Third Octave/Octave Filter Set Type 1625

Valid from serial no. 1205040

037-0412

Consisting of:

Updating

Due to the constant progress in technology the instrument will from time to time be brought up to date in order to provide continuously improved performance.

For this reason there may be small variations between the instrument and the Service Instruction.

However, the local Service Representative is in possession of all informations regarding any change that has been made.

Trouble Shooting

If any fault should occur, check the instrument according to the Checking Procedure.

Before correcting any apparent deviation make sure that the measuring instrument has tolerances small enough not to affect the measurement.

When a fault has been traced and corrected, the voltages and adjustments influenced by the correction must be rechecked. The complete instrument should then be tested to make sure that all basic functions are operative.

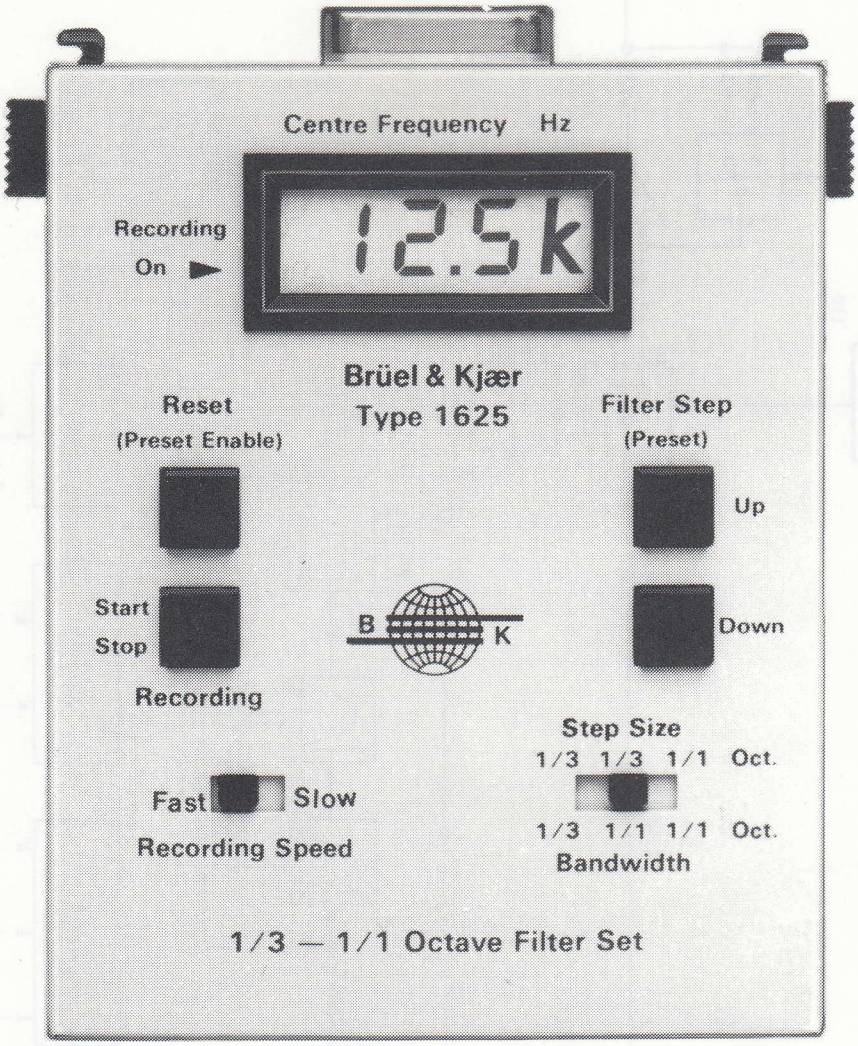
The tolerances given in these notes are intended for use as guide for adjustments.

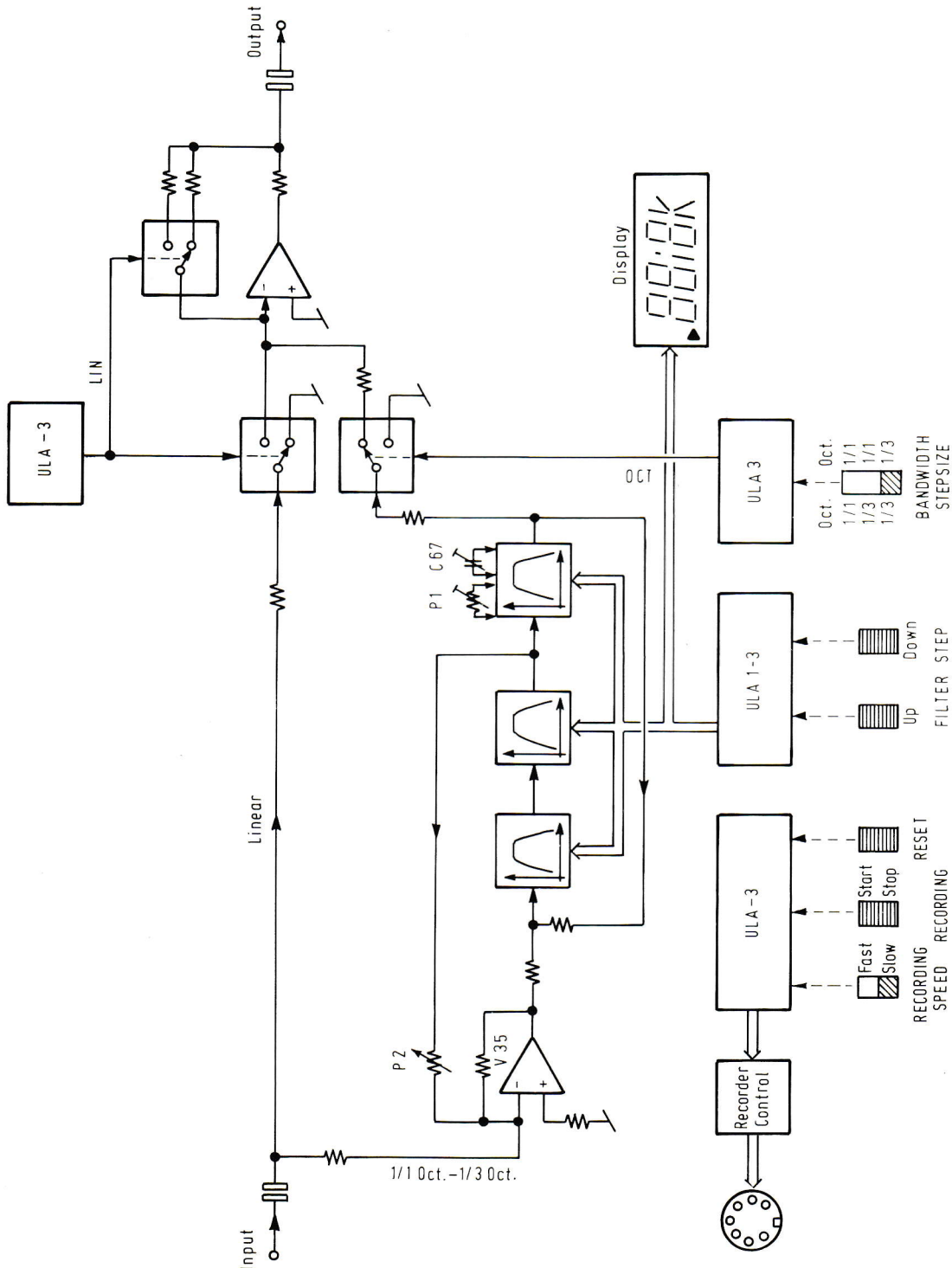
Many instruments have various aids to be used when trouble shooting or adjustment is carried out. They are not necessarily mentioned in the Service Instruction.

