

COMPRESSOR AMPLIFIER

179-120

CONTENS:

	DRAW. No.
Technical Specifications	179-1211-A-4
Terminals & Interconnections	179-1202-A-3
Characteristics, Input Filter	179-1219-A-4
Input-Output Terminations	179-1220-A-4
Instruction for Alignment, Block	
Diagram Compressor Card	179-1222-A-4
Component Lay-out	179-1230-A-3
Electrical Partslist	179-1241-A-3
Diagram Amplifier Card	179-1242
Component Lay-out	179-1232-A-3
Electrical Partslist	179-1243-A-3
Diagram Switch Unit	179-A1
Component Lay-out	179-A130-A-4
Electrical Partslist	179-A141-A-4
Diagram Switch Unit	179-A2
Component Lay-out	179-A131-A-3
Electrical Partslist	179-A230-A-4
Diagram Switch Unit	179-A3
Component Lay-out	179-A241-A-4
Electrical Partslist	179-A231-A-3
Diagram Switch Unit	179-A4
Component Lay-out	179-A330-A-4
Electrical Partslist	179-A341-A-4
Diagram Switch Unit	179-A430-A-4
Component Lay-out	179-A441-A-4
Electrical Partslist	179-A431-A-3

Supply Voltage	: 24 V dc \pm 10% - common
Maximum Ripple Voltage	: 0.1 V pp
Current Consumption, steady state	: approx. 100mA
Current Consumption, during heat-up	: approx. 275mA in 45 seconds
Temperature Range	: -20 to +60°C (-4 to +140°F)
Frequency Range (0.5dB points)	: 20 c/s to 20.000 c/s
Input Filter	: see fig. 4
Input Impedance within freq. range	: see Input Terminations fig. 1
Output Impedance within freq. range	: see Output Terminations fig. 2
Minimum Load Impedance	: 100 ohms
Basic Amplification	: see fig. 3 Characteristics
Compression Range	: see fig. 3 Characteristics
Compression Ratio	: adjustable 1:1 2:1 3:1 5:1 20:1
Attack Time	: adjustable 100 microseconds/20dB to 200 milliseconds/20dB (11 steps)
Recovery Time	: adjustable 60 milliseconds/20dB to 4 seconds/20dB and one "Auto" position (11 steps)
"Auto" dual time constants	: 200 msec. upon 15 seconds
Recovery Delay	: switchable 0 or 50 milliseconds
Distortion under static conditions	: less than 0.5% up to 20dB gain reduction
Signal to noise ratio at compression threshold	: 80 dB A-curve
Instrument Output	: 0 to 1 mA for 0 to 20dB compression Linear dB scale
<u>Limiter Function</u>	
Attack Time	: 1.5 millisecond combined with a full-wave logarithmic clipping circuit
Recovery Time	: following the recovery time set for the compressor
Limitation Threshold "Normal" Note 1	+6 dBu output with any of the three output-terminations shown in fig. 2
Limitation Threshold "High" Note 1	+19 dBu output when using the 0.7 : 1 output transformer +16 dBu output when using the direct output or the 1:1 output transformer
<u>Stereo Operation</u>	
The control voltage of two units may be interconnected to obtain equal gain reduction in the two stereo channels. The control voltage is accessible at the connector pin 3. - To obtain equal reference level, terminal 2 "12V adjust" of the two units must be interconnected.	

Connector : Tuchel T2700 Standard Colour : Dull Black

Mechanical Outline : Al-module

Front 40x190mm (1.58x7.5")

Depth 105 mm (4.1")

Weight : approx. 1 Kg

(approx. 35 oz.)

Note 1: The limitation level stated above applies to steady state conditions. Peaks shorter than 1.5mS will be limited at a level max. 3dB above steady state conditions.

