

TANDBERG® TPA 3009A

Circuit Diagram with Alignment Instructions and Illustrated Parts List

TANDBERG Power Amplifier 3009 A

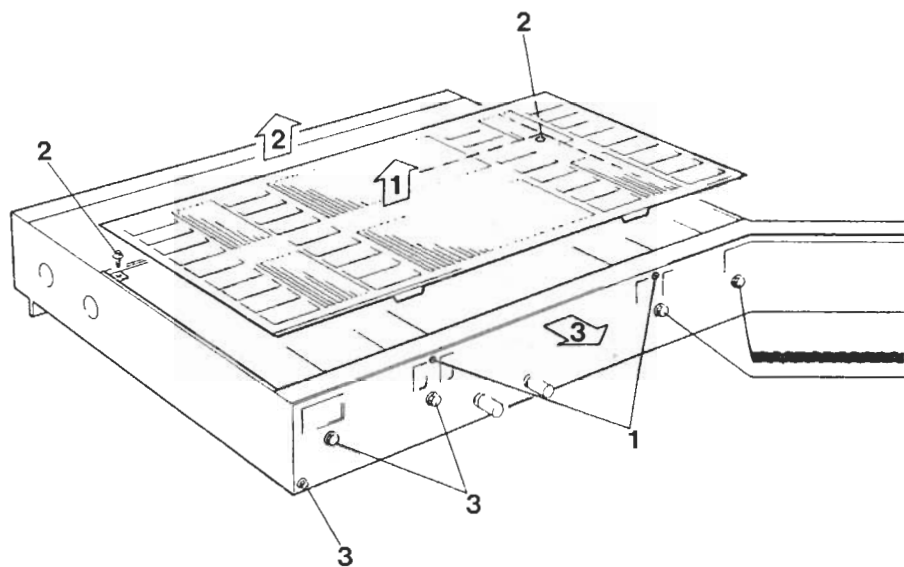
Peak Clipping

Contents

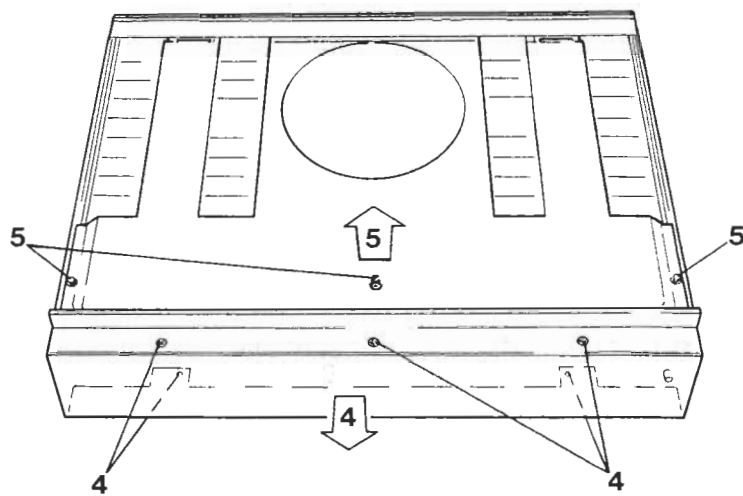
	Page
Dismantling	3
Electrical adjustments	4
P.c. boards	5
Circuit diagram	6
Parts list	8
Technical data	15

Dismantling

- Top cover, rear (1)
- Top cover, front (2)
- Rear panel (3)
- Front panel (4)
- Bottom cover (5)



Dismantling the rear and top covers.



Dismantling the front and bottom covers.

Electrical adjustments

Test conditions

Approx. 30 minutes warming up time without signal applied. The top and bottom cover should not be removed, otherwise the unit must be covered.

Distortion, unloaded

Adjust R131 to minimum distortion, at 12 V output, 1 kHz, and no load. The distortion should be less than 0.004%.

D.c. offset adjustment

- Solder two LED's (light emitting diodes) with opposite polarity together in parallel and connect them to the contact J106 on the power amplifier board (collector on Q102).
- Adjust R115 until the LED's are switched off.
- Remove the LED's and measure the d.c. voltage on the output terminals. The d.c. voltage should be less than ± 35 mV.

Quiescent current

The quiescent current should be adjusted without load and no signal applied at the input terminals.

- Adjust R164 on the output amplifier board to 35 mV across R505 and R605 on the power supply board.

Distortion, loaded

Apply a signal of 1 kHz and drive the amplifier to 12 V on the output terminals when the load is 4 ohm.

- Adjust R131 to minimum distortion. The distortion should be less than 0.005%.

Checking the speaker protection relay

- Disconnect speaker load.
- Apply 6 to 8 V d.c. with 220 kohm in series (+ and – alternately) to R508/R509. The relay should then open.

NOTE!

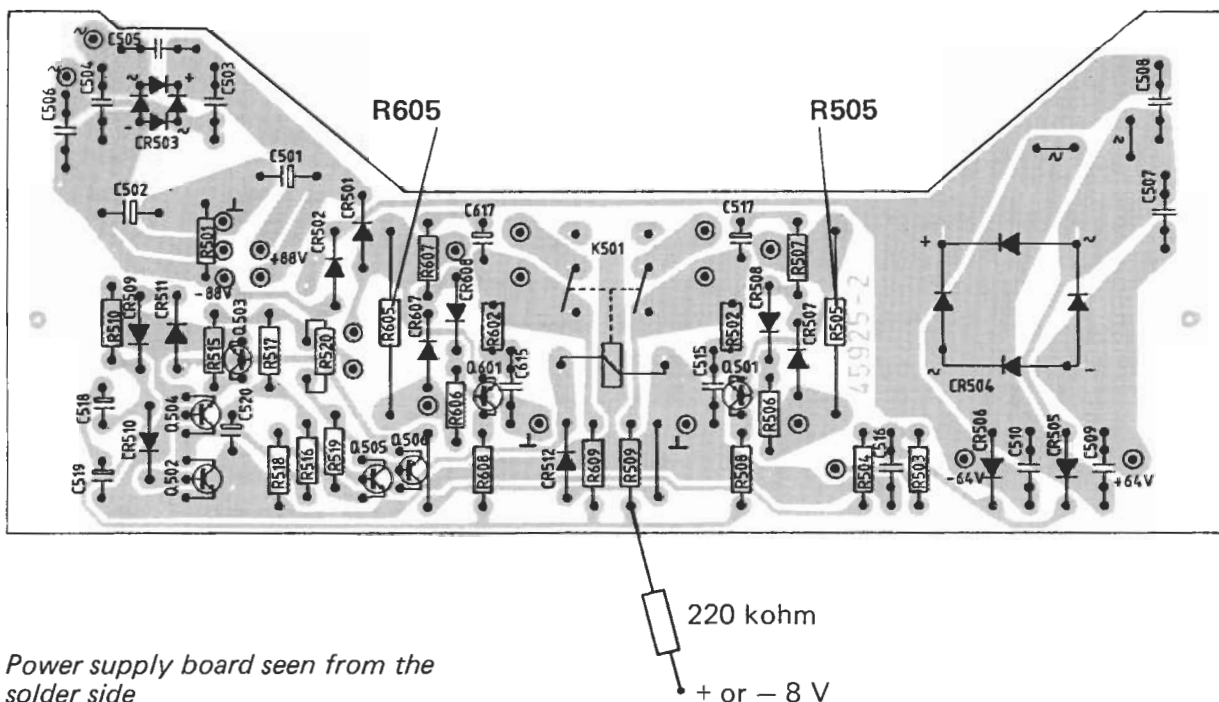
Input FET's Q103 and Q104 are matched pair, and should be replaced with the same group. Each matched pair of transistors needs a specific value of source resistors (written by hand on the pc board). After replacing the FET's, check for correct current.

