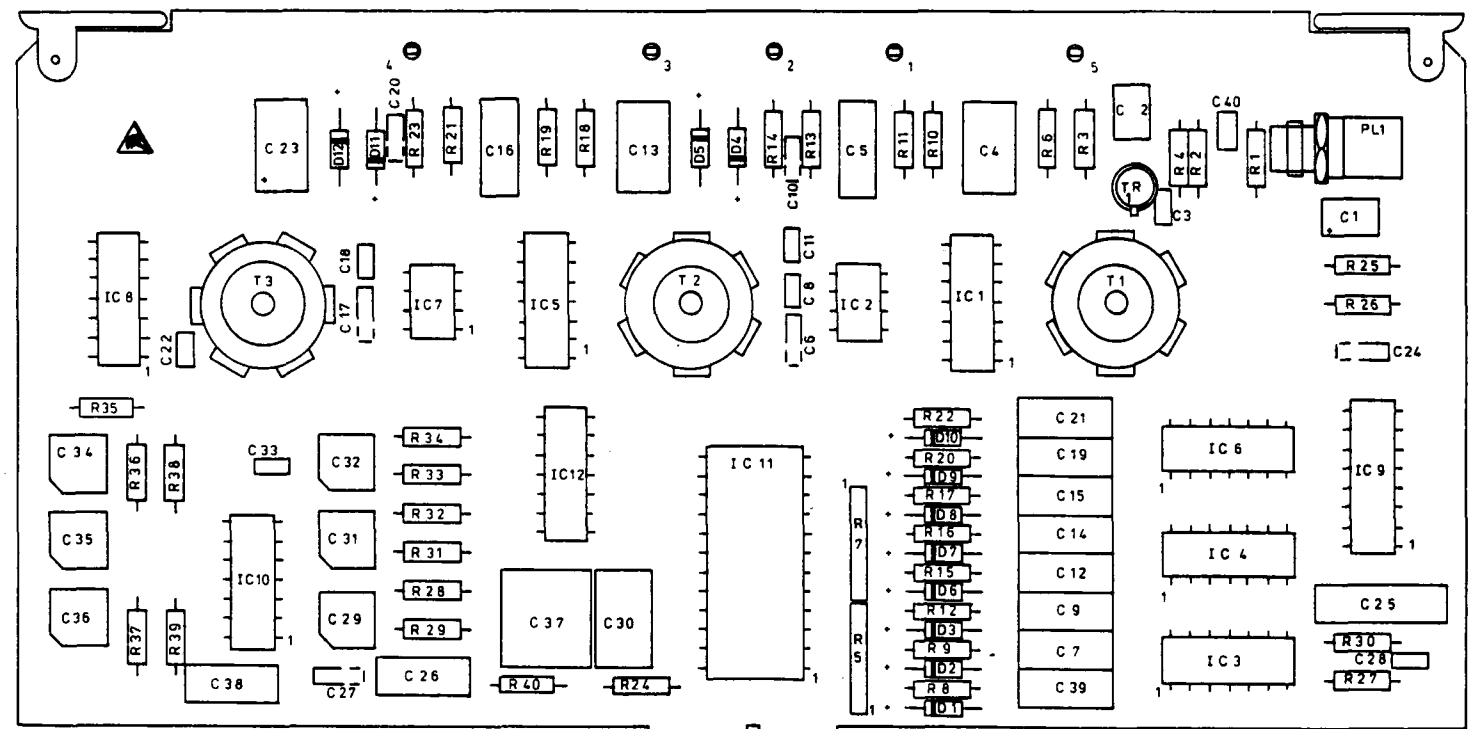
ASSEMBLY P.C.B. A27 I.F. AMPLIFIER

REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.	REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.
R1	150k	1	0W35	MF	0001-0003.110/-	C18	22p	2	63	Cer.	0001-0004.290/-
R2	82k5	1	0W35	MF	0001-0002.933/-	C19	100n	10	100	PE	0001-0010.365/-
R3	39k2	1	0W35	MF	0001-0002.658/-	C20	10n	20	100	Cer.	0001-0004.818/-
R4	68R1	1	0W35	MF	0001-0000.427/-	C21	100n	10	100	PE	0001-0010.365/-
R5	4 x 10k	2	0W25	RESISTOR PACK S.I.L.	0000-7604.535/-	C22	1n	10	63	Cer.	0001-0004.698/-
R6	3k01	1	0W35	MF	0001-0001.620/-	C23	47µ	20	6.3	Tant.	0001-0041.062/-
R7	4 x 10k	2	0W25	RESISTOR Pack S.I.L.	0000-7604.535/-	C24	10n	20	100	Cer.	0001-0004.818/-
R8	180k	2	0W25	MF	0000-7601.392/-	C25	470n	10	100	PE	0001-0010.446/-
R9	180k	2	0W25	MF	0000-7601.392/-	C26	220n	10	100	PE	0001-0010.404/-
R10	1M	1	0W35	MF	0000-0027.507/-	C27	10n	20	100	Cer.	0001-0004.818/-
R11	2k21	1	0W35	MF	0001-0001.497/-	C28	82p	2	63	Cer.	0001-0004.481/-
R12	180k	2	0W25	MF	0000-7601.392/-	C29	680p	2	63	PF	0000-7598.531/-
R13	10k	1	0W35	MF	0001-0002.137/-	C30	68µ	20	16	Tant.	0001-0041.114/-
R14	221R	1	0W35	MF	0001-0000.715/-	C31	220p	2	63	PF	0000-7598.544/-
R15	180k	2	0W25	MF	0000-7601.392/-	C32	3n3	2	63	PF	0000-7598.560/-
R16	180k	2	0W25	MF	0000-7601.392/-	C33	47p	2	63	Cer.	0001-0004.397/-
R17	180k	2	0W25	MF	0000-7601.392/-	C34	2n2	2	63	PF	0000-7573.695/-
R18	1M	1	0W35	MF	0000-0027.507/-	C35	2n2	2	63	PF	0000-7573.695/-
R19	2k21	1	0W35	MF	0001-0001.407/-	C36	2n2	2	63	PF	0000-7573.695/-
R20	180k	2	0W25	MF	0000-7601.392/-	C37	220µ	20	10	Tant.	0001-0041.208/-
R21	10k	1	0W35	MF	0001-0002.137/-	C38	220n	10	100	PE	0001-0010.404/-
R22	180k	2	0W25	MF	0000-7601.392/-	C39	100n	10	100	PE	0001-0010.365/-
R23	221R	1	0W35	MF	0001-0000.715/-	C40	1n	10	63	Cer.	0001-0004.698/-
R24	47R	2	0W25	MF	0000-7601.321/-	TR1				BC109 C	0000-7602.126/-
R25	3k92	1	0W35	MF	0001-0001.730/-	D1				1N914 or 1N4448	0001-0018.493/-
R26	47k	2	0W25	MF	0000-7558.393/-	D2				1N914 or 1N4448	0001-0018.493/-
R27	150k	1	0W35	MF	0001-0003.110/-	D3				1N914 or 1N4448	0001-0018.493/-
R28	1M	1	0W35	MF	0000-0027.507/-	D4				1N914 or 1N4448	0001-0018.493/-
R29	3k3	2	0W25	MF	4980-0000.012/-	D5				1N914 or 1N4448	0001-0018.493/-
R30	5k11	1	0W35	MF	0001-0001.853/-	D6				1N914 or 1N4448	0001-0018.493/-
R31	5k11	1	0W35	MF	0001-0001.853/-	D7				1N914 or 1N4448	0001-0018.493/-
R32	21k5	1	0W35	MF	0001-0002.438/-	D8				1N914 or 1N4448	0001-0018.493/-
R33	21k5	1	0W35	MF	0001-0002.438/-	D9				1N914 or 1N4448	0001-0018.493/-
R34	21k5	1	0W35	MF	0001-0002.438/-	D10				1N914 or 1N4448	0001-0018.493/-
R35	470R	2	0W25	MF	0000-7560.608/-	D11				1N914 or 1N4448	0001-0018.493/-
R36	6k34	1	0W35	MF	0001-0001.947/-	D12				1N914 or 1N4448	0001-0018.493/-
R37	169k	1	0W35	MF	0001-0003.136/-	IC1				4066	0001-0067.554/-
R38	1k78	1	0W35	MF	0001-0003.796/-	IC2				5534	0000-7513.257/-
R39	169k	1	0W35	MF	0001-0003.136/-	IC3				4077	0001-0070.897/-
R40	26R7	2	0W25	MF	0001-0000.207/-	IC4				4068	0001-0070.907/-
C1	2µ2	20	35	Tant.	0001-0040.762/-	IC5				4066	0001-0067.554/-
C2	4µ7	20	10	Tant.	0001-0040.801/-	IC6				4077	0001-0070.897/-
C3	1n	10	63	Cer.	0001-0004.698/-	IC7				5534	0000-7513.257/-
C4	47µ	20	16	Tant.	0001-0041.062/-	IC8				4066	0001-0067.554/-
C5	220n	10	100	PE	0001-0010.404/-	IC9				4538	0001-0070.761/-
C6	10n	20	100	Cer.	0001-0004.818/-	IC10				3403	0000-7513.309/-
C7	100n	20	100	PE	0001-0010.365/-	IC11				6654	0000-7601.965/-
C8	22p	2	63	Cer.	0001-0004.290/-	IC12				4001	0001-0015.962/-
C9	100n	20	100	PE	0001-0010.365/-	T1				TRANSFORMER	4502-1310.006/4
C10	10n	20	100	Cer.	0001-0004.818/-	T2				TRANSFORMER	4502-1310.006/4
C11	1n	10	63	Cer.	0001-0004.698/-	T3				TRANSFORMER	4502-1311.005/4
C12	100n	10	100	PE	0001-0010.365/-	PL1				HOUSING WN119/8/3	0000-2687.065/6
C13	47µ	20	6.3	PE	0001-0041.062/-					PLUG BULKHEAD	
C14	100n	10	100	PE	0001-0010.365/-					WN119/8/3	0000-2686.008/5
C15	100n	10	100	PE	0001-0010.365/-					RING	0000-2687.078/5
C16	220n	10	100	PE	0001-0010.404/-					SCREW	0000-1637.058/5
C17	10n	20	100	Cer.	0001-0004.818/-	A27				P.C.B. I.F. AMPLIFIER	4502-0127.009/2



NOTES 1) Suffix a on edge connector denotes component side, b denotes non-component side.  
 10) INPUT 10kHz (1-90 -20dB)  
 11) FROM LEVEL RANGE SW VIA INTERCONNECTION BOARD  
 12) FROM FRONT PANEL SWITCHES  
 13) POWER SUPPLY  
 14) TO INPUT UNIT ASSEMBLY

Fig. 16 Circuit Diagram, I.F. Amplifier/EPROM, 27



CIRCUIT REFERENCES TO BE PRECEDED BY BOARD ASSEMBLY NUMBER  
 eg. C4 BECOMES C2704  
 R25 BECOMES R2725

Fig. 17 Component Layout, I.F. Amplifier/EPROM, 27

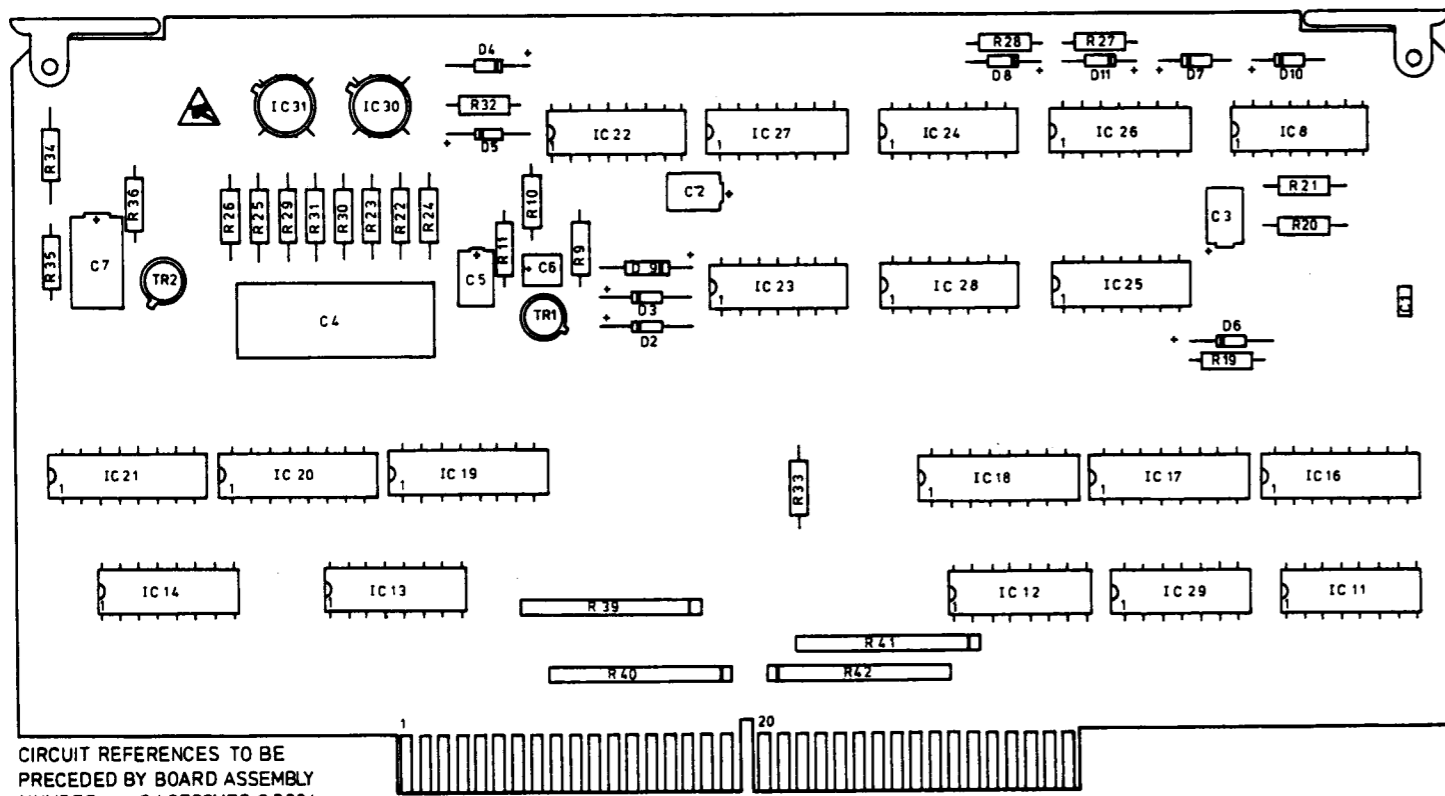
ASSEMBLY P.C.B. A83 METER and DEMODULATOR

REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.	REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.	REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.
R1	825R	1	0W35	MF	0001-0001.154/-	R58	1k	1	0W35	MF	0001-0001.219/-	C21	4n7	2	63	PF	0000-7598.528/-
R2	10k	1	0W35	MF	0001-0002.137/-	R59	3M3	5	0W25	MF	0001-0007.336/-	C22	2n2	2	63	Tant.	0000-7573.695/-
R3	56k2	1	0W35	MF	0001-0002.797/-	R60	47R	2	0W25	MF	0000-7601.321/-	C23	1n	10	63	Cer.	0001-0004.698/-
R4	10k	1	0W35	MF	0001-0002.137/-	R61	100k	1	0W35	MF	0001-0002.991/-	C24	1u	20	35	Tant.	0001-0040.704/-
R5	270k	2	0W25	MF	0000-7601.363/-	R62	10k	1	0W35	MF	0001-0002.137/-	C25	56p	2	63	Cer.	0001-0004.423/-
R6	10k	1	0W35	MF	0001-0002.137/-	R63	12k1	1	0W35	MF	0001-0002.218/-	C26	22u	20	16	Tant.	0001-0040.966/-
R7	61k9	1	0W35	MF	0001-0002.836/-	R64	2k	1	0W35	MF	0001-0001.455/-	C27	470n	10	100	PE	0001-0010.446/-
R8	24k	1	0W35	MF	0000-7601.334/-	R65	33R	2	0W25	MF	0000-7601.347/-	C28	1u	20	35	Tant.	0001-0040.704/-
R9	6k81	1	0W35	MF	0001-0001.976/-	R66	4k7	2	0W25	MF	0001-0001.811/-	C29	3n3	10	63	Cer.	0001-0004.779/-
R10	68R1	1	0W35	MF	0001-0000.427/-	R67	4k99	0.1	0W125	MF	0000-7512.724/-	C30	10u	20	25	Tant.	0001-0040.885/-
R11	3k3	2	0W25	MF	4980-0000.012/-	R68	56k2	1	0W35	MF	0001-0002.797/-	C31	100u	20	10	Tant.	0001-0041.156/-
R12	221R	1	0W35	MF	0001-0000.715/-	R69	35k7	1	0W35	MF	0001-0002.616/-	C32	33p	2	100	Cer.	0001-0004.342/-
R13	10k	1	0W35	MF	0001-0002.137/-	R70	100k	1	0W35	MF	0001-0002.991/-	C33	100n	10	100	PE	0001-0010.365/-
R14	10k	1	0W35	MF	0001-0002.137/-	R71	5k11	1	0W35	MF	0001-0001.853/-	C35	100n	10	100	PE	0001-0010.365/-
R15	68R1	1	0W35	MF	0001-0000.427/-	R72	5k11	1	0W35	MF	0001-0001.853/-	C36	4u7	20	10	Tant.	0001-0040.801/-
R16	100R	1	0W35	MF	0001-0000.537/-	R78	10k	2	0W125	RESISTOR NETWORK	0000-7602.760/-	C37	100n	10	100	PE	0001-0010.365/-
R17	3k3	2	0W25	MF	4980-0000.012/-	R79	51k1	1	0W35	MF	0001-0002.768/-	C38	1u	20	35	Tant.	0001-0040.704/-
R18	330R	2	0W25	MF	0000-7601.389/-	R80	11k	1	0W35	MF	0001-0002.179/-	C39	1u	20	35	Tant.	0001-0040.704/-
R19	10k	1	0W35	MF	0001-0002.137/-	R81	11k	1	0W35	MF	0001-0002.179/-	C40	10n	20	40	Cer.	0001-0004.818/-
R20	1k	1	0W35	MF	0001-0001.219/-	R82	39k2	1	0W35	MF	0001-0002.658/-	C41	22n	10	100	PF	0001-0010.255/-
R21	221R	1	0W35	MF	0001-0000.715/-	R83	24k3	1	0W35	MF	0001-0002.470/-	C42	15n	10	100	PF	0001-0010.239/-
R22	1k8	2	0W25	MF	0001-0014.510/-	R84	1k	1	0W35	MF	0001-0001.219/-	C43	47n	10	100	PF	0001-0010.310/-
R23	68R1	1	0W35	MF	0001-0000.427/-	R85	1k	1	0W35	MF	0001-0001.219/-	C44	22n	10	100	PF	0001-0010.255/-
R24	470R	2	0W25	MF	0000-7560.608/-	R86	137k	1	0W35	MF	0001-0003.084/-	C45	47u	20	6.3	Tant.	0001-0041.059/-
R25	432R	1	0W35	MF	0001-0000.935/-	R87	604R	1	0W35	MF	0001-0001.031/-	C46	1u	20	35	Tant.	0001-0040.704/-
R26	221R	1	0W35	MF	0001-0000.715/-	R88	33R	2	0W25	MF	0000-7601.347/-	C48	33u	20	10	Tant.	0001-0040.995/-
R27	10k	1	0W35	MF	0001-0002.137/-	R90	10k	1	0W35	MF	0001-0002.137/-	C49	33p	2	100	Cer.	0001-0004.342/-
R28	10k	1	0W35	MF	0001-0002.137/-	R91	10k	1	0W35	MF	0001-0002.137/-	C50	270p	2	63	Cer.	0001-0004.627/-
R29	33R	2	0W25	MF	0000-7601.347/-	R92	68R1	1	0W35	MF	0001-0000.427/-	C51	270p	2	63	Cer.	0001-0004.627/-
R30	90R9	1	0W35	MF	0001-0000.511/-	R93	2k2	1	0W35	MF	0001-0001.497/-	C52	1n	10	63	Cer.	0001-0004.698/-
R31	10k	1	0W35	MF	0001-0002.137/-	R94	12k1	1	0W35	MF	0001-0002.218/-	C53	10n	20	40	Cer.	0001-0004.818/-
R32	33R	2	0W25	MF	0000-7601.347/-	R95	1k	1	0W35	MF	0001-0001.219/-	C54	22n	20	40	Cer.	0001-0006.418/-
R33	5k11	1	0W35	MF	0001-0001.853/-	R96	8k25	1	0W35	MF	0001-0002.056/-	C55	33u	1	40	Tant.	0001-0040.995/-
R34	392R	1	0W35	MF	0001-0000.896/-	R97	243R	1	0W35	MF	0001-0000.731/-	C56	22n	20	40	Cer.	0001-0006.418/-
R35	392R	1	0W35	MF	0001-0000.896/-	R98	100k	1	0W35	MF	0001-0002.991/-	C57	1n	20	100	Cer.	0001-0004.698/-
R36	56R2	1	0W35	MF	0001-0000.346/-	R99	100R	1	0W35	MF	0001-0000.537/-	C58	4n7	10	63	Cer.	0001-0004.795/-
R37	5k11	1	0W35	MF	0001-0001.853/-	R100	16k2	1	0W35	MF	0001-0002.315/-	C59	180p	2	63	Cer.	0001-0004.591/-
R38	56R2	1	0W35	MF	0001-0000.346/-	C1	100n	10	100	PE	0001-0010.365/-	TR1				BC109	0000-7602.029/-
R39	1k	1	0W35	MF	0001-0001.219/-	C2	100n	10	100	PE	0001-0010.365/-	TR2				BC109	0000-7602.029/-
R40	68R1	1	0W35	MF	0001-0000.427/-	C3	22u	20	16	Tant.	0001-0040.966/-	TR3				2N2369A	0000-7542.066/-
R41	1k21	1	0W35	MF	0001-0001.277/-	C4	1u	10	100	PE	0001-0010.501/-	TR4				2N3251	0001-0017.342/-
R42	5k11	1	0W35	MF	0001-0001.853/-	C5	4u7	20	10	Tant.	0001-0040.801/-	TR5				2N2369A	0000-7542.066/-
R43	68R1	1	0W35	MF	0001-0000.427/-	C6	33p	2	63	Cer.	0001-0004.342/-	TR6				BC 109	0000-7602.029/-
R44	5k11	1	0W35	MF	0001-0001.853/-	C7	22p	2	63	Cer.	0001-0004.290/-	TR7				BC 109	0000-7602.029/-
R45	1k8	2	0W25	MF	0000-0014.510/-	C8	8p2	0.25	63	Cer.	0001-0004.148/-	TR8				BC 109	0000-7602.029/-
R46	5k11	1	0W35	MF	0001-0001.853/-	C9	33p	2	100	Cer.	0001-0004.342/-	TR9				BFW 11	0000-7602.003/-
R47	6k81	1	0W35	MF	0001-0001.976/-	C10	100u	20	10	Tant.	0001-0041.156/-	TR10				2N2369A	0000-7542.066/-
R48	1k8	2	0W25	MF	0001-0014.510/-	C11	330u	20	6.3	Tant.	0001-0041.211/-	TR11				2N2369A	0000-7542.066/-
R49	47k	2	0W25	MF	0000-7558.393/-	C12	100n	10	100	PE	0001-0010.365/-	D1				1N914 or 1N4448	0001-0018.493/-
R50	33R	2	0W25	MF	0000-7601.347/-	C13	68u	20	16	Tant.	0001-0041.114/-	D2				1N914 or 1N4448	0001-0018.493/-
R51	10k	1	0W35	MF	0001-0002.137/-	C14	100n	10	100	PE	0001-0010.365/-	D3				1N914 or 1N4448	0001-0018.493/-
R52	68R1	1	0W35	MF	0001-0000.427/-	C15	22u	20	16	Tant.	0001-0040.966/-	RV1	100R	20	0.5	Var.	0000-7601.648/-
R53	27k	2	0W25	MF	0000-7558.377/-	C16	15u	20	16	Tant.	0001-0040.924/-	RV2	50k	20	0.5	Var.	0000-7601.635/-
R54	27k	2	0W25	MF	0000-7558.377/-	C17	22u	20	16	Tant.	0001-0040.966/-	RV3	1k	20	0.5	Var.	0000-7573.679/-
R55	1k5	1	0W35	MF	0001-0001.358/-	C18	15u	20	16	Tant.	0001-0040.924/-	IC1				4538	0000-0070.761/-
R56	33k	2	0W25	MF	4980-0000.009/-	C19	22u	20	16	Tant.	0001-0040.966/-	IC2				311	0000-7601.004/-
R57	1k	1	0W35	MF	0001-0001.219/-	C20	22u	20	16	Tant.	0001-0040.966/-	IC3				301	0000-7601.978/-

REF.	VALUE	TOL. ±%	RATING	TYPE	PART NO.
IC4				3039	0001-0016.314/-
IC5				3130	0001-0069.918/-
IC6				ZN 423 T	0000-7601.923/-
IC7				4066	0001-0067.554/-
IC8				3130	0001-0069.918/-
IC9				4013	0001-0015.991/-
IC10				4066	0001-0067.554/-
IC12				3403	0000-7513.309/-
IC13				4066	0001-0067.554/-
IC14				4024	0001-0016.039/-
IC15				4018	0001-0068.760/-
XL1	6.144MHz			CRYSTAL	0000-7602.715/-
RL1				RSD - 12V	0001-0069.620/-
RL2				RSD - 12V	0001-0069.620/-
L1	51.5mH			INDUCTOR	4502-1436.003/4
L2	51.5mH			INDUCTOR	4502-1436.003/4
PL1				CONNECTOR ELBOW PC	0000-2687.065/6
PL2				HOUSING COAX. SKT.	
				BULKHEAD	0000-2686.008/5
				MOUNTING SPACER RING	0000-2687.078/5
				SCREW	0000-1637.058/5
AB3				P.C.B. METER and DEMODULATOR	4502-0283.008/2

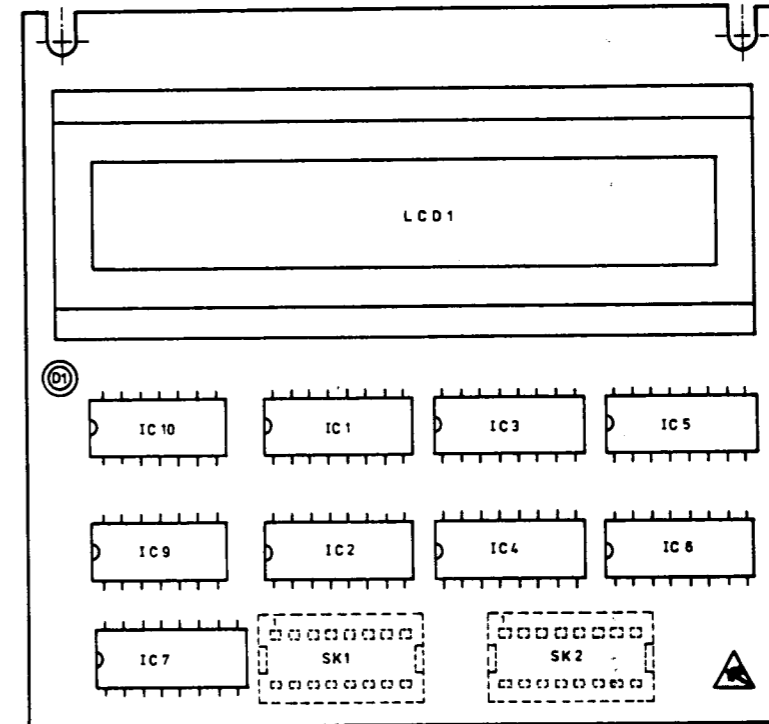






CIRCUIT REFERENCES TO BE  
PRECEDED BY BOARD ASSEMBLY  
NUMBER eg C4 BECOMES C2904  
IC 8 BECOMES IC 2913

Fig. 20 Component Layout, Frequency Control, (29)



CIRCUIT REFERENCES TO BE  
PRECEDED BY BOARD ASSEMBLY  
NUMBER eg IC 2 BECOMES IC3202.

Fig. 21 Component Layout, Frequency Display, (32)

ASSEMBLY P.C.B. A29 FREQUENCY CONTROL

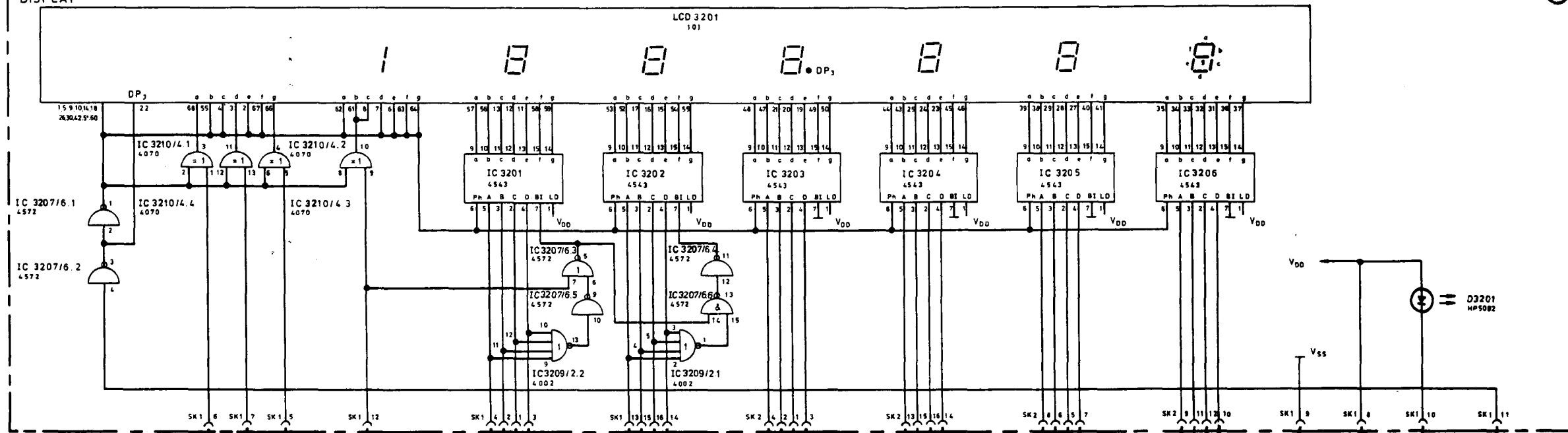
REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.
R9	39R2	1	0W35	MF	0001-0003.547/-
R10	221k	1	0W35	MF	0001-0003.217/-
R11	56k2	1	0W35	MF	0001-0002.797/-
R19	56k2	1	0W35	MF	0001-0002.797/-
R20	100R	1	0W35	MF	0001-0000.537/-
R21	562k	1	0W35	CF	0001-0003.408/-
R22	27k	2	0W25	MF	0000-7558.377/-
R23	100k	1	0W35	MF	0001-0002.991/-
R24	82R5	1	0W35	MF	0001-0000.472/-
R25	1M2	5	0W35	CF	0001-0007.297/-
R26	1M2	5	0W35	CF	0001-0007.297/-
R27	301k	1	0W35	MF	0001-0062.025/-
R28	33k	2	0W25	MF	4980-0000.009/-
R29	82R5	1	0W35	MF	0001-0000.472/-
R30	221k	1	0W35	MF	0001-0003.217/-
R31	27k	2	0W25	MF	0000-7558.377/-
R32	7k5	1	0W35	MF	0001-0002.014/-
R33	825R	1	0W35	MF	0001-0001.154/-
R34	562k	1	0W35	CF	0001-0003.408/-
R35	56k2	1	0W35	MF	0001-0002.797/-
R36	301k	1	0W35	MF	0001-0062.025/-
R38					
R39	10 x 100k	2	0W2	RESISTOR PACK	0000-7604.441/-
R40	10 x 100k	2	0W2	RESISTOR PACK	0000-7604.441/-
R41	10 x 100k	2	0W2	RESISTOR PACK	0000-7604.441/-
R42	10 x 100k	2	0W2	RESISTOR PACK	0000-7604.441/-
C1	1n	20	100	Cer.	0000-7602.809/-
C2	33μ	20	10	Tant.	0001-0040.995/-
C3	33μ	20	10	Tant.	0001-0040.995/-

REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.
C4	3μ3	10	63	Tant.	0000-7601.606/-
C5	33μ	20	10	Tant.	0001-0040.995/-
C6	4μ7	20	10	Tant.	0001-0040.801/-
C7	100μ	20	10	Tant.	0001-0041.156/-
TR1				8CY71	0001-0016.534/-
TR2				BC109	0000-7602.029/-
D2				1N914 or 1N4448	0001-0018.493/-
D3				1N914 or 1N4448	0001-0018.493/-
D4				1N914 or 1N4448	0001-0018.493/-
D5				1N914 or 1N4448	0001-0018.493/-
D6				1N914 or 1N4448	0001-0018.493/-
D7				1N914 or 1N4448	0001-0018.493/-
D8				1N914 or 1N4448	0001-0018.493/-
D9				BZY88C8V2	0001-0019.036/-
D10				1N914 or 1N4448	0001-0018.493/-
D11				1N914 or 1N4448	0001-0018.493/-
IC8				4040	0001-0065.462/-
IC11				4503	0000-7548.853/-
IC12				4503	0000-7548.853/-
IC13				4503	0000-7548.853/-
IC14				4503	0000-7548.853/-
IC15				4510	0001-7548.650/-
IC16				4510	0001-7548.650/-
IC17				4510	0001-7548.650/-
IC18				4510	0001-7548.650/-
IC19				4510	0001-7548.650/-
IC20				4510	0001-7548.650/-
IC21				4510	0001-7548.650/-
IC22				4175	0000-7529.416/-

REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.
IC23			4013		0001-0015.991/-
IC24			4081		0001-0070.884/-
IC25			4069		0001-0070.978/-
IC26			4023		0001-0016.026/-
IC27			4001		0001-0015.962/-
IC28			4075		0001-0071.016/-
IC29			4082		0001-0070.868/-
IC30			μA 776 TC		0000-7604.425/-
IC31			μA 776 TC		0000-7604.425/-
A29			P.C.B. FREQUENCY CONTROL		4502-0129.007/2

