



Limiter Amplifier

179-300Cx

Contents:

- Technical Specifications
- Terminals, Input-Output Terminations
- Special Applications
- Recovery time- and Delay Curves
- Instruction for Alignment
- Diagram
- Component Layout
- Electrical Partslist

Draw.no.:

- 179-3011-A-4
- 179-3002-Cx-4
- 179-3018-A-4
- 179-3019-C-4
- 179-3022-Cx-4
- 179-3030-Cx-3
- 179-3041-Cx-4
- 179-3031-Cx-4



Supply Voltage symmetrical	:	± 15 V dc $\pm 10\%$	0V common
Maximum Ripple Voltage	:	0.1 V pp	
Current Consumption steady state	:	60 mA	
Current Consumption during heat-up	:	approx. 225 mA	in 45 sec.
Current Consumption without oven	:	35 mA	
Temperature Range	:	-20 ^o C to +60 ^o C	(-4 to +140 ^o F)
Frequency Range within 0,5 dB	:	20 Hz to 20kHz	
Input Impedance high level input	:	22 kohms in series with 100 μ F	
Input Impedance low level input	:	460 ohms in series with 100 μ F	
Output Impedance	:	less than 1 ohm in series with	
Minimum Load Impedance	:	100 ohms	100 μ F
Basic Amplification high level input	:	0dB \pm 0.5	
Basic Amplification low level input	:	+34 dB \pm 0.75	
Limitation Level ref. to output Note 1	:	+6 dB	
Limitation Range	:	more than 35 dB	
Distortion under steady conditions 1 kHz 0 to 20 dB limitation	:	less than 0.2 %	
40 Hz 0 to 20 dB limitation	:	less than 0.2 %	
Signal to Noise Ratio at Limitation Threshold flat respons	:	73 dBu	
RMS (Δf 23kHz) Control Voltage output (Instrument etc.) Note 2	:	1 Volt per 5 dB ref. to 0V	
Indicator Output (LED indicator)	:	14 mA	
Attack Time Note 1	:	1.5 millisecond combined with a full-wave logarithmic clipping circuit	
Recovery Time Note 3	:	Dual time constants 200 msec. upon 15 seconds	

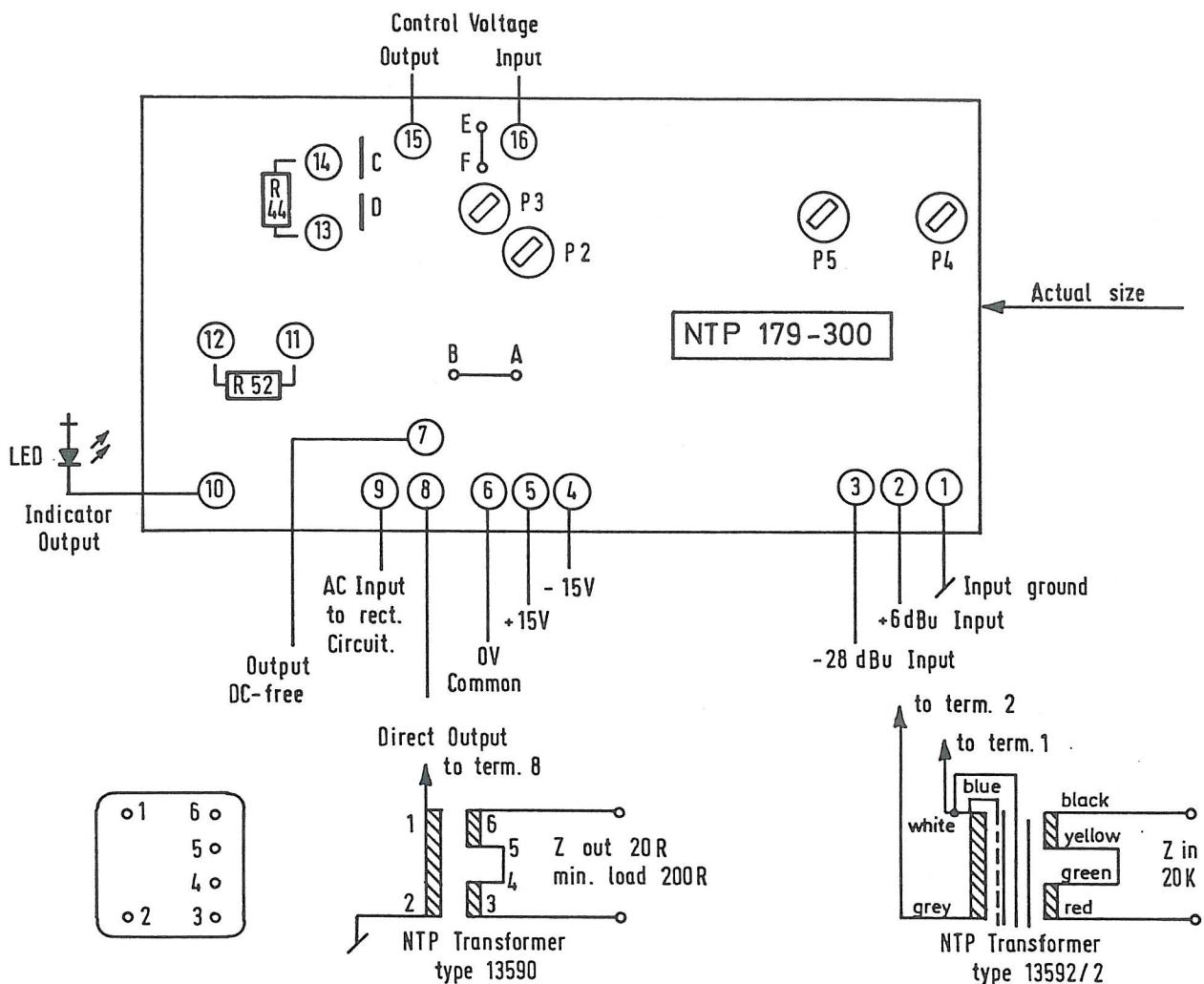
Note 1: The limitation level stated above applies to steady state conditions. Peaks shorter than 1.5 msec. will be limited at a level max. 3 dB above steady state conditions.