The voltage across R147 should be $2.2 \text{ V} \pm 0.2 \text{ V}$.

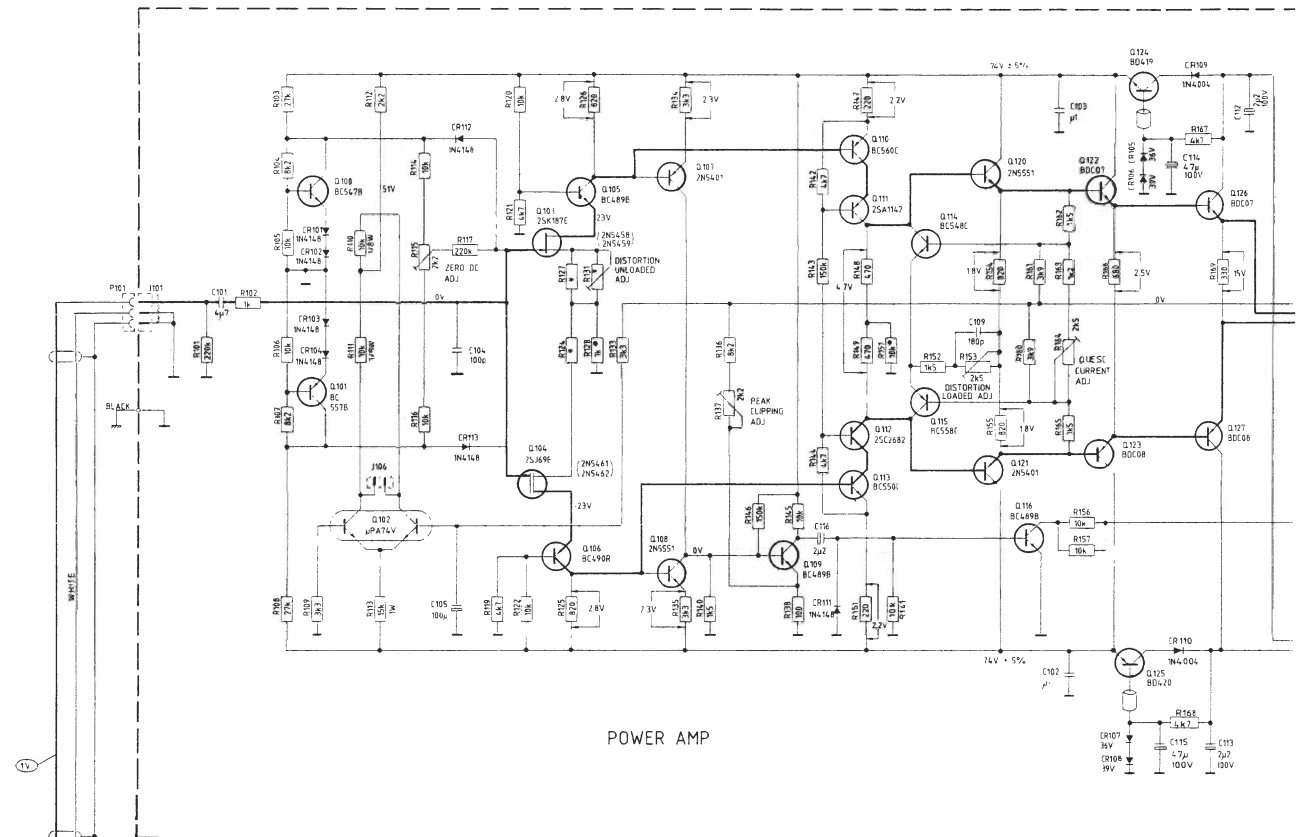
All measurements in the amplifier must be made with a probe having minimum 5 kohms.

Peak clipping

Adjust R137 to minimum light in LED at slight dipping.