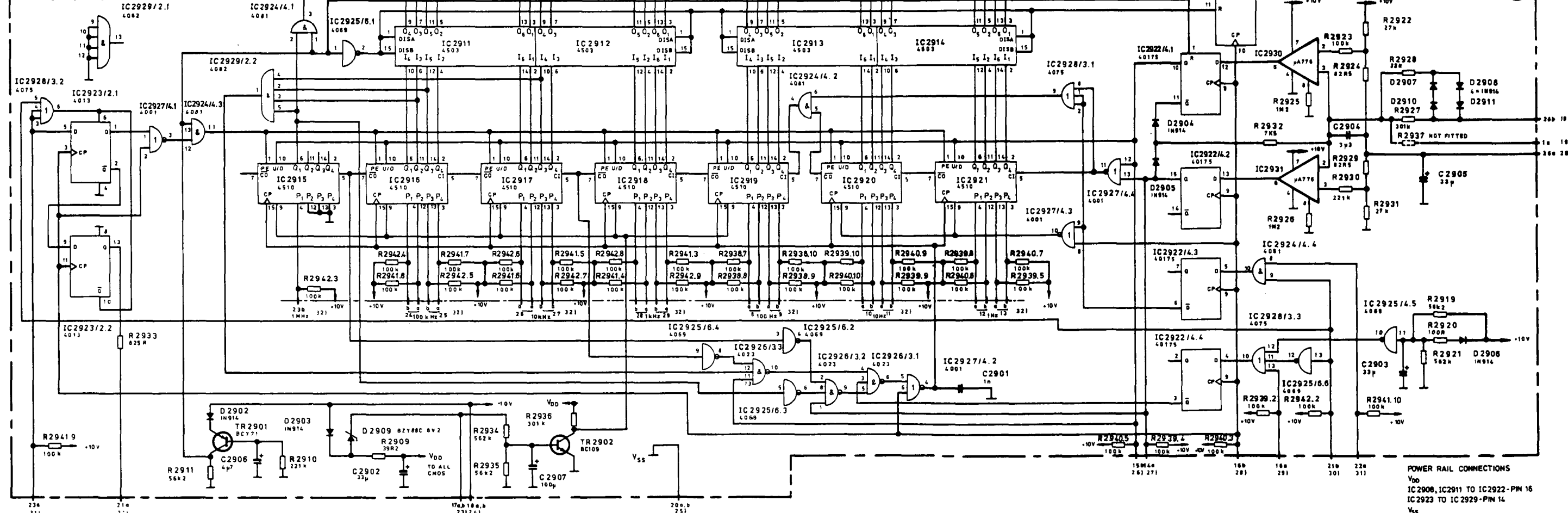
ASSEMBLY P.C.B. A32 DISPLAY BOARD

REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.
D1			LED 5082 - 4955		0000-7599.925/-
IC1			4543		0001-0068.618/-
IC2			4543		0001-0068.618/-
IC3			4543		0001-0068.618/-
IC4			4543		0001-0068.618/-
IC5			4543		0001-0068.618/-
IC6			4543		0001-0068.618/-
IC7			4572		0001-0068.540/-
IC9			4002		0001-0067.570/-
IC10			4070		0001-0071.029/-
SK1			SOCKET D.I.L. 16-WAY		0000-7518.391/-
SK2			SOCKET D.I.L. 16-WAY		0000-7518.391/-
LCD1			LCD 3922.315.09.0		0000-7603.727/-
A32			P.C.B. DISPLAY BOARD		4502-0132.007/2



POWER RAIL CONNECTIONS  
V<sub>DD</sub>  
IC 3201 TO IC 3206-PIN 16  
IC 3207, IC 3209, IC 3210-PIN 14  
V<sub>SS</sub>  
IC 3201 TO IC 3206-PIN 8  
IC 3207, IC 3209, IC 3210-PIN 7

Fig. 22 Circuit Diagram, Frequency Control, 29 and Frequency Display 32



POWER RAIL CONNECTIONS  
V<sub>DD</sub>  
IC 2906, IC 2911 TO IC 2922-PIN 16  
IC 2923 TO IC 2929-PIN 14  
V<sub>SS</sub>  
IC 2906, IC 2911 TO IC 2922-PIN 8  
IC 2923 TO IC 2929-PIN 7

- NOTES 1) Suffix a on edge connector denotes component side, b denotes non-component side
- 11) DIV1 1MHz
  - 12) " 100kHz
  - 13) " 10kHz
  - 14) " 1kHz
  - 15) " 100Hz
  - 16) " 10Hz
  - 17) " 1Hz
  - 18) To motor M+
  - 19) Not connected
  - 20) To motor M-
  - 21) DAV
  - 22) DAC
  - 23) U<sub>BATT</sub>
  - 24) +10V
  - 25) GND
  - 26) To DIV1 UP
  - 27) To DIV1 DN
  - 28) To DIV1 DAW
  - 29) To SW LOCK
  - 30) To SW REM
  - 31) To SW COR/FINE
  - 32) To back panel connector, not fitted

ASSEMBLY P.C.B. A30 CALIBRATION

REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.	REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.	REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.	
R1	15k	1	0W35	MF	0001-0002.289/-	R60	1k	1	0W35	MF	0001-0001.219/-	C33	100n	20	100	Cer.	0000-7598.450/-	
R2	3k3	2	0W25	MF	4980-0000.012/-	R61	5k62	1	0W35	MF	0001-0001.895/-	C34	10n	20	40	Cer.	0001-0004.818/-	
R3	68R1	1	0W35	MF	0001-0000.427/-	R62	39k2	1	0W35	MF	0001-0002.658/-	C35	100n	20	100	Cer.	0000-7598.450/-	
R4	4k7	2	0W25	MF	0001-0001.811/-	R63	1k5	1	0W35	MF	0001-0001.358/-	C36	100n	20	100	Cer.	0000-7598.450/-	
R5	6k81	1	0W35	MF	0001-0001.976/-	R64	5k62	1	0W35	MF	0001-0001.895/-	C37	100n	20	100	Cer.	0000-7598.450/-	
R6	10k	1	0W35	MF	0001-0002.137/-	R65	47R	2	0W25	MF	0001-7601.321/-	C38	100n	20	100	Cer.	0000-7598.450/-	
R7	68R1	1	0W35	MF	0001-0000.427/-	R66	470R	2	0W25	MF	0000-7560.608/-	C39	100n	20	100	Cer.	0000-7598.450/-	
R8	68R1	1	0W35	MF	0001-0000.427/-	R67	2k21	1	0W35	MF	0001-0001.497/-	C40	10u	20	25	Tant.	0000-0040.885/-	
R9	1k82	1	0W35	MF	0001-0001.413/-	R68	33k	2	0W25	MF	4980-0000.009/-	TR1				2N2369A	0000-7542.066/-	
R10	121R	1	0W35	MF	0001-0000.566/-	R69	68R1	1	0W35	MF	0001-0000.427/-	TR2				2N3251	0001-0017.342/-	
R11	1k	1	0W35	MF	0001-0001.219/-	R70	68k1	1	0W35	MF	0001-0002.878/-	TR3				2N2369A	0000-7542.066/-	
R12	68R1	1	0W35	MF	0001-0000.427/-	R71	68R1	1	0W35	MF	0001-0000.427/-	TR4				2N2917	0000-7531.268/-	
R13	357R	1	0W35	MF	0001-0000.867/-	R72	909R	2	0W25	MF	0001-0001.183/-	TR5				2N2369A	0000-7542.066/-	
R14	1k	1	0W35	MF	0001-0001.219/-	R73	2k21	2	0W25	MF	0001-0001.497/-	TR6				2N2369A	0000-7542.066/-	
R15	100R	1	0W35	MF	0001-0000.537/-	R74	1k1	1	0W35	MF	0001-0001.235/-	TR7				2N2369A	0000-7542.066/-	
R16	698R	1	0W35	MF	0001-0001.099/-	R75	330	2	0W25	MF	0000-7601.389/-	TR8				FET BF245A	0001-0016.628/-	
R17	301R	1	0W35	MF	0001-0000.799/-	R76	68k1	1	0W35	MF	0001-0002.878/-	TR9				FET BF245A	0001-0016.628/-	
R18	280R	1	0W35	MF	0001-0000.773/-	R77	68R1	1	0W35	MF	0001-0000.427/-	TR10				BC109	0000-7602.029/-	
R19	330R	2	0W25	MF	0000-7601.389/-	R78	33k	2	0W25	MF	4980-0000.009/-	D1				1N4448	0001-0018.493/-	
R20	3k57	1	0W35	MF	0001-0001.691/-	R79	1M	1	0W35	MF	0001-0027.507/-	D2				ZPD 5V1	0001-0018.846/-	
R21	6k19	1	0W35	MF	0001-0001.934/-	R80	1M	1	0W35	MF	0001-0027.507/-	D3				1N4448	0001-0018.493/-	
R22	68R1	1	0W35	MF	0001-0000.427/-	R81	100k	1	0W35	MF	0001-0002.991/-	D4				1N4448	0001-0018.493/-	
R23	301R	1	0W35	MF	0001-0000.799/-	R82	100k	1	0W35	MF	0001-0002.991/-	RV2	2k0	20	0W5	Var.	0000-7579.039/-	
R24	68R1	1	0W35	MF	0001-0000.427/-	R83	100k	1	0W35	MF	0001-0002.991/-	IC1				CA 3086	0000-7601.952/-	
R25	26R7	1	0W35	MF	0001-0000.207/-	R84	301k	2	0W25	MF	0001-0062.025/-	IC2				MC1458	0001-0014.989/-	
R26	2k4	2	0W25	MF	0000-7601.415/-	C1	100n	20	100	Cer.	0000-7598.450/-	IC3				CA 3086	0000-7601.952/-	
R27	2k21	1	0W35	MF	0001-0001.497/-	C2	100n	20	100	Cer.	0000-7598.450/-	IC4				CD 4066	0001-0067.554/-	
R28	1k3	2	0W25	MF	0000-0001.303/-	C3	100n	20	100	Cer.	0000-7598.450/-	L1	1.5uH			INDUCTOR	4502-1412.001/4	
R29	100R	1	0W35	MF	0001-0000.537/-	C4	910p	2	63	PF	0000-7598.557/-	L2	1.5uH			INDUCTOR	4502-1412.001/4	
R30	68R1	1	0W35	MF	0001-0000.427/-	C5	100n	20	100	Cer.	0000-7598.450/-	L3	33uH			INDUCTOR	0000-7556.230/-	
R31	432R	1	0W35	MF	0001-0000.935/-	C6	39p	2	63	Cer.	0000-0004.371/-	L4	33uH			INDUCTOR	0000-7556.230/-	
R32	10R	1	0W35	MF	0001-0000.074/-	C7	910p	2	63	PF	0000-7598.557/-	L5	33uH			INDUCTOR	0000-7556.230/-	
R33	47R	2	0W25	MF	0000-7601.321/-	C8	180p	2	63	Cer.	0001-0004.591/-	L6	220uH			INDUCTOR	0000-7556.337/-	
R35	3k65	1	0W35	MF	0001-0001.701/-	C9	12p	2	63	Cer.	0001-0004.203/-	RL1				RSD - 12V	0001-0069.620/-	
R36	76R8	1	0W35	MF	0001-0065.307/-	C10	390p	2	63	Cer.	0001-0004.656/-	RL2				RSD - 12V	0001-0069.620/-	
R37	24k3	1	0W35	MF	0001-0002.470/-	C11	47p	2	63	Cer.	0001-0004.397/-	X1				MIXER A/1769/B	1769-1000.004/2	
R38	1k	1	0W35	MF	0001-0001.219/-	C12	390p	2	63	Cer.	0001-0004.656/-	A30				P.C.B. CALIBRATION	4502-0130.009/2	
R39	68R1	1	0W35	MF	0001-0000.427/-	C13	27p	2	63	Cer.	0001-0004.326/-							
R40	10k	1	0W35	MF	0001-0002.137/-	C14	150p	2	63	Cer.	0001-0004.575/-							
R41	698R	1	0W35	MF	0001-0001.099/-	C15	33u	20	10	Tant.	0001-0040.995/-							
R43	750R	2	0W25	MF	0001-0001.125/-	C16	10p	2	63	Cer.	0001-0004.177/-							
R44	3k01	1	0W35	MF	0001-0001.620/-	C17	100u	20	10	Tant.	0001-0041.156/-							
R45	4k7	2	0W25	MF	0001-0001.811/-	C18	47u	20	16	Tant.	0001-0041.062/-							
R46	100R	1	0W35	MF	0001-0000.537/-	C19	10n	20	40	Cer.	0001-0004.818/-							
R47	100k	1	0W35	MF	0001-0002.991/-	C20	100n	20	100	Cer.	0000-7598.450/-							
R48	100k	1	0W35	MF	0001-0002.991/-	C21	68u	20	16	Tant.	0000-0041.114/-							
R49	10k	1	0W35	MF	0001-0002.137/-	C22	47u	20	6.3	Tant.	0001-0041.059/-							
R50	10k	1	0W35	MF	0001-0002.137/-	C23	10n	20	40	Cer.	0001-0004.818/-							
R51	47R	2	0W25	MF	0000-7601.321/-	C24	100n	20	100	Cer.	0000-7598.450/-							
R52	825R	1	0W35	MF	0001-0001.154/-	C25	3u3	10	63	PE	0000-7601.606/-							
R53	47R	2	0W25	MF	0001-7601.321/-	C26	680n	10	100	PE	0001-0010.462/-							
R54	68R1	1	0W35	MF	0001-0000.427/-	C27	33u	20	10	Tant.	0001-0040.995/-							
R55	562R	1	0W35	MF	0001-0001.015/-	C28	330n	10	100	PE	0001-0010.420/-							
R56	562R	1	0W35	MF	0001-0001.015/-	C29	100n	20	100	Cer.	0000-7598.450/-							
R57	221R	1	0W35	MF	0001-0000.715/-	C30	100n	20	100	Cer.	0000-7598.450/-							
R58	68R1	1	0W35	MF	0001-0000.427/-	C31	100n	20	100	Cer.	0000-7598.450/-							
R59	68R1	1	0W35	MF	0001-0000.427/-	C32	100n	20	100	Cer.	0000-7598.450/-							

PRINTED CIRCUIT BOARD ASSEMBLY A30  
CALIBRATION

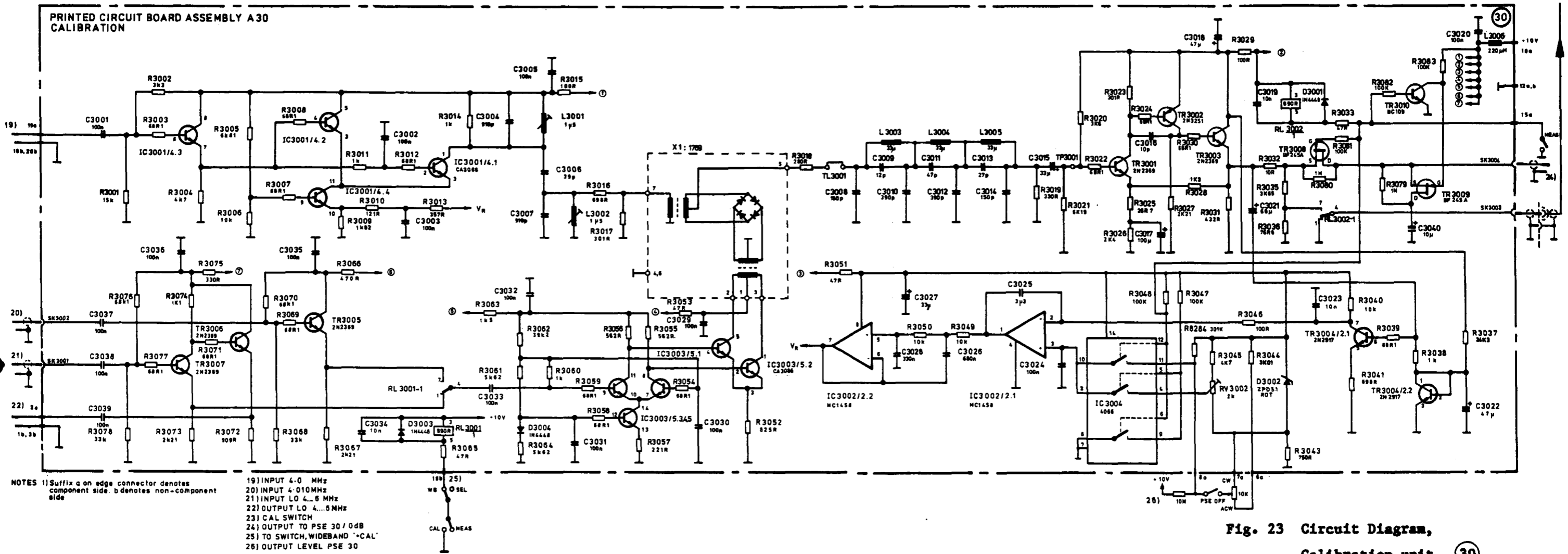
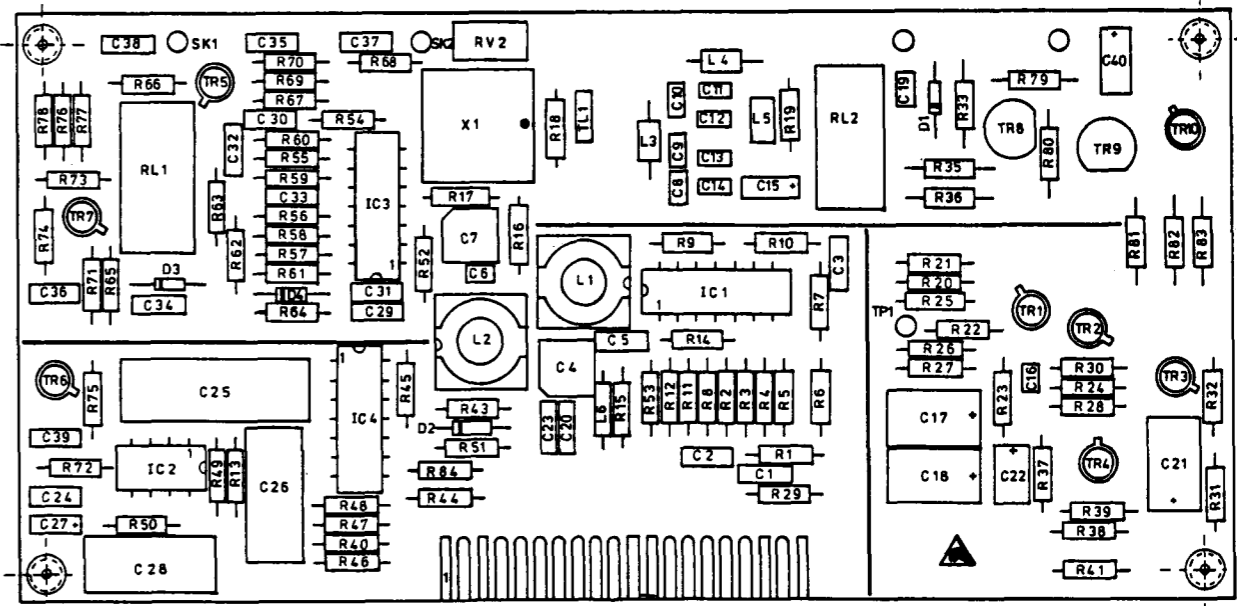