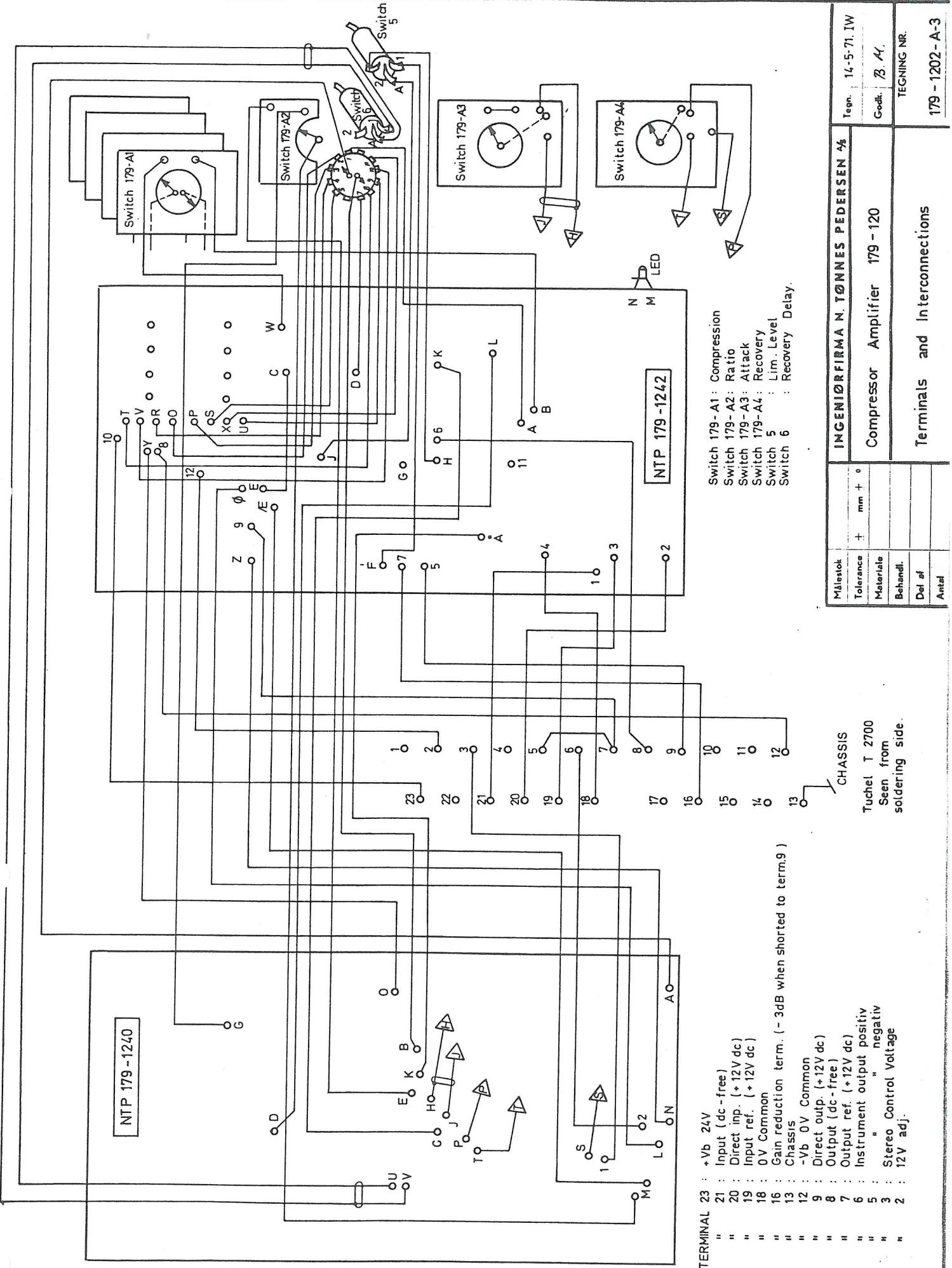


Fig. 3

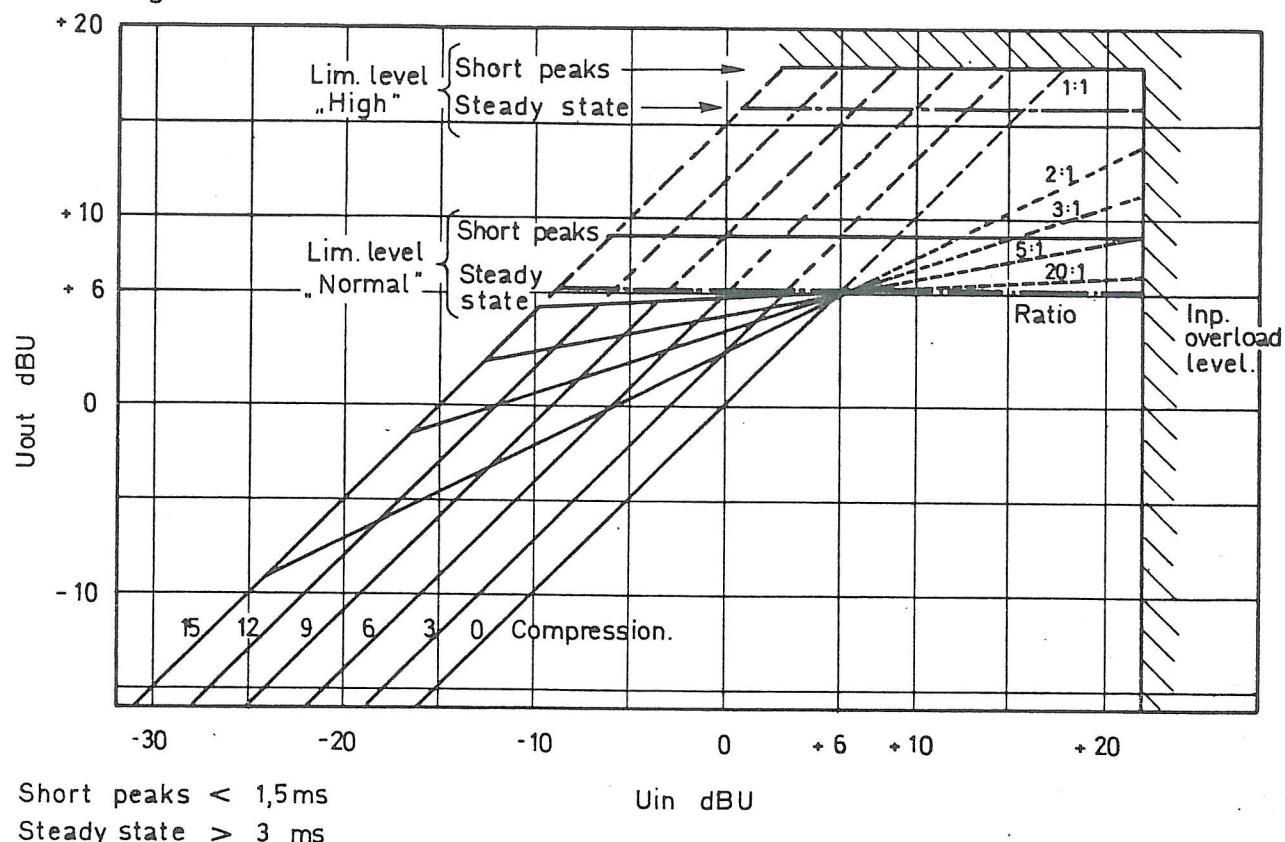
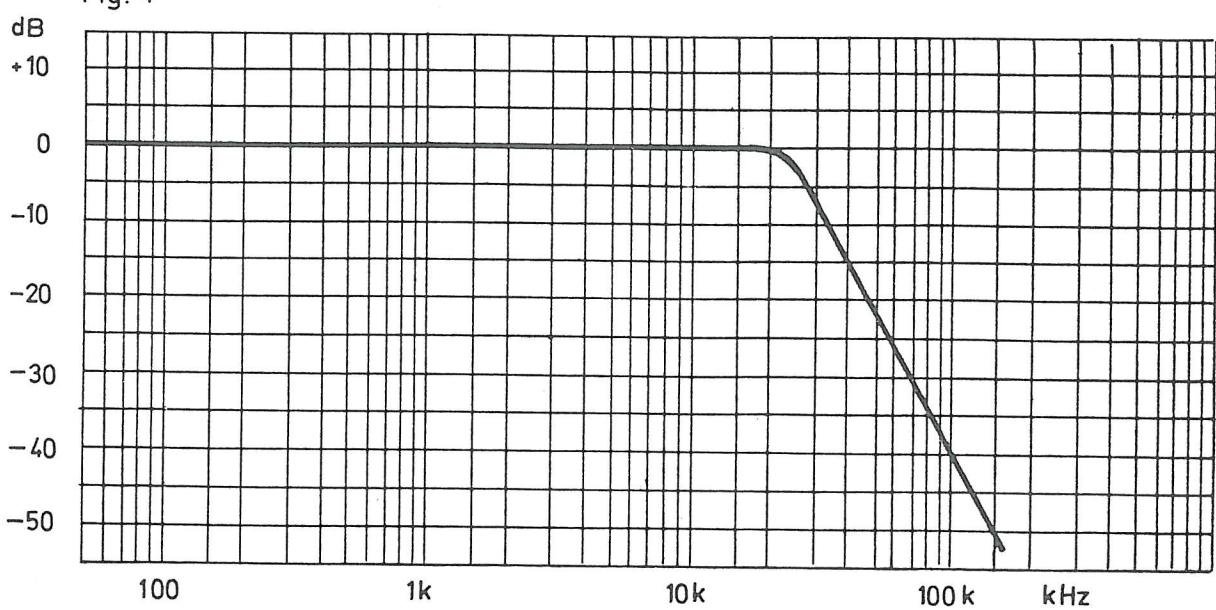


Fig. 4

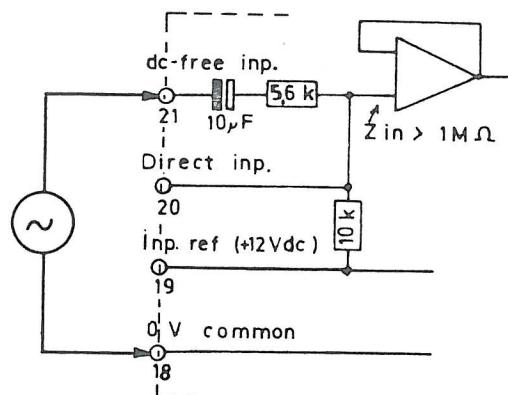


INPUT FILTER CURVE

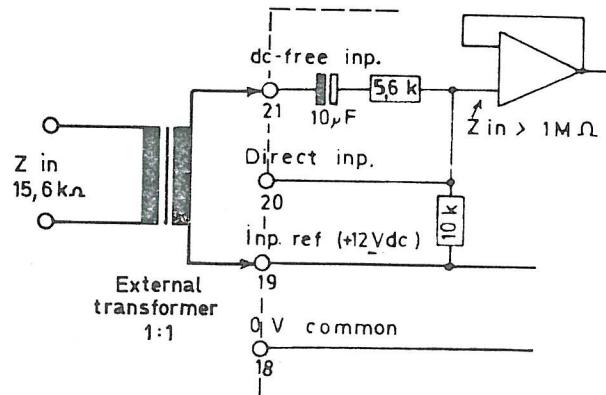
INPUT TERMINATIONS

fig. 1

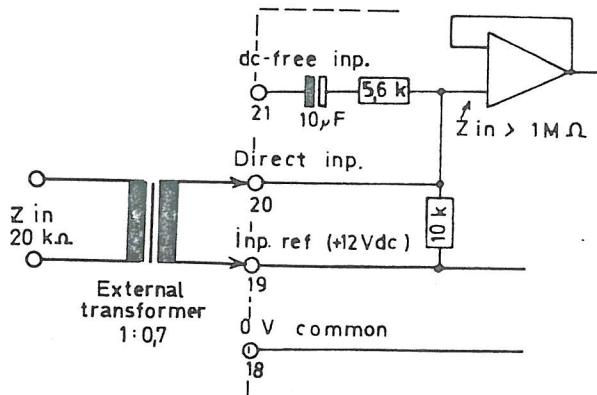
A)

UNSYMMETRICAL

B)

BALANCED FLOATING

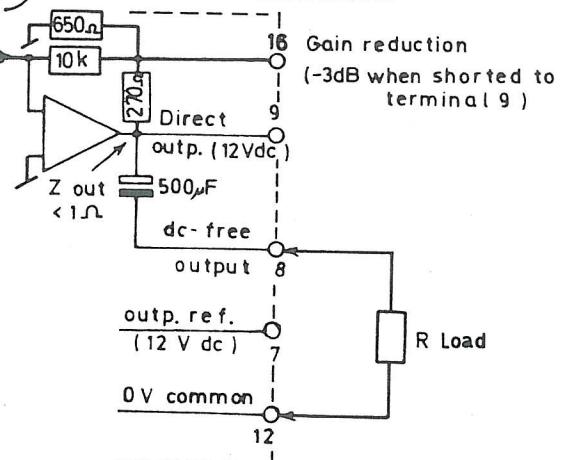
C)

BALANCED FLOATING

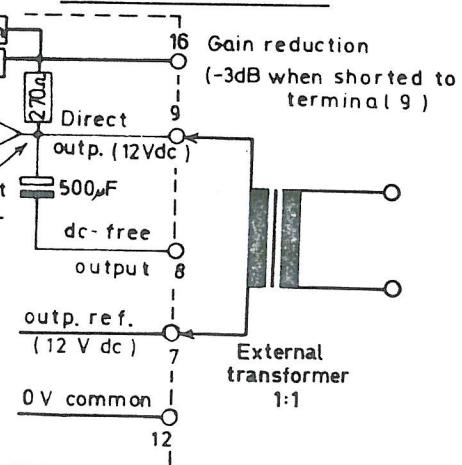
OUTPUT TERMINATIONS

fig. 2

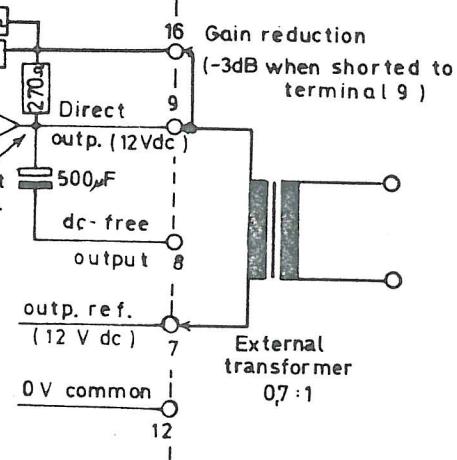
A)

UNSYMMETRICAL

B)

BALANCED FLOATING

C)

BALANCED FLOATING

Normally the Compressor Amplifier will stay correctly adjusted, except when a component has failed and has been replaced; then it may be necessary to make certain adjustments. Before attempting to make any adjustments, note the permissible indication errors stated in Technical Specifications.

The functions of the trimpotentiometers are as follows:

- P1 Bias adjustment of Op. amp A1
- P2 Compensates for individual pinch-off of the F.E.T. (Q1)
- P3 Compensates for individual slope $\frac{\Delta R_{SD}}{\Delta V_{GD}}$ of the F.E.T.
- P4 Linearity adjustment of the FET Attenuator circuit.
- P5 Adjusts for minimum distortion of the FET attenuator.
- P6 Adjusts the threshold level.

Do not attempt to make any adjustments until the current consumption has fallen to a steady level approx. 100 mA after 60 sec. Correct sequence of adjustments is as follows:

a. Bias adjustment of P1

Conditions: No input signal.

Recovery switch in pos. 0.06 sec.

Connect a-DC voltmeter (or DC-oscilloscope sens. approx. 20mV/div.) between TP7 and TP1.
P1 is adjusted until the voltage measured is the same whether TP2 is connected to TP9 or not.

b. Pinch-off adjustment of P2

Conditions: Input signal +6dBu 1kHz

Ratio switch in pos. 1:1

Lim. level switch in pos. "high"

P2 is adjusted until the output voltage is +6dBu (0dB amplification).

The adjustment range can be altered by connecting or disconnecting R15 and/or R16.

c. Slope dB/V and Linearity adjustment of P3 and P4

Conditions: Like referred under pos. b.