Circuit diagram



POWER AMP



2N5459
2N5462



BC447
BC449
BC450
BC546
BC547
BC548
BC557
BC558



2N5401
2N5551



BD007
BD008



2SA1142
2SC2682



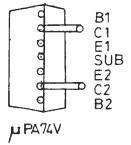
2SK187
2SJ69
2SJ44
2SK163



BD419
BD420



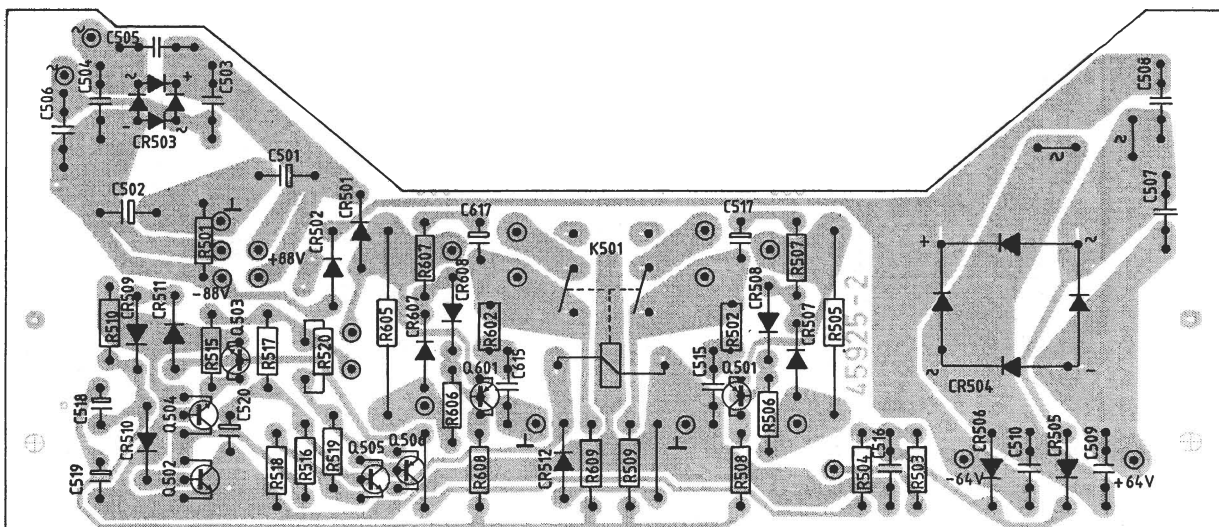
2SK175
2SJ55

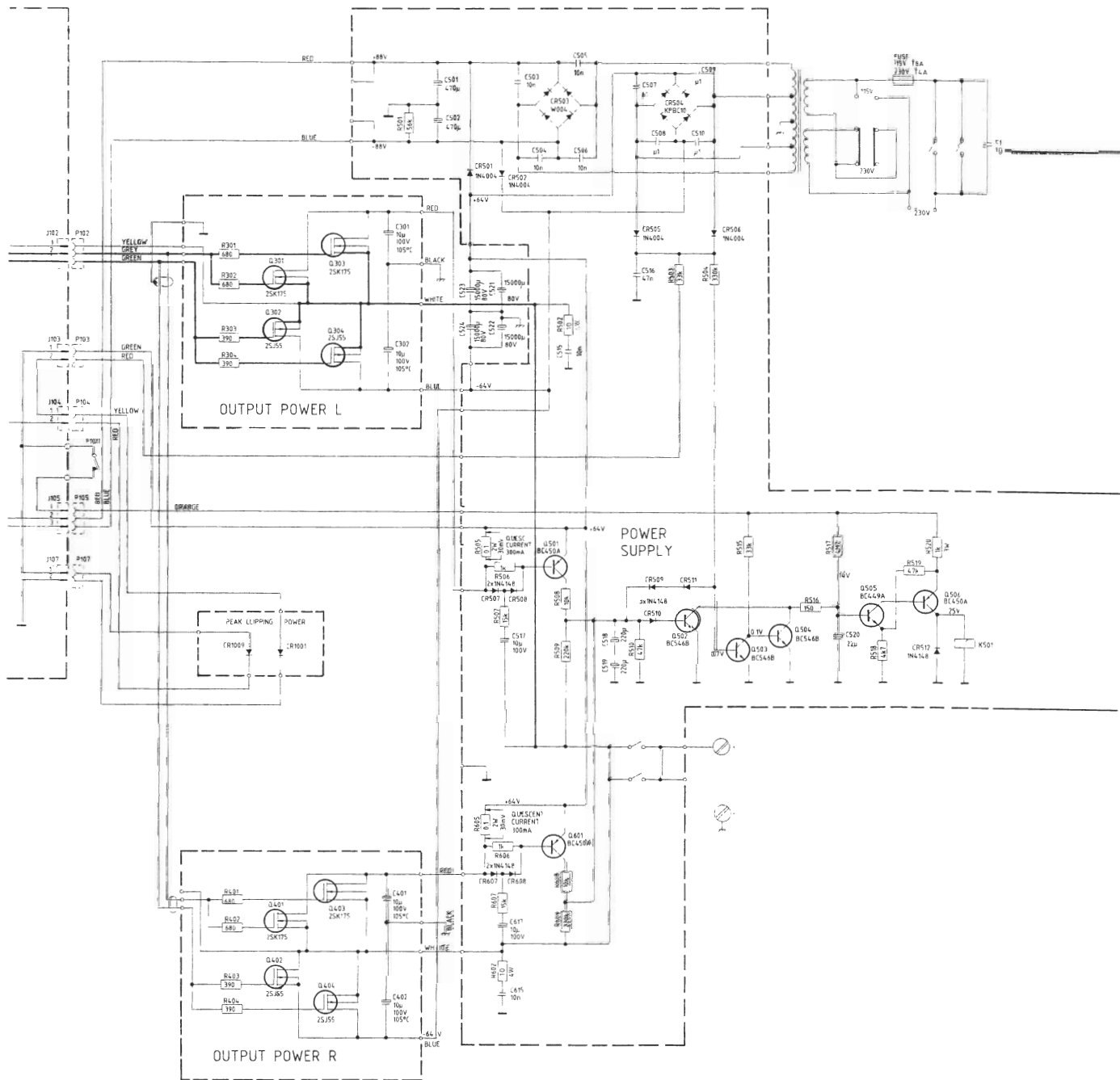


μPA74V

B1
C1
U1
B
C2
B2

TRANSISTORS ARE SEEN FROM UNDERNEATH.





ADJUSTMENTS

- Adj "Distortion unloaded" R131/231 to min. distortion, 12V output, 1kHz, no load.
0,004% max. distortion
The voltage across R150/250 should be 2,65V ±0,45V
All measurements must be made with a probe having minimum 5kohms resistors in both terminals
- Connect two LED's in antiparallell to J206 Adj "Zero DC" R115/215 until both diodes turns off DC at speaker output should be within ± 50mV DC
- Adj. "Distortion loaded" R153/253 to min, distortion at 12V across 4Ω. 1kHz, 0,005% max.
- Adj. "Quiescent current" R164/264 to 30mV across R505/605.
- Adj. "Peak clipping" R137/237 to min light in LED at slight clipping.

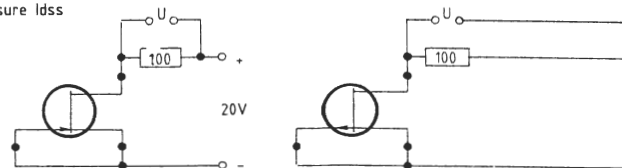
Check the adjustments after 15 min warm-up time.

- Components with this marking has 1% tolerance

When Q103/104/203/204 have to be replaced, the following must be done. Use the table below to find the combination of the transistors' Idss groups and source resistors, Resistors marked * is dependent on Idss of the field-effect transistors

2N5458 (2N5459) , 2N5461 (2N5462)			
Idss(mA)	R124	R127	R131
4-5	82 Ω	220 Ω	1k
5-6	120 Ω	220 Ω	1k
6-7	180 Ω	470 Ω	1k
7-8	270 Ω	680 Ω	1k
8-9	330 Ω	1k	1k
9-10	390 Ω	1k2	1k
10-11	470 Ω	1k	2k2

