

# **NAD** SERVICE MANUAL

*MC-Service*

**3225PE**  
**3020i**  
**INTEGRATED AMPLIFIERS**

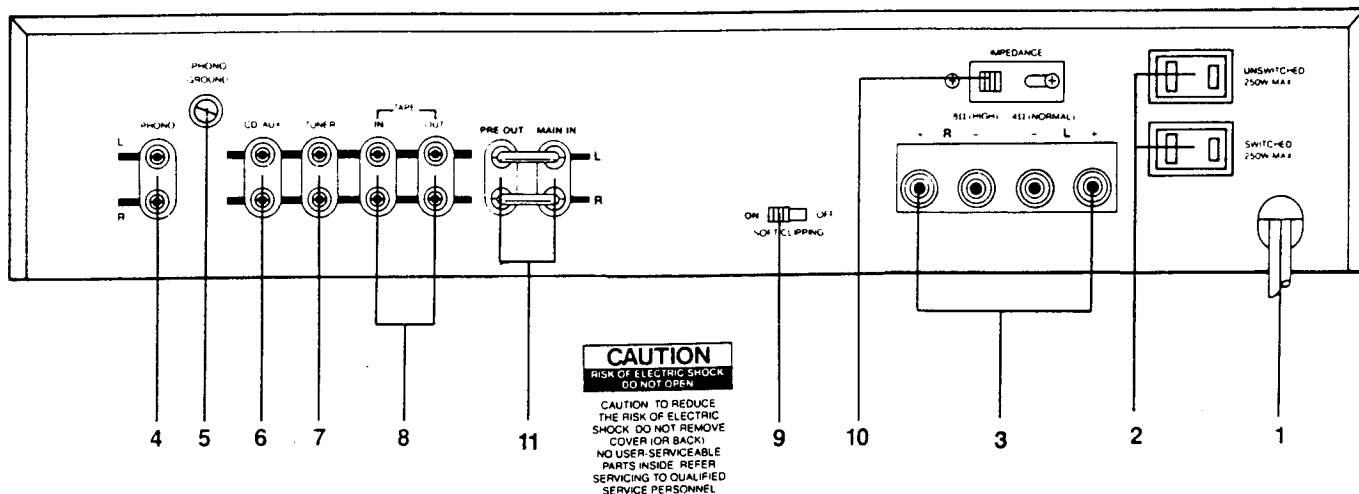
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**3225PE/3020i**

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**REAR PANEL**

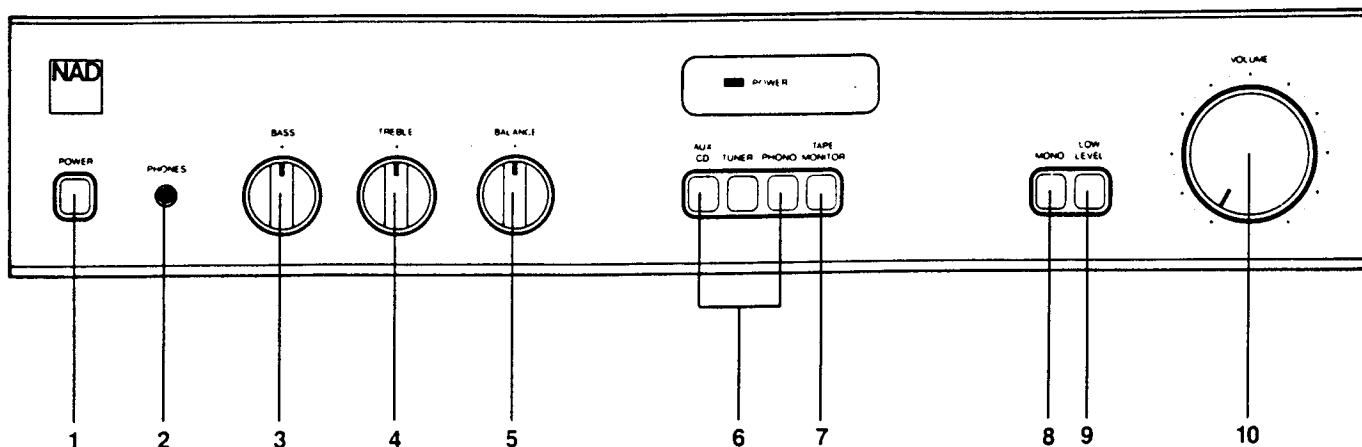
1. AC Line Cord.
2. AC Outlets (not in U.K. version).
3. Speakers.
4. Phono Input.
5. Phono Ground.
6. CD/Aux Input.
7. Tuner Input.
8. Tape Input/Output.
9. Soft Clipping.
10. Speaker Impedance.
11. Preamp Out/Main In



**FRONT PANEL**

1. Power.
2. Phones.
3. Bass.
4. Treble.
5. Balance.
6. Input Selector.
7. Tape Monitor.
8. Mono.
9. Low Level.
10. Volume.

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# INTEGRATED AMPLIFIER SPECIFICATION NAD 3020i/3225PE

## Power Amplifier Section Stereo Mode

	<b>3020i</b>	<b>3225PE</b>
CONTINUOUS AVERAGE POWER	20W (13dbW)	25W (14dbW)
OUTPUT INTO 8 OHMS		
(Min. Power per channel, 20Hz-20KHz, both channels driven, with no more than rated distortion)		
Rated Distortion	0.03 %	0.03 %
(THD 20Hz-20KHz)		
Clipping Power	30W	40W
(Maximum continuous power per channel)		
IHF Dynamic Headroom at 8 ohms	+3db	+4db
IHF Dynamic Power (Maximum short term power per channel)		
8 ohms:	40W(16dbW)	60W(18dbW)
4 ohms:	40W(16dbW)	85W(19dbW)
2 ohms:	50W(17dbW)	90W(19.5dbW)
Slew Factor	> 50	> 50
Slew Rate	15V/uSec	15V/uSec
Damping Factor	> 40	> 40
(ref. 8 ohms 50 Hz)		
Input Impedance	R=20Kohm C=470pf	R=20Kohm C=820pf
Input Sensitivity	1W 20W 25W	200mV 900mV
at 8 ohms		1V
Voltage Gain	X14 (23db)	X14 (23db)
Frequency Response	6Hz to 80KHz +0,-3db	6Hz to 60KHz +0,-3db
Signal/Noise ratio, A Weighted		
Ref. 1W	100db	100db
Ref. Rated power	113db	114db
THD	< 0.03 %	< 0.03 %
(Total Harmonic Distortion 20Hz-20KHz, from 250mW to rated output)		
SMPTE I.M.	< 0.03 %	< 0.03 %
(Intermodulation Distortion, 60Hz+7KHz, 4:1 From 250mW to rated output)		
IHF I.M.	< 0.03 %	< 0.03 %
(CCIF IM Distortion, 19+20KHz at rated output)		
<b>Preamplifier Section</b>		
<b>Phono Input</b>		
Input Impedance (R and C)	MM: 47Kohm + 300pf	47Kohm + 300pf
Input Sensitivity ref. 1W/20W	MM: 0.55mV/2.4mV	
1W/25W 1KHz	MM: 0.52mV/2.5mV	
Input Overload at 20Hz	MM: 20mV	20mV
1KHz	200mV	200mV
20KHz	1.7V	1.7V
RIAA Accuracy	+/-0.5db	+/-0.5db
Signal/Noise ratio (A-Weighted with cartridge connected)		
ref. 5mV in.	MM: 75db	75db
<b>Line Level Inputs (CD, Video, Tape)</b>		
Input Impedance (R and C)	40Kohm + 440pf	40Kohm + 440pf
Input Sensitivity ref. 1W/20W	33mV/150mV	
1W/25W		34mV/160mV
Maximum Input Signal	> 10V	> 10V
Signal/Noise ratio (ref. 1W)	87db	87db
(A Weighted) (ref. rated power)	100db	101db
Frequency Response, 20Hz-20KHz	+0.5db, -1db -3db at 12Hz	+0.5db, -1db -3db at 12Hz
Infrasonic Filter	18db/Octave	18db/Octave
THD (20Hz-20KHz at 5V RMS Out)	0.01 %	0.01 %
<b>Line Level Outputs</b>		
Preamp Output Impedance	600 ohms	600 ohms
Maximum Output Level	14V	12V
Tape output Impedance	Source Z + 2K ohms	Source Z + 2K ohms
<b>Controls</b>		
Treble	10KHz +/- 7db	+/- 7db
Bass	50Hz +/- 10db	+/- 10db
Audio Muting (Low Level)	-20db	-20db
Power Consumption	140W	150W
Net Weight	5Kg	5Kg
Dimension (Width x Height x Depth)	420x80x250mm	420x80x250mm

## ALIGNMENT METHOD

### AUDIO SECTION 3225PE/3020i

#### IMPORTANT

Speaker impedance switch should be in 8 ohm position while adjust center voltage and idling current.

