

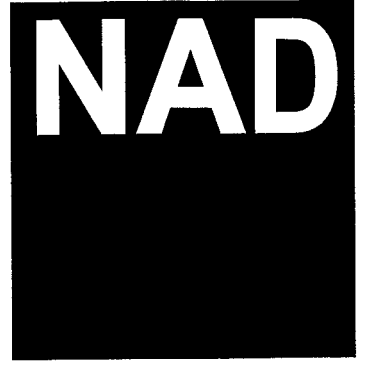
S500

**COMPACT
DISC PLAYER**

SERVICE MANUAL



V27270



S500

**COMPACT
DISC PLAYER**

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SERVICE SAFETY PRECAUTIONS

1. Replacing the Fuses

CAUTION: FOR CONTINUED PROTECTION AGAINST THE RISK OF FIRE REPLACE ONLY WITH SAME TYPE OF FUSE.


REFERENCE NO.	PART NUMBER	DESCRIPTION
AC INLET FUSE F451-F452*AH	5120-0032-0	Fuse Time Lag 500mA 250V 5x20mm UL/CSA Fuse Time Lag 2A 250V 5x20mm UL/CSA
AC INLET FUSE F451-F452*C	5120-0065-0	Fuse Time Lag 250mA 250V 5x20mm SEMKO/VDE Fuse Time Lag 2A 250V 5x20mm SEMKO/VDE

NOTE:

*AH : North American model only

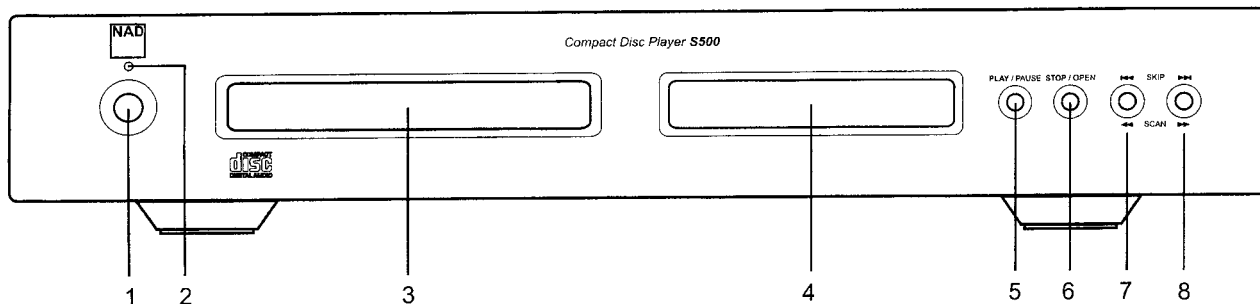
*C : European model only

2. Safety-check out (North American model only)

Parts marked with the symbol  are critical with regard to the risk of fire and electric shock. Replace only with parts recommended by the manufacturer.

FRONT PANEL / REAR PANEL VIEW

FRONT PANEL CONTROLS



1. POWER SWITCH
2. POWER INDICATOR
3. DISC DRAWER
4. DISPLAY

5. PLAY/PAUSE
6. STOP/OPEN
7. SKIP/SCAN DOWN
8. SKIP/SCAN UP

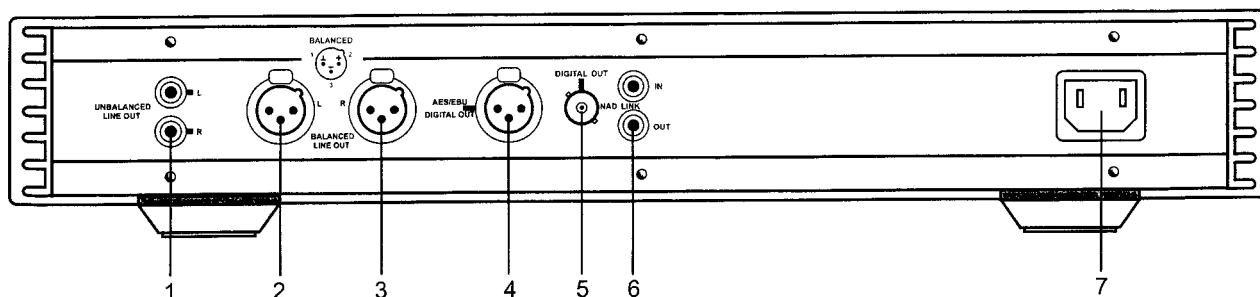


The graphic symbol of a lightning flash with an arrow point within a triangle signifies that there is dangerous voltage within the unit and it poses a hazard to anyone removing the cover to gain access to the interior of the unit. **Only qualified service personnel should make such attempt.**



The graphic symbol of an exclamation point within an equilateral triangle warns a user of the device that it is necessary to refer to the instruction manual and its warnings for proper operation of the unit.

REAR PANEL CONNECTIONS



1. UNBALANCED LINE OUTPUT
2. LEFT BALANCED LINE OUTPUT
3. RIGHT BALANCED LINE OUTPUT
4. AES/EBU BALANCED DIGITAL OUTPUT

5. COAXIAL DIGITAL OUTPUT
6. NAD LINK INPUT/OUTPUT
7. AC INLET

THIS DEVICE COMPLIES WITH PART 15 OF THE FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS:
 (1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE, AND
 (2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED, INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRABLE OPERATION.

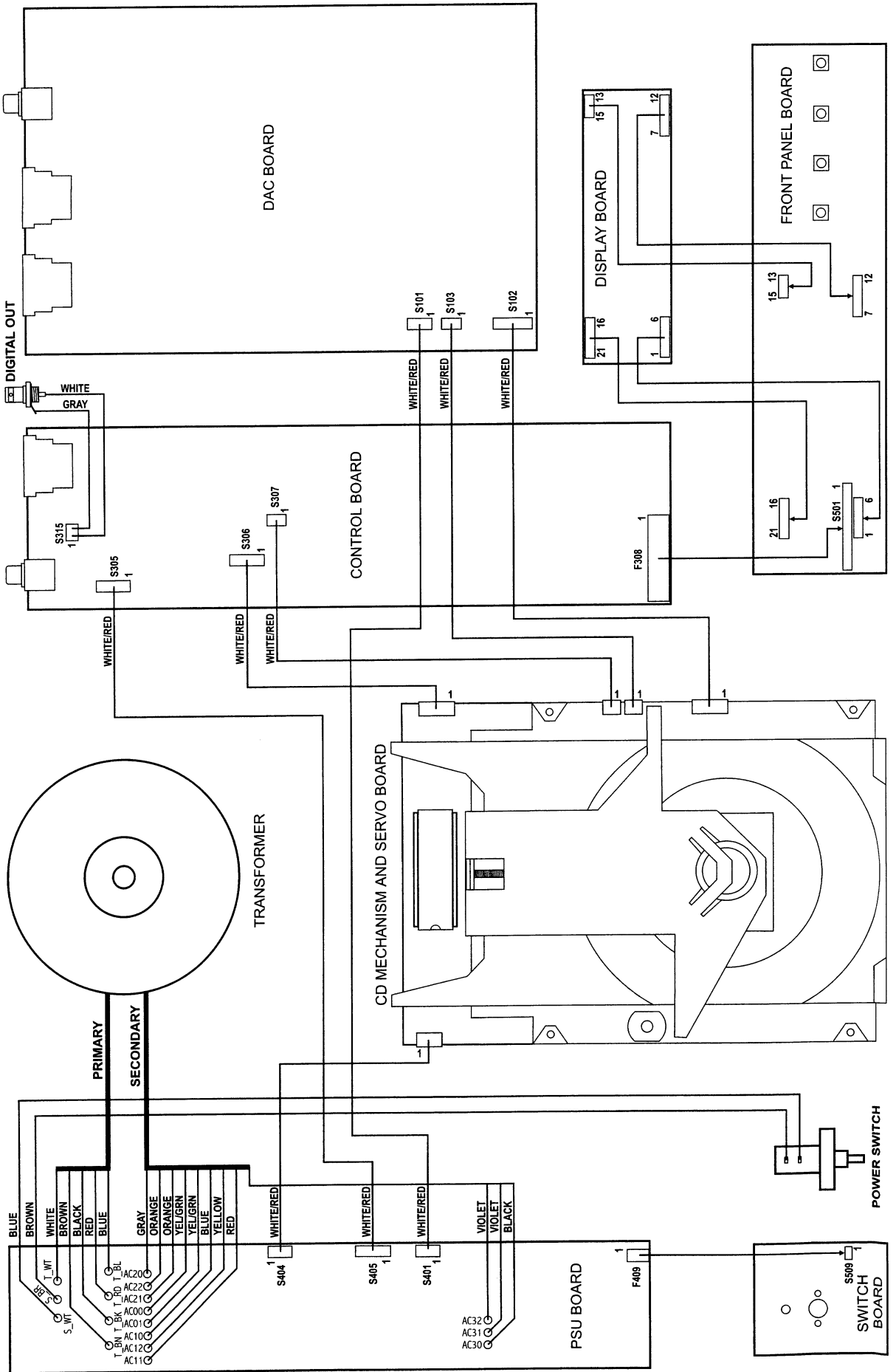
SPECIFICATIONS

Disc capacity	Single disc 120mm or 80mm
Digital-to-Analogue conversion	Crystal multi bit; 20-bit resolution
Analogue filter	5 pole active
Frequency response 5Hz-20kHz	+/-0.15dB
THD at 0dB, 1kHz	0.002%
Dynamic range	98dB
Linearity	+/-0.5dB from 0dB to -90dB
Signal-to-Noise ratio A-weighted (at play with de-emphasis)	110dB
Channel separation	1kHz 100dB 20kHz 99dB
Wow and flutter	Unmeasurable (Quartz accuracy)
Output impedance	120Ω
Output level at 0dB	2.2Vrms
Digital error correction	CIRC with double error correction in C1 and C2
Digital code output	Unbalanced Sony/Philips serial data format Balanced AES/EBU serial data format