A floating external DC-source 0-6 V is connected between term. 3 and 5, term. 3 positive. The DC voltage is set to 3.0 Volt, and P3 is adjusted so that the output level is -9dBu (15 dB attenuation). Now the DC voltage is set to

6.0 Volt, and P4 is adjusted until the output level is -24 dBu (30 dB attenuation). Because of mutual dependence between P3 and P4 the adjustments are repeated until correct output level is obtained.

d. Threshold level adjustment of P6

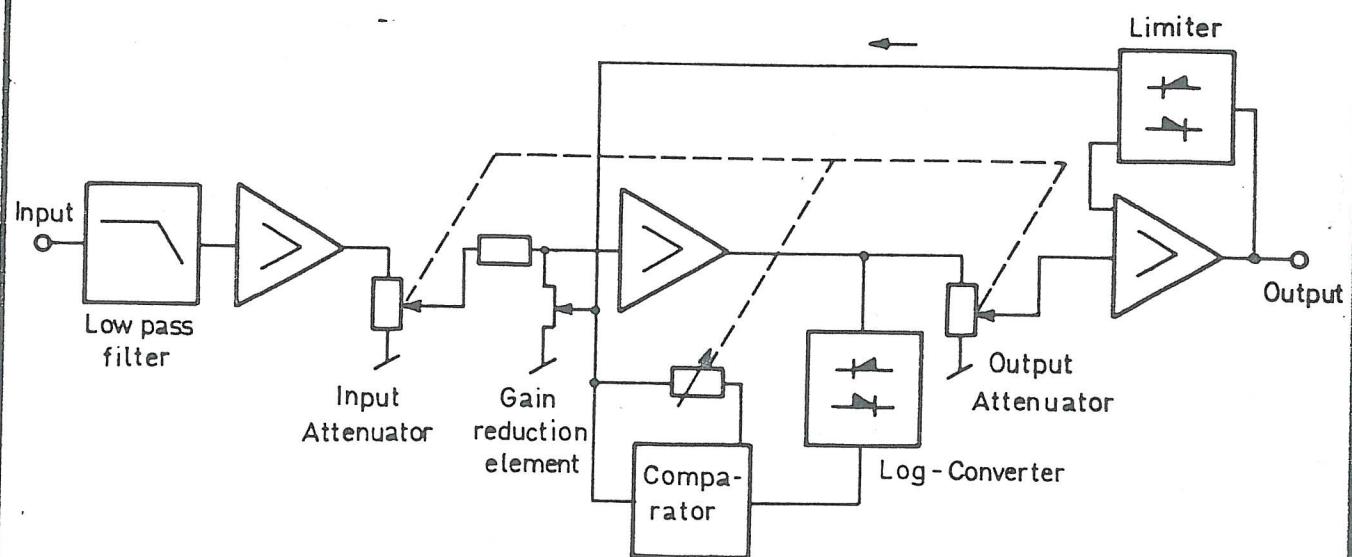
Conditions: Input signal +6 dBu 1kHz
Ratio switch in pos. 20:1
Lim. level switch in pos. "high"
Compression switch in pos. 15 dB

P6 is adjusted to an output level of +6 dBu

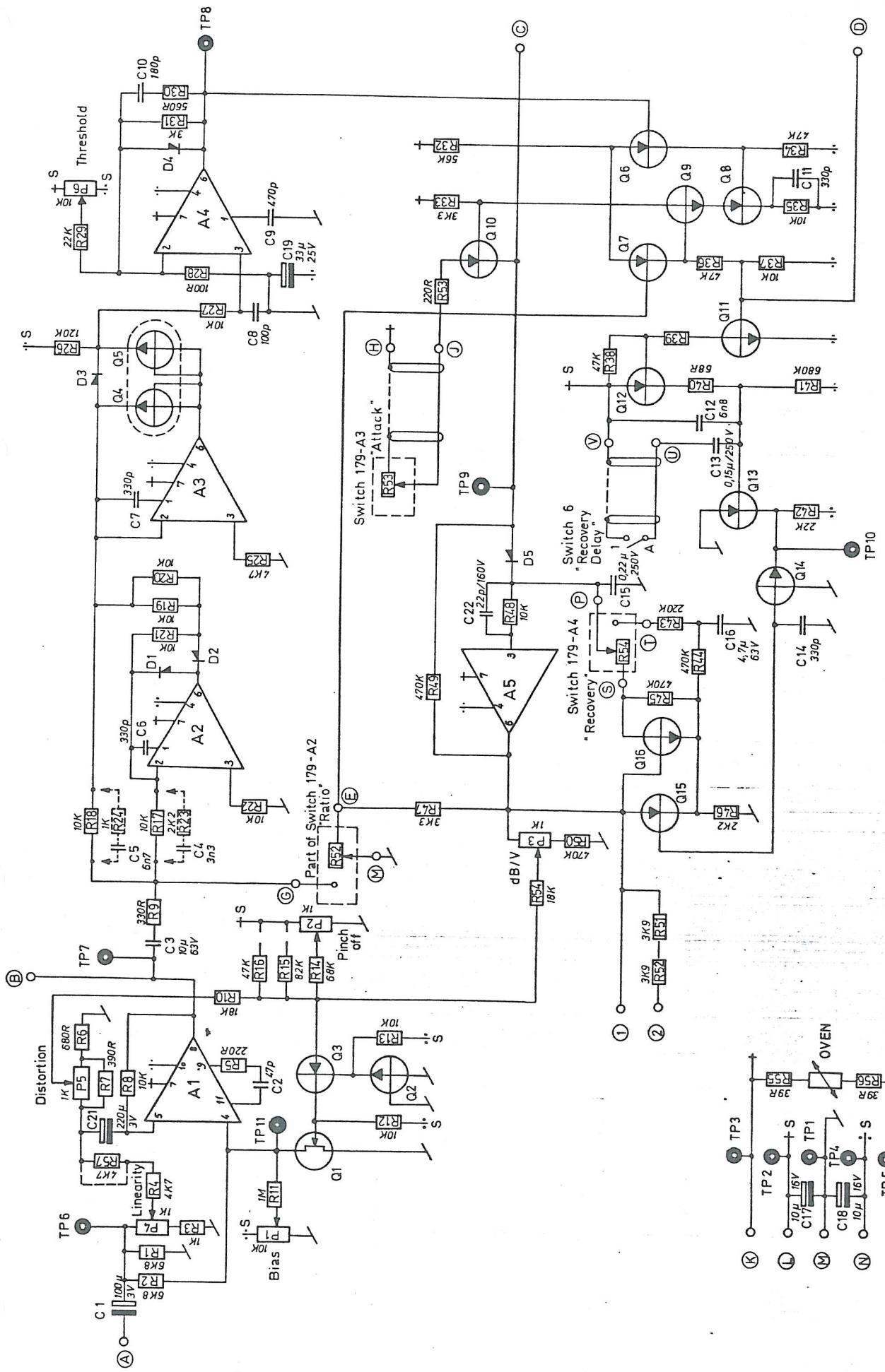
e. Distortion adjustment of P5

Conditions: Ratio switch in pos. 2:1
Input level and the other controls are set like under pos. d.

P5 is adjusted to minimum distortion.
Because of interaction between P5 and P2, the adjustment mentioned under pos. b is carried out once more.

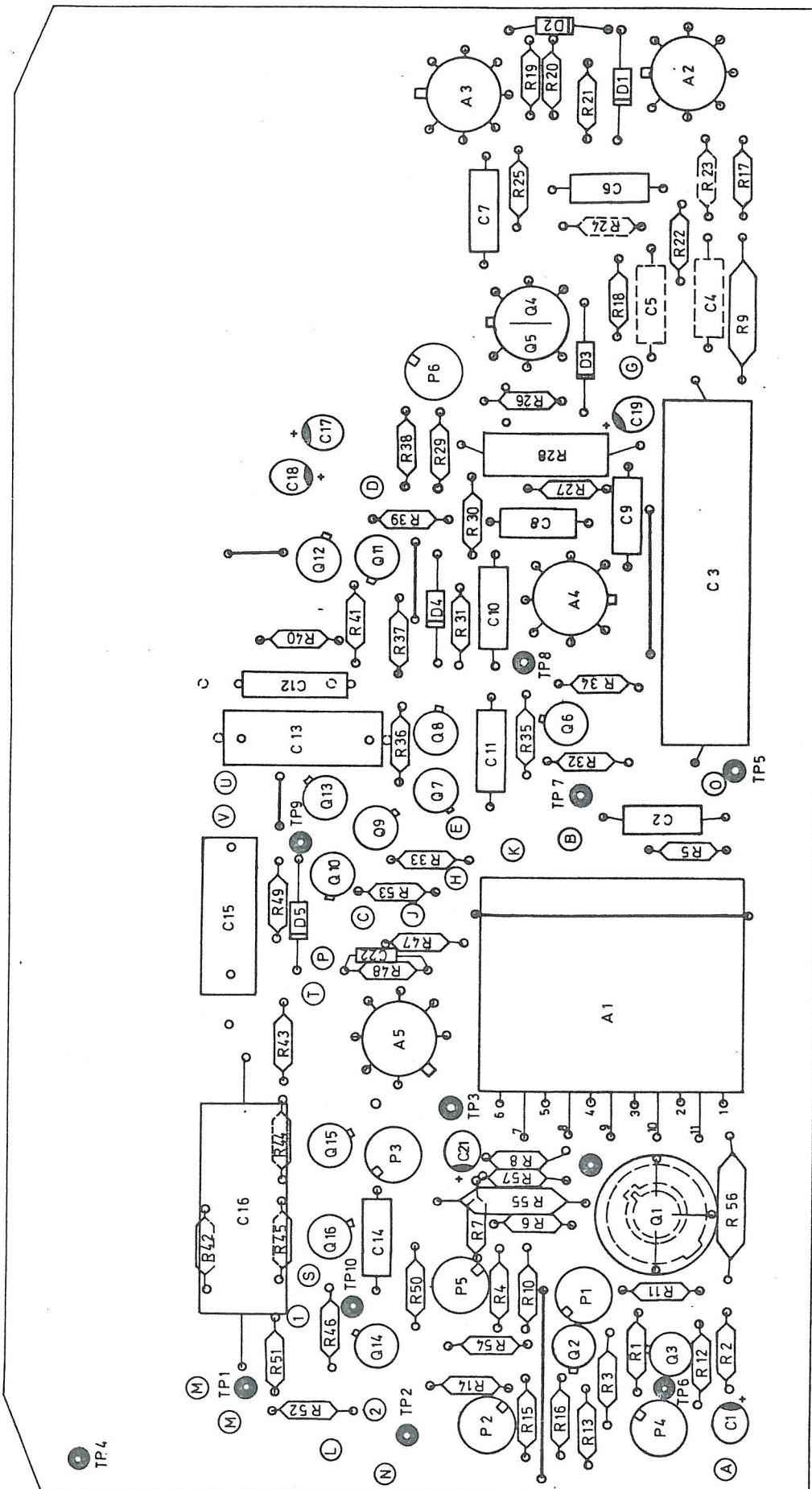


BLOCK DIAGRAM



INGENØRFIRMAN TØNNES PEDERSEN AS	Compressor Amplifier 179 ~ 120	Tegn. 10-5-71, 1W
Målestok + mm + 0	Behandl. Del af Antal	Godk. 3. M.
Tolerancemateriale		TEGNING NR.