#### INITIAL ADJUSTMENT (No load connected)

##### A. CENTER VOLTAGE

1. Connector DC millivoltmeter to L channel output terminal.
2. Turn on and adjust to 0 V +/- 30mV with R411 (470 ohm). Connect DC millivoltmeter to R channel output terminal and adjust R412 to 0 V +/- 30mV.

##### B. IDLING CURRENT

1. Remove solder short across R455 and R456.
2. Connect DC millivoltmeter across R455 (1 ohm) (output transistor's collector resistor) and adjust R443 for 26-30mV reading on meter. Repeat adjustment with R444, connecting meter across R456 (1 ohm).
3. Leave power on for minimum 5 minutes.

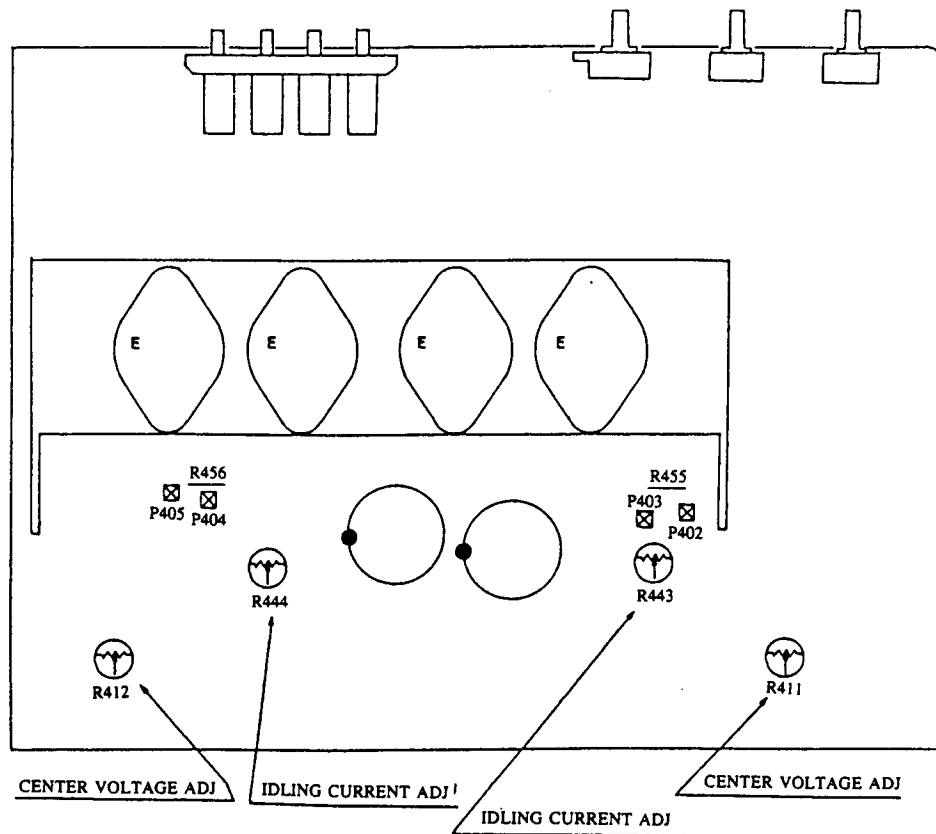
#### FINAL ADJUSTMENT

##### C. CENTER VOLTAGE

1. Repeat step A about.

##### D. IDLING CURRENT

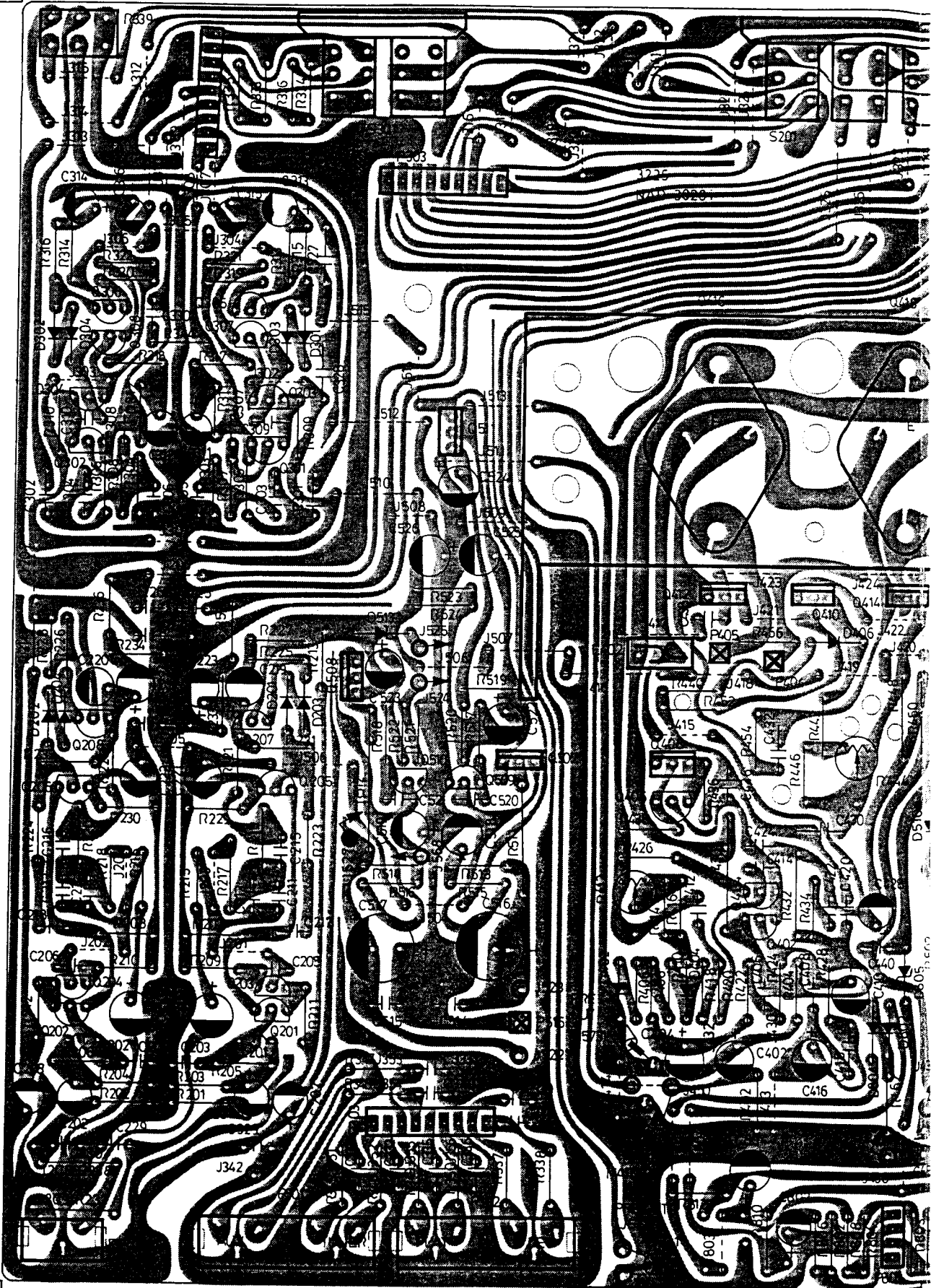
1. Repeat step B and adjust with R443, R444 for 30mV reading on meter.
2. After the alignment is finished, 1 ohm resistor R455, R456 is shorted by solder short.