Physical specifications

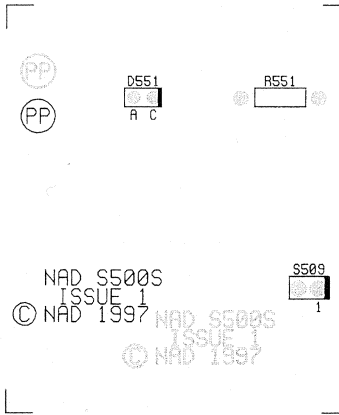
Dimensions (W x H x D)	450 x 67 x 286 mm
Net weight	5 kg / 11 lbs

WIRING DIAGRAM

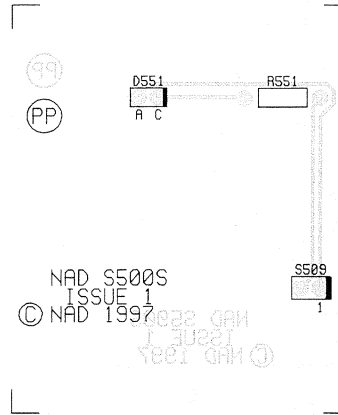


PCB LAYOUT

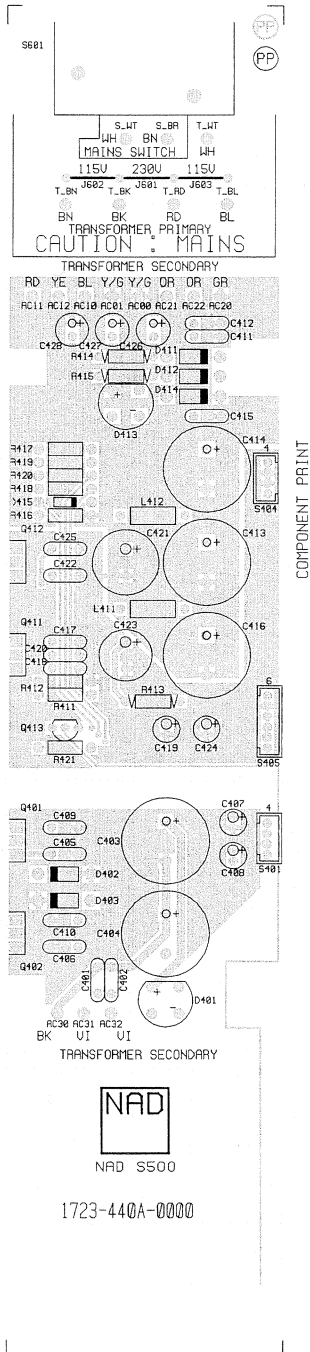
POWER SWITCH - COMPONENT SIDE



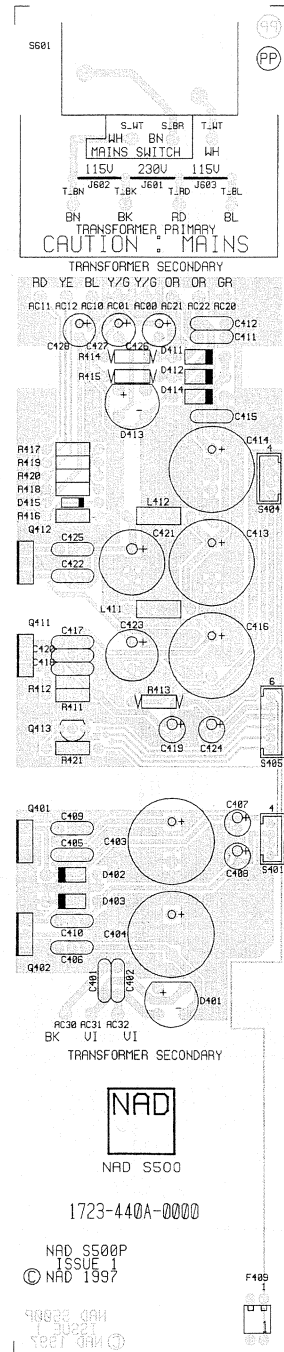
POWER SWITCH - SOLDER SIDE



PSU - COMPONENT SIDE

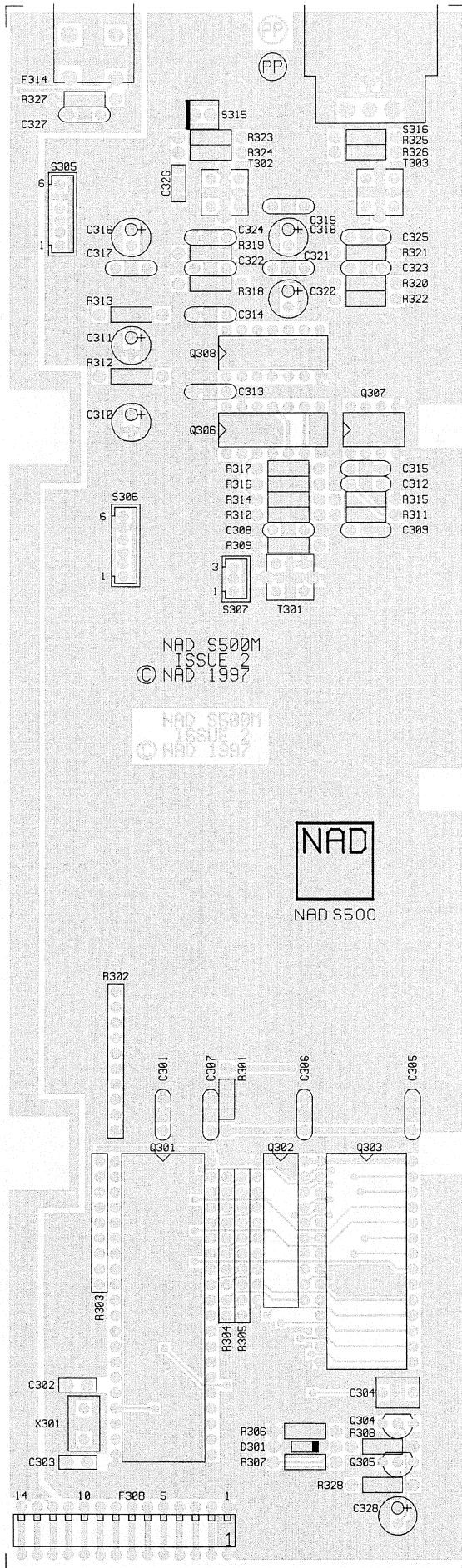


PSU - SOLDER SIDE

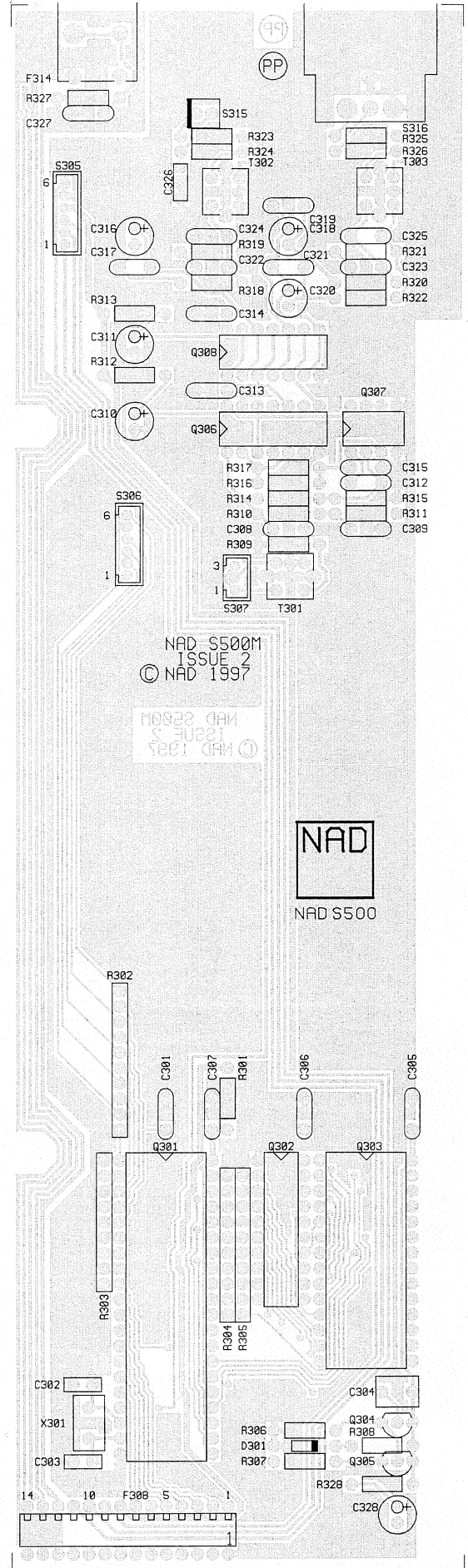


PCB LAYOUT

CONTROL - COMPONENT SIDE

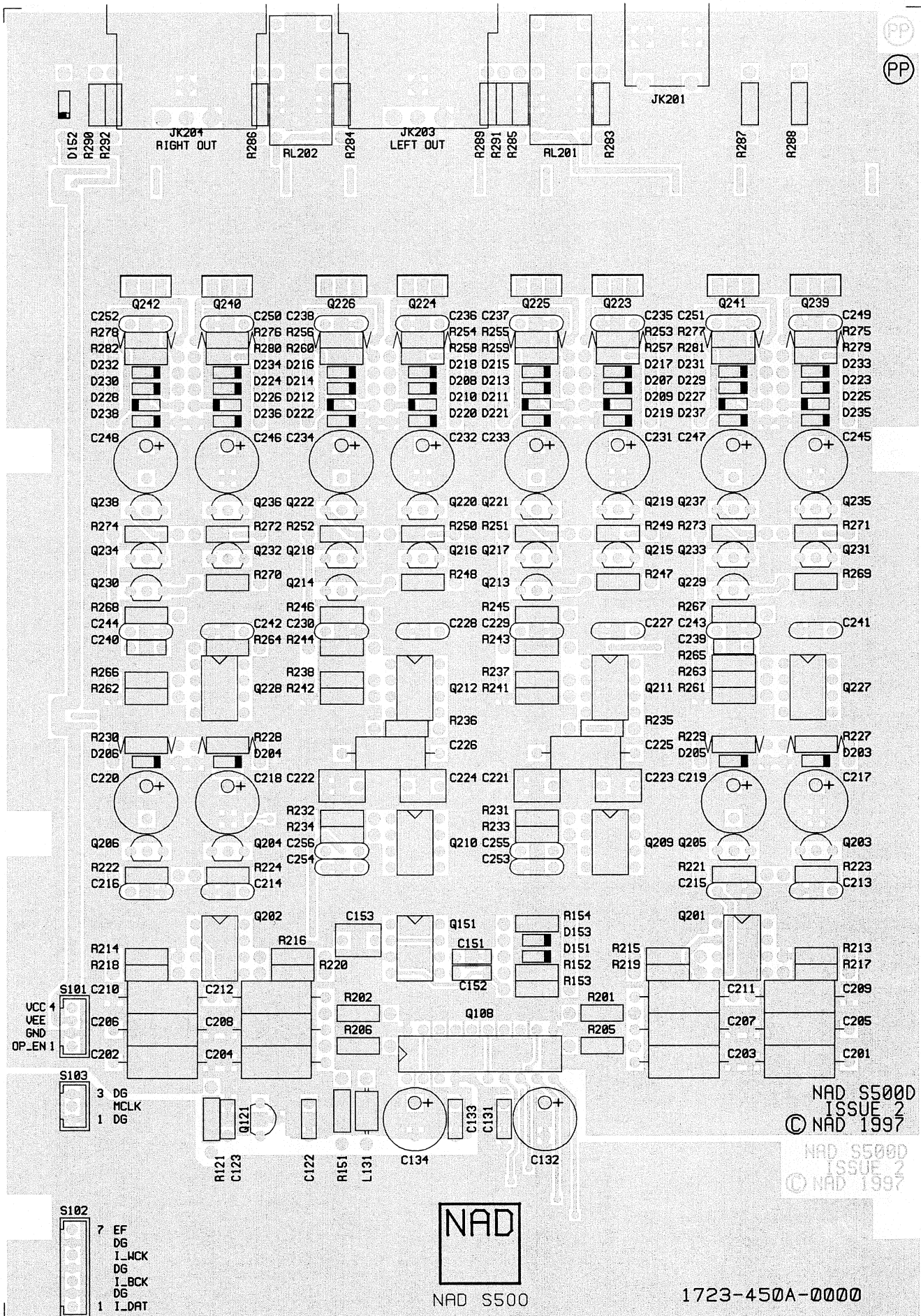


CONTROL - SOLDER SIDE



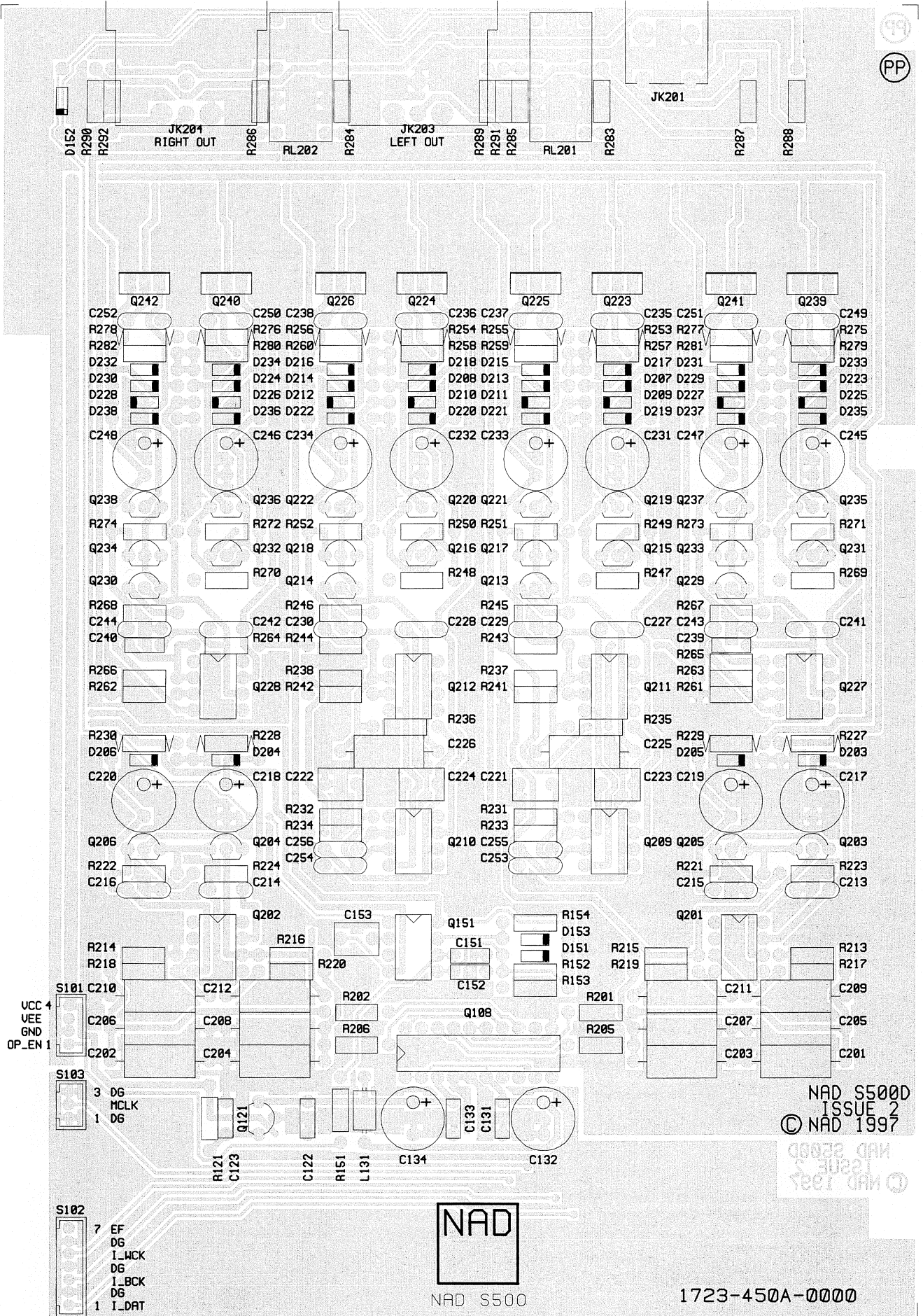
PCB LAYOUT

DAC BOARD - COMPONENT SIDE



PCB LAYOUT

DAC BOARD - SOLDER SIDE