Compressor Card 179 - 1240
Diagram



Mållestok	2:1	INGENIØRFIRMA N. TØNNES PEDERSEN & Co	Tegn.	9 - 6 - 71 1W
Toleranse	± mm ± °	Compressor Amplifier	Code.	B.M.
Materiale		179 - 120		TEGNING NR.
Behandl.				179 - 1241 A-3
Del af				
Areal				

Ref. no.	Qty.	Description	Value / Size			Type no.	Manufacturer
R51	1	Resistor, carbon	39R	1/8W	5%	SBB 0207	Beyschlag
R5,53	2	" , "	220R	"	"	"	"
R 7	1	" "	390R	"	"	"	"
R50	1	" "	470R	"	"	"	"
R30	1	" "	560R	"	"	"	"
R 6	1	" "	680R	"	"	"	"
R 3	1	" "	1k	"	"	"	"
R46	1	" "	2k2	"	"	"	"
R31	1	" "	3k	"	"	"	"
R33,47	2	" "	3k3	"	"	"	"
R52	1	" "	3k9	"	"	"	"
R 4,25,57	3	" "	4k7	"	"	"	"
R1, 2	2	" "	6k8	"	"	"	"
R 8,12,13, 17-22,27, 35,37,48	13	" "	10k	"	"	"	"
R10,54	2	" "	18k	"	"	"	"
R29,42	2	" "	22k	"	"	"	"
R16,34,36, 38,39	5	" "	47k	"	"	"	"
R32	1	" "	56k	"	"	"	"
R14,40	2	" "	68k	"	"	"	"
R15	1	" "	82k	"	"	"	"
R26	1	" "	120k	"	"	"	"
R43	1	" "	220k	"	"	"	"
R44,45,49	3	" "	470k	"	"	"	"
R41	1	" "	680k	"	"	"	"
R11	1	" "	1M	"	"	"	"
R55,56	2	" "	39R	1/3W	"	"	"
R9	1	" "	330R	"	"	"	"
R28	1	" "	100R	1W	"	"	Vitrohm 253g
P 2- 5	4	Potmeter, trim	1k			3329H-102	Bourns
P 1, 6	2	" "	10k			3329H-103	"
C22	1	Capacitor, styroflex	22p	160V			Siemens
C 2	1	" "	47p		5%	B31310	"
C 8	1	" "	100p		"	B31310	"
C10	1	" "	180p		"	B31310	"
C6,7,11,14	4	" "	330p		"	B31310	"
C 9	1	" "	470p		"	B31310	"
C12	1	" "	6n8		"	B31310	"
C13	1	" , polyester	0,15u	250V	10%	B32234	"
C15	1	" "	0,22u	"	"	B32234	"
C16	1	" "	4u7	63V	"	MKT1813-547/06	"
C 3	1	" "	10u	"	"	MKT1813-547/06	"
C17,18	2	" , tantal	10u	16V		ETP 2	ERO
C19	1	" "	33u	25V		ETP 3	"
C 1	1	" "	100u	3V		ETP 3	"
C21	1	" "	220u	"		ETP 4	"
D 1- 5	5	Diode				1N4148	Texas
Q 1	1	Transistor				179-1218-A-4	NTP
Q 2, 9,11, 14,16	5	"	Si 216N.spec.			BC 237 B	Siemens



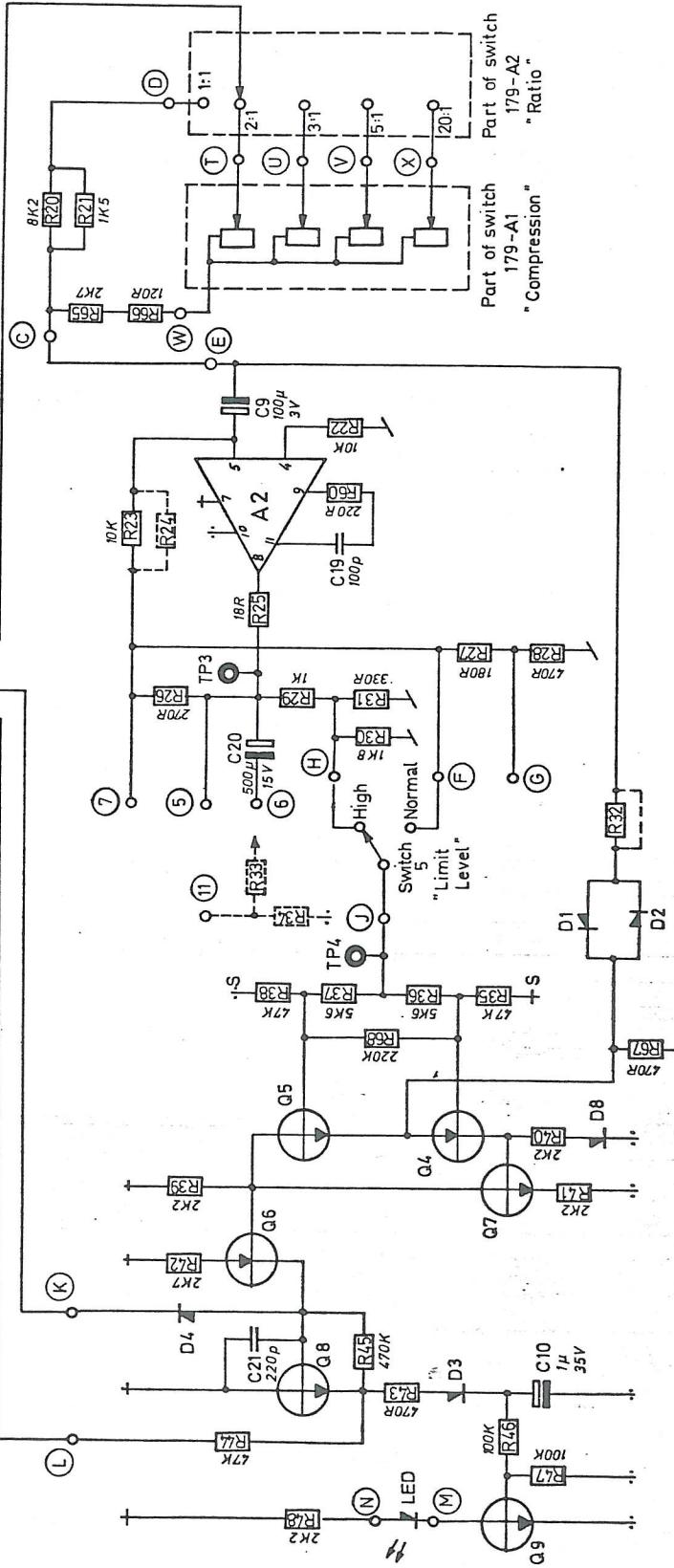
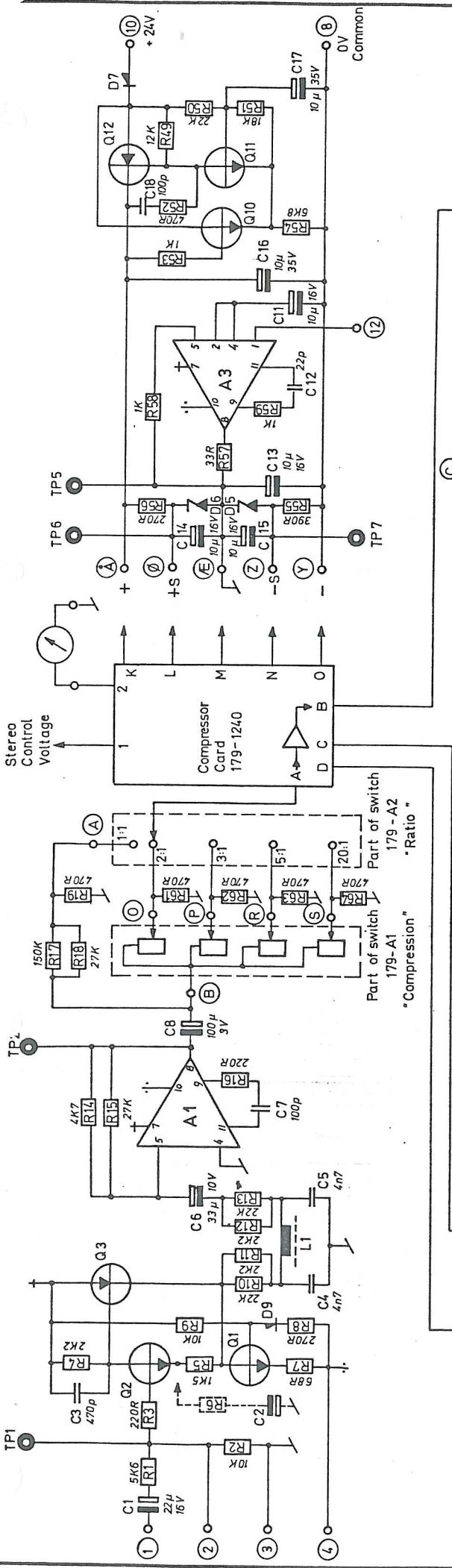
COMPRESSOR AMPLIFIER 179-120
 COMPRESSOR CARD 179-1240
 ELECTRICAL PARTSLIST

