



LIMITER AMPLIFIER
179-240 and 179-240-B

A

Contents:

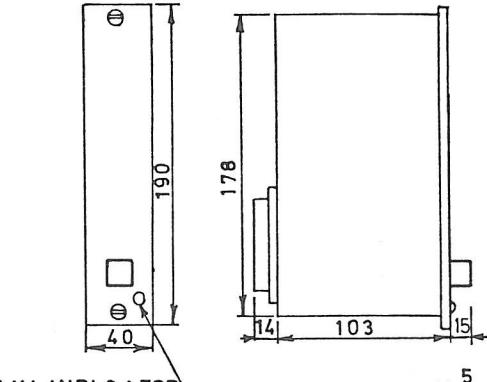
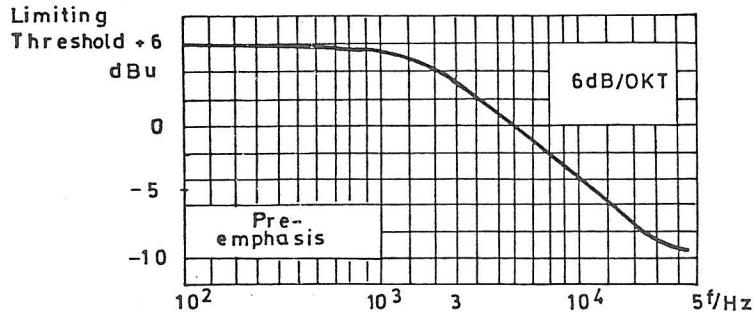
- Technical Specification
- Instruction for Alignment
- Diagram
- Component Lay-out
- Parts list

Draw. No. :

- 179-2411-A4
- 179-2322-A4
- 179-2430-A3 (B3)
- 179-2441-A3
- 179-2431-A4

Supply Voltage	:	24 V dc $\pm 10\%$
Maximum Ripple Voltage	:	0,1 V pp
Current Consumption, steady state	:	appr. 75 mA
Current Consumption, during heat-up	:	200 mA
Temperature Range	:	-20°C to +60°C (-40°F to +140°F)
Frequency Response	:	$\pm 0,5$ dB 20 Hz to 20 kHz
Input Impedance 20 Hz to 20 kHz	:	22 kOhms $\pm 10\%$ floating
Output Impedance 20 Hz to 20 kHz	:	20 Ohms floating
Input Overload level	:	+21 dBu (8,6 V rms)
Minimum load	:	200 Ohms
Basic Amplification	:	0 $\pm 0,5$ dB
Limiting threshold, ref. to output	:	+6 dBu (1,55 V rms) $\pm 0,5$ dB ¹⁾
Limiting Range	:	>30 dB
Distortion 20 Hz to 20 kHz	:	0 to 15 dB lim. 0,3%
Attack Time	:	1,5 msec. ¹⁾
Recovery Time dual time constants	:	200 msec. upon 15 sec.
Control Voltage in- and output (Instr.etc.)	:	1 V/5 dB ref. to pin 5 ²⁾
Signal to Noise Ratio at lim. threshold	:	86 dB A-curve
Standard colour	:	Dull black
Connector	:	Tuchel T 2700
Mechanical Outlines	:	see drawing

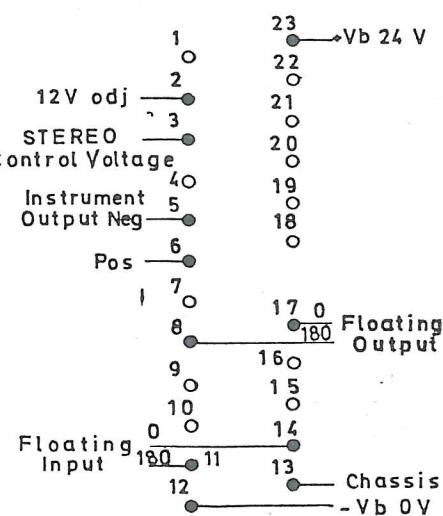
A Pre-emphasis: 50 μ sec. (normally not connected)



1.) The attack time is combined with a full-wave logarithmic clipping circuit. The limiting threshold stated above applies to steady state conditions. Peaks shorter than 1,5 msec. will be limited at a level max. 3 dB above steady state conditions.

