

SPM30 Schematics

This file was scanned from the Wandel and Goltermann layout and schematic “appendix” for the SPM30. All the pages that include schematics or drawings are included – those omitted (in the interests of having a reasonable size download file) only contain parts lists, with very limited component information, mostly already included on the schematics. There is no fault-finding or alignment information; this is presumably included in another section of the manual that I do not have.

Most of the schematics in the original are A3-sized fold-out sheets. These have been scanned as two A4 sized images with overlap in the middle, so that they can be printed on a normal A3 sized printer, and joined together later if required.

The PSE30 tracking generator board is an option, and when not fitted the right-hand side of the front panel is different to that shown above, with no output controls or sockets.

Good luck,
Jim, M0BMU

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A81 Interconnection Board

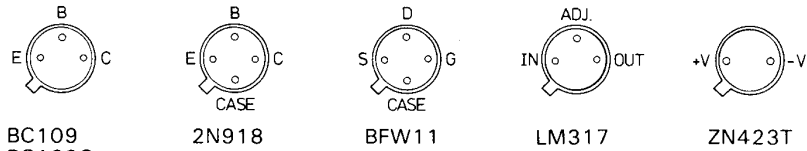
Spares and Accessories

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

ILLUSTRATIONS & COMPONENTS LISTS

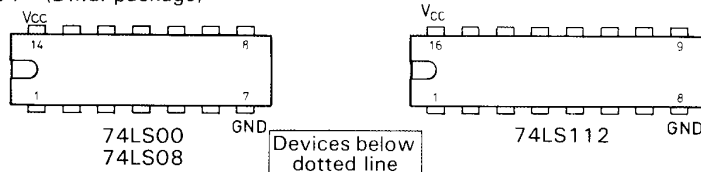
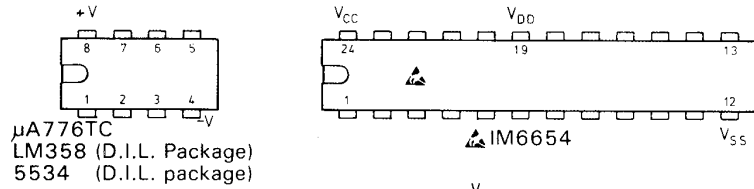
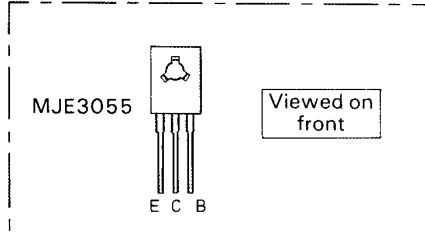
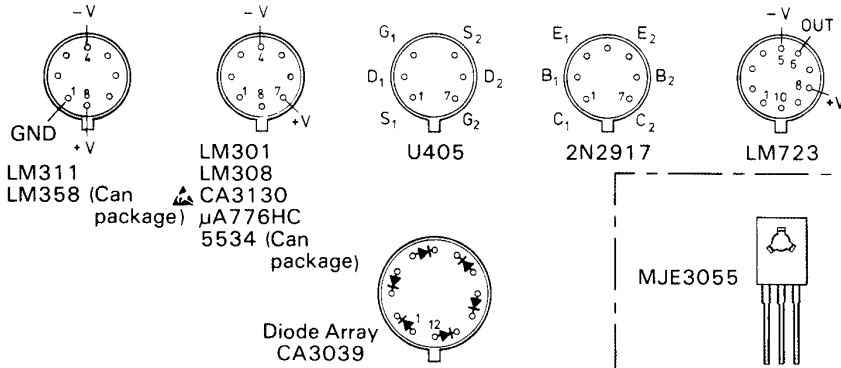
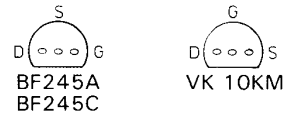
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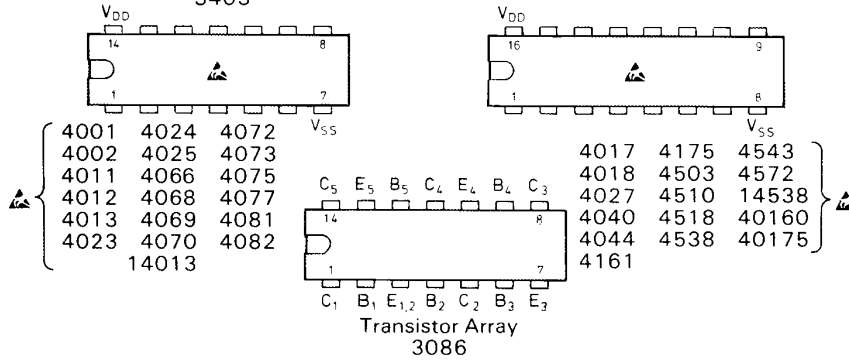
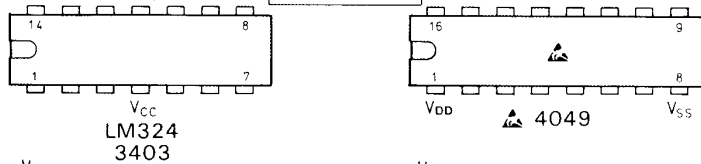


BC109
BC109C
BCY71
2N2219
2N2369A
2N2894
2N2905
2N3251
2N3947

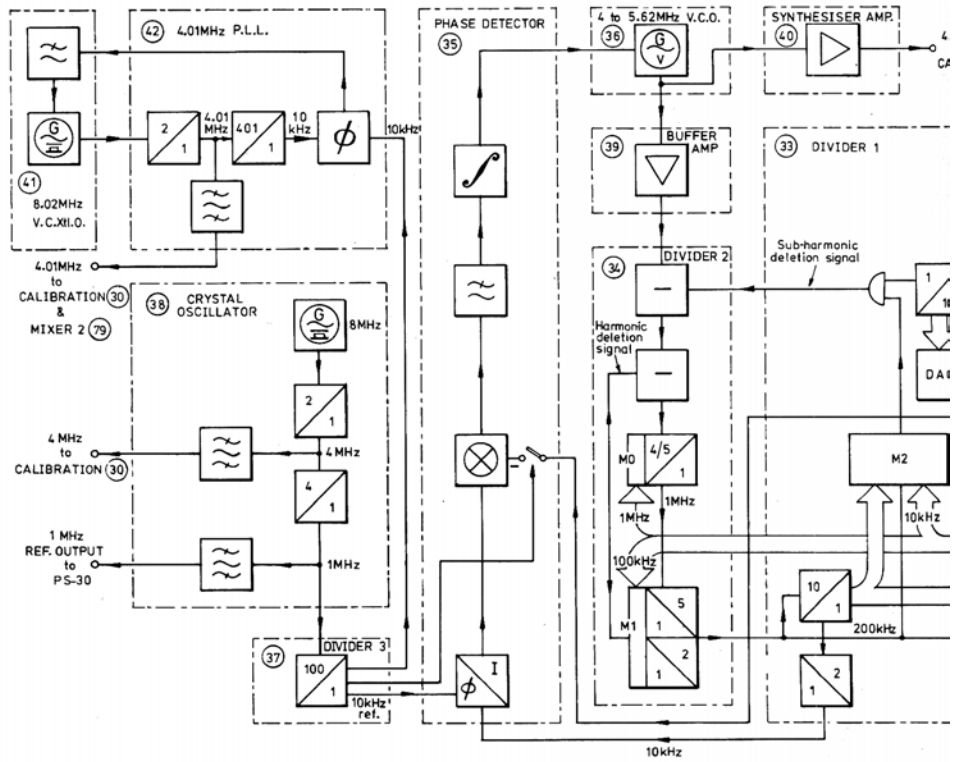
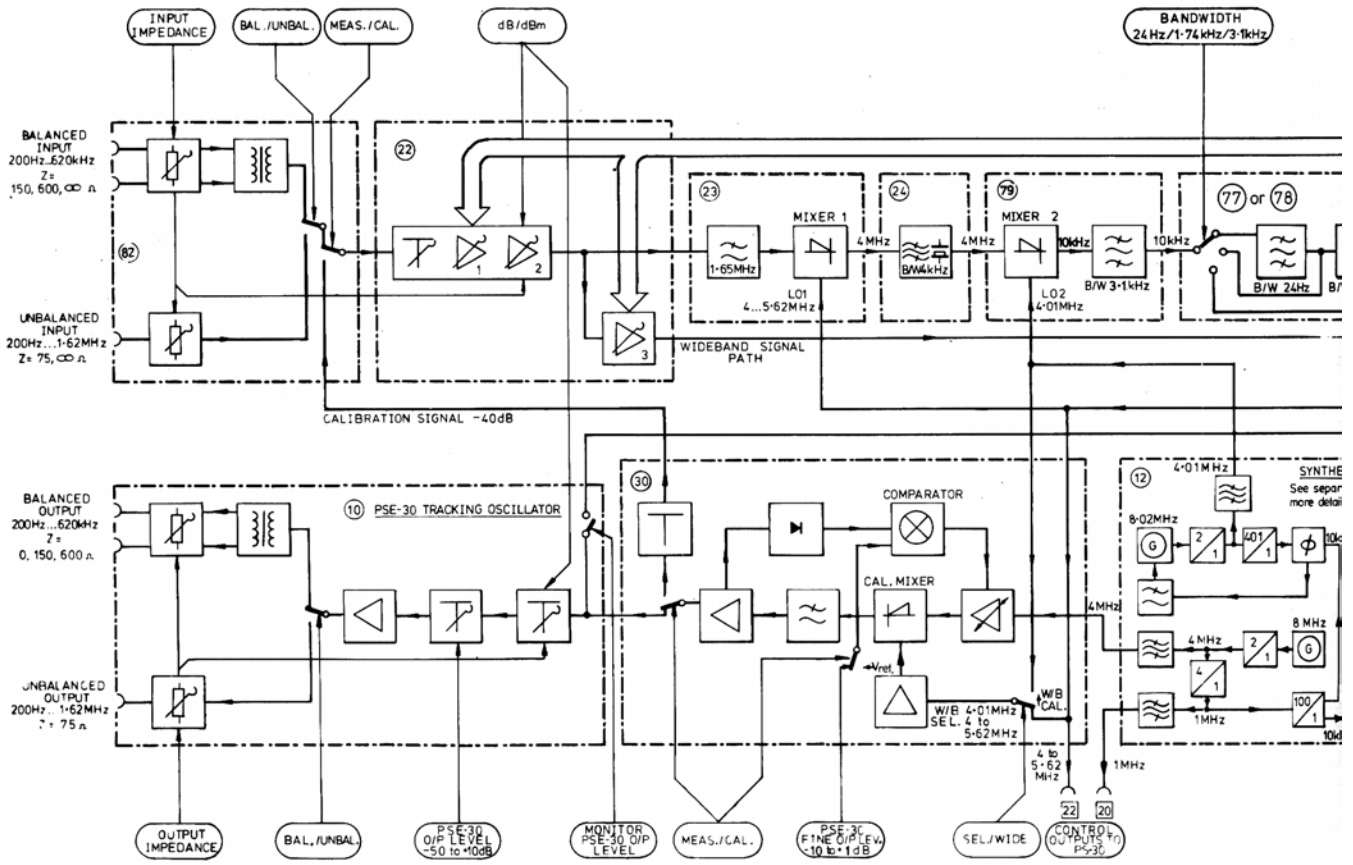
Devices above dotted line
viewed on bases



Devices below
dotted line
viewed on top



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



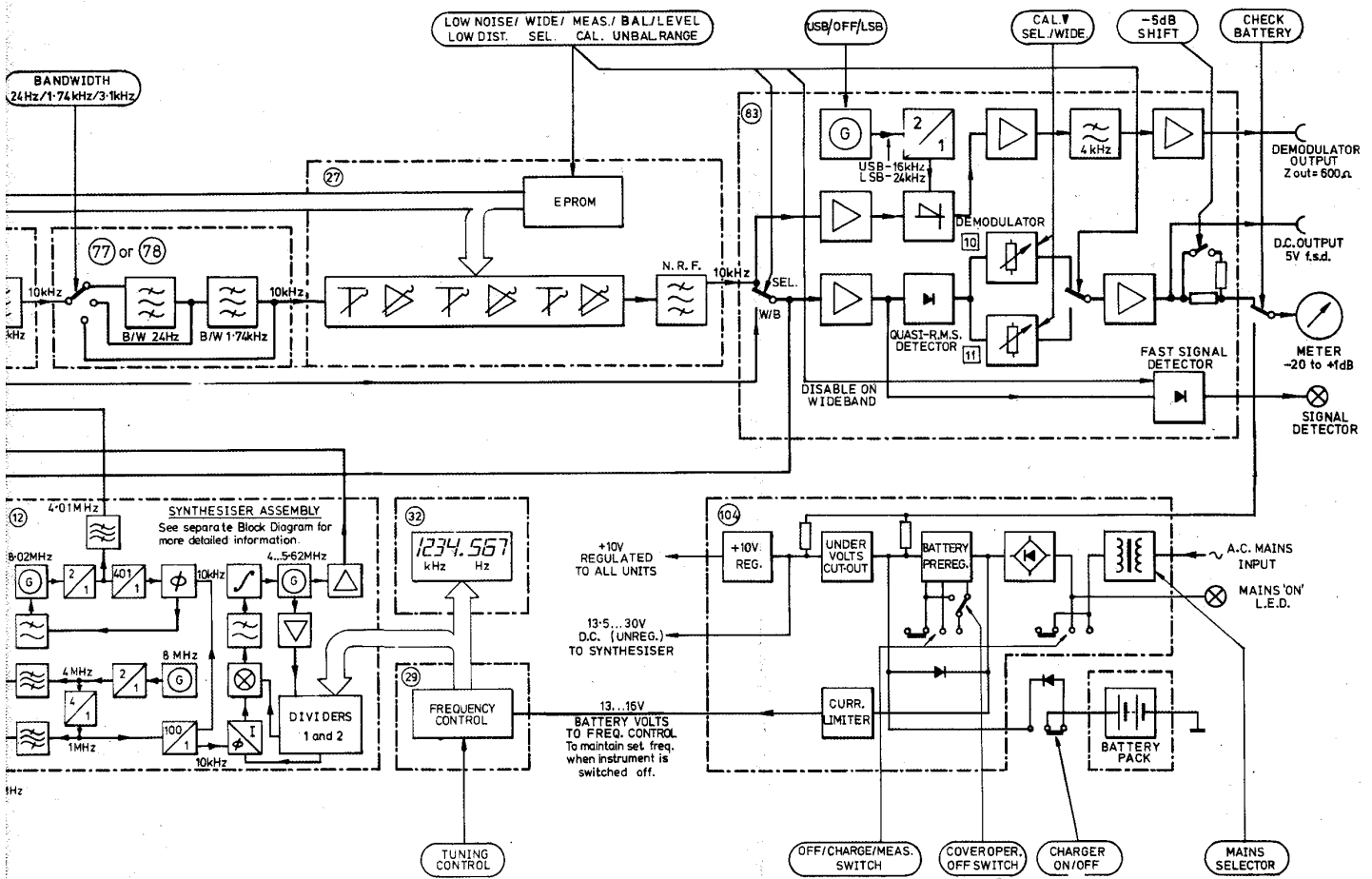


Fig. 1 Block Diagram of Complete Instrument, SPM-30/PSE-30

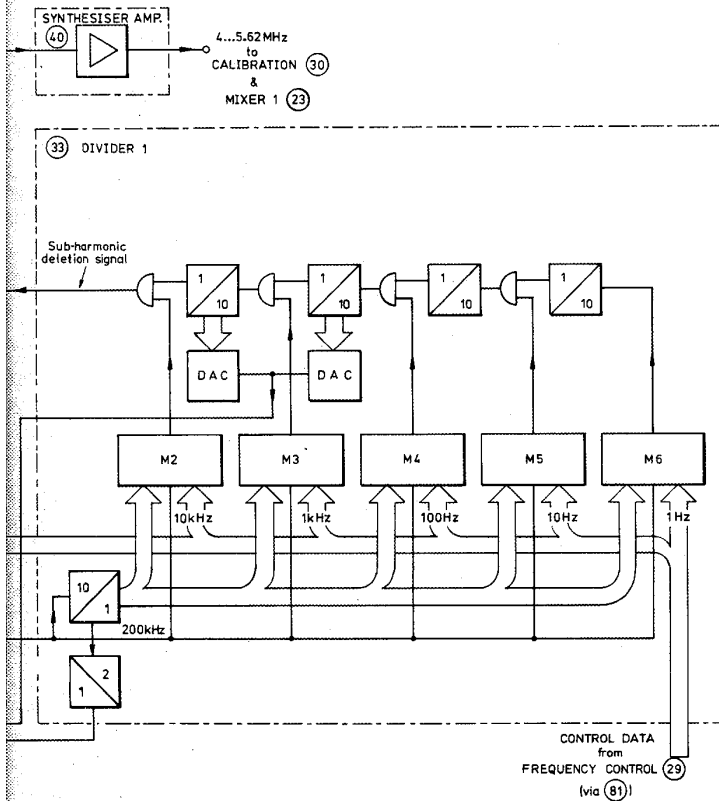
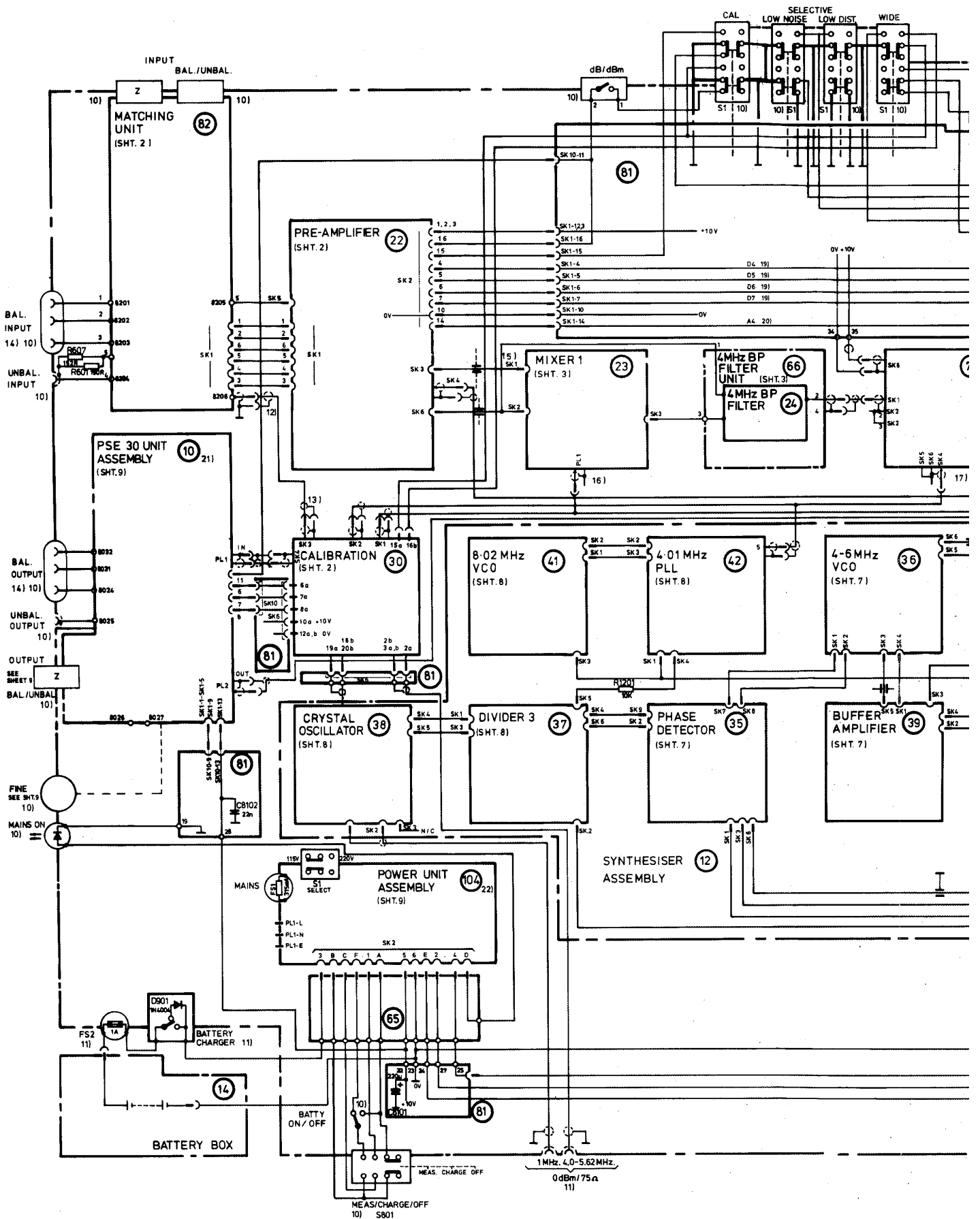


Fig. 2 Block Diagram of Synthesiser Assembly, (12)

(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



- | | | |
|-------------------------|-----------------------|---|
| 10) ON FRONT PANEL | 14) 200 Hz - 1.64 MHz | 19) DATA LINES D4-D7. |
| 11) ON REAR PANEL | 15) -20dB | 20) ADDRESS LINES A0-A7. |
| 12) -40dB | 16) 4 - 5.64 MHz | 21) INCORPORATING ASSEMBLY A80 |
| 13) SEL: 200Hz-1.64MHz. | 17) 4.01 MHz | 22) INCORPORATING ASSEMBLY A84. |
| WIDE BAND: 10KHz. | 18) 200 Hz - 1.64 MHz | 23) SK9 REPRESENTED BY PLATED THRO' HOLES ONLY. |

