

ONKYO® SERVICE MANUAL

Integrated Stereo Amplifier MODEL A-8690



UG	220V AC, 50Hz
----	---------------

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK  ON THE SCHEMATIC DIAGRAM AND IN THE PARTS LIST ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE THESE COMPONENTS WITH ONKYO PARTS WHOSE PARTS NUMBERS APPEAR AS SHOWN IN THIS MANUAL.

MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

TABLE OF CONTENTS

Item	Page
Specifications	2
Precautions	2
Adjustment procedures	3
Front panel facilities	5
IC block diagram	6
System connections	9
Packing procedures	10
Chassis exploded view	11
Exploded view parts list	13
Printed circuit board parts list	14
Printed circuit board view	18
Block diagram	23
Schematic diagram	27



A-8690

SPECIFICATIONS

Power Output:	100 watts per channel, min RMS. at 8 ohms, both channels driven from 20 Hz to 20 kHz, with no more than 0.008% Total harmonic distortion.
Dynamic Power:	310 watts 2 ohms, 220 watts 4 ohms
Total Harmonic Distortion:	0.008% at rated power 0.008% at 1 watt output
Intermodulation Distortion:	0.005% at rated power
Damping Factor:	100 at 8 ohms
Input Sensitivity/Impedance:	Phono (MM): 2.5 mV/50 kohms Phono (MC): 160µV/220 ohms CD DIRECT: 150 mV/50 kohms TUNER: 150 mV/50 kohms Tape Play: 150 mV/50 kohms VCR Play: 150 mV/50 kohms VDP Play: 150 mV/50 kohms
Output Level/Impedance:	Tape Rec: 150 mV/1.5 kohms (Phono) Pre Out: 1 V/600 ohms
Phono Overload:	Phono (MM): 200 mV RMS. at 1 kHz, 0.015% THD.
Tone Control: (Vol-20 dB)	CONTRABASS: +10/+20 dB (Muting: OFF/ON) at 20 Hz BASS: ±10 dB at 70 Hz TREBLE: ±8 dB at 20 kHz
High Cut:	6 kHz (6 dB/Octave) (TREBLE min.)
Frequency Response:	CD, Tuner: 2-50,000 Hz (+0, -1 dB)

RIAA Deviation:	Phono (MM): ±0.3 dB, 20 Hz - 20 kHz
Signal to Noise	Phono (MM): 94 dB (5.0 mV input)
Ratio (IHF-A):	Phono (MC): 75 dB (0.5 mV input) CD: 107 dB
Muting (Vol - 20 dB):	-15 dB

D/A CONVERTER SECTION

Coaxial Input:	0.5 Vp-p/75Ω
Output:	0.5 Vp-p/75Ω
Optical Input:	
Digital Sampling Frequency:	32,44.1, 48 kHz
Frequency Response:	2-20,000 Hz±0.2 dB
Total Harmonic Distortion:	0.0015% at 1 kHz
Signal to Noise Ratio: (IHF-A):	110 dB
Dynamic Range (IHF-A):	103 dB
Max. Output Level:	2V r.m.s.

GENERAL

Power Supply:	European models AC220 V, 50 Hz
Dimensions:	435 (W)×164 (H)×392 (D) mm 17-1/8"×6-7/16"×15-7/16"
Weight:	14.5 kg, 32.0 lbs.

Specifications and features are subject to change without notice.

PRECAUTIONS

1. Replacing the fuses

For continued protection against risk fire, replace only with same type and same rating fuse.

CIRCUIT NO.	PART NO.	DESCRIPTION
F922	252077 or	4A-SE-EAK Primary fuse
	252077CC	4A-SE-EAK Primary fuse

ADJUSTMENT PROCEDURES

Adjustments and Checking the Protection Circuitry

1. Preparations

- 1) Place the unit on the workbench. (There should be about 15 mm of space between the base plate of the unit and the work surface.)
- 2) Set up the unit as follows.
 - (1) No load
 - (2) No signal
 - (3) Volume turned all the way down
 - (4) Speaker switch OFF
 - (5) Power switch OFF

Note) Check the following points before making adjustments

- (1) The power switch should be OFF.
- (2) The interior of the unit should not be warm.
- (3) The DAC circuit board should be mounted correctly.

2. Idling current adjustment

- 1) Turn the power switch ON and allow the unit to warm up for about 10 minutes.
 - (1) Adjust R531 (R532) so that the voltage at test point VCT-IID on the NAAF-3114 circuit board is $15\text{mV} \pm 5\text{mV}$.

3. Check of operation of protection circuitry

- 1) Check of operation of protection relay
 - (1) Confirm that the relay turns ON approximately 5 seconds after the power switch is turned ON.
 - (2) The SOURCE DIRECT indicator LED should light at the same time.
 - (3) The relay should turn OFF approximately 0.5 seconds after the power switch is turned OFF.
- 2) Check of DC detection and servo circuitry operation
 - (1) Turn the power on with no load.
 - (2) After the speaker relay turns ON, apply DC+200mV to the LINE input terminals. Confirm that the relay turns OFF.
 - (3) Confirm that operation is the same as (2) above when an input of DC-200mV is applied.

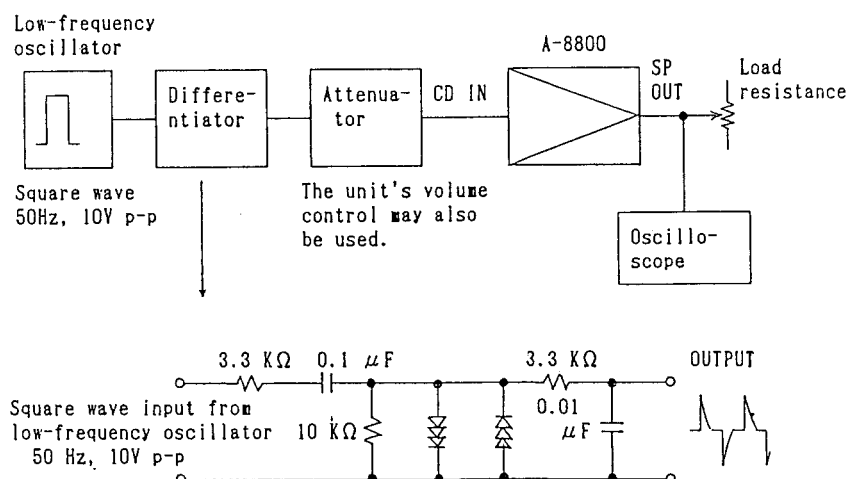
Note) Under no circumstances connect a load or short the speaker terminals when performing the above test.

