



## Limiter Amplifier

179-280D

### Contents:

Technical specifications

Draw.No.:

: 179-2811-D-4

General description

: 179-2812-D-4

} Mangler

Instruction for alignment

: 179-2822-D-4

Schematic diagram

: 179-2830-D-3

Component lay-out

: 179-2841-D-3

Electrical partslist

: 179-2831-D-3



## Limiter Amplifier

179-280D

### Contents:

- Technical specifications
- General description
- Instruction for alignment
- Schematic diagram
- Component lay-out
- Electrical partslist

### Draw.No.:

- : 179-2811-D-4
- : 179-2812-D-4
- : 179-2822-D-4
- : 179-2830-D-3
- : 179-2841-D-3
- : 179-2831-D-3

The limiter amplifier is an all-round limiter to be built-in in 19" rack systems with circuit board size 100 x 160 mm with a 32-pole DIN-connector. In- and output-threshold level can be adjusted on the circuit board by means of two trim-potentiometres and pre-emphasis on limiter threshold can also be selected (front edge switch). Supply voltage to the limiter can be either symmetrical or unsymmetrical with either positive or negative terminal as reference.

Temperature range	:	0 to 60° amb.temp.
Supply voltage	:	22V to 32V DC or ±11V to ±16V DC
Max. ripple voltage on supply	:	0.1V peak
Current consumption, at amb.temp. 25°C	:	
after heat-up	:	appr. 70mA (±15V supply)
during heat-up	:	appr. 200mA (±15V supply)
Input threshold, adjustable	:	0 to +20dBu
Output threshold, adjustable	:	0 to +20dBu
Threshold level tolerance	:	±0.6dB
Input and output overload level	:	+21dBu
Frequency response (Fig. 1)	:	20-20kHz ±0.5dB
Signal to noise ratio	:	≥ 72dB weighted CCIR468-1
Distortion (40Hz - 15kHz)	:	
a) at threshold	:	≤ 0.1%
b) above threshold up to	:	
21dBu	:	≤ 0.2%
Input impedance (balanced floating)	:	22kOhms ±10%
Output impedance (balanced floating)	:	≤ 21Ohms
Minimum load resistance	:	200 Ohms
Input balance (CMRR) at 15 kHz	:	≥ 60dB
Pre-emphasis on threshold level	:	
(switchable)	:	50uS (Fig. 2)
Control voltage slope (Note 1)	:	5dB/V
Attack-time (Note 2 and 3)	:	1.5ms (Fig. 3)
Recovery delay	:	50ms + 60% - 10%
Recovery time (dual) (Note 3)	:	0.1s upon 20s (Fig. 4)
Mechanical outlines (Fig. 5)	:	100x160mm Euroboard

Note 1:

The controlvoltage of two units may be linked together to obtain equal gainreduction in the two stereo channels.

Note 2:

The attacktime is the period of time it takes the control-voltage to reach 90% of its steady-state value, measured with 5kHz tone-bursts input signal. Peaks shorter than 1.5ms will be limited by a full-wave smooth clipping circuit to a value approximately 3dB higher than the output threshold level with a steady sinusodial input signal. Fig. 3. Attack time increases linear up to approximately 10ms by increasing  $R_{38}$  on circuit diagram 179-2830-D-3.

Note 3:

The limiter amplifier can have custom-specified time-constants.