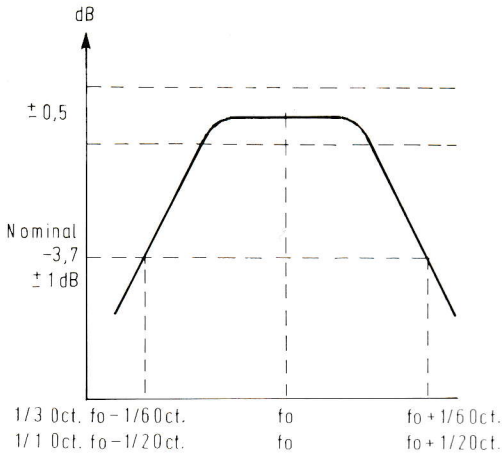
The local Service Representative is in possession of information regarding these aids.

Spare Parts

Please state type and serial number of the instrument when ordering spare parts.


Centre Frequency Hz
12.5k
Recording
On
Brüel & Kjær
Type 1625
Reset
(Preset Enable)
Filter Step
(Preset)
Up
Down
Start
Stop
Recording
B K
Step Size
1/3 1/3 1/1 Oct.
1/3 1/1 1/1 Oct.
Bandwidth
Fast
Slow
Recording Speed
1/3 — 1/1 Octave Filter Set


Output
Input
Linear
LIN
ULA-3
Display
OCT
ULA 3
ULA 1-3
ULA-3
Recorder Control
P1 C67
P2
V35
1/1 Oct.-1/3 Oct.
Oct. 1 Oct.
1/1 1/1
1/3 1/1
1/3 1/3
BANDWIDTH STEPSIZE
Up
Down
FILTER STEP
Start
Stop
RESET
Fast
Slow
RECORDING SPEED
RECORDING



-1/2 Oct.	-1/6 Oct.	Center Frequency Hz f_0	+1/6 Oct.	+1/2 Oct.
17,78	22,39	25,1159	28,18	35,45,
22,39	28,18	31,6228	35,45	44,66
28,18	35,45	39,8107	44,66	56,21
35,45	44,66	50,1187	56,21	70,77
44,66	56,21	63,0957	70,77	89,09
56,21	70,77	79,4328	89,09	112,3
70,77	89,09	100,000	112,3	141,3
89,09	112,3	125,893	141,3	177,8
112,3	141,3	158,489	177,8	223,9
141,3	177,8	199,526	223,9	281,8
177,8	223,9	251,159	281,8	354,5
223,9	281,8	316,228	354,5	446,6
281,8	354,5	398,107	446,6	562,1
354,5	446,6	501,187	562,1	707,7
446,6	562,1	630,957	707,7	890,9
562,1	707,7	794,328	890,9	1,123 k
707,7	890,9	1000,00	1,123 k	1,413 k
890,9	1,123 k	1258,93	1,413 k	1,778 k
1,123 k	1,413 k	1584,89	1,778 k	2,239 k
1,413 k	1,778 k	1995,26	2,239 k	2,818 k
1,778 k	2,239 k	2511,59	2,818 k	3,545 k
2,239 k	2,818 k	3162,28	3,545 k	4,466 k
2,818 k	3,545 k	3981,07	4,466 k	5,621 k
3,545 k	4,466 k	5011,87	5,621 k	7,077 k
4,466 k	5,621 k	6309,57	7,077 k	8,909 k
5,621 k	7,077 k	7943,28	8,909 k	11,23 k
7,077 k	8,909 k	10000,0	11,23 k	14,13 k
8,909 k	11,23 k	12589,3	14,13 k	17,78 k
11,23 k	14,13 k	15848,9	17,78 k	22,39 k
14,13 k	17,78 k	19952,6	22,39 k	28,18 k

2230 DETECTOR: "RMS"
POWER: "On"
TIME WEIGHTING: "Fast"
REF-TEST-OPERATE: "Operate"
DISPLAY: "SPL"
FSD: "100"
SOUND INCIDENCE: "Frontal"
ALL-MAX/MIN-PAUSE: "All"
EXT. FILTER: "Out"
FREQ. WEIGHTING: "Lin"

Connect the Filter Set to the Precision Integrating Sound Level Meter type 2230.

Input signal to 2230 through a 15 pf capacitor (Adaptor WA 0302): 50 mV, 1 kHz.
If necessary adjust "Sens. Adj." on the right side of 2230.

2230 EXT. FILTER to "In"
1625 FILTER STEP: "Lin"
BANDWIDTH: "1/3" Oct.
RECORDING SPEED: "Fast"

Check the Display reading: 94,0 ± 0,3.
Check the Display reading at all center frequencies: 94 ± 0,5.
If necessary consult 1625.2 Adjustment Procedure.

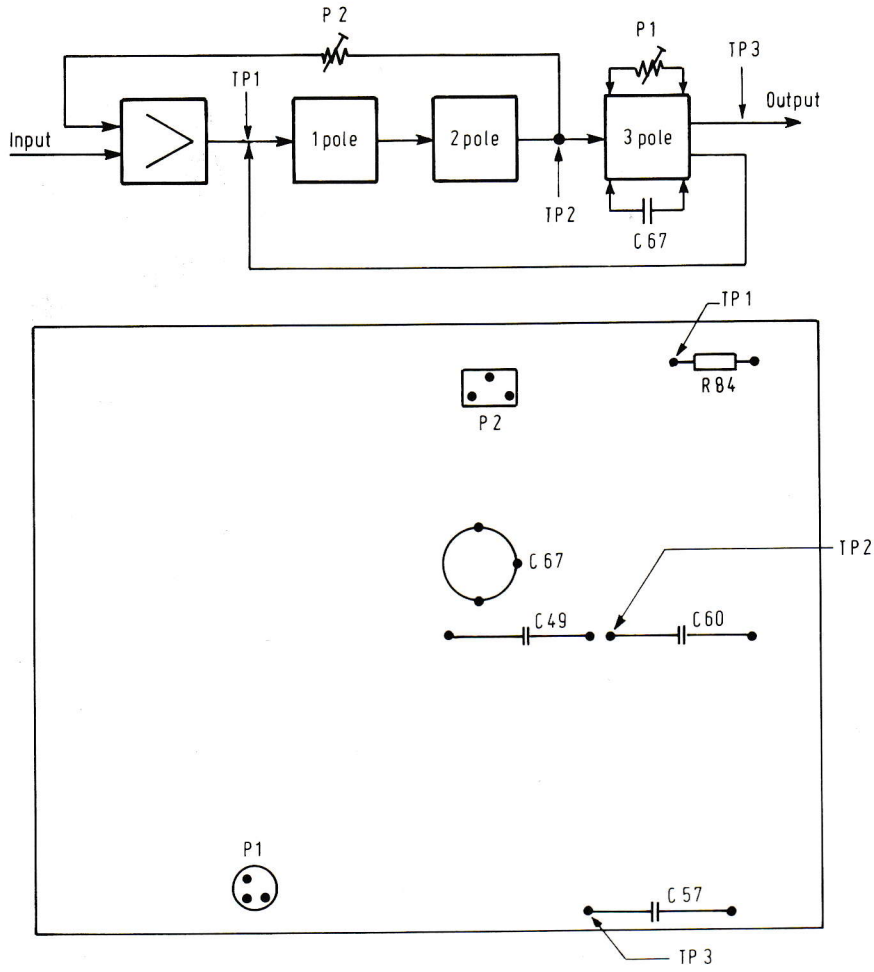
Check all filter responses to be as shown above at f_0 ± 1/6 Oct.
Tolerance ± 1 dB.