Note 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 it is possible to apply an external control voltage giving a gain reduction of 5 dB per Volt up to 30 dB reduction.

Note 3: It is not recommended to charge recovery-and delay-times when the card is used as a limiter. For override and other special functions, various time constants can be obtained by changing R 32 and R 44, and by changing R 52, See curves on 179-3019-A-4.



- Terminal 1 : Input ground
 " 2 : +6dBu input, Zin 10kΩ
 " 3 : -28dBu input, Zin 400 Ωm
 " 4 : -15V supply voltage
 " 5 : +15V supply voltage
 " 6 : 0V common
 " 7 : Output through 100uF cap. (DC-free)
 " 8 : Direct output normally connected to rect.circuit.
 " 9 : Input to rect. circuit, Zin 27kΩm
 " 10 : Indicator output
 " 11 : Recovery delay (R52) see curve I
 " 12 : Recovery time (R44) see curve II
 " 13 : Recovery time (R44) see curve II
 " 14 : DC control voltage output
 " 15 : DC control voltage input

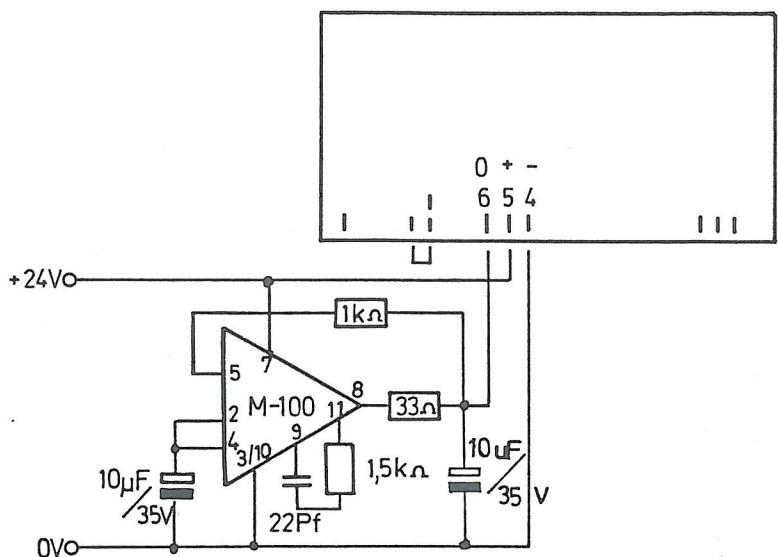
NOTE: If the Limiter card is used with NTP input and output transformers for balanced floating operation, the limitation level will be raised by 3dB, unless R24 is decreased until the Limitation level is +6dB.

For transformers with 1:1 ratio, no modifications are needed.

Unsymmetrical supply voltage

If the Limiter Amplifier is supplied from an unsymmetrical power supply, an external voltage splitter must be provided.

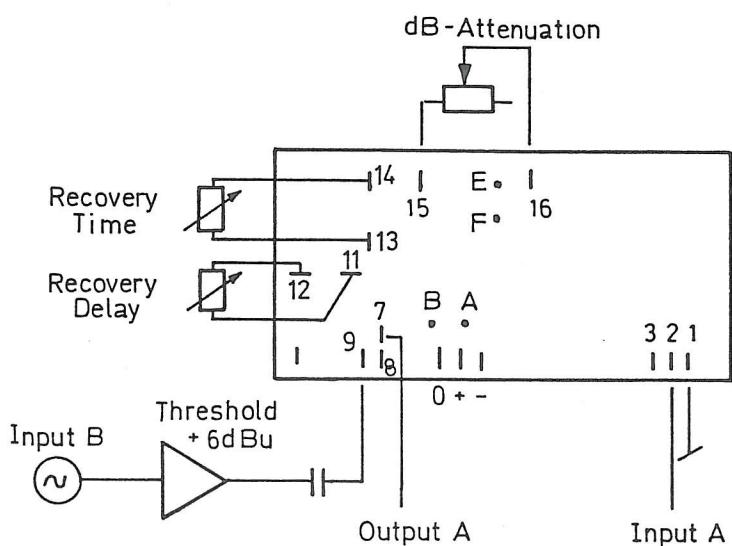
For instance an M-100 Gp. amp. connected as shown to the left.