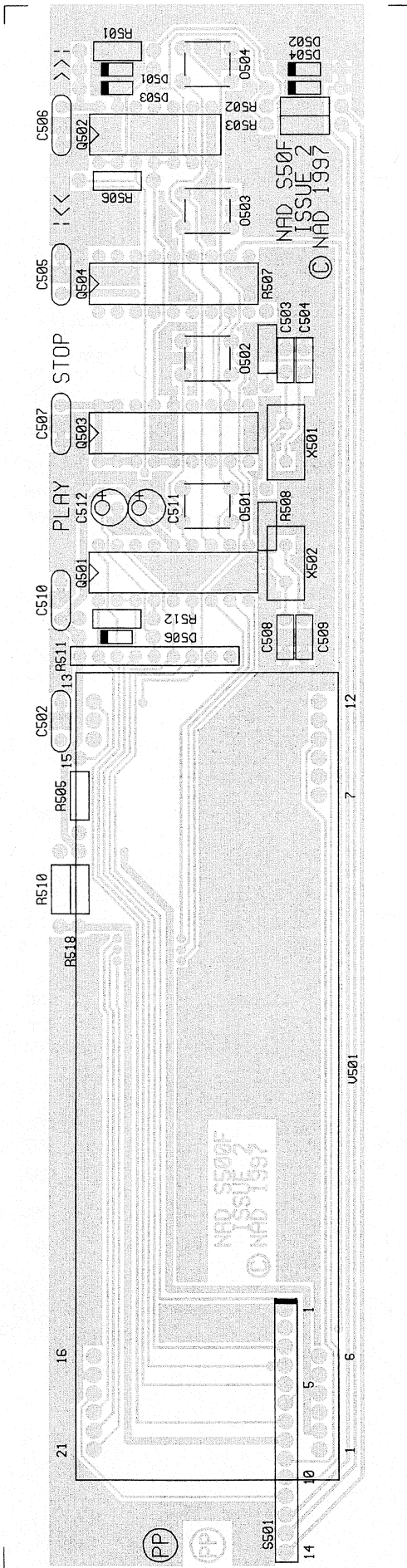
NAD
NAD S500

NAD S500D
ISSUE 2
© NAD 1997

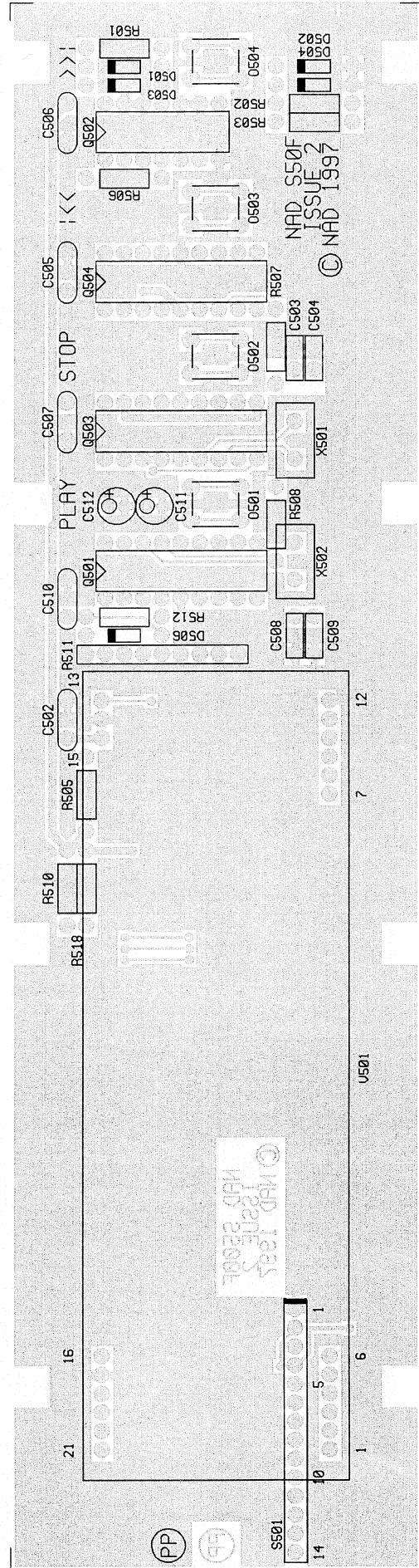
1723-450A-0000

PCB LAYOUT

FRONT PANEL - COMPONENT SIDE

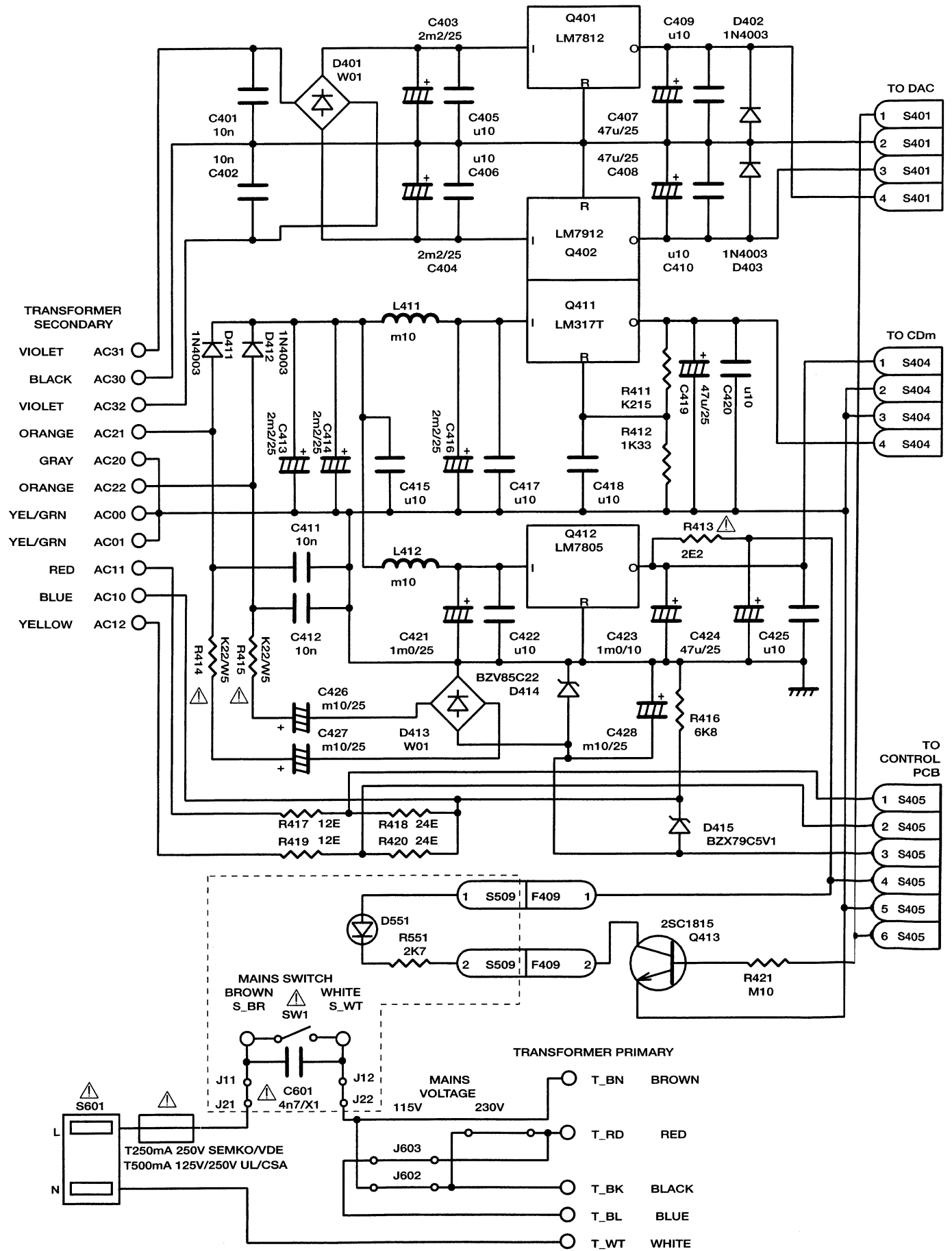


FRONT PANEL - SOLDER SIDE

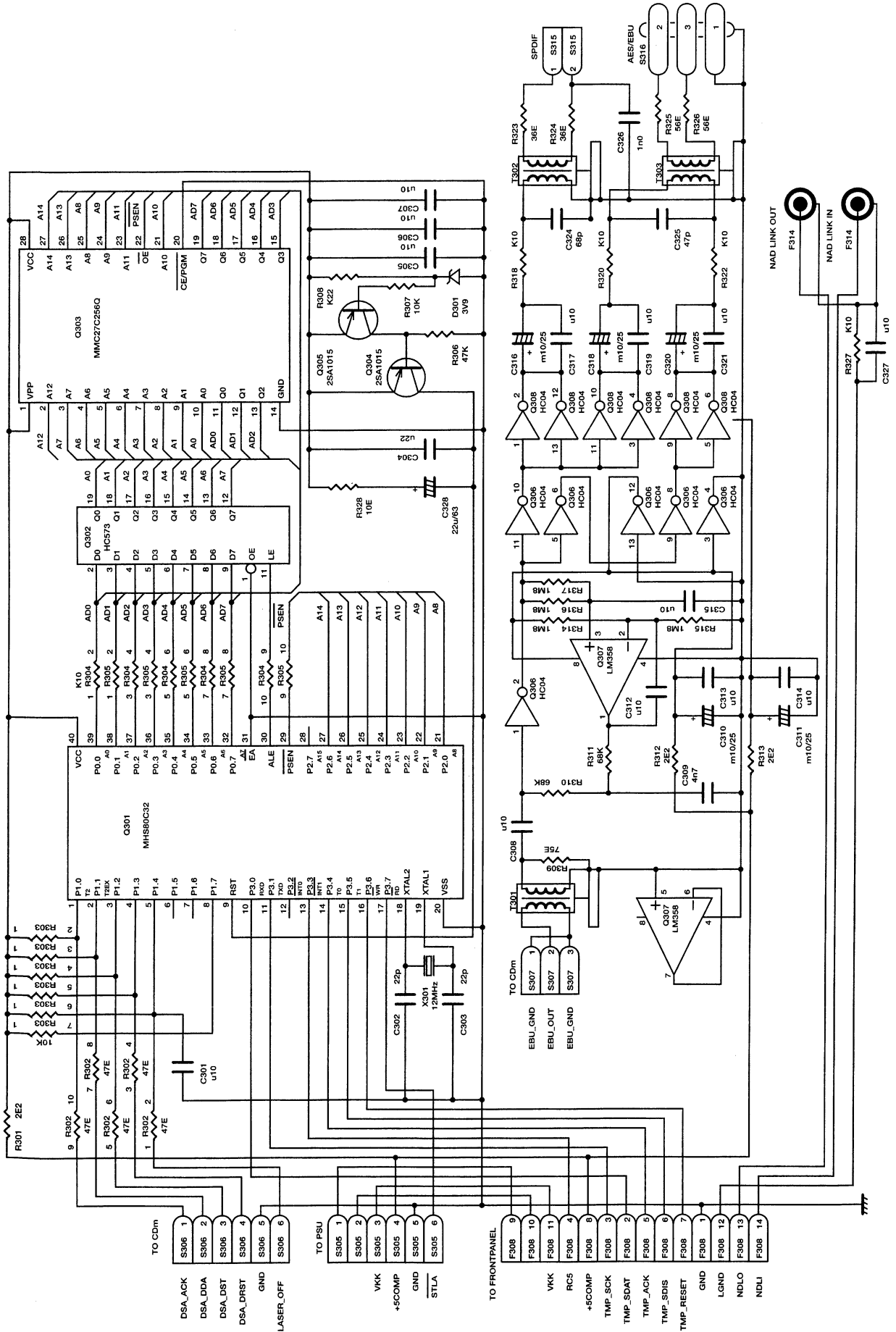


SCHEMATIC DIAGRAM

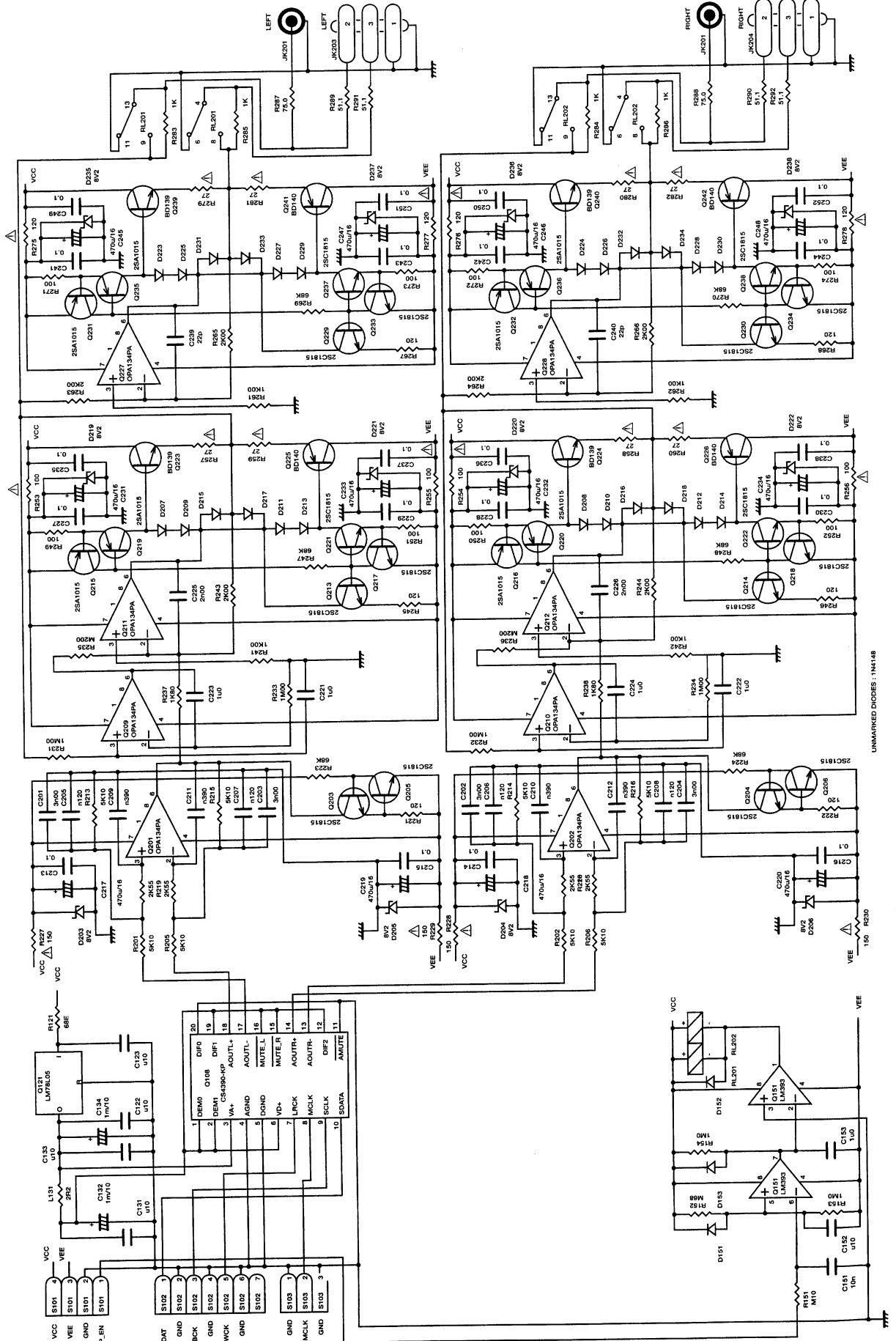
PSU BOARD



SCHEMATIC DIAGRAM CONTROL BOARD

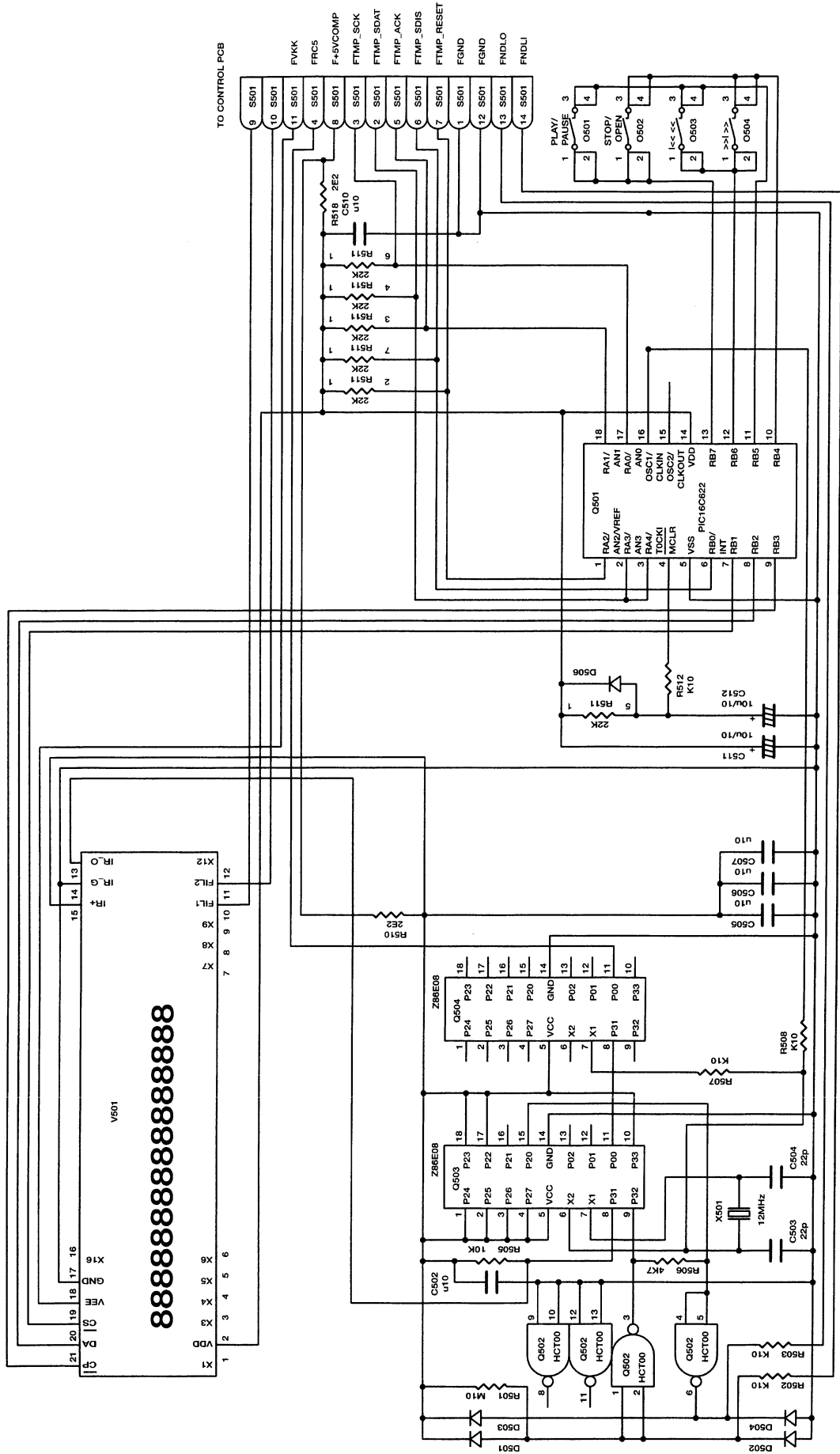


SCHEMATIC DIAGRAM DAC BOARD



UNMARKED CODES: 14K148

SCHEMATIC DIAGRAM FRONT PANEL BOARD



UNMARKED DIODES: 1N4148

ELECTRICAL PARTS LIST

<u>Reference No</u>	<u>Part Number</u>	<u>Description</u>
<u>POWER SWITCH ASSEMBLY</u> <u>PCB BOARD</u>	PCB-N0860C-SW	POWER SWITCH ASSEMBLY