BANDWIDTH to "1/1" Oct.
STOP SIZE: "1/3" Oct.

Check all filter responses to be as shown above at f_0 ± 1/2 Oct.
Tolerance ± 1 dB.

Connect 1625 to a Level Recorder 2306 via cable AQ 0034.
Connect "AC Out" on 2230 to Signal Input on 2306 via cable AO 0173.

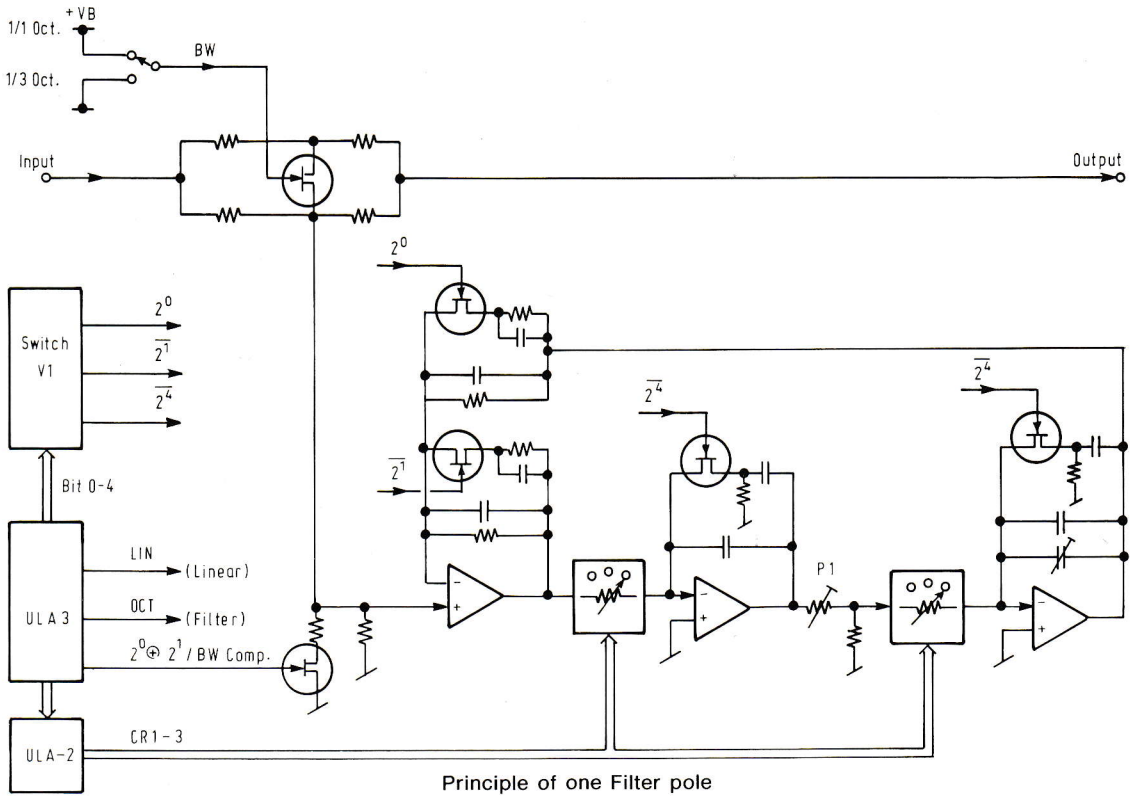
Activate RESET and START.
Check that 1625 steps through all 1/1 oct. centre frequencies, Lin and stops.