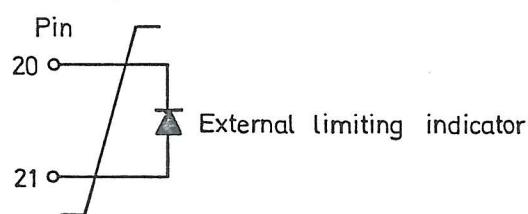
2.) Stereo Operation:
The Control Voltage of two units may be linked so as to obtain equal gain reduction in the two stereo channels. By cutting the connection between the two terminals L and M it is possible to apply an external control voltage to pin 3 giving a gain reduction of 5 dB per Volt up to 30 dB reduction.

Specifications subject to change.



Note: The B-version is without ON-OFF switch.

Tuchel connector



NOTE !

This modification is only valid on
Limiter amplifiers 179-240 serial numbers
11353 to 11380, delivered to F.F.V. Sweden



Normally the Limiter 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. A2
- P2 Compensates for individual pinch-off of the F.E.T. (Q1)
- P3 Compensates for individual slope $\frac{R_{SD}}{V_{GD}}$ of the F.E.T.
- P4 Linearity adjustment of the FET Attenuator circuit.
- P5 Adjustments for minimum distortion of the FET Attenuator.

Do not attempt to make any adjustments until the current consumption has fallen to a steady level approx. 75mA after 60 sec. Correct sequence of adjustments is as follows:

a. Bias adjustment of P1

Conditions: No input signal.

Connect a DC voltmeter (or DC-oscilloscope sens. approx. 20mV/div.) between TP3 and TP2.

P1 is adjusted until the voltage measured is the same whether TP 1 is connected to T2 or not.

b. Pinch-off adjustment of P2

Conditions: Input signal +6dBu 1kHz

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

The adjustment range can be altered by connecting or disconnecting R4 and / or R5.

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

Conditions: Like referred under pos. b.