Fig. 1: Relative frequency response

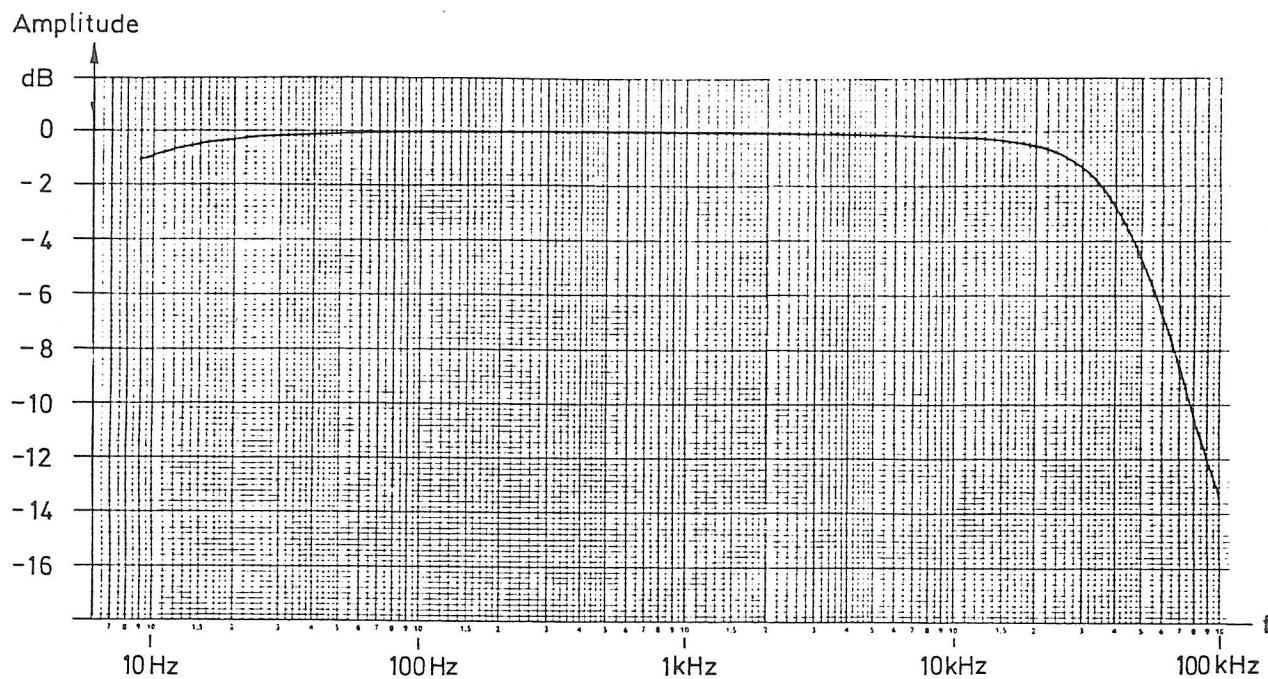
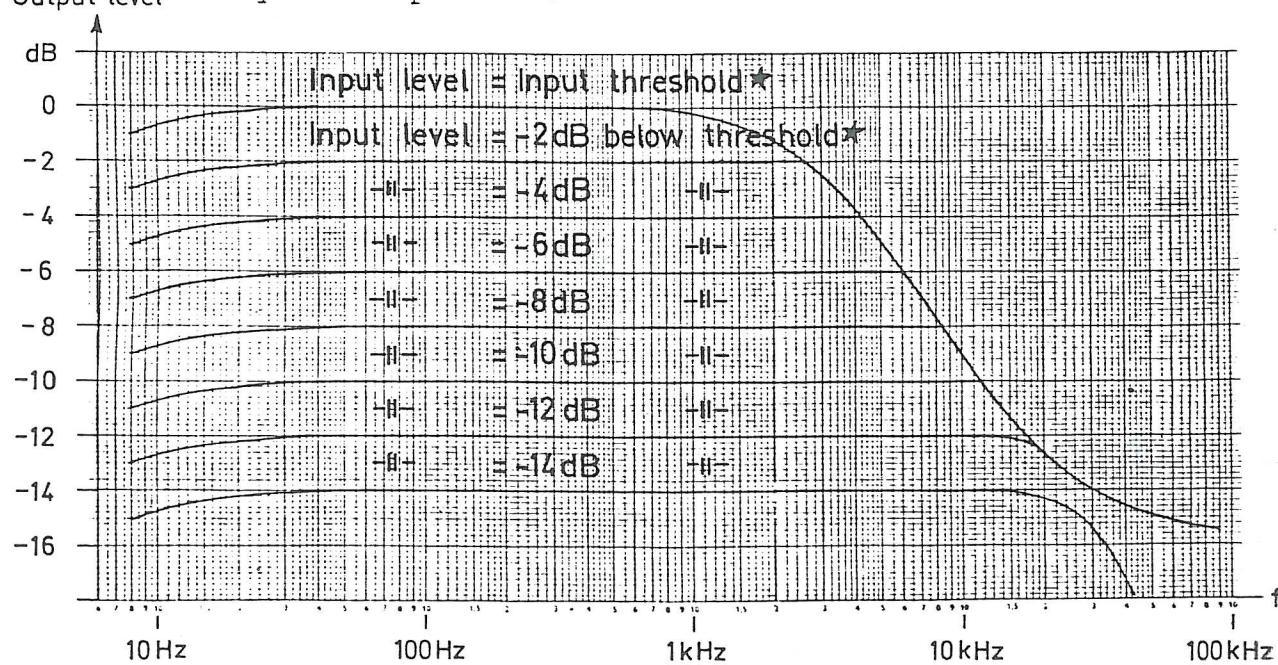


Fig. 2: Threshold level with 50us pre-emphasis us.freqency and input level.



★ refers to threshold without pre-emphasis.

Pre-emphasis timeconstant can be changed by changing the value of  $C_{14}$  on circuit diagram 179-2830-D-3. i.e. 22nF T=25us.

Fig. 5: Mechanical outlines and pin connections.

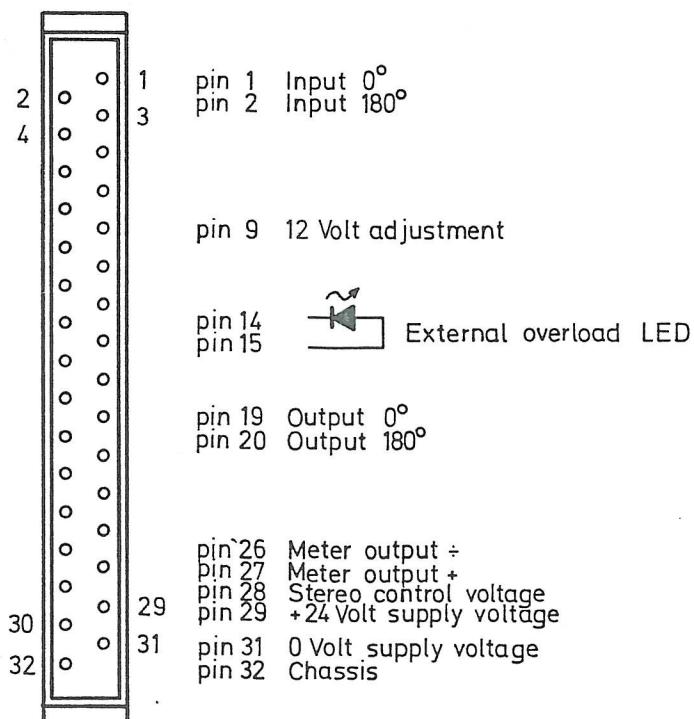
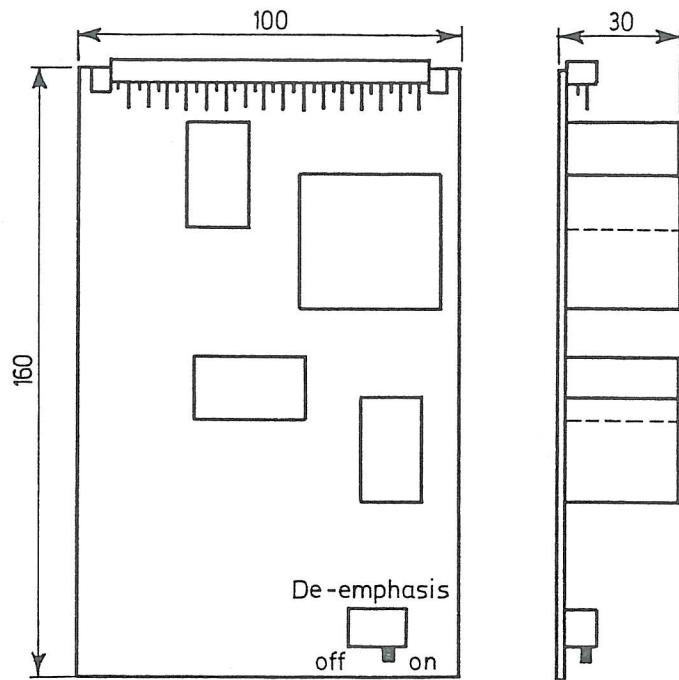