Viewed from the component side

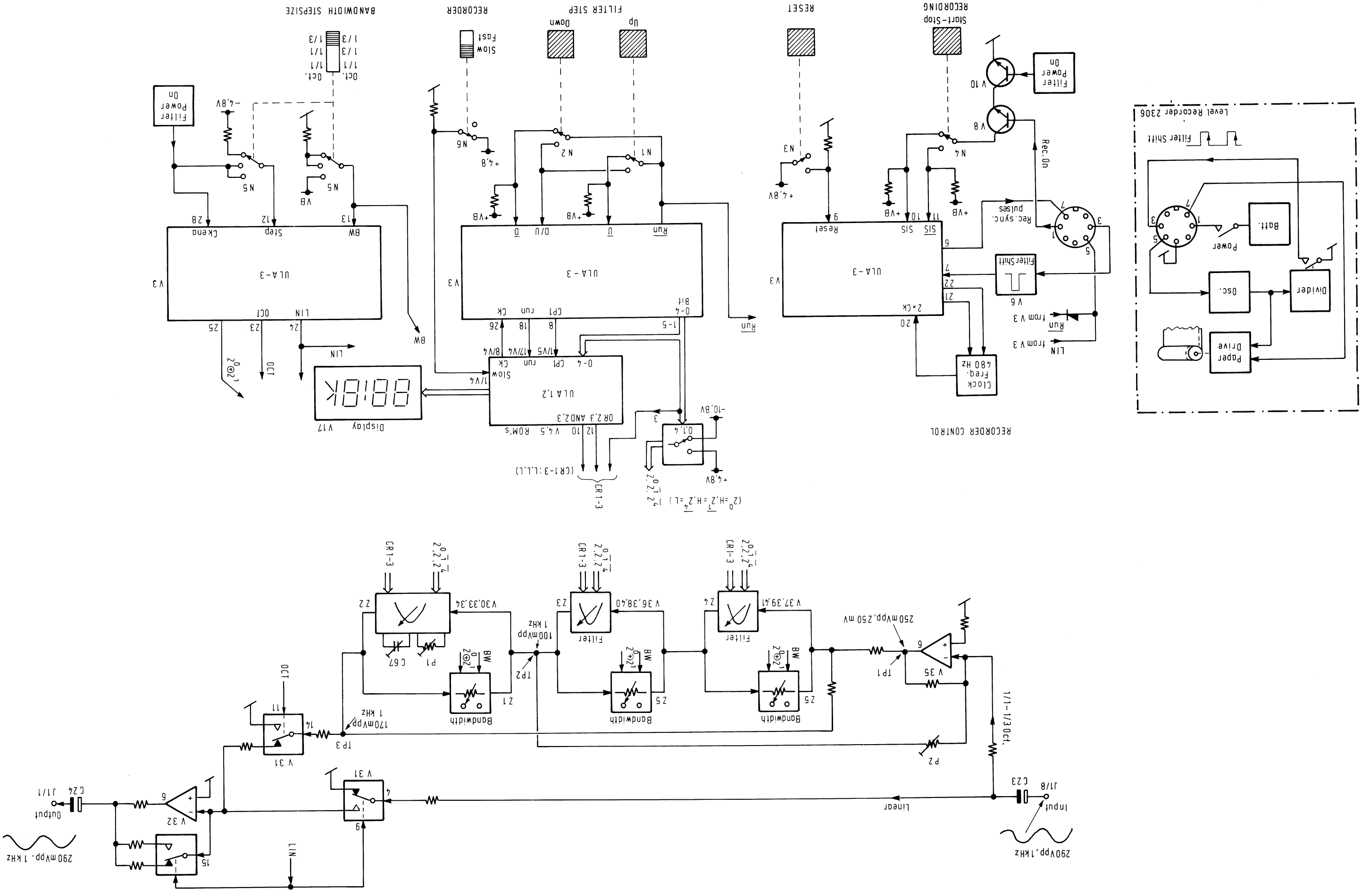
2230 DETECTOR: "RMS" POWER: "On" TIME WIEGHTING: "Fast" REF–TEST–OPERATE: "Operate" DISPLAY: "SPL" FSD: "100" SOUND INCIDENCE: "Frontal" ALL–MAX/MIN–PAUSE: "All" EXT. FILTER: "Out" FREQ. WEIGHTING: "Lin"	Connect the 1625 to the Precision Integrating Sound Level Meter type 2230. Input signal to 2230 through a 15 pF capacitor (Adaptor WA 0302): 50 mV, 1 kHz. Check the Display reading: 94,0 ± 0,1. If necessary adjust "Sens. Adj." on the right side of 2230.
2230 EXT. FILTER to "In" **1625** BANDWIDTH: "1/3" Oct. RECORD SPEED: "Lin" FILTER STEP to "Lin"	Check the Display reading: 94,0 ± 0,3.
FILTER STEP to "160" Hz	Change the input frequency to 160 Hz. Adjust P1 to max. resonans level at "AC Out". Check the phase shift between TP1 and TP2: 0° ± 1°. If necessary adjust the input frequency. Check the phase shift between TP1 and TP3: 180° ± 1°. If necessary fine adjust P1.
FILTER STEP to "20" kHz	Change the input frequency to 19,952 kHz. Adjust C67 to max. resonans level at "AC Out".
FILTER STEP to "1" kHz	Check that the 1 kHz level is equal to Lin level. If necessary adjust P2.