Override function

Break the connections
E - F and A - B and 8 - 9

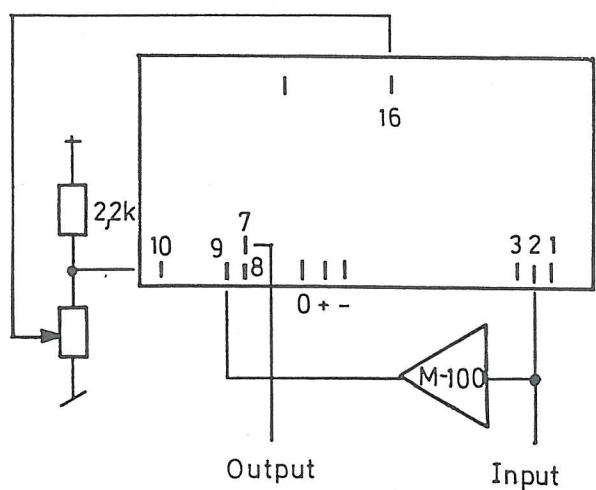
An override function is accomplished by letting one sound channel control another sound channel. In the example to the left the sound channel B will override the channel A as soon as the level to term. 9 exceeds +6dBu. The attenuation of channel A is determined by the potentiometer P. For desired recovery time and recovery delay, see the curve on draw No. 179-3019-A-4.



Squelch function

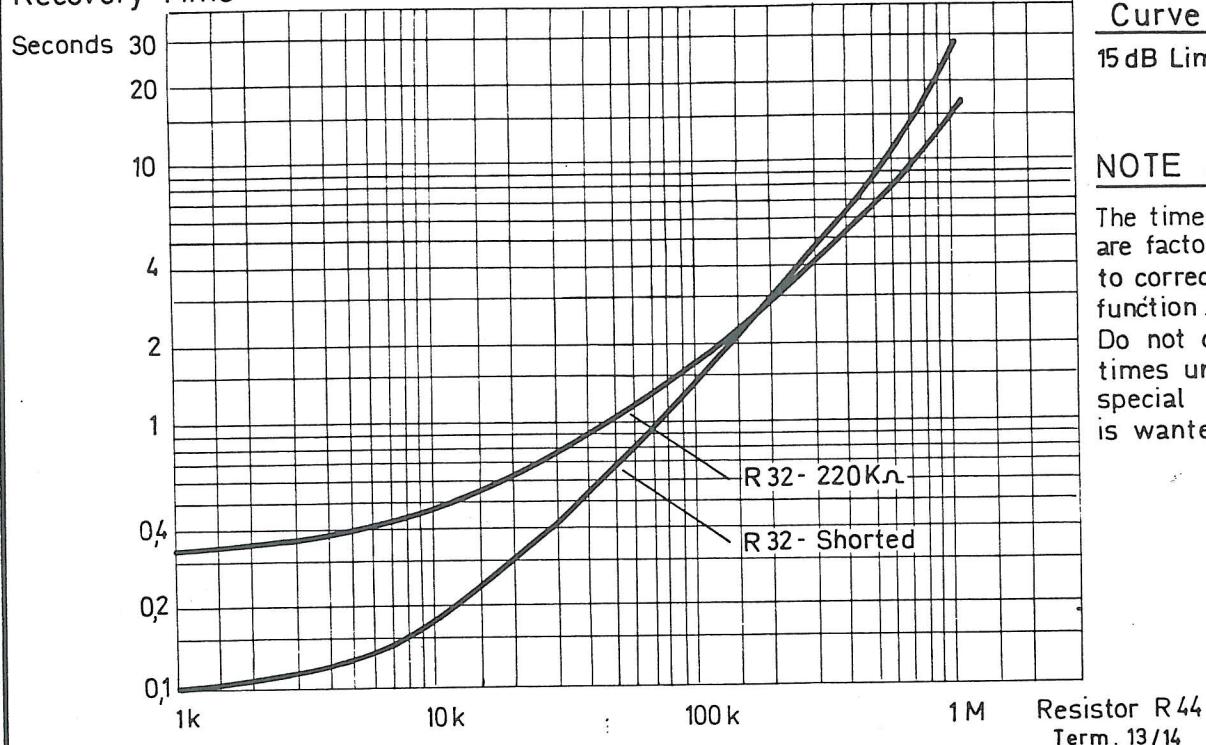
Break the connections
E - F and A - B and 8 - 9

The squelch threshold is determined by the gain of the external M-100 Amplifier. The potentiometer P determines the range that is squelched (max. appr. 30dB).