Partlist

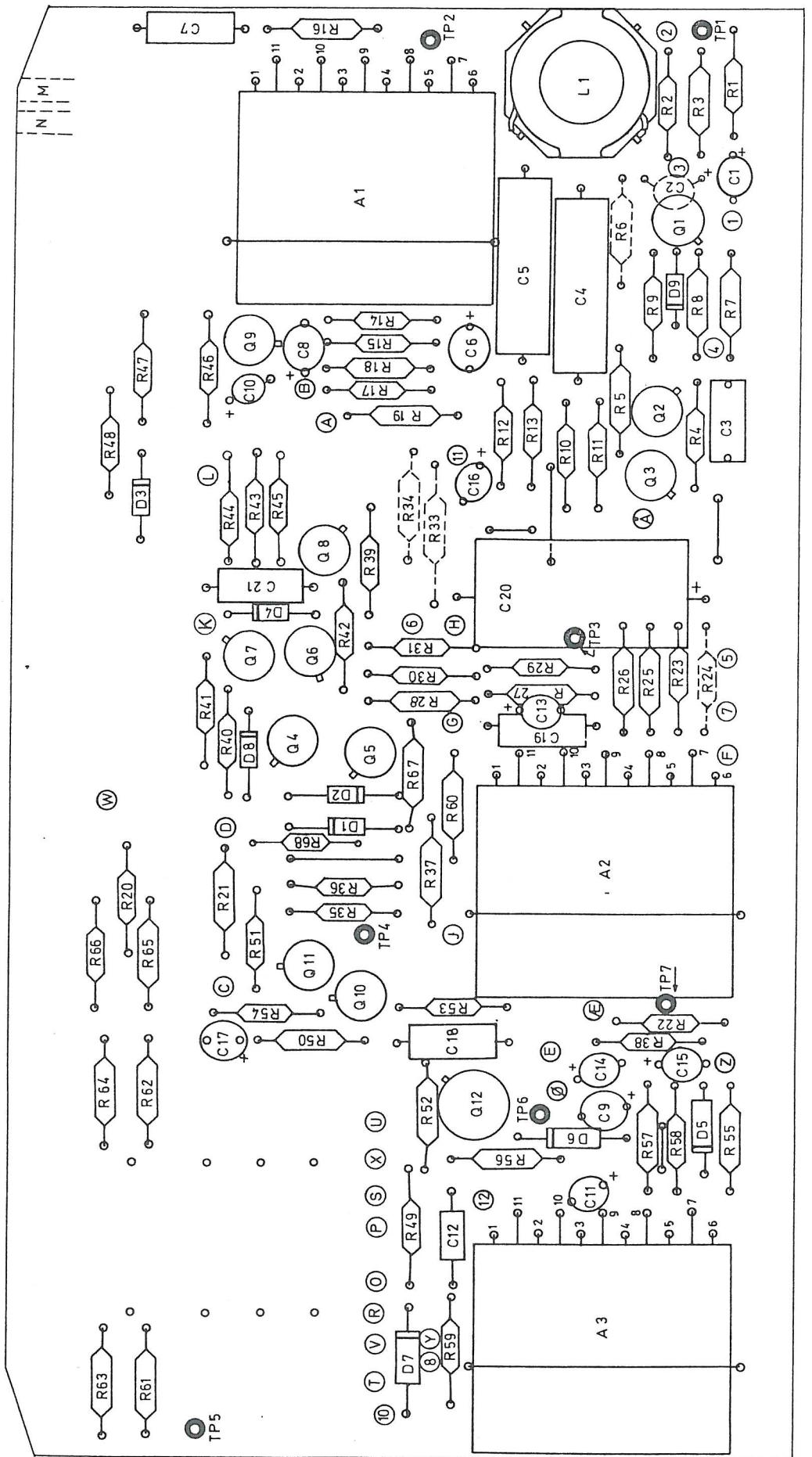
Page 1 of 2

No.: 179-1231-A-3

Ref. no.	Qty.	Description	Value / Size	Type no.	Manufacturer
Q 3, 6- 8, 10,12,13, 15	8	Transistor		BC 307 B	Siemens
Q 4, 5	2	" , dual		MD 8001	Motorola
A 2- 4	3	Op-amp		LM 301	National
A 5	1	"		LM310	"
A 1	1	Lin-amp		M100	NTP
		Transistor Oven	To-18 80°C	5 ST 1-2	JERMYN
	10	Copper tube rivets		S 6086	United Shoe
	12	Transistor spacers		To 18-002	
		P.C. Board		179-1240-B	NTP



INGENIORFIRMAN TØNNES PEDERSEN A/S	Tegn.	13-5-71. IW
Compressor Amplifier 179-120	Gedt.	B.H.
Amplifier Card 179-1242	TEGNING NR.	179 - 1232 - A - 3
Diagram		



Målestok Toleranc Behandl. Antal	2 : 1 + mm + Det af Antal	INGENIØRFIRMAN TØNNES PEDERSEN A/S Compressor Amplifier 179 - 120	Tegn. 3-5-71 W Godk. 3 4.
Material Materiale Det af Antal	Amplifier Card 179 - 120 Component Layout	TEGNING NR. 179 - 1203-A3	

11/12-73 W (tilføjet R68)

12/10-73 W

Korttegning 4.14.1.199

Ref. no.	Qty.	Description	Value / Size			Type no.	Manufacturer
R25	1	Resistor, carbon	18R	1/8W	5%	SBB 0207	Beyschlag
R57	1	" "	33R	"	"	" "	"
R 7	1	" "	68R	"	"	" "	"
R66	1	" "	120R	"	"	" "	"
R17	1	" "	150R	"	"	" "	"
R27	1	" "	180R	"	"	" "	"
R 3,16,60	3	" "	220R	"	"	" "	"
R 8,26,56	3	" "	270R	"	"	" "	"
R55	1	" "	390R	"	"	" "	"
R19,28,43, 52,61-64, 67	9	" "	470R	"	"	" "	"
R29,53,58, 59	4	" "	1k	"	"	" "	"
R 5,21	2	" "	1k5	"	"	" "	"
R30	1	" "	1k8	"	"	" "	"
R 4,11,12, 39-41,48	7	" "	2k2	"	"	" "	"
R42,65	2	" "	2k7	"	"	" "	"
R14	1	" "	4k7	"	"	" "	"
R 1,36,37	3	" "	5k6	"	"	" "	"
R54	1	" "	6k8	"	"	" "	"
R20	1	" "	8k2	"	"	" "	"
R 2, 9,22, 23	4	" "	10k	"	"	" "	"
R49	1	" "	12k	"	"	" "	"
R51	1	" "	18k	"	"	" "	"
R10,13,50	3	" "	22k	"	"	" "	"
R15,18	2	" "	27k	"	"	" "	"
R35,38,44	3	" "	47k	"	"	" "	"
R46,47	2	" "	100k	"	"	" "	"
R68	1	" "	220k	"	"	" "	"
R31	1	" "	330k	"	"	" "	"
R45	1	" "	470k	"	"	" "	"
C12	1	Capacitor, styroflex	22p	5%	B31110	Siemens	
C 7,18,19	3	" "	100p	"	B31310	"	
C21	1	" "	220p	"	B31310	"	
C 3	1	" "	470p	"	B31310	"	
C 4, 5	2	" , polycarbon.	4n7	250V	2222-426-44702	Philips	
C10	1	" , tantal	lu	35V	ETP 1	ERO	
C11,13-15	4	" "	10u	16V	ETP 2	"	
C16,17	2	" "	10u	35V	ETP 2	"	
C 1	1	" "	22u	16V	ETP 3	"	
C 6	1	" "	33u	10V	ETP 3	"	
C 8, 9	2	" "	100u	10V	ETP 3	"	
C20	1	" , ellyt	470u	16V	EB	"	
D 7	1	Diode			1N4002		
D 3,4,8,9	4	"			1N4148		
D 1, 2	2	"			BAX 13	Texas	
D 5,6	2	" , ref.			1N821		
Q1,2,5,7-11	8	Transistor			BC 237 B	Siemens	
Q 3,4,6	3	"			BC 307 B	"	
Q12	1	"			BC 327-16	"	