- 3) Signal input from the circuit illustrated below with no load.

- (1) Confirm that the speaker relay does not turn OFF even when a 2 ohm load is connected when a peak value of 35V p-p is output.
- (2) Next, confirm that when a 1 ohm load is connected the speaker relay switches OFF and ON a couple of times and then stays OFF.

Note) The period before that relay stays OFF should not last for more than 1 minute.

Relay OFF status can be canceled by switching the power OFF.



NOTE) Semi-fixed resistors enclosed in parentheses () are for the right channel.

4. DAC block adjustment

1) Confirmation of fs display

- (1) Input a digital signal to one of the DIGITAL input terminals (1-3).
- (2) The indicator LED should light as follows according to the sampling frequency of the input signal.

32kHz	orange
44.1kHz	green
48kHz	red

2) Distortion adjustment

(1) Preparations

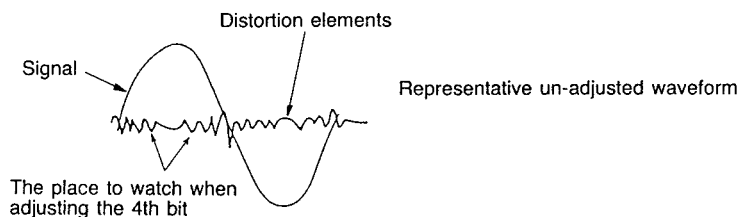
- Connect the digital output terminal of a suitable equipped CD player to the DIGITAL 1 digital input terminal of the A-8690.
- Connect a distortion meter to the analog output of circuit board NADC-3386 or to the unit's analog REC OUT terminal.
- Input the distortion meter signal output and the distortion output to dual-phenomenon oscilloscope.

(2) Turn power ON to the unit.

(3) Play track 2 of the test disc (YEDS-18).

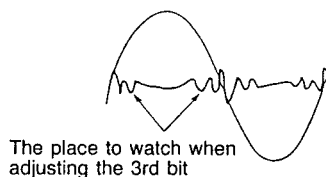
(4) Adjusting the 4th bit.

Adjust semi-fixed resistor R815 (R816) so that the non-continuous portion (difference in level) of the distortion elements shown at right is as small as possible.



(5) Adjusting the 3rd bit.

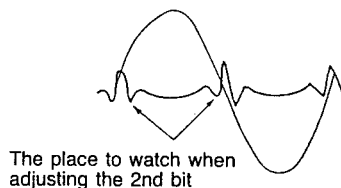
As with (3) above, adjust semi-fixed resistor R813 (R814) so that the non-continuous portion (difference in level) of the distortion elements is as small as possible.



(6) Adjusting the 2nd bit.

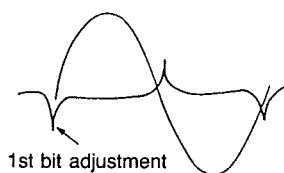
As above, adjust semi-fixed resistor R811 (R812) so that the non-continuous portion (difference in level) of the distortion elements is as small as possible.

Note) It does not matter is up to this point the level of overall distortion is high.



(7) Adjusting the 2nd bit.

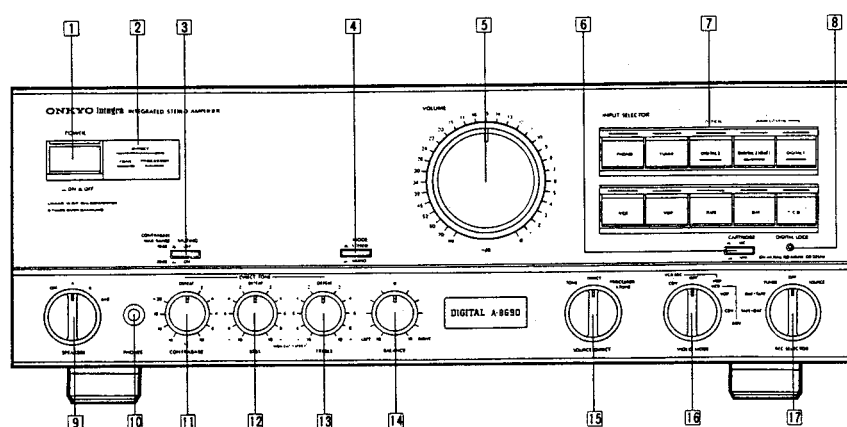
Adjust semi-fixed resistor R809 (R 810) so that the non-continuous portion of the final remaining distortion waveform is as small as possible.



(8) Repeat steps (4) – (7) above to fine adjust to optimum settings.

Note) The distortion meter must be accurate to 0.001% or better and possess a distortion output terminal.

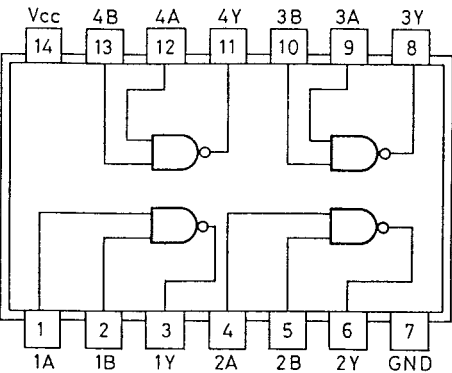
FRONT PANEL FACILITIES



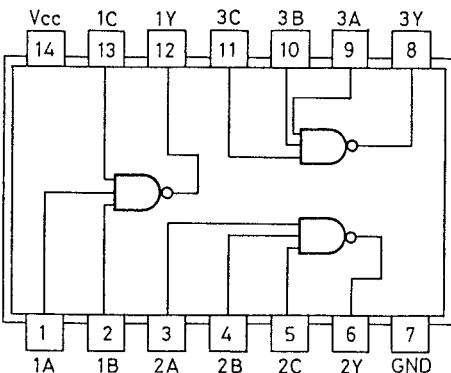
1. Power switch (POWER)
2. Operation indicator (DIRECT/TONE/PROCESSOR)
3. Muting switch (MUTING)
4. Mode selector switch (MODE)
STEREO, MONO
5. Volume control (VOLUME)
6. Cartridge selector switch (CARTRIDGE)
MC, MM
7. Input selector buttons and Indicators (INPUT SELECTOR)
DIGITAL 1, DIGITAL 2 (DAT), DIGITAL 3
PHONO, TUNER, VCR, VDP, TAPE, DAT, CD
8. Digital lock indicator (DIGITAL LOCK)
9. Speaker selector switch (SPEAKERS)
OFF, A, B, A+B
10. Headphone jack (PHONES)
11. Contrabass control (CONTRABASS)
12. Bass control (BASS)
13. Treble control (TREBLE)
14. Balance control (BALANCE)
15. Source direct switch (SOURCE DIRECT)
TONE, DIRECT, PROCESSOR & TONE
16. Video mode switch (VIDEO MODE)
VCR REC...CDV, OFF, VDP/VCR
VDP/VCR, VDP, CDV...BGV
17. Recording source selector switch (REC SELECTOR)
TAPE ► DAT, DAT ► TAPE, TUNER, OFF,
SOURCE