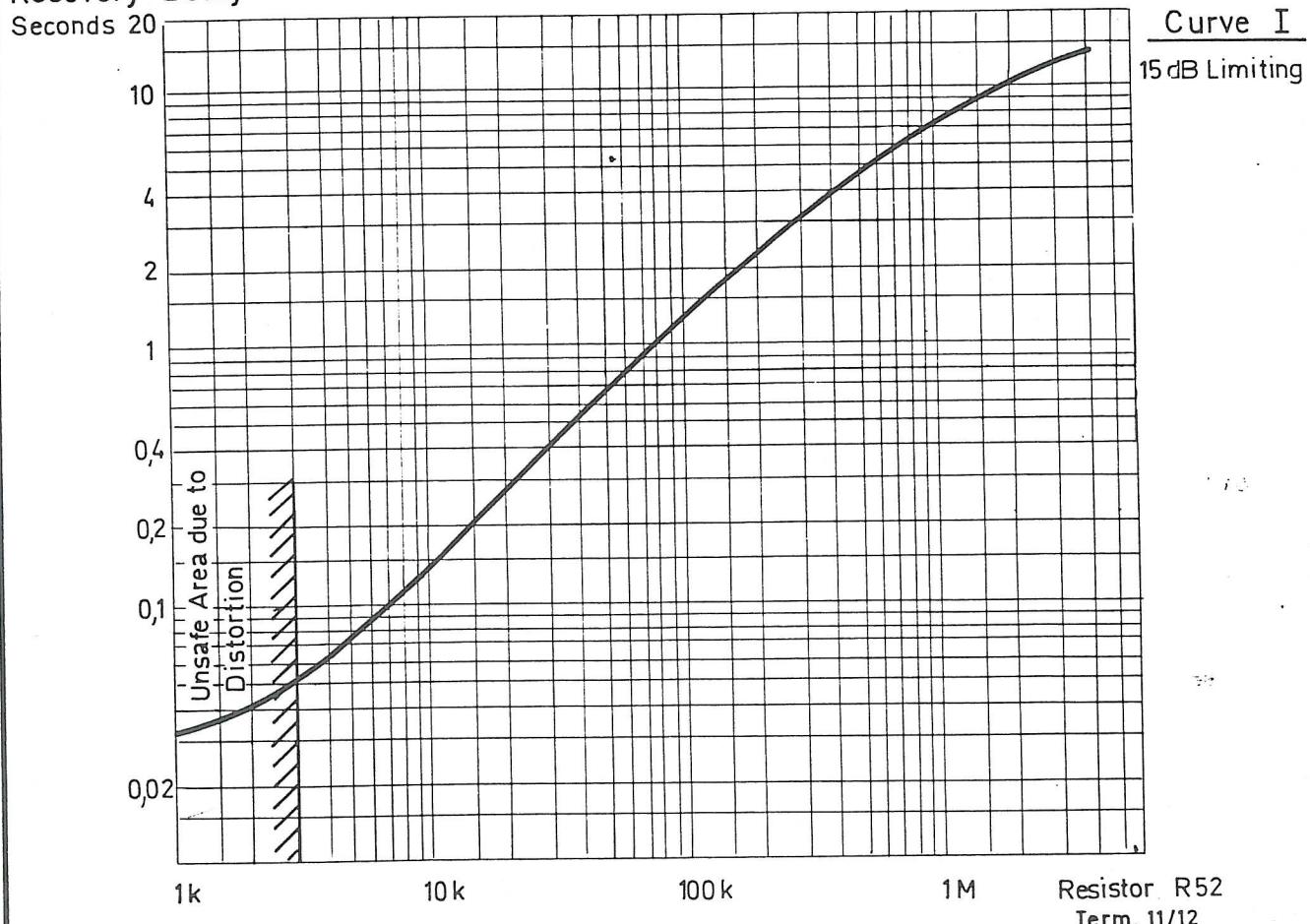


NOTE. For further information of Limiter Amplifier
179-300 please contact the factory.

Recovery Time



Recovery Delay



Målestok		INGENIØRFIRMA N. TØNNES PEDERSEN A/s	Tegn.	27.2.75 1W
Tolerance	+ mm + °	Limiter Amplifier 179-300-C		
Materiale			Godk.	B.M.
Behandl.				TEGNING NR.
Del af		Recovery time & -delay curves		179-3019-C-4
Antal				

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:

P2 Compensates for individual pinch-off of the FET (Q1)

P3 Compensates for individual slope $\frac{\Delta R_{SD}}{\Delta V_{GD}}$ of the FET

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. 50mA after 60 sec.

Correct sequence of adjustments is as follows:

b. Pinch-off adjustment of P2

Conditions: Input signal +6dBu 1kHz on terminal 2.