Fig. 23 Circuit Diagram, Calibration unit, 30



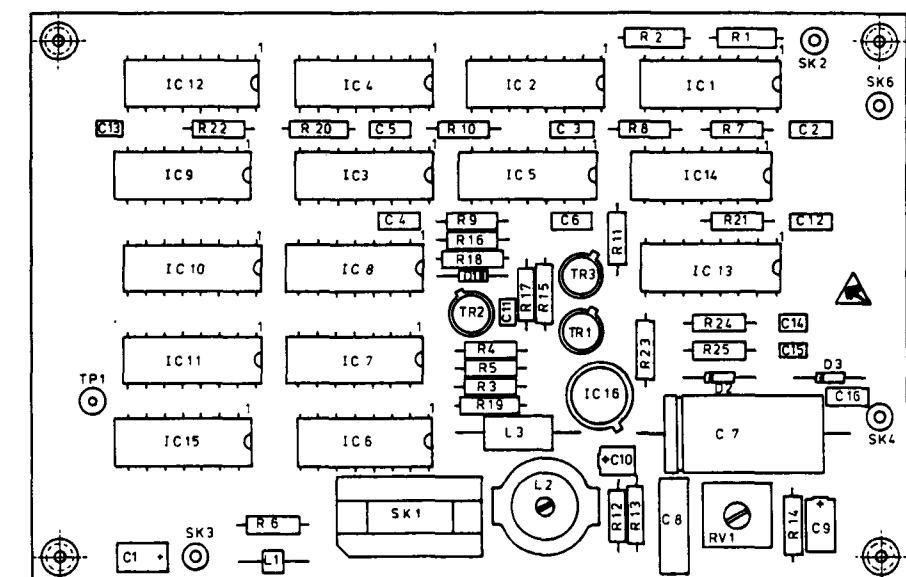
CIRCUIT REFERENCES TO BE PRECEDED BY BOARD ASSEMBLY NUMBER.  
e.g. R41 BECOMES R3041  
C7 BECOMES C3007

Fig. 24 Component Layout, Calibration unit, 30

ASSEMBLY P.C.B. A33 DIVIDER 1

REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.
R1	29k8	0.5	0W125	MF	0000-7599.174/-
R2	60k4	0.5	0W125	MF	0000-7598.243/-
R3	120k	0.5	0W125	MF	0000-7598.256/-
R4	243k	0.5	0W125	MF	0000-7598.269/-
R5	301k	0.5	0W125	MF	0000-7598.272/-
R6	612k	0.5	0W125	MF	0000-7600.474/-
R7	1M2	5	0W35	CF	0001-0007.297/-
R8	2M4	5	0W35	CF	0000-7601.376/-
R21	10k	1	0W35	MF	0001-0002.137/-
R22	5R62	1	0W35	MF	0001-0003.945/-
C5	470p	10	63	Cer.	0001-0004.669/-
C6	22p	2	63	Cer.	0001-0004.290/-
C7	1n	10	63	Cer.	0001-0004.698/-
C8	1n	10	63	Cer.	0001-0004.698/-
C9	1n	10	63	Cer.	0001-0004.698/-
C10	1n	10	63	Cer.	0001-0004.698/-
C11	1n	10	63	Cer.	0001-0004.698/-
C12	1n	10	63	Cer.	0001-0004.698/-
C13	1n	10	63	Cer.	0001-0004.698/-
C14	1n	10	63	Cer.	0001-0004.698/-
C15	1n	10	63	Cer.	0001-0004.698/-
C16	1n	10	63	Cer.	0001-0004.698/-
C17	1n	10	63	Cer.	0001-0004.698/-
C18	1n	10	63	Cer.	0001-0004.698/-
C19	1n	10	63	Cer.	0001-0004.698/-
C20	1n	10	63	Cer.	0001-0004.698/-
C21	1n	10	63	Cer.	0001-0004.698/-
C22	1n	10	63	Cer.	0001-0004.698/-
C23	1n	10	63	Cer.	0001-0004.698/-
C24	1n	10	63	Cer.	0001-0004.698/-
C25	1n	10	63	Cer.	0001-0004.698/-
C26	1n	10	63	Cer.	0001-0004.698/-
C27	1n	10	63	Cer.	0001-0004.698/-
C28	1n	10	63	Cer.	0001-0004.698/-
C29	1n	10	63	Cer.	0001-0004.698/-
C30	1n	10	63	Cer.	0001-0004.698/-
C31	1n	10	63	Cer.	0001-0004.698/-
C32	1n	10	63	Cer.	0001-0004.698/-
C33	1n	10	63	Cer.	0001-0004.698/-
C39	1n	10	63	Cer.	0001-0004.698/-
C40	10u	+50-10	63	Elec.	0001-0041.693/-
C41	10u	+50-10	63	Elec.	0001-0041.693/-
D1				1N4448	0001-0018.493/-
D2				1N4448	0001-0018.493/-
D3				1N4448	0001-0018.493/-
D4				1N4448	0001-0018.493/-
D5				1N4448	0001-0018.493/-
D6				1N4448	0001-0018.493/-
D7				1N4448	0001-0018.493/-
D8				1N4448	0001-0018.493/-
D9				1N4448	0001-0018.493/-
D10				1N4448	0001-0018.493/-
D11				1N4448	0001-0018.493/-
D12				1N4448	0001-0018.493/-
D13				1N4448	0001-0018.493/-
D14				1N4448	0001-0018.493/-

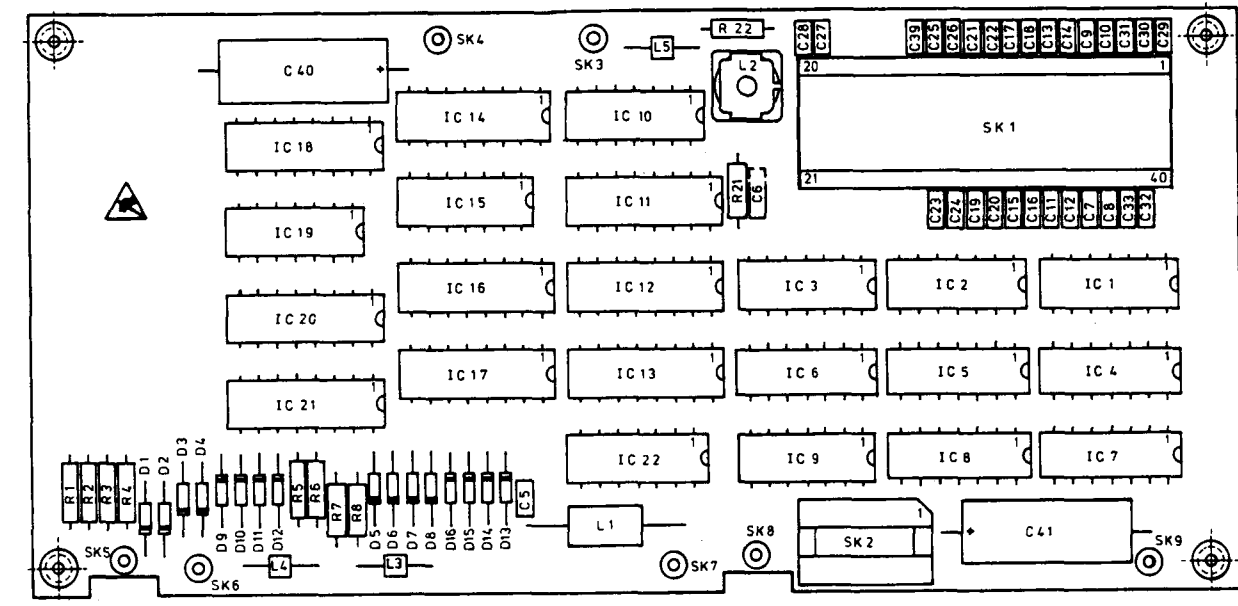
REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.
D15				1N4448	0001-0018.493/-
D16				1N4448	0001-0018.493/-
IC1				4011	0001-0015.988/-
IC2				4011	0001-0015.988/-
IC3				4011	0001-0015.988/-
IC4				14023	0001-0016.026/-
IC5				14023	0001-0016.026/-
IC6				14023	0001-0016.026/-
IC7				14082	0001-0070.868/-
IC8				14082	0001-0070.868/-
IC9				4012	0001-0065.475/-
IC10				4073	0001-0070.871/-
IC11				4027	0001-0016.042/-
IC12				4160	0000-7529.351/-
IC13				4049	0001-0068.197/-
IC14				4027	0001-0016.042/-
IC15				4011	0001-0015.988/-
IC16				4160	0000-7529.351/-
IC17				4160	0000-7529.351/-
IC18				4027	0001-0016.042/-
IC19				4011	0001-0015.988/-
IC20				4160	0000-7529.351/-
IC21				4160	0000-7529.351/-
IC22				14023	0001-0016.026/-
L1				INDUCTOR	0001-0042.757/-
L2				INDUCTOR	4502-1423.003/4
L3				FERRITE BEAD	0000-7567.737/-
L4				FERRITE BEAD	0000-7567.737/-
L5				FERRITE BEAD	0000-7567.737/-
SK1				SOCKET D.I.L. 40-WAY	
				J23 - 8040	0000-7541.711/-
SK2				SOCKET D.I.L. 14-WAY	0000-7518.388/-
A33				P.C.B. DIVIDER 1	4502-0133.006/2



COMPONENT REFERENCES TO BE PRECEDED  
BY BOARD ASSEMBLY NUMBER eg R21BECOMES R3421  
C4 BECOMES C3404

Fig. 25 Component Layout, Divider 2, 34

REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.
D1				1N4448	0001-0018.493/-
D2				1N4448	0001-0018.493/-
D3				1N4448	0001-0018.493/-
D4				1N4448	0001-0018.493/-
D5				1N4448	0001-0018.493/-
D6				1N4448	0001-0018.493/-
D7				1N4448	0001-0018.493/-
D8				1N4448	0001-0018.493/-
D9				1N4448	0001-0018.493/-
D10				1N4448	0001-0018.493/-
D11				1N4448	0001-0018.493/-
D12				1N4448	0001-0018.493/-
D13				1N4448	0001-0018.493/-
D14				1N4448	0001-0018.493/-

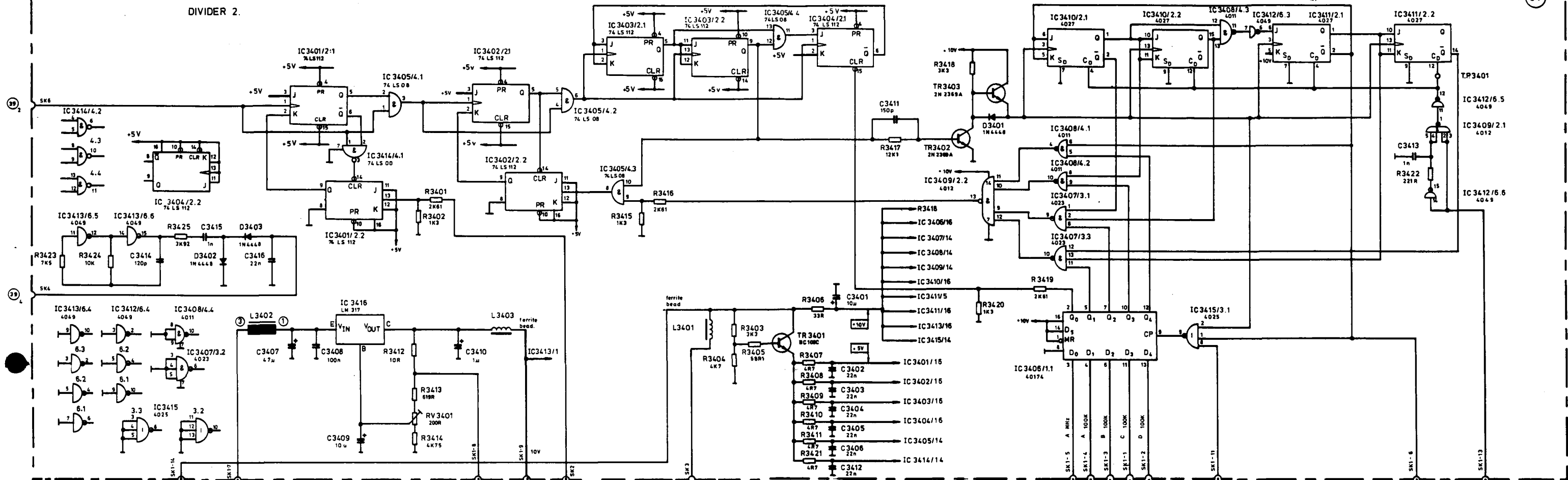


CIRCUIT REFERENCES TO BE PRECEDED  
BY BOARD ASSEMBLY NUMBER  
e.g. R7 BECOMES R3307  
C30 BECOMES C3330

Fig. 26 Component Layout, Divider 1, 33

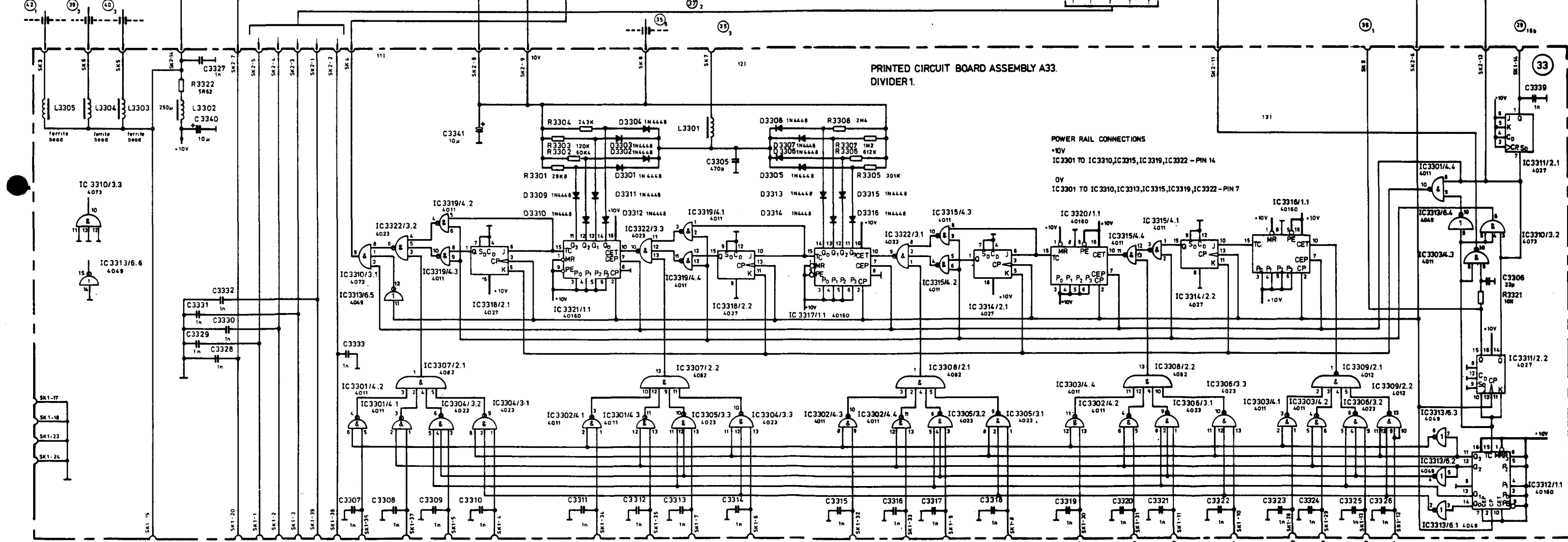
PRINTED CIRCUIT BOARD ASSEMBLY A34  
DIVIDER 2.

34



PRINTED CIRCUIT BOARD ASSEMBLY A33  
DIVIDER 1.