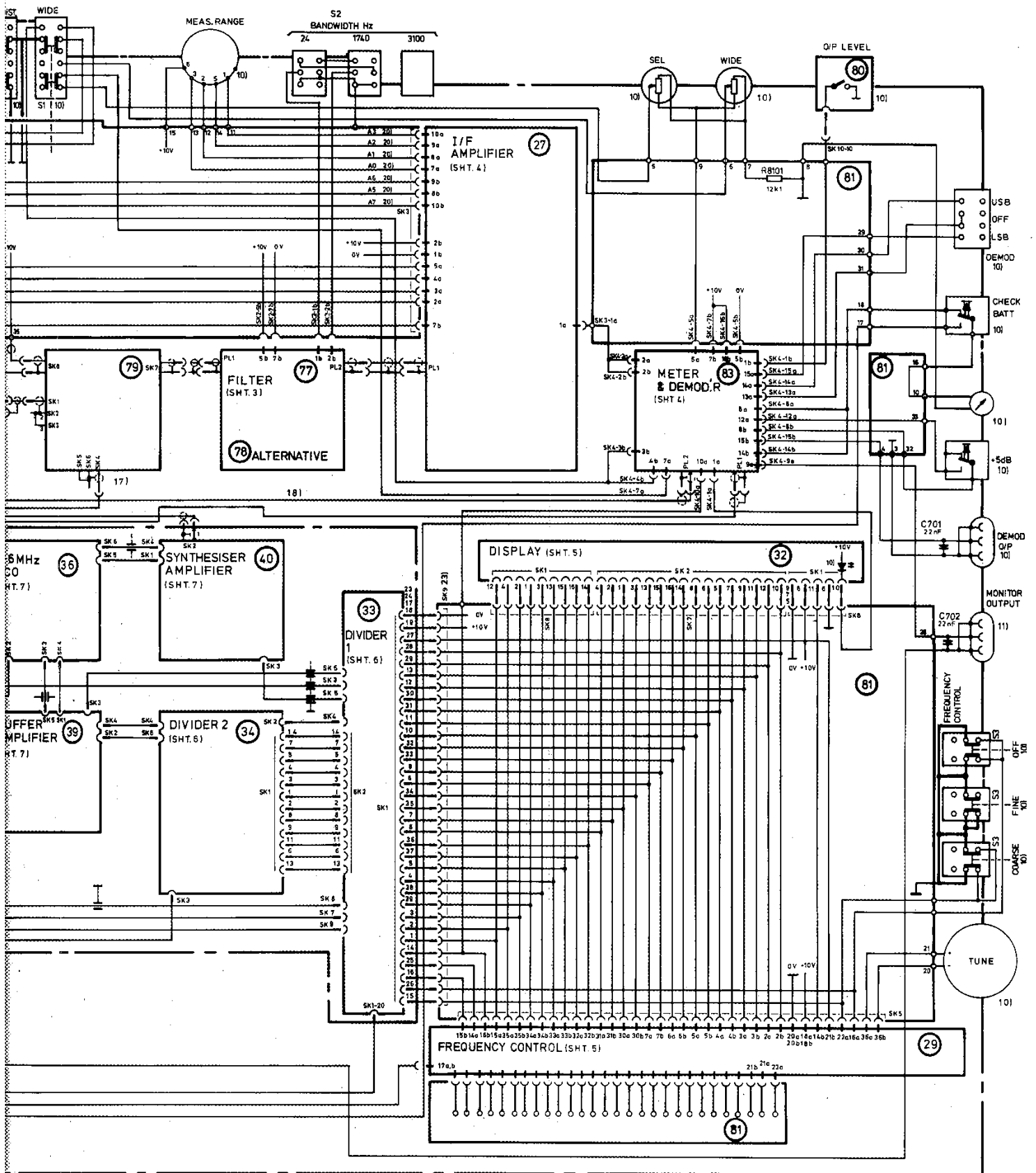


Fig. 3 Interconnections Diagram

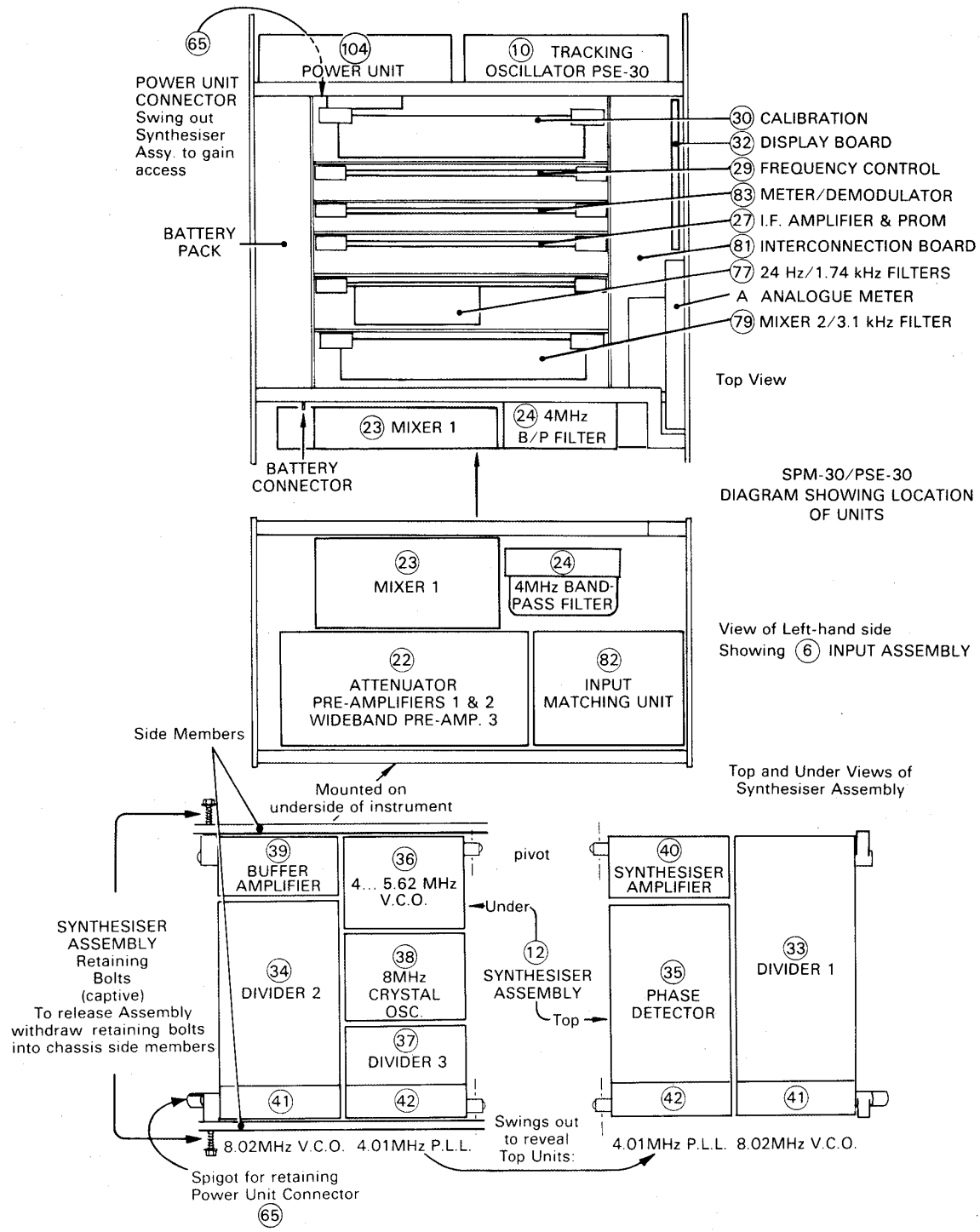
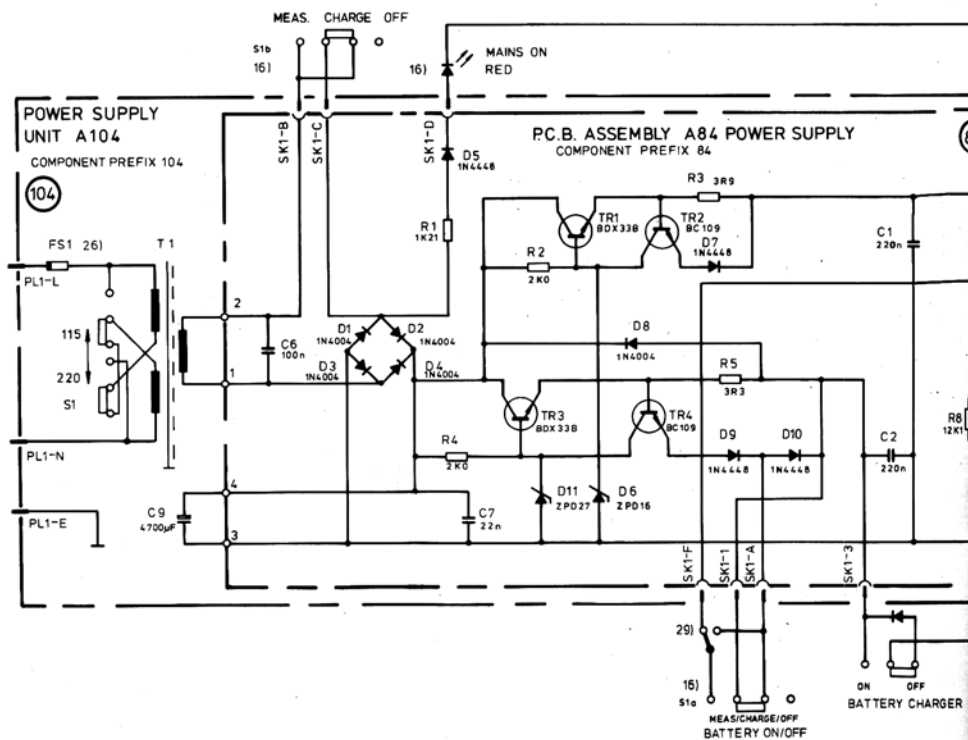


Fig. 4 Location of units within Instrument

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
- 26) 220V - 315mA 115V - 630mA
- 27) FINE LEVEL CONTROL.
- 28) RESISTORS NOT FITTED ON STD SERIES
- 29) COVER OPERATED OFF SWITCH

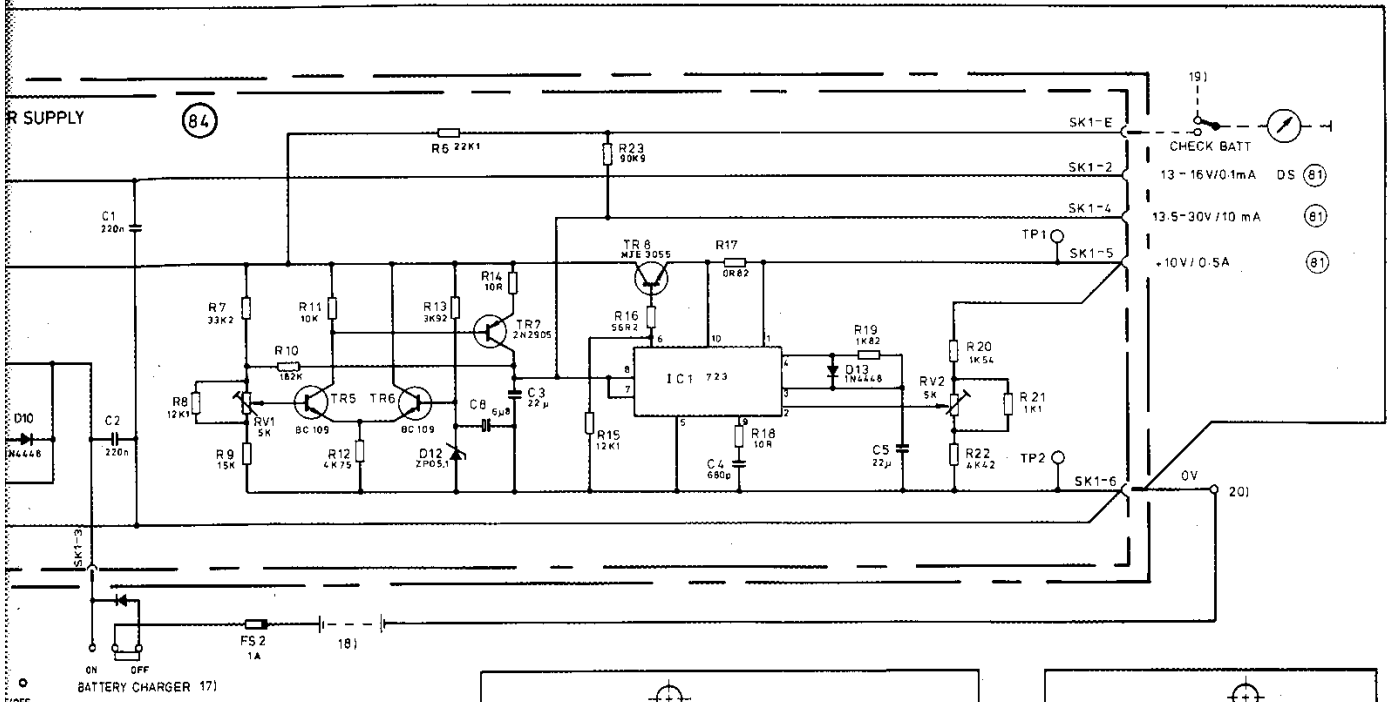
ASSEMBLY A104 POWER SUPPLY

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/-
			115V	FUSELINK, T 630mA	
FS2			Batt.	FUSELINK, T 1A	0001-0020.711/-
A84				P.C.B. POWER SUPPLY UNIT	4502-1084.002/3

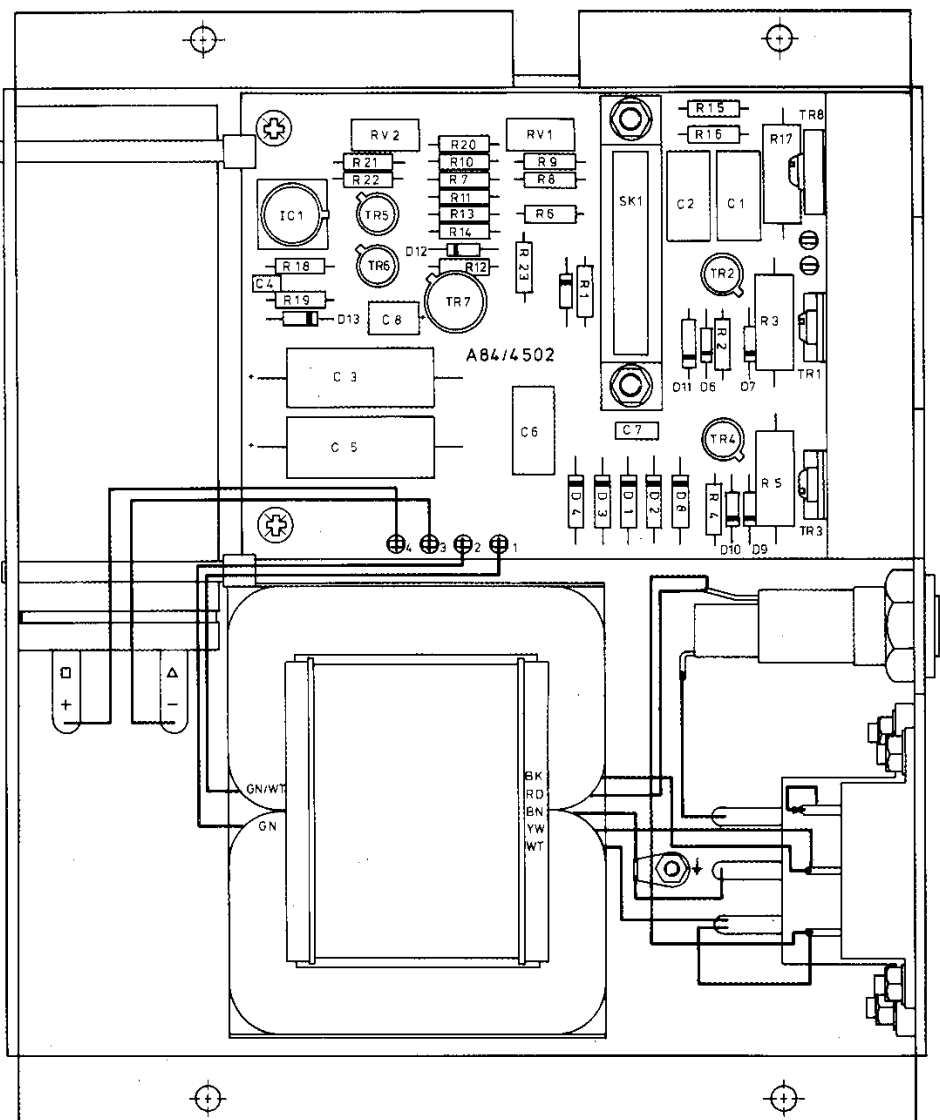
ASSEMBLY P.C.B. A84, used on A104 POWER SUPPLY

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	0R82	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
RV1	5k	20	0W5 Lin.	Variable
C1	220n		100V	
C2	220n		100V	
C3	22µ		40V	Elec.
C4	680p	10	63V	Cer.
C5	22µ		40V	Elec.
C6	100n	10	100V	
C7	22n	10	40V	
C8	6µ8		35V	Elec.
TR1				BDX 33B
TR2				BC109
TR3				BDX 33B
TR4				BC109
TR5				BC109
TR6				BC109
TR7				2N2905
TR8				MJE 3055
D1				1N4004
D2				1N4004
D3				1N4004
D4				1N4004
D5				1N4448
D6				BZY88/C16
D7				1N4448
D8				1N4004
D9				1N4448
D10				1N4448
D11				BZY88/C27
D12				ZPD 5.1
D13				1N4448
IC1				µA 723
SK1				EDGE CONNECTOR, 1
A84				P.C.B. POWER SUPPLY UNIT (less compo

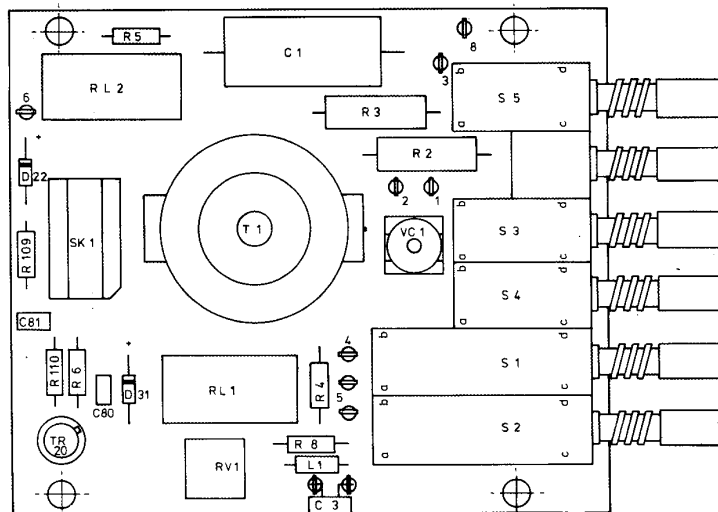
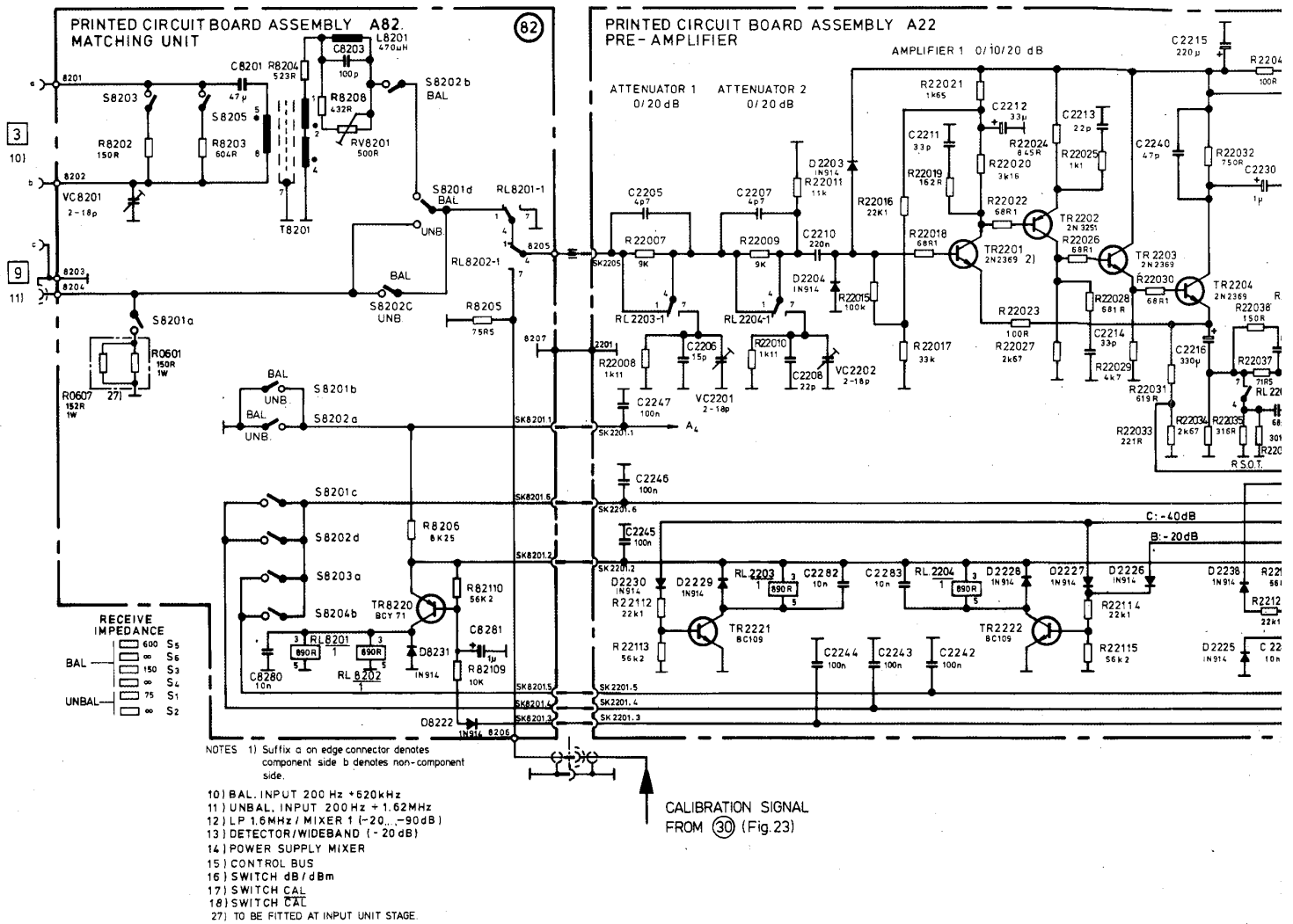


NG	TYPE	PART NO.
in.	Variable	0000-7574.283/-
		0001-0010.404/-
		0001-0010.404/-
Elec.		0001-0041.716/-
Cer.		0001-0004.685/-
Elec.		0001-0041.716/-
		0001-0010.365/-
		0001-0006.418/-
Elec.		0001-0040.856/-
BDX 33B		0000-7591.059/-
BC109		0000-7602.029/-
BDX 33B		0000-7591.059/-
BC109		0000-7602.029/-
BC109		0000-7602.029/-
BC109		0000-7602.029/-
2N2905		0001-0017.287/-
MJE 3055		0001-0017.148/-
1N4004		0000-7605.026/-
1N4004		0000-7605.026/-
1N4004		0000-7605.026/-
1N4004		0000-7605.026/-
1N4448		0001-0018.493/-
BZY88/C16		0001-0019.159/-
1N4448		0001-0018.493/-
1N4004		0000-7605.026/-
1N4448		0001-0018.493/-
1N4448		0001-0018.493/-
BZY88/C27		0000-7594.687/-
ZPD 5.1		0001-0018.833/-
1N4448		0001-0018.493/-
μA 723		0001-0015.852/-
EDGE CONNECTOR, 12-WAY		0000-7606.054/-
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)



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

Fig. 8 Component Layout, Input Matching unit, (82)

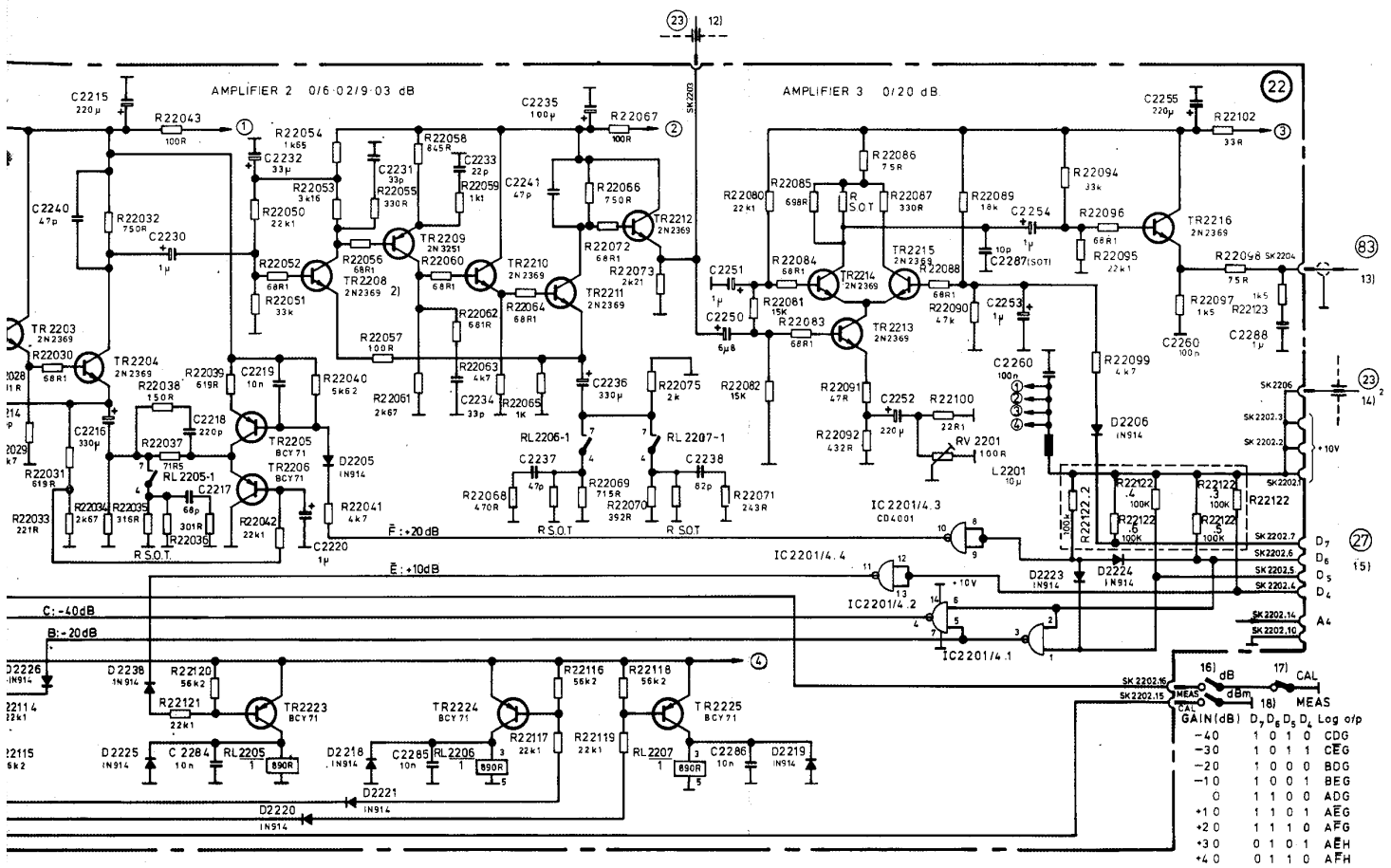
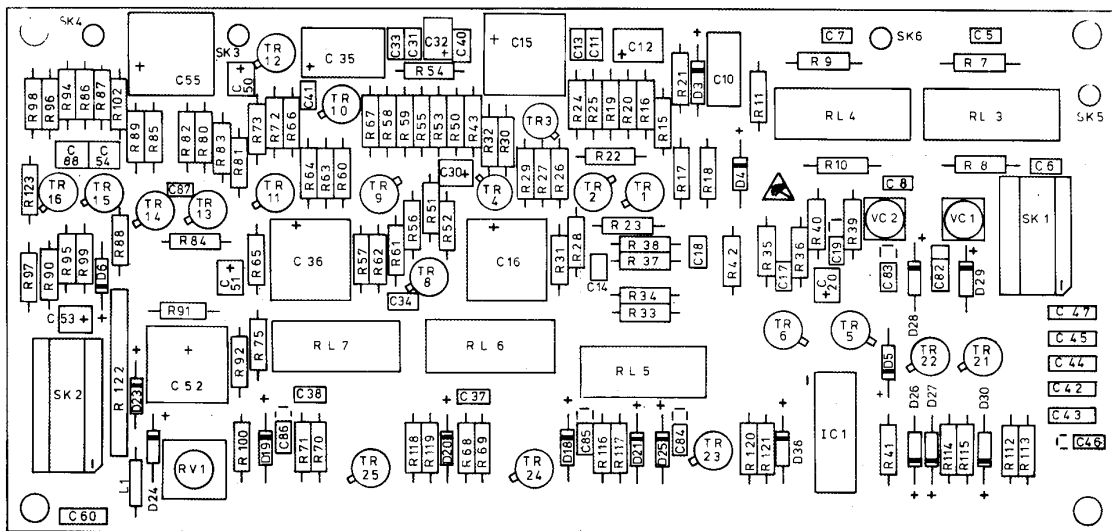