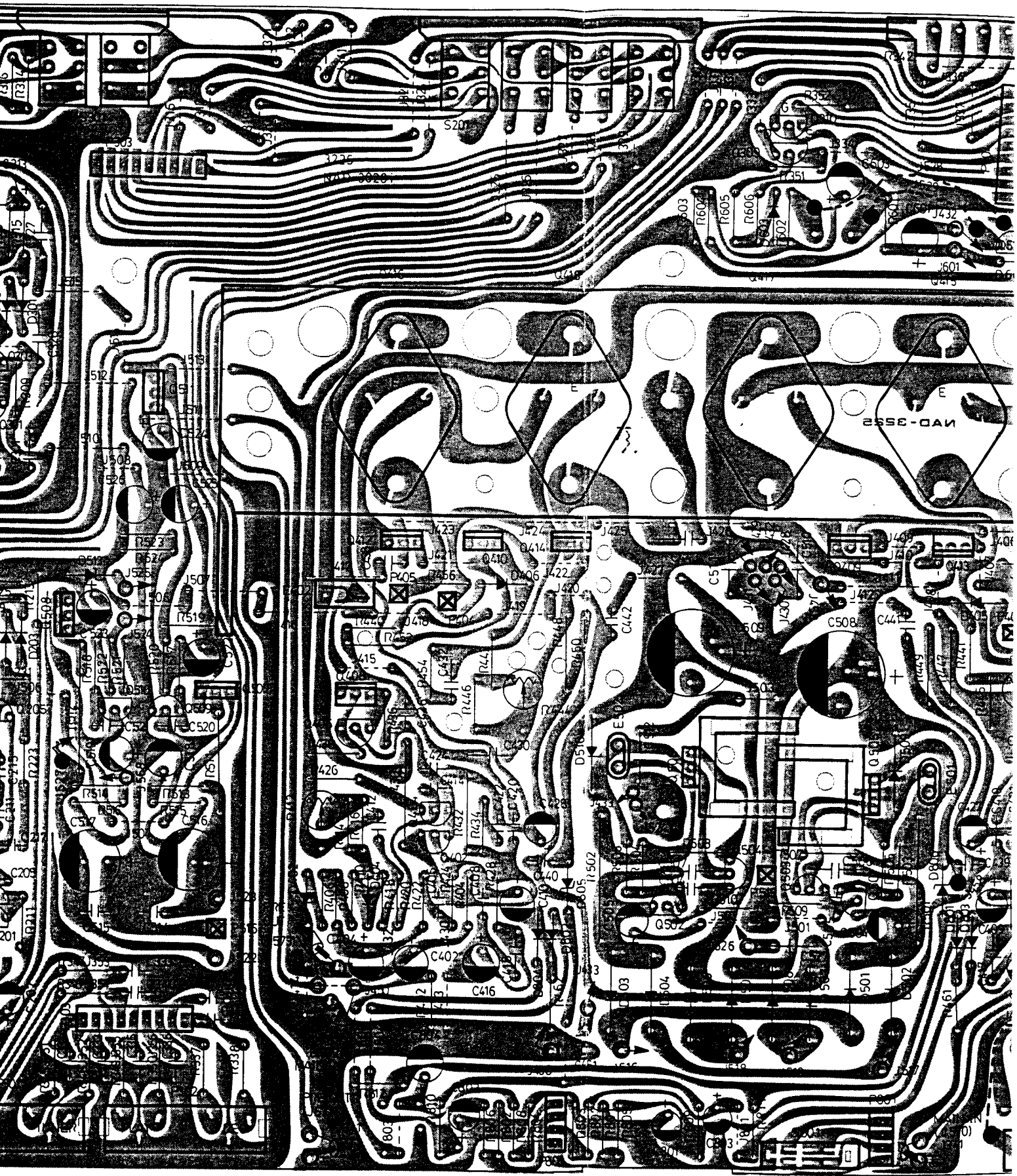
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# NAD3225PE AMPLIFIER PCB LAYOUT



# 25PE AMPLIFIER PCB LAYOUT

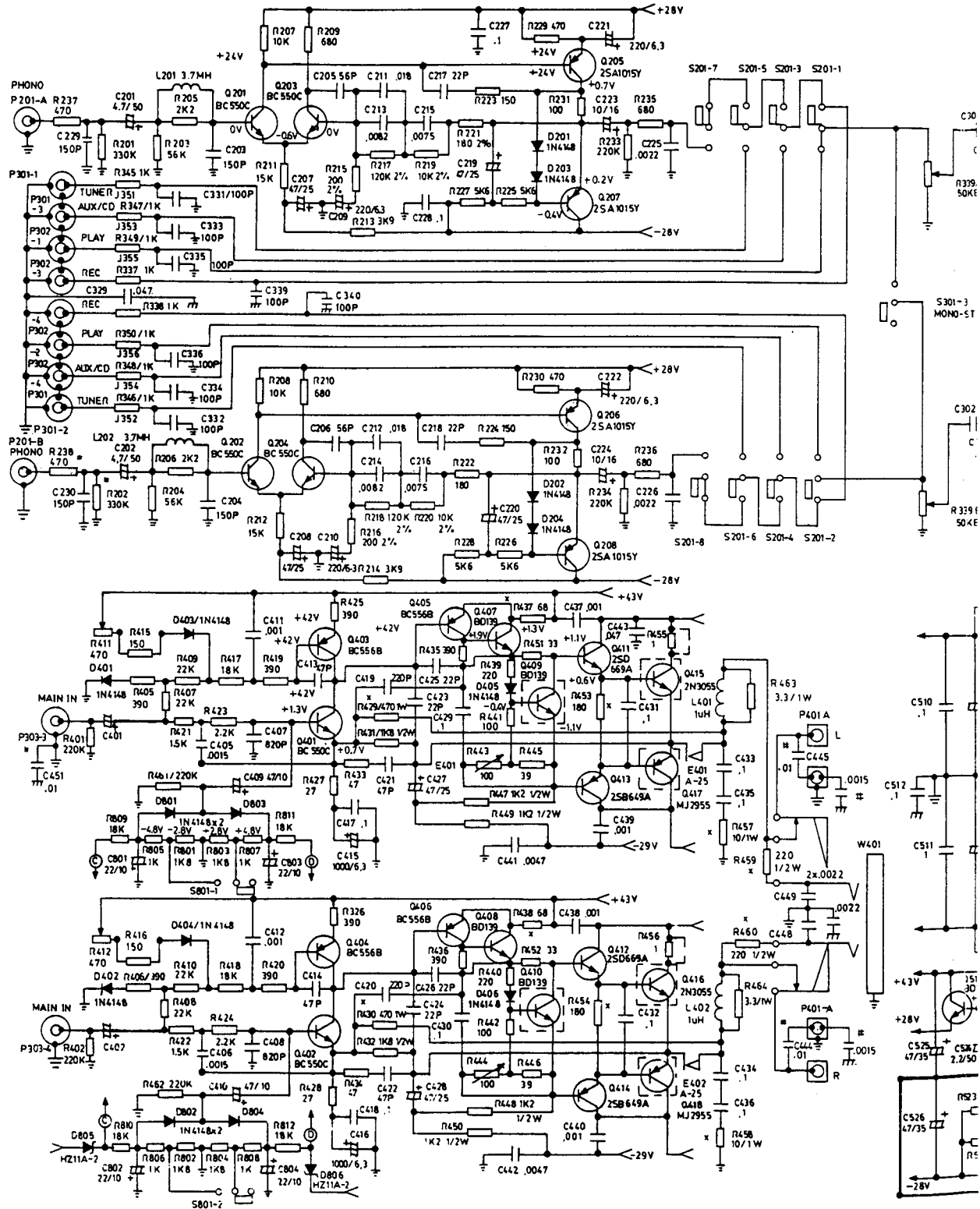


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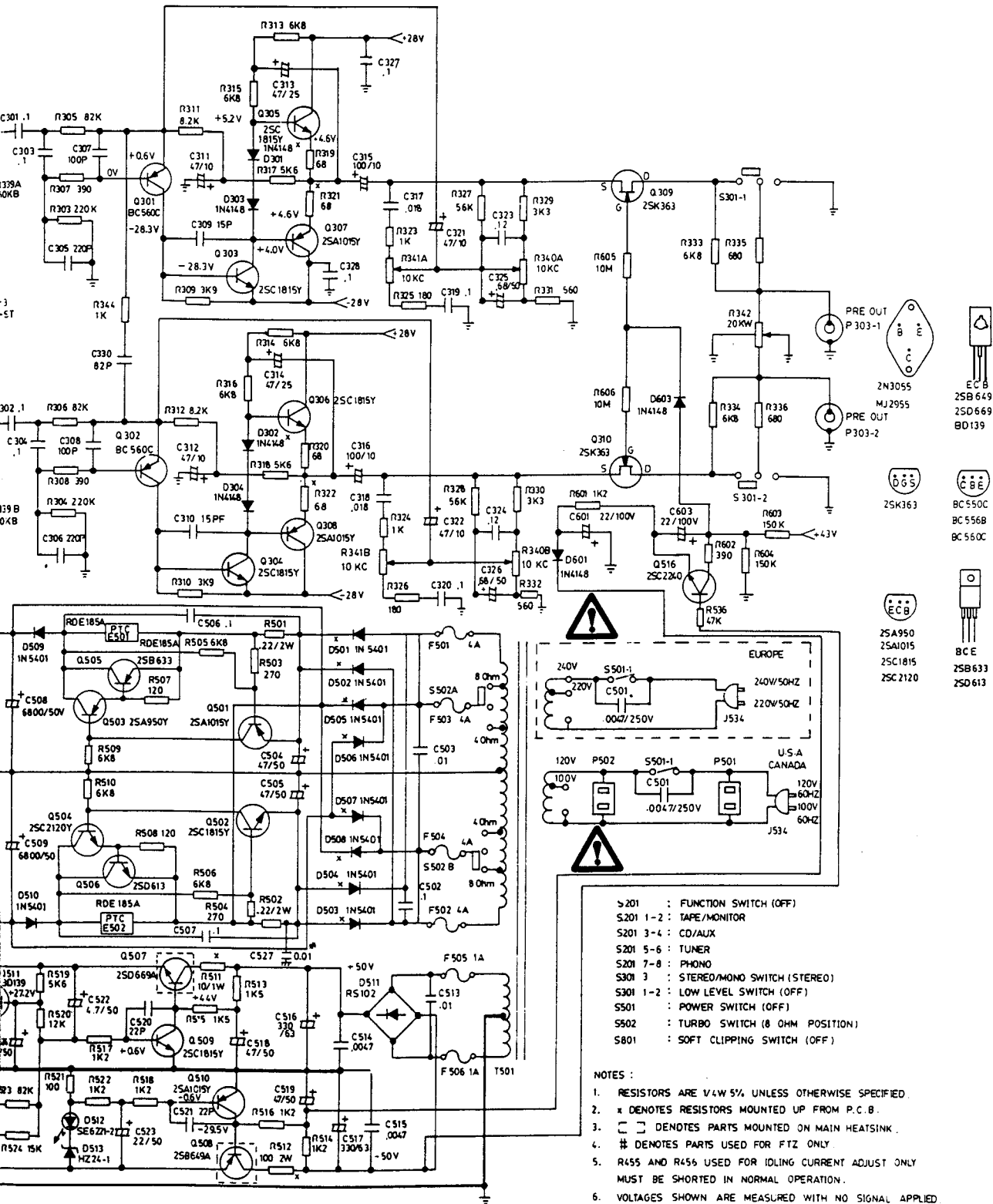
# SCHEMATIC DIAGRAM NAD3225PE AMI