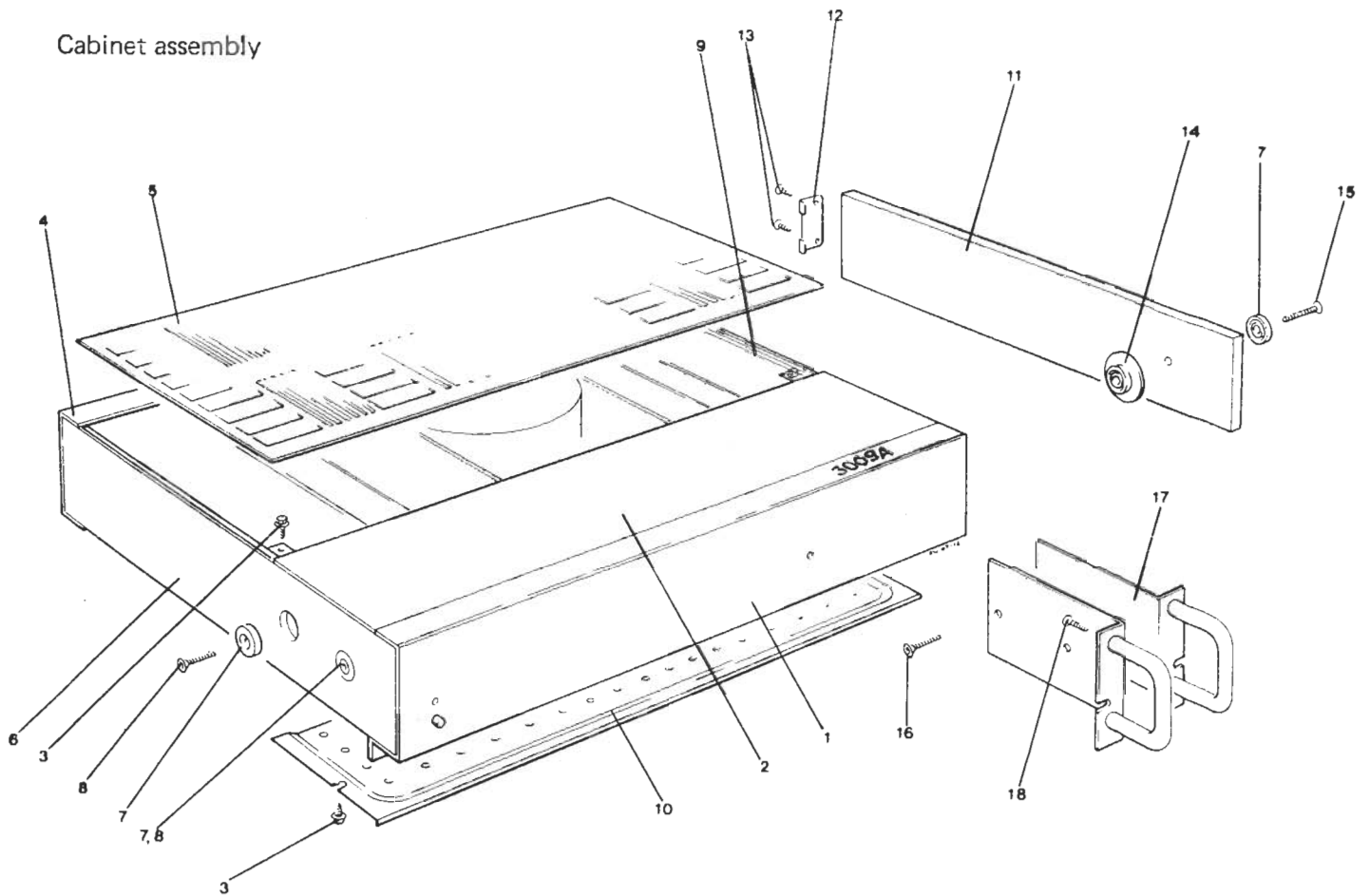
How to measure Idss



$$Idss(mA) = \frac{U(\text{volt})}{0,1(Kohm)}$$
 Both FET's must be within the same Idss-group