Fig. 7 Circuit Diagram,
Input Matching unit, 82 and
Pre-amplifier/Attenuator 22

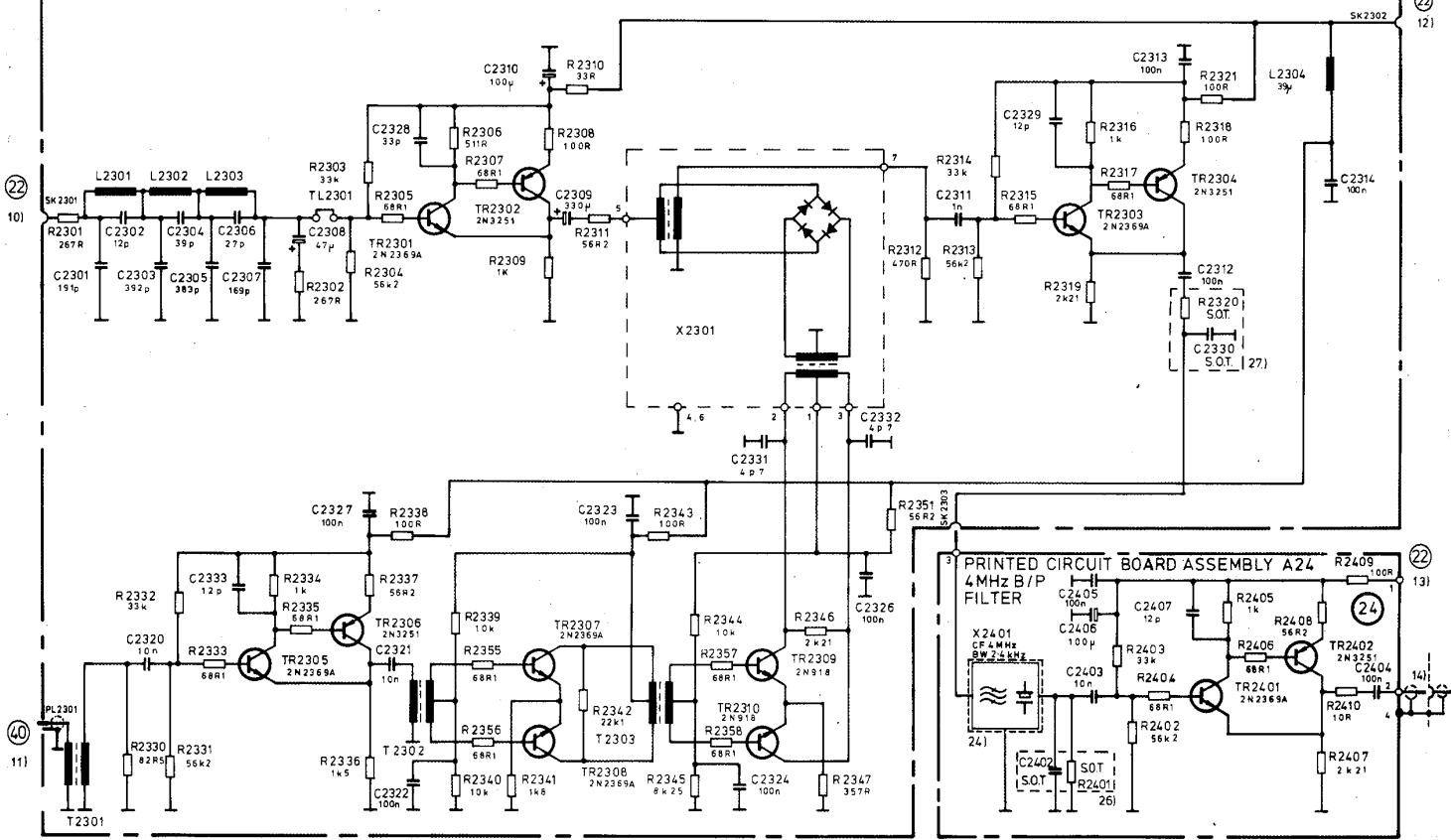


CIRCUIT REFERENCES TO BE PRECEDED BY
BOARD ASSEMBLY NUMBER
e.g. C60 BECOMES C2260
TR4 BECOMES TR2204

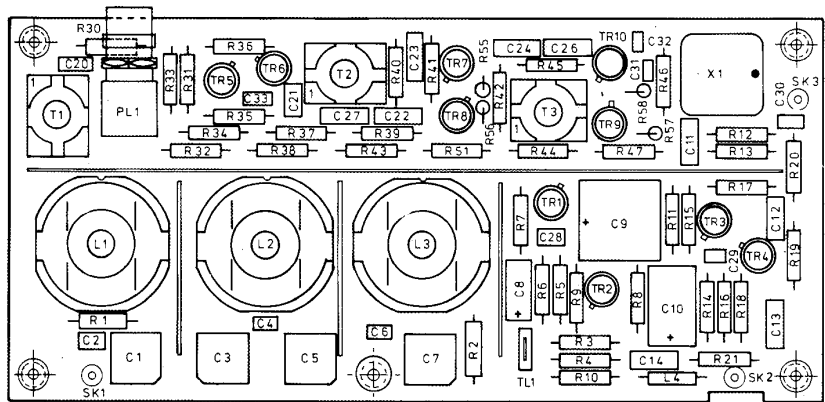
Fig. 9 Component Layout,
Pre-amplifier/Attenuator, 22

PRINTED CIRCUIT BOARD ASSEMBLY A23
MIXER 1

23

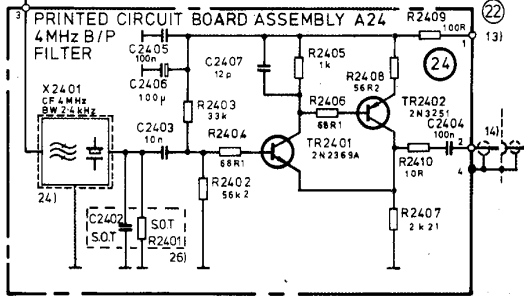


- NOTES 1) Suffix a on edge connector denotes component side b denotes non-component side.
- 10) SIG i/p 200Hz - 1.6MHz (-40dB)
 11) L.O. i/p 4 - 5.62 MHz
 12) +10V from pre-amp
 13) +10V
 14) o/p 1st IF 4MHz (-57dB)
 15) INPUT L.O. 4.01MHz
 16) OUTPUT 2nd IF (-40dB)
 17) +10V
 18) BW 24kHz
 19) BW 1.74kHz
- 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 " " " 11p
 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 SK 1 BECOMES SK6601

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

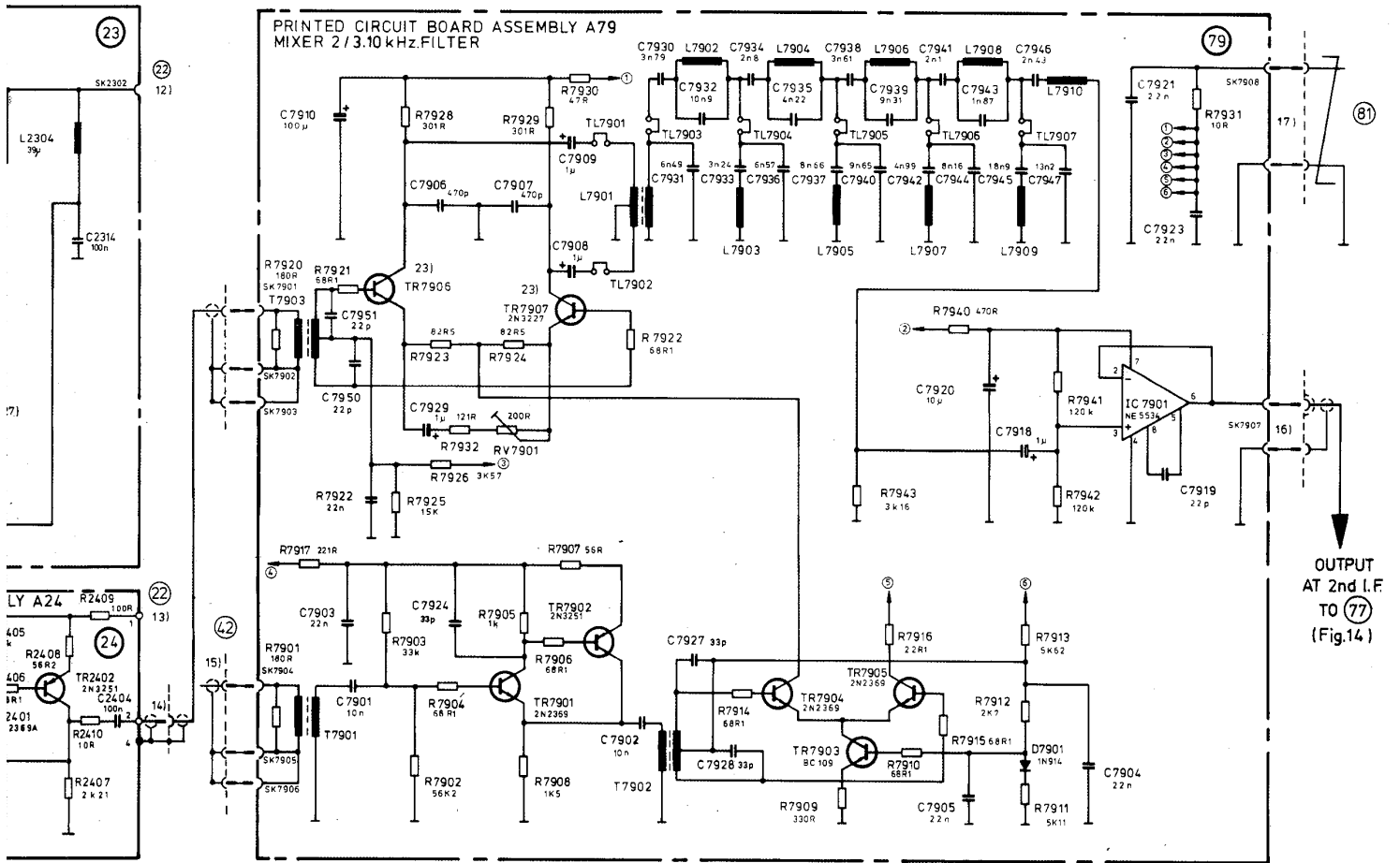
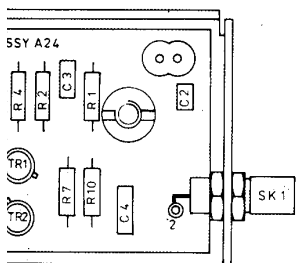


Fig. 10 Circuit Diagram, Mixer 1, 23 ;
4MHz B/P Filter, 24 and
Mixer 2/3.1kHz Filter, 79



ED BY
C6 BECOMES C2406

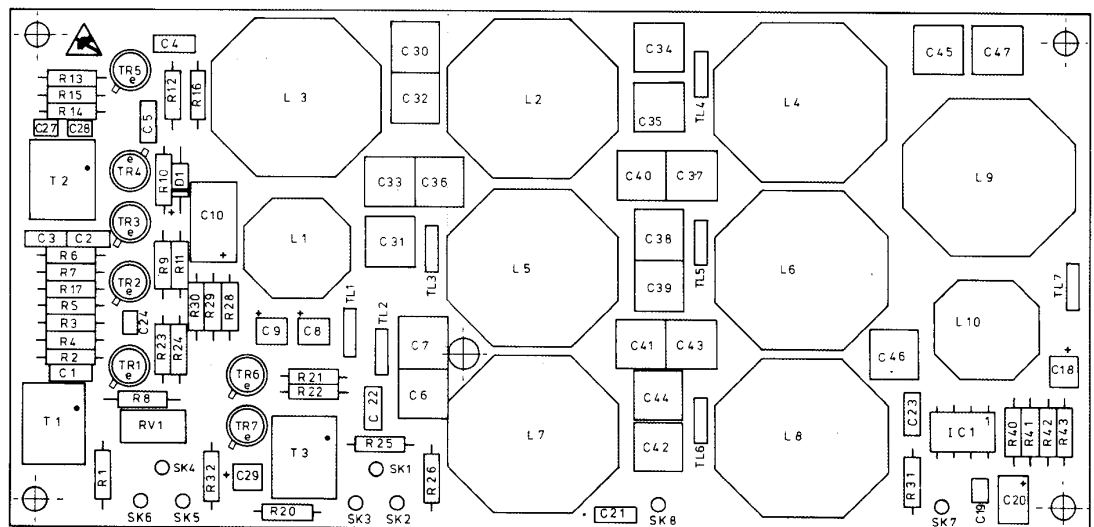
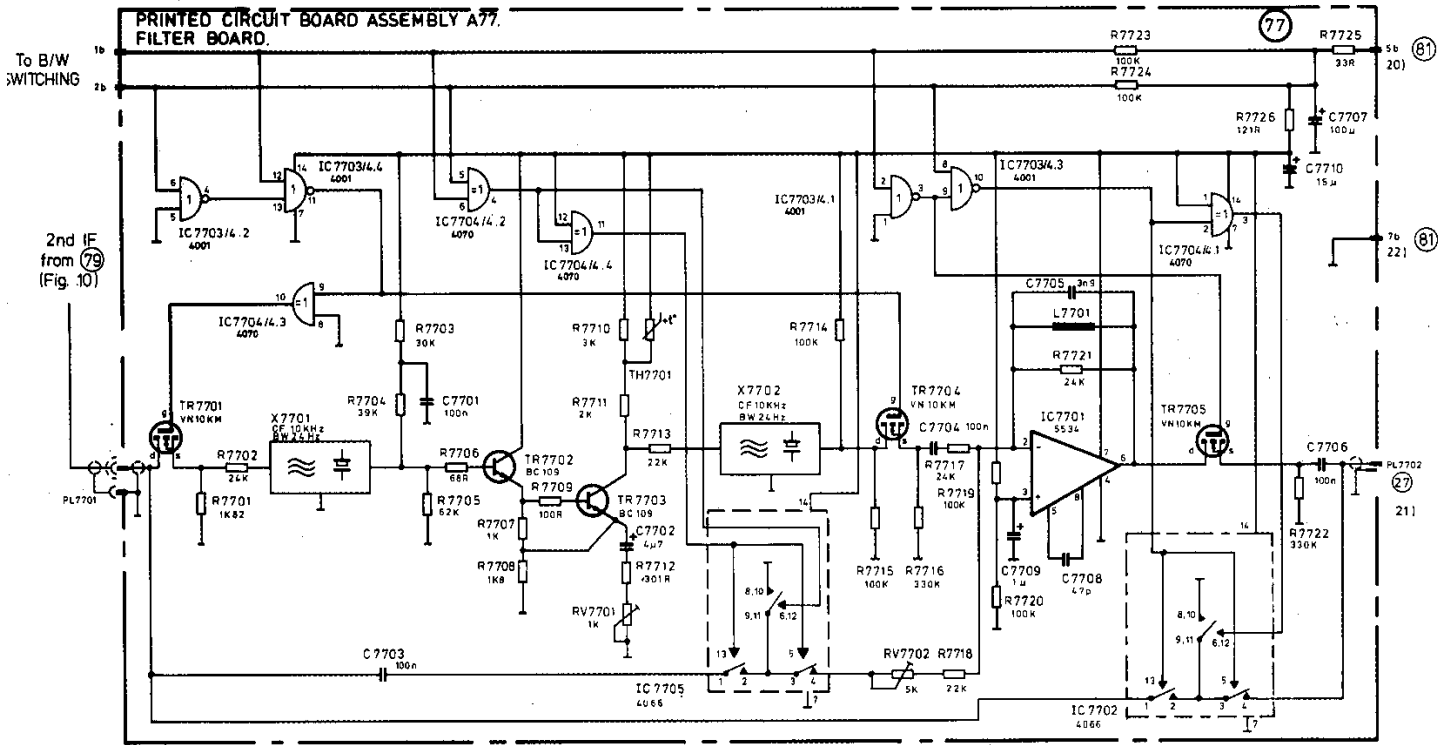


Fig. 13 Component Layout,
Mixer 2/3.1kHz Filter, 79

out,
er, 24

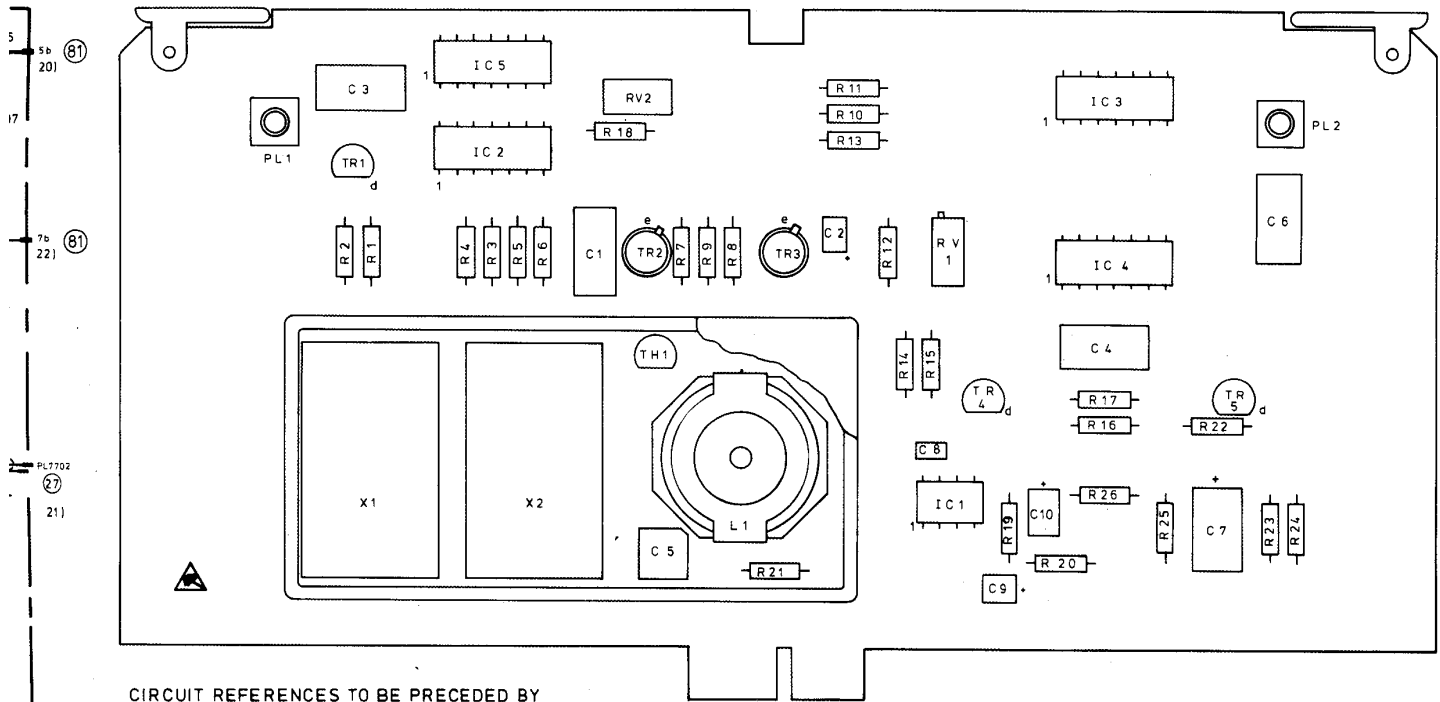


NOTES 1) Suffix a on edge connector denotes component side, b denotes non-component side.
 20) +10V
 21) OUTPUT (to IFAMP)
 22) 0V

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

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

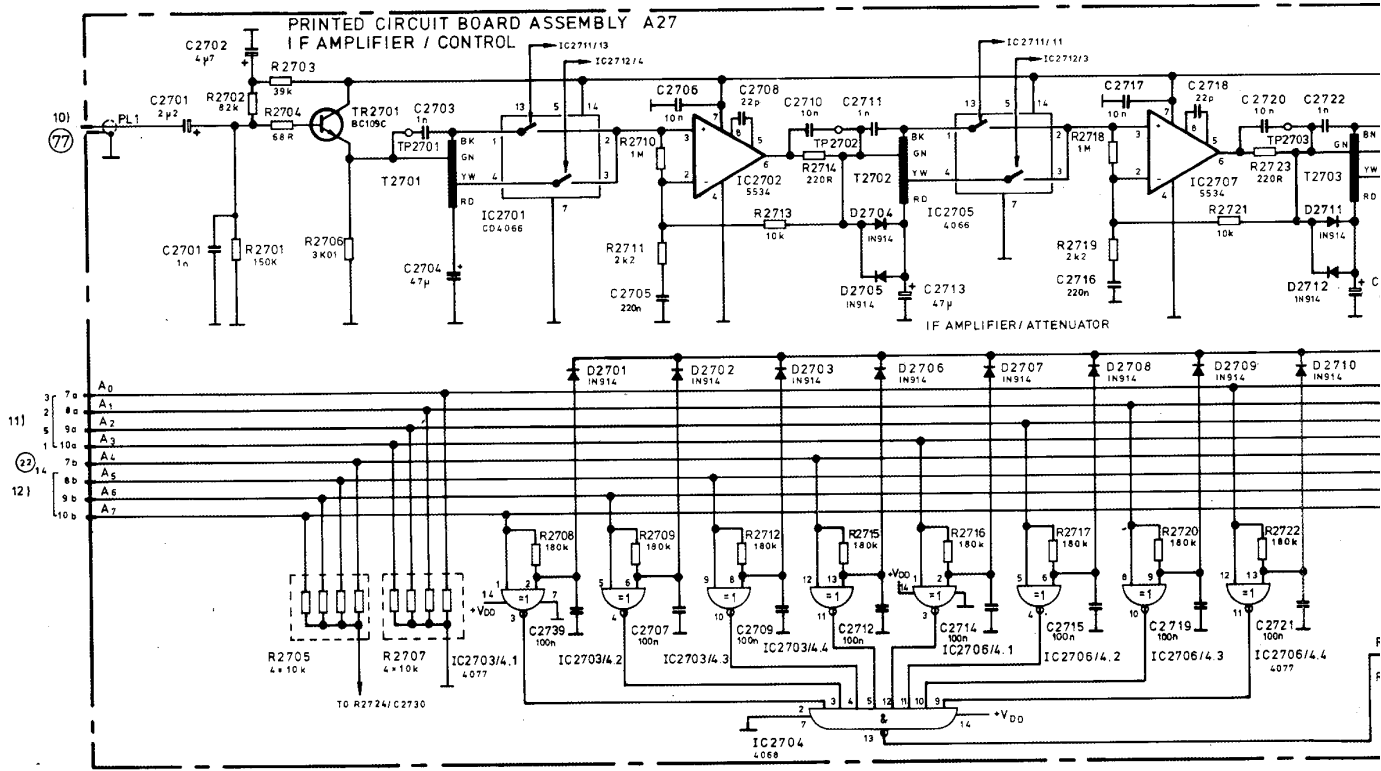
REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.
R1	1k82	1	0W35	MF	0001-0001.413/-
R2	24k	2	0W25	MF	0000-7601.334/-
R3	30k1	1	0W35	MF	0001-0002.564/-
R4	39k2	1	0W35	MF	0001-0002.658/-
R5	61k9	1	0W35	MF	0001-0002.836/-
R6	68R1	1	0W35	MF	0001-0000.427/-
R7	1k	1	0W35	MF	0001-0001.219/-
R8	1k8	2	0W25	MF	0001-0014.510/-
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	4μ7	20	10	Tant.	0001-0040.801/-



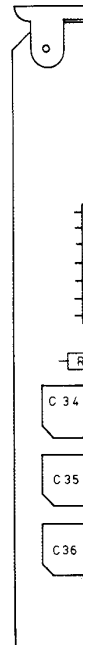
CIRCUIT REFERENCES TO BE PRECEDED BY
BOARD ASSY NUMBER
eg X1 BECOMES X7701
R21 BECOMES R7721