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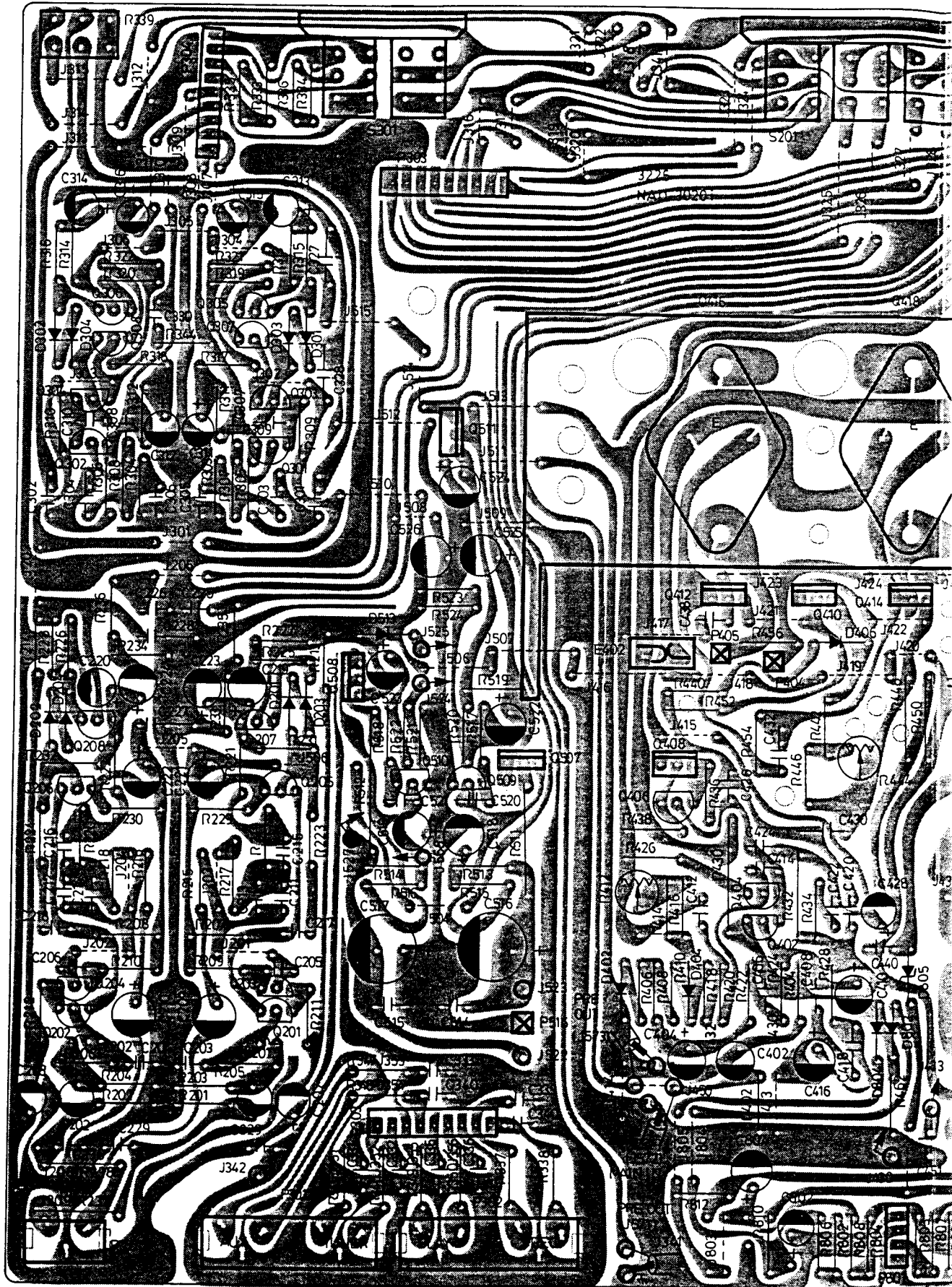


# AMPLIFIER



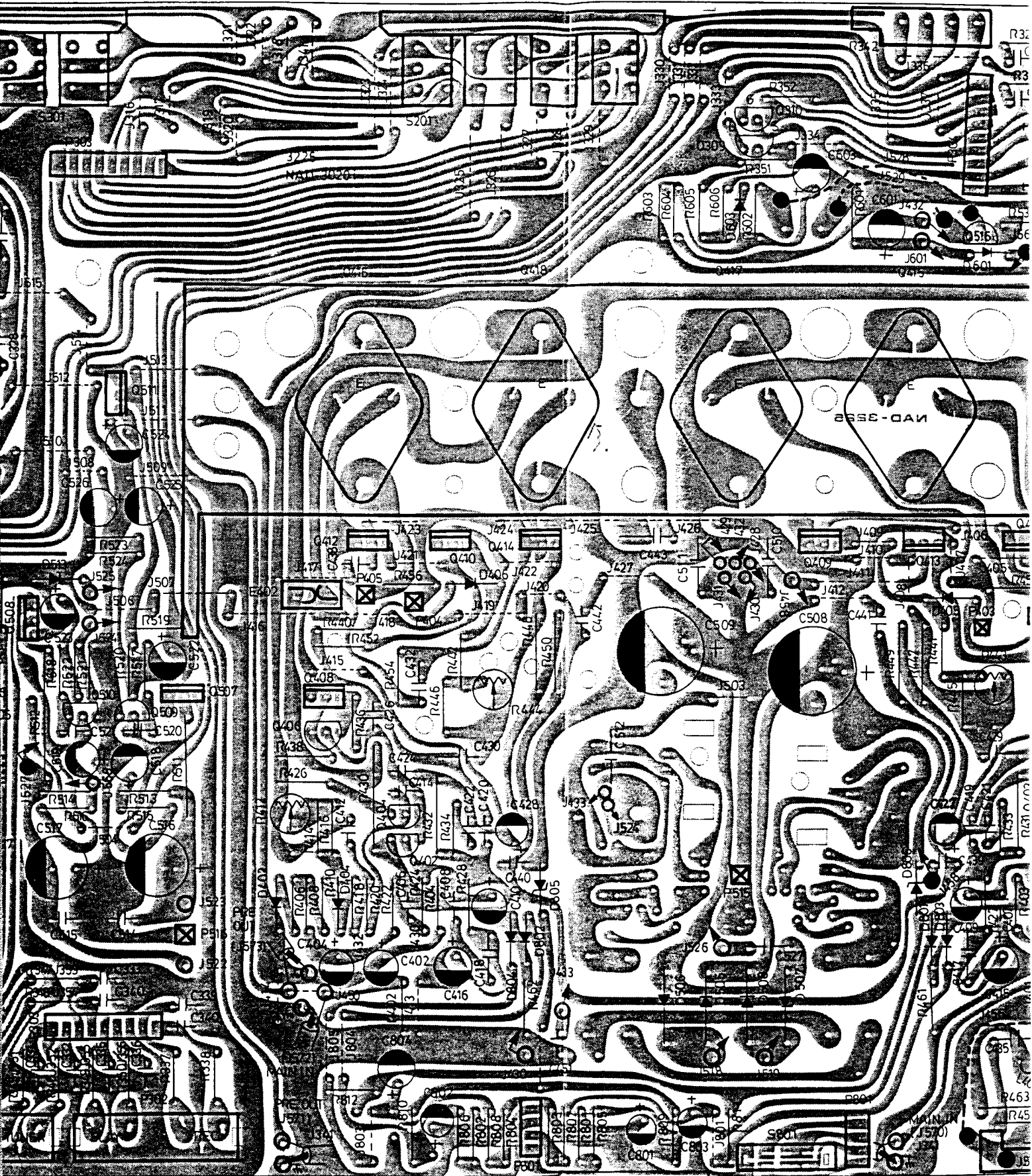
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# NAD3020i AMPLIFIER PCB LAYOUT