Fig. 3: Output level and control voltage with 5kHz tone-burst and input amplitude 10dB above threshold level.

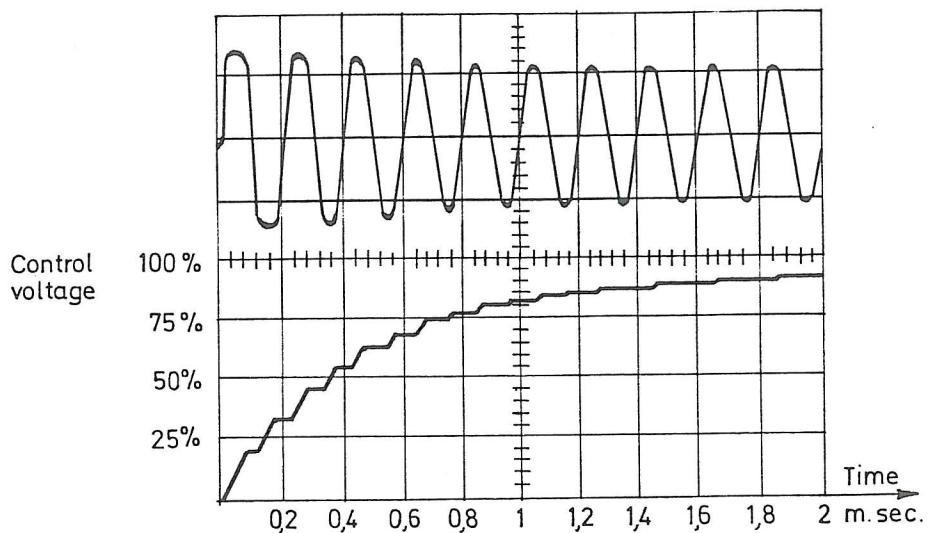