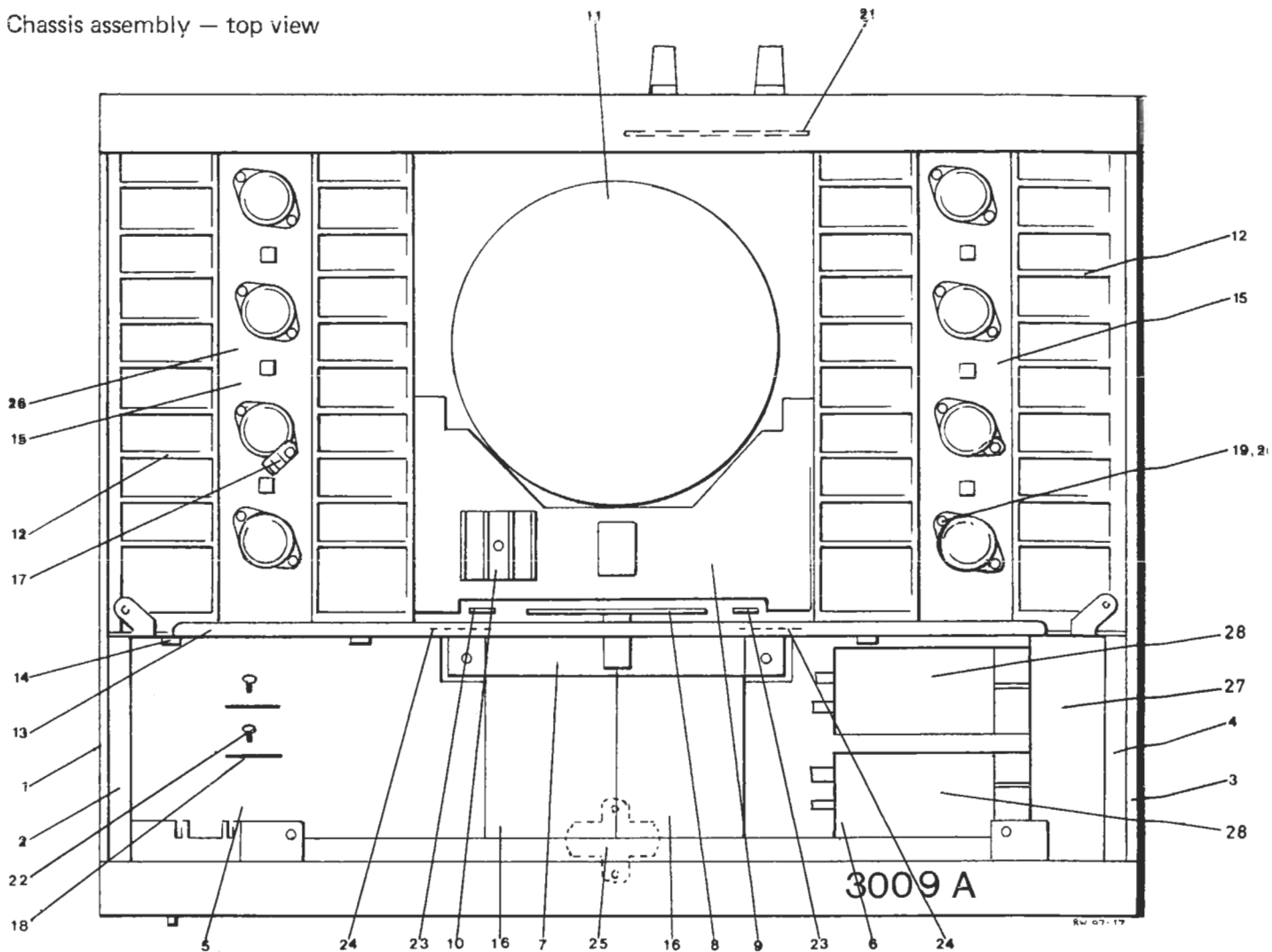
Parts list

Cabinet assembly



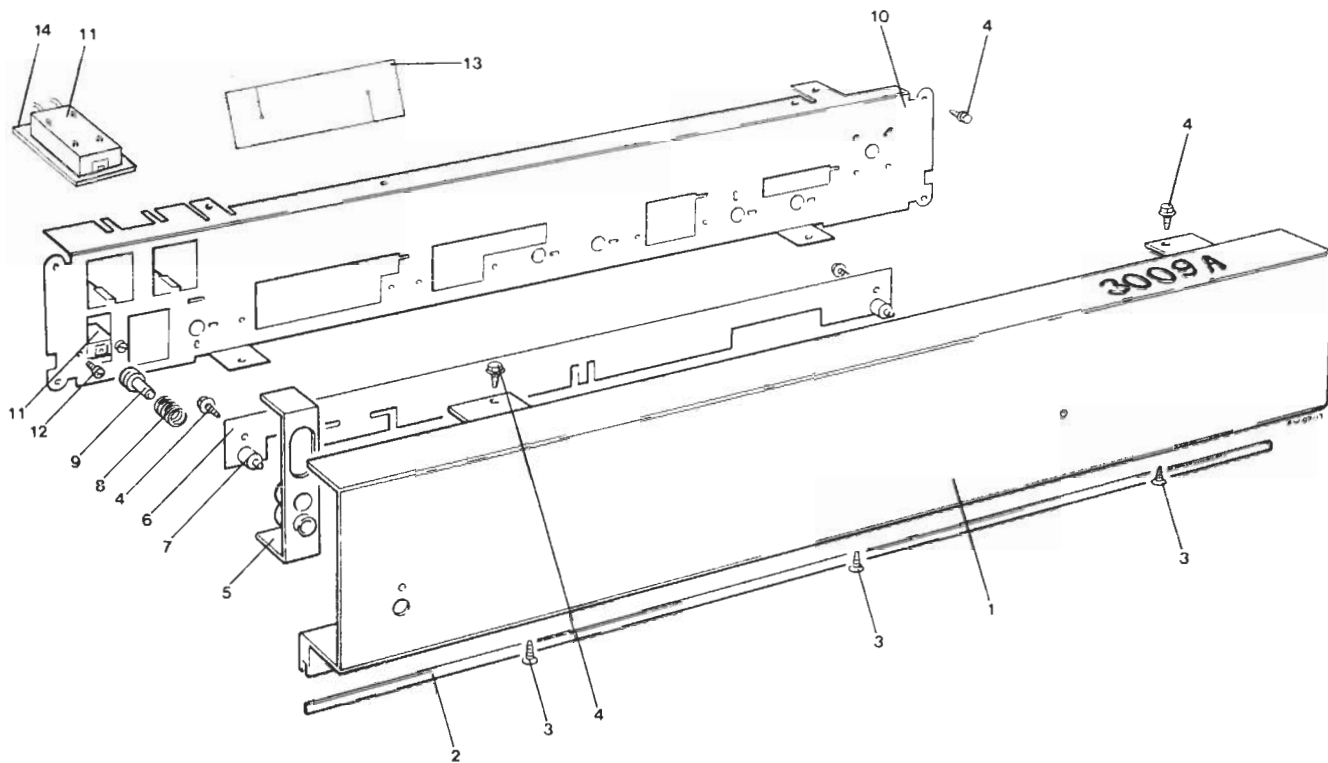
SPECIFY THIS WHEN ORDERING				
Index	Order No.	Beskrivelse	Description (notes)	Reference
1	*	Kabinett-enhet	Cabinet assembly	
2	422876	Skinne	Panel, front	
	412581	Plate	Plate, top front	
3	346854	Skrue	Screw, M3,5 x 6,3 hex hd, with collar	
4	422882	Skinne	Panel, back	
5	421908	Plate	Plate, top	
6	375969	Skinne	Plate, side, left	
7	400602	Hylse	Spacer, black plastic	
8	401105	Skrue	Screw, M4 x 16 csk hd, black	
9	406816	Skinne	Plate, side, right	
10	376939	Plate	Plate, bottom Extra side panels	
11	006803	Plate	Panel, side, pair, black	
11	006968	Plate	Panel, side, pair, rose wood	
12	405875A	Vinkel	Bracket, side panel	
13	409661	Skrue	Screw, 3/8" No. 4 csk hd, black	
14	400480	Avstandsstykke	Spacer, black plastic	
15	402786	Skrue	Screw, M4 x 25 csk hd, black	
16	401105A	Skrue	Extra 19" rack mount Screw, M4 x 16 csk hd, black	
17	996467	Håndtak	Rack mount kit, 19"	Supplied with index No. 16 and 18
18	404819	Skrue	Screw, M4 x 12 csk hd, black	

Chassis assembly — top view



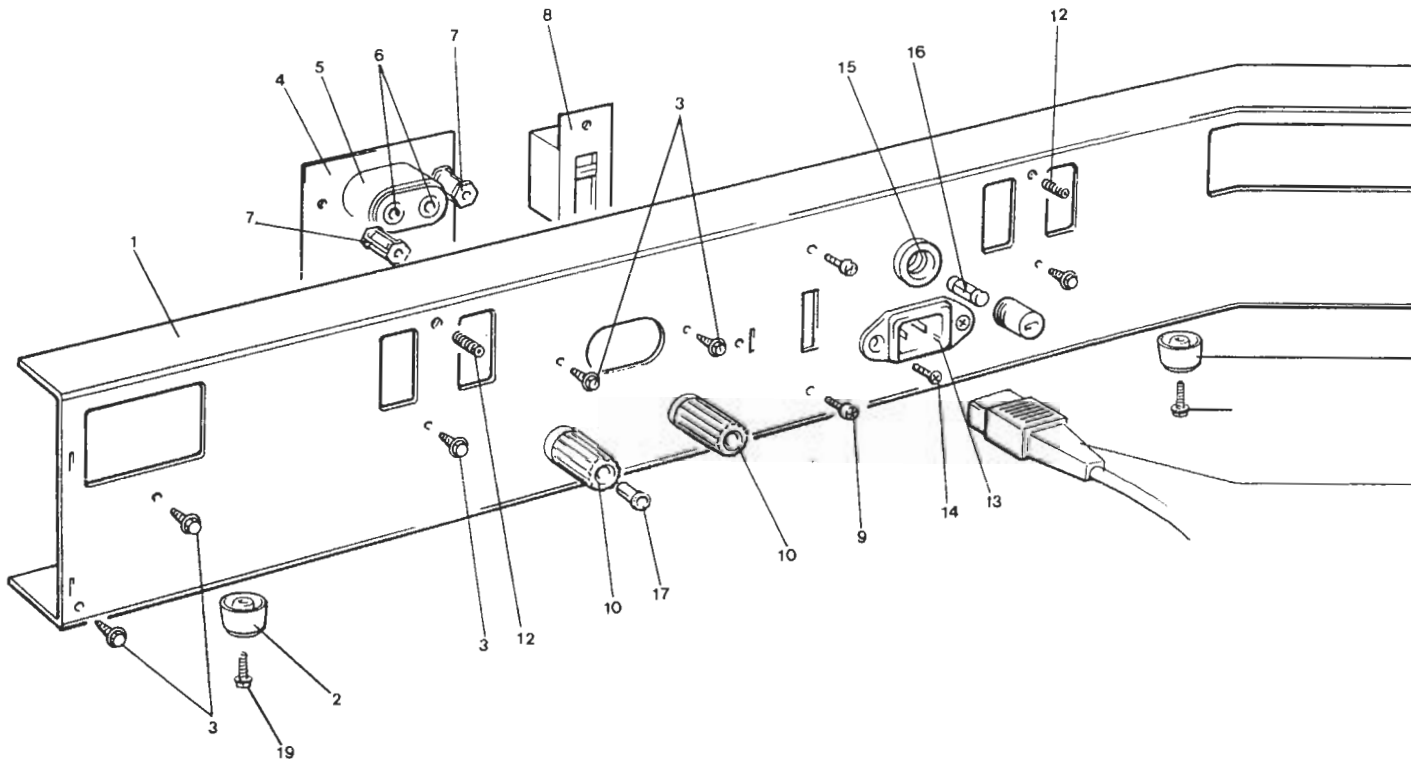
SPECIFY THIS WHEN ORDERING			Description (notes)	Reference
Order No.	Beskrivelse			
1	375969	Sjassis-enhet	Chassis assembly, top view	
2	417178	Skinne	Plate, side, left	
3	406816	Skinne	Plate, side, right	
4	417175	Skinne	Plate, chassis, side, right	
5	997309	Kort	Board, Power Amplifier	
7	378268	Holder	Clamp	
8	424988	Brakett	Bracket, terminal	
9	997310	Kort	Board, relay/rectifier	
10	375344	Kjøleribbe	Heatsink	
11	422286A	Transformator	Transformer, TD0185	
12	405272	Kjøleribbe	Heatsink	
13	375610A	Plate	Plate, chassis	
14	345389A	Skrue	Screw, M3.5 x 9.5 hex hd, with collar	
15	997307	Kort	Board, output power (Not including index 12 and transistors)	
16	375229	Elko	Capacitor, 15.000 uF, 80 V	
17	376207	Fjær	Clamp, spring	
18	423564	Plate	Plate, heatsink	
19	213918	Skrue	Screw, M3 x 16 ch hd	
20	218609	Skive	Washer, M3.2	
21	997313	Kort	Board, input	
22	414695	Skrue	Screw, M2.3 x 6	
24	424889	Tube	Tube	
25	402434	Vinkel	Bracket	
26	372615	Holder	Socket	Output transistors
27	429667	Brakett Elko	Bracket Elko	
28	429648	Elko	Capacitor, 15.000 uF, 80 V	