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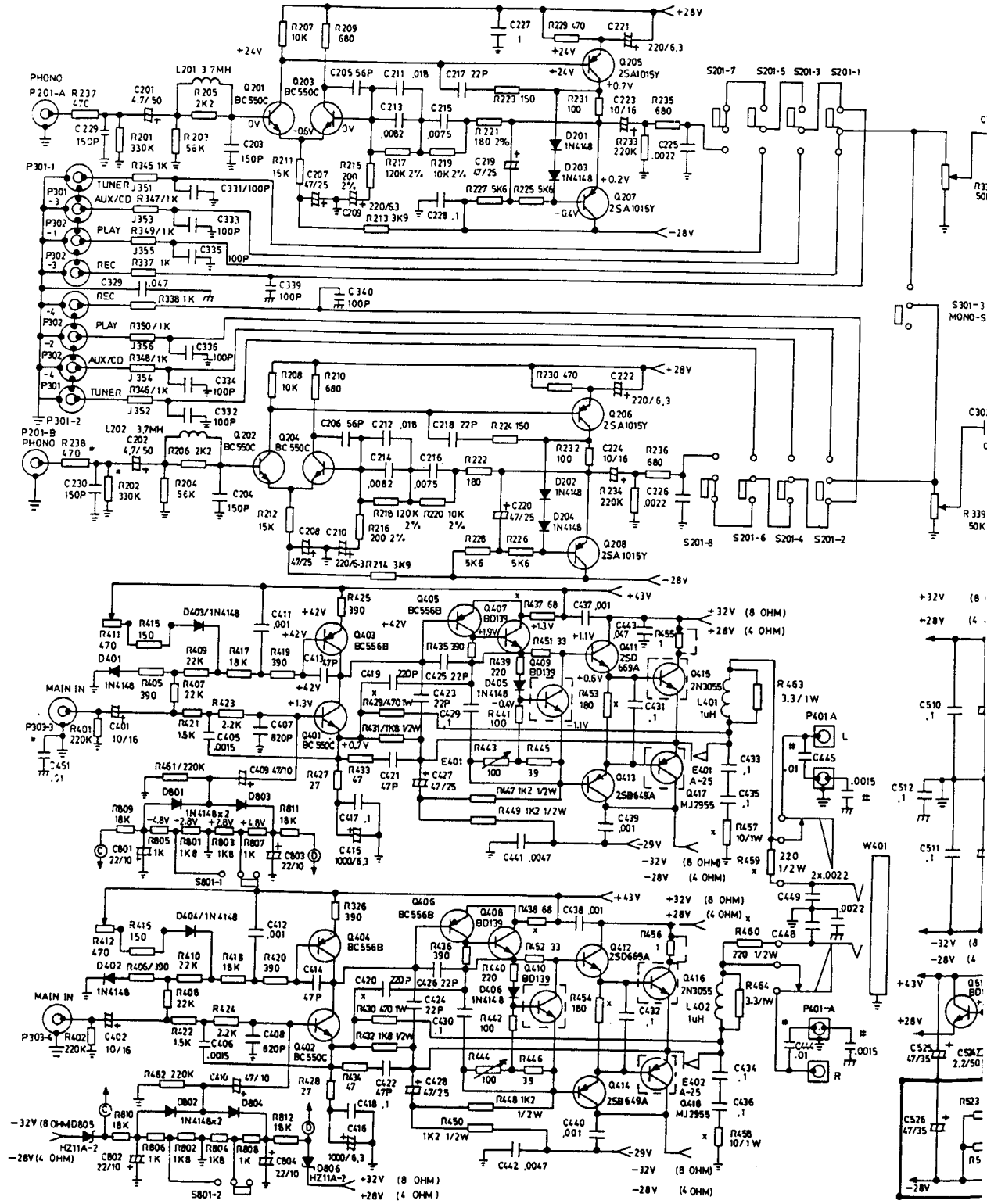
# AMPLIFIER PCB LAYOUT