IC BLOCK DIAGRAM

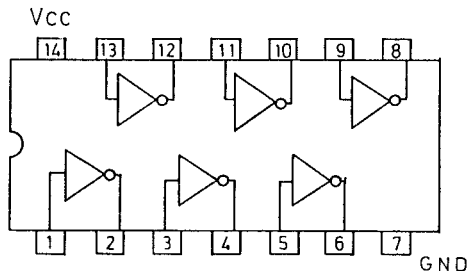
74HC00P (NAND gate)



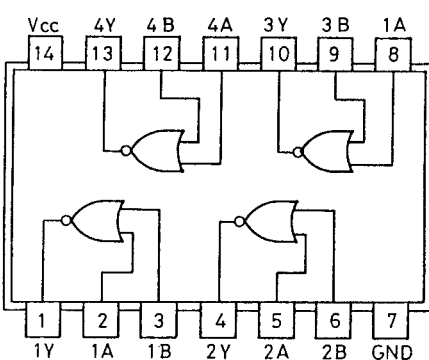
74HCU10P (NAND gate)



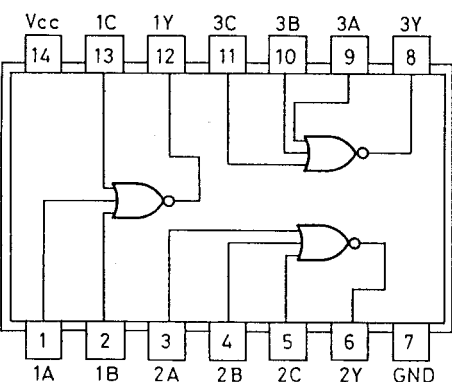
74HCU04P (Hex inverter)



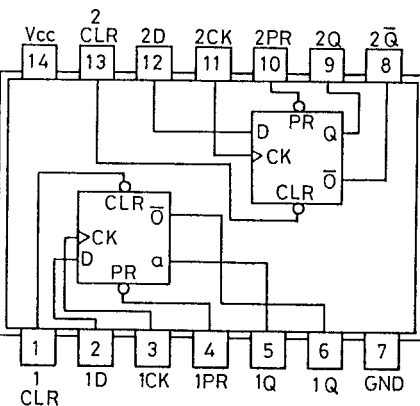
74HC02P (NOR gate)



74HC27P (NOR gate)



74HC74P (D-FF)

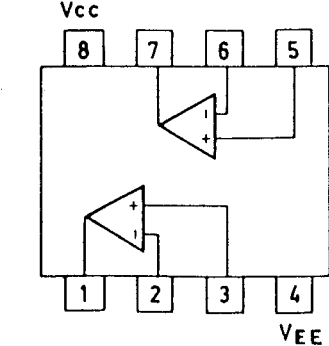


NJM4560DX (OP Amp.)

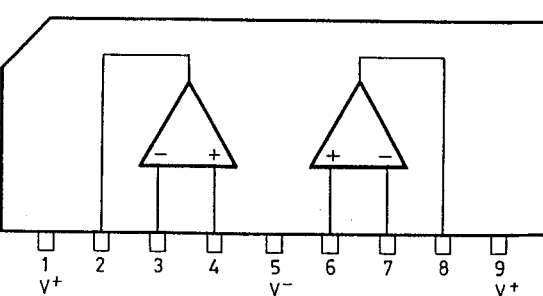
NJM4565DB

NJM2904D

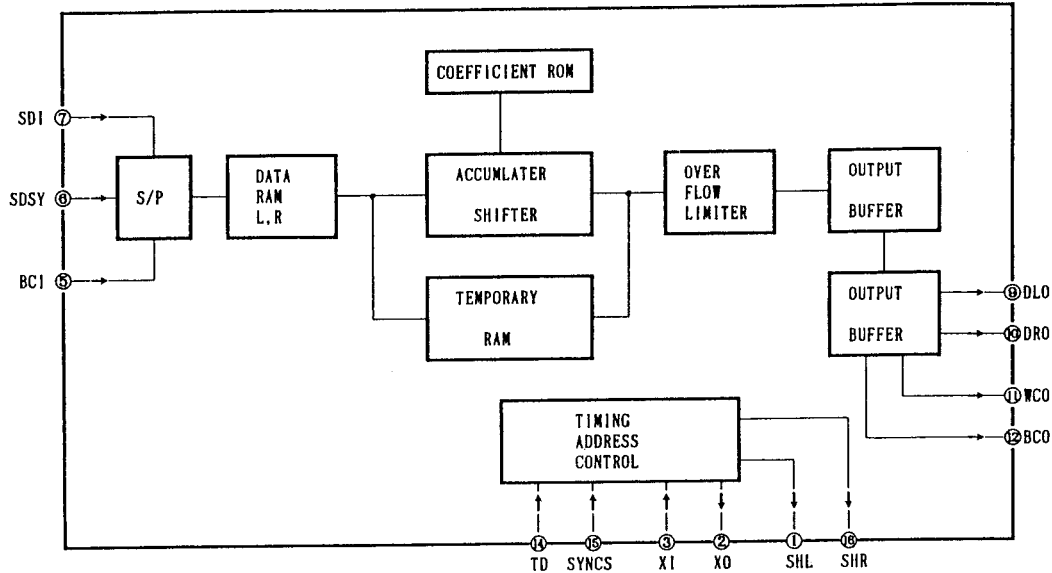
NJM5532DD



NJM4558SE (OP Amp.)