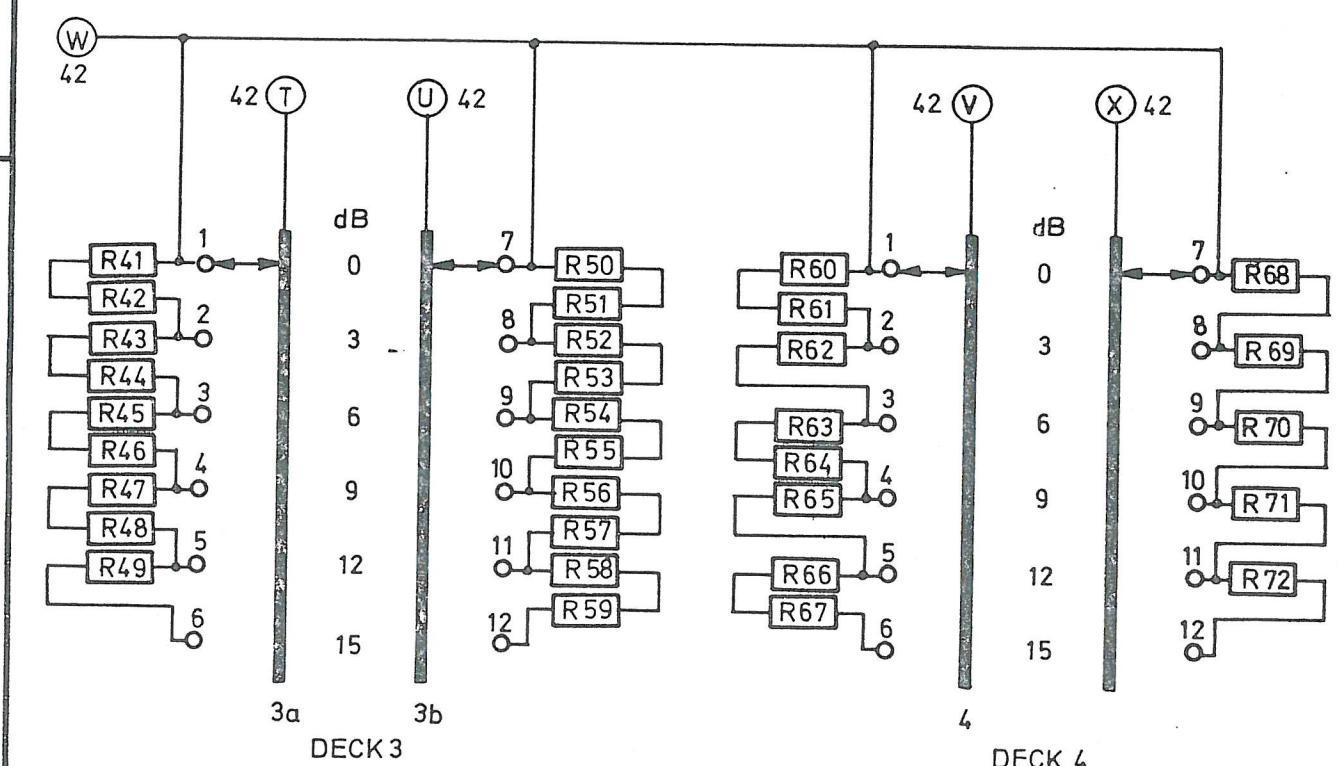
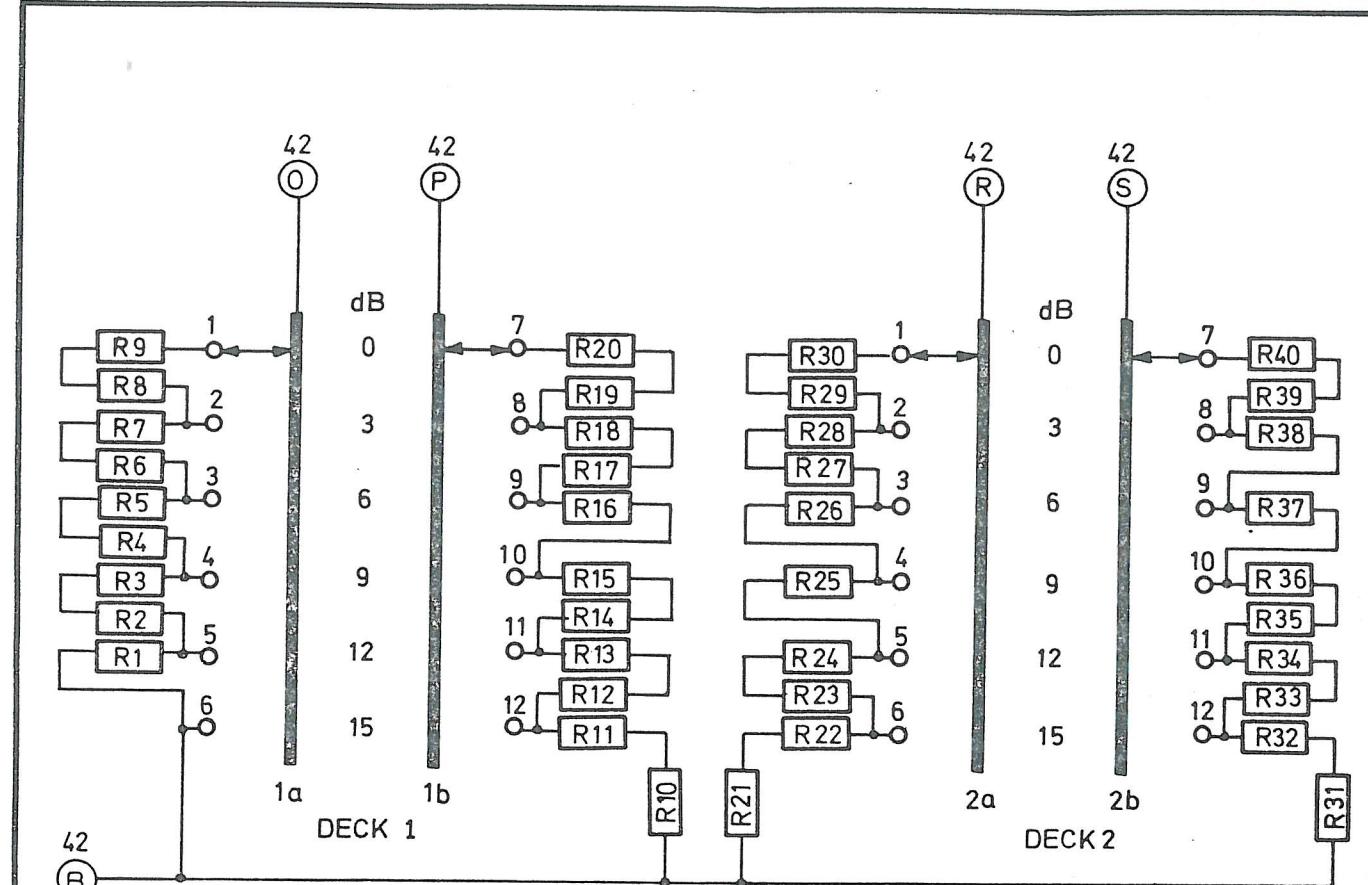
COMPRESSOR AMPLIFIER 179-120
AMPLIFIER CARD 179-1242
ELECTRICAL PARTSLIST

Partslist

Page 1 of 2

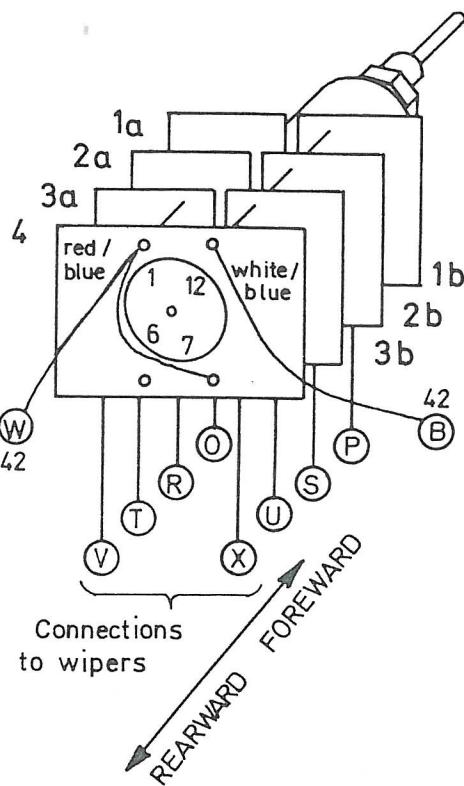
No.: 179-1233-A-3

Ref. no.	Qty.	Description	Value / Size	Type no.	Manufacturer
A 1- 3	3	Op-amp		M-100	NTP
L 1	1	Coil consists of: Potcore Bobin Tag plate Spring	B65651-K0250-A022 B65652-A0000-M001 B65655-A0007-X000 8 x 11	179-1217-A-4	Siemens " " "
	7	Copper Tube rivets		S6086	United Shoe
	11	Transistor Spacers		To-18-002	
	1	" "		to-518-003	
		P.C. Board		179-1242-B-3	NTP



Målestok		INGENIØRFIRMA N. TØNNES PEDERSEN A/s	
Tolerance	+ mm + 0	Tegn.	13-5-71 I.W.
Materiale		Godk.	
Behandl.			TEGNING NR.
Del af		Function : Compression	179 - A130-A-4
Antal			

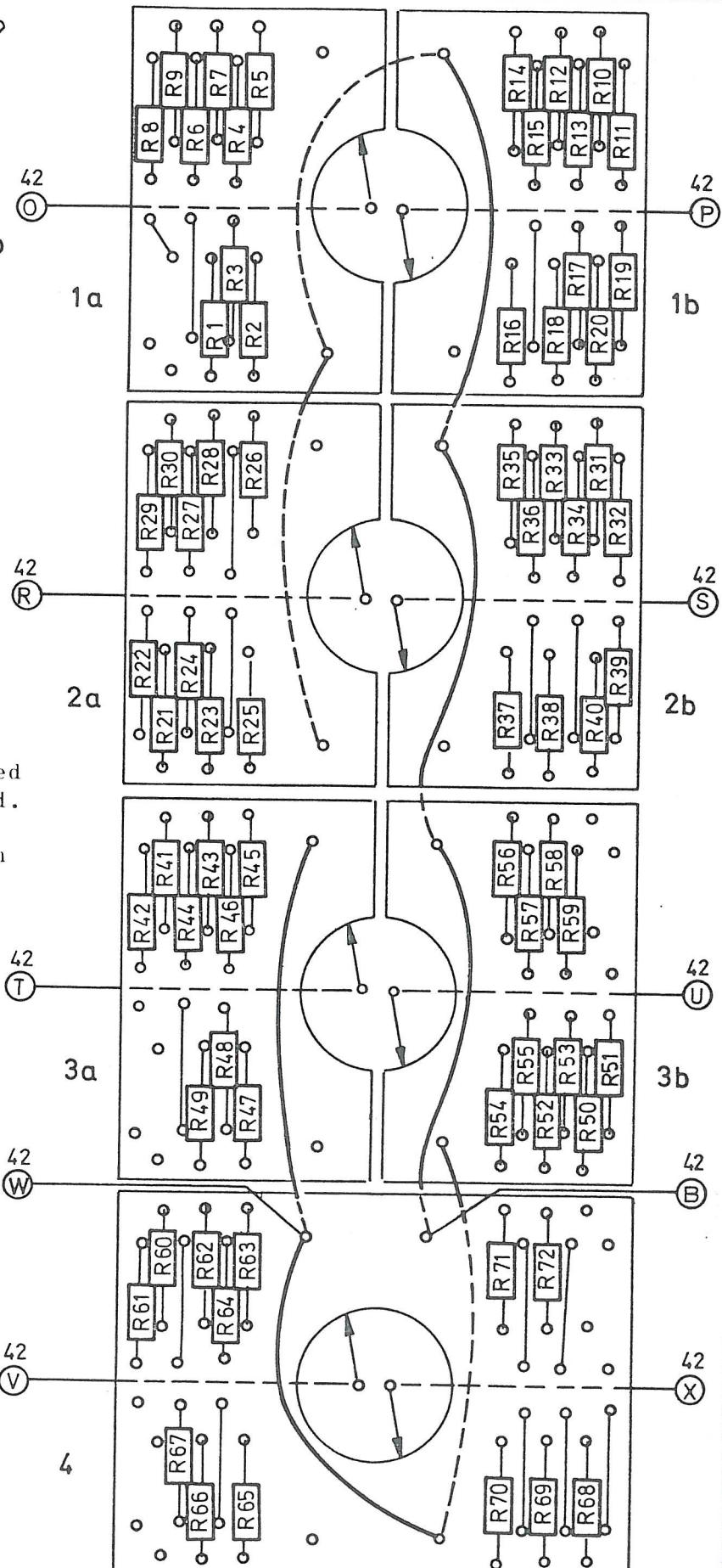
Switch Unit 179 - A1 (part of 179-120)



Component side of printed circuits facing rearward.