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

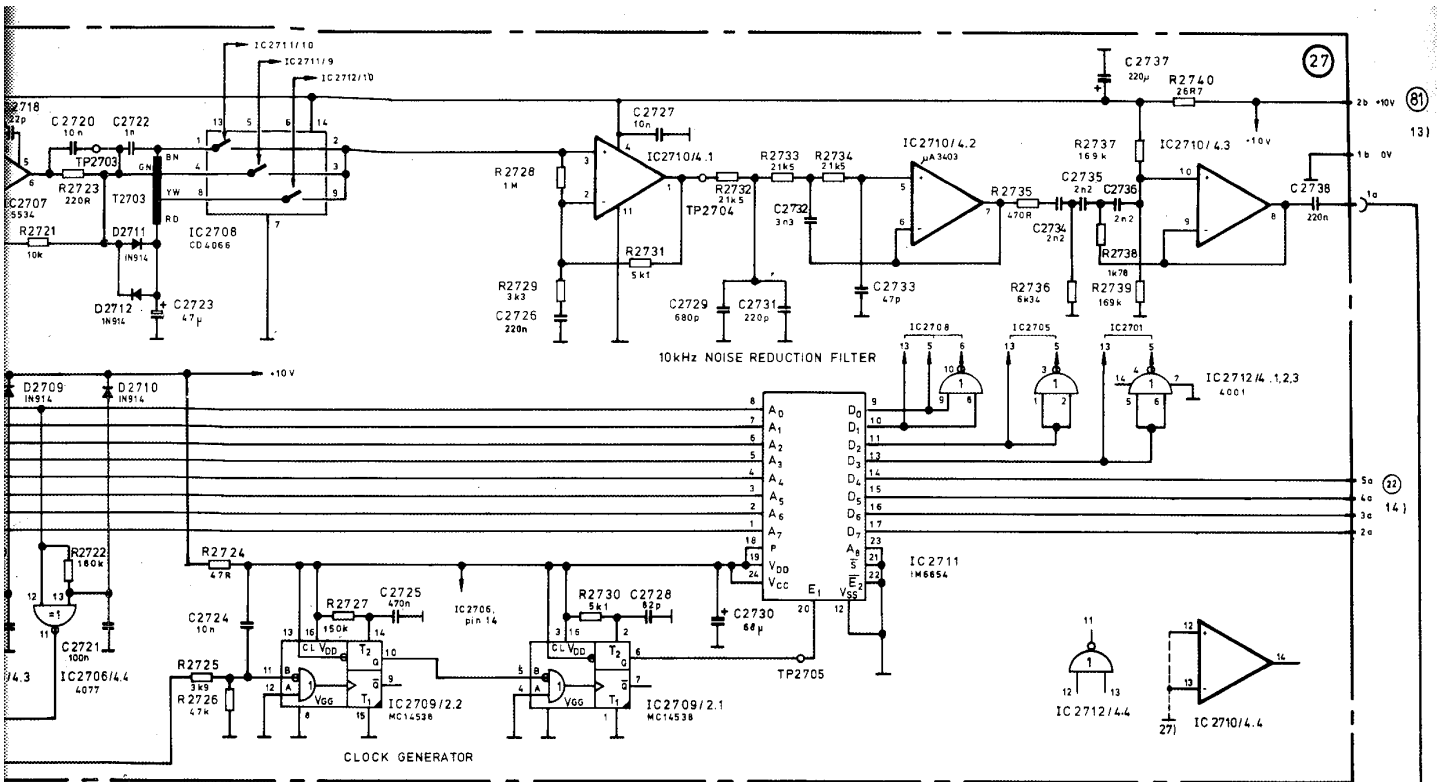
REF.	VALUE	TOL. ± X	RATING	TYPE	PART NO.
C3	100n	10	100	PE	0001-0010.365/-
C4	100n	10	100	PE	0001-0010.365/-
C5	3n9	2	63	PF	0000-7598.447/-
C6	100n	10	100	PE	0001-0010.365/-
C7	100μ	20	10	Tant.	0001-0041.156/-
C8	47p	2	63	Cer.	0001-0004.397/-
C9	1μ	20	35	Tant.	0001-0040.704/-
C10	15μ	20	16	Tant.	0001-0040.924/-
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



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

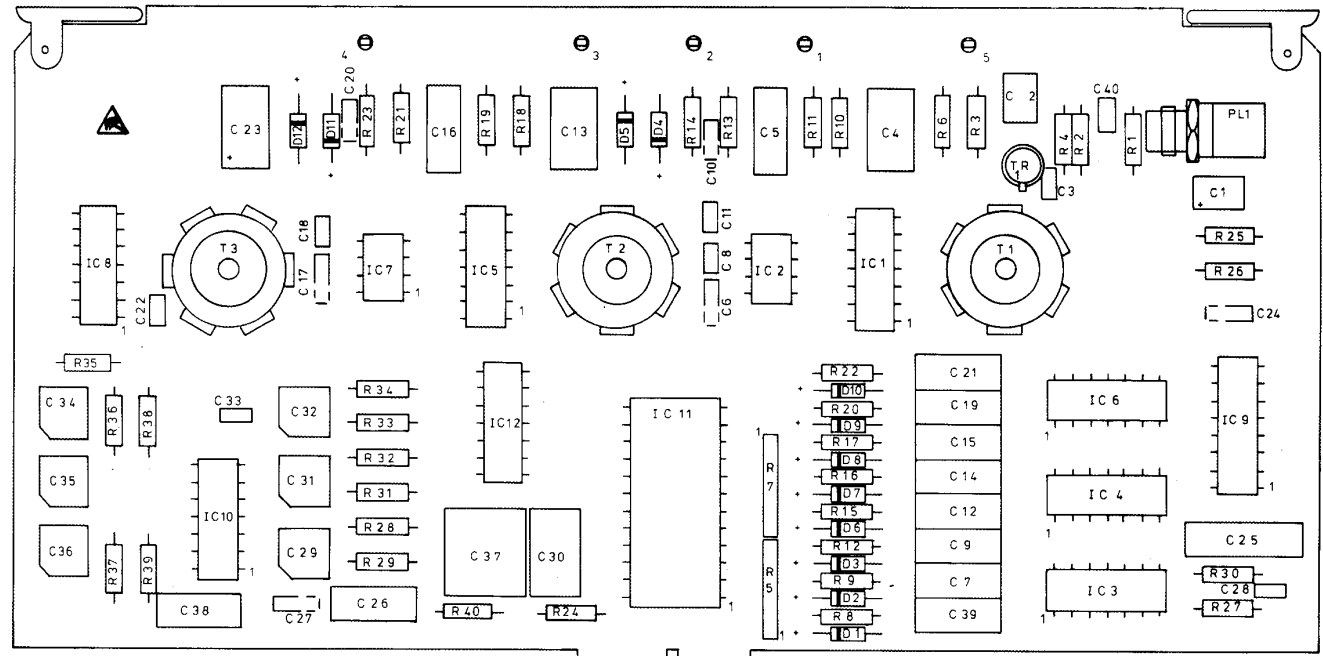


CIRCUIT REF
BY BOARD A
eg C4 BECC
R25 BECI



SELECTIVE SIGNAL TO (83) (Fig.18)

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

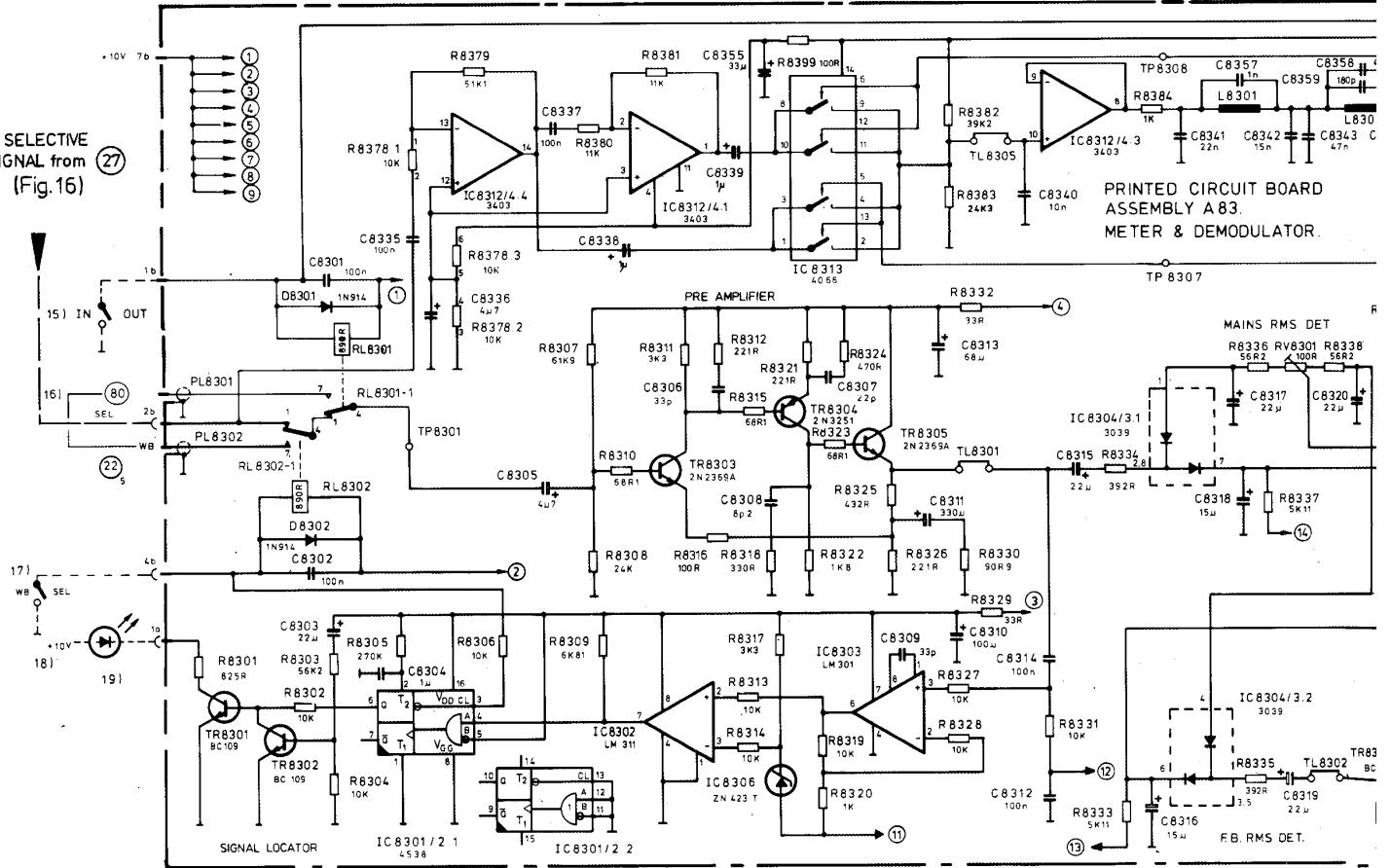


CIRCUIT REFERENCES TO BE PRECEDED BY BOARD ASSEMBLY NUMBER
 eg C4 BECOMES C2704
 R25 BECOMES R2725

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

SELECTIVE SIGNAL from (27)

PRINTED CIRCUIT BOARD ASSEMBLY A83 METER & DEMODULATOR.

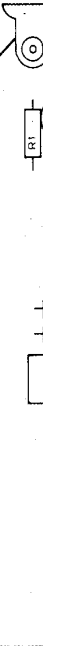


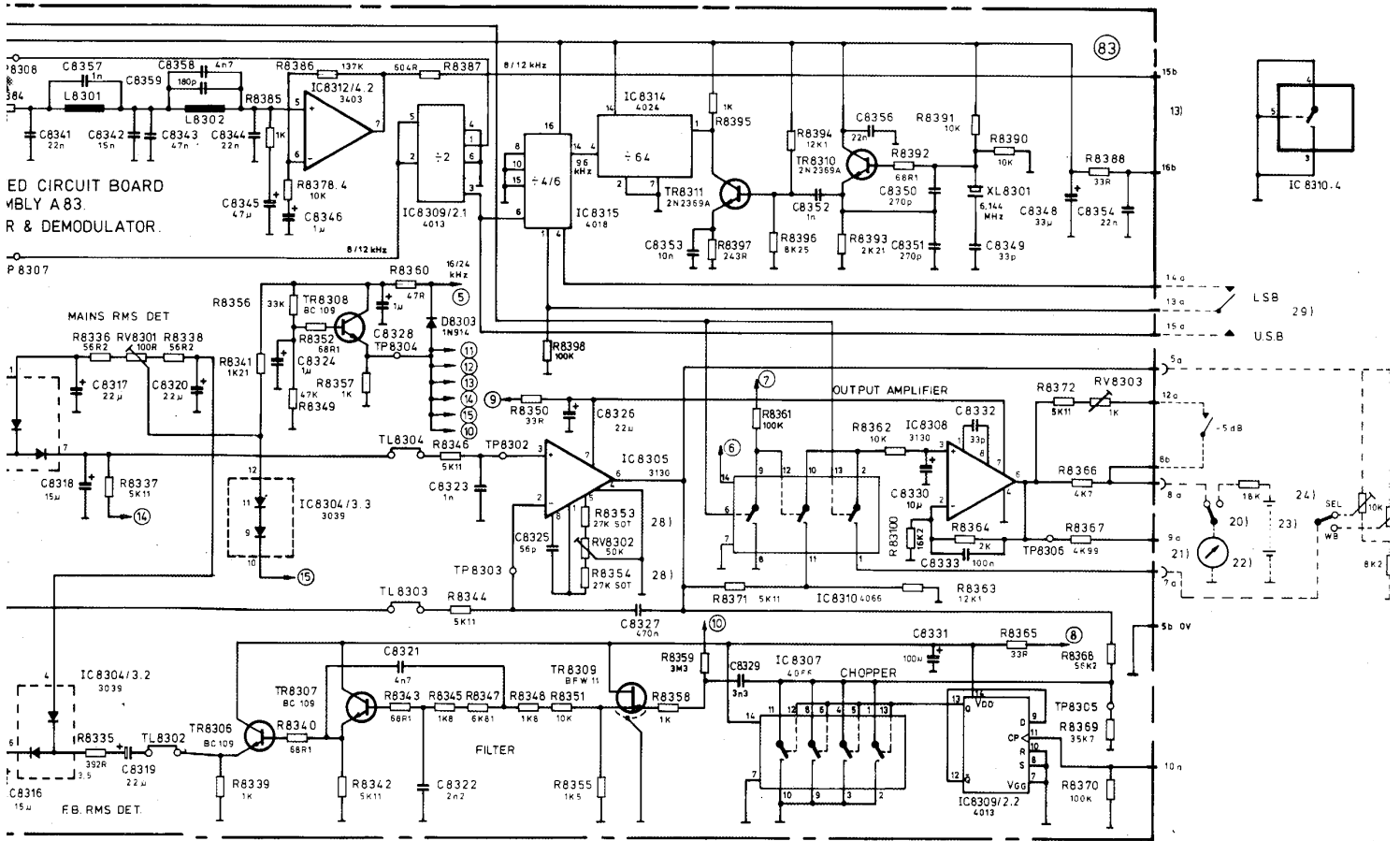
NOTES 1) Suffix a on edge connector denotes component side b denotes non-component side.

- 13 | POWER SUPPLY
- 15) [SW] SWITCH ON PSE (IF FITTED).
- 16) | SIGNAL
- 17) | FRONT PANEL SW
- 18) | ION DISPLAY BOARD
- 19) | LED(IGN) ON DISPLAY BOARD

- 20) BATTERY CH SW FRONT PANEL
- 21) | D.C. O/P TO REAR PANEL SOCKET.
- 22) | SIFAM DS48 METER ON FRONT PANEL
- 23) | BATTERY
- 24) | WB/SEL SW ON FRONT PANEL
- 25) | CAL POT ON FRONT PANEL
- 26) | ON INTERCONNECTION BOARD
- 27) | PINS 12 & 13 TO BE EARTHED ONLY FROM 'C' SERIES ONWARDS.

- 28) | R53 & R54,5 EACH BE APP IS CHANGED NOT EXCEED
- 29) | USB/L5B SW

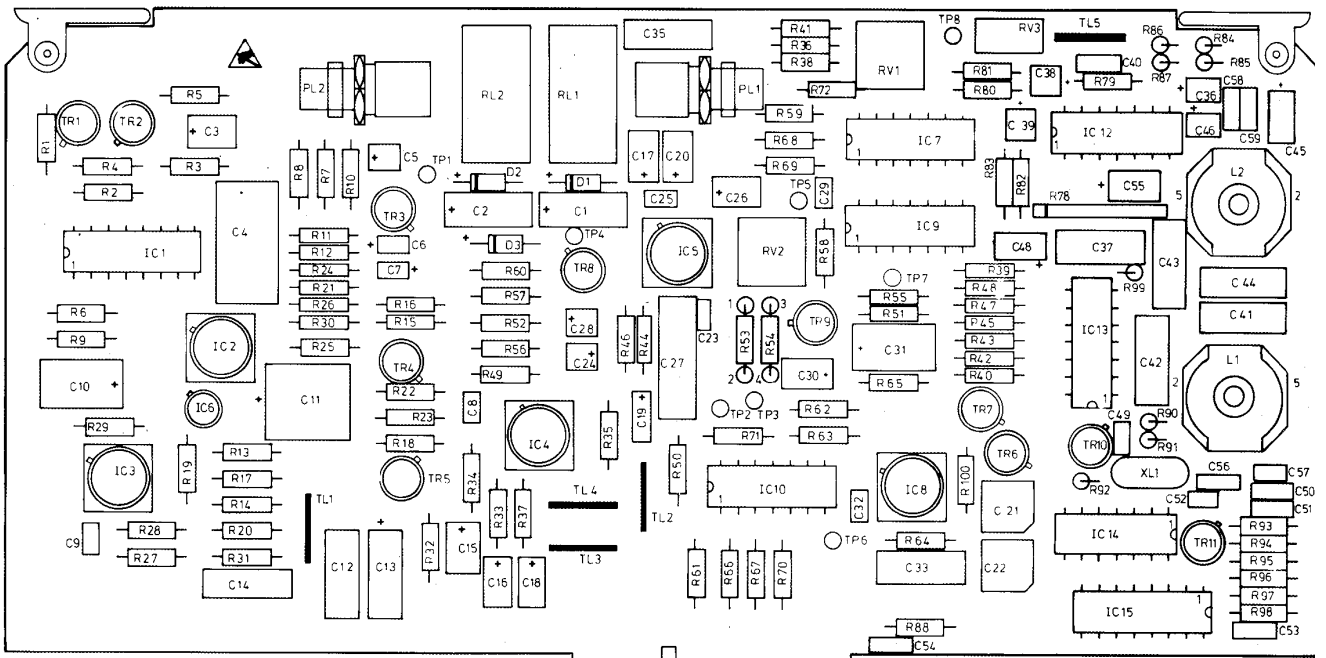




28) R53 & R54, SOT RESISTORS WILL EACH BE APPROX 27K IF EITHER IS CHANGED THEIR SUM TOTAL MUST NOT EXCEED 54K
29) USB/LSB SW ON FRONT PANEL

Fig. 18 Circuit Diagram, Meter and Demodulator, (83)

RIES ONWARDS.



COMPONENT REFERENCES TO BE PRECEDED BY BOARD ASSEMBLY NUMBER.
e.g. R19 BECOMES R8319
C9 BECOMES C8309

Fig. 19. Component Layout, Meter and Demodulator, (83)

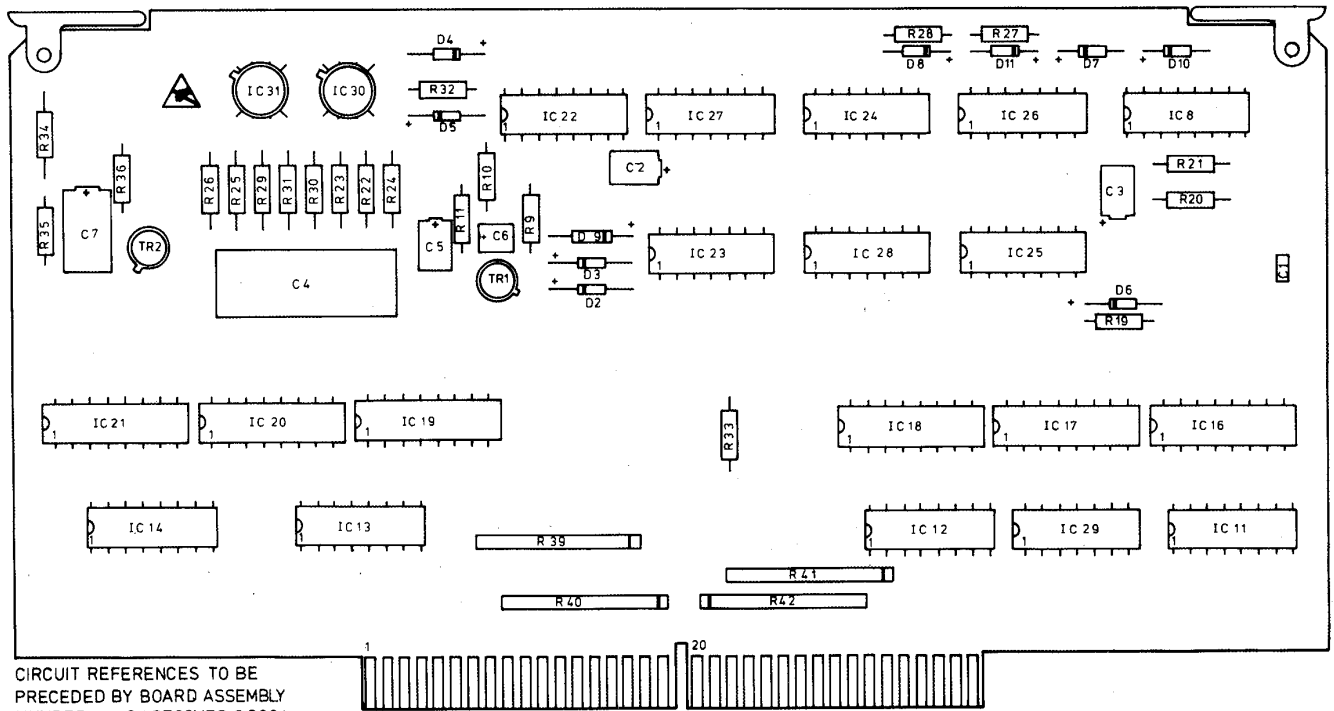
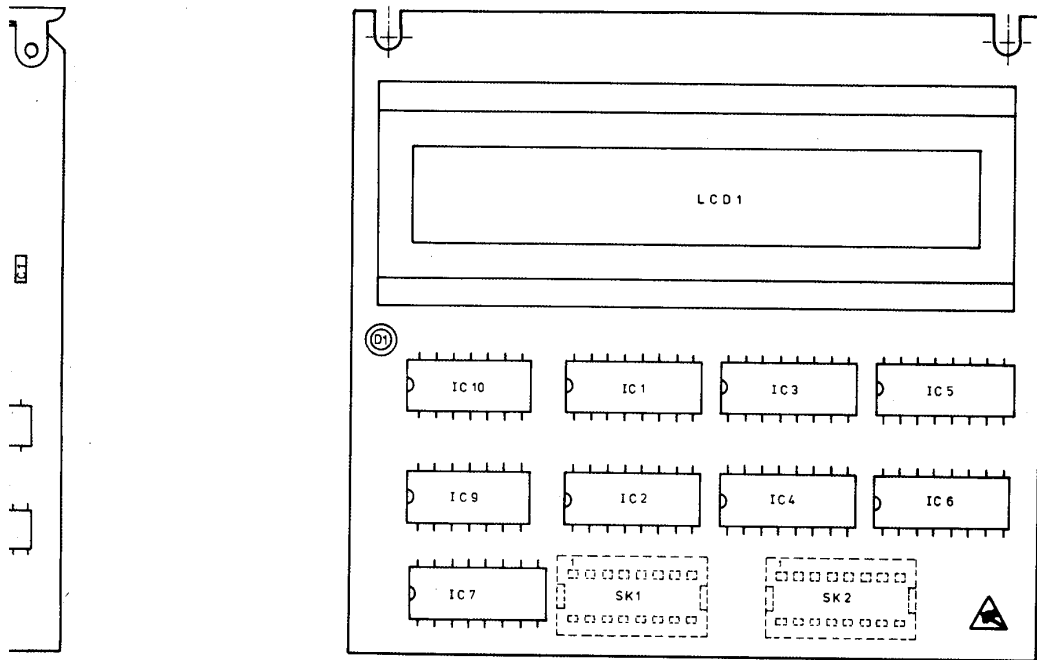


Fig. 20 Component Layout, Frequency Control, (29)

ASSEMBLY P.C.B. A29 FREQUENCY CONTROL

REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.	REF.	VALUE	TOL. ± %	RATING
R9	39R2	1	0W35	MF	0001-0003.547/-	C4	3μ3	10	63
R10	221k	1	0W35	MF	0001-0003.217/-	C5	33μ	20	10
R11	56k2	1	0W35	MF	0001-0002.797/-	C6	4μ7	20	10
R19	56k2	1	0W35	MF	0001-0002.797/-	C7	100μ	20	10
R20	100R	1	0W35	MF	0001-0000.537/-	TR1			BC
R21	562k	1	0W35	CF	0001-0003.408/-	TR2			BC
R22	27k	2	0W25	MF	0000-7558.377/-	D2			1N
R23	100k	1	0W35	MF	0001-0002.991/-	D3			1N
R24	82R5	1	0W35	MF	0001-0000.472/-	D4			1N
R25	1M2	5	0W35	CF	0001-0007.297/-	D5			1N
R26	1M2	5	0W35	CF	0001-0007.297/-	D6			1N
R27	301k	1	0W35	MF	0001-0062.025/-	D7			1N
R28	33k	2	0W25	MF	4980-0000.009/-	D8			1N
R29	82R5	1	0W35	MF	0001-0000.472/-	D9			BZ
R30	221k	1	0W35	MF	0001-0003.217/-	D10			1N
R31	27k	2	0W25	MF	0000-7558.377/-	D11			1N
R32	7k5	1	0W35	MF	0001-0002.014/-	IC8			40
R33	825R	1	0W35	MF	0001-0001.154/-	IC11			45
R34	562k	1	0W35	CF	0001-0003.408/-	IC12			45
R35	56k2	1	0W35	MF	0001-0002.797/-	IC13			45
R36	301k	1	0W35	MF	0001-0062.025/-	IC14			45
R38						IC15			45
R39	10 x 100k	2	0W2	RESISTOR PACK	0000-7604.441/-	IC16			45
R40	10 x 100k	2	0W2	RESISTOR PACK	0000-7604.441/-	IC17			45
R41	10 x 100k	2	0W2	RESISTOR PACK	0000-7604.441/-	IC18			45
R42	10 x 100k	2	0W2	RESISTOR PACK	0000-7604.441/-	IC19			45
C1	1n	20	100	Cer.	0000-7602.809/-	IC20			45
C2	33μ	20	10	Tant.	0001-0040.995/-	IC21			45
C3	33μ	20	10	Tant.	0001-0040.995/-	IC22			41