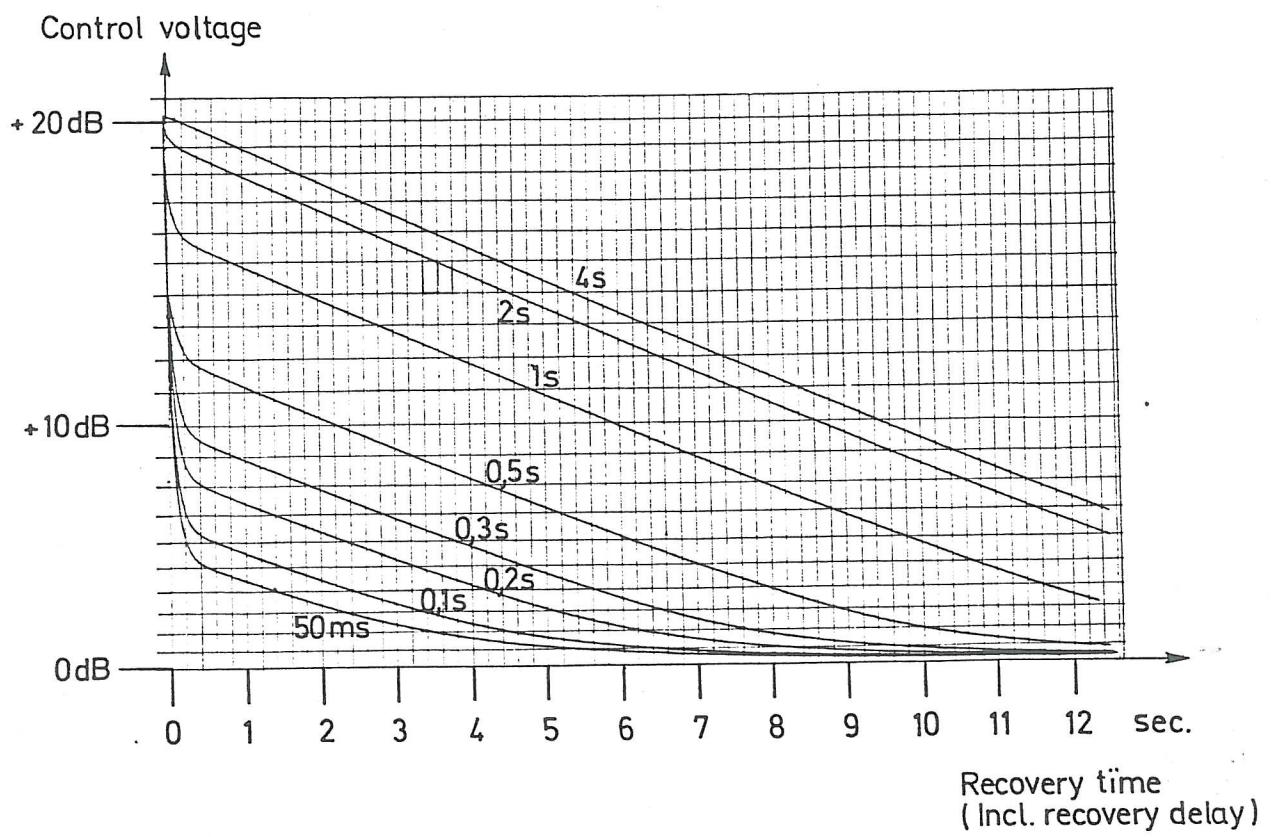
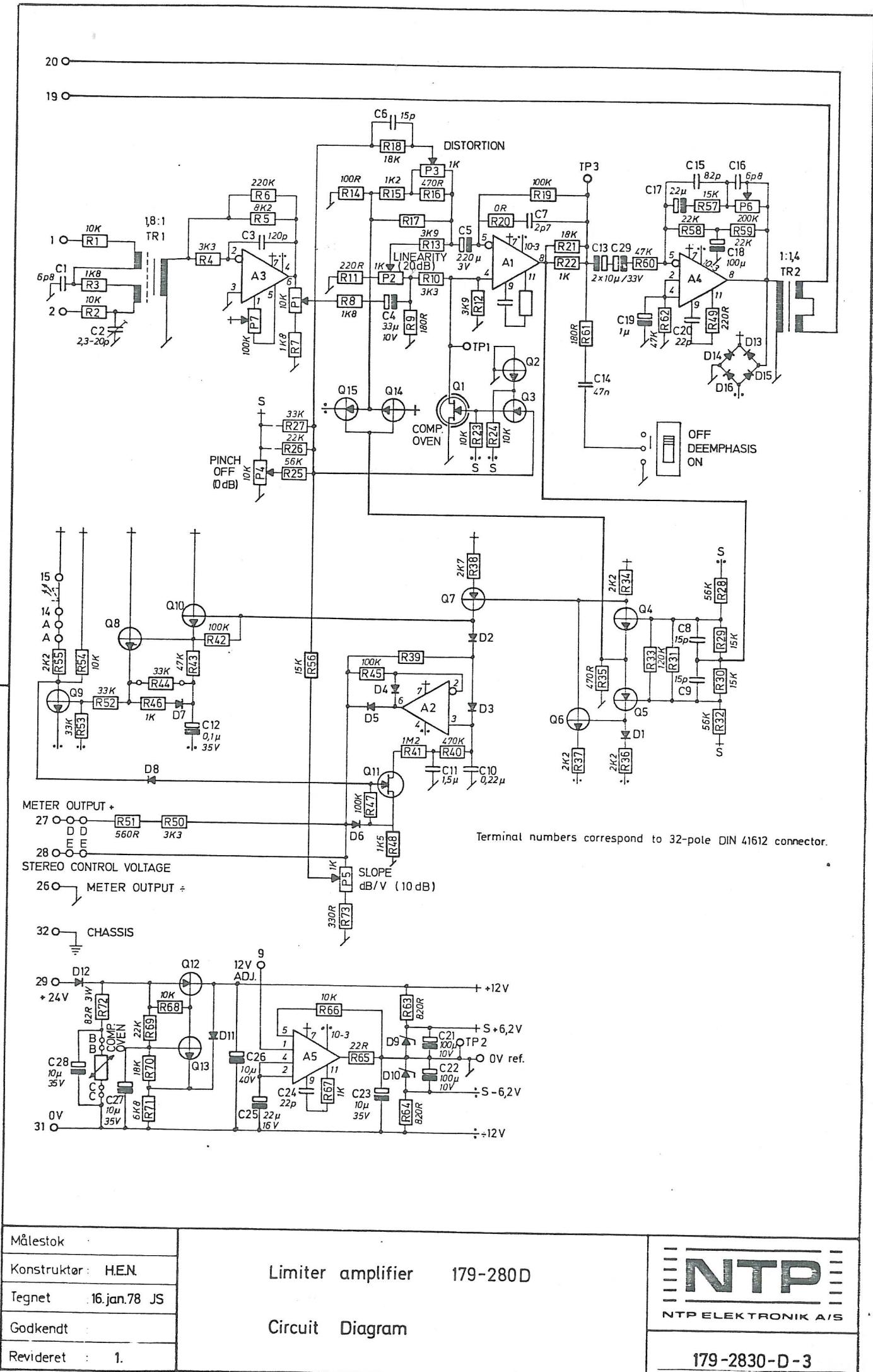
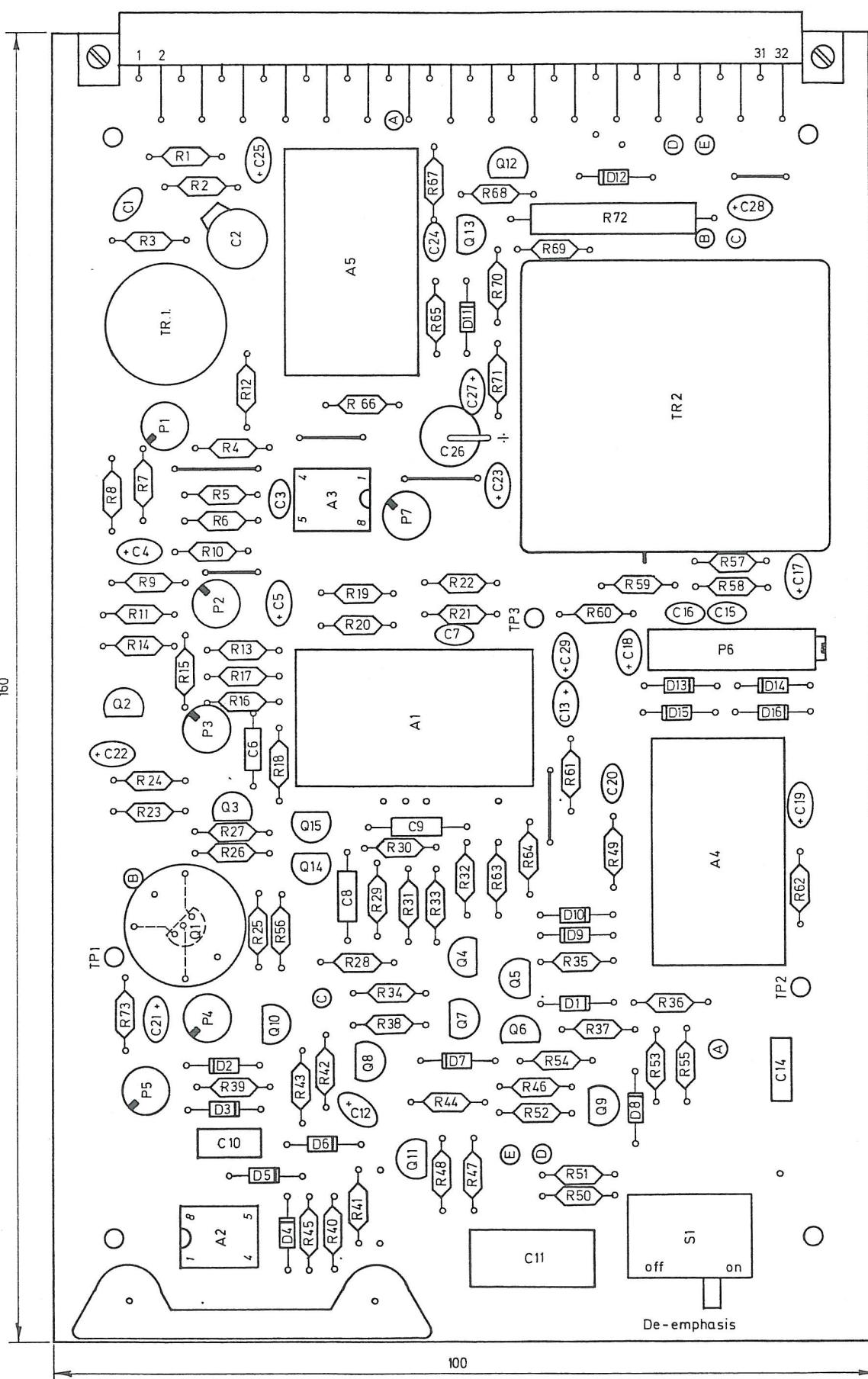