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

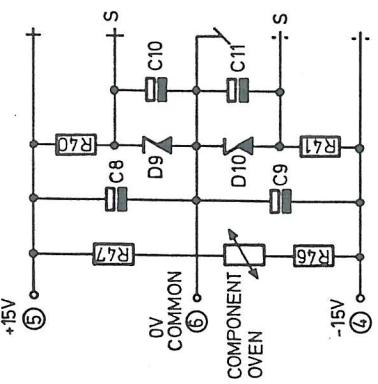
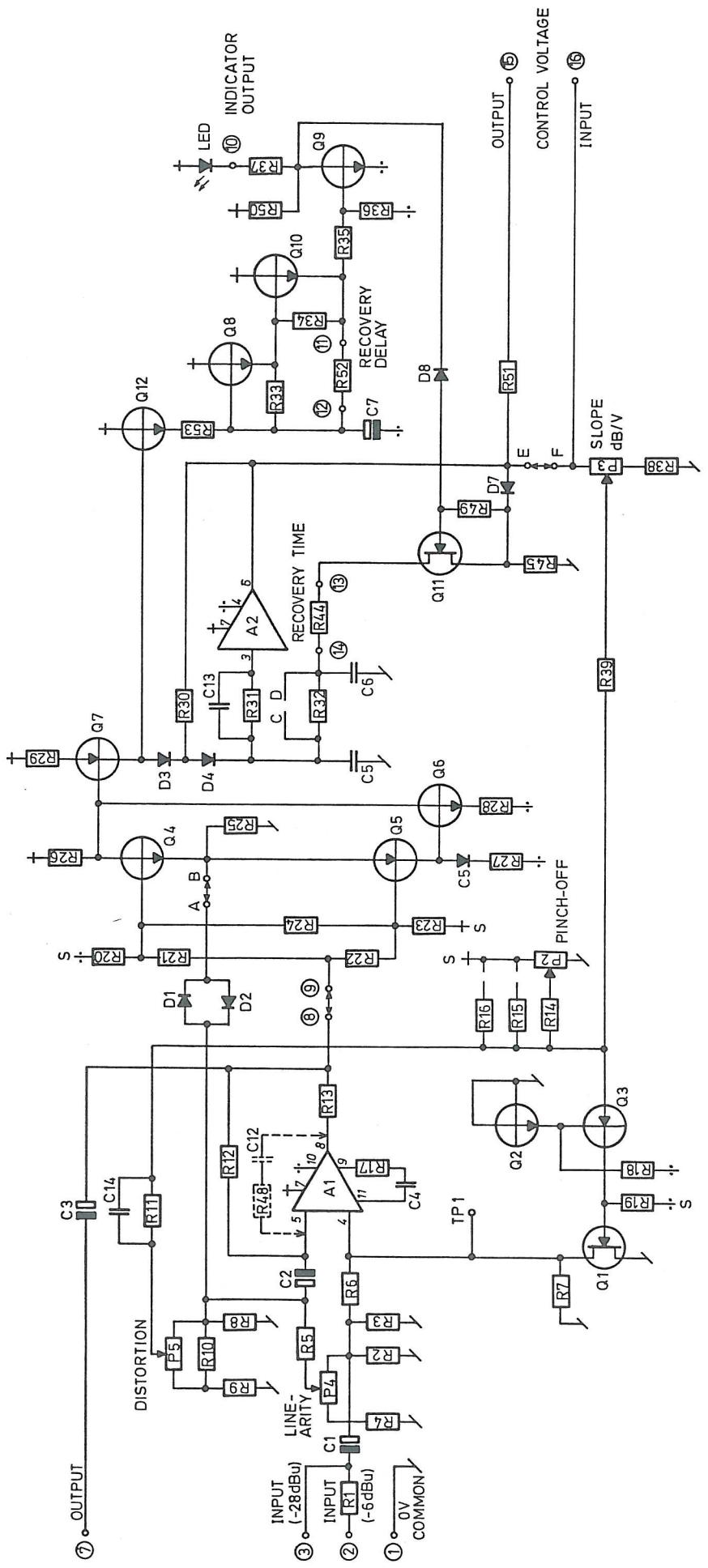
Conditions: Like referred under pos. b.

A floating external DC-source 0-6 V is connected between terminal 6 and 16, terminal 16 positive. The DC voltage is set to 3.0 volt, and P3 is adjusted so that the output level is -9dBu (15dB attenuation). Now the DC voltage is set to 6.0 Volt, and P4 is adjusted, until the output level is -24dBu (30dB attenuation). Because of mutual dependence between P3 and P4, the adjustments are repeated, until correct output level is obtained.