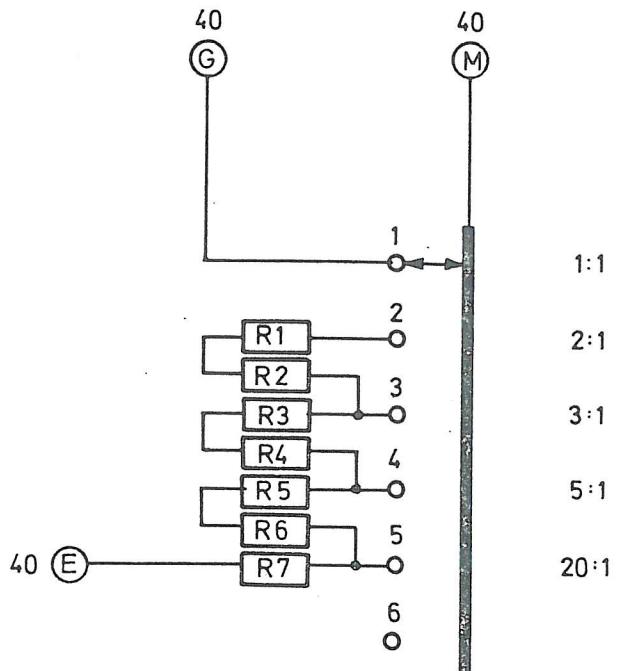
Switch unit assembled in the following order:

- 1 : wires soldered to wipers
- 2 : deck 4
- 3 : decks 3b and 3a
- 4 : decks 2b and 2a
- 5 : decks 1b and 1a
- 6 : interconnections between decks connected.

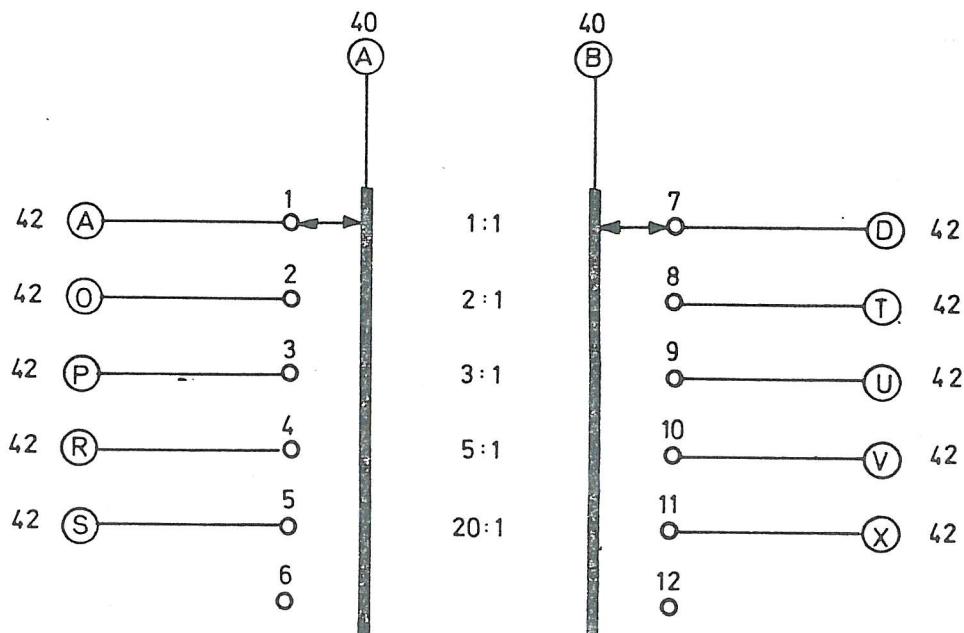


Målestok	2:1	INGENIØRFIRMA N. TØNNES PEDERSEN A/s	Tegn.	12-5-71. IW
Tolerance	+ mm + 0			
Materiale		Switch Unit 179-A1 (part of 179-120)	Godk.	
Behandl.		Function: Compression	TEGNING NR.	
Del af		Component Lay - out		179 - A141-A-4
Antal				

Ref. no.	Qty.	Description	Value / Size			Type no.	Manufacturer
R61	1	Resistor, carbon	33R	1/8W	5%	SBB 0207	Beyschlag
R64	1	" "	39R	"	"	" "	"
R34,69	2	" "	47R	"	"	" "	"
R15,22,51, 57,68,70, 71,72	8	" "	56R	"	"	" "	"
R11,13,36, 53,67	5	" "	68R	"	"	" "	"
R55,59	2	" "	82R	"	"	" "	"
R 4,24	2	" "	100R	"	"	" "	"
R46	1	" "	120R	"	"	" "	"
R42,44	2	" "	150R	"	"	" "	"
R32	1	" "	180R	"	"	" "	"
R27,60	2	" "	220R	"	"	" "	"
R19,62,63	3	" "	270R	"	"	" "	"
R 1, 2, 3, 17,29,65	6	" "	330R	"	"	" "	"
R 6,10,66	3	" "	390R	"	"	" "	"
R12,39,48, 50	4	" "	470R	"	"	" "	"
R 8,23,52	3	" "	560R	"	"	" "	"
R33,54	2	" "	680R	"	"	" "	"
R14,21,56	3	" "	820R	"	"	" "	"
R25,35,41, 58	4	" "	1k	"	"	" "	"
R 5,31	2	" "	1k2	"	"	" "	"
R16,26,37, 43	4	" "	1k5	"	"	" "	"
R 7,18,28, 38,45	5	" "	2k2	"	"	" "	"
R40,47	2	" "	2k7	"	"	" "	"
R30	1	" "	3k3	"	"	" "	"
R20	1	" "	3k9	"	"	" "	"
R 9,49	2	" "	4k7	"	"	" "	"
RS	1	Switch				Mx4/8x6k, t = 12	EBE
PC	4	P.C. Boards				182-9040	NTP
3 of the P.C. Boards are divided into halves.							

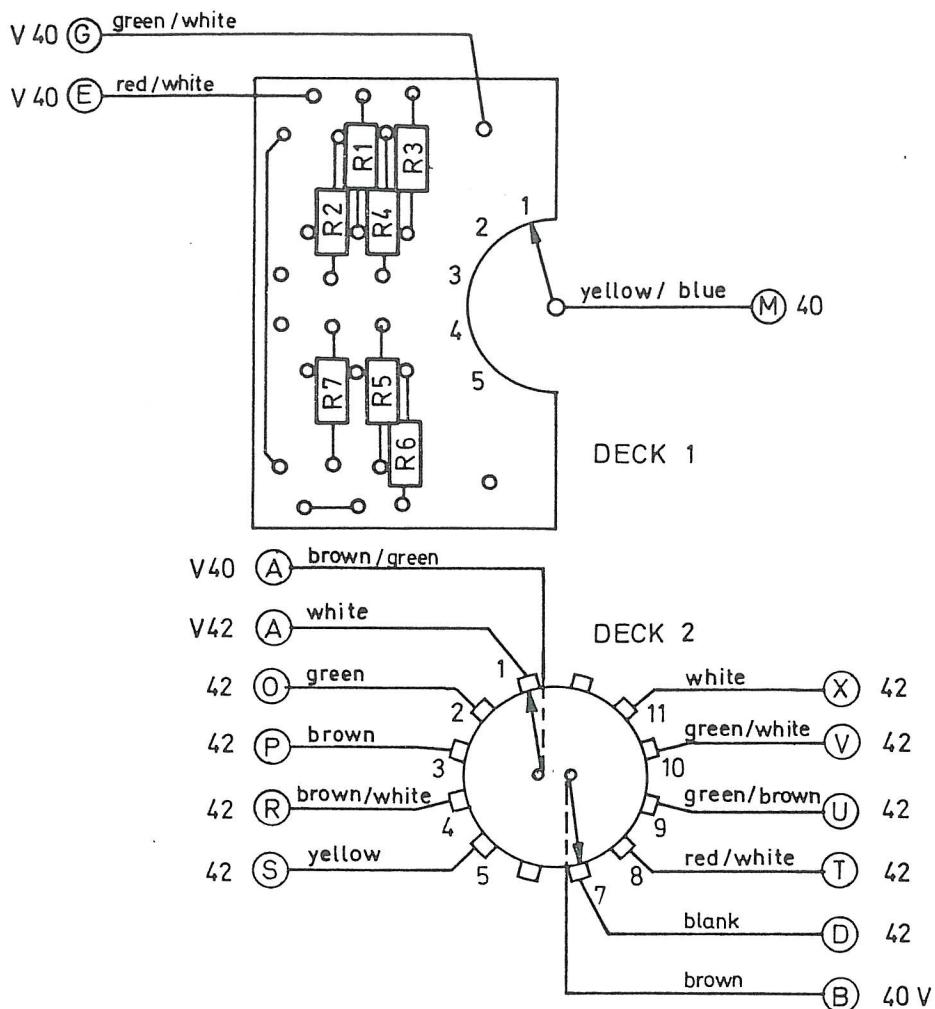


DECK 1



DECK 2

Målestok		INGENIØRFIRMA N. TØNNES PEDERSEN A/s	Tegn.	12-5-71. IW
Tolerance	\pm mm \pm 0	Switch Unit 179-A2 (part of 179-120)		
Materiale			Godk.	
Behandl.		Function : Ratio	TEGNING NR.	
Del af		Diagram		179 -A230 - A-4
Antal				



Riser 3/6-71 /W 6-1-76. T.L.