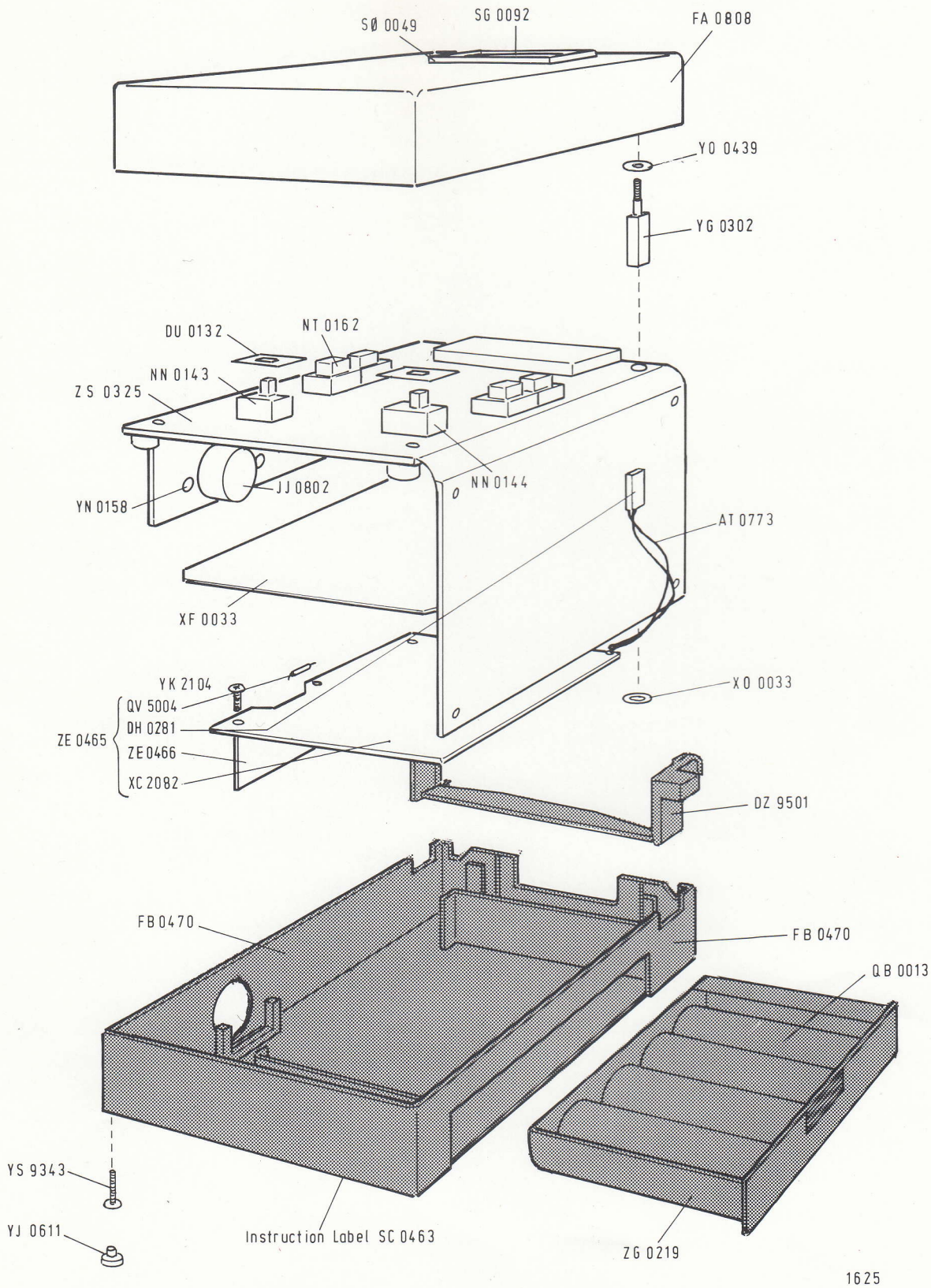
SIMPLIFIED DIAGRAM



Principle of one Filter pole

Filter Hz	Filter No.	Bit 0–4					Filter Code						Control Signals		
		0	1	2	3	4	2^0	2^2	2^4	CR3	CR2	CR1	0+1	LIN	OCT
20	0	0	0	0	0	0	0	1	1	0	0	0	1	0	1
25	1	1	0	0	0	0	1	1	1	0	0	0	0	0	1
31,5	2	0	1	0	0	0	0	0	1	0	0	0	0	0	1
40	3	1	1	0	0	0	1	0	1	0	0	0	1	0	1
50	4	0	0	1	0	0	0	1	1	0	0	1	1	0	1
63	5	1	0	1	0	0	1	1	1	0	0	1	0	0	1
80	6	0	1	1	0	0	0	0	1	0	0	1	0	0	1
100	7	1	1	1	0	0	1	0	1	0	0	1	1	0	1
125	8	0	0	0	1	0	0	1	1	0	1	1	1	0	1
160	9	1	0	0	1	0	1	1	1	0	1	1	0	0	1
200	10	0	1	0	1	0	0	0	1	0	1	1	0	0	1
250	11	1	1	0	1	0	1	0	1	0	1	1	1	0	1
315	12	0	0	1	1	0	0	1	1	1	1	1	1	0	1
400	13	1	0	1	1	0	1	1	1	1	1	1	0	0	1
500	14	0	1	1	1	0	0	0	1	1	1	1	0	0	1
630	15	1	1	1	1	0	1	0	1	1	1	1	1	0	1
800	16	0	0	0	0	1	0	1	0	0	0	0	1	0	1
1,00 k	17	1	0	0	0	1	1	1	0	0	0	0	0	0	1
1,25 k	18	0	1	0	0	1	0	0	0	0	0	0	0	0	1
1,60 k	19	1	1	0	0	1	1	0	0	0	0	0	1	0	1
2,00 k	20	0	0	1	0	1	0	1	0	0	0	1	1	0	1
2,50 k	21	1	0	1	0	1	1	1	0	0	0	1	0	0	1
3,15 k	22	0	1	1	0	1	0	0	0	0	0	1	0	0	1
4,00 k	23	1	1	1	0	1	1	0	0	0	0	1	1	0	1
5,00 k	24	0	0	0	1	1	0	1	0	0	1	1	1	0	1
6,30 k	25	1	0	0	1	1	1	1	0	0	1	1	0	0	1
8,00 k	26	0	1	0	1	1	0	0	0	0	1	1	0	0	1
10,0 k	27	1	1	0	1	1	1	0	0	0	1	1	1	0	1
12,5 k	28	0	0	1	1	1	0	1	0	1	1	1	1	0	1
16,0 k	29	1	0	1	1	1	1	1	0	1	1	1	0	0	1
20,0 k	30	0	1	1	1	1	0	0	0	1	1	1	0	0	1
LIN	31	1	1	1	1	1	1	0	0	1	1	1	1	1	0

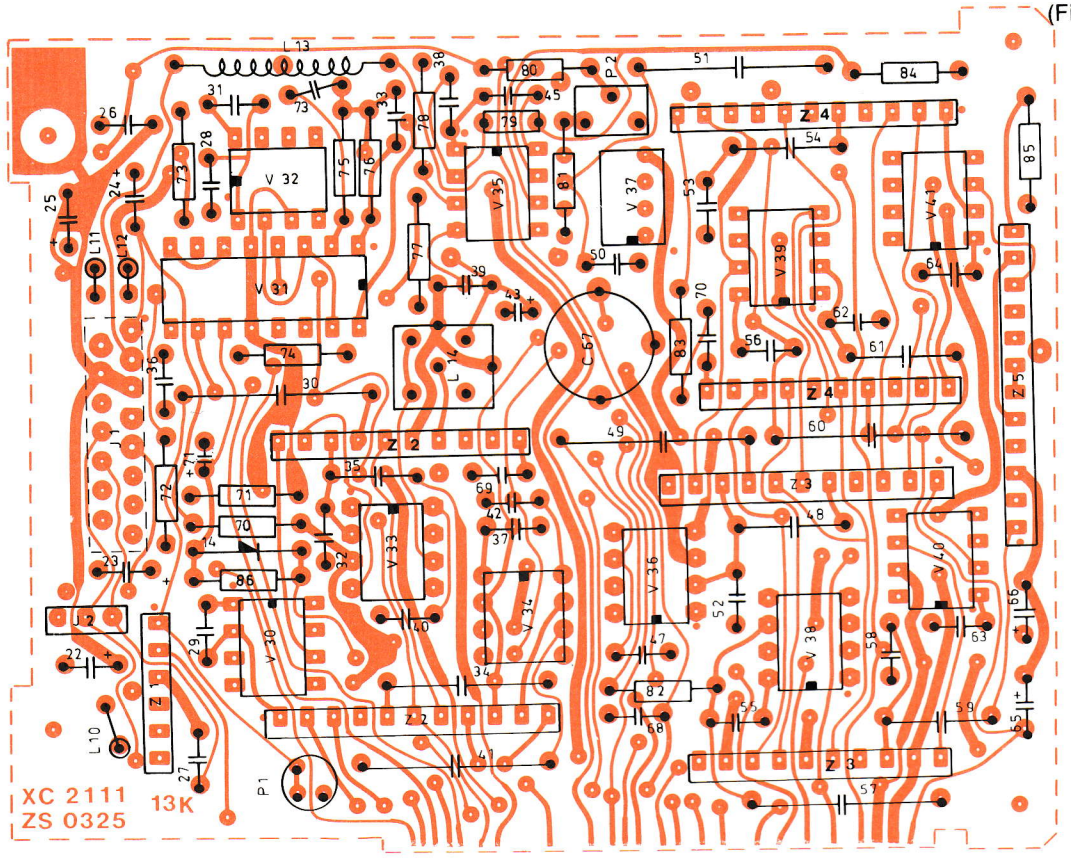

Level Recorder 2306
Filter Shift
Power
Batt.
Divider
Osc.
Paper Drive
RECORDER CONTROL
Start-Stop RECORDING
RESET
Filter Power On
Rec.On
Rec.sync. pulses
ULA-3
Reset
SIS
Filter Shift
Clock Freq. 480 Hz
LIN from V3
Run from V3
Up
Down
Slow
Fast
FILTER STEP
RECORDER
BANDWIDTH STEPSIZE
Oct.
1/1
1/3
Display V17
ULA 1,2
OR 2,3 AND 2,3
ROM's
Run
Bandwidth
Filter
Linear
Input
Output
290 mVpp. 1 kHz
290 Vpp, 1 kHz
250 mVpp, 250 mV
100mVpp 1 kHz
170mVpp 1 kHz
1/1-1/3 Oct.
P1
P2
TP1
TP2
TP3
C67
C23
C24
J1/8
J1/1
J30
J31


SØ 0049
SG 0092
FA 0808
YO 0439
YG 0302
DU 0132
NT 0162
NN 0143
ZS 0325
NN 0144
JJ 0802
YN 0158
AT 0773
XF 0033
YK 2104
XO 0033
QV 5004
DH 0281
ZE 0465
ZE 0466
XC 2082
DZ 9501
FB 0470
FB 0470
QB 0013
YS 9343
YJ 0611
Instruction Label SC 0463
ZG 0219
1625