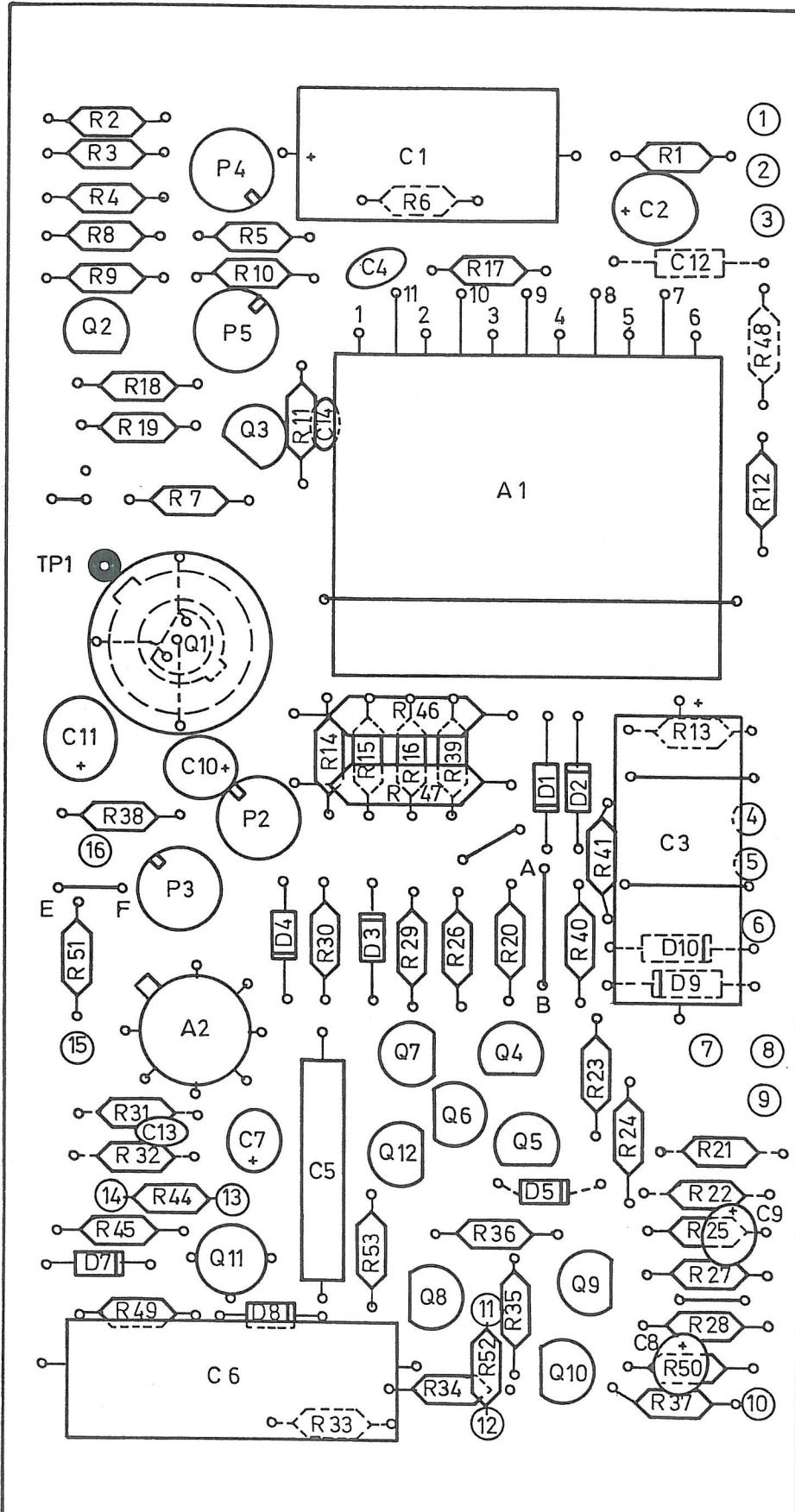
e. Distortion adjustment of P5 conditions: +16dBu 1kHz on term. 2.

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.



Pos.:	Aantal:	Material:	Behandl.:	Del. al:
Målestok:				
Tolerans: \pm	mm			
Tegnat:	: 23.8.82. JS.			
Godkendt:				
Revideret:				
NTP				
NTP ELEKTRONIK A/S				
179-3030-Cx-3				



Flex on pins
of C8 and
C9.

Målestok : 2:1
Konstruktør: B.S.
Tegnet : 23.8.82. JS.
Godkendt :
Revideret : 1./13.1.88jl

Limiter Amplifier 179-300 Cx

Component Lay-out.

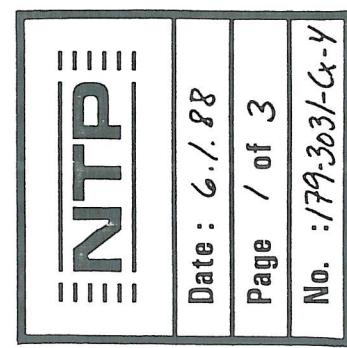
NTP
NTP ELEKTRONIK A/B

NTP ELETTRONICA S.p.A.