Fig. 4: Recovery time us. tone-burst length.





160



Målestok :

Konstruktør : H.E.N

Tegnet : 15.1.79 JS

Godkendt :

Revideret : 1.

Limiter Amplifier

179 280 D

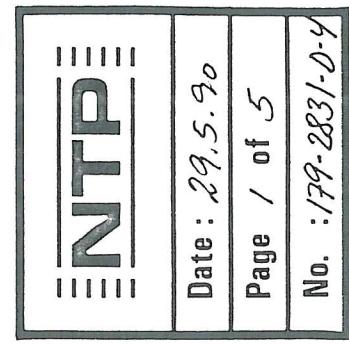
Component Lay-out

  
NTP ELEKTRONIK A/S

179-2841-D-3

## NTP 179-280D LIMITER AMPLIFIER

REF. NO	NTP-ID.	DESCRIPTION	QTY	PARTS LIST	PAGE 179-280D
R 65	RCA-2220	RESISTOR CARBON 22R 0.66W 5%	1	MBB 0207	MBB 0207 22R
R 14	RCA-3100	RESISTOR CARBON 100R 0.66W 5%	1	MBB 0207	MBB 0207 100R
R 9	RCA-3180	RESISTOR CARBON 180R 0.66W 5%	1	MBB 0207	MBB 0207 180R
R 61	RCA-3180	RESISTOR CARBON 180R 0.66W 5%	1	MBB 0207	MBB 0207 180R
R 11	RCA-3220	RESISTOR CARBON 220R 0.66W 5%	1	MBB 0207	MBB 0207 220R
R 49	RCA-3220	RESISTOR CARBON 220R 0.66W 5%	1	MBB 0207	MBB 0207 220R
R 73	RCA-3330	RESISTOR CARBON 330R 0.66W 5%	1	MBB 0207	MBB 0207 330R
R 16	RCA-3470	RESISTOR CARBON 470R 0.66W 5%	1	MBB 0207	MBB 0207 470R
R 35	RCA-3470	RESISTOR CARBON 470R 0.66W 5%	1	MBB 0207	MBB 0207 470R
R 51	RCA-3560	RESISTOR CARBON 560R 0.66W 5%	1	MBB 0207	MBB 0207 560R
R 63	RCA-3820	RESISTOR CARBON 820R 0.66W 5%	1	MBB 0207	MBB 0207 820R
R 64	RCA-3820	RESISTOR CARBON 820R 0.66W 5%	1	MBB 0207	MBB 0207 820R
R 22	RCA-4100	RESISTOR CARBON 1K 0.66W 5%	1	MBB 0207	MBB 0207 1K
R 46	RCA-4100	RESISTOR CARBON 1K 0.66W 5%	1	MBB 0207	MBB 0207 1K
R 67	RCA-4100	RESISTOR CARBON 1K 0.66W 5%	1	MBB 0207	MBB 0207 1K
R 15	RCA-4120	RESISTOR CARBON 1K2 0.66W 5%	1	MBB 0207	MBB 0207 1K2
R 48	RCA-4150	RESISTOR CARBON 1K5 0.66W 5%	1	MBB 0207	MBB 0207 1K5
R 3	RCA-4180	RESISTOR CARBON 1K8 0.66W 5%	1	MBB 0207	MBB 0207 1K8
R 7	RCA-4180	RESISTOR CARBON 1K8 0.66W 5%	1	MBB 0207	MBB 0207 1K8
R 8	RCA-4180	RESISTOR CARBON 1K8 0.66W 5%	1	MBB 0207	MBB 0207 1K8
R 34	RCA-4220	RESISTOR CARBON 2K2 0.66W 5%	1	MBB 0207	MBB 0207 2K2
R 36	RCA-4220	RESISTOR CARBON 2K2 0.66W 5%	1	MBB 0207	MBB 0207 2K2
R 37	RCA-4220	RESISTOR CARBON 2K2 0.66W 5%	1	MBB 0207	MBB 0207 2K2
R 55	RCA-4220	RESISTOR CARBON 2K2 0.66W 5%	1	MBB 0207	MBB 0207 2K2
R 38	RCA-4270	RESISTOR CARBON 2K7 0.66W 5%	1	MBB 0207	MBB 0207 2K7
R 4	RCA-4330	RESISTOR CARBON 3K3 0.66W 5%	1	MBB 0207	MBB 0207 3K3
R 10	RCA-4330	RESISTOR CARBON 3K3 0.66W 5%	1	MBB 0207	MBB 0207 3K3
R 50	RCA-4330	RESISTOR CARBON 3K3 0.66W 5%	1	MBB 0207	MBB 0207 3K3
R 12	RCA-4390	RESISTOR CARBON 3K9 0.66W 5%	1	MBB 0207	MBB 0207 3K9
R 13	RCA-4390	RESISTOR CARBON 3K9 0.66W 5%	1	MBB 0207	MBB 0207 3K9
R 71	RCA-4680	RESISTOR CARBON 6K8 0.66W 5%	1	MBB 0207	MBB 0207 6K8
R 5	RCA-4820	RESISTOR CARBON 8K2 0.66W 5%	1	MBB 0207	MBB 0207 8K2
R 1	RCA-5100	RESISTOR CARBON 10K 0.66W 5%	1	MBB 0207	MBB 0207 10K