<u>CAPACITOR</u> C601 △	8910-0049-0	CAP400V 4700P DE7150F472MVA1KC
<u>LED</u> D551	3700-3538-B	BLUE LED 3MM
<u>RESISTOR</u> R551	471F-272J-2-E	RMF 0.4W 2.7K 5%
<u>SWITCH</u> SW1 △	5200-3181-0-01	POWER SWITCH
<u>PSU ASSEMBLY</u> <u>PCB BOARD</u>	PCB-N0861C-PWR	PSU ASSEMBLY
<u>CAPACITORS</u> C403-C404 C405-C406 C407-C408 C409-C410 C413-C414 C415 C416 C417-C418 C419 C420,C422 C421 C423 C424 C425 C426-C428	157E-228M-5-5&F 153I-104M-9-NLU 157E-476M-5-1µF 153I-104M-9-NLU 157E-228M-5-5&F 153I-104M-9-NLU 157E-228M-5-5&F 153I-104M-9-NLU 157E-228M-5-5&F 153I-104M-9-NLU 157E-476M-5-1µF 153I-104M-9-NLU 157E-108M-5-X9F 157C-108M-5-S9F 157E-476M-5-1µF 153I-104M-9-NLU 157E-107M-5-KµF	CE 25V 2200µF 20% CM 63V 0.1µF 20% CE 25V 47µF 20% CM 63V 0.1µF 20% CE 25V 2200µF 20% CM 63V 0.1µF 20% CE 25V 2200µF 20% CM 63V 0.1µF 20% CE 25V 47µF 20% CM 63V 0.1µF 20% CE 25V 1000µF 20% CE 10V 1000µF 20% CE 25V 47µF 20% CM 63V 0.1µF 20% CE 25V 100µF 20%
<u>DIODES</u> D401,D413 D402-D403 D411-D412 D414 D415	4840-0490-0 4804-0010-2 4804-0010-2 4840-2090-0 4837-5V11-2	BRIDGE RECTIFIER 100V 1.5A DIODE 1N4001 DIODE 1N4001 ZD 1.3W 22V BZV85C22 5% ZD 1/2W 5.1V
<u>INDUCTORS</u> L411-L412	1803-0044-0	INDUCTOR 100uH B78108-S1104-J
<u>ICS</u> Q401 Q402 Q411 Q412	3130-2520-3 3130-3800-0 3130-5610-0 3130-2020-3	IC 7812 12V REGULATOR IC UPC79M12HF REGULATOR IC LM317T+ADJ REGULATOR IC 7805 5V REGULATOR