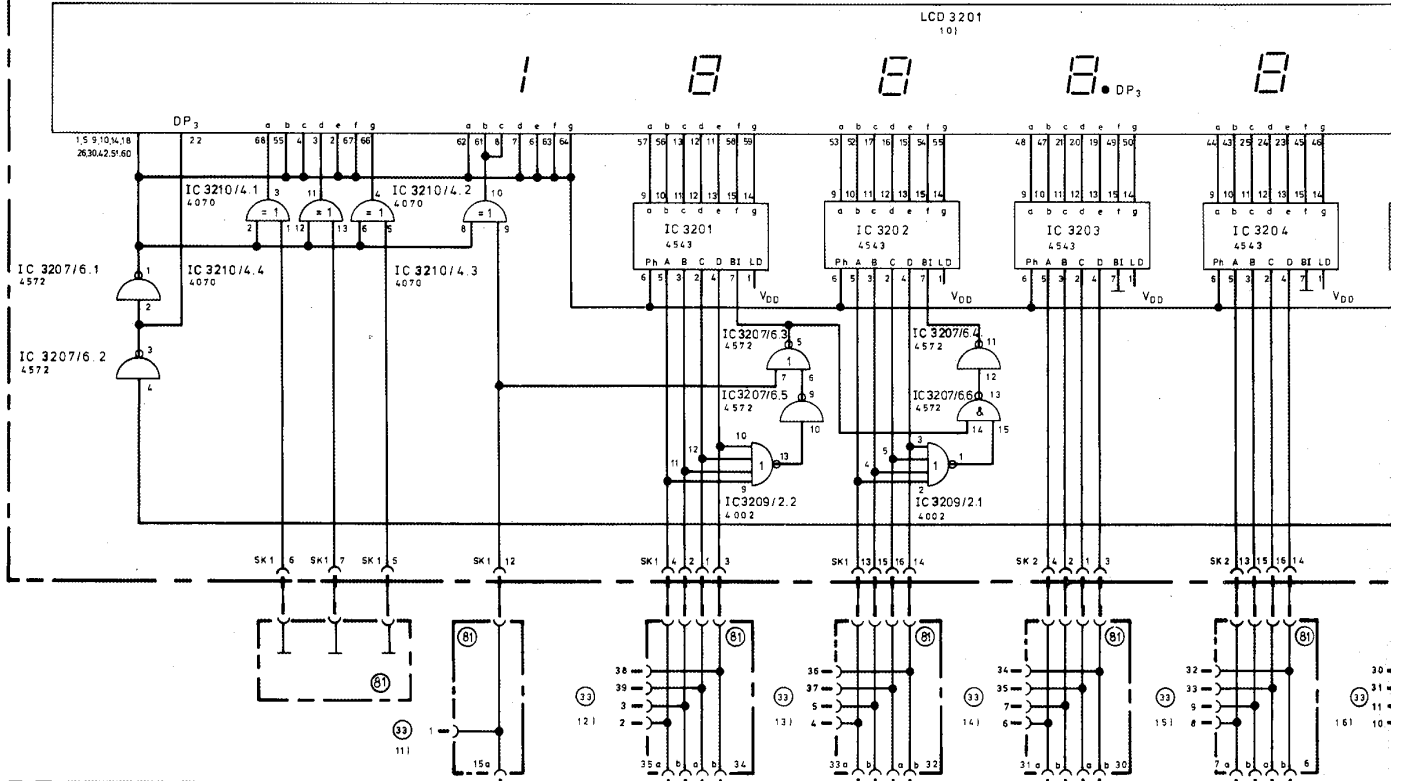


CIRCUIT REFERENCES TO BE
 PRECEDED BY BOARD ASSEMBLY
 NUMBER eg IC2 BECOMES IC3202.

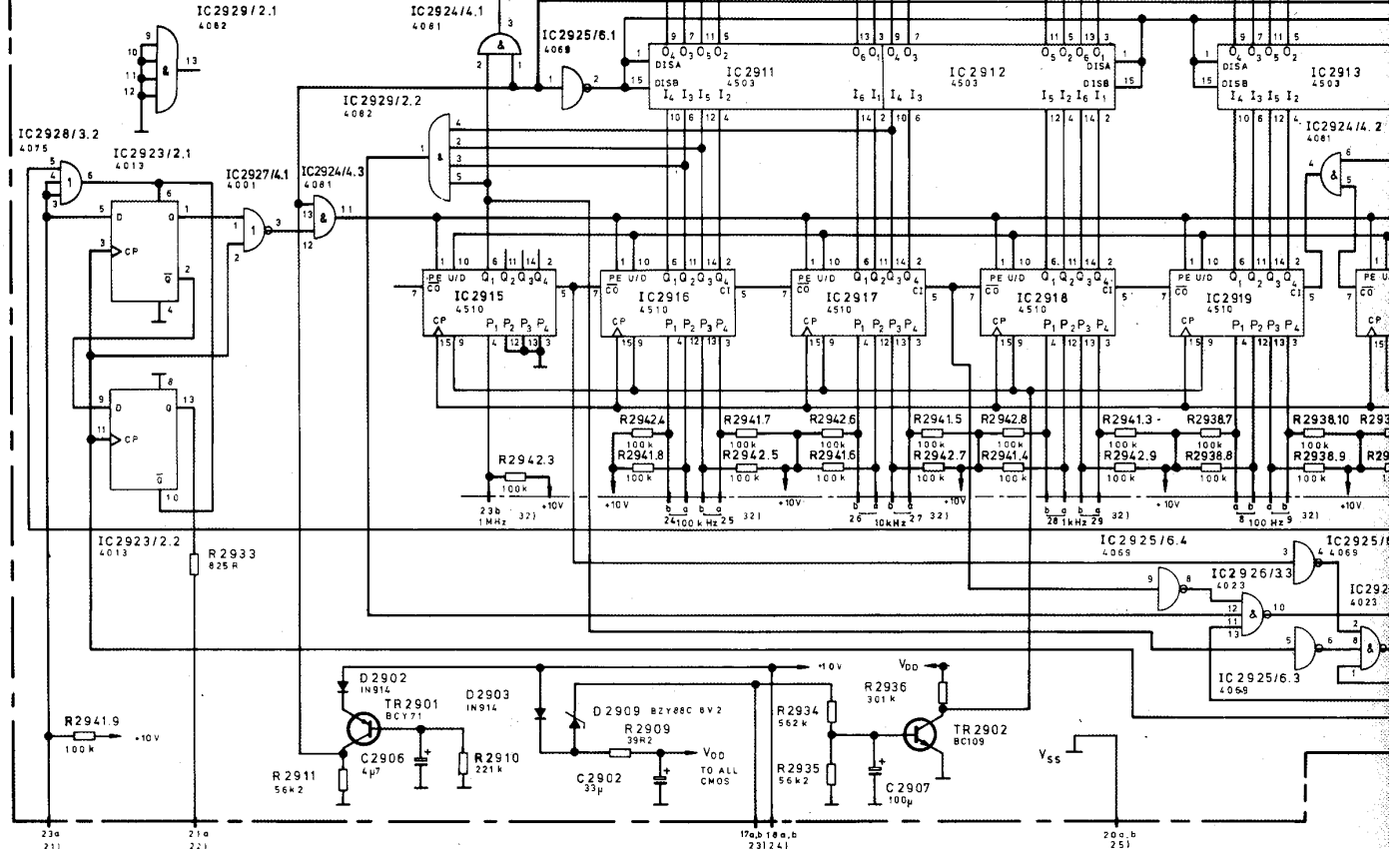
Fig. 21 Component Layout, Frequency Display, (32)

TYPE	PART NO.	REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.
Tant.	0000-7601.606/-	IC23			4013		0001-0015.991/-
Tant.	0001-0040.995/-	IC24			4081		0001-0070.884/-
Tant.	0001-0040.801/-	IC25			4069		0001-0070.978/-
Tant.	0001-0041.156/-	IC26			4023		0001-0016.026/-
BCY71	0001-0016.534/-	IC27			4001		0001-0015.962/-
BC109	0000-7602.029/-	IC28			4075		0001-0071.016/-
1N914 or 1N4448	0001-0018.493/-	IC29			4082		0001-0070.868/-
1N914 or 1N4448	0001-0018.493/-	IC30			µA 776 TC		0000-7604.425/-
1N914 or 1N4448	0001-0018.493/-	IC31			µA 776 TC		0000-7604.425/-
1N914 or 1N4448	0001-0018.493/-	A29			P.C.B. FREQUENCY CONTROL		4502-0129.007/2
1N914 or 1N4448	0001-0018.493/-						
1N914 or 1N4448	0001-0018.493/-						
1N914 or 1N4448	0001-0018.493/-						
BZY88C8V2	0001-0019.036/-						
1N914 or 1N4448	0001-0018.493/-						
1N914 or 1N4448	0001-0018.493/-						
4040	0001-0065.462/-	D1			LED 5082 - 4955		0000-7599.925/-
4503	0000-7548.853/-	IC1			4543		0001-0068.618/-
4503	0000-7548.853/-	IC2			4543		0001-0068.618/-
4503	0000-7548.853/-	IC3			4543		0001-0068.618/-
4503	0000-7548.853/-	IC4			4543		0001-0068.618/-
4503	0000-7548.853/-	IC5			4543		0001-0068.618/-
4510	0001-7548.650/-	IC6			4543		0001-0068.618/-
4510	0001-7548.650/-	IC7			4572		0001-0068.540/-
4510	0001-7548.650/-	IC9			4002		0001-0067.570/-
4510	0001-7548.650/-	IC10			4070		0001-0071.029/-
4510	0001-7548.650/-	SK1			SOCKET D.I.L. 16-WAY		0000-7518.391/-
4510	0001-7548.650/-	SK2			SOCKET D.I.L. 16-WAY		0000-7518.391/-
4510	0001-7548.650/-	LCD1			LCD 3922.315.09.0		0000-7603.727/-
4175	0000-7529.416/-	A32			P.C.B. DISPLAY BOARD		4502-0132.007/2

PRINTED CIRCUIT BOARD ASSEMBLY A32
DISPLAY



PRINTED CIRCUIT BOARD ASSEMBLY A29
FREQUENCY CONTROL



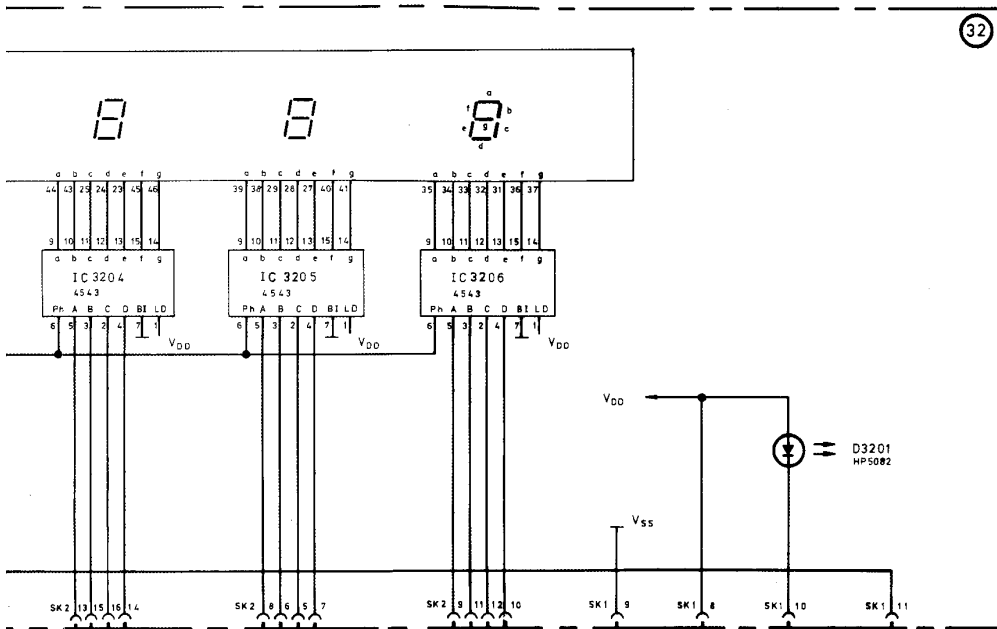
NOTES 1) Suffix a on edge connector denotes component side, b denotes non-component side

10) LIQUID CRYSTAL DISPLAY

- 11) DIV1 1MHz
- 12) " 100kHz
- 13) " 10kHz
- 14) " 1kHz
- 15) " 100Hz
- 16) " 10Hz
- 17) " 1Hz
- 18) To motor M+

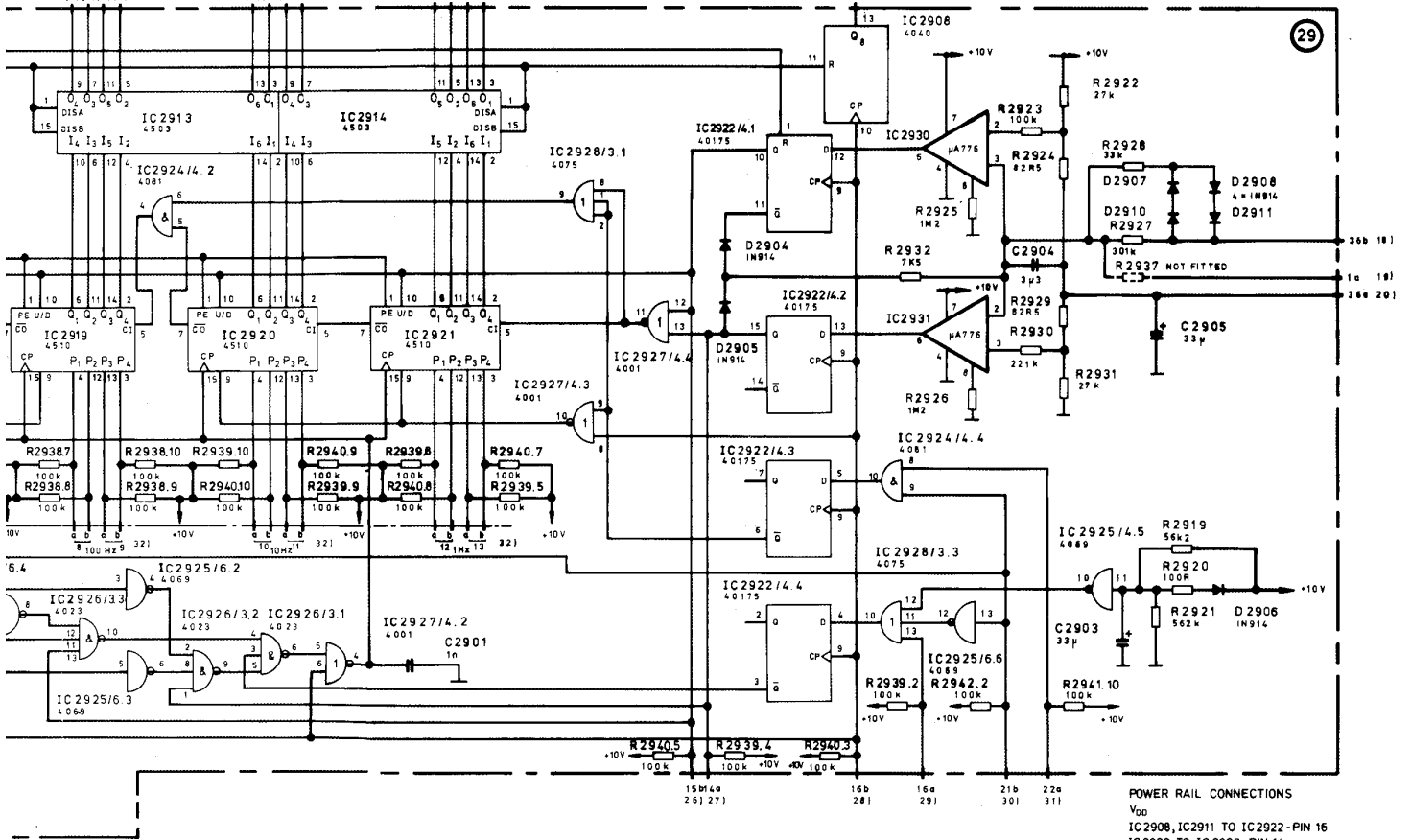
- 19) Not connected
- 20) To motor M-
- 21) DAV
- 22) DAC
- 23) U_{BATT}
- 24) +10V
- 25) GND
- 26) To DIV1 UP

- 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



POWER RAIL CONNECTIONS
 V_{DD}
 IC 3201 TO IC 3206 - PIN 16
 IC 3207, IC 3209, IC 3210 - PIN 14
 V_{SS}
 IC 3201 TO IC 3206 - PIN 8
 IC 3207, IC 3209, IC 3210 - PIN 7

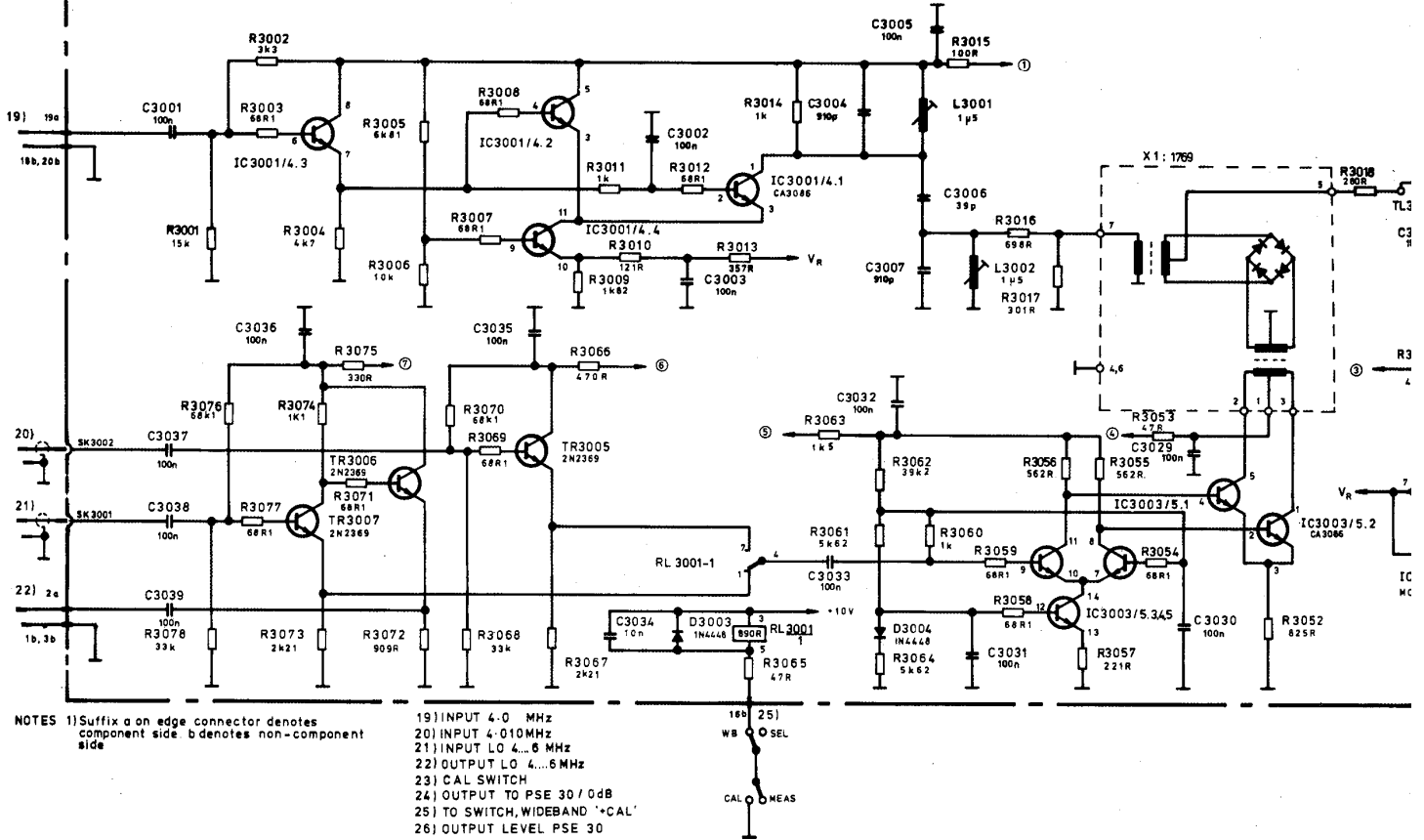
Fig. 22 Circuit Diagram, Frequency Control, and Frequency Display



POWER RAIL CONNECTIONS
 V_{DD}
 IC2908, IC2911 TO IC2922 - PIN 16
 IC2923 TO IC2929 - PIN 14
 V_{SS}
 IC2908, IC2911 TO IC2922 - PIN 8
 IC2923 TO IC2929 - PIN 7

To DIV1 DN
 To DIV1 DAW
 To SW LOCK
 To SW REM
 To SW COR/FINE
 To back panel connector, not fitted

PRINTED CIRCUIT BOARD ASSEMBLY A30
CALIBRATION



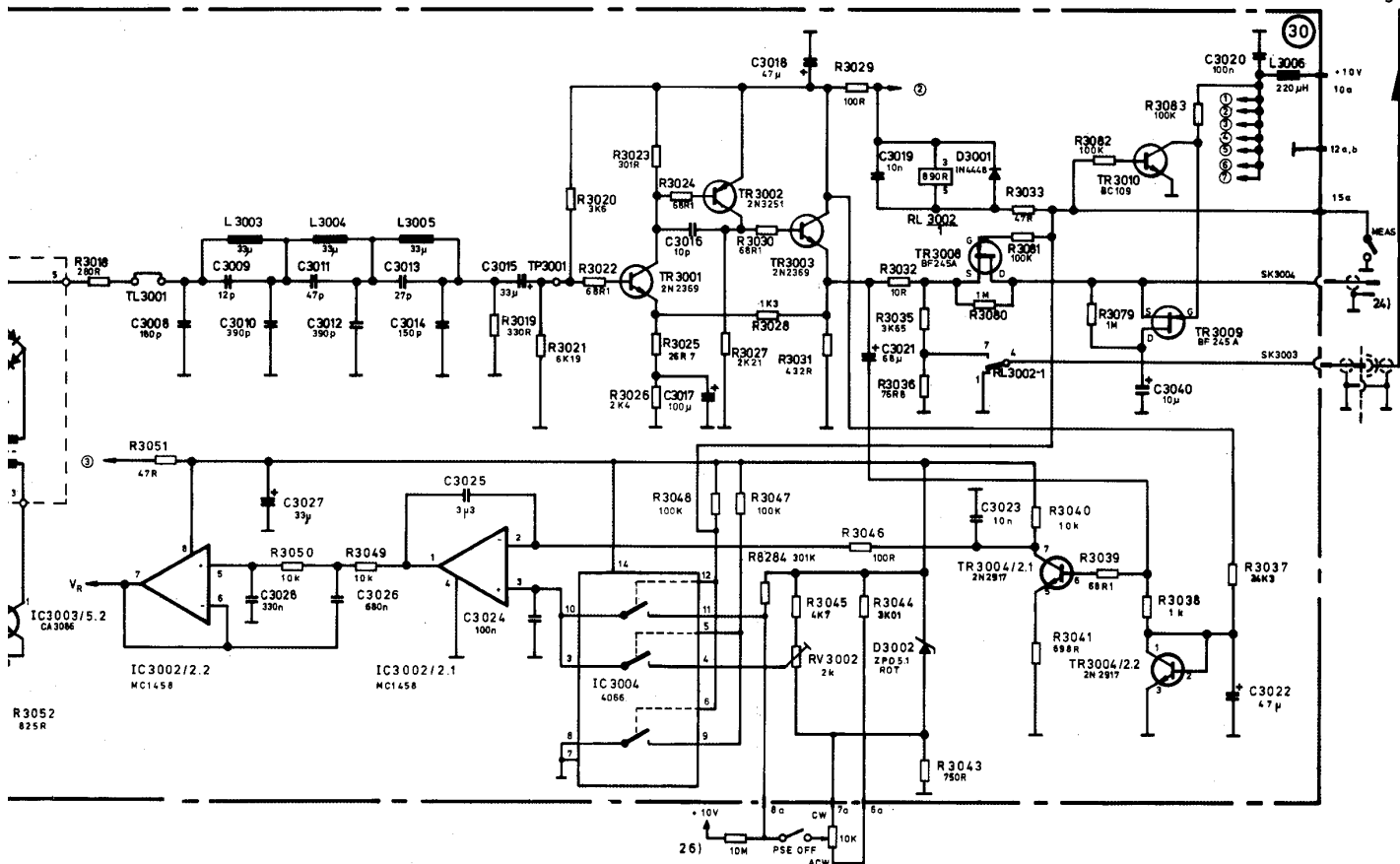
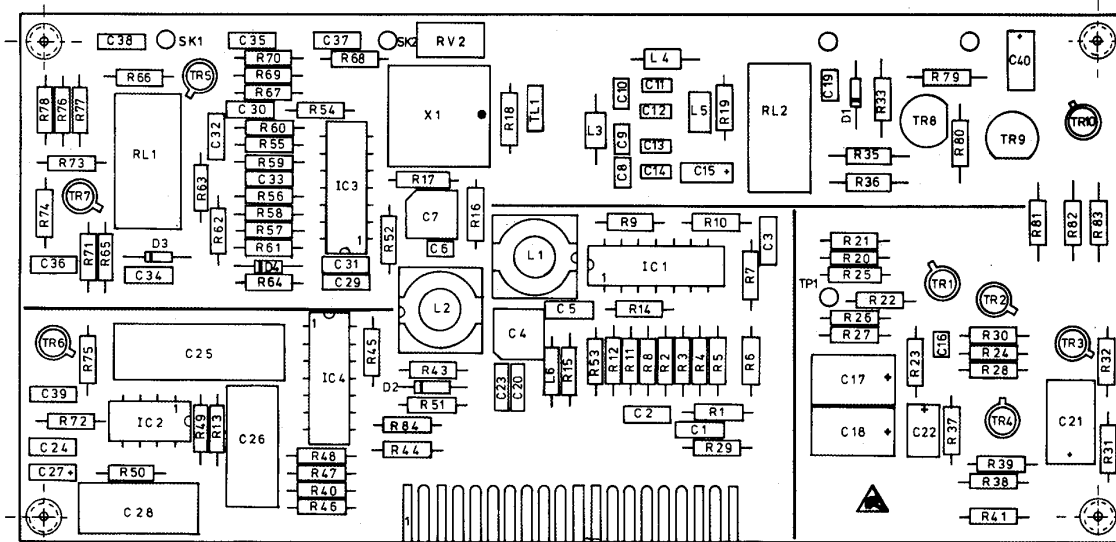