Målestok	2 : 1	INGENIØRFIRMA N. TØNNES PEDERSEN A/s	Tegn.	11-5-71 IW
Tolerance	\pm mm \pm 0		Godk.	
Materiale		Switch Unit 179-A2 (part of 179-120)		
Behandl.		Function : Ratio	TEGNING NR.	
Del af		Component Lay - out		179- A 241- A-4
Antal				

Ref. no.	Qty.	Description	Value / Size	Type no.	Manufacturer	
R 6	1	Resistor, carbon	33R	1/8W	5%	
R 4, 7	2	" "	82R	"	"	Beyschlag
R 2	1	" "	150R	"	"	"
R 5	1	" "	330R	"	"	"
R 3	1	" "	470R	"	"	"
R 1	1	" "	1k8	"	"	"
RS	1	Switch		Mx2/4x5k, T = 12	EBE	
PC	1/2	P.C. Board		182-9040	NTP	

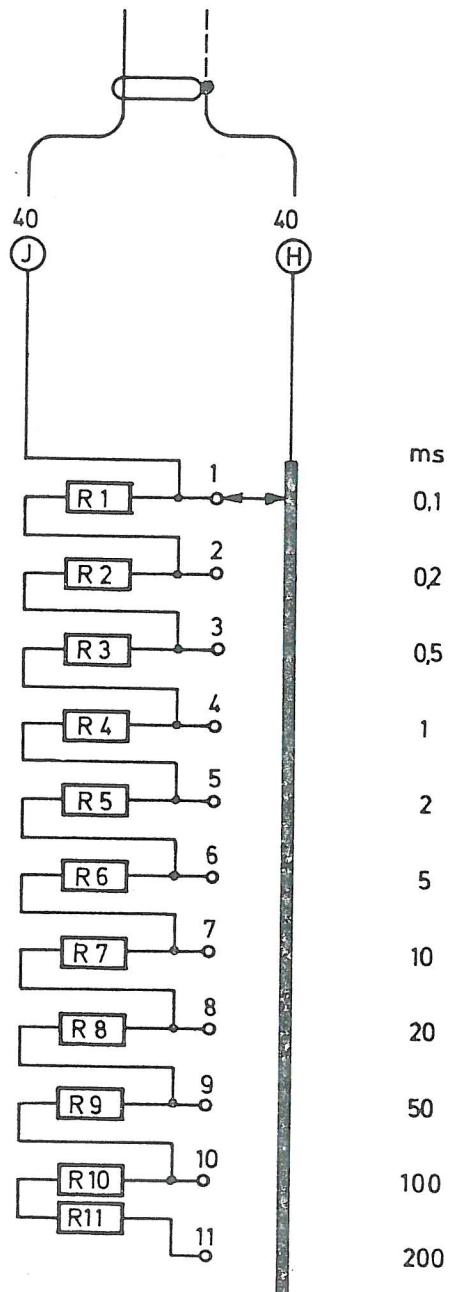


SWITCH UNIT 179-A2 (part of 179-120)
ELECTRICAL PARTSLIST

Partslist

Page 1 of 1

No.: 179-A231-A-3



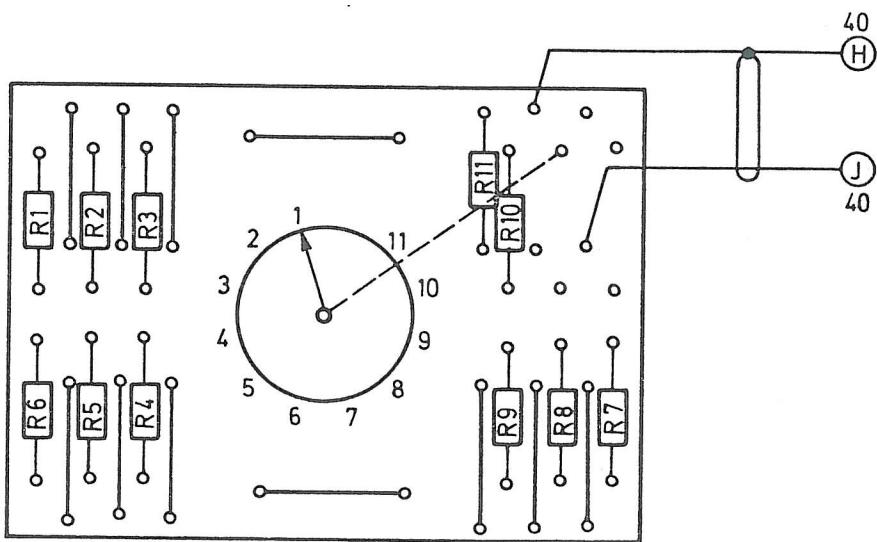
Note :

R11 is only used in 179-140 !

Strap in 179-120

Retteiser

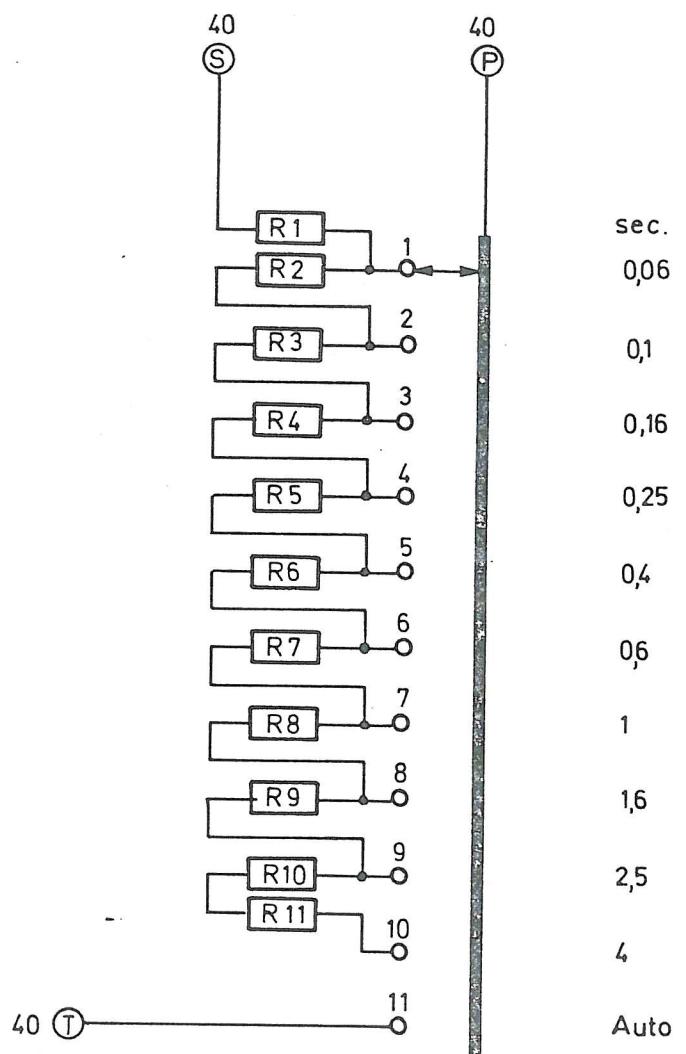
Pos.:	Antal:	Materiale:	Behandl.	Del af
Målestok :				
Tolerance : \pm mm				
Tegnet : 2-2-77 TL				
Godkendt:				
Revideret :				
Switch Unit 179 - A3 (Part of 179-140)				NTP NTP ELEKTRONIK A/S
Funcion: Attack				179 - A330 - A - 4
Diagram				



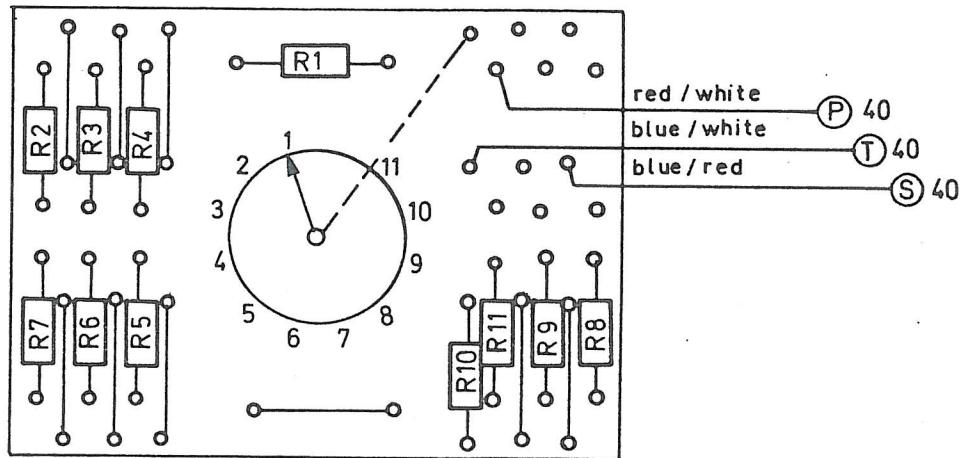
Pos :	Antal :	Materiale :	Behandl.	Del af
Målestok :				
Tolerance: \pm mm				
Tegnet : 2-2-77 TL				
Godkendt:				
Revideret :				
Switch Unit 179-A3 (Part of 179-140)				NTP NTP ELEKTRONIK A/S
Function: Attack				
Components Lay-out				179-A 341-A-4

Ref. no.	Qty.	Description	Value / Size			Type no.	Manufacturer
R 1	1	Resistor, carbon	220R	1/8W	5%	SBB 0207	Beyschlag
R 2	1	" "	680R	"	"	" "	"
R 3	1	" "	1k2	"	"	" "	"
R 4	1	" "	2k2	"	"	" "	"
R 5	1	" "	6k8	"	"	" "	"
R 6	1	" "	12k	"	"	" "	"
R 7	1	" "	27k	"	"	" "	"
R 8	1	" "	82k	"	"	" "	"
R 9	1	" "	180k	"	"	" "	"
R11	1	" "	270k	"	"	" "	"
R10	1	" "	330k	"	"	" "	"
RS	1	Switch				Mx1/lx11k; T = 12	EBE
PC	1	P.C. Board				182-9040	NTP
Note: R11 is only used in 179-140 ! Strap in 179-120.							





Målestok		INGENIØRFIRMA N. TØNNES PEDERSEN A/s	Tegn.	12-5-71 IW
Tolerance	± mm ± 0			
Materiale		Switch Unit 179 - A4 (part of 179 120)	Godk.	
Behandl.			TEGNING NR.	
Del af		Function : Recovery		
Antal		Diagram		179-A430-A-4



Målestok	2:1	INGENIØRFIRMA N. TØNNES PEDERSEN A/s	Tegn.	11-5-71-IW
Tolerance	\pm mm \pm 0			
Materiale		Switch Unit 179 - A4 (part of 179-120)	Godk.	
Behandl.				TEGNING NR.
Del af		Function : Recovery		179 - A441 - A4
Antal		Component Lay - out		

Ref. no.	Qty.	Description	Value / Size			Type no.	Manufacturer
R 2	1	Resistor, carbon	33k	1/8W	5%	SBB 0207	Beyschlag
R 3	1	" "	39k	" "	" "	" "	"
R 1	1	" "	47k	" "	" "	" "	"
R 4	1	" "	68k	" "	" "	" "	"
R 5	1	" "	120k	" "	" "	" "	"
R 6	1	" "	180k	" "	" "	" "	"
R 7	1	" "	390k	" "	" "	" "	"
R10	1	" "	470k	" "	" "	" "	"
R 8	1	" "	560k	" "	" "	" "	"
R 9	1	" "	680k	" "	" "	" "	"
R11	1	" "	1M	" "	" "	" "	"
RS	1	Switch	Mx1/1x11k; T = 12			EBE	
PC	1	P.C. Board	182-9040			NTP	



SWITCH UNIT, 179-A4 (part of 179-120)
ELECTRICAL PARTSLIST

Partslist

Page 1 of 1

No.: 179-A431-A-3