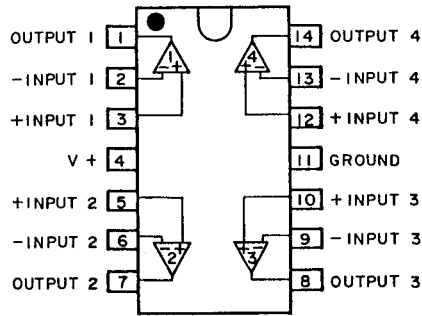


YM3414 (Eight times over sampling digital filter)

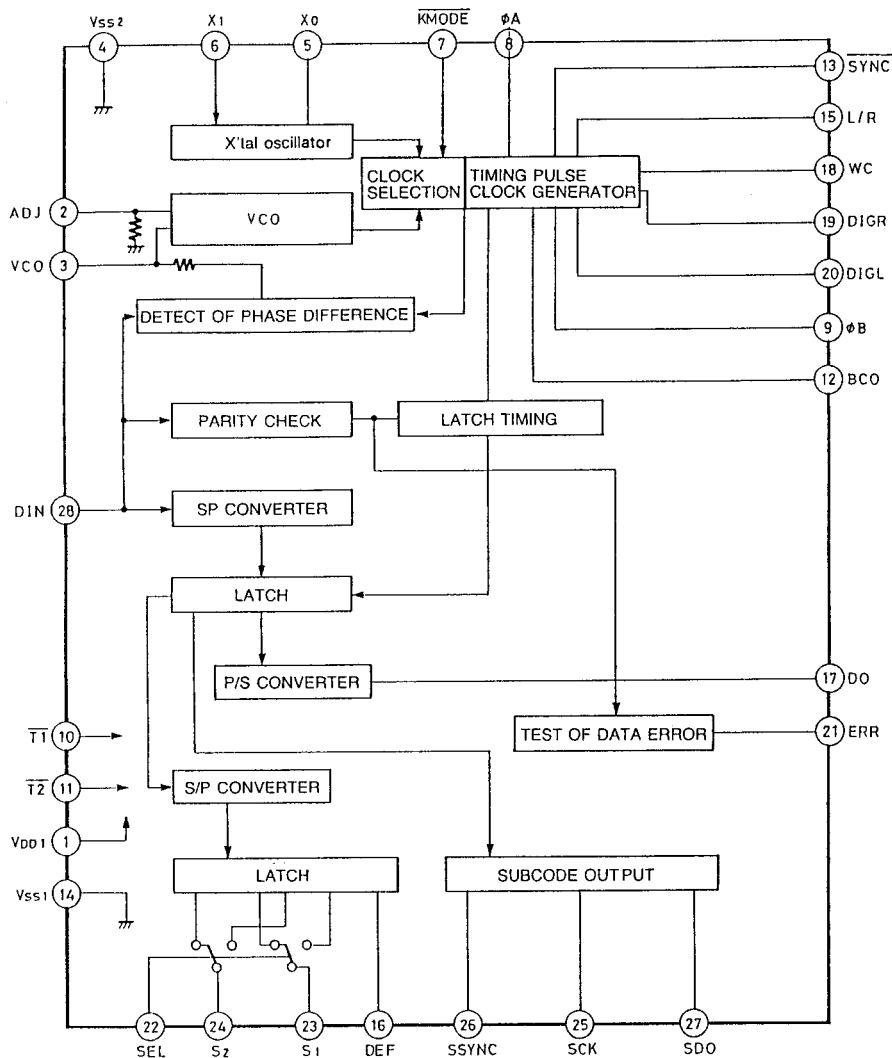


PIN NO.	TERMINAL	I/O	DESCRIPTION
1	SHL	O	When one DAC(TD=L):Deglitching signal of left channel (when four times) When two DAC(TD=H):Deglitching signal of left and right channels(when eight times)
2	XO	O	Connect the x'tal oscillator between XI and XO. The clock frequency is 384×Fs.
3	XI	I	
4	VDD2		+5V:Power supply terminal for x'tal oscillator and deglitching signal.
5	BCI	I	Bit clock input terminal.
6	SDSY	I	Clock shown L/Rch division of input data and input timing.
7	SDI	I	16 bits serial data input terminal.
8	VDDI		+5V:Power supply terminal for digital signal.
9	DLO	O	When one DAC(TD=L):Output terminal for L/R channel data (When four times) When two DAC(TD=H):Output terminal for L channel data (when eight times)
10	DRO	O	R channel data output terminal.
11	WCO	O	Word clock of output data DLO/DRO.
12	BCO	O	Bit clock of output data.
13	VSS		Ground terminal
14	TD	I	1DAC/2DAC selector terminal: 1DAC at low, 2DAC at high.
15	SYNCs	I	Asynchronous input jitter absorption synchronous signal. Synchronous input at high level, SDSY inhibiting at low level.
16	SHR	O	R channel deglitching signal when one DAC.

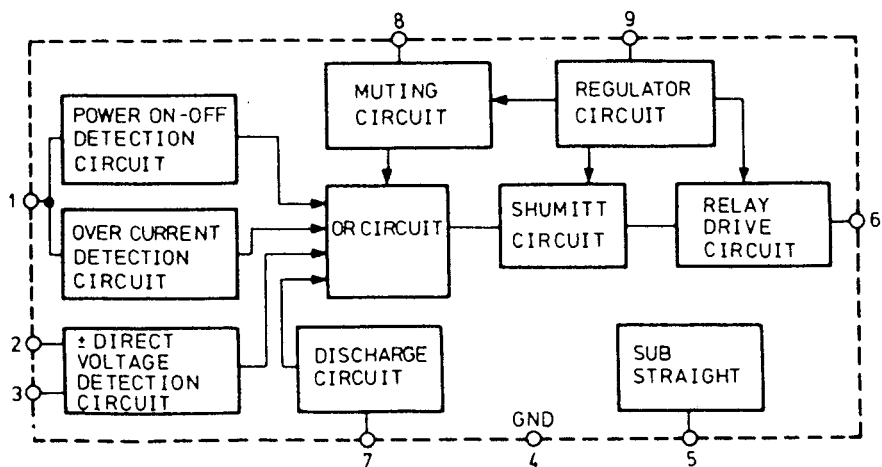
NJM2902N (OP Amp)