Reference No	Part Number	Description
TRANSISTOR		
Q413	4860-0700-5	TR 2SC1815
RESISTORS		
R411	471G-2150-2-E	RMF 0.6W 215R 1%
R412	471G-1331-2-E	RMF 0.6W 1.33K 1%
R413	471E-2R2J-2-EF	RFU 0.3W 2.2R 5%
R414-R415	4717-221J-2-EF	RFU 0.5W 220 5%
R416	471G-682A-2-E	RMF 0.6W 6.8K 1%
R417,R419	471G-120A-2-E	RMF 0.6W 12R 1%
R418,R420	471G-240A-2-E	RMF 0.6W 24R 1%
R421	471G-104A-2-E	RMF 0.6W 100K 1%
CONTROL ASSEMBLY		
PCB BOARD		
	PCB-N0860C-CPU	CONTROL ASSEMBLY
CAPACITORS		
C301	153I-104M-9-NLU	CM 63V 0.1 μ F 20%
C302-C303	15CG-220A-5-GIE	CC 100V 22pF 1% NPO
C304	153I-224M-9-NNU	CM 63V 0.22 μ F 20%
C305-C308	153I-104M-9-NLU	CM 63V 0.1 μ F 20%
C310-C311	157E-107M-5-LUC	CE 25V 100 μ F 20%
C312-C315	153I-104M-9-NLU	CM 63V 0.1 μ F 20%
C316,C318,C320	157E-107M-5-LUC	CE 25V 100 μ F 20%
C317,C319,C321	153I-104M-9-NLU	CM 63V 0.1 μ F 20%
C324	15CH-680J-5-KG	CC 50V 68pF 5% NPO
C325	15CH-470J-5-KG	CC 50V 47pF 5% NPO
C327	153I-104M-9-NLU	CM 63V 0.1 μ F 20%
C328	157I-226M-5-LU	CE 63V 22 μ F 20%
DIODE		
D301	4837-3B20-2	ZD 1/2W 3.8-4.0V
JACKS		
F314	2113-1121-0	2P RCA JACK Y/Y AU HSP-242V-22
S315	2113-1325-0	BNC SPDIF OUT
S316	2113-1151-0	XLR AES/EBU OUT
ICS		
Q301	3130-8400-0	IC MHS80C32 UPC
Q302	3130-6140-0	IC 74HC573 8X D-TYPE LATCHES
Q303	3130-8410-0	IC MMC27C256Q EPROM
Q306,Q308	3130-5840-0	IC 74HC04 HEX INVERTERS
Q307	3130-8390-0	IC LM358N OP AMP DIP8
TRANSISTORS		
Q304-Q305	4860-0660-5	TR 2SA1015
RESISTORS		
R301	471F-2R2J-2-E	RMF 0.4W 2.2R 5%
R302	4707-470C-5-5	RCFA 1/2W 47R 2%
R303	4707-103C-5-8	RCFA 1/2W 10K 2%
R304-R305	4707-101C-5-5	RCFA 1/2W 100R 2%
R306	471F-473J-2-E	RMF 0.4W 47K 5%
R307	471F-103J-2-E	RMF 0.4W 10K 5%
R308	471F-221J-2-E	RMF 0.4W 220 5%

Reference No	Part Number	Description
R309	471F-750J-2-E	RMF 0.4W 75R 5%
R310-R311	471F-683J-2-E	RMF 0.4W 68K 5%
R312-R313	471F-2R2J-2-E	RMF 0.4W 2.2R 5%
R314-R317	471F-185J-2-E	RMF 0.4W 1.8M 5%
R318,R320,R322	471F-101J-2-E	RMF 0.4W 100R 5%
R323-R324	471F-360J-2-E	RMF 0.4W 36R 5%
R325-R326	471F-560J-2-E	RMF 0.4W 56R 5%
R327	471F-101J-2-E	RMF 0.4W 100R 5%
R328	4715-100J-2	RMF 1/4W 10R 5%
COILS		
T301-T303	1802-0450-0	DIGITAL COIL 015-910-27BB
RESONATOR		
X301	2703-0190-0	CR RESONATOR CSA 12MHZ
FRONT PANEL BOARD ASSEMBLY		
PCB BOARD	PCB-N0860C-DISP	FRONT PANEL BOARD ASSEMBLY
CAPACITORS		
C503-C504	15CG-220A-5-GIE	CC 100V 22pF 1% NPO
C511-C512	157D-106M-5-GIL	CE 16V 10µF 20%
DIODES		
D501-D506	4804-1480-2	DIODE 1N4148
SWITCHES		
O501-O504	5200-3011-0-01	TACT SWITCH 4P
ICS		
Q501	3130-8420-0	IC PIC16C622A-20 I/P CONTROLLER
Q502	3130-7370-0	IC 74HCT00 NAND GATE
Q503-504	3130-6410-0	IC Z86E08 OTP MICROCONTROLLER
RESISTORS		
R501	471F-104J-2-E	RMF 0.4W 100K 5%
R502-R503	471F-101J-2-E	RMF 0.4W 100R 5%
R505	471F-103J-2-E	RMF 0.4W 10K 5%
R506	471F-472J-2-E	RMF 0.4W 4.7K 5%
R507-R508	471F-101J-2-E	RMF 0.4W 100R 5%
R510,R518	471F-2R2J-2-E	RMF 0.4W 2.2R 5%
R511	4707-223C-5-8	RCFA 1/2W 22K 2%
R512	471F-101J-2-E	RMF 0.4W 100R 5%
RESONATOR		
X501	2703-0190-0	CR RESONATOR CSA 12MHZ
DAC BOARD ASSEMBLY		
PCB BAORD	PCB-N0860C-MAIN	DAC BOARD ASSEMBLY
CAPACITORS		
C122-C123,C131	153I-104M-9-NLU	CM 63V 0.1µF 20%
C132,C134	157C-108M-5-S9F	CE 10V 1000µF 20%
C133,C152	153I-104M-9-NLU	CM 63V 0.1µF 20%

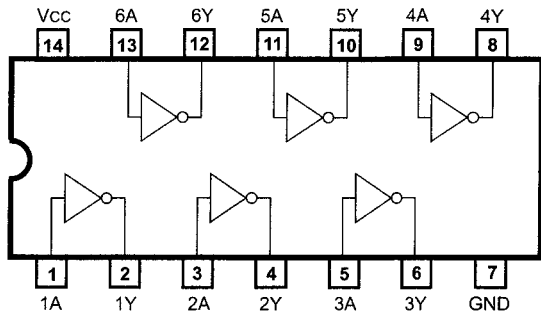
Reference No	Part Number	Description
C151	15FI-103Z-5-HKE	CC 63V 0.01u +80/-20%
C153	153I-105J-9-NSU	CM 63V 1μF 5%
C201-C204	158S-302A-2-IUE	CP 160V 3000pF 1%
C205-C208	158M-121A-2-IUE	CP 630V 120pF 1%
C209-C212	158M-391A-2-IUE	CP 630V 390pF 1%
C213-C216	153I-104M-9-NLU	CM 63V 0.1μF 20%
C217-C220	157D-477M-5-SXF	CE 16V 470μF 20%
C221-C224	153I-105J-9-NSU	CM 63V 1μF 5%
C225-C226	158R-202A-2-IUE	CP 250V 2000pF 1%
C227-C230	153I-104M-9-NLU	CM 63V 0.1μF 20%
C231-C234	157D-477M-5-SXF	CE 16V 470μF 20%
C235-C238	153I-104M-9-NLU	CM 63V 0.1μF 20%
C239-C240	15CG-220A-5-GIE	CC 100V 22pF 1% NPO
C241-C244	153I-104M-9-NLU	CM 63V 0.1μF 20%
C245-C248	157D-477M-5-SXF	CE 16V 470μF 20%
C249-C252	153I-104M-9-NLU	CM 63V 0.1μF 20%
DIODES		
D151-D153,D207-D218	4804-1480-2	DIODE 1N4148
D203-D206,D219-D222	4837-8V23-2	DZ 1/2W 8.2V
D223-D234	4804-1480-2	DIODE 1N4148
D235-D238	4837-8V23-2	DZ 1/2W 8.2V
JACKS		
JK201	2113-1203-0	2P RCA JACK W/R AU
JK203-JK204	2113-1151-0	XLR BALANCE OUT
ICs		
Q108	3130-8380-0	IC CS4390-KP STEREO DAC
Q121	3130-0640-0	IC NJM78L05A 826
Q151	3131-5160-0	IC LM393N
Q201-Q202,Q209-Q212	3130-6940-0	IC OPA134PA OP AMP
Q227-Q228	3130-6940-0	IC OPA134PA OP AMP
TRANSISTORS		
Q203-Q206,Q213-Q214	4860-0700-5	TR 2SC1815
Q215-Q216	4860-0660-5	TR 2SA1015
Q217-Q218	4860-0700-5	TR 2SC1815
Q219-Q220	4860-0660-5	TR 2SA1015
Q221-Q222	4860-0700-5	TR 2SC1815
Q223-Q224	485D-1390-5	TR BD139-10 HFE 63-160
Q225-Q226	4860-1430-5	TR BD140-10 HFE 63-160
Q229-Q230	4860-0700-5	TR 2SC1815
Q231-Q232	4860-0660-5	TR 2SA1015
Q233-Q234	4860-0700-5	TR 2SC1815
Q235-Q236	4860-0660-5	TR 2SA1015
Q237-Q238	4860-0700-5	TR 2SC1815
Q239-Q240	485D-1390-5	TR BD139-10 HFE 63-160
Q241-Q242	4860-1430-5	TR BD140-10 HFE 63-160
RESISTORS		
R121	471F-680J-2-E	RMF 0.4W 68R 5%
R151	471F-104J-2-E	RMF 0.4W 100K 5%
R152	471F-684J-2-E	RMF 0.4W 680K 5%
R153-R154	471F-105J-2-E	RMF 0.4W 1M 5%