Front panel



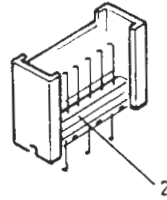
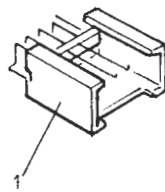
SPECIFY THIS WHEN ORDERING				
Index	Order No.	Beskrivelse	Description (notes)	Reference
1	* 422876	Frontskinne	Front panel	
2	379030B	Skinne	Panel, front	
		List	Strip, rubber	
3	307990	Skrue	Screw, plate, 3/8" No. 6csk hd	
4	346854A	Skrue	Screw, M3.5 x 6.3 hex hd, with collar	
5	376048A	Hylse	Guide, push button knob	
6	377780	Kort	Board, LED, without components	
7	374425	Diode	Diode, SLP-132B, light emitting	
8	408023	Fjær	Spring	
9	376896A	Knapp	Knob, push button	POWER
10	376235	Plate	Plate, chassis	
11	370992	Bryter	Switch	POWER
12	290842	Skrue	Screw, M3 x 6 poz p.hd	
13	419319	Plate	Plate	Isolation
14	997312	Kort	Board, Main switch	

Back panel



SPECIFY THIS WHEN ORDERING				
Index	Order No.	Beskrivelse	Description (notes)	Reference
1	422882	Bakskinne	Back panel	
2	352421	Skinne	Panel, back	
		Fot	Foot, plastic	
3	360755	Skrue	Screw, M3.5 x 7.9 hex hd, with collar	
4	997313	Kort	Board, speaker connector	
5	379001	Hylse	Surround, phono socket, double	
6	371142	Kontakt	Socket, phono	INPUT
7	422484	Avstandsstykke	Spacer	
8	374152	Vender	Switch, voltage selector	
9	338082	Skrue	Screw, plate, 3/8" No. 4 pan hd, black	
10	997305	Kontakt	Socket, 4 mm, red, T-3025	SPEAKERS
12	400753	Skrue	Screw, set, M4 x 18	
13	374081	Kontakt	Socket, power, 6075-1	
14	262876	Skrue	Screw, plate, 1/4" No. 4 csk hd, black	
15	363909	Holder	Holder, fuse	
16	281165	Sikring	Fuse, 4A, 5 x 20 mm, slow, 207-63, 230 V	EUROPE
16	377241	Sikring	Fuse, 8A, 5 x 20 mm, slow, 19195, 115 V	USA
17	375403	Hylse	Sleeve, black plastic	
18	379906	Ledning	Cable, power	EUROPE
18	377873	Ledning	Cable, power	USA
19	350402A	Skrue	Screw, M3.5 x 15 hex hd, with collar	

Connectors



SPECIFY THIS WHEN ORDERING					
Index	Ordering No.	Beskrivelse (merknader)	Description (notes)	Reference	
1	*	Kontakter	Connectors		
	411948	Plint	Connector, 2 pole, horizontal, red	AMP, MT 0-826 715-2	
	411946	Plint	Connector, 2 pole, horizontal, black	" " 718-2	
	419814	Plint	Connector, 3 pole, horizontal, green	" " 716-3	
	419820	Plint	Connector, 3 pole, horizontal, black	" " 718-3	
	411952	Plint	Connector, 4 pole horizontal, red	" " 715-4	
	411955	Plint	Connector, 4 pole, horizontal, blue	" " 717-4	
	411957	Plint	Connector, 6 pole, horizontal, black	" " 718-6	
	411962	Plint	Connector, 7 pole, horizontal, black	" " 718-7	
	411969	Plint	Connector, 8 pole, horizontal, black	" " 718-8	
	2	411728	Plint	Connector, 2 pole, black	" " 379-2
		411909	Plint	Connector, 2 pole, red	" " 376-2
		411911	Plint	Connector, 2 pole, green	" " 377-2
		411913	Plint	Connector, 2 pole, blue	" " 378-2
		411721	Plint	Connector, 3 pole, black	" " 379-3
		411915	Plint	Connector, 3 pole, red	" " 376-3
		411917	Plint	Connector, 3 pole, green	" " 377-3
411922		Plint	Connector, 3 pole, blue	" " 378-3	
411736		Plint	Connector, 4 pole, black	" " 379-4	
411924		Plint	Connector, 4 pole, red	" " 376-4	
411926		Plint	Connector, 4 pole, green	" " 377-4	
411928		Plint	Connector, 4 pole, blue	" " 378-4	
411931		Plint	Connector, 5 pole, blue	" " 378-5	
411738		Plint	Connector, 5 pole, black	" " 379-5	
410409		Plint	Connector, 6 pole, red	" " 376-6	
410411		Plint	Connector, 6 pole, green	" " 377-6	
410413		Plint	Connector, 6 pole, blue	" " 378-6	
410415		Plint	Connector, 6 pole, black	" " 379-6	
419826		Plint	Connector, 7 pole, red	" " 376-7	
413696		Plint	Connector, 7 pole, blue	" " 378-7	
411940	Plint	Connector, 7 pole, black	" " 379-7		
419828	Plint	Connector, 9 pole, black	" " 379-9		
411152	Plint	Connector, 10 pole, black	AMP, MT 1-826 379-0		
411755	Plint	Connector, 12 pole, black	" " 379-2		