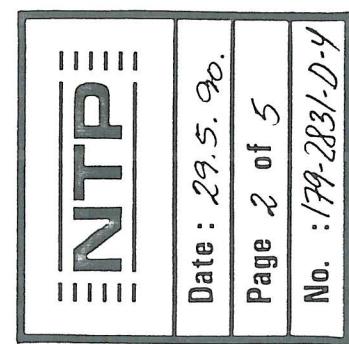
Date : 29.5.90

Page / of 5

No. : 179-2831-D-4

## NTP 179-280D LIMITER AMPLIFIER

REF. NO	NTP-ID.	DESCRIPTION	QTY	PARTS LIST	PAGE
R 2	RCA-5100	RESISTOR CARBON 10K 0.66W 5%	1	MBB 0207	179-280D
R 23	RCA-5100	RESISTOR CARBON 10K 0.66W 5%	1	MBB 0207	
R 24	RCA-5100	RESISTOR CARBON 10K 0.66W 5%	1	MBB 0207	
R 54	RCA-5100	RESISTOR CARBON 10K 0.66W 5%	1	MBB 0207	
R 66	RCA-5100	RESISTOR CARBON 10K 0.66W 5%	1	MBB 0207	
R 68	RCA-5100	RESISTOR CARBON 10K 0.66W 5%	1	MBB 0207	
R 29	RCA-5150	RESISTOR CARBON 15K 0.66W 5%	1	MBB 0207	
R 30	RCA-5150	RESISTOR CARBON 15K 0.66W 5%	1	MBB 0207	
R 56	RCA-5150	RESISTOR CARBON 15K 0.66W 5%	1	MBB 0207	
R 57	RCA-5150	RESISTOR CARBON 15K 0.66W 5%	1	MBB 0207	
R 18	RCA-5180	RESISTOR CARBON 18K 0.66W 5%	1	MBB 0207	
R 21	RCA-5180	RESISTOR CARBON 18K 0.66W 5%	1	MBB 0207	
R 70	RCA-5180	RESISTOR CARBON 18K 0.66W 5%	1	MBB 0207	
R 26	RCA-5220	RESISTOR CARBON 22K 0.66W 5%	1	MBB 0207	
R 58	RCA-5220	RESISTOR CARBON 22K 0.66W 5%	1	MBB 0207	
R 59	RCA-5220	RESISTOR CARBON 22K 0.66W 5%	1	MBB 0207	
R 69	RCA-5220	RESISTOR CARBON 22K 0.66W 5%	1	MBB 0207	
R 27	RCA-5330	RESISTOR CARBON 33K 0.66W 5%	1	MBB 0207	
R 44	RCA-5330	RESISTOR CARBON 33K 0.66W 5%	1	MBB 0207	
R 52	RCA-5330	RESISTOR CARBON 33K 0.66W 5%	1	MBB 0207	
R 53	RCA-5330	RESISTOR CARBON 33K 0.66W 5%	1	MBB 0207	
R 43	RCA-5470	RESISTOR CARBON 47K 0.66W 5%	1	MBB 0207	
R 60	RCA-5470	RESISTOR CARBON 47K 0.66W 5%	1	MBB 0207	
R 62	RCA-5470	RESISTOR CARBON 47K 0.66W 5%	1	MBB 0207	
R 25	RCA-5560	RESISTOR CARBON 56K 0.66W 5%	1	MBB 0207	
R 28	RCA-5560	RESISTOR CARBON 56K 0.66W 5%	1	MBB 0207	
R 32	RCA-5560	RESISTOR CARBON 56K 0.66W 5%	1	MBB 0207	
R 19	RCA-6100	RESISTOR CARBON 100K 0.66W 5	1	MBB 0207	
R 42	RCA-6100	RESISTOR CARBON 100K 0.66W 5	1	MBB 0207	
R 45	RCA-6100	RESISTOR CARBON 100K 0.66W 5	1	MBB 0207	
R 47	RCA-6100	RESISTOR CARBON 100K 0.66W 5	1	MBB 0207	
R 31	RCA-6120	RESISTOR CARBON 120K 0.66W 5	1	MBB 0207	
R 6	RCA-6220	RESISTOR CARBON 220K 0.66W 5	1	MBB 0207	



Date : 29.5.90.