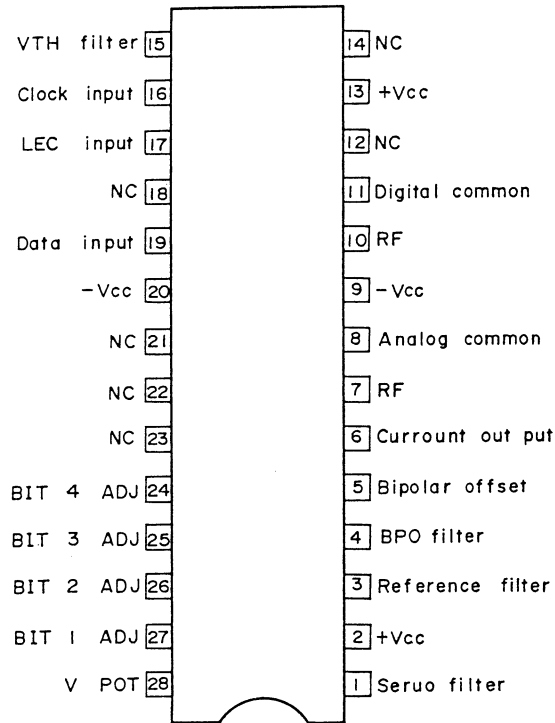
YM3623B (Digital decoder)



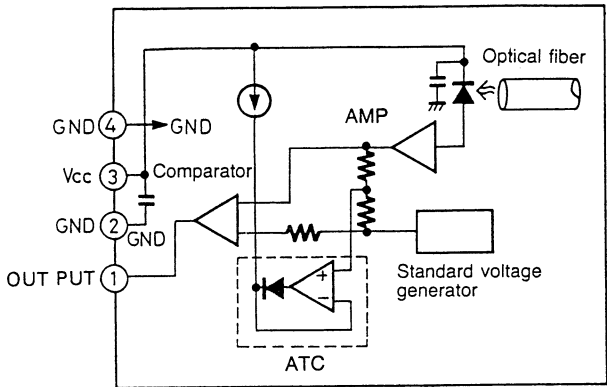
TA7317P (Protective circuit)



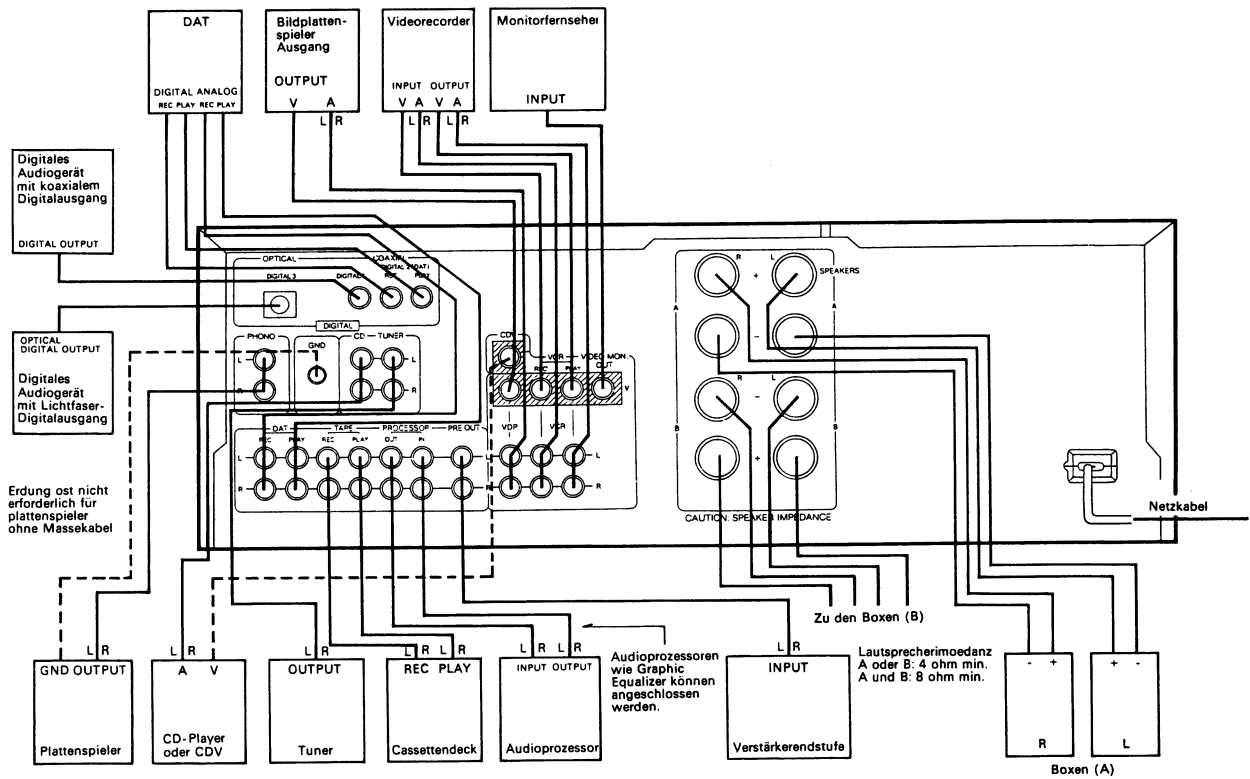
PCM58P (D/A converter)



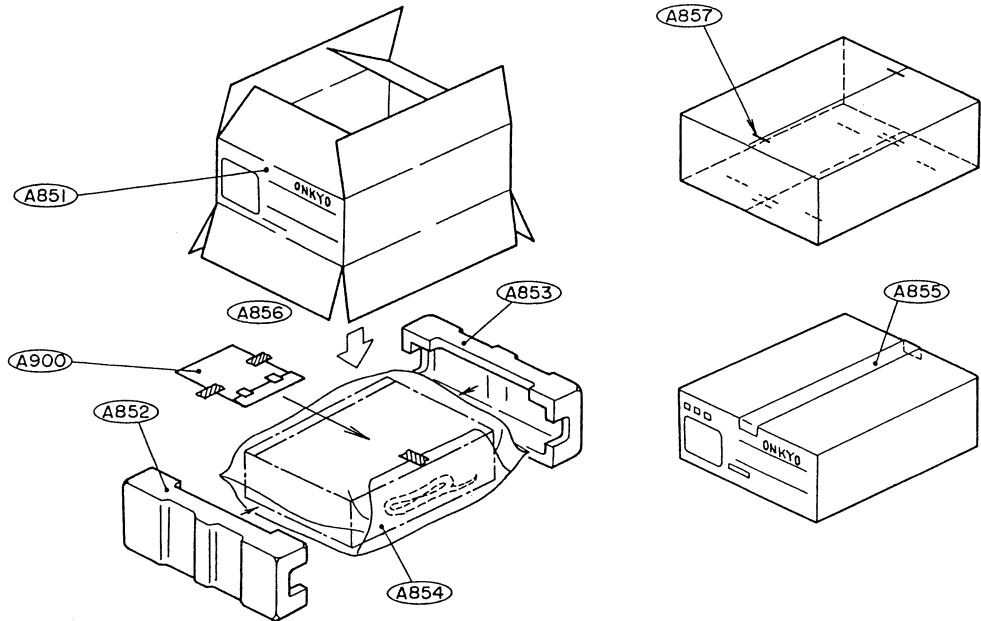
TORX175 (Optical receiver)