SPECIFY THIS WHEN ORDERING				
Index	Order No.	Beskrivelse	Description (notes)	Reference
CR101	247007	Diode	Diode, 1N4148	
CR102	247007	Diode	Diode, 1N4148	
CR103	247007	Diode	Diode, 1N4148	
CR104	247007	Diode	Diode, 1N4148	
CR105	422708	Diode	Diode, RD 36E	
CR106	422706	Diode	Diode, RD 39E	
CR107	422708	Diode	Diode, RD 36E	
CR108	422706	Diode	Diode, RD 39E	
CR109	286058	Diode	Diode, 1N4004	
CR110	286058	Diode	Diode, 1N4004	
CR111	247007	Diode	Diode, 1N4148	
CR112	247007	Diode	Diode, 1N4148	
CR113	247007	Diode	Diode, 1N4148	
CR501	286058	Diode	Diode, 1N4004	
CR502	286058	Diode	Diode, 1N4004	
CR505	286058	Diode	Diode, 1N4004	
CR506	286058	Diode	Diode, 1N4004	
CR507	247007	Diode	Diode, 1N4148	
CR508	247007	Diode	Diode, 1N4148	
CR509	247007	Diode	Diode, 1N4148	
CR510	247007	Diode	Diode, 1N4148	
CR511	247007	Diode	Diode, 1N4148	
CR512	247007	Diode	Diode, 1N4148	
CR607	247007	Diode	Diode, 1N4148	
CR608	247007	Diode	Diode, 1N4148	
CR1001	374425	Diode	Diode, SLP-132B	
CR1009	374425	Diode	Diode, SLP-132B	

SPECIFY THIS WHEN ORDERING				
Index	Order No.	Beskrivelse	Description (notes)	Reference
C1	411155	Kondensator	Capacitor, 10 nF, 250 V	
C101	429690	Kondensator	Capacitor, 4.7 uF, P.Prop	
C102	284370	Kondensator	Capacitor, 100 nF	
C103	284370	Kondensator	Capacitor, 100 nF	
C104	251884	Kondensator	Capacitor, 100 pF	
C105	341042	Kondensator	Capacitor, 100 uF, 10 V	
C109	370661	Kondensator	Capacitor, 180 pF	
C111	340338	Kondensator	Capacitor, 470 uF, 6.3 V	
C112	413806	Kondensator	Capacitor, 2.2 uF, 100 V	
C113	413806	Kondensator	Capacitor, 2.2 uF, 100 V	
C114	413804	Kondensator	Capacitor, 47 uF, 100 V	
C115	413804	Kondensator	Capacitor, 47 uF, 100 V	
C116	413806	Kondensator	Capacitor, 2.2 uF, 100 V	
C201	422965	Kondensator	Capacitor, 2.2 uF	
C202	284370	Kondensator	Capacitor, 100 nF	
C203	284370	Kondensator	Capacitor, 100 nF	
C204	251884	Kondensator	Capacitor, 100 pF	
C205	341042	Kondensator	Capacitor, 100 uF, 10 V	
C209	370661	Kondensator	Capacitor, 180 pF	
C211	340338	Kondensator	Capacitor, 470 uF, 6.3 V	
C212	413806	Kondensator	Capacitor, 2.2 uF, 100 V	
C213	413806	Kondensator	Capacitor, 2.2 uF, 100 V	
C214	413804	Kondensator	Capacitor, 47 uF, 100 V	
C215	413804	Kondensator	Capacitor, 47 uF, 100 V	
C215	413806	Kondensator	Capacitor, 2.2 uF, 100 V	
C301	417633	Kondensator	Capacitor, 10 uF, 100 V	
C302	417633	Kondensator	Capacitor, 10 uF, 100 V	
C401	417633	Kondensator	Capacitor, 10 uF, 100 V	
C402	417633	Kondensator	Capacitor, 10 uF, 100 V	
C501	378728	Kondensator	Capacitor, 470 uF, 100 V	
C502	378728	Kondensator	Capacitor, 470 uF, 100 V	
C503	277351	Kondensator	Capacitor, 10 nF	
C504	277351	Kondensator	Capacitor, 10 nF	
C505	277351	Kondensator	Capacitor, 10 nF	
C506	277351	Kondensator	Capacitor, 10 nF	
C507	208115	Kondensator	Capacitor, 100 nF	
C508	208115	Kondensator	Capacitor, 100 nF	
C509	208115	Kondensator	Capacitor, 100 nF	
C510	208115	Kondensator	Capacitor, 100 nF	
C515	372967	Kondensator	Capacitor, 10 nF	
C516	281008	Kondensator	Capacitor, 47 nF	
C517	379159	Kondensator	Capacitor, 10 uF, 100 V	
C518	344404	Kondensator	Capacitor, 220 uF, 16 V	
C519	344404	Kondensator	Capacitor, 220 uF, 16 V	
C520	372673	Kondensator	Capacitor, 22 uF, 35 V	
C521	375229	Kondensator	Capacitor, 15.000 uF, 80 V	
C522	375229	Kondensator	Capacitor, 15.000 uF, 80 V	
C523	429648	Kondensator	Capacitor, 15.000 uF, 80 V	
C524	429648	Kondensator	Capacitor, 15.000 uF, 80 V	
C615	372967	Kondensator	Capacitor, 10 nF	
C617	379159	Kondensator	Capacitor, 10 uF, 100 V	

SPECIFY THIS WHEN ORDERING				
Index	Order No.	Beskrivelse	Description (notes)	Reference
K501	377090	Relé	Relay, LY2Z - OAUPL	
L501	422698	Spole	Coil	
L601	422698	Spole	Coil	
CR503	358507	Likeretter	Rectifier, WO4, 400 V 1	
CR504	372400	Likeretter	Rectifier, KBFC 25-02	