Reference No	Part Number	Description
R201-R206,R213-R216	471G-512A-2-E	RMF 0.6W 5.1K 1%
R217-R220	471G-2551-2-E	RMF 0.6W 2.55K 1%
R221-R222	471F-121J-2-E	RMF 0.4W 120R 5%
R223-R224	471F-683J-2-E	RMF 0.4W 68K 5%
R227-R230 △	471E-151J-2-EF	RFU 0.3W 150R 5%
R231-R234	471G-105A-2-E	RMF 0.6W 1M 1%
R235-R236	471G-204A-2-E	RMF 0.6W 200K 1%
R237-R238	471G-182A-2-E	RMF 0.6W 1.8K 1%
R241-R242	471G-102A-2-E	RMF 0.6W 1K 1%
R243-R244	471G-202A-2-E	RMF 0.6W 2K 1%
R245-R246	471F-121J-2-E	RMF 0.4W 120R 5%
R247-R248	471F-683J-2-E	RMF 0.4W 68K 5%
R249-R252	471F-101J-2-E	RMF 0.4W 100R 5%
R253-R256 △	471E-101J-2-EF	RFU 0.3W 100R 5%
R257-R260 △	471E-270J-2-EF	RFU 0.3W 27R 5%
R261-R262	471G-102A-2-E	RMF 0.6W 1K 1%
R263-R266	471G-202A-2-E	RMF 0.6W 2K 1%
R267-R268	471F-121J-2-E	RMF 0.4W 120R 5%
R269-R270	471F-683J-2-E	RMF 0.4W 68K 5%
R271-R274	471F-101J-2-E	RMF 0.4W 100R 5%
R275-R278 △	471E-121J-2-EF	RFU 0.3W 120R 5%
R279-R282 △	471E-270J-2-EF	RFU 0.3W 27R 5%
R283-R286	471F-102J-2-E	RMF 0.4W 1K 5%

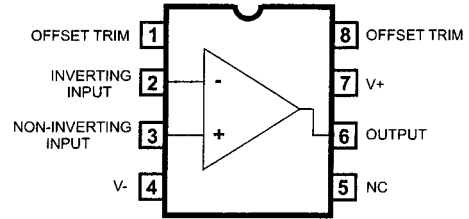
NOTE : – The components identified by △ mark are critical for risk of fire and electrical shock.
Replace only with part number specified.
– Capacitors : CM-Mylar, CE-Electrolytic, CC-Ceramic, CP-Polystyrene.
– Resistors : RMF-Metal Film, RFU-Fusible.

IC BLOCK DIAGRAM

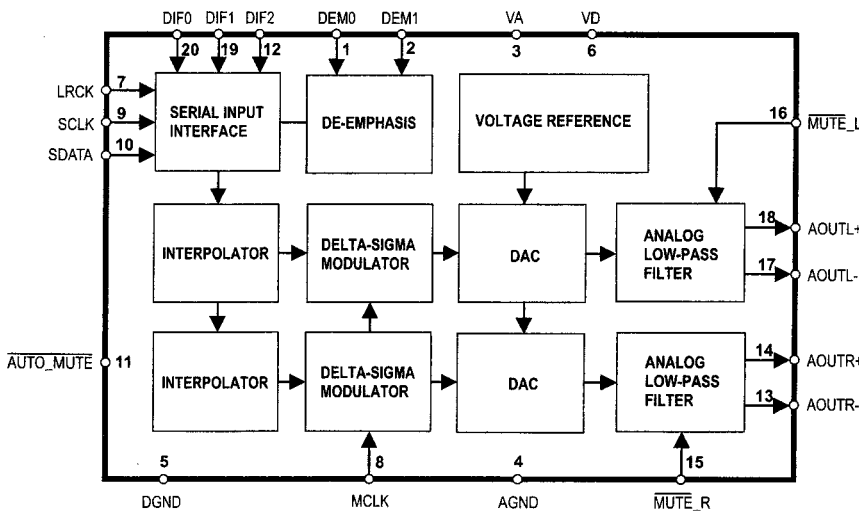
Q306, Q308: 74HC04
HEX INVERTERS



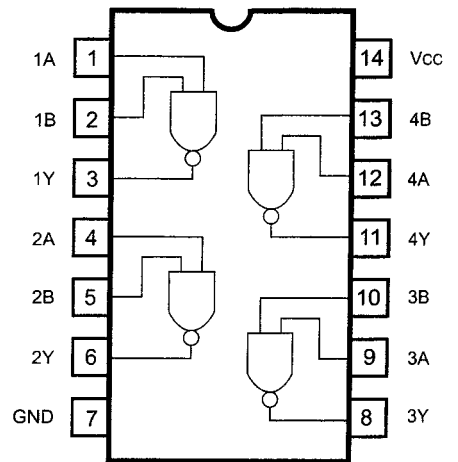
Q201-Q202, Q209-Q212, Q227-Q228: OPA134PA
HIGH PERFORMANCE MONO OP-AMP



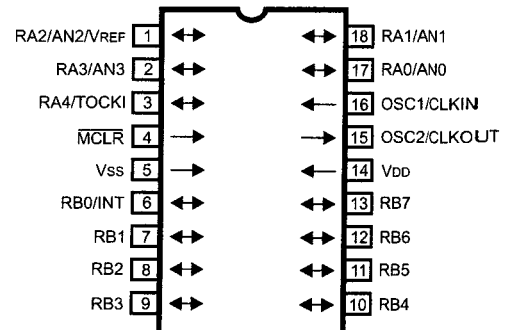
Q108: CS4390
24-BIT STEREO DAC



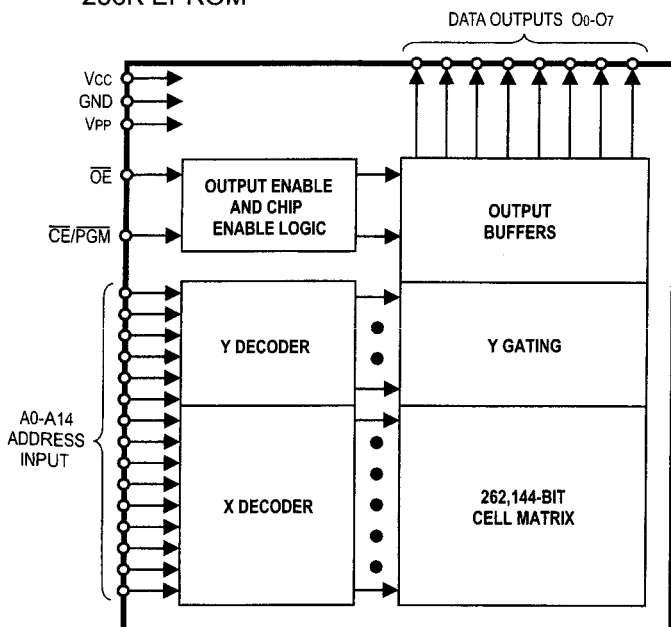
Q502: 74HCT00
2-INPUT QUAD NAND GATE



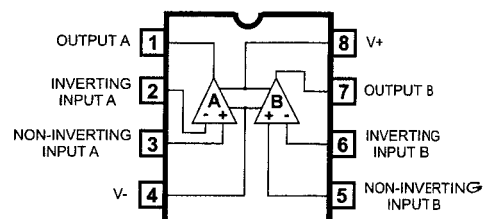
Q501: PIC16C622A-20
8-BIT MICROCONTROLLER