Page 2 of 5

No. : 179-2831-D-Y

## NTP 179-280D LIMITER AMPLIFIER

## PARTS LIST

## 179-280D

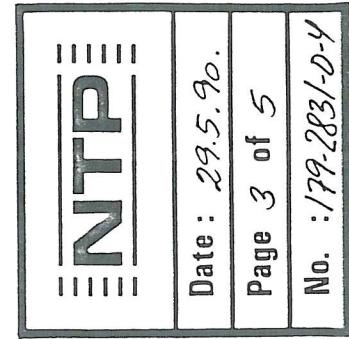
## REF. NO NTP-ID. DESCRIPTION

## QTY

## PARTS LIST

## MANUFACT/DRW.NO. PART NO.

R 40	RCA-6470	RESISTOR CARBON 470K 0.66W 5%	1	MBB 0207	MBB 0207 470K
R 41	RCA-7120	RESISTOR CARBON 1M2 0.66W 5%	1	MBB 0207	MBB 0207 1M2
R 20	RWA-00000	STRAP 0.0 OHMS	1	RWA-0000	RWA-0000
R 72	RWC-2820	RESISTOR WIRE-WOUND 82R 3W	1	RP145152	RP145152
P 6	RFA-6200	TRIMPOTENTIOMETER 200K	1	BOURNS 3006	3006P-1-204
P 2	RFB-4100	TRIMPOTENTIOMETER 1K	1	BOURNS 3329	3329H-1-102
P 3	RFB-4100	TRIMPOTENTIOMETER 1K	1	BOURNS 3329	3329H-1-102
P 5	RFB-4100	TRIMPOTENTIOMETER 1K	1	BOURNS 3329	3329H-1-102
P 1	RFB-5100	TRIMPOTENTIOMETER 10K	1	BOURNS 3329	3329H-1-103
P 4	RFB-5100	TRIMPOTENTIOMETER 10K	1	BOURNS 3329	3329H-1-103
P 7	RFB-6100	TRIMPOTENTIOMETER 100K	1	BOURNS 3329	3329H-1-104
C 7	CCB-0127	CAP CERAMIC 2.7PF/100V	1	PH 2222	2222 632 03278
C 1	CCB-0168	CAP CERAMIC 6.8PF/100V	1	PH 2222	2222 632 57688
C 16	CCB-0168	CAP CERAMIC 6.8PF/100V	1	PH 2222	2222 632 57688
C 6	CCB-0215	CAP CERAMIC 15PF/100V	1	PH 2222	2222 632 58159
C 8	CCB-0215	CAP CERAMIC 15PF/100V	1	PH 2222	2222 632 58159
C 9	CCB-0215	CAP CERAMIC 15PF/100V	1	PH 2222	2222 632 58159
C 20	CCB-0222	CAP CERAMIC 22PF/100V	1	PH 2222	2222 632 58229
C 24	CCB-0222	CAP CERAMIC 22PF/100V	1	PH 2222	2222 632 58229
C 15	CCB-0282	CAP CERAMIC 82PF/100V	1	PH 2222	2222 632 58829
C 3	CCB-0312	CAP CERAMIC 120PF/100V	1	PH 2222	2222 632 70121
C 10	CKH-06222	CAP POLYESTER 220NF/100V	1	SIEMENS B32560	B32560 D1224 J
C 14	CKI-0547	CAP POLYESTER 47NF/250V	1	SIEMENS B32560	B32560 D3473 J
C 11	CKQ-0715	CAP POLYESTER 1.5UF/100V	1	SIEMENS B32562	B32562 B1155 J
C 26	CFD-0810	CAP ELECTROLYTIC 10UF/40V	1	ROE EB	ROE EB 15UF
C 5	CTA-0922	CAP TANTALUM 220UF/3V	1	ERO ETQ	ETQ 5 220UF
C 4	CTC-0833	CAP TANTALUM 33UF/10V	1	ERO ETP	ETP 3G 33UF
C 18	CTC-0910	CAP TANTALUM 100UF/10V	1	ERO ETQ	ETQ 5 100UF
C 21	CTC-0910	CAP TANTALUM 100UF/10V	1	ERO ETQ	ETQ 5 100UF
C 22	CTC-0910	CAP TANTALUM 100UF/10V	1	ERO ETP	ETP 3G 100UF
C 17	CTD-0822	CAP TANTALUM 22UF/16V	1	ERO ETP	ETP 3G 22UF
C 25	CTD-0822	CAP TANTALUM 22UF/16V	1	ERO ETP	ETP 3G 22UF
C 12	CTF-0610	CAP TANTALUM 100NF/35V	1	ERO ETP	ETP 1A 100NF



Date : 29.5.90.