33



- 10) 200KHz CLOCK
- 11) SUB HARMONIC DETECTION PULSE
- 12) PHASE COMPENSATION CURRENT
- 13) PHASE MEASURING TIME
- 14) DATA CHANGE

Fig. 27 Circuit Diagram, Divider 1, and Divider 2, 33

ASSEMBLY P.C.B. A34 DIVIDER 2

REF.	VALUE	TOL. ±%	RATING	TYPE	PART NO.
R1	2k61	1	OW35	MF	0001-0001.565/-
R2	1k3	1	OW35	MF	0001-0001.303/-
R3	3k3	2	OW25	MF	4980-0000.012/-
R4	4k7	2	OW25	MF	0001-0001.811/-
R5	68R1	2	OW25	MF	0001-0000.427/-
R6	33R	2	OW25	MF	0000-7601.347/-
R7	4R7	5	OW25	MF	0001-0006.609/-
R8	4R7	5	OW25	MF	0001-0006.609/-
R9	4R7	5	OW25	MF	0001-0006.609/-
R10	4R7	5	OW25	MF	0001-0006.609/-
R11	4R7	5	OW25	MF	0001-0006.609/-
R12	10R	1	OW35	MF	0001-0000.074/-
R13	619R	0.5	OW125	MF	0000-7512.245/-
R14	4k75	0.5	OW125	MF	0000-7535.251/-
R15	1k3	1	OW35	MF	0001-0001.303/-
R16	2k61	1	OW35	MF	0001-0001.565/-
R17	12k1	1	OW35	MF	0001-0002.218/-
R18	3k3	2	OW25	MF	4980-0000.012/-
R19	2k61	1	OW35	MF	0001-0001.565/-
R20	1k3	1	OW35	MF	0001-0001.303/-
R21	4R7	5	OW25	MF	0001-0006.609/-
R22	221R	1	OW35	MF	0001-0000.715/-
R23	7k5	1	OW35	MF	0001-0002.014/-
R24	10k	1	OW35	MF	0001-0002.137/-
R25	3k92	1	OW35	MF	0001-0001.730/-
C1	10u	20	25	Tant.	0001-0040.885/-
C2	22n	20	100	Cer.	0001-0006.418/-
C3	22n	20	100	Cer.	0001-0006.418/-
C4	22n	20	100	Cer.	0001-0006.418/-
C5	22n	20	100	Cer.	0001-0006.418/-
C6	22n	20	100	Cer.	0001-0006.418/-
C7	47u	+50-10%	40	Tant.	0001-0041.758/-
C8	100n	10	100	PE	0001-0010.365/-
C9	10u	20	25	Tant.	0001-0040.885/-
C10	1u	20	35	Tant.	0001-0040.704/-
C11	150p	2	63	Cer.	0001-0004.575/-
C12	22n	20	100		0001-0006.418/-
C13	1n	20	100		0001-0004.698/-
C14	120p	2	63	Cer.	0001-0004.562/-
C15	1n	20	100		0001-0004.698/-
C16	22n	20	100	Cer.	0001-0006.418/-
TR1				BC109 C	0000-7602.126/-
TR2				2N2369A	0000-7542.066/-
TR3				2N2369A	0000-7542.066/-
D1				1N4448	0001-0018.493/-
D2				1N4448	0001-0018.493/-
D3				1N4448	0001-0018.493/-
RV1	200R	20	OW5	Var.	0000-7601.622/-
IC1				74 LS 112	0001-0071.427/-
IC2				74 LS 112	0001-0071.427/-
IC3				74 LS 112	0001-0071.427/-
IC4				74 LS 112	0001-0071.427/-
IC5				74 LS 08	0001-0067.169/-
IC6				40174	0000-7565.399/-
IC7				4023	0001-0016.026/-
IC8				4011	0001-0015.988/-
IC9				4012	0001-0065.475/-

REF.	VALUE	TOL. ±%	RATING	TYPE	PART NO.
IC10				4027	0001-0016.042/-
IC11				4027	0001-0016.042/-
IC12				4049	0001-0068.197/-
IC13				4049	0001-0068.197/-
IC14				74 LS 00	0001-0065.695/-
IC15				4025	0001-0065.488/-
IC16				LM 317	0000-7596.724/-
L1				B62110	0000-7567.737/-
L2				INDUCTOR	4502-1429.007/4
L3				B82114	0001-0042.757/-
SK1				SOCKET D.I.L. 14-WAY	
				J23 - 2028Z	0000-7518.388/-
A34				P.C.B. DIVIDER 2	4502-0134.005/2

ASSEMBLY P.C.B. A35 PHASE DETECTOR

REF.	VALUE	TOL. ±%	RATING	TYPE	PART NO.
R1	8k25	1	OW35	MF	0001-0002.056/-
R2	5k23	1	OW35	MF	0001-0001.866/-
R3	7k15	1	OW35	MF	0001-0001.992/-
R4	909R	0.5	OW125	MF	0000-7509.685/-
R5	68R1	1	OW35	MF	0001-0000.427/-
R6	27k4	1	OW35	MF	0001-0002.522/-
R7	6k19	1	OW35	MF	0001-0001.934/-
R8	25k5	0.5	OW125	MF	0000-7599.682/-
R9	20k	1	OW35	MF	0001-0002.409/-
R10	200K	0.5	OW125	MF	0000-7591.428/-
R11	562k	0.5	OW125	MF	0000-7598.298/-
R12	196k	0.5	OW125	MF	0000-7598.308/-
R13	16k5	1	OW35	MF	0001-0002.328/-
R14	7k15	1	OW35	MF	0001-0001.992/-
R15	226R	0.5	OW125	MF	0000-7515.174/-
R16	68R1	1	OW35	MF	0001-0000.427/-
R17	3k83	1	OW35	MF	0001-0001.727/-
R18	7k32	1	OW35	MF	0001-0002.001/-
R19	6k34	0.5	OW125	MF	0000-7512.339/-
R20	105k	0.5	OW125	MF	0000-7598.285/-
R21	26k7	0.5	OW125	MF	0000-7528.747/-
R22	54k9	1	OW35	MF	0001-0002.784/-
R23	86k6	1	OW35	MF	0001-0002.959/-
R24	1k5	1	OW35	MF	0001-0001.358/-
R25	68R1	1	OW35	MF	0001-0000.427/-
R26	26k7	1	OW35	MF	0001-0002.519/-
R27	7k15	1	OW35	MF	0001-0001.992/-
R28	16k5	1	OW35	MF	0001-0002.328/-
R29	1k33	1	OW35	MF	0001-0001.316/-
R30	909R	1	OW35	MF	0001-0001.183/-
R31	68R1	1	OW35	MF	0001-0000.427/-
R32	270k	2	OW25	MF	0000-7601.363/-
R33	348k	1	OW35	MF	0001-0003.314/-
R34	100R	1	OW35	MF	0001-0000.537/-
R35	402k	1	OW35	MF	0001-0063.121/-
R36	84k5	1	OW35	MF	0001-0002.946/-
R37	196k	1	OW35	MF	0001-0065.394/-
R38	59k	1	OW35	MF	0001-0002.810/-

REF.	VALUE	TOL. ±%	RATING	TYPE	PART NO.
R40	3k01	1	OW35	MF	0001-0001.620/-
R41	35k7	1	OW35	MF	0001-0002.616/-
R42	1M2	5	OW25	CF	0001-0007.297/-
R43	100R	1	OW35	MF	0001-0000.537/-
R45	2k7	2	OW25	MF	0000-7558.380/-
R46	287R	1	OW35	MF	0001-0000.786/-
R47	22k1	1	OW35	MF	0001-0002.441/-
R48	3k01	1	OW35	MF	0001-0001.620/-
R49	4k02	1	OW35	MF	0001-0001.743/-
R50	1k5	1	OW35	MF	0001-0001.358/-
R51	4k02	1	OW35	MF	0001-0001.743/-
R52	475R	1	OW35	MF	0001-0000.964/-
R53	68R1	1	OW35	MF	0001-0000.427/-
R54	200R	1	OW35	MF	0001-0000.676/-
R55	68R1	1	OW35	MF	0001-0000.427/-
R56	475R	1	OW35	MF	0001-0000.964/-
R57	3M3	5	OW25	CF	0001-0007.336/-
R58	100R	1	OW35	MF	0001-0000.537/-
R59	7k5	1	OW35	MF	0001-0002.014/-
R60	301R	1	OW35	MF	0001-0000.799/-
R61	47R	2	OW25	MF	0000-7601.321/-
R62	3M3	5	OW25	CF	0001-0007.336/-
R63	10M	5	OW33	CF	0001-0005.707/-
R64	4M7	5	OW33	CF	0001-0005.671/-
R65	665k	1	OW35	MF	0000-7518.948/-
R66	3k3	2	OW25	MF	4980-0000.012/-
R67	1M8	5	OW25	CF	0001-0007.310/-
R81	10k	1	OW35	MF	0001-0002.137/-
R82	1M2	5	OW25	CF	0001-0007.297/-
R83	100k	1	OW35	MF	0001-0002.991/-
C1	33p	2	63	Cer.	0001-0004.342/-
C2	22n	20	100	Cer.	0001-0006.418/-
C3	100n	10	100	PE	0001-0010.365/-
C4	10p	2	63	Cer.	0001-0004.177/-
C5	22n	20	100	Cer.	0001-0006.418/-
C6	22n	20	100	Cer.	0001-0006.418/-
C7	10p	2	63	Cer.	0001-0004.177/-
C8	10u	2	40		0000-7603.418/-
C10	330n	10	100	PE	0001-0010.420/-
C11	220n	10	100	PE	0001-0010.404/-
C12	4u7	20	6.3	Tant.	0001-0040.801/-
C13	1n5	10	63	Cer.	0001-0004.711/-
C14	22n	10	100	PE	0001-0010.255/-
C15	100p	2	63	Cer.	0001-0004.517/-
C16	330n	10	100	PE	0001-0010.420/-
C17	1u0	20	35	Tant.	0001-0040.704/-
C18	33p	2	63	Cer.	0001-0004.342/-
C19	1u0	10	100		0001-0010.093/-
C20	22n	20	100	Cer.	0001-0006.418/-

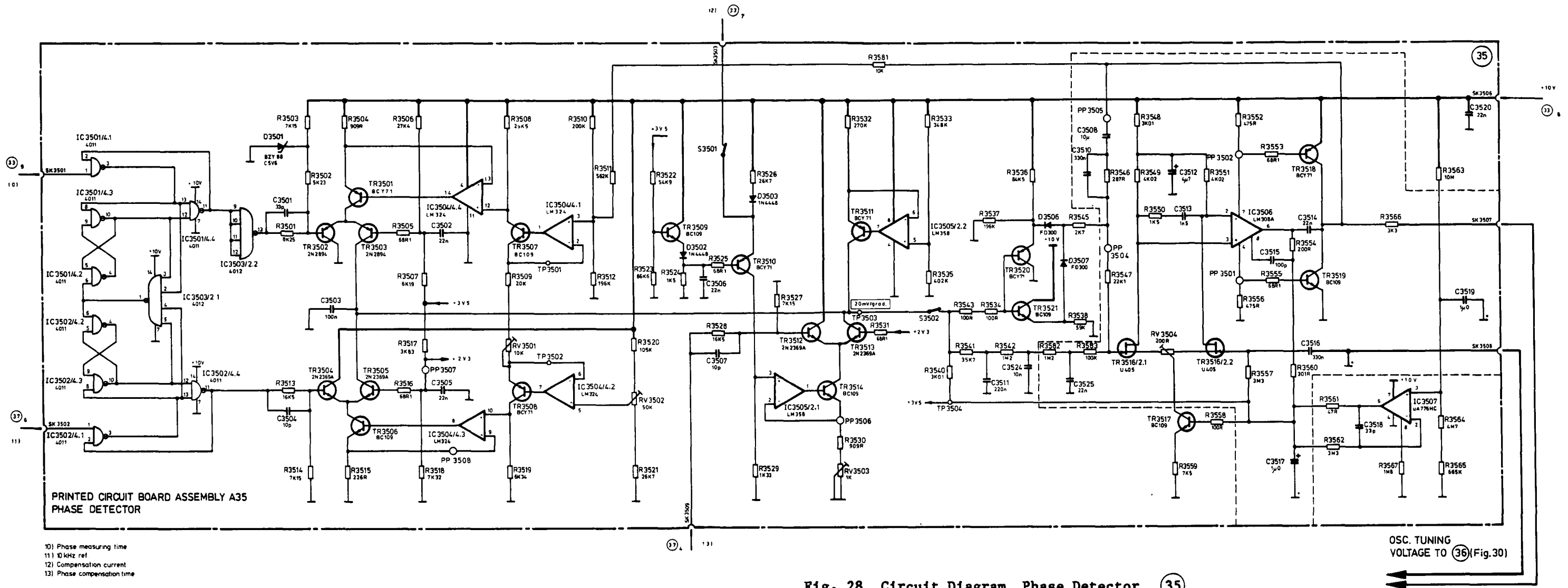
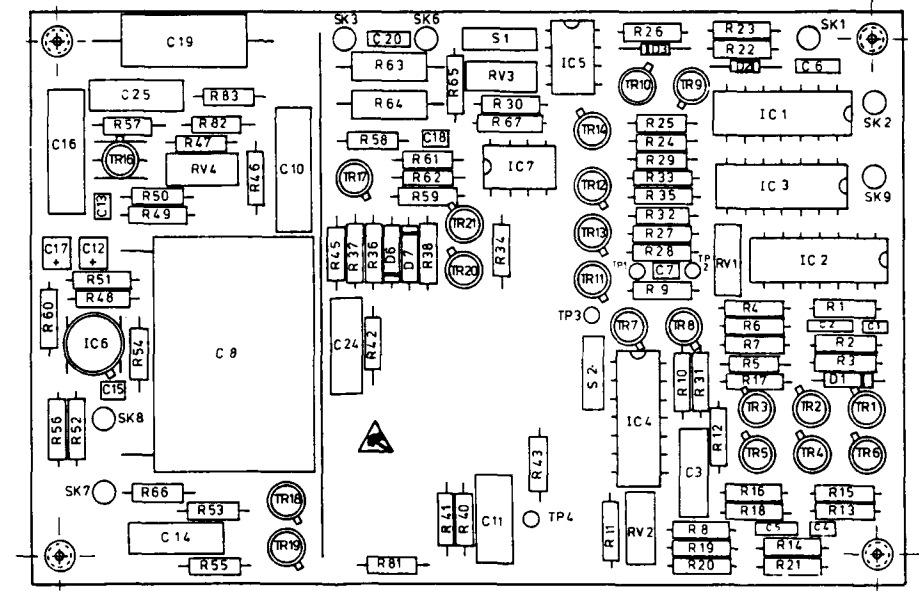


Fig. 28 Circuit Diagram, Phase Detector, (35)

REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.	REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.
C24	10n	10	100	PE	0001-0010.213/-	D1				BZY 88C5V6	0001-0018.859/-
C25	22n	20	100	PE	0001-0010.255/-	D2				1N4448	0001-0018.493/-
TR1				BCY71	0001-0016.534/-	D3				1N4448	0001-0018.493/-
TR2				2N2894	0001-0016.929/-	D6				FDH 300	0001-0018.192/-
TR3				2N2894	0001-0016.929/-	D7				FDH 300	0001-0018.192/-
TR4				2N2369A	0000-7542.066/-	RV1	10k	10 LIN	OW2	Var.	0000-7537.929/-
TR5				2N2369A	0000-7542.066/-	RV2	50k	20 LIN	OW2	Var.	0000-7571.752/-
TR6				BC109	0000-7602.029/-	RV3	1k	20 LIN	OW2	Var.	0000-7571.723/-
TR7				BC109	0000-7602.029/-	RV4	200R	10 LIN	OW2	Var.	0000-7571.710/-
TR8				BCY71	0001-0016.534/-	IC1				4011	0001-0015.988/-
TR9				BC109	0000-7602.029/-	IC2				4011	0001-0015.988/-
TR10				BCY71	0001-0016.534/-	IC3				4012	0001-0065.475/-
TR11				BCY71	0001-0016.534/-	IC4				LM 324	0000-7578.085/-
TR12				2N2369A	0000-7542.066/-	IC5				LM 358	0000-7581.140/-
TR13				2N2369A	0000-7542.066/-	IC6				LM 308 A	0000-7537.071/-
TR14				BC109	0000-7602.029/-	IC7				µA 776 HC	0000-7604.425/-
TR16				U405	0000-7567.863/-	S1				09100003	0000-7569.999/-
TR17				BC109	0000-7602.029/-	S2				09100003	0000-7569.999/-
TR18				BCY71	0001-0016.534/-	A35				P.C.B. PHASE DETECTOR	4502-0135.004/2
TR19				BC109	0000-7602.029/-						
TR20				BCY71	0001-0016.534/-						
TR21				BC109	0000-7602.029/-						



COMPONENT REFERENCES TO BE PRECEDED BY BOARD ASSEMBLY NUMBER eg TR14 BECOMES TR3514 D7 BECOMES D3507

Fig. 29 Component Layout, Phase Detector, (35)



ASSEMBLY P.C.B. A36 4 - 5.62MHz V.C.O.

REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.
R1	1k8	2	0W25	MF	0001-0015.510/-
R2	221k	1	0W35	MF	0001-0003.217/-
R3	221k	1	0W35	MF	0001-0003.217/-
R4	100R	1	0W35	MF	0001-0000.537/-
R5	4k7	2	0W25	MF	0001-0001.811/-
R6	68R1	1	0W35	MF	0001-0000.427/-
R7	100R	1	0W35	MF	0001-0000.537/-
R8	10k	1	0W35	MF	0001-0002.137/-
R9	100R	1	0W35	MF	0001-0000.537/-
R10	47k	2	0W25	MF	0000-7558.393/-
R11	39k2	1	0W35	MF	0001-0002.658/-
R12	1k	1	0W35	MF	0001-0001.219/-
R13	33k	2	0W25	MF	4980-0000.009/-
R14	470R	2	0W25	MF	0000-7560.608/-
R15	4k7	2	0W25	MF	0001-0001.811/-
R16	4R7	5	0W25	MF	0001-0006.609/-
R17	1k21	1	0W35	MF	0001-0001.277/-
R18	100R	1	0W35	MF	0001-0000.537/-
C1	100n	10	100	PE	0001-0010.365/-
C2	100n	10	100	PE	0001-0010.365/-
C4	2µ2	5	63		0000-7605.699/-
C5	6µ8	20	6.3	Tant.	0001-0040.830/-
C6	10n	20	40	Cer.	0001-0004.818/-
C7	10n	20	40	Cer.	0001-0004.818/-
C8	100n	10	100	PE	0001-0010.365/-
C9	10n	20	40	Cer.	0001-0004.818/-
C10	1n	20	63	Cer.	0001-0004.698/-
C11	22µ	20	16	Tant.	0001-0040.966/-
C12	100n	10	100	PE	0001-0010.365/-
C13	10µ	20	16	Al.Ox.	0000-7602.773/-
TR1				BF 245 A	0001-0016.628/-
TR2				BF 245 A	0001-0016.628/-
TR3				BF 245 A	0001-0016.628/-
TR4				BC109	0000-7602.029/-
TR5				2N3947	0001-0056.824/-
TR6				BC109	0000-7602.029/-
D1				BB113	0001-0063.943/-
D2				BB113	0001-0063.943/-
D3				1N5711	0001-0018.228/-
D4				1N5711	0001-0018.228/-
RV1	50k	20	0W5		0000-7601.635/-
RV2	1M	20	0W5		0000-7601.619/-
L1	6µH			L24/4502/D	4502-1424.002/4
L2				L26/L27/4502/D	4502-1426.000/4
L3				L26/L27/4502/D	4502-1426.000/4
L4	100µH			210/16471	0000-7556.298/-
L5	200µH			L25/4502/D	4502-1425.001/4
A36				P.C.B.	
				4-5.62MHz V.C.O	4502-0136.003/3

ASSEMBLY P.C.B. A39 BUFFER

REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.
R1	68R1	1	0W35	MF	0001-0000.427/-
R2	22k1	1	0W35	MF	0001-0002.441/-
R3	68R1	1	0W35	MF	0001-0000.427/-
R4	27k	2	0W25	MF	0000-7558.377/-
R5	68R1	1	0W35	MF	0001-0000.427/-
R6	5k62	1	0W35	MF	0001-0001.895/-
R7	5k62	1	0W35	MF	0001-0001.895/-
R8	68R1	1	0W35	MF	0001-0000.427/-
R9	1k	1	0W35	MF	0001-0001.219/-
R10	18k	2	0W25	MF	0001-0027.484/-
R11	18k	2	0W25	MF	0001-0027.484/-
R12	6k81	1	0W35	MF	0001-0001.976/-
R13	2k21	1	0W35	MF	0001-0001.497/-
R14	27R	2	0W25	MF	0001-0065.200/-
R15	1k8	2	0W25	MF	0001-0014.510/-
R16	18k	2	0W25	MF	0001-0027.484/-
R17	18k	2	0W25	MF	0001-0027.484/-
R18	100k	2	0W25	MF	0001-0002.991/-
C1	4µ7	20	10	Tant.	0001-0040.801/-
C2	22n	20	40	Cer.	0001-0006.418/-
C3	1n	20	100	Cer.	0001-0004.698/-
C4	10n	20	100	Cer.	0001-0004.818/-
C5	10n	20	100	Cer.	0001-0004.818/-
C6	1n	20	100	Cer.	0001-0004.698/-
TR1				2N2369A MF	0000-7542.066/-
TR2				2N2894	0001-0016.929/-
TR3				2N2894	0001-0016.929/-
TR4				2N2894	0001-0016.929/-
TR5				2N2369A	0000-7542.066/-
A39				P.C.B. BUFFER	4502-0139.003/3

ASSEMBLY P.C.B. A40 SYNTHESISER AMPLIFIER

REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.
R1	5k62	1	0W35	MF	0001-0001.895/-
R2	24k9	1	0W35	MF	0001-0002.483/-
R3	68R1	1	0W35	MF	0001-0000.427/-
R4	3k3	2	0W25	MF	4980-0000.012/-
R5	1k21	1	0W35	MF	0001-0001.277/-
R6	1k65	1	0W35	MF	0001-0059.232/-
R7	51R1	1	0W35	MF	0001-0065.284/-
R8	75R	1	0W35	MF	0001-0000.456/-
R9	237R	1	0W35	MF	0001-0003.754/-
R10	68R1	1	0W35	MF	0001-0000.427/-
R11	21k	1	0W35	MF	0001-0002.425/-
R12	76k8	1	0W35	MF	0001-0002.917/-
R13	68R1	1	0W35	MF	0001-0000.427/-
R14	68R1	1	0W35	MF	0001-0000.427/-
R15	8R25	1	0W35	CF	0000-7518.854/-
R16	68R1	1	0W35	MF	0001-0000.427/-
C1	1n	20	100	Cer.	0001-0004.698/-
C2	100n	10	100	PE	0001-0010.365/-
C3	10n	2	100	Cer.	0001-0004.818/-
C4	4µ7	20	10	Tant.	0001-0040.801/-
C5	10µ	+50-10	63	Elect.	0001-0041.693/-
C6	22n	20	40	Cer.	0001-0006.418/-
TR1				2N2369A	0000-7542.066/-
TR2				2N3251	0001-0017.342/-
TR3				2N2369A	0000-7542.066/-
TR4				2N3251	0001-0017.342/-
TR5				BC109	0000-7602.029/-
TR6				BC109	0000-7602.029/-
L1	590µH			L28/4502/D	4502-1428.008/4
A40				P.C.B. SYNTHESISER AMPLIFIER	4502-0140.002/3

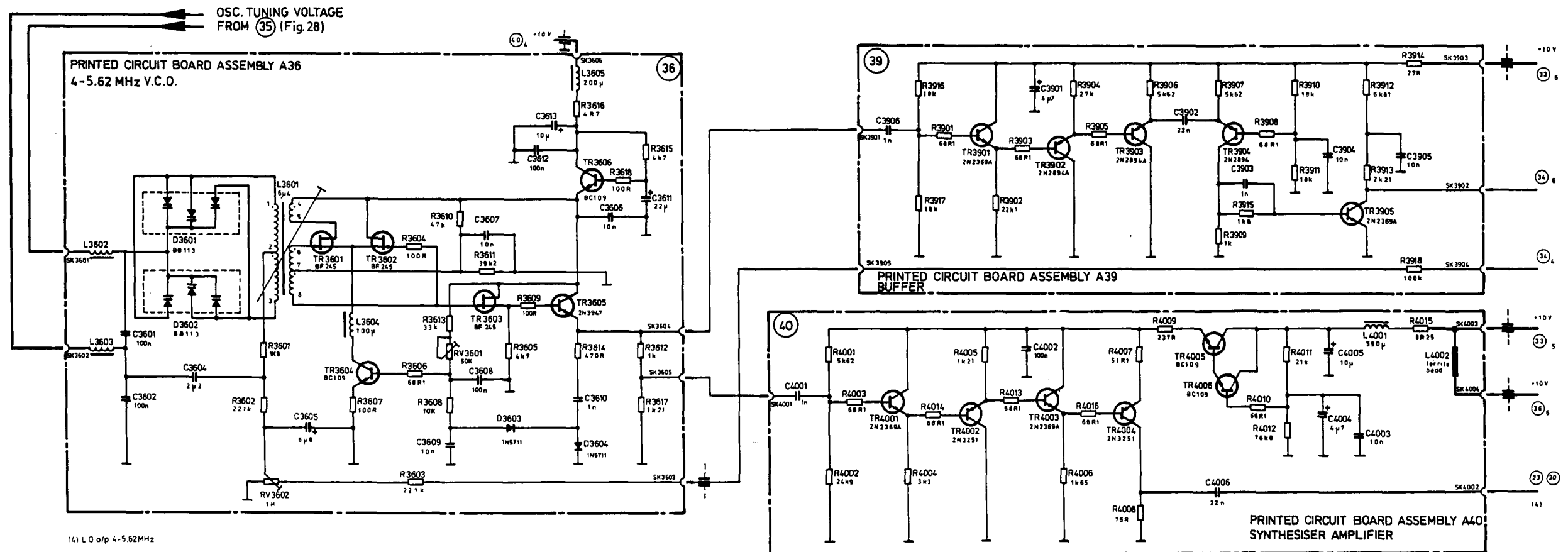
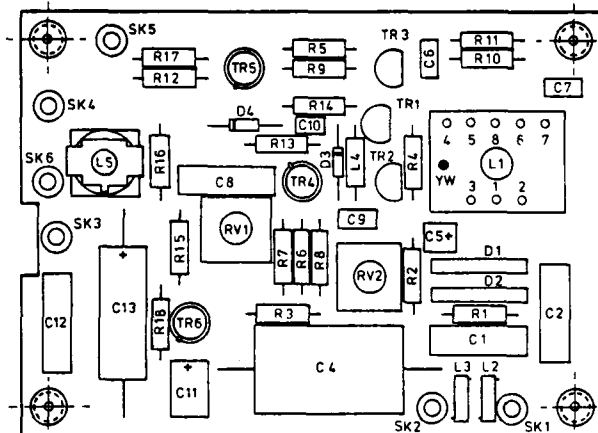
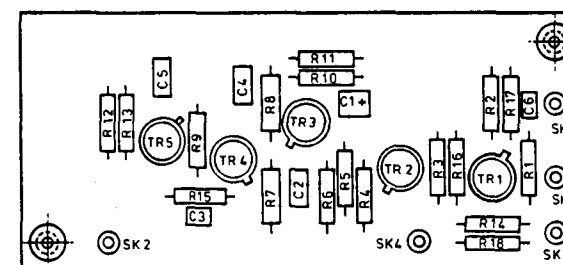


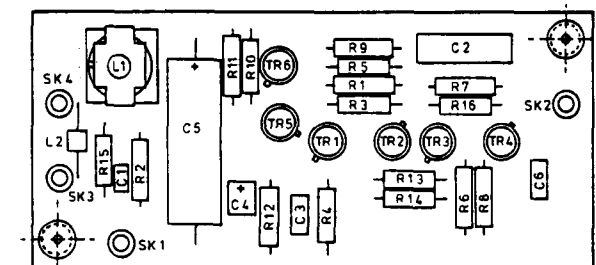
Fig. 30 Circuit Diagram,  
4...5.62MHz V.C.O., (36) ;  
Buffer, (39) and  
Synthesiser Amplifier, (40)



CIRCUIT REFERENCES TO BE PRECEDED  
BY BOARD ASSEMBLY NUMBERS  
eg R15 BECOMES R3615  
C9 BECOMES C3609



CIRCUIT REFERENCES TO BE PRECEDED  
BY BOARD ASSEMBLY NUMBERS.  
eg R11 BECOMES R3911  
C1 BECOMES C3901.



CIRCUIT REFERENCES TO BE PRECEDED  
BY BOARD ASSEMBLY NUMBERS.  
eg R15 BECOMES R4015  
C5 BECOMES C4005.

Fig. 31 Component Layout, 4...5.62MHz V.C.O., (36)

Fig. 32 Component Layout, Buffer Amp., (39)

Fig. 33 Component Layout,  
Synthesiser Amplifier, (40)

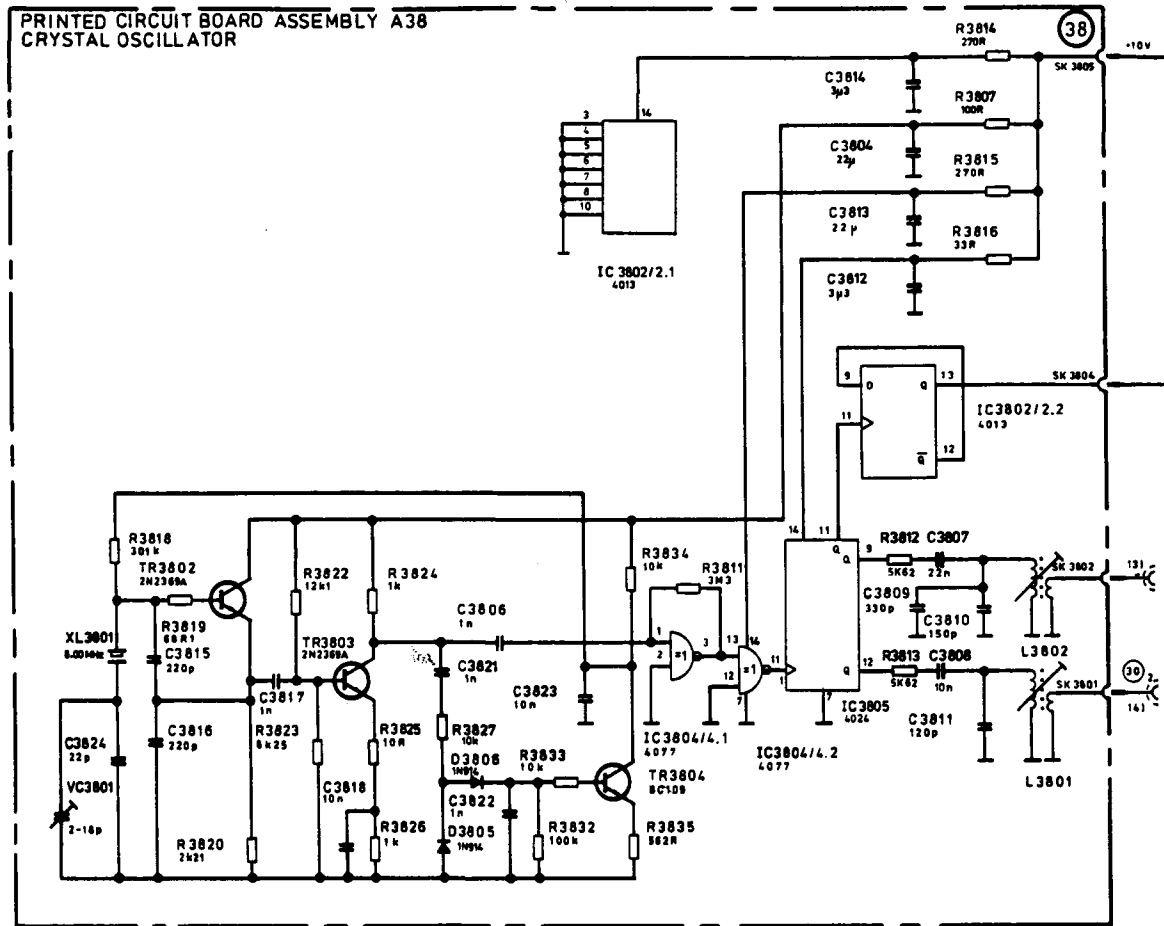
ASSEMBLY P.C.B. A38 CRYSTAL OSCILLATOR

REF.	VALUE	TOL. ±%	RATING	TYPE	PART NO.
R7	100R	1	0W35	MF	0001-0000.537/-
R11	3M3	5	0W25	CF	0001-0007.336/-
R12	5k62	1	0W35	MF	0001-0001.895/-
R13	5k62	1	0W35	MF	0001-0001.895/-
R14	270R	2	0W25	MF	0000-7559.499/-
R15	270R	2	0W25	MF	0000-7559.499/-
R16	33R	2	0W25	MF	0000-7601.347/-
R18	301k	1	0W35	MF	0001-0062.025/-
R19	68R1	1	0W35	MF	0001-0000.427/-
R20	2k21	1	0W35	MF	0001-0001.497/-
R22	12k1	1	0W35	MF	0001-0002.218/-
R23	8k25	1	0W35	MF	0001-0002.056/-
R24	1k	1	0W35	MF	0001-0001.219/-
R25	10R	1	0W35	MF	0001-0000.074/-
R26	1k	1	0W35	MF	0001-0001.219/-
R27	10k	1	0W35	MF	0001-0002.137/-
R32	100k	1	0W35	MF	0001-0002.991/-
R33	10k	1	0W35	MF	0001-0002.137/-
R34	10k	1	0W35	MF	0001-0002.137/-
R35	562R	1	0W35	MF	0001-0001.015/-
C4	22μ	20	16	Tant.	0001-0040.966/-
C6	1n	10	63	Cer.	0001-0004.698/-
C7	22n	20	40	Cer.	0001-0006.418/-
C8	10n	20	40	Cer.	0001-0004.818/-
C9	330p	2	63	Cer.	0001-0004.630/-
C10	150p	2	63	Cer.	0001-0004.575/-
C11	120p	2	63	Cer.	0001-0004.562/-
C12	3μ3	20	16	Tant.	0001-0040.775/-
C13	22μ	20	16	Tant.	0001-0040.966/-
C14	3μ3	20	16	Tant.	0001-0040.775/-
C15	220p	2	63	Cer.	0001-0004.601/-
C16	220p	2	63	Cer.	0001-0004.601/-
C17	1n	10	63	Cer.	0001-0004.698/-
C18	10n	20	40	Cer.	0001-0004.818/-
C21	1n	10	63	Cer.	0001-0004.698/-
C22	1n	10	63	Cer.	0001-0004.698/-
C23	10n	20	40	Cer.	0001-0004.818/-
C24	22p	2	63	Cer.	0001-0004.290/-
TR2				2N2369A	0000-7542.066/-
TR3				2N2369A	0000-7542.066/-
TR4				BC109	0000-7602.029/-
D5				1N914 or 1N4448	0001-0018.493/-
D6				1N914 or 1N4448	0001-0018.493/-
IC2				4013	0001-0015.991/-
IC4				4077	0000-7565.218/-
IC5				4024	0001-0016.039/-
VC1	2 - 18p		300	809 - 05003	0000-7598.463/-
L1	12.7μH			INDUCTOR	4502-1431.008/4
L2	52.7μH			INDUCTOR	4502-1432.007/4
XL1	8MHz			FILTER	4502-9702.001/4
A38				P.C.B. CRYSTAL OSCILLATOR	4502-0138.001/3

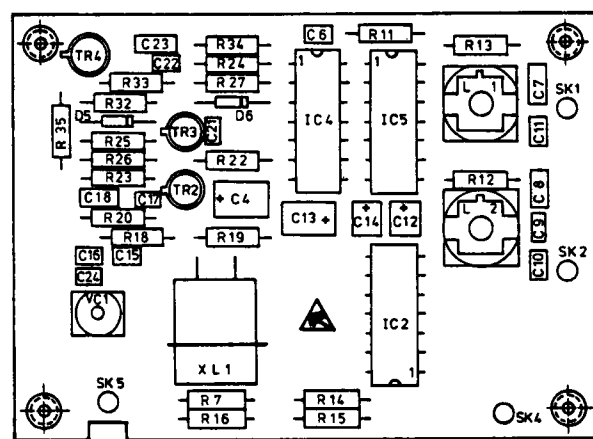
ASSEMBLY P.C.B. A37 DIVIDER 3

REF.	VALUE	TOL. ±%	RATING	TYPE	PART NO.
R1	18k	2	0W25	MF	0001-0027.484/-
R2	18k	2	0W25	MF	0001-0027.484/-
R3	68R1	1	0W35	MF	0001-0000.427/-
R4	5k62	1	0W35	MF	0001-0001.895/-
R5	5k62	1	0W35	MF	0001-0001.895/-
R6	681R	1	0W35	MF	0001-0001.086/-
R7	68R1	1	0W35	MF	0001-0000.427/-
R8	18k	2	0W25	MF	0001-0027.484/-
R9	18k	2	0W25	MF	0001-0027.484/-
R10	1k8	2	0W25	MF	0001-0014.510/-
R11	22k1	1	0W35	MF	0001-0002.441/-
R12	15R	1	0W35	MF	0001-0014.879/-
C1	22n	20	40	Cer.	0001-0006.418/-
C2	1n	10	63	Cer.	0001-0004.698/-
C3	10n	20	40	Cer.	0001-0004.818/-
C4	33μ	20	6.3	Tant.	0001-0040.995/-
TR1				2N3251	0001-0017.342/-
TR2				2N3251	0001-0017.342/-
TR3				2N2369A	0000-7542.066/-
IC1				4518	0001-0016.178/-
IC2				40175	0000-7529.416/-
IC3				4011	0001-0015.988/-
L1				INDUCTOR	0000-7567.737/-
L2				INDUCTOR	4502-1430.009/4
A37				P.C.B. DIVIDER 3	4502-0137.002/3