Fig. 23 Circuit Diagram,
Calibration unit, ③①

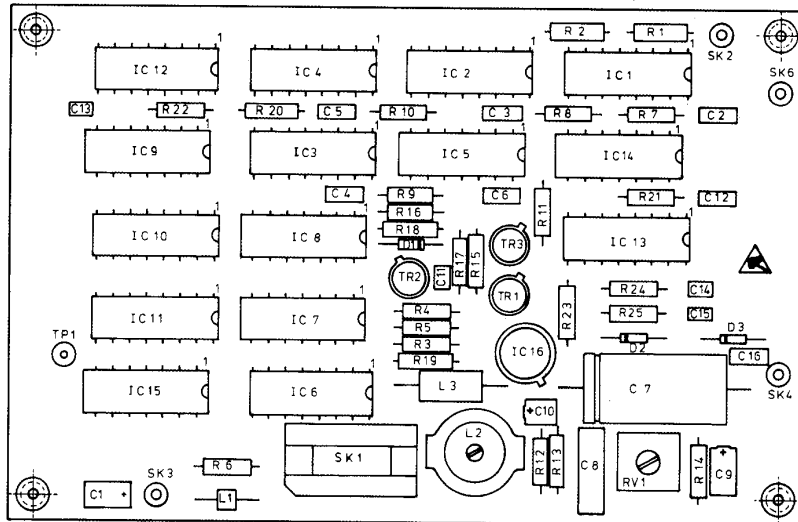


CIRCUIT REFERENCES TO BE PRECEDED BY
BOARD ASSEMBLY NUMBER.
e.g. R41 BECOMES R3041
C7 BECOMES C3007.

Fig. 24 Component Layout,
Calibration unit, ③①

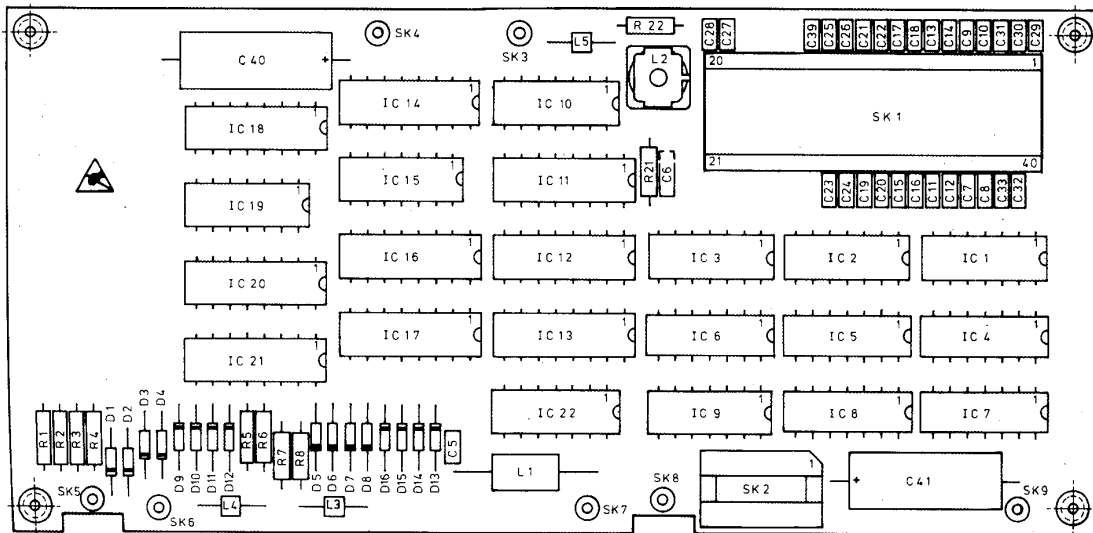
TYPE PART NO.

3	0001-0018.493/-
3	0001-0018.493/-
	0001-0015.988/-
	0001-0015.988/-
	0001-0015.988/-
	0001-0016.026/-
	0001-0016.026/-
	0001-0016.026/-
	0001-0070.868/-
	0001-0070.868/-
	0001-0065.475/-
	0001-0070.871/-
	0001-0016.042/-
	0000-7529.351/-
	0001-0068.197/-
	0001-0016.042/-
	0001-0015.988/-
	0000-7529.351/-
	0000-7529.351/-
	0001-0016.042/-
	0001-0015.988/-
	0000-7529.351/-
	0000-7529.351/-
	0001-0016.026/-
FOR	0001-0042.757/-
FOR	4502-1423.003/4
FE BEAD	0000-7567.737/-
FE BEAD	0000-7567.737/-
FE BEAD	0000-7567.737/-
F D.I.L. 40-WAY	
8040	0000-7541.711/-
F D.I.L. 14-WAY	0000-7518.388/-
DIVIDER 1	4502-0133.006/2



COMPONENT REFERENCES TO BE PRECEDED
 BY BOARD ASSEMBLY NUMBER eg R21 BECOMES R3421
 C4 BECOMES C3404

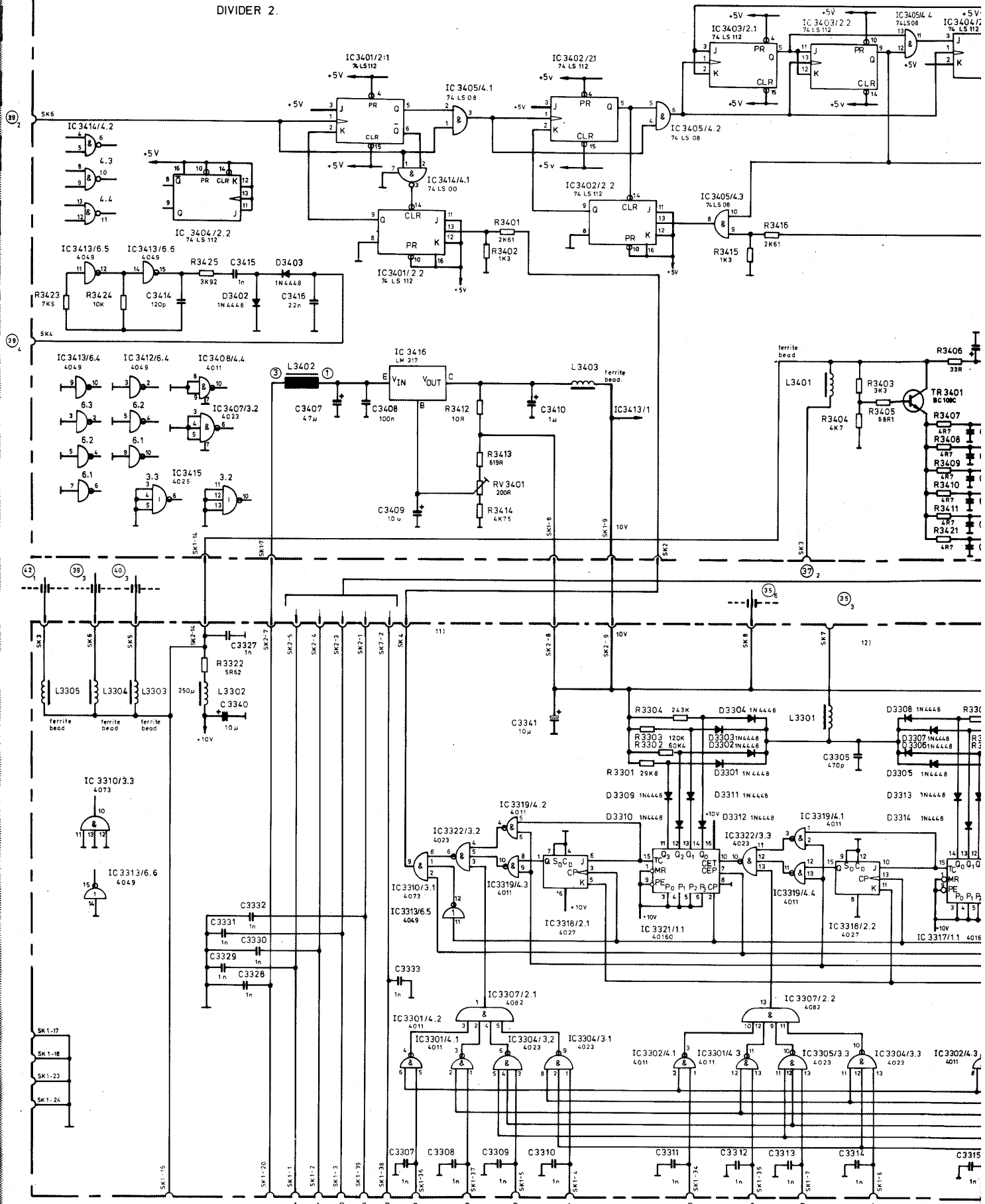
Fig. 25 Component Layout, Divider 2, (34)



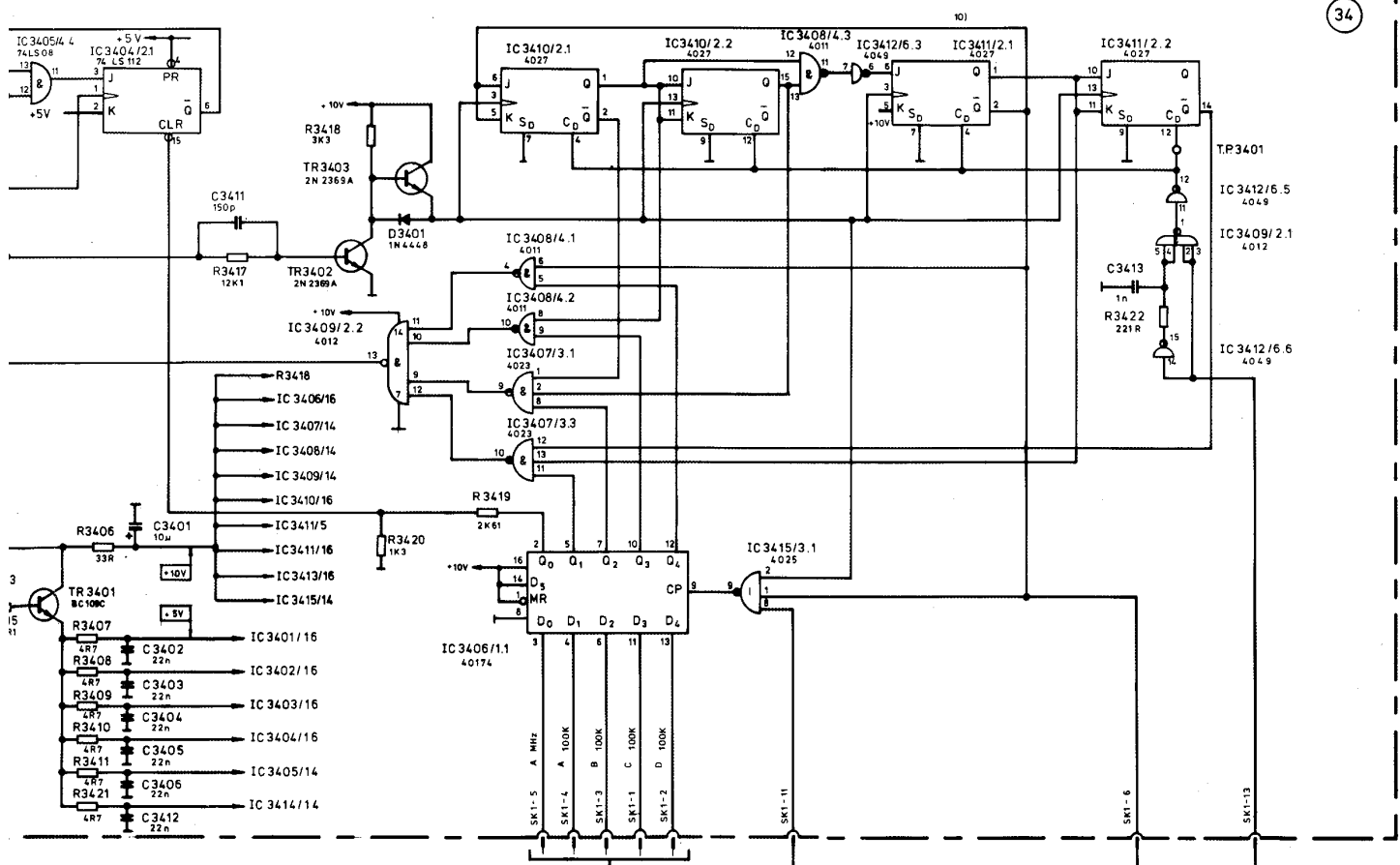
CIRCUIT REFERENCES TO BE PRECEDED
 BY BOARD ASSEMBLY NUMBER
 e.g. R7 BECOMES R3307
 C30 BECOMES C3330

Fig. 26 Component Layout, Divider 1, (33)

PRINTED CIRCUIT BOARD ASSEMBLY A34
DIVIDER 2.



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



PRINTED CIRCUIT BOARD ASSEMBLY A33.
DIVIDER 1.

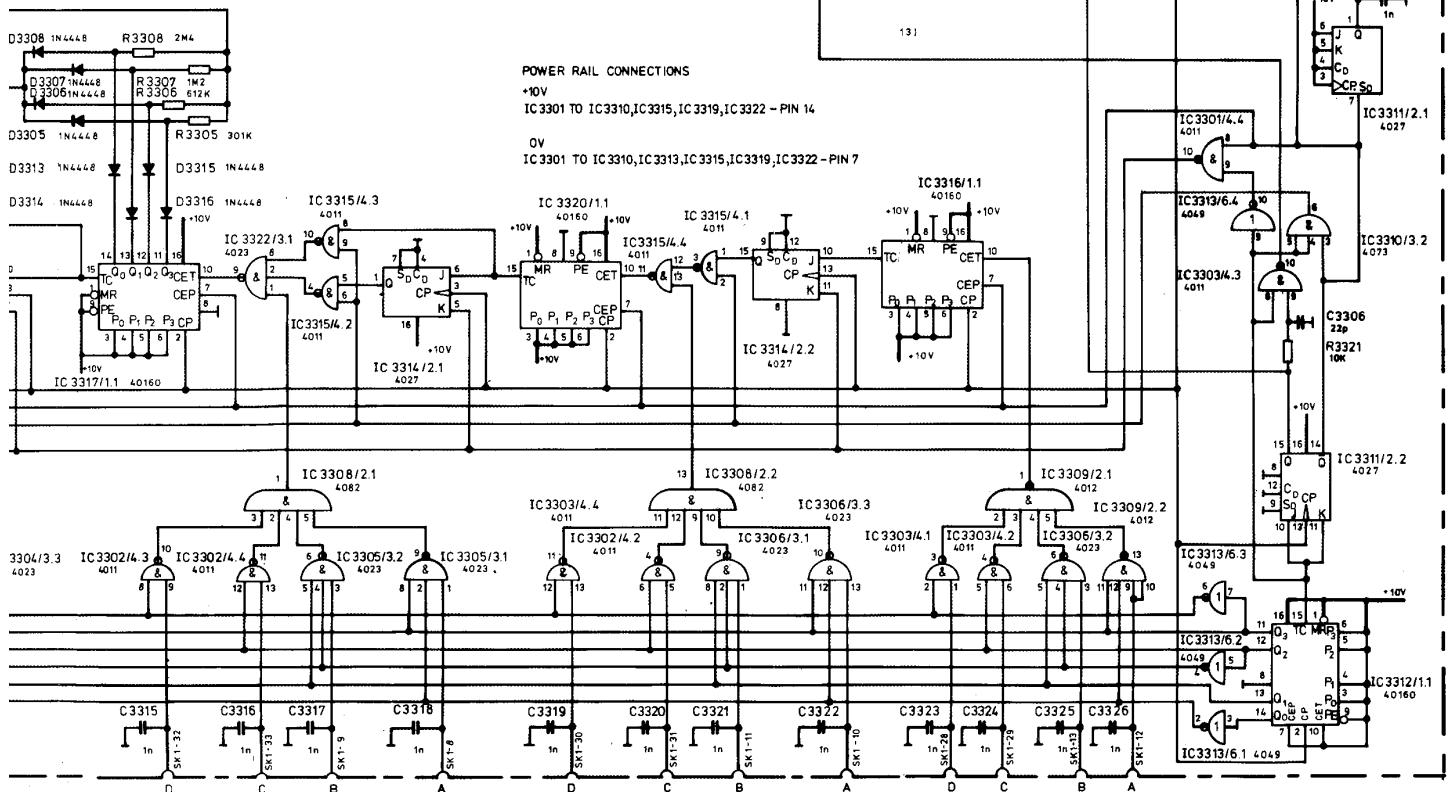
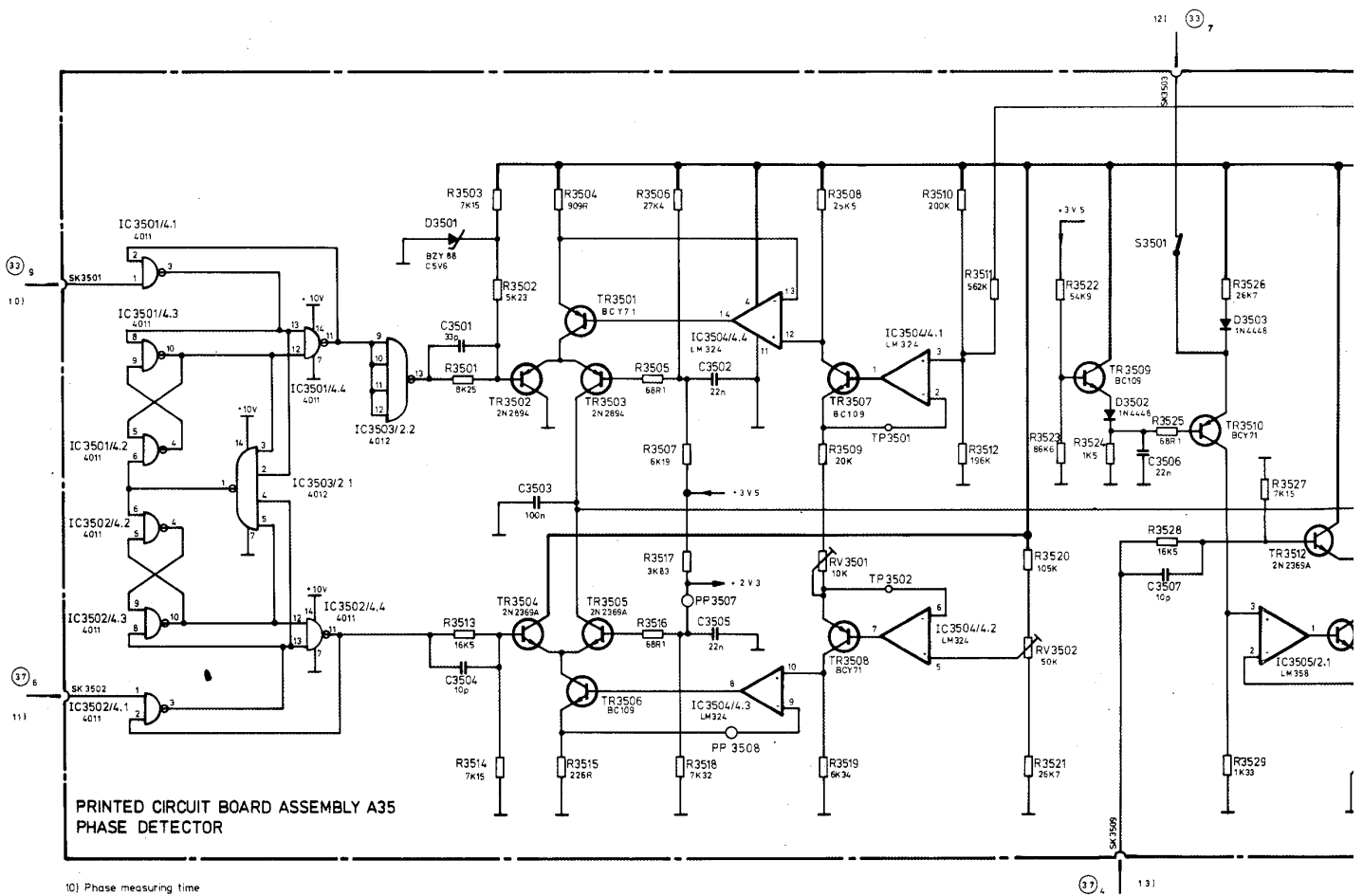


Fig. 27 Circuit Diagram, Divider 1, (33) and Divider 2, (34)



10) Phase measuring time
 11) 10 kHz ref.
 12) Compensation current
 13) Phase compensation time

Fig.

REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.	REF.	VALUE	TOL. ± %	RATING	TY
C24	10n	10	100	PE	0001-0010.213/-	D1				BZY 88C5V1
C25	22n	20	100	PE	0001-0010.255/-	D2				1N4448
TR1				BCY71	0001-0016.534/-	D3				1N4448
TR2				2N2894	0001-0016.929/-	D6				FDH 300
TR3				2N2894	0001-0016.929/-	D7				FDH 300
TR4				2N2369A	0000-7542.066/-	RV1	10k	10 LIN	0W2	V.
TR5				2N2369A	0000-7542.066/-	RV2	50k	20 LIN	0W2	V.
TR6				BC109	0000-7602.029/-	RV3	1k	20 LIN	0W2	V.
TR7				BC109	0000-7602.029/-	RV4	200R	10 LIN	0W2	V.
TR8				BCY71	0001-0016.534/-	IC1				4011
TR9				BC109	0000-7602.029/-	IC2				4011
TR10				BCY71	0001-0016.534/-	IC3				4012
TR11				BCY71	0001-0016.534/-	IC4				LM 324
TR12				2N2369A	0000-7542.066/-	IC5				LM 358
TR13				2N2369A	0000-7542.066/-	IC6				LM 308 A
TR14				BC109	0000-7602.029/-	IC7				µA 776 HC
TR16				U405	0000-7567.863/-	S1				09100003
TR17				BC109	0000-7602.029/-	S2				09100003
TR18				BCY71	0001-0016.534/-	A35				P.C.B. PH
TR19				BC109	0000-7602.029/-					DETECTOR
TR20				BCY71	0001-0016.534/-					
TR21				BC109	0000-7602.029/-					

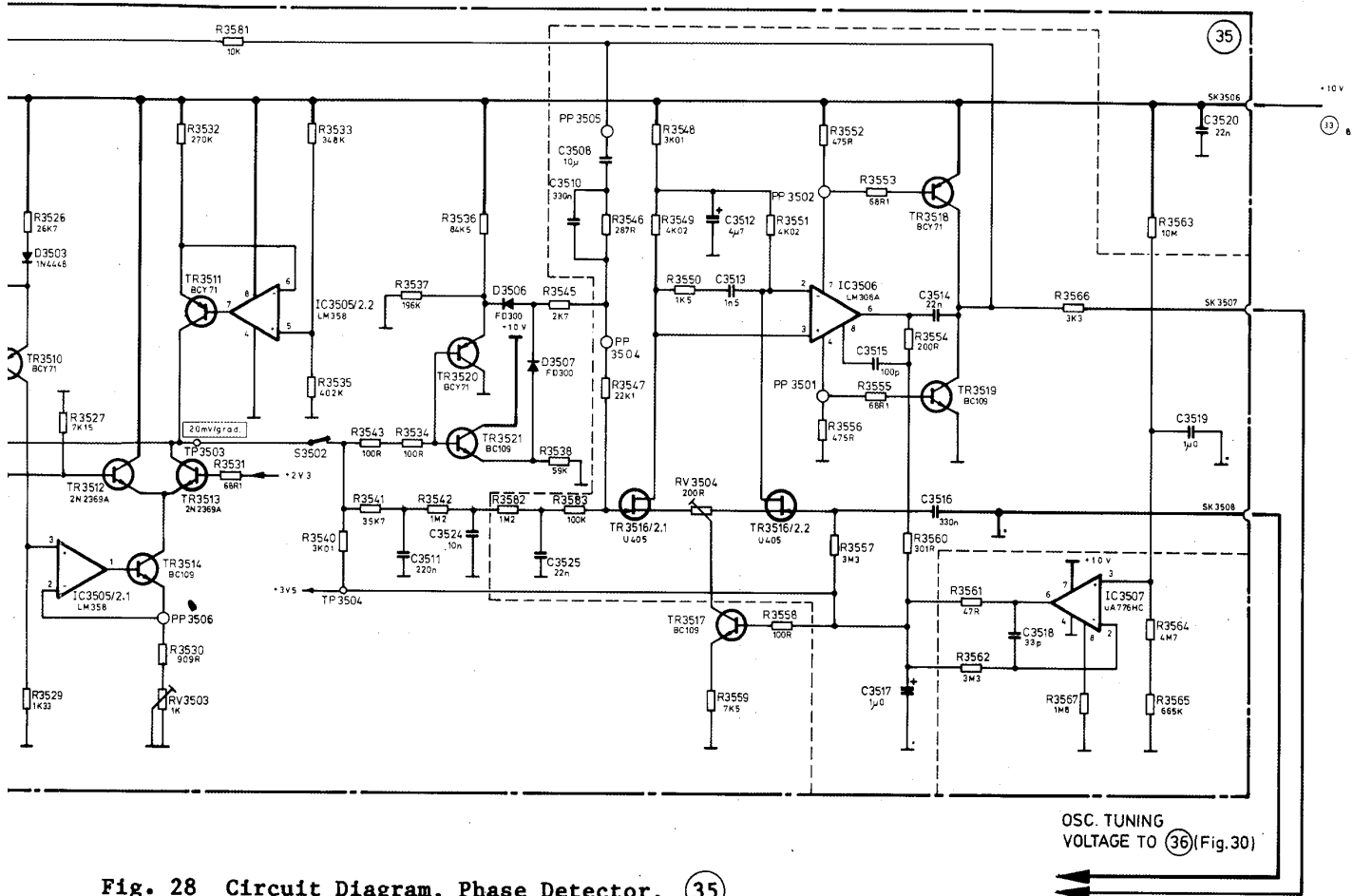
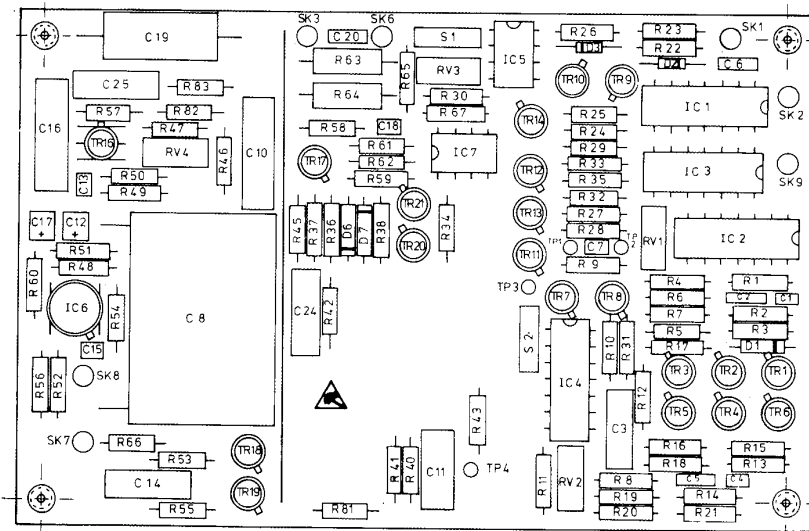


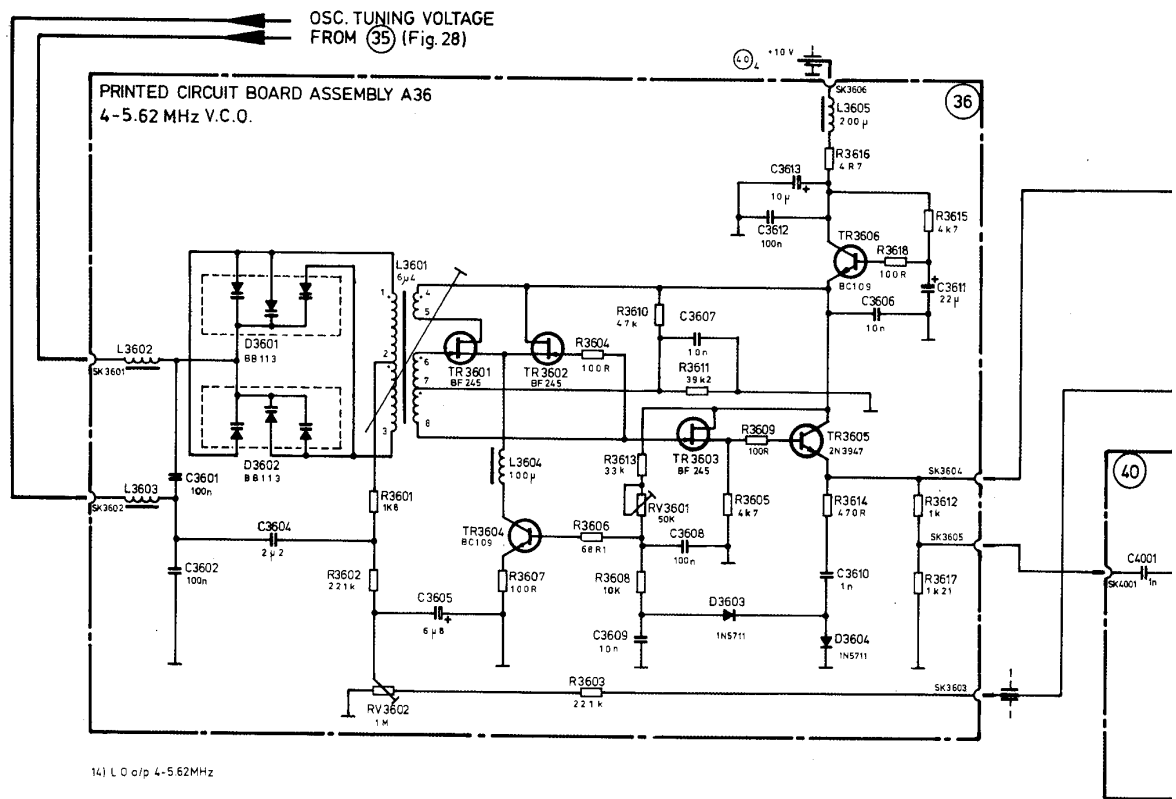
Fig. 28 Circuit Diagram, Phase Detector, 35

ING	TYPE	PART NO.
	BZY 88C5V6	0001-0018.859/-
	1N4448	0001-0018.493/-
	1N4448	0001-0018.493/-
	FDH 300	0001-0018.192/-
	FDH 300	0001-0018.192/-
	Var.	0000-7537.929/-
	Var.	0000-7571.752/-
	Var.	0000-7571.723/-
	Var.	0000-7571.710/-
	4011	0001-0015.988/-
	4011	0001-0015.988/-
	4012	0001-0065.475/-
	LM 324	0000-7578.085/-
	LM 358	0000-7581.140/-
	LM 308 A	0000-7537.071/-
	µA 776 HC	0000-7604.425/-
	09100003	0000-7569.999/-
	09100003	0000-7569.999/-
	P.C.B. PHASE	
	DETECTOR	4502-0135.004/2

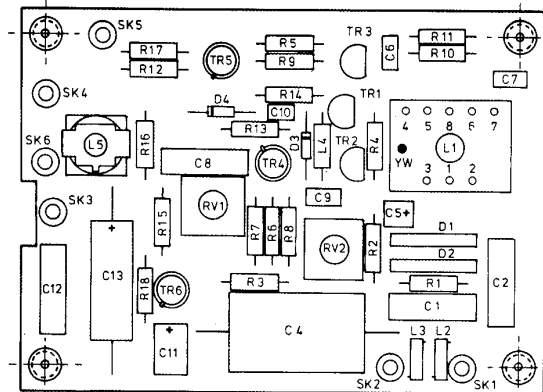


COMPONENT REFERENCES TO BE PRECEDED BY BOARD ASSEMBLY NUMBER eg TR14 BECOMES TR3514 D7 BECOMES D3507

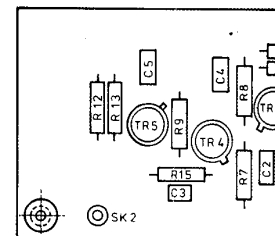
Fig. 29 Component Layout, Phase Detector, 35



14) L.O. o/p 4-5.62MHz



CIRCUIT REFERENCES TO BE PRECEDED
BY BOARD ASSEMBLY NUMBERS
e.g R15 BECOMES R3615
C9 BECOMES C3609.



CIRCUIT REFERENCES TO B1
BY BOARD ASSEMBLY NUMBE
e.g R11 BECOMES R3911
C1 BECOMES C3901.

Fig. 32 Component

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

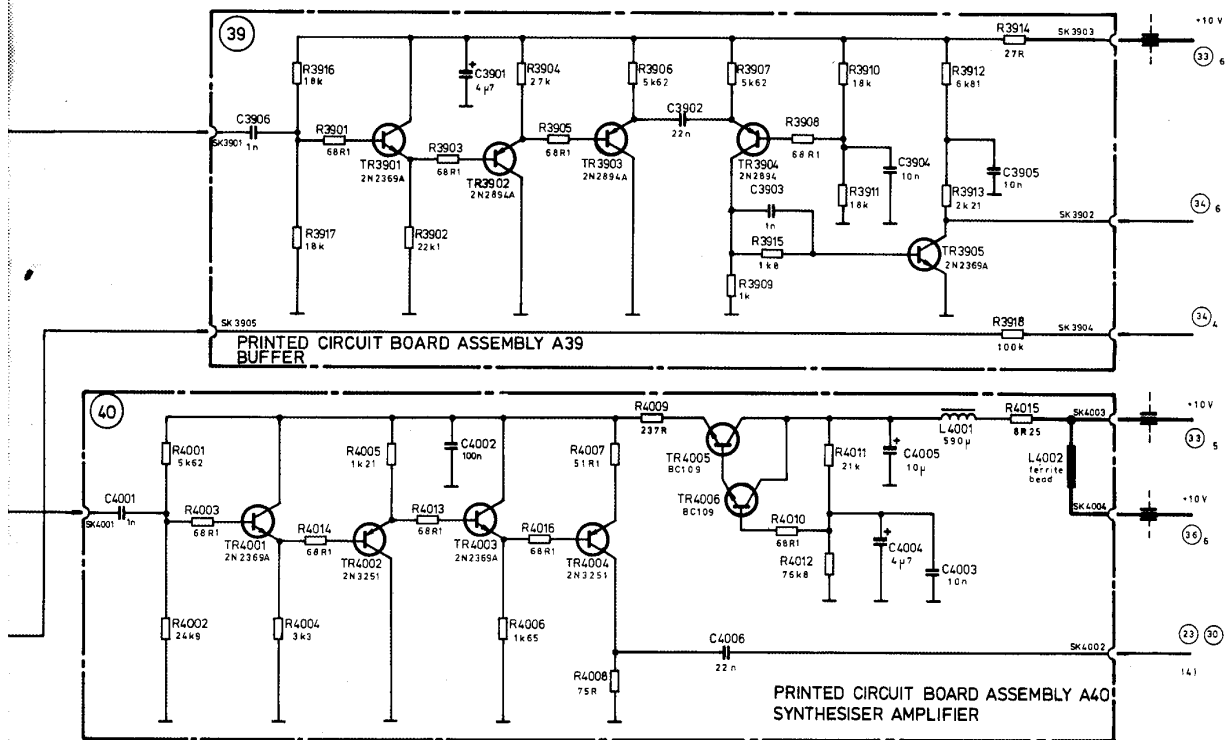
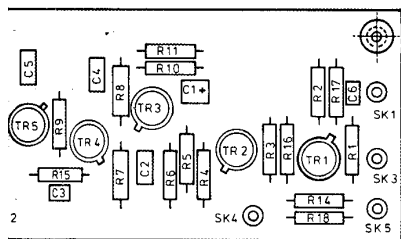
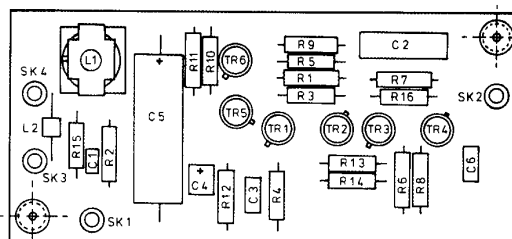


Fig. 30 Circuit Diagram,
4...5.62MHz V.C.O., (36) ;
Buffer, (39) and
Synthesiser Amplifier, (40)



REFERENCES TO BE PRECEDED
ASSEMBLY NUMBERS.
ECOMES R3911
ECOMES C3901.

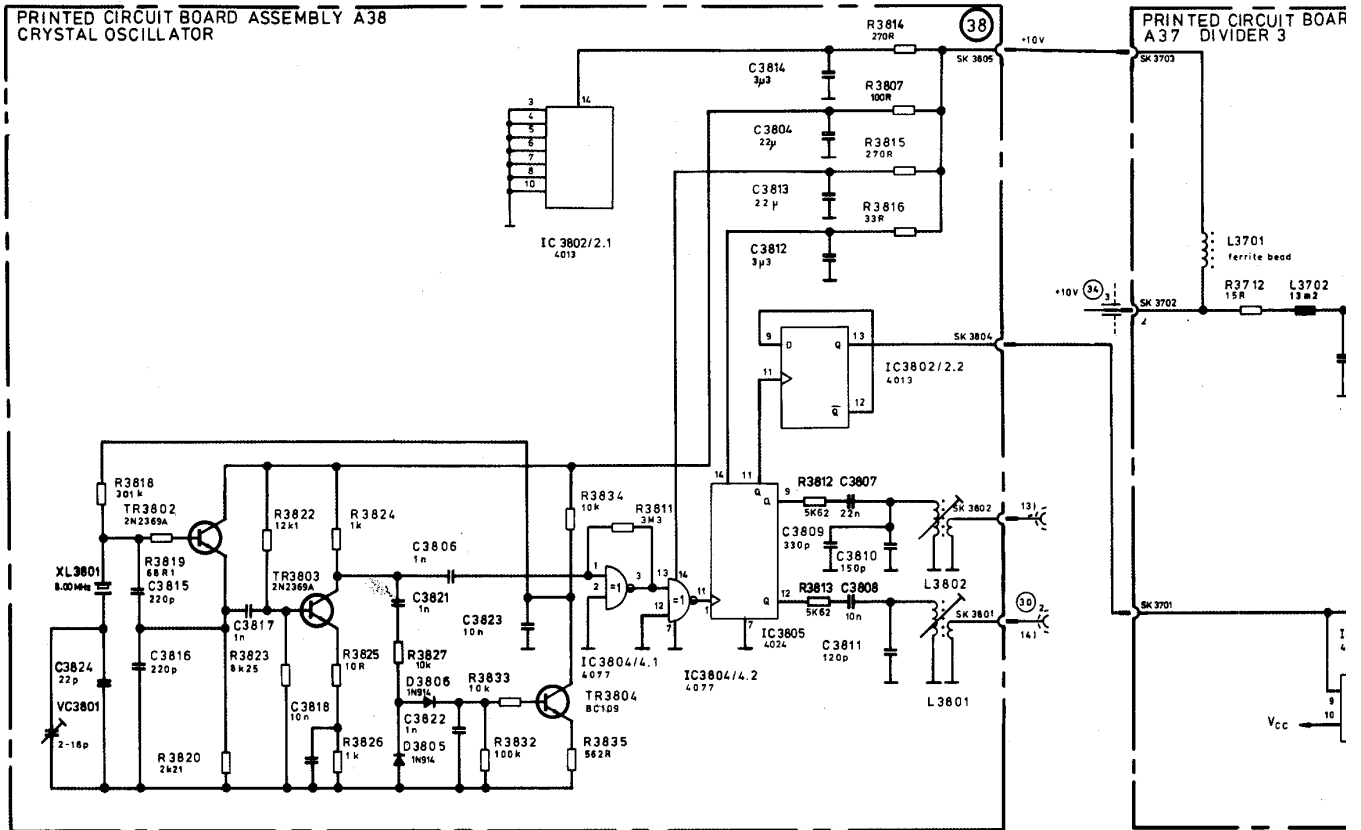


CIRCUIT REFERENCES TO BE PRECEDED
BY BOARD ASSEMBLY NUMBERS.
e.g. R15 BECOMES R4015
C5 BECOMES C4005

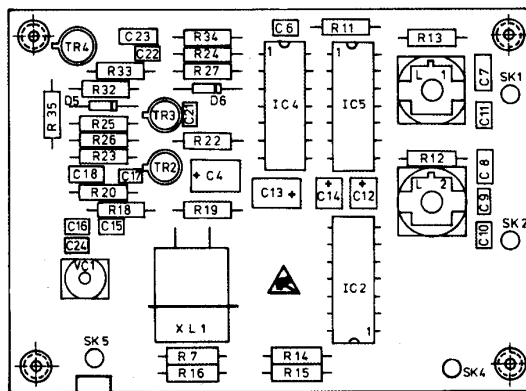
Component Layout, Buffer Amp., (39)

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

PRINTED CIRCUIT BOARD ASSEMBLY A38
CRYSTAL OSCILLATOR



- 10) 1MHz Sync. Not connected
- 13) 1MHz 75 μ to back panel
- 14) 4MHz 75 μ
- 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

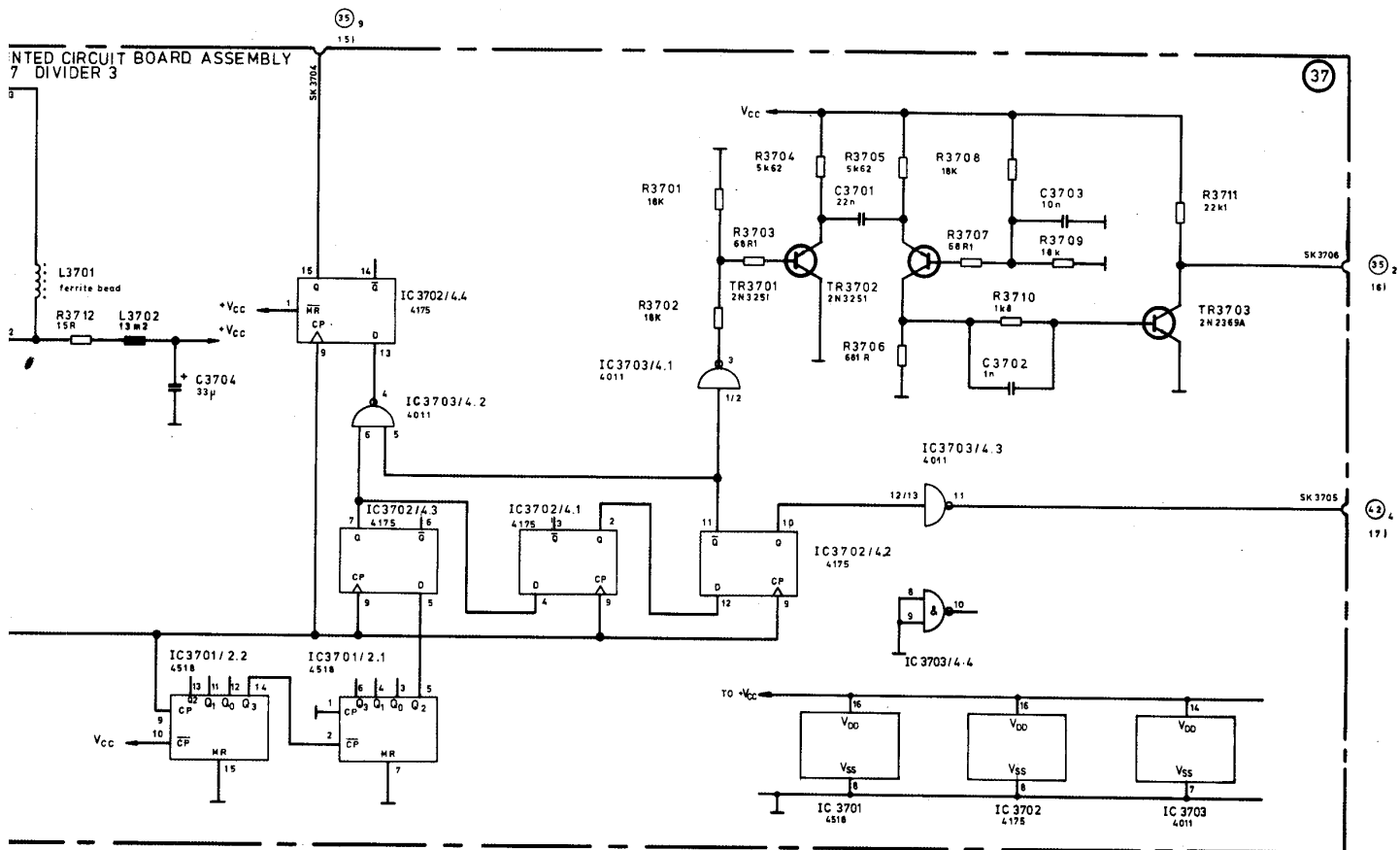
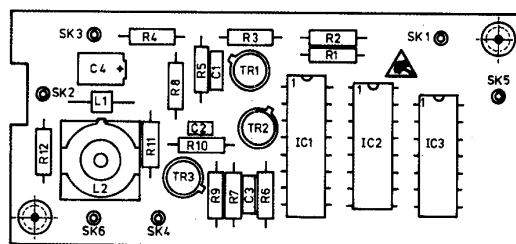


Fig. 34 Circuit Diagram,
 8MHz Crystal Oscillator, (38)
 and Divider 3, (37)



CIRCUIT REFERENCES TO BE PRECEDED BY BOARD ASSEMBLY
 NUMBER eg IC 1 BECOMES IC3701 R10 BECOMES R3710.