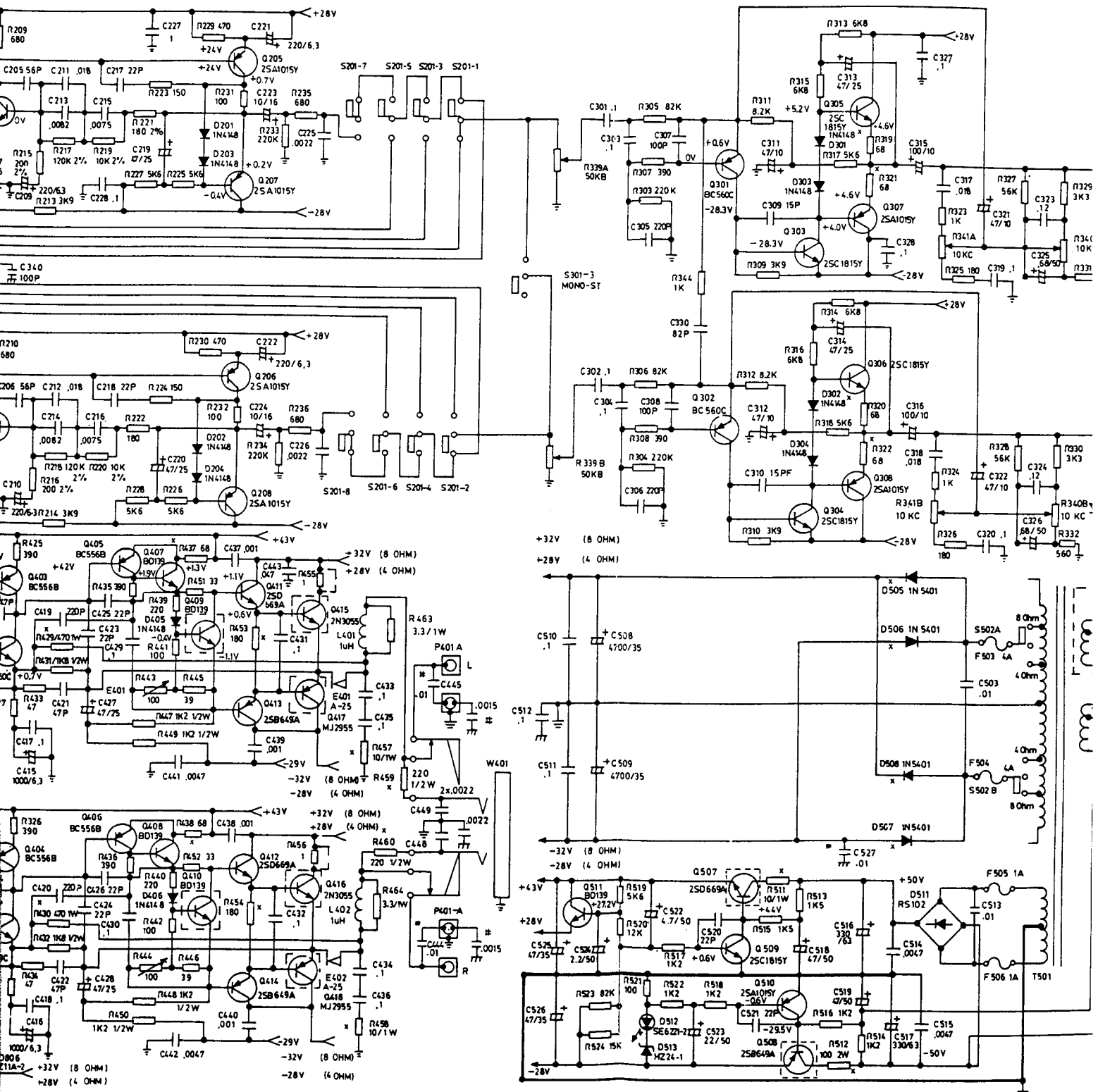
# SCHEMATIC DIAGRAM NAD3020i AMPLIFIER



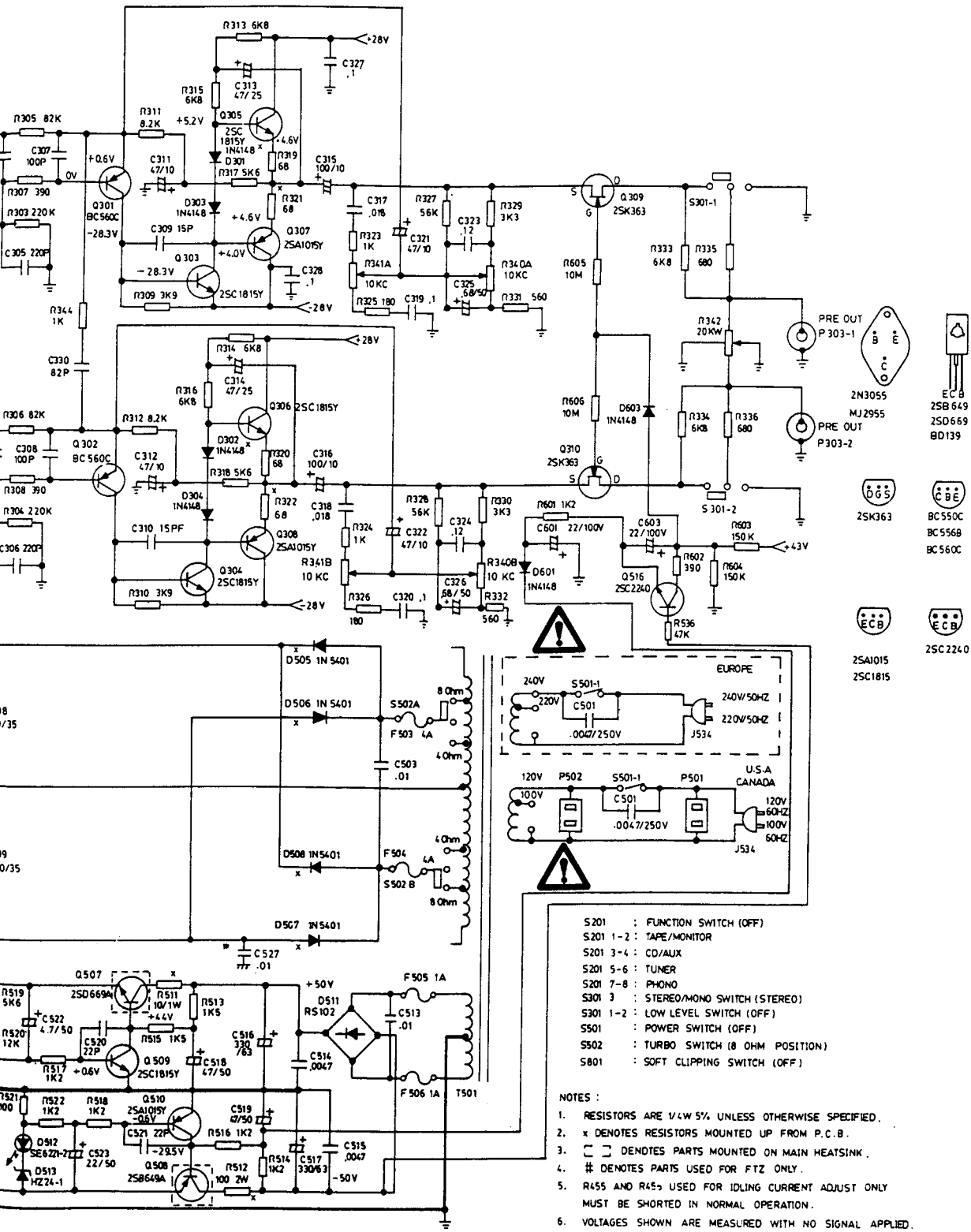
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# SCHEMATIC DIAGRAM NAD3020i AMPLIFIER



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- S201 : FUNCTION SWITCH (OFF)  
 S201 1-2 : TAPE/MONITOR  
 S201 3-4 : CD/AUX  
 S201 5-6 : TUNER  
 S201 7-8 : PHONO  
 S301 3 : STEREO/MONO SWITCH (STEREO)  
 S301 1-2 : LOW LEVEL SWITCH (OFF)  
 S501 : POWER SWITCH (OFF)  
 S502 : TURBO SWITCH (8 OHM POSITION)  
 S801 : SOFT CLIPPING SWITCH (OFF)

- NOTES :
1. RESISTORS ARE 1/4W 5% UNLESS OTHERWISE SPECIFIED.
  2. x DENOTES RESISTORS MOUNTED UP FROM P.C.B.
  3. □ DENOTES PARTS MOUNTED ON MAIN HEATSINK.
  4. # DENOTES PARTS USED FOR FTZ ONLY.
  5. R455 AND R456 USED FOR IDLING CURRENT ADJUST ONLY MUST BE SHORTED IN NORMAL OPERATION.
  6. VOLTAGES SHOWN ARE MEASURED WITH NO SIGNAL APPLIED.

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3225PE/3020i PARTS LIST

SYMBOL	PART NO.	DESCRIPTION	REF.
C201	C202	573-11M7547	
C203	C204	571-071150	
C205	C206	571-0170560	
C207	C208	573-11M3647	
C209	C210	573-11M3722	
C211	C212	572-110318	
C213	C214	572-110282	
C215	C216	572-110275	
C217	C218	571-0170220	
C219	C220	573-11M5647	
C221	C222	573-11M3722	
C223	C224	573-11M4610	
C225	C226	572-110222	
C227	C228	571-0274100	
C229	C230	571-071150	
C301	C302	572-110410	
C303	C304	572-110410	
C305	C306	571-0711220	
C307	C308	571-071100	
C309	C310	571-0710150	
C311	C312	573-11M3647	
C313	C314	573-11M5647	
C315	C316	573-11M3710	
C317	C318	572-110318	
C319	C320	572-110410	
C321	C322	573-11M3647	
C323	C324	572-110412	
C325	C326	573-11M7468	
C327	C328	571-0274100	
C329	C443	571-0273470	
C330	C331	571-0710820	
C332	C333	571-071100	
C334	C335	571-071100	
C336	C337	571-071100	
C338	C339	571-071100	
C401	C402	573-11M4610	
C405	C406	572-110215	
C407	C408	571-0711820	
C409	C410	573-11M3647	
C411	C412	572-110210	
C413	C414	571-0710470	
C415	C416	573-11M3810	
C417	C418	571-0274100	
C419	C420	571-0711220	
C421	C422	571-0710470	
C423	C424	571-0710220	
C425	C426	571-0710220	
C427	C428	573-11M5647	
C429	C430	572-110410	
C431	C432	572-110410	
C433	C434	571-0274100	
C436	C437	571-0274100	
C438	C439	571-0M72100	
C440	C441	571-0M72100	
C442	C443	571-0K72500	
C444	C445	571-0K73100	
C446	C447	571-071150	
C448	C449	571-0712220	
C450	C451	571-0712220	
C452	C527	571-0K73100	
C501	C502	571-0M22470	
C503	C504	572-11M50310	
C505	C506	573-11M7647	
C507	C508	571-0274100	
C509	C510	573-11M5647	
C511	C512	573-11T7868	
C513	C514	571-0274100	
C515	C516	572-11M50310	
C517	C518	571-0715000	
C519	C520	573-11M8733	
C521	C522	573-11M7647	
C523	C524	573-11M7622	
C525	C526	573-11M7522	
C527	C528	573-11M6647	
C529	C530	573-11M6647	
C601	C602	573-11M4622	
C801	C802	573-11M4622	
C803	C804	573-11M4622	
D201	D202	501-21N4148	
D301	D302	501-21N4148	
D303	D304	501-21N4148	
D401	D402	501-21N4148	
D403	D404	501-21N4148	
D405	D406	501-21N4148	
D501	D502	501-11N5401	
D503	D504	501-11N5401	
D505	D506	501-11N5401	
D507	D508	501-11N5401	
D509	D510	501-11N5401	
D511	D512	501-7RS102	
D513	D514	502-1R2551	
D515	D601	501-40240-005	
D603	D801	501-21N4148	
D803	D804	501-21N4148	
D805	D806	501-40110-005	
E401	E402	530-23600-B	
E403	E404	530-35400-B	
E501	E502	549-21851	
F501	F502	530-4041B	
F501	F502	330-4051A	
F503	F504	330-4041B	
F505	F506	330-1051A	
F507	F508	330-1051A	
F509	F510	330-1051A	
F511	F512	330-1051A	
F513	F514	330-1051A	
F515	F516	330-1051A	
F518	F519	330-1051A	
Q201	Q202	517-25C1815Y	
Q203	Q204	517-25A1015Y	
Q205	Q206	517-25A1015Y	
Q207	Q208	517-25A1015Y	
Q301	Q302	517-BC560C	
Q303	Q304	517-BC550C	
Q305	Q306	517-BC556B	
Q401	Q402	517-BC550C	
Q403	Q404	517-BC556B	
Q405	Q406	517-BC556B	
Q407	Q408	517-BD139-10	
Q409	Q410	517-BD139-10	
Q411	Q412	517-2SD669AC	
Q413	Q414	517-2SB649A-C	
Q415	Q416	517-2N3055	
Q417	Q418	517-MJ2955	
Q501	Q502	517-2SA1015Y	
Q503	Q504	517-2SA950Y	
Q505	Q506	517-2SC2120Y	
Q507	Q508	517-2SB633D	
Q509	Q510	517-2SD613D	
Q511	Q512	517-2SD669AC	
Q513	Q514	517-2SB649A-C	
Q515	Q516	517-2SC1815Y	
Q517	Q518	517-2SA1015Y	
Q519	Q520	517-BD139-10	
Q521	Q522	517-2SC2240GR	
R201	R202	704-13J3530	
R203	R204	704-13J4560	
R205	R206	704-13J3220	
R207	R208	704-13J4100	
R209	R210	704-13J2680	
R211	R212	704-13J4150	
R213	R214	704-13J3390	
R215	R216	704-13G2200	
R217	R218	704-13G5120	
R219	R220	704-13G4120	
R221	R222	704-13G2180	
R223	R224	704-13J2150	
R225	R226	704-13J3560	
R227	R228	704-13J3560	
R229	R230	704-13J2470	
R231	R232	704-13J2100	
R233	R234	704-13J5220	
R235	R236	704-13J2680	
R237	R238	704-13J2470	
R303	R304	704-13J5220	
R305	R306	704-13J4820	
R307	R308	704-13J2390	
R309	R310	704-13J3390	
R311	R312	704-13J3820	
R313	R314	704-13J3680	
R315	R316	704-13J3680	
R317	R318	704-13J3560	
R319	R320	704-13J1680	
R321	R322	704-13J1680	
R323	R324	704-13J3100	
R325	R326	704-13J2180	
R327	R328	704-13J4560	
R329	R330	704-13J3330	
R331	R332	704-13J2560	
R333	R334	704-13J3680	
R335	R336	704-13J2680	
R337	R338	704-13J3100	
R339	R340	507-330B21	
R342	R343	507-3103C21	
R344	R345	507-3203W11-T	
R347	R348	704-13J3100	
R349	R350	704-13J3100	
R401	R402	704-13J5220	
R405	R406	704-13J2680	
R407	R408	704-13J4220	
R409	R410	704-13J4220	
R411	R412	508-A004	
R415	R416	704-13J2150	
R417	R418	704-13J4180	
R419	R420	704-13J2390	
R421	R422	704-13J3150	
R423	R424	704-13J3220	
R427	R428	704-13J2390	
R429	R430	705-15J2470	
R431	R432	704-14J3180	
R433	R434	704-13J2390	
R435	R436	704-13J2390	
R437	R438	704-13J1680	
R439	R440	704-13J2220	
R441	R442	704-13J2100	
R443	R444	508-A003	
R445	R446	704-13J1390	
R447	R448	704-14J3120	
R449	R450	704-14J3120	
R451	R452	704-13J1330	
R453	R454	704-13J2180	
R455	R456	704-13J0100	
R457	R458	705-15J1100	
R459	R460	704-14J2220	
R461	R462	704-13J5220	
R463	R464	704-15J0330	
R501	R502	705-16J0022	
R503	R504	704-13J2270	
R505	R506	704-13J3680	
R507	R508	704-13J2120	
R509	R510	704-13J3680	
R511	R512	705-15J1100	
R513	R514	705-16J2100	
R515	R516	704-13J3150	
R517	R518	704-13J3120	
R519	R520	704-13J3680	
R521	R522	704-13J1210	
R523	R524	704-13J3120	
R525	R526	704-13J4820	
R527	R528	704-13J4150	
R529	R530	704-13J4470	
R602	R603	704-13J2390	
R605	R606	704-13J5150	
R801	R802	704-13J3180	
R803	R804	704-13J3180	
R805	R806	704-13J3180	
R807	R808	704-13J3180	
R809	R810	704-13J4180	
R811	R812	704-13J4180	
S201	S202	526-3102	
S301	S302	526-3103	
S501	S502	526-3110-1	
S503	S504	526-3105	
S801	S802	526-52205	
W401	W402	527-4020	