PRINTED CIRCUIT BOARD ASSEMBLY A38  
CRYSTAL OSCILLATOR



- 10) 1MHz Sync. Not connected
- 13) 1MHz 75  $\mu$  to back panel
- 14) 4MHz 75  $\mu$
- 15) Compensation time pulse
- 16) 10 kHz to phase detector
- 17) 10 kHz to 4-01 MHz PLL



CIRCUIT REFERENCES TO BE  
PRECEDED BY BOARD ASSEMBLY  
NUMBER eg XL1 BECOMES XL3801  
C16 BECOMES C3816

Fig. 35 Component Layout, 8MHz Crystal Oscillator, 38

PRINTED CIRCUIT BOARD ASSEMBLY  
A37 DIVIDER 3

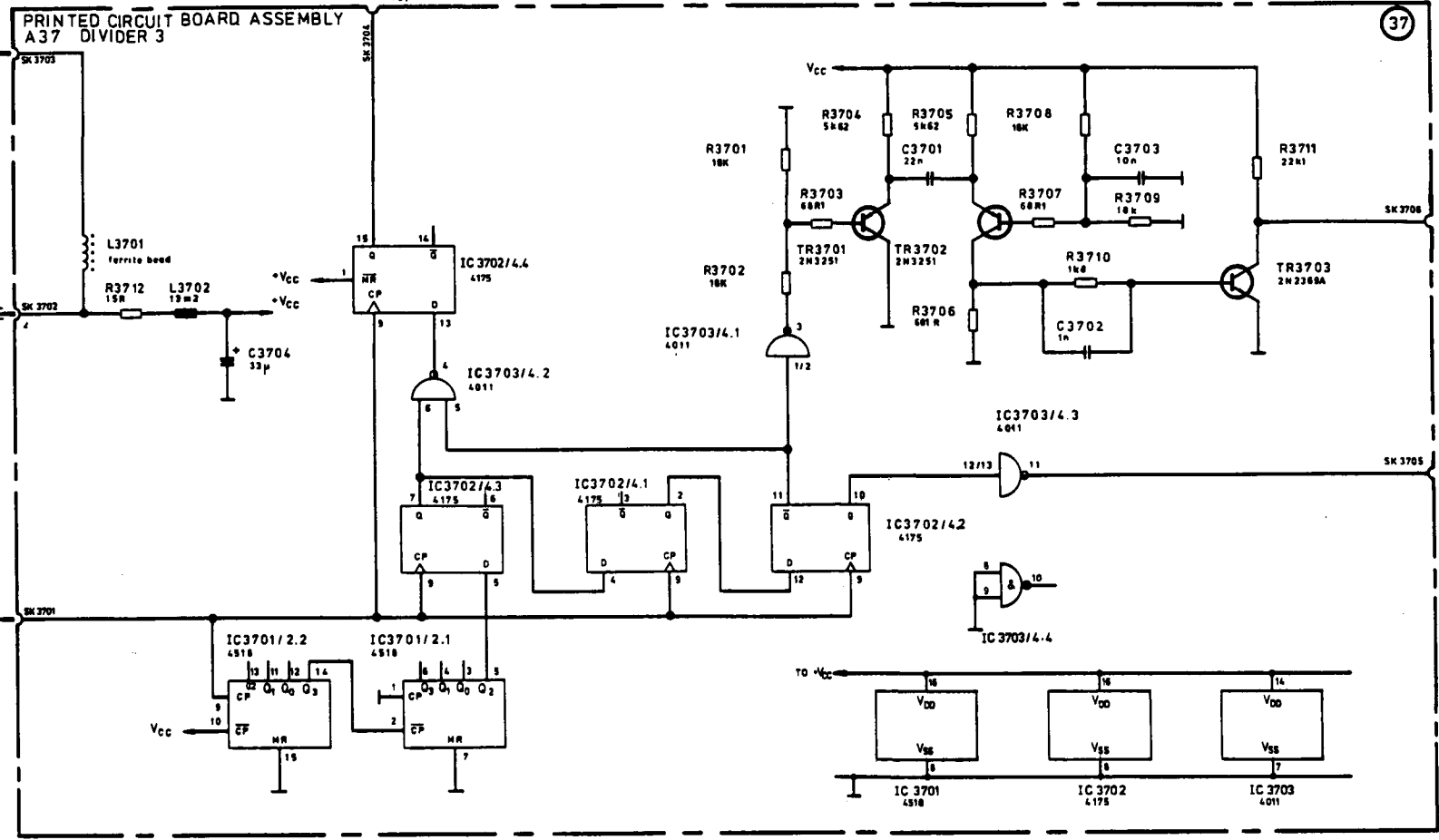
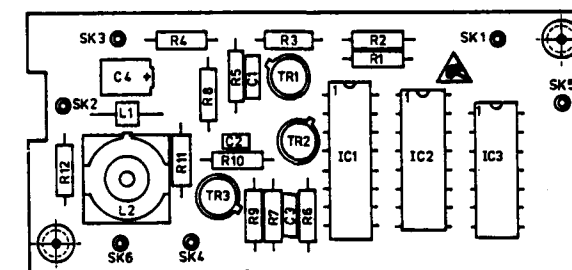


Fig. 34 Circuit Diagram,  
8MHz Crystal Oscillator, 38  
and Divider 3, 37



CIRCUIT REFERENCES TO BE PRECEDED BY BOARD ASSEMBLY  
NUMBER eg IC1 BECOMES IC3701 R10 BECOMES R3710.

Fig. 36 Component Layout, Divider 3, 37

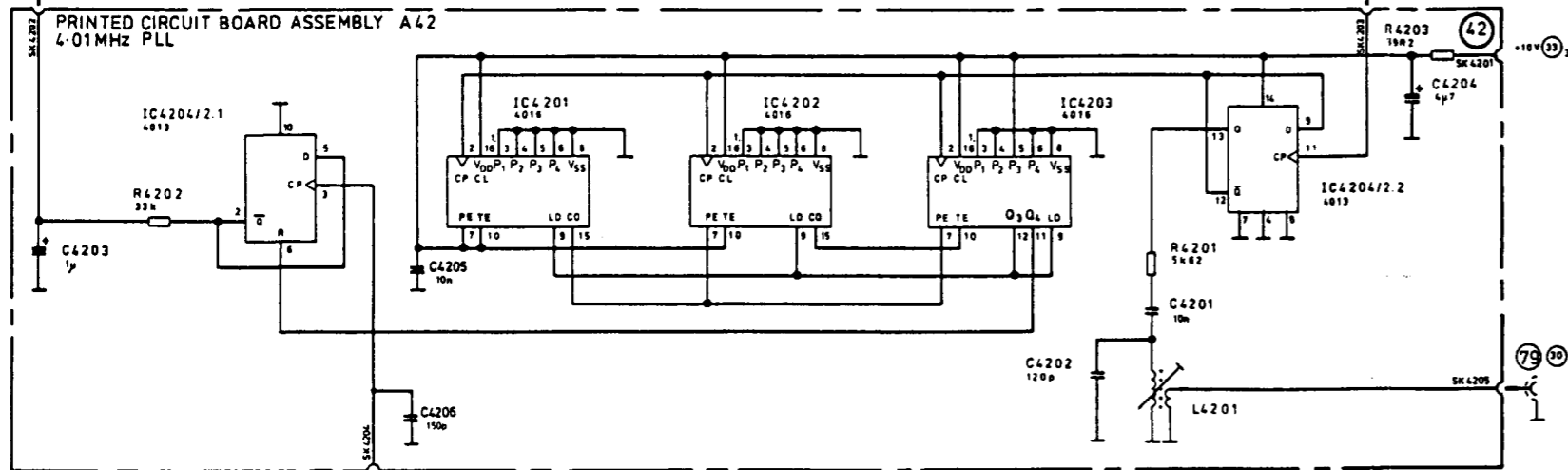
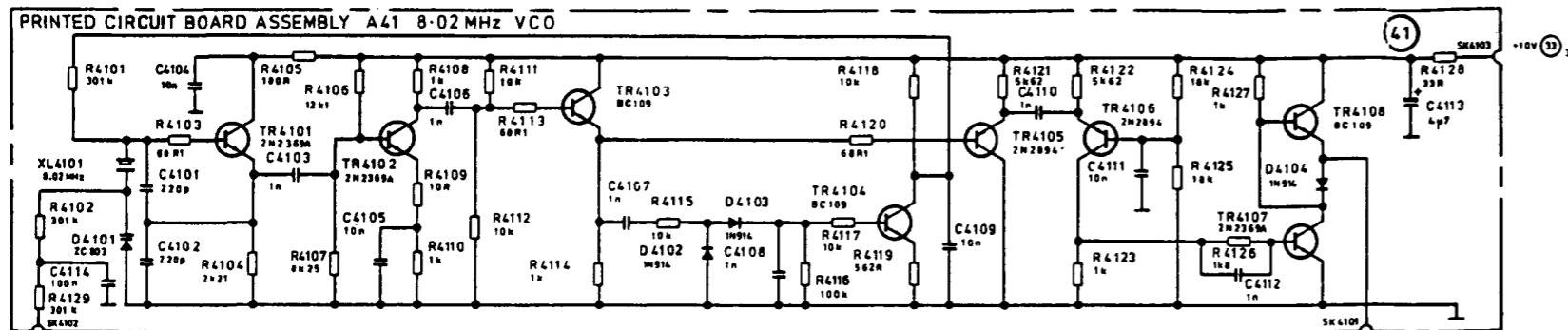
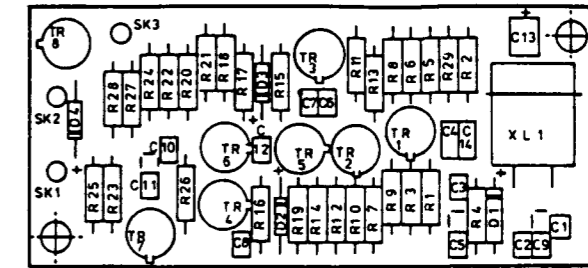
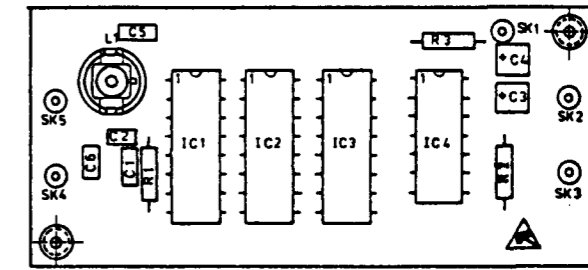


Fig. 37 Circuit Diagram, 8.02MHz V.C.O., (41) and 4.01MHz P.L.L., (42)



COMPONENT REFERENCES TO BE PRECEDED BY BOARD ASSEMBLY NUMBERS  
e.g. R 25 BECOMES R4125.  
C 8 BECOMES C4108

Fig. 38 Component Layout, 8.02MHz V.C.O., (41)



CIRCUIT REFERENCES TO BE PRECEDED BY BOARD ASSEMBLY NUMBER eg IC 2 BECOMES IC4202

Fig. 39 Component Layout, 4.01MHz P.L.L., (42)

ASSEMBLY P.C.B. A41 8.02MHz V.C.O.

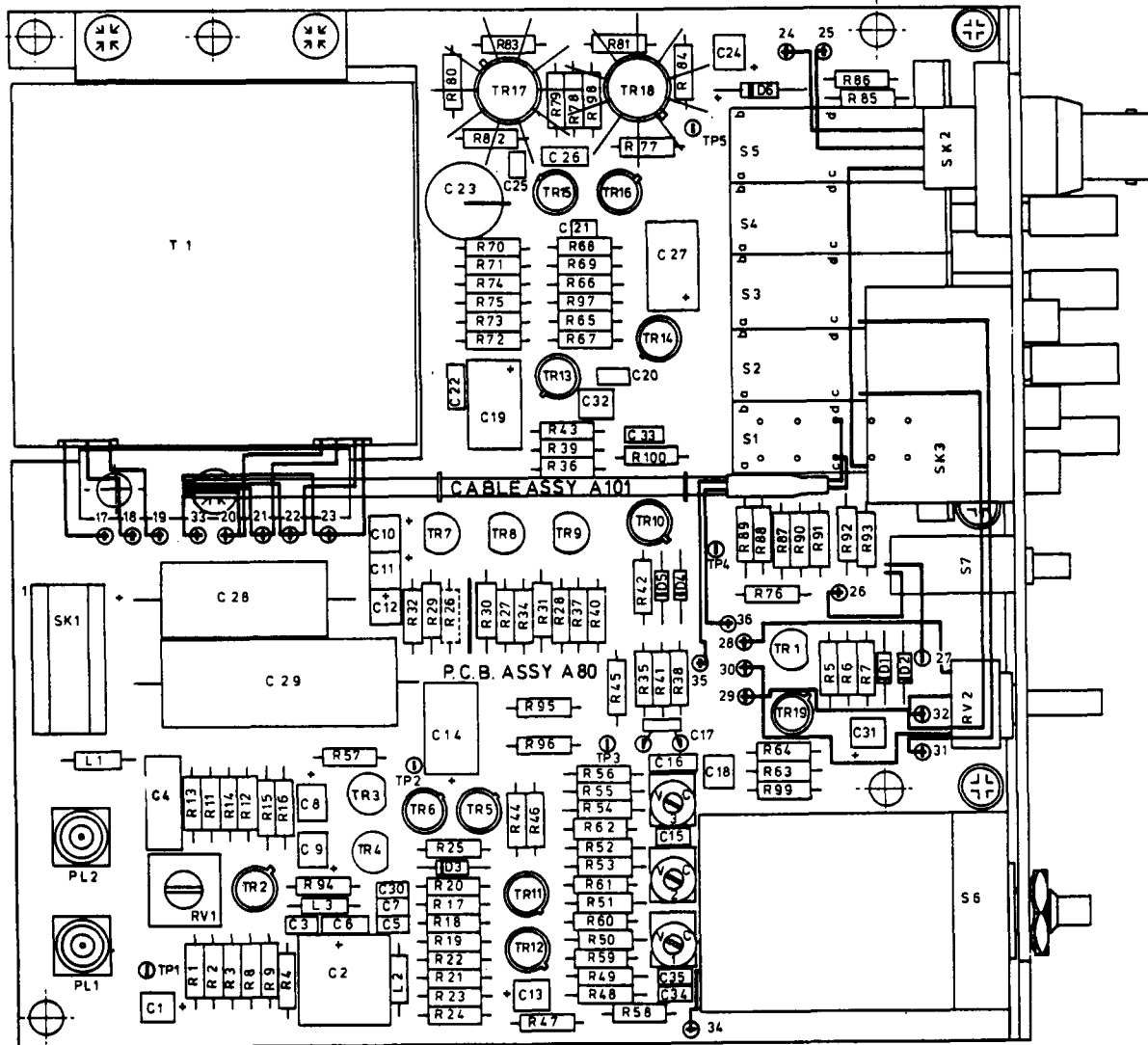
REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.
R1	301k	1	0W35	MF	0001-0062.025/-
R2	301k	1	0W35	MF	0001-0062.025/-
R3	68R1	1	0W35	MF	0001-0000.427/-
R4	2k21	1	0W35	MF	0001-0001.497/-
R5	180R	2	0W25	MF	0000-7558.403/-
R6	12k1	1	0W35	MF	0001-0002.218/-
R7	8k25	1	0W35	MF	0001-0002.056/-
R8	1k	1	0W35	MF	0001-0001.219/-
R9	10R	1	0W35	MF	0001-0000.074/-
R10	1k	1	0W35	MF	0001-0001.219/-
R11	10k	1	0W35	MF	0001-0002.137/-
R12	10k	1	0W35	MF	0001-0002.137/-
R13	68R1	1	0W35	MF	0001-0000.427/-
R14	1k	1	0W35	MF	0001-0001.219/-
R15	10k	1	0W35	MF	0001-0002.137/-
R16	100k	1	0W35	MF	0001-0002.991/-
R17	10k	1	0W35	MF	0001-0002.137/-
R18	10k	1	0W35	MF	0001-0002.137/-
R19	562R	1	0W35	MF	0001-0001.015/-
R20	68R1	1	0W35	MF	0001-0000.427/-
R21	5k62	1	0W35	MF	0001-0001.895/-
R22	5k62	1	0W35	MF	0001-0001.895/-
R23	1k	1	0W35	MF	0001-0001.219/-
R24	18k	2	0W25	MF	0001-0027.484/-
R25	18k	2	0W25	MF	0001-0027.484/-

REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.
R26	1k8	2	0W25	MF	0001-0014.510/-
R27	1k	1	0W35	MF	0001-0001.219/-
R28	33R	2	0W25	MF	0000-7601.347/-
R29	301k	1	0W35	MF	0001-0062.025/-
C1	220p	2	63	Cer.	0001-0004.601/-
C2	220p	2	63	Cer.	0001-0004.601/-
C3	1n	10	63	Cer.	0001-0004.698/-
C4	10n	20	40	Cer.	0001-0004.818/-
C5	10n	20	40	Cer.	0001-0004.818/-
C6	1n	10	63	Cer.	0001-0004.698/-
C7	1n	10	63	Cer.	0001-0004.698/-
C8	1n	10	63	Cer.	0001-0004.698/-
C9	10n	20	40	Cer.	0001-0004.818/-
C10	1n	10	63	Cer.	0001-0004.698/-
C11	10n	20	40	Cer.	0001-0004.818/-
C12	1n	10	63	Cer.	0001-0004.698/-
C13	4µ7	20	10	Tant.	0001-0040.810/-
C14	100n	20	100	Cer.	0000-7598.450/-
TR1				2N2369A	0000-7542.066/-
TR2				2N2369A	0000-7542.066/-
TR3				BC109	0000-7602.029/-
TR4				BC109	0000-7602.029/-
TR5				2N2894	0001-0016.929/-
TR6				2N2894	0001-0016.929/-
TR7				2N2369A	0000-7542.066/-

REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.
TR8				BC109	0000-7602.029/-
D1				ZC803	0000-7601.936/-
D2				1N914 or 1N4448	0001-0018.493/-
D3				1N914 or 1N4448	0001-0018.493/-
D4				1N914 or 1N4448	0001-0018.493/-
XL1	8.02MHz				4502-9701.002/4
A41				P.C.B. 8.02MHz V.C.O.	4502-0141.001/3

ASSEMBLY P.C.B. A42 4.01MHz P.L.L.

REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.
R1	5k62	1	0W35	MF	0001-0001.895/-
R2	33k	2	0W25	MF	4980-0000.009/-
R3	39R2	1	0W35	MF	0001-0003.547/-
C1	10n	20	100	Cer.	0001-0004.818/-
C2	120p	2	63	Cer.	0001-0004.562/-
C3	1µ	20	35	Tant.	0001-0040.704/-
C4	4µ7	20	10	Tant.	0001-0040.801/-
C5	10n	20	40	Cer.	0001-0004.818/-
C6	150p	2	63	Cer.	0001-0004.575/-
IC1				40160	0000-7529.351/-
IC2				40160	0000-7529.351/-
IC3				40160	0000-7529.351/-
IC4				4013	0000-7565.315/-
L1	12.7µH			INDUCTOR	4502-1431.008/4
A42				P.C.B. 4.01MHz P.L.L.	4502-0142.000/3



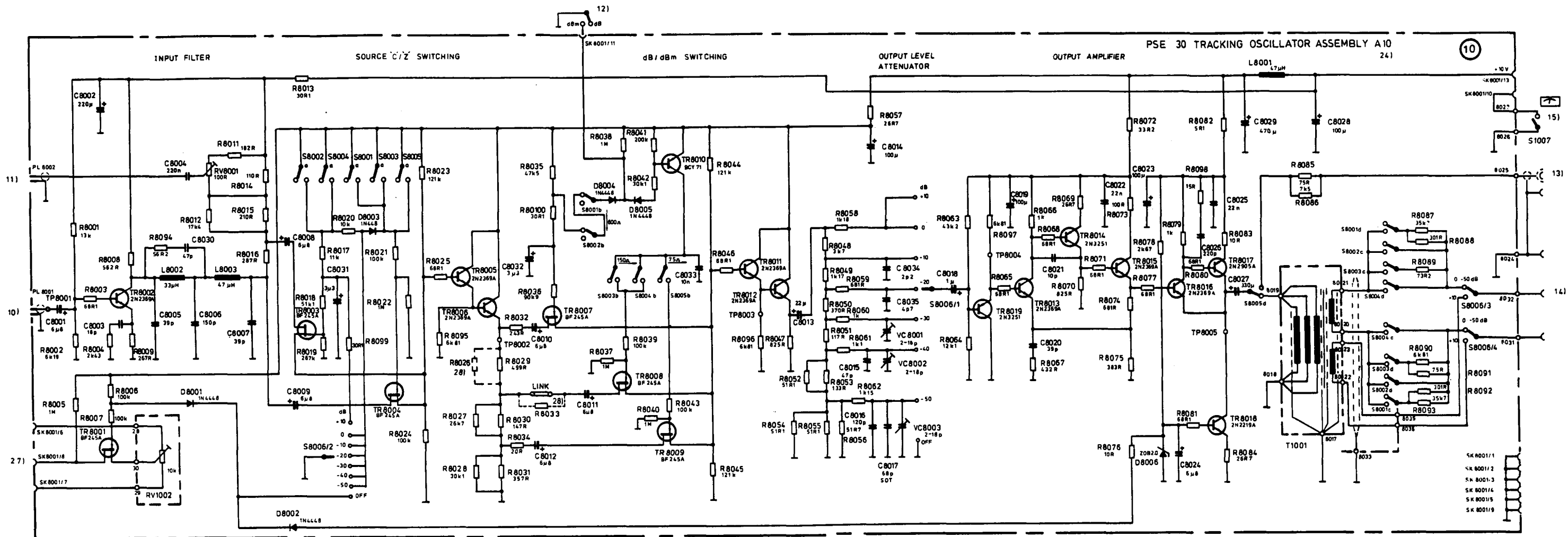
CIRCUIT REFERENCES TO BE PRECEDED  
 BY BOARD ASSEMBLY NUMBER  
 e.g. R 87 BECOMES R 80087  
 C 3 BECOMES C 80003

COMPONENTS SK2, SK3, S7, RV2, T1,  
 PRECEDED BY 10 e.g. SK1002

Fig. 40 Component Layout, PSE-30 Tracking Oscillator, (10)

#### ASSEMBLY A10 PSE-30 TRACKING OSCILLATOR

REF.	VALUE	TOL. ±%	RATING	TYPE	PART NO.
RV2	10k	20	1W	Var.	0000-7545.270/-
S7				SWITCH MICRO <input type="checkbox"/>	0001-0034.176/-
				SWITCH BUTTON <input type="checkbox"/>	0000-3705.425/5
T1				TRANSFORMER	4502-1309.004/4
SK2				VERSACON BODY	0000-1681.004/5
				VERSACON LOCKING	
				RING	0000-1672.055/5
				VERSACON ADAPTOR	0000-1674.008/5
SK3				C.F. SOCKET 3-POLE	0000-3713.006/4
A80				P.C.B. PSE-30	
				Complete	4502-1080.006/2



- 10) CALIBRATION 0dB 0.2 - 1620 kHz
- 11) METER - 20dB
- 12) ON FRONT PANEL dB/dBm SWITCH
- 13) UNBAL OUTPUT 0.2 - 1620 kHz
- 14) BAL OUTPUT 0.2 - 620 kHz
- 15) OUTPUT LEVEL MONITOR FACILITY
- 27) FINE LEVEL CONTROL
- 28) RESISTOR NOT FITTED ON E SERIES. REPLACED BY LINK.

Fig. 41 Circuit Diagram, PSE-30 Tracking Oscillator, 10

ASSEMBLY P.C.B. A80 used on PSE-30 TRACKING GENERATOR

REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.	REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.	REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.
R1	13k	1	0W35	MF	0001-0003.631/-	R30	147R	0.25	0W35	MF	0000-7598.311/-	R58	1k18	1	0W35	MF	0001-0001.264/-
R2	6k19	1	0W35	MF	0001-0001.934/-	R31	357R	0.25	0W35	MF	0000-7598.324/-	R59	681R	1	0W35	MF	0001-0001.086/-
R3	68R1	1	0W35	MF	0001-0000.427/-	R32	243R	1	0W35	MF	0001-0000.731/-	R60	1k	1	0W35	MF	0001-0001.219/-
R4	2k43	1	0W35	MF	0001-0001.536/-	R34	20R	1	0W35	MF	0001-0065.158/-	R61	1k1	1	0W35	MF	0001-0001.235/-
R5	1M	1	0W35	MF	0001-0027.507/-	R35	47k5	1	0W35	MF	0001-0002.739/-	R62	1k15	1	0W35	MF	0001-0001.251/-
R6	100k	1	0W35	MF	0001-0002.991/-	R36	90k9	1	0W35	MF	0001-0002.975/-	R63	43k2	1	0W35	MF	0001-0002.690/-
R7	100k	1	0W35	MF	0001-0002.991/-	R37	1M	5	0W35	MF	0001-0027.507/-	R64	12k1	1	0W35	MF	0001-0002.218/-
R8	562R	1	0W35	MF	0001-0001.015/-	R38	1M	5	0W35	MF	0001-0027.507/-	R65	68R1	1	0W35	MF	0001-0000.427/-
R9	267R	1	0W35	MF	0001-0003.576/-	R39	100k	1	0W35	MF	0001-0002.991/-	R66	1k	1	0W35	MF	0001-0001.219/-
R11	182R	1	0W35	MF	0001-0000.663/-	R40	1M	5	0W35	MF	0001-0027.507/-	R67	432R	1	0W35	MF	0001-0000.935/-
R12	17k4	1	0W35	MF	0001-0002.344/-	R41	200k	1	0W35	MF	0001-0003.181/-	R68	68R1	1	0W35	MF	0001-0000.427/-
R13	30R1	1	0W35	MF	0001-0000.236/-	R42	30k1	1	0W35	MF	0001-0002.564/-	R69	267R	1	0W35	MF	0001-0000.207/-
R14	110R	1	0W35	MF	0001-0000.553/-	R43	100k	1	0W35	MF	0001-0002.991/-	R70	825R	1	0W35	MF	0001-0001.154/-
R15	210R	0.25	0W35	MF	0000-7520.538/-	R44	121k	1	0W35	MF	0001-0003.042/-	R71	68R1	1	0W35	MF	0001-0000.427/-
R16	287R	0.25	0W35	MF	0000-7561.241/-	R45	121k	1	0W35	MF	0001-0003.042/-	R72	33R2	1	0W35	MF	0001-0000.265/-
R17	11k	1	0W35	MF	0001-0002.179/-	R46	68R1	1	0W35	MF	0001-0000.427/-	R73	100R	1	0W35	MF	0001-0000.537/-
R18	51k1	1	0W35	MF	0001-0002.768/-	R47	825R	1	0W35	MF	0001-0001.154/-	R74	681R	1	0W35	MF	0001-0001.086/-
R19	267k	1	0W35	MF	0001-0067.444/-	R48	3k7	0.25	0W35	MF	0000-7598.337/-	R75	383R	1	0W35	MF	0001-0000.888/-
R20	10k	1	0W35	MF	0001-0002.137/-	R49	1k17	0.25	0W35	MF	0000-7598.340/-	R76	10R	1	0W35	MF	0001-0000.074/-
R21	100k	1	0W35	MF	0001-0002.991/-	R50	370R	0.25	0W35	MF	0000-7598.353/-	R77	68R1	1	0W35	MF	0001-0000.427/-
R22	1M	5	0W25	MF	0001-0027.507/-	R51	117R	0.25	0W25	MF	0000-7598.366/-	R78	2k67	1	0W35	MF	0001-0001.578/-
R23	121k	1	0W35	MF	0001-0003.042/-	R52	51R1	0.25	0W35	MF	0000-7513.710/-	R79	1k	1	0W35	MF	0001-0001.219/-
R24	100k	1	0W35	MF	0001-0002.991/-	R53	133R	0.25	0W35	MF	0000-7598.379/-	R80	68R1	1	0W35	MF	0001-0000.427/-
R25	68R1	1	0W35	MF	0001-0000.427/-	R54	51R1	0.25	0W35	MF	0000-7513.710/-	R81	68R1	1	0W35	MF	0001-0000.427/-
R27	26k7	1	0W35	MF	0001-0002.519/-	R55	51R1	0.25	0W35	MF	0000-7513.710/-	R82	5R1	1	0W35	MF	0001-0016.783/-
R28	30k1	1	0W35	MF	0001-0002.564/-	R56	51R7	0.25	0W35	MF	0000-7584.008/-	R83	10R	1	0W35	MF	0001-0000.074/-
R29	499R	0.25	0W35	MF	0000-7511.673/-	R57	267R	1	0W35	MF	0001-0000.207/-	R84	267R	1	0W35	MF	0001-0000.207/-

REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.
R85	75R	0.25	OW35	MF	0001-7562.538/-
R86	7k5	1	OW35	MF	0001-0002.014/-
R87	35k7	1	OW35	MF	0001-0002.616/-
R88	301R	0.25	OW35	MF	0000-7594.315/-
R89	73R2	0.25	OW35	MF	0000-7576.867/-
R90	6k81	1	OW35	MF	0001-0001.976/-
R91	75R	0.25	OW35	MF	0001-7562.538/-
R92	301R	0.25	OW35	MF	0000-7594.315/-
R93	35k7	1	OW35	MF	0001-0002.616/-
R94	56R2	1	OW35	MF	0001-0000.346/-
R95	6k81	1	OW35	MF	0001-0001.976/-
R96	6k81	1	OW35	MF	0001-0001.976/-
R97	6k81	1	OW35	MF	0001-0001.976/-
R98	15R	1	OW35	MF	0001-0014.879/-
R99	30R1	1	OW35	MF	0001-0000.236/-
R100	30R1	1	OW35	MF	0001-0000.236/-
C1	6μ8	20	6.3	Tant.	0001-0040.830/-
C2	220μ	20	10	Tant.	0001-0041.208/-
C3	18p	2	63	Cer.	0001-0004.258/-
C4	220n	20	100	PE	0001-0010.404/-
C5	39p	2	63	Cer.	0001-0004.371/-
C6	150p	2	63	Cer.	0001-0004.575/-
C7	39p	2	63	Cer.	0001-0004.371/-
C8	6μ8	20	6.3	Tant.	0001-0040.830/-
C9	6μ8	20	6.3	Tant.	0001-0040.830/-
C10	6μ8	20	6.3	Tant.	0001-0040.830/-
C11	6μ8	20	6.3	Tant.	0001-0040.830/-
C12	6μ8	20	6.3	Tant.	0001-0040.830/-
C13	22μ	20	16	Tant.	0001-0040.966/-
C14	100μ	20	10	Tant.	0001-0041.156/-
C15	47p	2	63	Cer.	0001-0004.397/-
C16	120p	2	63	Cer.	0001-0004.562/-
C17	68p	2	63	Cer.	0001-0004.452/-
C18	1μ	20	35	Tant.	0001-0040.704/-
C19	100μ	20	6.3	Tant.	0001-0041.156/-
C20	39p	2	63	Cer.	0001-0004.371/-
C21	10p	2	63	Cer.	0001-0004.177/-
C22	22n	20	40	Cer.	0001-0006.418/-
C23	100μ	10	25	Elect.	0000-7568.202/-
C24	6μ8	20	6.3	Tant.	0001-0040.830/-
C25	22n	20	40	Cer.	0001-0006.418/-
C26	220p	2	63	Cer.	0001-0004.601/-
C27	330μ	20	6.3	Tant.	0001-0041.211/-
C28	100μ	10	25	Elect.	0000-7568.202/-
C29	470μ	10	16	Elect.	0001-0041.910/-
C30	47p	2	63	Cer.	0001-0004.397/-
C31	3μ3	20	16	Tant.	0001-0040.775/-
C32	3μ3	20	16	Tant.	0001-0040.775/-
C33	10n	20	40	Cer.	0001-0004.818/-
C34	2p2	0.25p	63	Cer.	0001-0004.009/-
C35	4p7	0.25p	63	Cer.	0001-0004.083/-

REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.
TR1				BF245A	0001-0016.628/-
TR2				2N2369A	0000-7542.066/-
TR3				BF245A	0001-0016.628/-
TR4				BF245A	0001-0016.628/-
TR5				2N2369A	0000-7542.066/-
TR6				2N2369A	0000-7542.066/-
TR7				BF245A	0001-0016.628/-
TR8				BF245A	0001-0016.628/-
TR9				BF245A	0001-0016.628/-
TR10				BCY71	0001-0016.534/-
TR11				2N2369A	0000-7542.066/-
TR12				2N2369A	0000-7542.066/-
TR13				2N2369A	0000-7542.066/-
TR14				2N3251	0001-0017.342/-
TR15				2N2369A	0000-7542.066/-
TR16				2N2369A	0000-7542.066/-
TR17				2N2905A	0001-0017.287/-
TR18				2N2219A	0000-7601.486/-
TR19				2N3251	0001-0017.342/-
D1				1N4448	0001-0018.493/-
D2				1N4448	0001-0018.493/-
D3				1N4448	0001-0018.493/-
D4				1N4448	0001-0018.493/-
D5				1N4448	0001-0018.493/-
D6				ZOB 2.0	0001-0064.104/-
RV1	100R	20	0.5		0000-7601.648/-
VC1	2 - 18p		300	809 - 05003	0000-7598.463/-
VC2	2 - 18p		300	809 - 05003	0000-7598.463/-
VC3	2 - 18p		300	809 - 05003	0000-7598.463/-
S1					
S2				SWITCH PUSH BUTTON	
S3				-(OUTPUT IMPEDANCE)	0000-7602.443/4
S4					
S5					
S6				SWITCH, ROTARY	
				(OUTPUT LEVEL)	0000-7602.472/4
T1				PSE-30 TRANSFORMER	4502-1309.004/4
L1	47μH	10		INDUCTOR	0000-7556.256/-
L2	33μH	10		INDUCTOR	0000-7556.230/-
L3	47μH	10		INDUCTOR	0000-7556.256/-
SK1				SOCKET, D.I.L. 16-WAY	
				S83529 - 1	0000-7518.391/-
PL1				PLUG SUBMINAX	0000-2682.002/5
PL2				PLUG SUBMINAX	0000-2682.002/5
A80				P.C.B. PSE-30	
				TRACKING GENERATOR	4502-0249.000/2



**Manufactured By**



**W & G Instruments Ltd.**

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