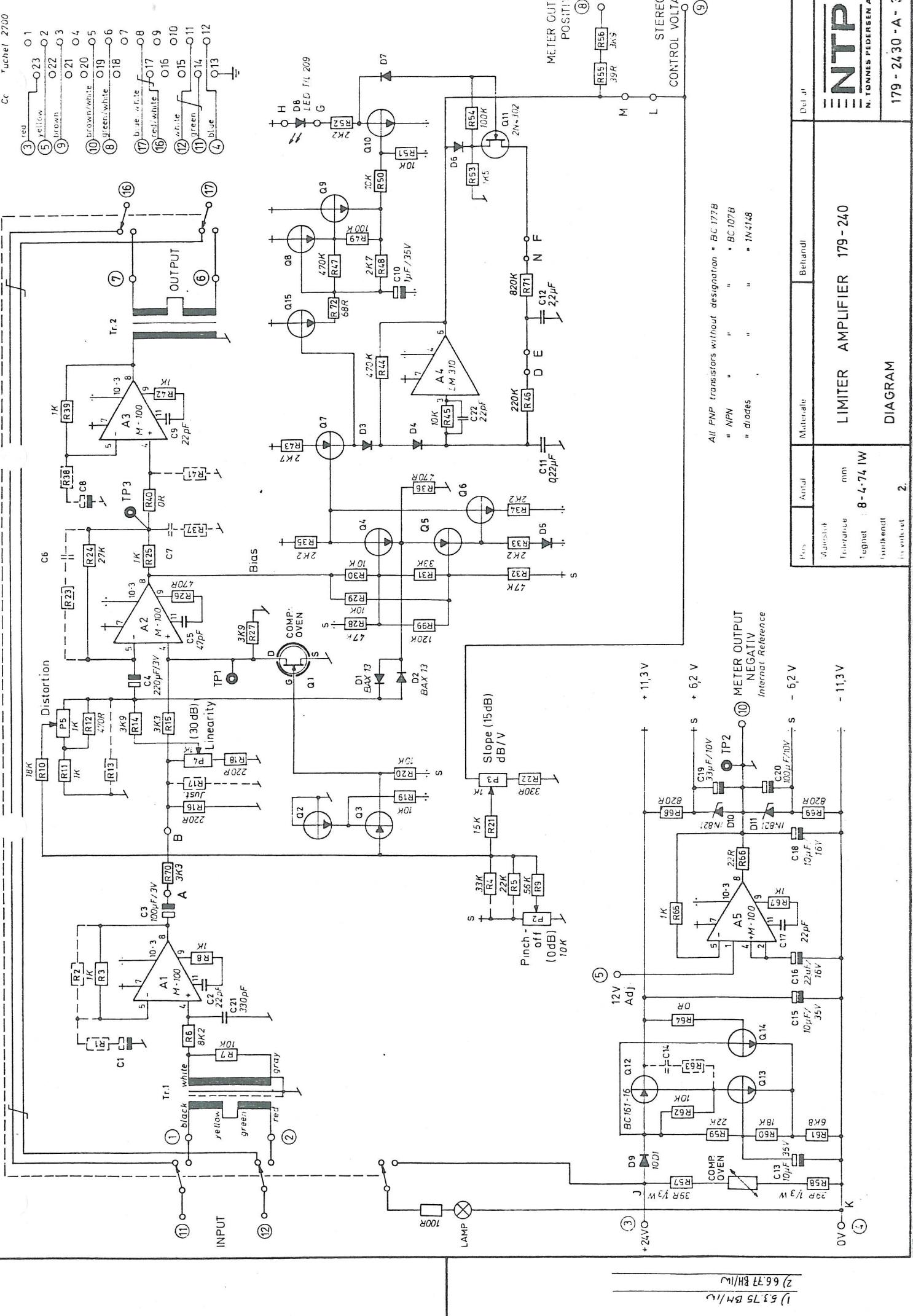
A floating external DC-source 0-6 V is connected between terminal 3 and 5, terminal 3 positive. The DC voltage is set to 3.0 Volt, and P3 is adjusted so that the output level is -9dBu (15 dB attenuation). Now the DC voltage is set to 6.0 Volt, and P4 is adjusted until the output level is -24dBu (30 dB attenuation). Because of mutual dependence between P3 and P4 the adjustments are repeated until correct output level is obtained.

e. Distortion adjustment of P5.