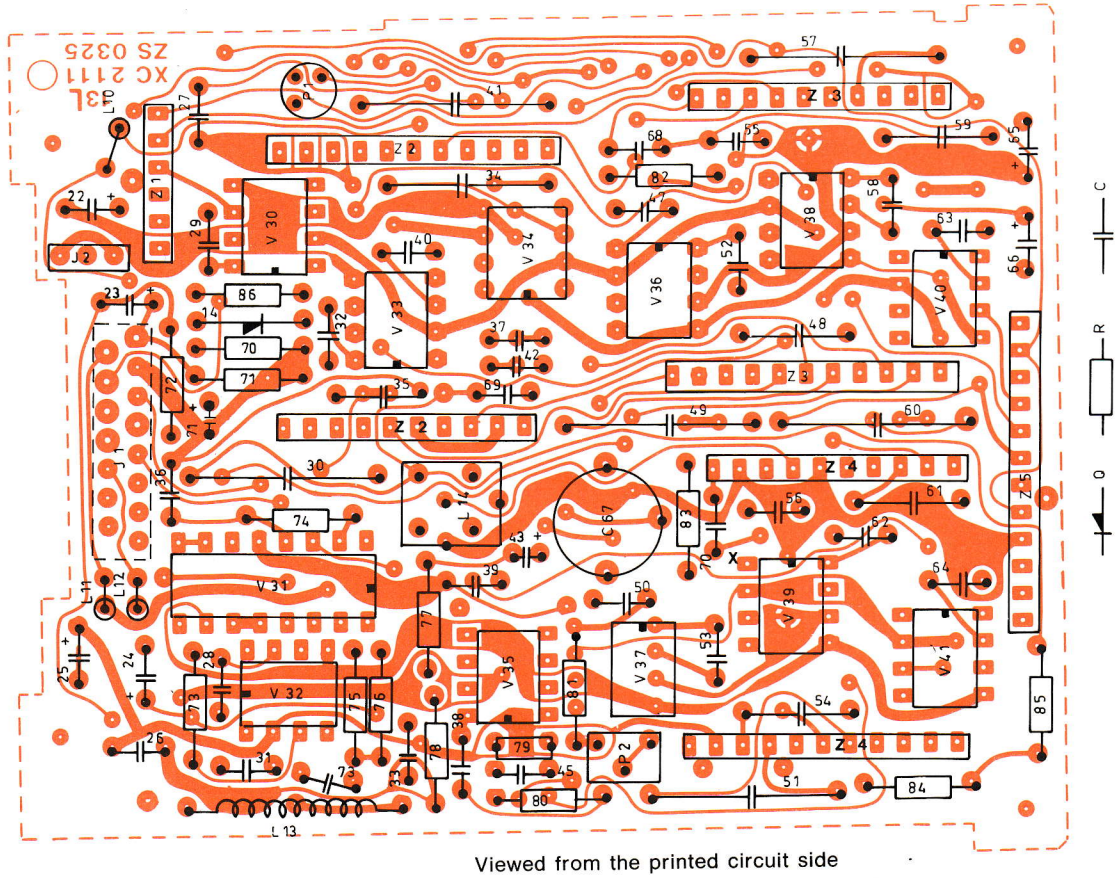
Filter Board

ZS 0325

LAYOUT DIAGRAM
(Filter Section)



Viewed from the component side



Viewed from the printed circuit side

ZS 0325

PARTS LIST
(Filter Section)

C 22	Electrolytic		47 µF/6,3 V	CE 0219
C 23,24	-		15 µF/16 V	CE 0356
C 25,26	-		47 µF/6,3 V	CE 0219
C 27	Ceramic		1 nF/1000 V	CK 3103
C 28	-		180 pF/400 V	CK 2186
C 29	-	2%	56 pF/500 V	CK 1561
C 30	Polystyrene	1%	16 nF/63 V	CT 1539
C 31	Ceramic	5%	22 pF/400 V	CK 1222
C 32	-		180 pF/400 V	CK 2186
C 33	-	10%	68 pF/400 V	CK 1684
C 34	Polystyrene	1%	390 pF/63 V	CT 1531
C 35	-	1%	412 pF/63 V	CT 1186
C 36-38	Ceramic		180 pF/400 V	CK 2186
C 39	-	10%	680 pF/400 V	CK 2683
C 40	-		180 pF/400 V	CK 2186
C 41	Polystyrene	1%	16 nF/63 V	CT 1539
C 42	Ceramic		180 pF/400 V	CK 2186
C 43	Tantalum		33 µF/3 V	CF 0052
C 45	Ceramic	3%	8,2 pF/400 V	CK 0821
C 47	-		180 pF/400 V	CK 2186
C 48	Polystyrene	1%	412 pF/63 V	CT 1186
C 49	-	1%	16 nF/63 V	CT 1539
C 50	Ceramic		180 pF/400 V	CK 2186
C 51	Polystyrene	1%	16 nF/63 V	CT 1539
C 52,53	Ceramic		180 pF/400 V	CK 2186
C 54	Polystyrene	1%	412 pF/63 V	CT 1186
C 55,56	Ceramic		180 pF/400 V	CK 2186
C 57	Polystyrene	1%	16 nF/63 V	CT 1539
C 58	Ceramic		180 pF/400 V	CK 2186
C 59	Polystyrene	1%	412 pF/63 V	CT 1186
C 60	-	1%	16 nF/63 V	CT 1539
C 61	-	1%	412 pF/63 V	CT 1186
C 62	Ceramic		180 pF/400 V	CK 2186
C 63,64	-	2%	56 pF/500 V	CK 1561
C 65,66	Electrolytic		15 µF/16 V	CE 0356
C 67	Variable		10-60 pF/250 V	CV 0038
C 68-70	Ceramic	3%	8,2 pF/400 V	CK 0821
C 71	Tantalum		0,33 µ/35 V	CF 0067
C 73	Ceramic		180 pF/100V	CK 2186