SYSTEM CONNECTIONS

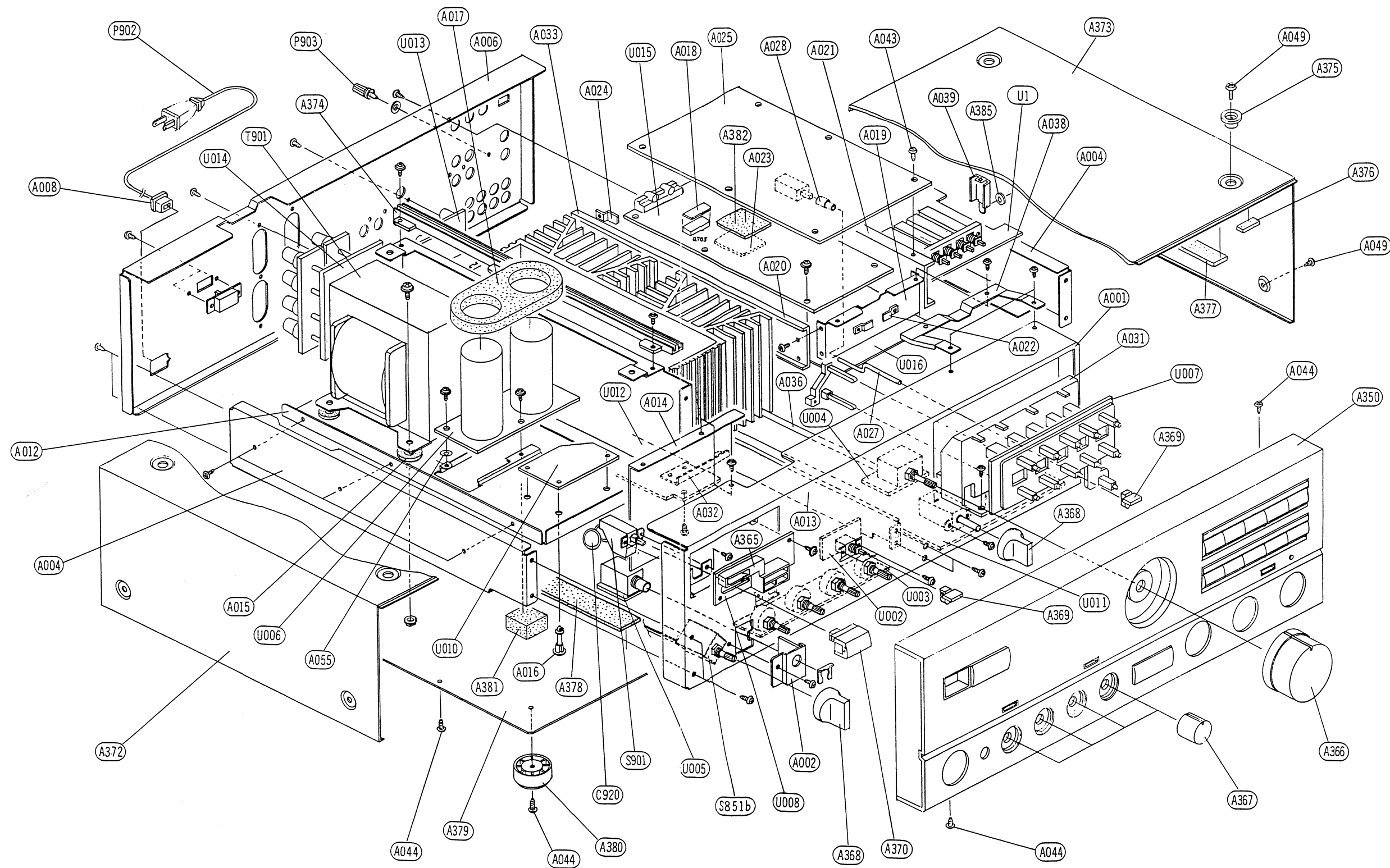


PACKING PROCEDURES



REF. NO.	PART NO.	DESCRIPTION
A851	29051789	MASTER CARTON BOX
A852	29091202	PAD, LEFT
A853	29091203	PAD, RIGHT
A854	29095108-1	SHEET, 1000×600
A855	260012	DAMPLON TAPE, W50
A856	261504	PAPER TAPE
A857	282301	SEALING HOOK
A900	—	ACCESSORY BAG
	29341327	INSTRUCTION MANUAL
	29365020	WARRANTY CARD
	29100094A	POLY BAG (WARRANTY CARD)
	29100006A	POLY BAG 350×250