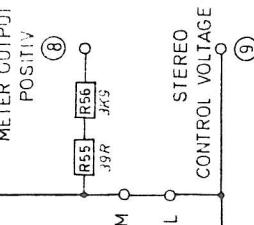
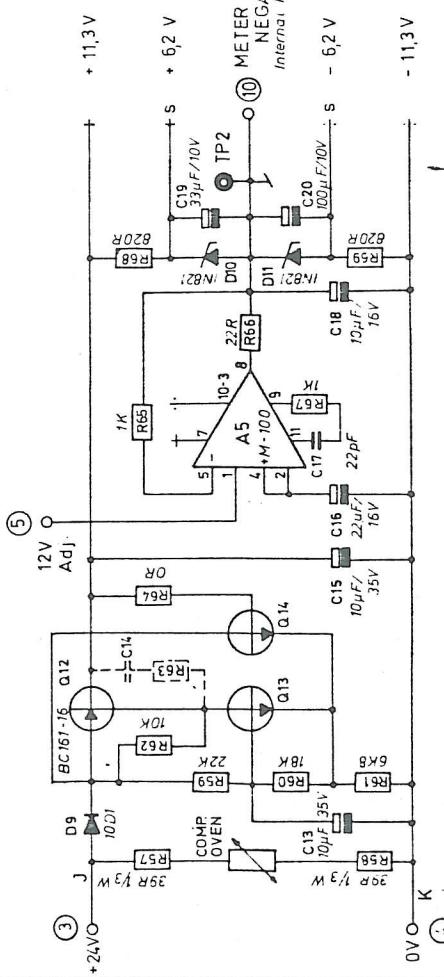
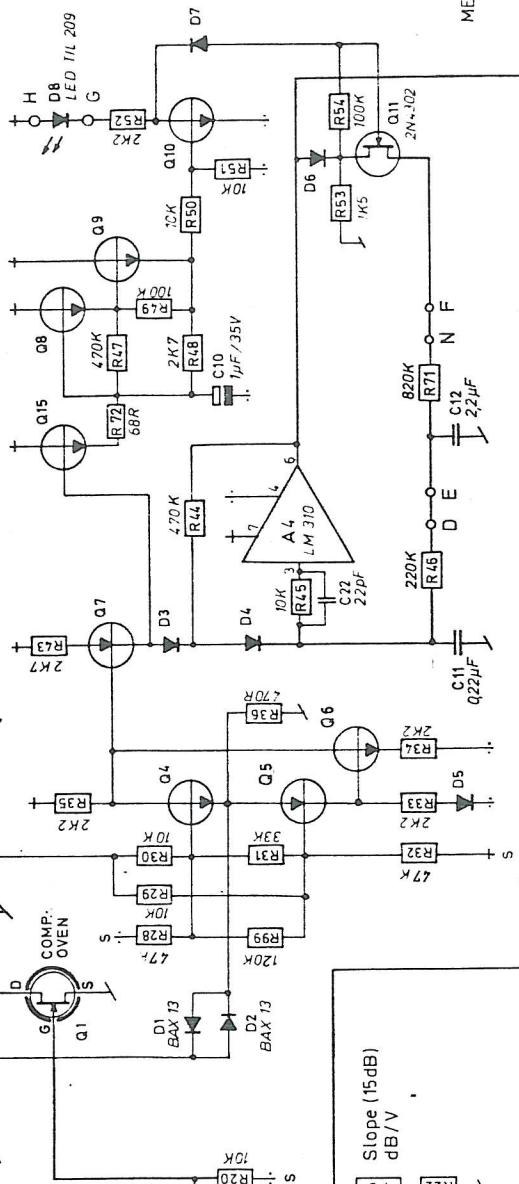
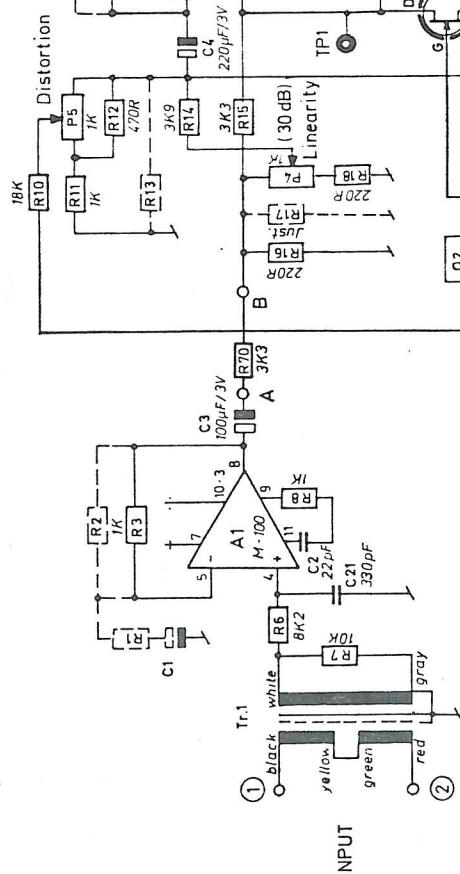
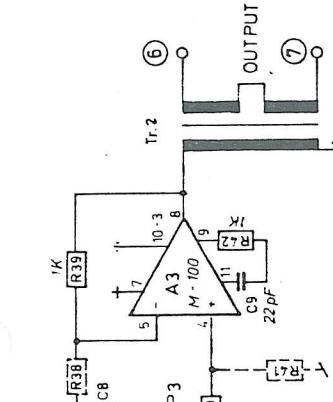
Conditions: Input signal +16dBu 1kHz

P5 is adjusted to minimum distortion.