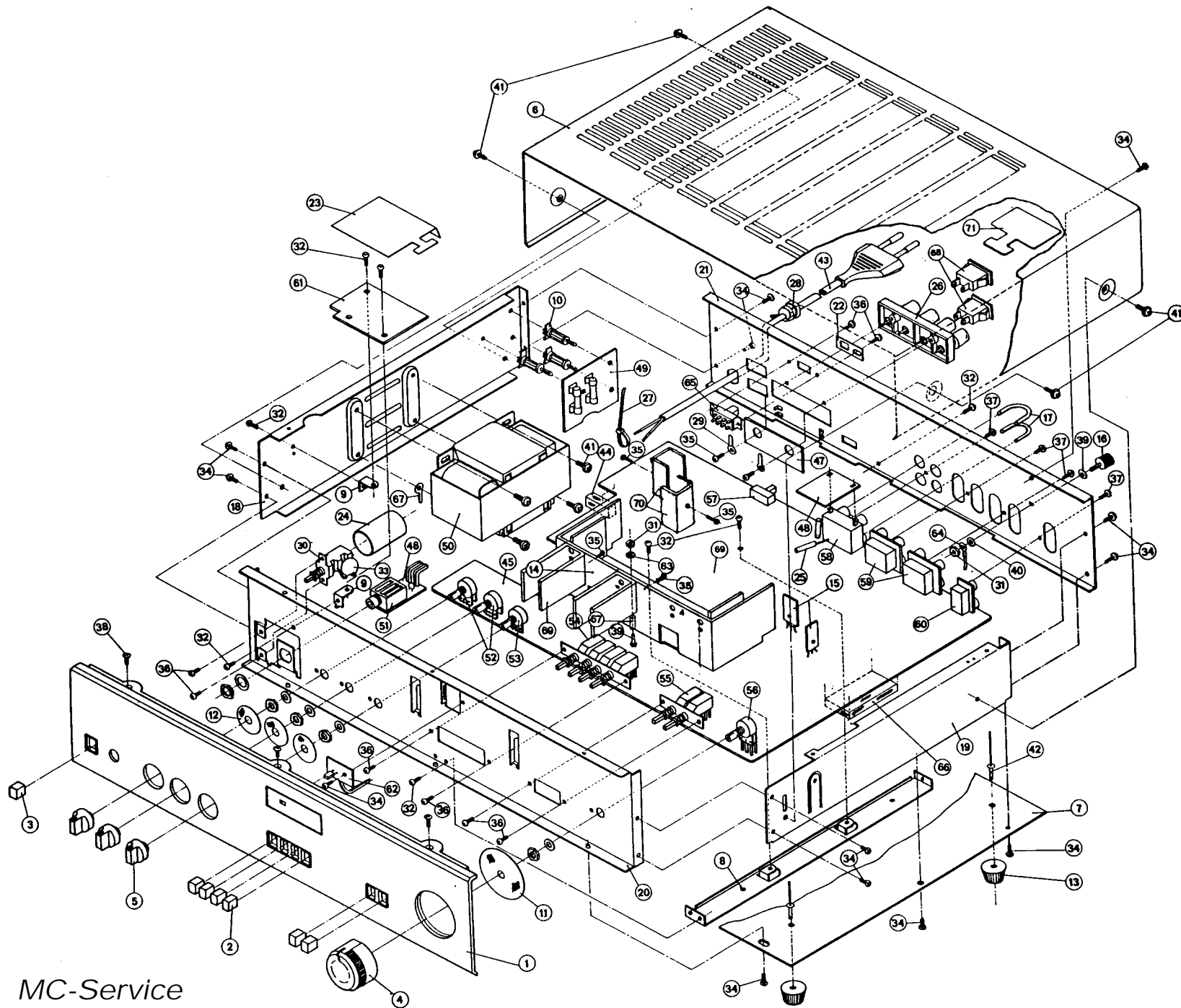
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Q303	Q304	517-25C1815Y	Tr.
Q305	Q306	517-25C1815Y	Tr.
Q307	Q308	517-25A1015Y	Tr.
Q309	Q310	517-25K363BL	Tr.
Q401	Q402	517-BC550C	Tr.
Q403	Q404	517-BC556B	Tr.
Q405	Q406	517-BC556B	Tr.
Q407	Q408	517-BD139-10	Tr.
Q409	Q410	517-BD139-10	Tr.
Q411	Q412	517-2SD669AC	Tr.
Q413	Q414	517-2SB649A-C	Tr.
Q415	Q416	517-2N3055	Tr.
Q417	Q418	517-MJ2955	Tr.
Q501	Q502	517-2SA1015Y	Tr.
Q503	Q504	517-2SA950Y	Tr.
Q505	Q506	517-2SC2120Y	Tr.
Q507	Q508	517-2SB633D	Tr.
Q509	Q510	517-2SD613D	Tr.
Q511	Q512	517-2SD669AC	Tr.
Q513	Q514	517-2SB649A-C	Tr.
Q515	Q516	517-2SC1815Y	Tr.
Q517	Q518	517-2SA1015Y	Tr.
Q519	Q520	517-B	