CHASSIS-EXPLODED VIEW



CHASSIS-EXPLODED VIEW-PARTS LIST

REF. NO.	PART NO.	DESCRIPTION				
A001	27110382	FRONT BRACKET		△ C920a	27300601	COVER (CAPACITOR), SB-1925
A002	27141199	BRACKET (HP)		△ P902	25148 or	POWR SUPPLY CABLE, AS-CEE or
A004	27115230C	SIDE BRACKET				
A006	27121176A	BACK PANEL			253150	POWR SUPPLY CABLE, AS-CEE
A008	27300750	BUSHING (CORD)				
A012	27130548B	BRACKET (PT)		P903	25060044	GROUND TERMINAL
A013	27130502C	BRACKET (H)		△ F922	252077 or	4A-SE-EAK or
A014	27150259	SHIELD PLATE			252077CC	4A-SE-EAK
A015	27270213	SPACER (PT)		△ S901	25035345A	POWRE SWITCH, NPS-111-L308P
A016	27190657	HOLDER				
A017	28140882	CUSHION (DUMPTER)		S851b	25030294	REMOTE SWITCH, OPERATION SECTION
A018	28400454	STABILIZER (DAC)				
A019	27130549A	BRACKET (D)		U001	1A116505-3A	NASW-3105-3A, INPUT SWITCH & EQUALIZER
A020	27225087C	SHIELD CASE (DL)				
A021	27225088C	SHIELD CASE (DR)				
A022	27141282	BRACKET (O)		U002	1A115506-3	NASW-3106-3, MODE SWITCH
A023	28140808	CUSHION				
A024	27141229A	BRACKET (O)		U003	1A115507-3	NAAF-3107-3, TONE CONTROL
A025	27262485	PLATE (D)				
A027	27260237C	SHAFT		U004	1A115508-3	NAAF-3108-3, VOLUME CONTROL
A028	28320135	JOINT				
A031	27273086E	JOINT ASS'Y				
A032	27141161A	BRACKET (HF)		U005	1A115509-3	NAETC-3109-3, HEAD PHONE
A033	27160230	HEATSINK				
A035	27141162A	BRACKET (HB)		U006	1A115510-3	NAPS-3110-3, POWER SUPPLY
A036	27130503D	BRACKET (PC)				
A038	27141163A	BRACKET (D)		U007	1A115511-3	NADIS-3111-3, INPUT LED
A039	27141235	BRACKET (E)				
A043	82143006	PAN HEAD SCREW, 3P+6FNBC		U008	1A115512-3	NADIS-3112-3, DISPLAY LED
A044	834430088	TAP-TIGHT SCREW, 3TTS+8BBC		U009	1A115521-3	NASW-3121-3, MUTING SWITCH
A049	838440089	TAP-TIGHT SCREW, 4TTB+8CBC				
A053	87313006	TOOTHED WASHER, M-3B		U010	1A115585-3A	NAETC-3385-3A, FUSE
A055	27270273	SPACER		U011	1A116513-3A	NAAF-3113-3A, POWER AMPLIFIER (I) PC BOARD ASS'Y
A350	1A116121	FRONT PANEL				
A365	28199174	FILM				
A366	28323171	KNOB (VOL)		U012	1A115514-3	NAAF-3114-3, POWER AMPLIFIER (II) PC BOARD ASS'Y
A367	28323123	KNOB (TONE)				
A368	28323173	KNOB (SP)				
A369	28323174	KNOB (PUSH)		U013	1A115516-3	NAETC-3116-3, VIDEO TERMINAL
A370	28323175	KNOB (POW)				
A371	28323176	KNOB (CAP)		U014	1A116517-3A	NAETC-3117-3A, SPEAKER & PROTECTOR
A372	28184409	TOP COVER (L)				
A373	28184410	TOP COVER (R)				
A374	27273090	JOINT (COVER)		U015	1A115586-1	NADG-3386-1, DIGITAL CIRCUIT PC BOARD ASS'Y
A375	27265155A	WASHER (COVER)				
A376	28140020	CUSHION		U016	1A115587-1	NAPS-3387-1, DIGITAL POWER SUPPLY
A377	28140695	CUSHION				
A378	28140761	CUSHION				
A379	27170251A	BOTTOM BOARD				
A380	27175153	LEG ASS'Y				
A381	28140810	CUSHION				
A382	28140807	CUSHION				
A385	27175011C	LEG				
Q609, Q610	2201873 or 2201876 or 2201874	TRANSISTOR, 2SC3858-O or TRANSISTOR, 2SC3858-P or TRANSISTOR, 2SC3858-Y				
Q611, Q612	2201863 or 2201866 or 2201864	TRANSISTOR, 2SA1494-O or TRANSISTOR, 2SA1494-P or TRANSISTOR, 2SA1494-Y				
△ T901	2300365B	POWER TRANSFORMER, NPT-1008G				
△ C920	350065A	0.01 μF, AC400V/125V, CAPACITOR (IS)				

NOTE: THE COMPONENTS IDENTIFIED BY MARK △ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PARTS NUMBER SPECIFIED.

NOTE: THE COMPONENTS IDENTIFIED BY MARK △ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PARTS NUMBER SPECIFIED.

PRINTED CIRCUIT BOARD PARTS LIST

INPUT SWITCH & EQUALIZER CIRCUIT PC BOARD
(NASW-3105-3A) – PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
IC		
Q105	222570	NJM4560X
Transistors		
Q101~104	2212185 or 2212186	2SK170GR or 2SK170BL
Coils		
L101, L102	231133	NCH-1188
Capacitors		
C101, C102	372125604	56 pF, 50V, Styrene
C103, C104	372121014	100 pF, 50V, Styrene
C105, C106	372122214	220 pF, 50V, Styrene
C107, C108	372121014	100 pF, 50V, Styrene
C109, C110	373302224	2200 pF, 12V, Film (PP)
C111, C112	379122234	0.022 μ F, 50V, Film (DEW)
C113, C114	379121834	0.018 μ F, 50V, Film (DEW)
C115, C116	379124734	0.047 μ F, 50V, Film (DEW)
C117, C124	354741029	1000 μ F, 16V, Elect.
C118, C123	391221227	1200 μ F, 6.3V, Elect. (MUSE)
C119, C120	391280227	2.2 μ F, 50V, Elect. (MUSE)
C121, C122	379121225	1200 pF, 50V, Film (DEW)
C125, C126	372121024	1000 pF, 50V, Styrene
C127	379121025	1000 pF, 50V, Film (DEW)
C131, C132	354754719	470 μ F, 25V, Elect.
C203, C204	373301014	100 pF, 125V, Film (PP)
Switches		
S101	25035583	NPS-142-L545
S201	25035572	NPS-742-362-L534
Sockets		
P101	2000764	NSAS-6P720
P223	2000557	NSAS-6P513
P224	2000960	NSAS-8P912
P232	2000776	NSAS-10P732
P961	2000665	NSAS-8P621
P962	2000782	NSAS-14P782
Jumper socket		
JL102	25050267	NSCT-3P95
JL255	25050272	NSCT-8P100
JL256	25050270	NSCT-6P98
JL227	25050271	NSCT-7P99
JL229	25050272	NSCT-8P100
JL231	25050270	NSCT-6P98
Terminals		
P191, P202	25045182	NPJ-2PDBL72 (PH)
P201	25045233	NPJ-2PDBL107 (CD)
Plug		
P211a	25055133	NPLG-3P117

MODE SWITCH CIRCUIT PC BOARD (NASW-3106-3)
– PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
Switch		
S332	25035584	NPS-122-L546