Because of interaction between P5 and P2, the adjustment mentioned under pos. b might be carried out once more.



(3) red
 (5) yellow
 (9) brown
 (10) brown/white
 (8) green/white
 (2) white
 (1) green
 (4) blue

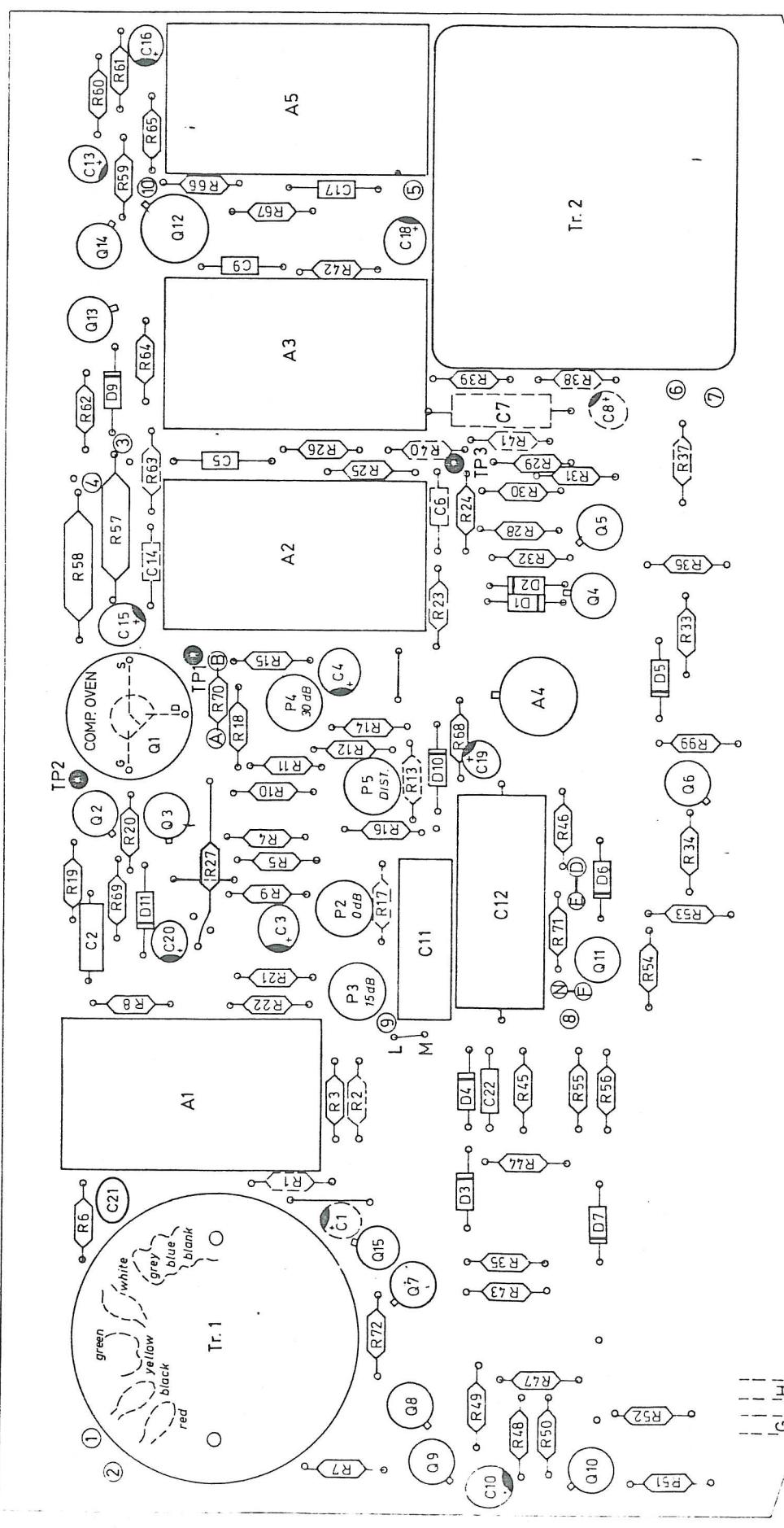


All PNP transistors without designation = BC 177B
" NPN " " " " BC 107B
" diodes " " " " IN 4148