Fig. 36 Component Layout, Divider 3, (37)

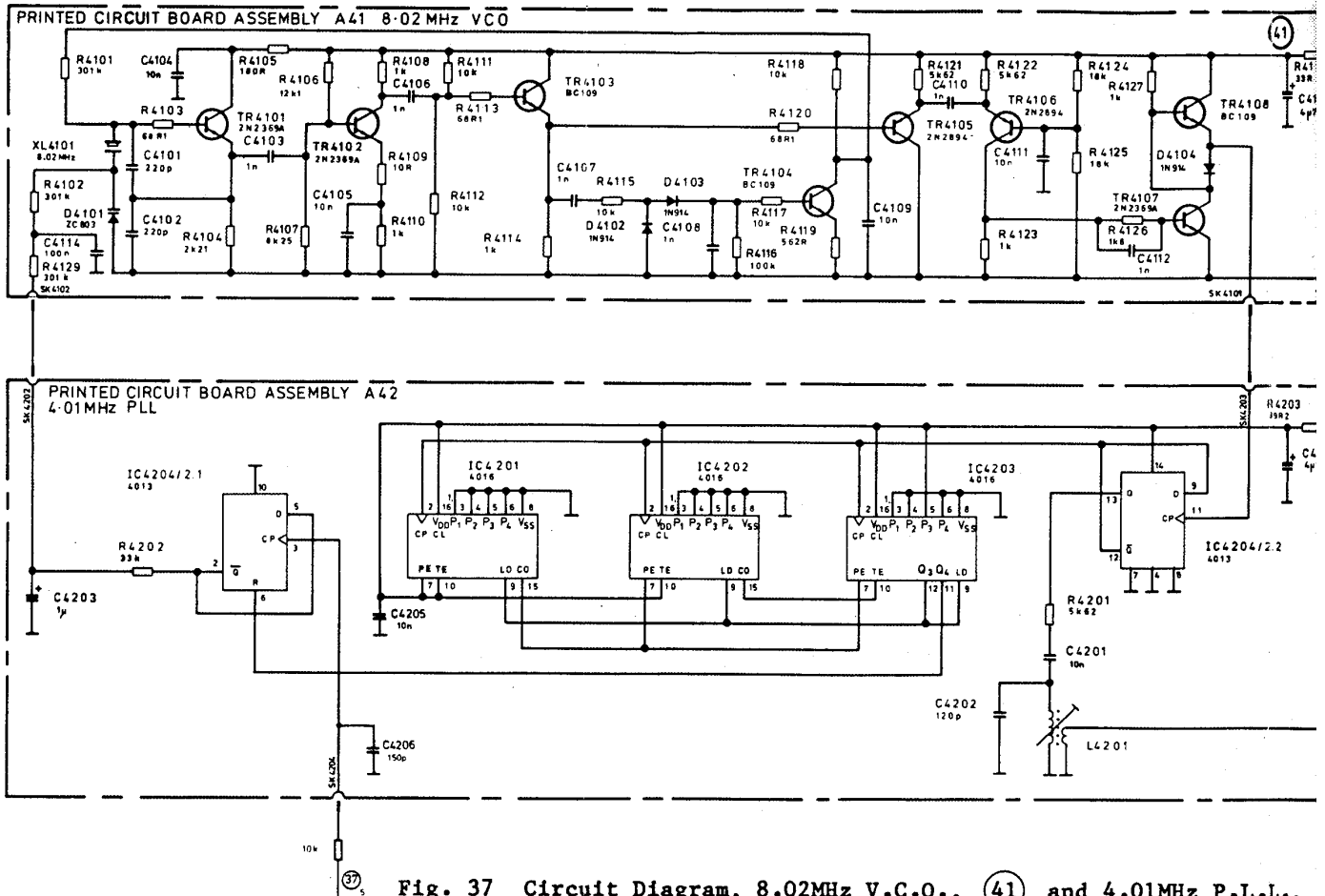
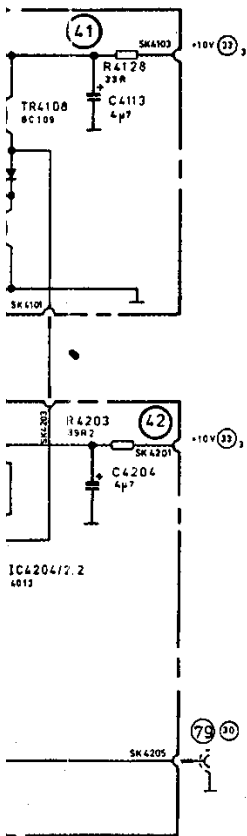


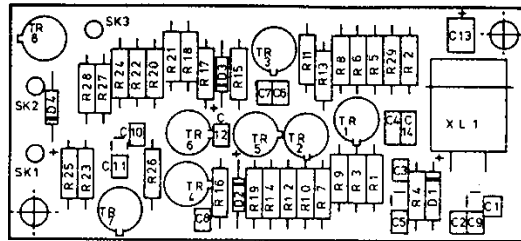
Fig. 37 Circuit Diagram, 8.02MHz V.C.O., (41) and 4.01MHz P.L.L.,

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

REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.	REF.	VALUE	TOL. ± %	RATING	TYPE
R1	301k	1	0W35	MF	0001-0062.025/-	R26	1k8	2	0W25	MF
R2	301k	1	0W35	MF	0001-0062.025/-	R27	1k	1	0W35	MF
R3	68R1	1	0W35	MF	0001-0000.427/-	R28	33R	2	0W25	MF
R4	2k21	1	0W35	MF	0001-0001.497/-	R29	301k	1	0W35	MF
R5	180R	2	0W25	MF	0000-7558.403/-	C1	220p	2	63	Cer
R6	12k1	1	0W35	MF	0001-0002.218/-	C2	220p	2	63	Cer
R7	8k25	1	0W35	MF	0001-0002.056/-	C3	1n	10	63	Cer
R8	1k	1	0W35	MF	0001-0001.219/-	C4	10n	20	40	Cer
R9	10R	1	0W35	MF	0001-0000.074/-	C5	10n	20	40	Cer
R10	1k	1	0W35	MF	0001-0001.219/-	C6	1n	10	63	Cer
R11	10k	1	0W35	MF	0001-0002.137/-	C7	1n	10	63	Cer
R12	10k	1	0W35	MF	0001-0002.137/-	C8	1n	10	63	Cer
R13	68R1	1	0W35	MF	0001-0000.427/-	C9	10n	20	40	Cer
R14	1k	1	0W35	MF	0001-0001.219/-	C10	1n	10	63	Cer
R15	10k	1	0W35	MF	0001-0002.137/-	C11	10n	20	40	Cer
R16	100k	1	0W35	MF	0001-0002.991/-	C12	1n	10	63	Cer
R17	10k	1	0W35	MF	0001-0002.137/-	C13	4μ7	20	10	Tant
R18	10k	1	0W35	MF	0001-0002.137/-	C14	100n	20	100	Cer
R19	562R	1	0W35	MF	0001-0001.015/-	TR1				2N2369A
R20	68R1	1	0W35	MF	0001-0000.427/-	TR2				2N2369A
R21	5k62	1	0W35	MF	0001-0001.895/-	TR3				BC109
R22	5k62	1	0W35	MF	0001-0001.895/-	TR4				BC109
R23	1k	1	0W35	MF	0001-0001.219/-	TR5				2N2894
R24	18k	2	0W25	MF	0001-0027.484/-	TR6				2N2894
R25	18k	2	0W25	MF	0001-0027.484/-	TR7				2N2369A



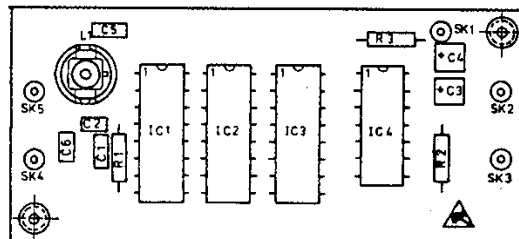
P.L.L., (42)



COMPONENT REFERENCES TO BE PRECEDED BY BOARD ASSEMBLY NUMBERS

e.g. R 25 BECOMES R4125.
C 8 BECOMES C4108.

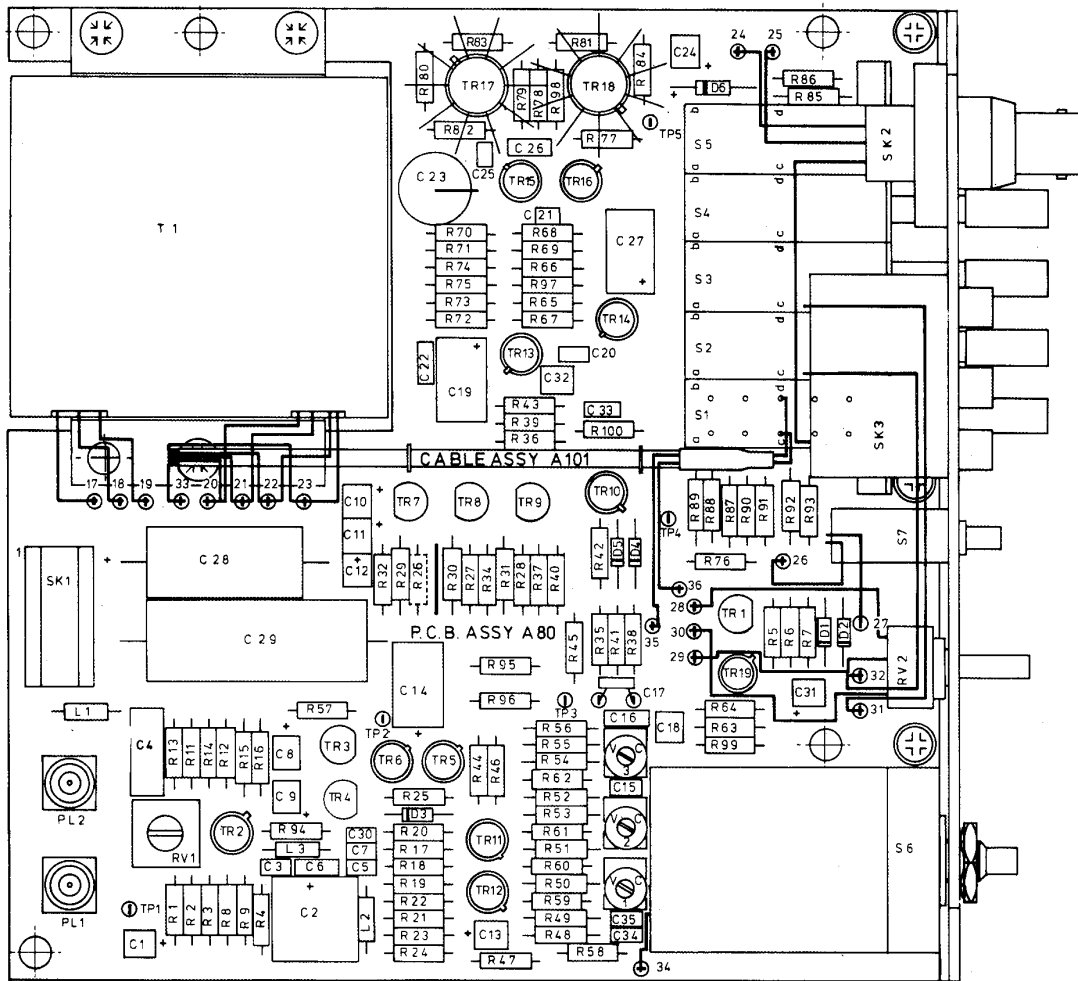
Fig. 38 Component Layout, 8.02MHz V.C.O., (41)



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

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

TYPE	PART NO.	REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.
MF	0001-0014.510/-	TR8				BC109	0000-7602.029/-
MF	0001-0001.219/-	D1				ZC803	0000-7601.936/-
MF	0000-7601.347/-	D2				1N914 or 1N4448	0001-0018.493/-
MF	0001-0062.025/-	D3				1N914 or 1N4448	0001-0018.493/-
Cer.	0001-0004.601/-	D4				1N914 or 1N4448	0001-0018.493/-
Cer.	0001-0004.601/-	XL1	8.02MHz				4502-9701.002/4
Cer.	0001-0004.698/-	A41				P.C.B. 8.02MHz	
Cer.	0001-0004.818/-					V.C.O.	4502-0141.001/3
Cer.	0001-0004.818/-	ASSEMBLY P.C.B. A42 4.01MHz P.L.L.					
Cer.	0001-0004.698/-	REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.
Cer.	0001-0004.698/-	R1	5k62	1	0W35	MF	0001-0001.895/-
Cer.	0001-0004.698/-	R2	33k	2	0W25	MF	4980-0000.009/-
Cer.	0001-0004.818/-	R3	39R2	1	0W35	MF	0001-0003.547/-
Cer.	0001-0004.818/-	C1	10n	20	100	Cer.	0001-0004.818/-
Cer.	0001-0004.698/-	C2	120p	2	63	Cer.	0001-0004.562/-
Tant.	0001-0040.810/-	C3	1μ	20	35	Tant.	0001-0040.704/-
Cer.	0000-7598.450/-	C4	4μ7	20	10	Tant.	0001-0040.801/-
2N2369A	0000-7542.066/-	C5	10n	20	40	Cer.	0001-0004.818/-
2N2369A	0000-7542.066/-	C6	150p	2	63	Cer.	0001-0004.575/-
BC109	0000-7602.029/-	IC1					0000-7529.351/-
BC109	0000-7602.029/-	IC2					0000-7529.351/-
2N2894	0001-0016.929/-	IC3					0000-7529.351/-
2N2894	0001-0016.929/-	IC4					0000-7565.315/-
2N2369A	0000-7542.066/-	L1	12.7μH			INDUCTOR	4502-1431.008/4
		A42				P.C.B. 4.01MHz P.L.L.	4502-0142.000/3

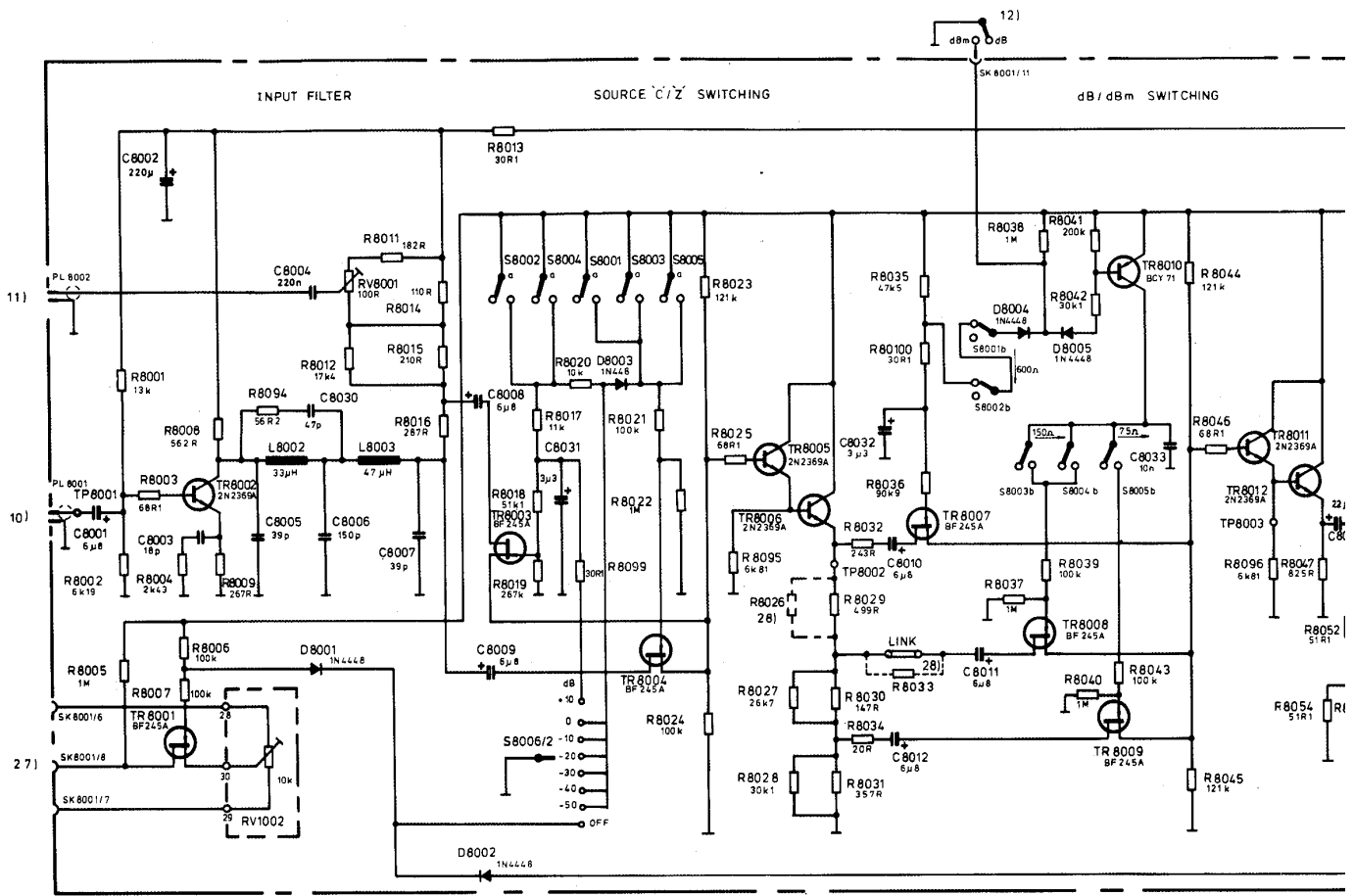


CIRCUIT REFERENCES TO BE PRECEDED
 BY BOARD ASSEMBLY NUMBER
 e.g. R87 BECOMES R80087
 C3 BECOMES C80003
 COMPONENTS SK2, SK3, S7, RV2, T1,
 PRECEDED BY 10 e.g. SK1002

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

ASSEMBLY A10 PSE-30 TRACKING OSCILLATOR

REF.	VALUE	TOL. \pm %	RATING	TYPE	PART NO.
RV2	10k	20	1W	Var.	0000-7545.270/-
S7				SWITCH MICRO <input checked="" type="checkbox"/>	0001-0034.176/-
				SWITCH BUTTON <input checked="" 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.

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

REF.	VALUE	TOL. ± %	RATING	TYPE	PART NO.	REF.	VALUE	TOL. ± %	RATING
R1	13k	1	0W35	MF	0001-0003.631/-	R30	147R	0.25	0W35
R2	6k19	1	0W35	MF	0001-0001.934/-	R31	357R	0.25	0W35
R3	68R1	1	0W35	MF	0001-0000.427/-	R32	243R	1	0W35
R4	2k43	1	0W35	MF	0001-0001.536/-	R34	20R	1	0W35
R5	1M	1	0W35	MF	0001-0027.507/-	R35	47k5	1	0W35
R6	100k	1	0W35	MF	0001-0002.991/-	R36	90k9	1	0W35
R7	100k	1	0W35	MF	0001-0002.991/-	R37	1M	5	0W35
R8	562R	1	0W35	MF	0001-0001.015/-	R38	1M	5	0W35
R9	267R	1	0W35	MF	0001-0003.576/-	R39	100k	1	0W35
R11	182R	1	0W35	MF	0001-0000.663/-	R40	1M	5	0W35
R12	17k4	1	0W35	MF	0001-0002.344/-	R41	200k	1	0W35
R13	30R1	1	0W35	MF	0001-0000.236/-	R42	30k1	1	0W35
R14	110R	1	0W35	MF	0001-0000.553/-	R43	100k	1	0W35
R15	210R	0.25	0W35	MF	0000-7520.538/-	R44	121k	1	0W35
R16	287R	0.25	0W35	MF	0000-7561.241/-	R45	121k	1	0W35
R17	11k	1	0W35	MF	0001-0002.179/-	R46	68R1	1	0W35
R18	51k1	1	0W35	MF	0001-0002.768/-	R47	825R	1	0W35
R19	267k	1	0W35	MF	0001-0067.444/-	R48	3k7	0.25	0W35
R20	10k	1	0W35	MF	0001-0002.137/-	R49	1k17	0.25	0W35
R21	100k	1	0W35	MF	0001-0002.991/-	R50	370R	0.25	0W35
R22	1M	5	0W25	MF	0001-0027.507/-	R51	117R	0.25	0W25
R23	121k	1	0W35	MF	0001-0003.042/-	R52	51R1	0.25	0W35
R24	100k	1	0W35	MF	0001-0002.991/-	R53	133R	0.25	0W35
R25	68R1	1	0W35	MF	0001-0000.427/-	R54	51R1	0.25	0W35
R27	26k7	1	0W35	MF	0001-0002.519/-	R55	51R1	0.25	0W35
R28	30k1	1	0W35	MF	0001-0002.564/-	R56	51R7	0.25	0W35
R29	499R	0.25	0W35	MF	0000-7511.673/-	R57	26R7	1	0W35

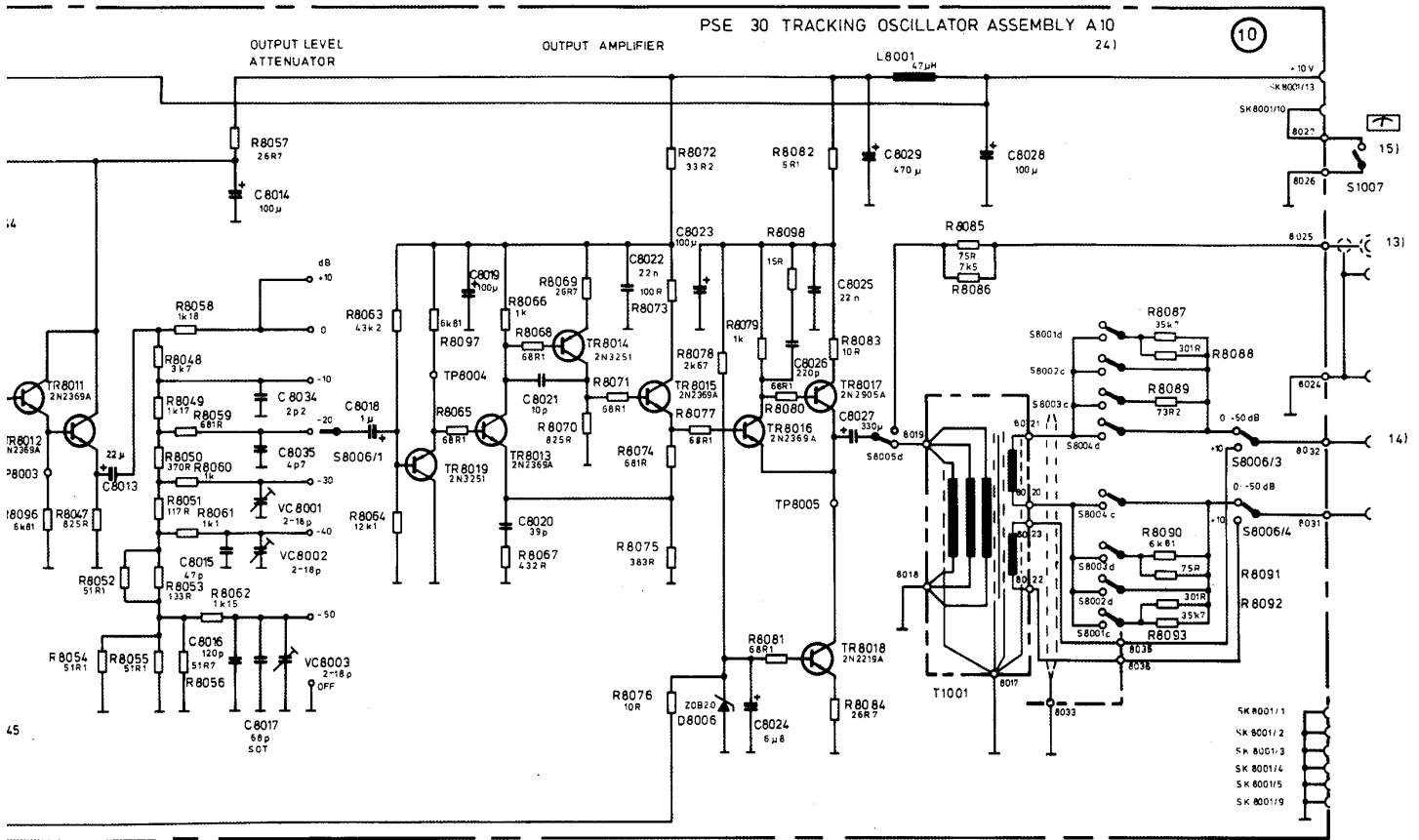


Fig. 41 Circuit Diagram,
PSE-30 Tracking Oscillator, 10

X	RATING	TYPE	PART NO.	REF.	VALUE	TOL. ± X	RATING	TYPE	PART NO.
	0W35	MF	0000-7598.311/-	R58	1k18	1	0W35	MF	0001-0001.264/-
	0W35	MF	0000-7598.324/-	R59	681R	1	0W35	MF	0001-0001.086/-
	0W35	MF	0001-0000.731/-	R60	1k	1	0W35	MF	0001-0001.219/-
	0W35	MF	0001-0065.158/-	R61	1k1	1	0W35	MF	0001-0001.235/-
	0W35	MF	0001-0002.739/-	R62	1k15	1	0W35	MF	0001-0001.251/-
	0W35	MF	0001-0002.975/-	R63	43k2	1	0W35	MF	0001-0002.690/-
	0W35	MF	0001-0027.507/-	R64	12k1	1	0W35	MF	0001-0002.218/-
	0W35	MF	0001-0027.507/-	R65	681R	1	0W35	MF	0001-0000.427/-
	0W35	MF	0001-0002.991/-	R66	1k	1	0W35	MF	0001-0001.219/-
	0W35	MF	0001-0027.507/-	R67	432R	1	0W35	MF	0001-0000.935/-
	0W35	MF	0001-0003.181/-	R68	681R	1	0W35	MF	0001-0000.427/-
	0W35	MF	0001-0002.564/-	R69	26R7	1	0W35	MF	0001-0000.207/-
	0W35	MF	0001-0002.991/-	R70	825R	1	0W35	MF	0001-0001.154/-
	0W35	MF	0001-0003.042/-	R71	681R	1	0W35	MF	0001-0000.427/-
	0W35	MF	0001-0003.042/-	R72	33R2	1	0W35	MF	0001-0000.265/-
	0W35	MF	0001-0000.427/-	R73	100R	1	0W35	MF	0001-0000.537/-
	0W35	MF	0001-0001.154/-	R74	681R	1	0W35	MF	0001-0001.086/-
	0W35	MF	0000-7598.337/-	R75	383R	1	0W35	MF	0001-0000.888/-
	0W35	MF	0000-7598.340/-	R76	10R	1	0W35	MF	0001-0000.074/-
	0W35	MF	0000-7598.353/-	R77	681R	1	0W35	MF	0001-0000.427/-
	0W25	MF	0000-7598.366/-	R78	2k67	1	0W35	MF	0001-0001.578/-
	0W35	MF	0000-7513.710/-	R79	1k	1	0W35	MF	0001-0001.219/-
	0W35	MF	0000-7598.379/-	R80	681R	1	0W35	MF	0001-0000.427/-
	0W35	MF	0000-7513.710/-	R81	681R	1	0W35	MF	0001-0000.427/-
	0W35	MF	0000-7513.710/-	R82	5R1	1	0W35	MF	0001-0016.783/-
	0W35	MF	0000-7584.008/-	R83	10R	1	0W35	MF	0001-0000.074/-
	0W35	MF	0001-0000.207/-	R84	26R7	1	0W35	MF	0001-0000.207/-