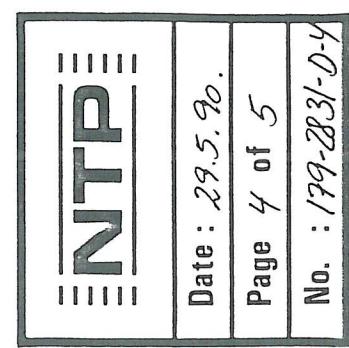
Page 3 of 5

No. : 179-283-D-4

## NTP 179-280D LIMITER AMPLIFIER

## PARTS LIST

REF. NO	NTP-ID.	DESCRIPTION	QTY	MANUFACT/DRW. NO.	PART NO.
C 19	CTF-0710	CAP TANTALUM 1UF / 35V	1	ERO ETP	ETP 1A 1UF
C 13	CTF-0810	CAP TANTALUM 10UF / 35V	1	ERO ETP	ETP 3G 10UF
C 23	CTF-0810	CAP TANTALUM 10UF / 35V	1	ERO ETP	ETP 3G 10UF
C 27	CTF-0810	CAP TANTALUM 10UF / 35V	1	ERO ETP	ETP 3G 10UF
C 28	CTF-0810	CAP TANTALUM 10UF / 35V	1	ERO ETP	ETP 3G 10UF
C 29	CTF-0810	CAP TANTALUM 10UF / 35V	1	ERO ETP	ETP 3G 10UF
C 2	CVB-0001	TRIMCAPACITOR 2-22PF	1	PH 2222 808	2222 808 11229
D 12	QDS-4002	DIODE, SILICIUM	1	F-126	IN 4002
D 13	QDS-4002	DIODE, SILICIUM	1	F-126	IN 4002
D 14	QDS-4002	DIODE, SILICIUM	1	F-126	IN 4002
D 15	QDS-4002	DIODE, SILICIUM	1	F-126	IN 4002
D 16	QDS-4002	DIODE, SILICIUM	1	F-126	IN 4002
D 1	QDS-4148	DIODE, SILICIUM	1	QDS-4148	IN 4148
D 2	QDS-4148	DIODE, SILICIUM	1	QDS-4148	IN 4148
D 3	QDS-4148	DIODE, SILICIUM	1	QDS-4148	IN 4148
D 4	QDS-4148	DIODE, SILICIUM	1	QDS-4148	IN 4148
D 5	QDS-4148	DIODE, SILICIUM	1	QDS-4148	IN 4148
D 6	QDS-4148	DIODE, SILICIUM	1	QDS-4148	IN 4148
D 7	QDS-4148	DIODE, SILICIUM	1	QDS-4148	IN 4148
D 8	QDS-4148	DIODE, SILICIUM	1	QDS-4148	IN 4148
D 11	QDS-4148	DIODE, SILICIUM	1	QDS-4148	IN 4148
D 9	QZR-0062	REFERENCE DIODE	1	DO-34	IN 821
D 10	QZR-0062	REFERENCE DIODE	1	DO-34	IN 821
Q 1b	QBA-0016	TRANSISTOR OVEN	1	QBA-0016	5 ST 1-2
Q 2	QBN-0237	TRANSISTOR, NPN	1	TO-92	BC237 B
Q 4	QBN-0237	TRANSISTOR, NPN	1	TO-92	BC237 B
Q 6	QBN-0237	TRANSISTOR, NPN	1	TO-92	BC237 B
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 13	QBN-0237	TRANSISTOR, NPN	1	TO-92	BC237 B
Q 14	QBN-0241	TRANSISTOR, NPN	1	TO-92	BF241
Q 3	QBP-0307	TRANSISTOR, PNP	1	TO-92	BC307



Date : 29.5.90.

Page 4 of 5

No. : 179-280D-4

Multi 29.05.90 9:13

PARTS LIST 179-280D PAGE 5

NTP 179-280D LIMITER AMPLIFIER

REF. NO.	NTP-ID.	DESCRIPTION	QTY	MANUFACT/DRW. NO.	PART NO.
Q 5	QBP-0307	TRANSISTOR, PNP	1	TO-92	BC307
Q 7	QBP-0307	TRANSISTOR, PNP	1	TO-92	BC307
Q 15	QBP-0451	TRANSISTOR PNP	1	TO-92	BF451
Q 12	QBP-2905	TRANSISTOR, PNP	1	TO-39	2N 2905
Q 11	QFN-4302	FET	1	QFN-4302	2N 4302
Q 1a	QFN-5486	FET TRANSISTOR	1	QFN-5486	2N 5486
A 1	250-100C	LINEAR AMPLIFIER	1	250-100C	250-100C
A 4	250-100C	LINEAR AMPLIFIER	1	250-100C	250-100C
A 5	250-100C	LINEAR AMPLIFIER	1	250-100C	250-100C
A 2	ILA-351	OP-AMP	1	NAT. LF351N	LF 351N
A 3	ILA-356	OP-AMP	1	NAT. LF356N	LF 356N
TR 1	LTB-0002	TRANSFORMER, PLUG IN	1.8:1	BEYER 310	310.200.101
TR 2	LTS-0003	OUTPUTTRANSFORMER	1:1	UDGÅR AF PROD.	JS 13590
S 1	SSB-0001	SLIDE SWITCH 2 POS	1	SIEMENS C42	42315-A60-A-2
TP 1	MHT-0002	TESTPOINT	1	ASSMANN	ALP 65
TP 2	MHT-0002	TESTPOINT	1	ASSMANN	ALP 65
TP 3	MHT-0002	TESTPOINT	1	ASSMANN	ALP 65
1	MEO-0951	CARD HANDLE CLEAR	1	ELMA	1091-51
2	KEM-6406	EUROCONNECTOR 64P ANGLE, MAL	1	ELCO 8257	8257 096 000
3	179-2850	SCREEN PLATE	1	179-2850-A-4	179-2850
4	179-2851	ISOLATIONS PLATE	1	179-2851-A-4	179-2851
5	351-1054	THREADED BUSHING	4	351-1054-A-4	351-1054
PCB	179-2840-D	P.C. BOARD	1	179-2840-D-3	179-2840-D