LIMITER AMPLIFIER 179-240-B

DIAGRAM

INTP
N. THOMAS FEDERSEN A/S



Pos.	Antal	Materiale	Bemærk	Dok. til
Målestok	2 : 1		LIMITER AMPLIFIER 179 - 240 and 179 - 240-B	
Førlaenge	mm			
Tegnet	8.4.74	IW	Component Layout	
Godkendt	1			
Revideret				

NTP
N TONNES PEDERSEN A/S
179 - 241 - A - 3

POS. DESIGN. REF.	ANT. / QTY	BETEGNELSE/DESCRIPTION	LEV. FABRIKAT	SUPPL. MANUFAC. T
R1		Resistor not used		
R2	"	" " "		
R3	"	1KΩ	5%	1,8W
R4	"	33K	"	"
R5	"	22K	"	"
R6	"	8,2KΩ	"	"
R7	"	10KΩ	"	"
R8	"	1KΩ	"	"
R9		" 56K	"	"
R10	"	18KΩ	"	"
R11	"	1KΩ	"	"
R12	"	470 Ω	"	"
R13	"	not used		
R14	"	3K9	"	"
R15	"	3K3	"	"
R16	"	220Ω	"	"
R17	"	not used		
R18		" 220Ω	"	"
R19	"	10KΩ	"	"
R20	"	10KΩ	"	"
R21	"	15KΩ	"	"
R22	"	330Ω	"	"
R23	Pre-empha- sis only	" 330Ω	"	"
R24	"	27KΩ	"	"
R25	"	1KΩ	"	"
R26	"	470Ω	"	"
R27		" 3K9	"	"
R28	"	47KΩ	"	"
R29	"	10KΩ	"	"
R30	"	10KΩ	"	"
R31	"	33KΩ	"	"
R32	"	47KΩ	"	"
R33	"	2,2KΩ	"	"
R34	"	2,2KΩ	"	"
R35	"	2,2KΩ	"	"
R36		" 470Ω	"	"
R37	Pre-empha- sis only	" 180Ω	"	"
R38	"	not used		
R39	"	1KΩ	"	"
R40	"	0Ω (strapped)		
R41	"	not used		
R42	"	1KΩ	"	"
R43	"	2,7KΩ	"	"
R44	"	470KΩ	"	"
R45		" 10KΩ	"	"
R46	"	220KΩ	"	"
R47	"	470KΩ	"	"
R48	"	2,7KΩ	"	"
R49	"	100KΩ	"	"
R50	"	10KΩ	"	"
R51	"	10KΩ	"	"
R52	"	2,2KΩ	"	"
R53	"	1,5KΩ	"	"

NTP

NTP ELEKTRONIK A/S

LIMITER AMPLIFIER 179-240

ELECTRICAL PARTS LIST

STYKLISTE/PARTS LIST

Pag. 1 / 3 ()

No.: 179-2431-A4

BM/ua
9.4.1974
ISSUED:
DATE/SIGN.