### 3225PE/3020i EXPLODED VIEW PARTS

ITEM	PARTS NO.	DESCRIPTION	QTY
1.	055-131A	Panel — Front	1
2.	073-1620	Button — Push	6
3.	073-1625	Button — Push (Power)	1
4.	081-1100	Knob — Volume	1
5.	081-1110	Knob — Control	3
6.	049-069A	Cover — Top	1
7.	049-0700	Cover — Bottom	1
8.	078-8120	Bracket — Middle	1
9.	078-8130	Bracket — Tuner PCB	2
10.	080-2090	Supporter — Circuit Board	3
11.	082-4490	Felt — Volume Knob	1
12.	082-4500	Felt — Control Knob	3
13.	082-4510	Rubber — Foot	4
14.	083-0710	Heat Sink	1
15.	083-0720	Heat Sink (S)	2
16.	085-1350	Thumb Screw Stud	1
17.	085-1360	Bar — Shorting	2
18.	095-7070	Plate — Left	1
19.	095-7080	Plate — Right	1
20.	095-7090	Plate — Front	1
21.	095-710E	Plate — Back (220V 50Hz 140W)	1
22.	095-7110	Plate — Switch	1
23.	095-7130	Plate — Terminal Board Cover	1
24.	099-0760	UL Heat Shrinkable Tube	0.03
25.	099-0770	UL Heat Shrinkable Tube	0.11
26.	099-0850	Loudspeaker Terminal Block	1
27.	527-060	Cable Tie 4"	8
28.	527-6002	Micro Bushing 4N40	1
29.	027-5000	Soldering Tag	2
30.	526-3110-1	Push Bottom Switch	1
31.	048-0620	Nut — 3.5mm	1
32.	093-3008BTBB(H)	Self-Tapping Screw 3 x 8 BTBB	
33.	571-0ME2470	Ceramic Capacitor	1
34.	093-3006BTBB(H)	Self-Tapping Screw 3 x 6 BTBB	1
35.	093-3006BTB	Self-Tapping Screw 3 x 6 BTB	8
36.	093-3008BH	Machine Screw M 3 x 0.5P x 8 BH	6
37.	093-3008BTBB	Self-Tapping Screw 3 x 8 BTBB	4
38.	093-3008KTB(H)	Self-Tapping Screw 3 x 8 KTB	3
39.	094-0740	Washer — Metal	1
40.	094-0760	Washer — External Tooth	1
41.	093-4006WHB(H)	Machine Screw M 4 x 0.7P x 6 WHB	2
42.	099-1100	Rivet	4
43.	529-51A01	AC Cord uL/CSA	1
	529-53B01	AC Cord BS	1
	529-53M01	AC Cord VDE/EMKO	1
	529-53S01	AC Cord SAA	1
44.	082-4020	Cushion	
45.	531-1054	Main Board	1
46.	531-9016	Headphone Board	1
47.	531-9015	Ext. Speaker Board	1
48.	531-2201	Ext. Pre-Amp Board	1
49.	531-V001	Fuse Board	1
50.	521-167AMV501	Power Transformer EI 67 x 55 mm	1
51.	527-4020	Headphone Jack 6.5mm	1
52.	507-3103C21	Volume 10K C (D) W/O Switch	2
53.	507-3203W11-T	Volume 20K W (S) W/O Switch	1
54.	526-3102	Push Switch 2I2I2S (SPUF41) Alps	1
55.	526-3103	Push Switch 2S2S (SPUF21) Alps	1
56.	507-3503B21	Volume 50K B (D) W/O Switch	1
57.	526-52205	Slide Switch 2P2T	1
58.	527-441101	RCA Jack 4 Pos	1
59.	527-441101	RCA Jack 4 Pos	2
60.	527-421201	RCA Jack 2 Pos	1
61.	531-U001	Terminal Board	1
62.	531-7049	Power LED Board	1
63.	094-0190	Washer — Ext. Tooth	16
64.	027-6003	Soldering Tag	1
65.	526-3105	Slide Switch 2P2T RG 10mm	1
66.	082-4530	Foam — Sheet	1
67.	027-6004	Soldering Tag	1
68.	527-3125U	AC Outlet (for UL/CSA only)	2
69.	083-0780	Heat Sink Fin (3225PE only)	4
70.	083-0790	Heat Sink Power Envelope (3225PE only)	2
71.	095-7120	Plate AC Socket Cover (UL/CSA, A/A1 only)	1

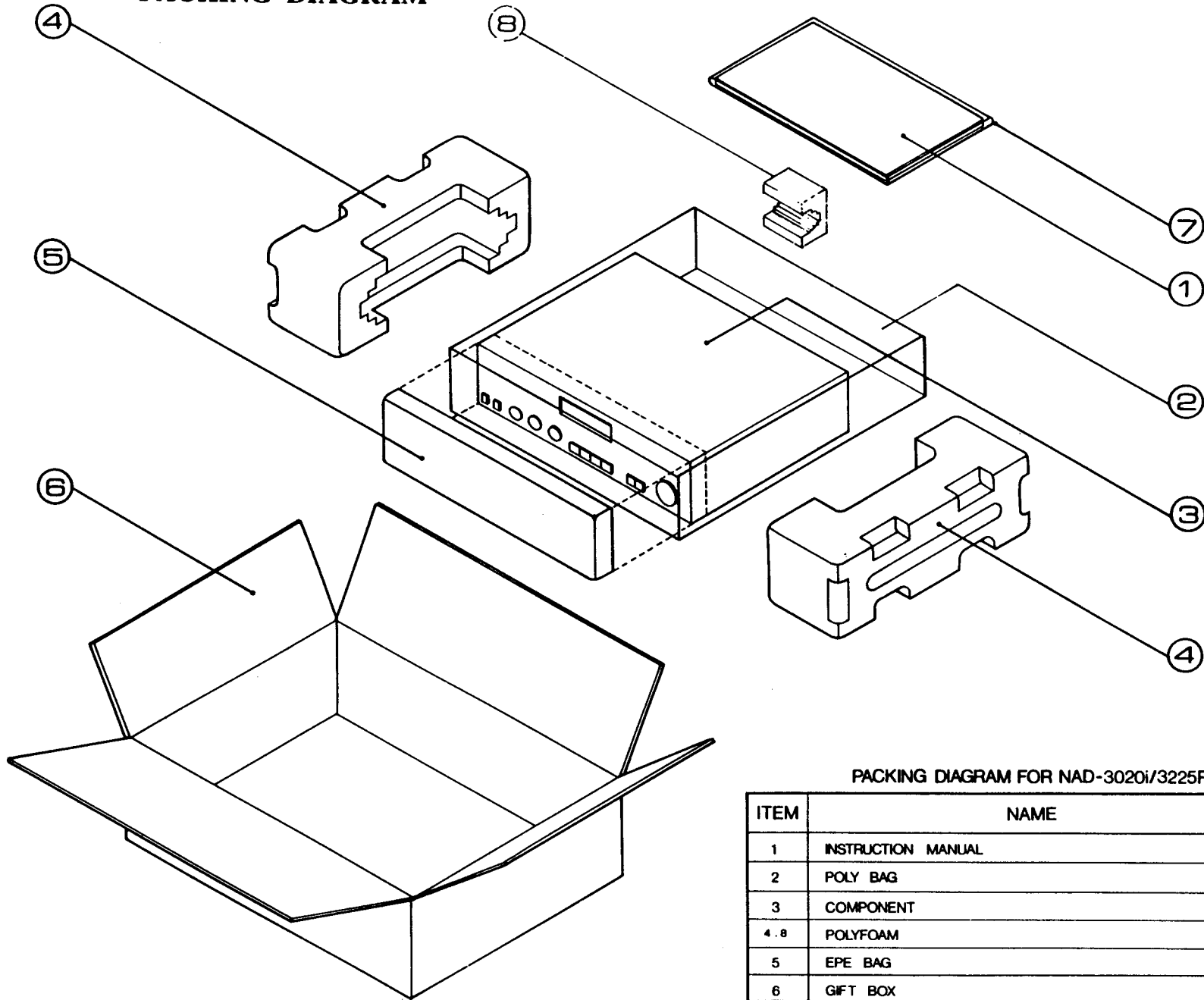
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EXPLODED VIEW



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# PACKING DIAGRAM



PACKING DIAGRAM FOR NAD-3020i/3225PE

ITEM	NAME	QTY
1	INSTRUCTION MANUAL	1
2	POLY BAG	1
3	COMPONENT	1
4, 8	POLYFOAM	2 1
5	EPE BAG	1
6	GIFT BOX	1
7	POLY BAG	1

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