179-3041-Cx-4

NTP 79-300C LIM. AMPLIFIER, BASIC SION

REF. NO.	NTP-ID.	DESCRIPTION	QTY	MANUFACT/DRW.NO. PART NO.
1	MHT-0002	TESTPOINT	16	ASSMANN ALP 65
2	QBA-0016	TRANSISTOR OVEN	1	QBA-0016 5 ST 1-2
3	179-3040	P.C. BOARD	1	179-3040-C-4 179-3040
A	250-100C	LINEAR AMPLIFIER	1	250-100C 250-100C
A	ILA-310F	OP-AMP	1	NAT. TO-5 LM 310H
C	CFD-0910	CAP ELECTROLYTIC 1000UF/40V	1	ROE EB ROE EB 100 UF
C	CTA-0922	CAP TANTALUM 220UF/3V	1	ERO ETQ ETQ 5 220UF
C	CFD-0910	CAP ELECTROLYTIC 100UF/40V	1	ROE EB ROE EB 100 UF
C	CCB-0147	CAP CERAMIC 4.7PF/100V	1	PH 2222 632 2222 632 57478
C	CLF-0622	CAP POLYESTER 220NF/250V	1	SIEMENS B32234 A32224, M
C	CLB-0722	CAP POLYESTER 2.2UF/100V	1	ROE MKT 1813 1813 522/015
C	CTF-0710	CAP TANTALUM 1UF/35V	1	ERO ETP ETP 1A 1UF
C	CGA-0810	CAP ELECTROLYTIC 10UF/35V	1	MATSUSHITA ESM ESM R2 10UF
C	CGA-0810	CAP ELECTROLYTIC 10UF/35V	1	MATSUSHITA ESM ESM R2 10UF
C	CTC-0633	CAP TANTALUM 33UF/10V	1	ERO ETP ETP 3G 33UF
C	CTC-0910	CAP TANTALUM 100UF/10V	1	ERO ETQ ETQ 5 100UF
C	CAA-0000	CAPACITOR, NOT USED	1	CAA-0000
C	CCB-0222	CAP CERAMIC 22PF/100V	1	PH 2222 632 2222 632 58229
D	QDS-0013	DIODE, SILICON	1	DO-35 BAX 13
D	QDS-0013	DIODE, SILICON	1	DO-35 BAX 13
D	QDS-4148	DIODE, SILICON	1	QDS-4148 1N 4148
D	QDS-4148	DIODE, SILICON	1	QDS-4148 1N 4148
D	QDS-4148	DIODE, SILICON	1	QDS-4148 1N 4148
D	QDA-0000	DIODE, NOT USED	1	QDA-0000 QDA-0000
D	QDS-4148	DIODE, SILICON	1	QDS-4148 1N 4148
D	QDS-4148	DIODE, SILICON	1	QDS-4148 1N 4148
D	QZR-0062	REFERENCED DIODE	1	DO-34 1N 821
D	QZR-0062	REFERENCED DIODE	1	DO-34 1N 821
P	RFA-9999	POTENTIOMETER, NOT USED	1	RFA-9999 RFA-9999
P	RFB-5100	TRIMPOTENTIOMETER 10K	1	BOURNS 3329 3329H-1-103
P	RFB-4100	TRIMPOTENTIOMETER 1K	1	BOURNS 3329 3329H-1-102
P	RFB-4100	TRIMPOTENTIOMETER 1K	1	BOURNS 3329 3329H-1-102
P	RFB-4100	TRIMPOTENTIOMETER 1K	1	BOURNS 3329 3329H-1-102
Q	QFN-5486	FET TRANSISTOR	1	QFN-5486 2N 5486
Q	QBN-0237	TRANSISTOR, NPN	1	T0-92 BC237 B
Q	QBP-0307	TRANSISTOR, PNP	1	T0-92 BC307
Q	QBN-0237	TRANSISTOR, NPN	1	T0-92 BC237 B
Q	QBP-0307	TRANSISTOR, PNP	1	T0-92 BC307
Q	QEN-0237	TRANSISTOR, NPN	1	T0-92 BC237 B
Q	QBP-0307	TRANSISTOR, PNP	1	T0-92 BC307



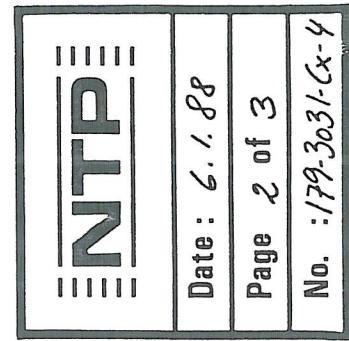
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LIM. AMPLIFIER, BASIC SECTION