POS. DESIGN. REF.	ANT. QTY	BETEGNELSE/DESCRIPTION					LEV. FABRIKAT	SUPPL. MANUFACT.
R54		Resistor	100KΩ	5%	1/8W		Resista SK 2	
R55		"	39Ω	"	"		"	"
R56		"	3,9KΩ	"	"		Beyschlag	
R57		"	39Ω	"	1/3W		"	
R58		"	39Ω	"	"		Resista SK 2	
R59		"	2,2KΩ	"	1/8W		"	"
R60		"	18KΩ	"	"		"	"
R61		"	6,8KΩ	"	"		"	"
R62		"	10KΩ	"	"		"	"
R63		"	not used					
R64		"	0Ω (strapped)					
R65		"	1KΩ	5%	1/8W		"	"
R66		"	22Ω	"	"		"	"
R67		"	1KΩ	"	"		"	"
R68		"	820Ω	"	"		"	"
R69		"	820Ω	"	"		"	"
R70		"	3,3KΩ	"	"		"	"
R71		"	820KΩ	"	"		"	"
R72		"	68Ω	"	"			
R73		"	100Ω	"	1/3W		Beyschlag	
R99		"	120KΩ	"	1/8W		Resista SK2	
P2			10KΩ	3329-1-103				"
P3		"	1KΩ	3329-1-102				"
P4		"	1KΩ	3329-1-102				"
P5		"	1KΩ	3329-1-102				"
C1		Capacitor not used						
C2		"	22pF/160V	Styroflex			Siemens	
C3		"	100µF/ 3V	Tantal			ER0	
C4		"	220µF/ 3V	Tantal			ER0	
C5		"	47pF/160V	Styroflex			Siemens	
C6 pre-empha- sis only		"	100pV/160V	Styroflex			Siemens	
C7	"	"	47nF/250V	Mepo			Miniwatt	
C8		"	not used					
C9		"	22pF/160V	Styroflex			Siemens	
C10		"	1µF/ 35V	Tantal			ER0	
C11		"	0,22µF/250V-32234 Polyest.				Siemens	
C12		"	2,2µF/100V	10%			Eromet	
C13		"	10µF/ 35V	Tantal			ER0	
C14		"	not used					
C15		"	10µF/ 35	Tantal			ER0	
C16		"	22µF/16	Tantal			ER0	
C17		"	22pF/160V	Styroflex			Siemens	
C18		"	10µF/ 16V	Tantal			ER0	
C19		"	33µF/ 110V	Tantal			ER0	
C20		"	100µF/ 10V	Tantal			ER0	
C21		"	330p/100v	Ceramic			Philips	
C22		"	22pF/160V	Styroflex			Siemens	



LIMITER AMPLIFIER 179-240

ELECTRICAL PARTS LIST

STYKLISTE/PARTS LIST

Pag. 2 / 3 ()

No.: 179-2431-A4

CRR: 1
27-4-83 B3

ISSUED: 9.4.1974 BM/ua
DATE/SIGN:

POS. DESIGN. REF.	ANT. QTY	BETEGNELSE/DESCRIPTION	LEV. FABRIKAT	SUPPL. MANUFACT.
D1		Si diode	BAX 13 (IN 4152)	Texas
D2	" "		BAX 13 (IN 4152)	"
D3	" "		IN 4148	"
D4	" "		IN 4148	"
D5	" "		IN 4148	"
D6	" "		IN 4148	"
D7	" "		IN 4148	"
D8		LED	TIL 209	"
D9		Si diode	10D1	J.R.
D10	"	Zenerdiode	IN 821	Motorola
D11	" "		IN 821	Motorola
Q1		FET	2N5486	National
Q2		Transistor	BC 107B(A)	Siemens
Q3	" "		BC 177B(A)	"
Q4	" "		BC 107B(A)	"
Q5	" "		BC 177B(A)	"
Q6	" "		BC 107B(A)	"
Q7	" "		BC 177B(A)	"
Q8	" "		BC 107B(A)	"
Q9	" "		BC 107B(A)	"
Q10	" "		BC 107B(A)	"
Q11		FET	2N4302	Amelco
Q12		Transistor	BC 161-16(10)	Siemens
Q13	" "		BC 107B(A)	"
Q14	" "		BC 107B(A)	"
Q15	" "		BC 107B(A)	"
A1		Operational Amplifier	M-100	NTP
A2	" "	" "	M-100	"
A3	" "	" "	M-100	"
A4	" "	" "	LM-310	NS
A5	" "	" "	M-100	NTP
Tr.1		Transformator Type JS 13592/2		JS
Tr.2	" "	" JS 13590		JS
Comp. oven conn.		Transistor oven type 5st 1-2 (80°C) (To-18) Tuchel T 2700		Jermyn Nordisk Elektronik
		Resistor 100Ω 1/3W 5%		Beyschlag
179-2340		Printed Circuit Board	179-2340	