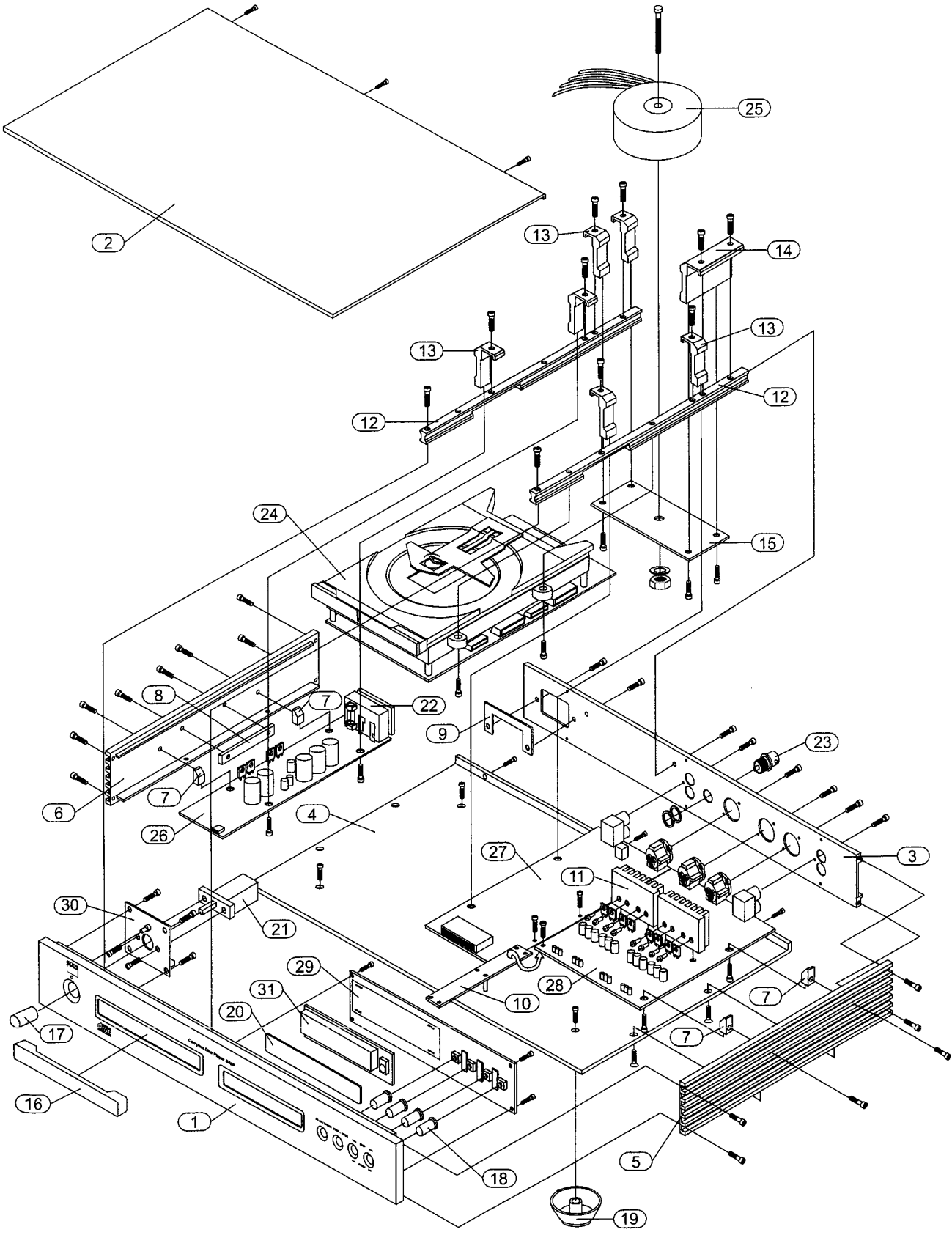
Q303: MMC27C256Q
256K EPROM



Q151: LM393N
LOW OFFSET DUAL COMPARATOR
Q307: LM358N
DUAL OP-AMP



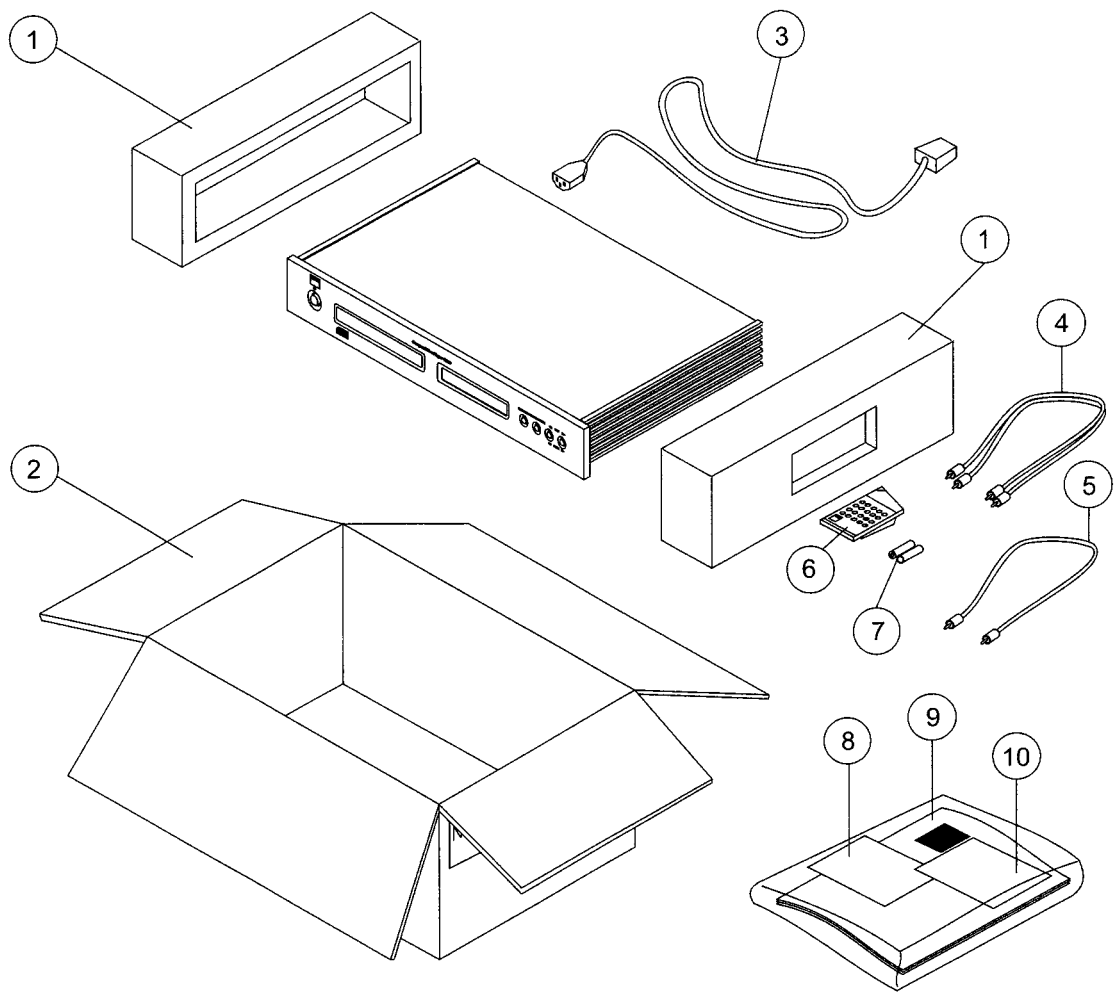
EXPLODED VIEW



EXPLODED VIEW PARTS LIST

ITEM	PART NUMBER	DESCRIPTION	QTY.
1	S500-2001-4	FASCIA	1
2	S500-2004-1	TOP COVER	1
3*AH	S500-2005AH-1	REAR PANEL 120V	1
3*C	S500-2005C-1	REAR PANEL 230V	1
4	S500-2003-1	BASE PLATE	1
5	S500-2002R-1	RIGHT SIDE PANEL	1
6	S500-2002L-1	LEFT SIDE PANEL	1
7	S500-2026-1	PCB BAR	4
8	S500-2036-1	CLAMP BAR	1
9	S100-2020-1	AC INLET PLATE	1
10	S500-2016-1	PCB PLATE	1
11	S100-2009-4	HEATSINK 1	2
12	S500-2006-1	CD MECHANISM BAR	2
13	S500-2046-1	PCB HOLDER	6
14	S500-2056-1	TRANSFORMER HOLDER	1
15	S500-2066-1	TRANSFORMER PLATE	1
16	S500-2008-1	CD TRAY LID	1
17	S100-2011-3	10MM POWER BUTTON	1
18	S400-2121-1	6MM INPUT BUTTON	4
19	S100-2013-2	FOOT W/ RUBBER CUSHION	4
20	S400-2221-1	DISPLAY LENS	1
21	5200-3181-0-01	POWER SWITCH	1
22	AC1	AC INLET	1
23	S500-0206	BNC CONNECTOR	1
24	L1265	CD MECHANISM W/ LOADER	1
25	TI-65575A	TRANSFORMER	1
26	S500-0130	PSU PCB	1
27	S500-0100	CONTROL PCB	1
28	S500-0150	DAC PCB	1
29	S500-0170	FRONT PANEL PCB	1
30	S500-0205	POWER SWITCH PCB W/ SWITCH	1
31	S400-DISPLAY	DISPLAY MODULE	1

PACKING DIAGRAM



ITEM	PART NUMBER	DESCRIPTION	QTY.
1	311215	POLYFOAM	1 SET
2	S500-2210-A	CARTON BOX	1
3*AH	POW4	POWER CORD NEMA 1-15 POLARIZED	1
3*C	POW2	POWER CORD CEE (7) XVII	1
4	101-000A	AUDIO CABLE	1
5	101-000B	NAD LINK CABLE	1
6	RC S500	REMOTE CONTROL HANDSET	1
7	R03	BATTERY	1 SET
8	WARR	WARRANTY CARD	1
9	S500-IM	INSTRUCTION MANUAL	1
10	D7051	S500 PREMIUM CARD	1

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