SPECIFY THIS WHEN ORDERING				
Index	Order No.	Beskrivelse	Description (notes)	Reference
R110	417943	Motstand	Resistor, 10 kohm, 1/8 W	
R111	417943	Motstand	Resistor, 10 kohm, 1/8 W	
R113	422659	Motstand	Resistor, 15 kohm, 1 W	
R115	424005	Motstand	Resistor, 2.5 kohm	Potionmeter
R124		Motstand	Resistor	Value depend on Q103/ Q104. Supplied with 997316. See table Idss Q103/104.
R127	413176	Motstand	Resistor	
R128	400207	Motstand	Resistor, 1 kohm, 1/8 W	
R131	429613	Motstand	Resistor, 1 kohm	Potentiometer
R137	424005	Motstand	Resistor, 2.5 kohm	Potentiometer
R147	424812	Motstand	Resistor, 220 ohm	Fusing-resistor
R148	424824	Motstand	Resistor, 470 ohm	Fusing-resistor
R149	424824	Motstand	Resistor, 470 ohm	Fusing-resistor
R150	424812	Motstand	Resistor, 220 ohm	Fusing-resistor
R151	313558	Motstand	Resistor, 10 kohm	
R153	424005	Motstand	Resistor, 2.5 kohm	Potentiometer
R154	428995	Motstand	Resistor, 820 ohm	Fusing-resistor
R155	428995	Motstand	Resistor, 820 ohm	Fusing-resistor
R162	424842	Motstand	Resistor, 1.5 kohm	Fusing-resistor
R163	424941	Motstand	Resistor, 1.2 kohm	Fusing-resistor
R164	424005	Motstand	Resistor, 2.5 kohm	Potentiometer
R165	424842	Motstand	Resistor, 1.5 kohm	Fusing-resistor
R166	424831	Motstand	Resistor, 680 ohm	Fusing-resistor
R169	424816	Motstand	Resistor, 330 ohm	Fusing-resistor
R301	424831	Motstand	Resistor, 680 ohm	Fusing-resistor
R302	424831	Motstand	Resistor, 680 ohm	Fusing-resistor
R303	424822	Motstand	Resistor, 390 ohm	Fusing-resistor
R304	424822	Motstand	Resistor, 390 ohm	Fusing-resistor
R401	424831	Motstand	Resistor, 680 ohm	Fusing-resistor
R402	424831	Motstand	Resistor, 680 ohm	Fusing-resistor
R403	424822	Motstand	Resistor, 390 ohm	Fusing-resistor
R404	424822	Motstand	Resistor, 390 ohm	Fusing-resistor
R502	426278	Motstand	Resistor, 47 ohm	2 Watt
R505	424950	Motstand	Resistor, 0.1 ohm	
R506	424834	Motstand	Resistor, 1 kohm	Fusing-resistor
R520	356214	Motstand	Resistor, 1 kohm	
R602	426278	Motstand	Resistor, 47 ohm	2 Watt
R605	424950	Motstand	Resistor, 0.1 ohm	
R606	424834	Motstand	Resistor, 1 kohm	Fusing-resistor
Other resistors are 1/4 W met. film 5%				

SPECIFY THIS WHEN ORDERING				
Index	Order No.	Beskrivelse	Description (notes)	Reference
Q100	230291	Transistor	Transistor, BC547B	
Q101	359260	Transistor	Transistor, BC557B	
Q102	422676	Transistor	Transistor, UPA 74V	
Q103	997316	Transistor	Transistor, 2SK 187E (2N5458)	Matched pair with Q104
Q104	997316	Transistor	Transistor, 2SJ 69E (2N5461)	Matched pair with Q103
Q105	342579	Transistor	Transistor, BC489B	
Q106	344167	Transistor	Transistor, BC490B	
Q107	413780	Transistor	Transistor, 2N5401	
Q108	413785	Transistor	Transistor, 2N5551	
Q109	342579	Transistor	Transistor, BC489B	
Q110	424793	Transistor	Transistor, BC560C	
Q111	422688	Transistor	Transistor, 2SA 1142	
Q112	422694	Transistor	Transistor, 2SC 2682	
Q113	413722	Transistor	Transistor, BC550C	
Q114	231261	Transistor	Transistor, BC548C	
Q115	309139	Transistor	Transistor, BC558C	
Q116	342579	Transistor	Transistor, BC489B	
Q120	413785	Transistor	Transistor, 2N5551	
Q121	413780	Transistor	Transistor, 2N5401	
Q122	422672	Transistor	Transistor, BDC07	
Q123	422696	Transistor	Transistor, BDC08	
Q124	370007	Transistor	Transistor, BD419	
Q125	364353	Transistor	Transistor, BD420	
Q126	422672	Transistor	Transistor, BDC07	
Q127	422696	Transistor	Transistor, BDC08	
Q301	413787	Transistor	Transistor, 2SK 175	
Q302	413792	Transistor	Transistor, 2SJ 55	

Q303	413787	Transistor	Transistor, 2SK 175
Q304	413792	Transistor	Transistor, 2SJ 55
Q401	413787	Transistor	Transistor, 2SK 175
Q402	413792	Transistor	Transistor, 2SJ 55
Q403	413787	Transistor	Transistor, 2SK 175
Q404	413792	Transistor	Transistor, 2SJ 55
Q501	422669	Transistor	Transistor, BC450A
Q502	344145	Transistor	Transistor, BC546B
Q503	344145	Transistor	Transistor, BC546B
Q504	344145	Transistor	Transistor, BC546B
Q505	362672	Transistor	Transistor, BC449A
Q506	422669	Transistor	Transistor, BC450A
Q601	422669	Transistor	Transistor, BC450A

Technical data

Power requirements: 115/230 V \pm 10%, 50/60 Hz

Power consumption: 50 – 770 W

Dimensions:
 Width: 17 1/8" (43.5 cm)
 Depth: 13 3/4" (35.0 cm)
 Height: 3 1/4" (8.3 cm)
 Weight: 25 lbs (11.3 kg)

Technical Data according to IHF-A-202, 1978

Continuous Average Power Output:
 (8 ohms, 20 – 20.000 Hz, THD < 0.05%)
 180 W

Frequency Response: 20 – 20.000 Hz, +0/– 0.1 dB

Sensitivity: 80 mV

A-weighted Signal-to-Noise Ratio:
 (Ref. 1 W/8 ohms) 94 dB

Secondary Disclosures

Output Impedance (20 – 20.000 Hz): 0.031 ohms

Wideband Damping Factor: 250

SMPTE Intermodulation Distortion: 0.05%

IHF Intermodulation Distortion: 0.05%

Transient Overload Recovery Time: Immeasurable

Reactive Load Factor: 1.4

Reactive Load Rating: 1.4 dB

Separation: > 75 dB

Difference of Frequency Response: < 0.1 dB

Other Technical Data

Frequency Response: 0.15 Hz – 1.5 MHz

Output Impedance (20 – 20.000 Hz): 0.031 ohms

Slew rate: 250 V/ μ S

A-weighted Signal-to-Noise Ratio:
 (Ref. 150 W/8 ohms) 117 dB

Rise time: 0.9 μ S

* Specifications are subject to change for further improvement without notice.

Tandberg Audio A.s
Fetveien 1, P.O. Box 49
N-2007 Kjeller, Norway

Bestilling av deler

Ved alle henvendelser, vennligst oppgi apparatets type og serienummer.
Ved bestilling av deler, oppgi bestillingsnummer og beskrivelse.

Ordering of spare parts

For all enquiries, please state the set's type and serial number.
When ordering, give the part's order number and description.

Bestillingsadresse

Kontakt nærmeste Tandberg-kontor eller:
Norsk Elektronikk Service A/S
Postboks 125
N - 2007 KJELLER - Norge

Telefon: (02) 71 68 20
Telex: 18007 kurer n

Ordering address

Contact your nearest Tandberg office, or:
Norsk Elektronikk Service A/S
P.O. Box 125
N - 2007 KJELLER - Norway

Telephone: (02) 71 68 20
Telex: 18007 kurer n