REF. NO.	NTP-ID.	DESCRIPTION	QTY	MANUFACT/DRW.NO.	PART NO.
Q 8	QBN-0237	TRANSISTOR, NPN	1	TO-92	BC237 B
Q 9	QBN-0237	TRANSISTOR, NPN	1	TO-92	BC237 B
Q 10	QBN-0237	TRANSISTOR, NPN	1	TO-92	BC237 B
Q 11	QFN-4302	FET	1	QFN-4302	2N 4302
Q 12	QBN-0237	TRANSISTOR, NPN	1	TO-92	BC237 B
R 1	RCA-5220	RESISTOR CARBON 22K 0.66W 5%	1	SBB 0207	22K
R 2	RCA-3680	RESISTOR CARBON 680R 0.66W 5%	1	SBB 0207	680R
R 3	RCA-5120	RESISTOR CARBON 12K 0.66W 5%	1	SBB 0207	12K
R 4	RCA-3470	RESISTOR CARBON 470R 0.66W 5%	1	SBB 0207	470R
R 5	RCA-4390	RESISTOR CARBON 3K9 0.66W 5%	1	SBB 0207	3K9
R 6	RCA-4330	RESISTOR CARBON 3K3 0.66W 5%	1	SBB 0207	3K3
R 7	RCA-4390	RESISTOR CARBON 3K9 0.66W 5%	1	SBB 0207	3K9
R 8	RCA-4390	RESISTOR CARBON 3K9 0.66W 5%	1	SBB 0207	3K9
R 9	RCA-3470	RESISTOR CARBON 470R 0.66W 5%	1	SBB 0207	470R
R 10	RCA-3220	RESISTOR CARBON 220R 0.66W 5%	1	SBB 0207	220R
R 11	RCA-5180	RESISTOR CARBON 18K 0.66W 5%	1	SBB 0207	18K
R 12	RMA-5619	RESISTOR METAL 61K9 0.4W 1%	1	PHILIPS MR25	2322 151 56193
R 13	RCA-2220	RESISTOR CARBON 22R 0.66W 5%	1	SBB 0207	22R
R 14	RCA-5560	RESISTOR CARBON 56K 0.66W 5%	1	SBB 0207	56K
R 15	RCA-5330	RESISTOR CARBON 33K 0.66W 5%	1	SBB 0207	33K
R 16	RCA-5220	RESISTOR CARBON 22K 0.66W 5%	1	SBB 0207	22K
R 17	RCA-4100	RESISTOR CARBON 1K 0.66W 5%	1	SBB 0207	1K
R 18	RCA-5100	RESISTOR CARBON 10K 0.66W 5%	1	SBB 0207	10K
R 19	RCA-5100	RESISTOR CARBON 10K 0.66W 5%	1	SBB 0207	10K
R 20	RCA-5560	RESISTOR CARBON 56K 0.66W 5%	1	SBB 0207	56K
R 21	RCA-5150	RESISTOR CARBON 15K 0.66W 5%	1	SBB 0207	15K
R 22	RCA-5150	RESISTOR CARBON 15K 0.66W 5%	1	SBB 0207	15K
R 23	RCA-5560	RESISTOR CARBON 56K 0.66W 5%	1	SBB 0207	56K
R 24	RCA-5820	RESISTOR CARBON 82K 0.66W 5%	1	SBB 0207	82K
R 25	RCA-3470	RESISTOR CARBON 470R 0.66W 5%	1	SBB 0207	470R
R 26	RCA-4220	RESISTOR CARBON 2K2 0.66W 5%	1	SBB 0207	2K2
R 27	RCA-4220	RESISTOR CARBON 2K2 0.66W 5%	1	SBB 0207	2K2
R 28	RCA-4220	RESISTOR CARBON 2K2 0.66W 5%	1	SBB 0207	2K2
R 29	RCA-4270	RESISTOR CARBON 2K7 0.66W 5%	1	SBB 0207	2K7
R 30	RCA-6470	RESISTOR CARBON 470K 0.66W 5%	1	SBB 0207	470K
R 31	RCA-5100	RESISTOR CARBON 10K 0.66W 5%	1	SBB 0207	10K
R 32	RCA-6220	RESISTOR CARBON 220K 0.66W 5%	1	SBB 0207	220K
R 33	RCA-6470	RESISTOR CARBON 470K 0.66W 5%	1	SBB 0207	470K
R 34	RCA-6100	RESISTOR CARBON 100K 0.66W 5%	1	SBB 0207	100K
R 35	RCA-5100	RESISTOR CARBON 10K 0.66W 5%	1	SBB 0207	10K

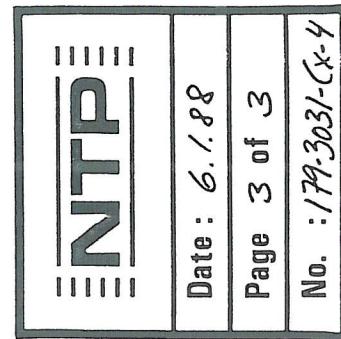


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REF. NO	NTP-ID.	DESCRIPTION	QTY	MANUFACT/DRW.NO.	PART NO.
R 36	RCA-5100	RESISTOR CARBON 10K 0.66W 5%	1	SBB 0207	10K
R 37	RCA-4220	RESISTOR CARBON 2K2 0.66W 5%	1	SBB 0207	2K2
R 38	RCA-3330	RESISTOR CARBON 330R 0.66W 5%	1	SBB 0207	330R
R 39	RCA-5150	RESISTOR CARBON 15K 0.66W 5%	1	SBB 0207	15K
R 40	RCA-3820	RESISTOR CARBON 820R 0.66W 5%	1	SBB 0207	820R
R 41	RCA-3820	RESISTOR CARBON 820R 0.66W 5%	1	SBB 0207	820R
R 42	RAA-9999	RESISTOR, NOT USED	1	RAA-9999	RAA-9999
R 43	RAA-9999	RESISTOR, NOT USED	1	RAA-9999	RAA-9999
R 44	RCA-6820	RESISTOR CARBON 820K 0.66W 5%	1	SBB 0207	820K
R 45	RCA-4150	RESISTOR CARBON 1K5 0.66W 5%	1	SBB 0207	1K5
R 46	RCC-2470	RESISTOR CARBON 47R 0.50W 5%	1	SBD 0411	47R
R 47	RCC-2470	RESISTOR CARBON 47R 0.50W 5%	1	SBD 0411	47R
R 48	RAA-9999	RESISTOR, NOT USED	1	RAA-9999	RAA-9999
R 49	RCA-6100	RESISTOR CARBON 100K 0.66W 5%	1	SBB 0207	100K
R 50	RCA-5100	RESISTOR CARBON 10K 0.66W 5%	1	SBB 0207	10K
R 51	RCA-4100	RESISTOR CARBON 1K 0.66W 5%	1	SBB 0207	1K
R 52	RCA-4270	RESISTOR CARBON 2K7 0.66W 5%	1	SBB 0207	2K7
R 53	RCA-2680	RESISTOR CARBON 68R 0.66W 5%	1	SBB 0207	68R



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