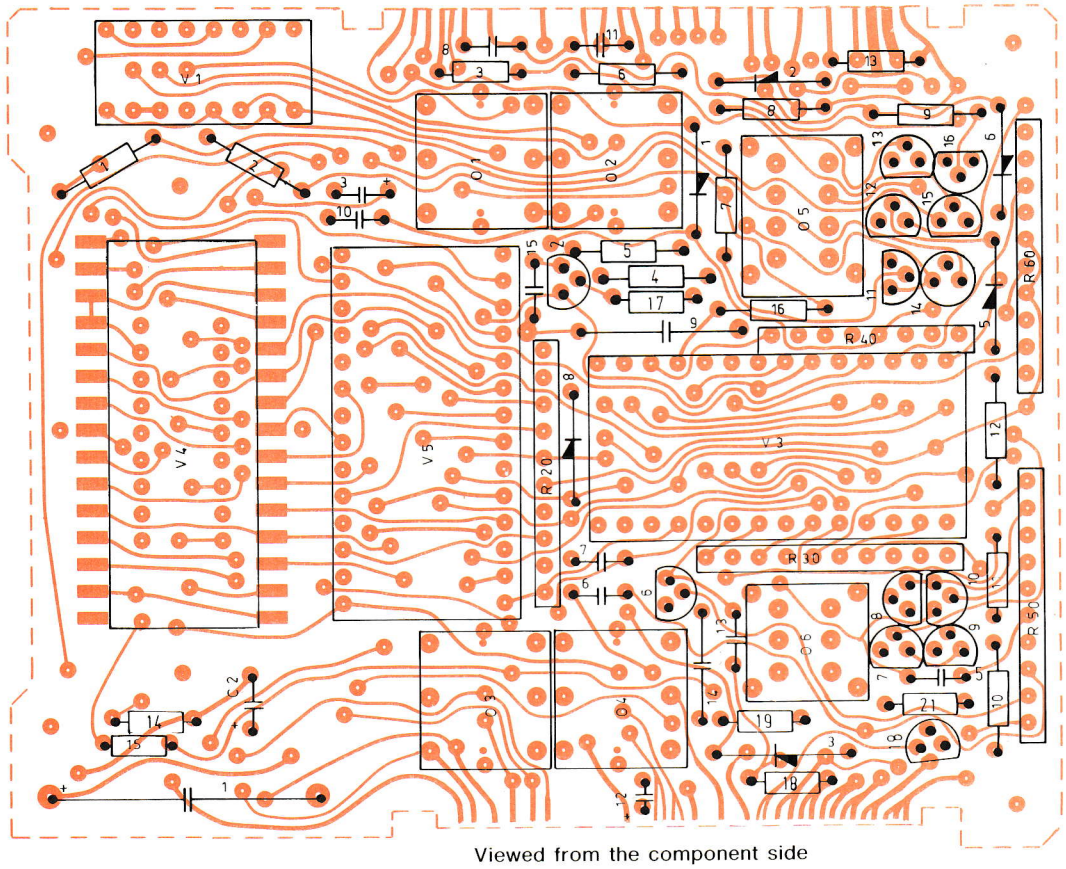
L 10	Coil	30 µH	LJ 0008
L 11,12	-	100 µH	LJ 0021
L 13	-	30 µH	LJ 0008
L 14	-	12 mH	LB 0829

P 1	Cermet			2 kΩ	PG 2218
P 2	-			10 kΩ	PG 3125
Q 14	Si.	1N4148		75 V/75mA	QV 0216
R 70	Carbon	1/4W	5%	470 kΩ	RB 5470
R 71	Metal	-	1%	309 kΩ	RF 5309
R 72	-	-	-	15 kΩ	RF 0063
R 73	Carbon	-	5%	100 Ω	RB 2100
R 74	Metal	-	1%	1,50 kΩ	RF 3150
R 75	-	-	-	3,01 kΩ	RF 3301
R 76	-	-	-	15 kΩ	RF 0063
R 77	-	-	-	1,50 kΩ	RF 3150
R 78	-	-	-	19,6 kΩ	RF 4196
R 79	-	-	-	51,1 kΩ	RF 4511
R 80	-	-	-	32,4 kΩ	RF 4324
R 81	-	-	-	39,2 kΩ	RF 4392
R 82,83	-	-	-	1,00 kΩ	RF 3100
R 84	-	-	-	10,2 kΩ	RF 4102
R 85	-	-	-	24,9 kΩ	RF 4249
R 86	-	-	-	332 kΩ	RF 5332

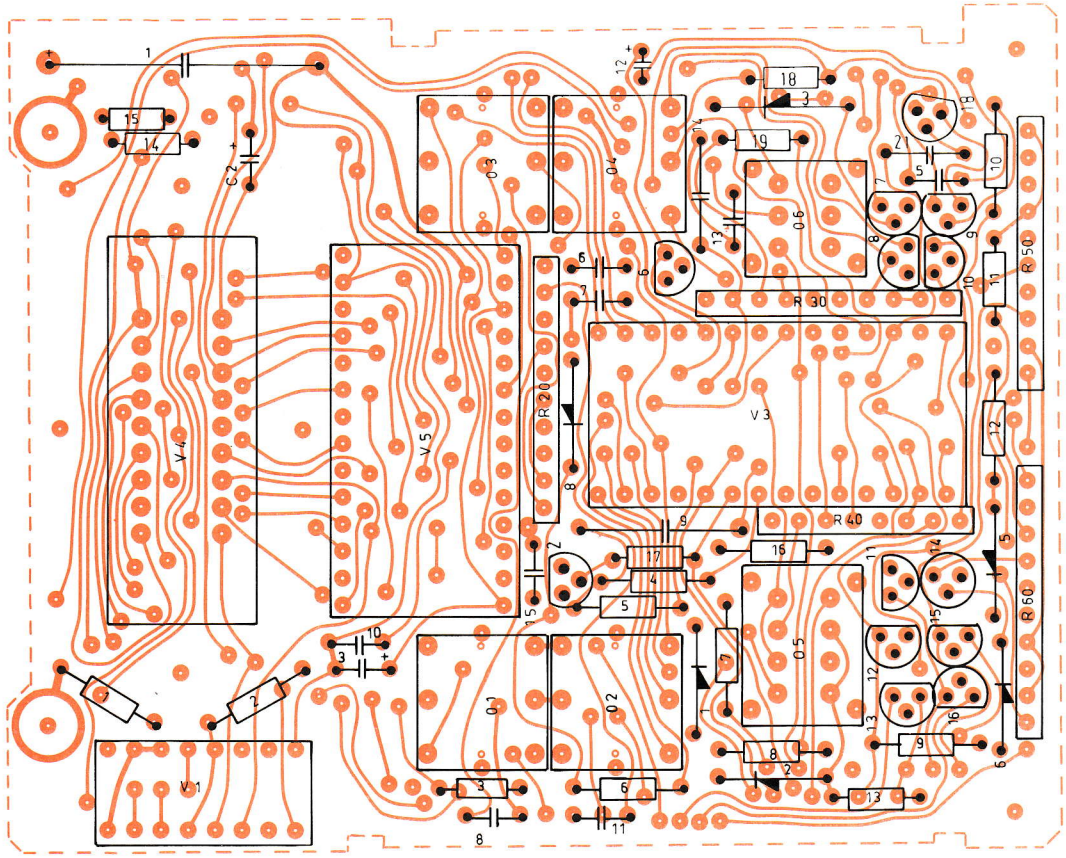
V 30	Op Amp	LM301	VE 0017
V 31	Multiplex CMOS	CD4053	VD 2126
V 32-41	Op Amp	LM301	VE 0017

Z 1	Thickfilm,	6-pin	ZE 0432
Z 2-4	-	21-pin	ZE 0430
Z 5	-	12-pin	ZE 0433
	Printed Circuit Board		XC 2111

LAYOUT DIAGRAM
(Digital Section)



Viewed from the component side



Viewed from the printed circuit side

ZS 0325

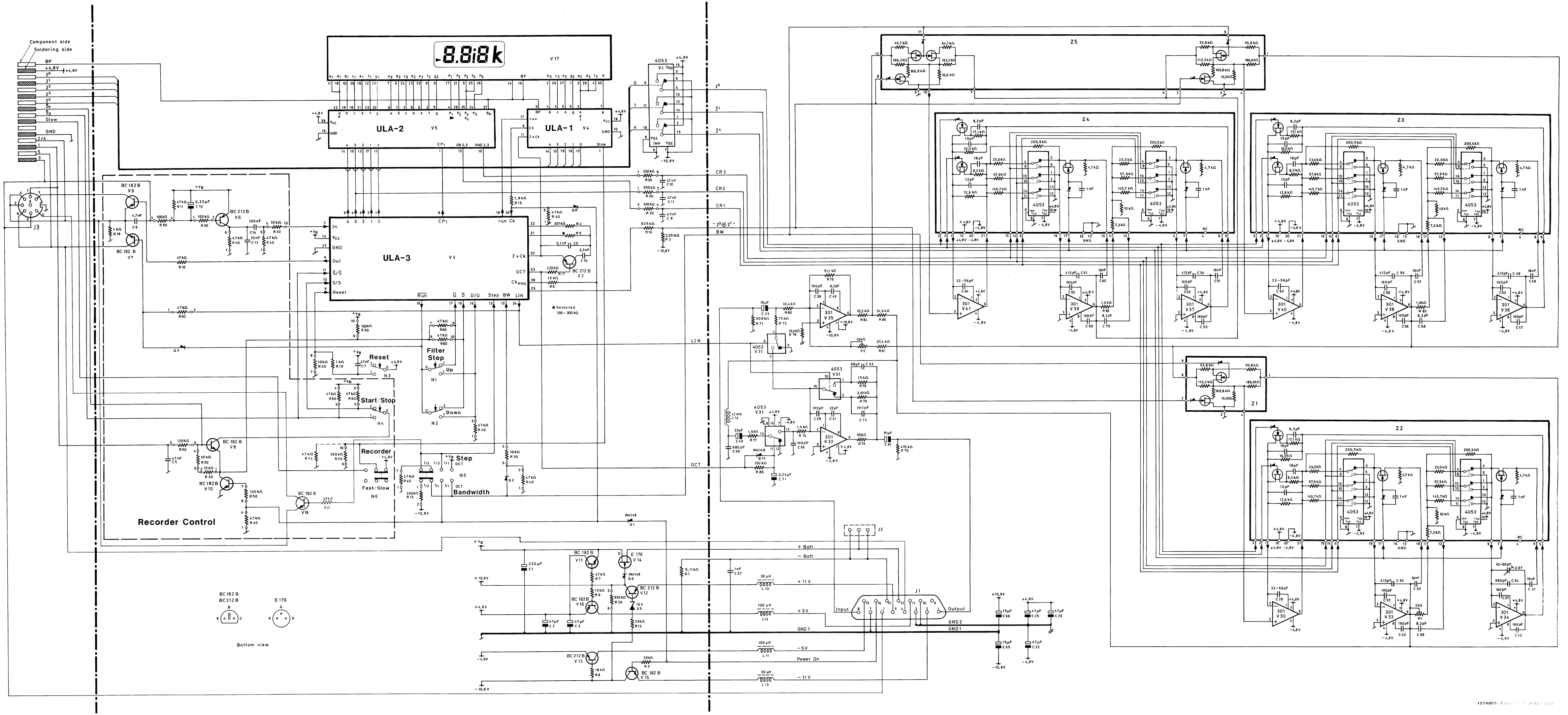
PARTS LIST
(Digital Section)

C 1	Electrolytic			220 µF/10 V	CE 0306
C 2,3	-			47 µF/6,3 V	CE 0219
C 5	Ceramic			47 nF/30 V	CK 4471
C 6	-			4,7 nF/30 V	CK 3473
C 7,8	-			47 nF/16 V	CK 4471
C 9	Polystyrene		1%	5,1 nF/63 V	CT 1179
C 10,11	Ceramic			47 nF/16 V	CK 4471
C 12	Tantalum			0,22 µF/35 V	CF 0063
C 13	Ceramic			10 nF/30 V	CK 4101
C 14	-			100 nF/50 V	CK 5104
C 15	-			3,3 nF/100 V	CK 3331
Q 1,2	Si.	1N4148		75 V/75 mA	QV 0216
Q 3	Schottky	BAT41		100 V/1 mA	QV 5009
Q 5	Ze.	ZF15		13,8-15,5 V/0,25W	QV 1325
Q 6	Si.	1N4148		75 V/75mA	QV 0216
Q 8	Si.	1N4148		75 V/75mA	QV 0216
R 1	Metal	1/4 W	1%	5,11 kΩ	RF 3511
R 2	-	-	-	2,05 MΩ	RH 6205
R 3	Carbon	-	5%	33 kΩ	RB 4330
R 4	Metal	-	1%	301 kΩ	RF 5301
R 5	-	-	-	196 kΩ	RF 5196
R 6	Carbon	-	5%	12 kΩ	RB 4120
R 7	-	-	-	47 kΩ	RB 4470
R 8	-	-	-	18 kΩ	RB 4180
R 9	-	-	-	12 kΩ	RB 4120
R 10,11	-	-	-	47 kΩ	RB 4470
R 12	-	-	-	33 kΩ	RB 4330
R 13	-	-	-	330 kΩ	RB 5330
R 14	-	-	-	47 kΩ	RA 0011
R 15	-	-	-	1,8 kΩ	RB 3180
R 16	Metal	-	1%	825 kΩ	RF 5825
R 17	Carbon	0,1W	5%	220 kΩ	RA 0024
R 18,19	-	-	-	1 kΩ	RA 0209

R 20	Resistance Network			5 × 330 kΩ	RZ 6533
R 21	Carbon	1/4 W	5%	47 kΩ	RA 0011
R 30	Resistance Network			5 × 10 kΩ	RZ 6412
R 40	-	-		7 × 47 kΩ	RZ 6449
R 50	-	-		5 × 100 kΩ	RZ 6510
R 60	-	-		5 × 47 kΩ	RZ 6450
V 1	Multiplex CMOS			CD4053	VD 2126
V 2	Si.			BC212B	VB 0049
V 3	CMOS			VD 7003	VD 7003
V 4	CMOS			MCA3017	VD 7004
V 5	CMOS			MCC3016	VD 7005
V 6	Si.			BC212B	VB 0049
V 7-11	-			BC182B	VB 0055
V 12,13	-			BC212B	VB 0049
V 14	FET			E176	VB 1500
V 15,16	Si.			BC182B	VB 0055
V 17	Display				VU 1004
V 18	Si.			BC182B	VB 0055

Jumper for display	DV 0313
Socket for display	DZ 9588
Contact socket for display	JG 0006
1-pin socket	JJ 0068
6-pin single in line socket	JJ 0611
8-pin DIN socket	JJ 0802
8-pin Socket	JJ 0817
10-pin single in line socket	JJ 1020
11-pin single in line socket	JJ 1105
12-pin single in line socket	JJ 1213
16-pin socket	JJ 1631
28-pin socket	JJ 2802
Plug for battery connection	JL 1001
15-pin plug	JP 1504
Printed Circuit Board	XC 2111

CIRCUIT DIAGRAM


Component side
Soldering side
ULA-1
ULA-2
ULA-3
Recorder Control
Reset
Start/Stop
Recorder
Fast/Slow
Filter Step
Up
Down
Step
Bandwidth
Run
D/U
Step
BW
LIN
OCT
Input
Output
+ Batt.
− Batt.
+ 11 V
+ 5V
GND 1
− 5V
Power On
− 11 V
GND 2
GND 1
Bottom view