TONE CONTROL CIRCUIT PC BOARD (NAAF-3107-3)
– PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
Capacitors		
C301, C302	379128225	8200 pF, 50V, Film (DEW)
C303, C304	379125625	5600 pF, 50V, Film (DEW)
C305, C306	379121025	1000 pF, 50V, Film (DEW)
C307, C308	379123935	0.039 μ F, 50V, Film (DEW)
C309, C310	379128235	0.082 μ F, 50V, Film (DEW)
Resistors		
R301	5148107	N16RGM C250KMN25, Variable
R302	5148108	N16RGM11C219K25, Variable
R303	5144001	N16RQM11C139K176K25, Variable
R304	5148113A	N16RGM11C176K25, Variable

VOLUME CONTROL CIRCUIT PC BOARD
(NAAF-3108-3) – PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
Resistor		
R305	5104212	N27DQ100KT100KT25 Variable
Plug		
P361a	25055137	NPLG-7P121
Jumper socket		
JL361	25050272	NSCT-8P100

HEAD PHONE JACK PC BOARD (NAETC-3109-3)
– PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
Stereo jack		
P853	25045229	HLJ4317-01-3120

POWER SUPPLY CIRCUIT PC BOARD (NAPS-3110-3)
– PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
Diodes		
D921	22380014	PB102F
D922, D923	22380003	1N5402F
Capacitors		
C921, C922	3500101A	15000 μ F, 71V, Elect
C923, C925	375103345	0.33 μ F, 125V, Elect. (ME)
C924	375104745	0.47 μ F, 125V, Elect. (ME)
Resistors		
R921, R922	442522294	0.22 Ω , 1/2W, Metal oxide film
R923	442525104	51 Ω , 1/2W, Metal oxide film
Plate		
	27301035	Bus line

INPUT LED CIRCUIT PC BOARD (NADIS-3111-3)
– PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
Diodes		
D201~D203	225142CX1 or SEL2913K-CX1 or 225142CX2 or SEL2913K-CX2 or 225142DX1 or SEL2913K-DX1 or	

D204~D210	225142DX2	SEL2913K-DX2, LED
	225137DG or	SEL2413E-DG or
	225137DY or	SEL2413E-DY or
	225137CG or	SEL2413E-CG or
	225137CY	SEL2413E-CY, LED
D211	225248	GL5ED5, LED
Sockets		
P951	2000918	NSAS-6P871
Plugs		
P961	25055185	NPLG-4P169
P962	25055188	NPLG-7P172
Holder		
	27190573A	(LED-11)

**DISPLAY LED CIRCUIT PC BOARD (NADIS-3112-3)
- PARTS LIST**

CIRCUIT NO.	PART NO.	DESCRIPTION
Diodes		
D911	225142DX2	SEL2913K-DX2
D912	225142DX2	SEL2913K-DX2
D301~D304	225137DG or	SEL2413E-DG or
	225137DY or	SEL2413E-DY or
	225137CG or	SEL2413E-CG or
	225137CY	SEL2413E-CY
	Holder	
	27190574	(LED-4)

**POWER AMPLIFIER (I) PC BOARD (NAAF-3113-3A)
- PARTS LIST**

CIRCUIT NO.	PART NO.	DESCRIPTION
ICs		
Q519, Q520	222942	NJM4558SE
Transistors		
Q501, Q502	2212805 or	2SK389-GR or
	2212806 or	2SK389-BL or
	2212807	2SK389-V
Q503~Q506	2211733 or	2SC1845-E or
	2211732	2SC1845-F
Q507, Q508	2211515 or	2SA995-F or
	2211516	2SA995-G
Q511, Q512	2211455 or	2SA1015-GR or
	2210803	2SA733-P
Q513, Q514	2211354 or	2SA949-Y or
	2211353	2SA949-O
Q901	2201444 or	2SD1408-Y or
	2201443	2SD1408-O
Q902	2201502 or	2SB889-Q or
	2201503	2SB889-R
Q903	2211733 or	2SC1845-E or
	2211732	2SC1845-F
Q904, Q905	2213335	2SK373-GR
Diodes		
D505, D506	225232	LTZ-R15, LED
D517~D520		
D273, D274	223145	1S2076TD
D902, D904	224652204 or	HZ22E-B4 or
	224152204 or	05AZ22R or
	224452204	MTZ22-D, Zener
	224650623 or	HZ6.2E-B3 or
	224150623 or	05AZ6.2Z or
D903	224450623	MTZ6.2-C, Zener
	Capacitors	
C381~C390	373301014	100 pF, 125V, Film (PP)
C501, C502	372126804	68 pF, 50V, Styrene
C503, C504	372121014	100 pF, 50V, Styrene

C505, C506	354780479	4.7 μ F, 50V, Elect.
C511, C512	372123304	33 pF, 50V, Styrene
C513~C516	391252207	22 μ FF, 25V, Elect. (MUSE)
C521, C522	372123304	33 pF, 50V, Styrene
C523, C524	354762209	22 μ F, 35V, Elect.
C861	354741019	100 μ F, 16V, Elect.
C901, C902	354772219	220 μ F, 63V, Elect.
C903, C904	354751019	100 μ F, 25V, Elect.
C905, C906	354751029	1000 μ F, 25V, Elect.
C911, C912	354774719	470 μ F, 63V, Elect.
C913	354721019	100 μ F, 6.3V, Elect.
C914	354722229	2200 μ F, 6.3V, Elect.
C917	354764709	47 μ F, 35V, Elect.

Resistors

R281~R283	442524704	47 Ω , 1/2W, Metal oxide film
R507, R508	441623314	330 Ω , 1W, Metal oxide film
R523, R524	442520684	6.8 Ω , 1/2W, Metal oxide film
R527, R528	442524734	47k Ω , 1/2W, Metal oxide film
R901, R902	441620434	4.3 Ω , 1W, Metal oxide film
R903	442523314	330 Ω , 1/2W, Metal oxide film
R904	442525114	510 Ω , 1/2W, Metal oxide film
R907	442521034	10k Ω , 1/2W, Metal oxide film

S351
S352
S353

Switches

25030219	NRSM-165-25SS, Rotary
25030292	NRSM-145-25SS, Rotary
25030302	NRSM-183-25SS, Rotary

Terminals

P291	25045165	NPJ-4PDBL59, (TAPE)
P292, P293	25045165	NPJ-4PDBL59, (DAT, PRC)
P294	25045182	NPJ-2PDBL72, (PREOUT)
P295	25045166	NPJ-6PDL60, (VIDEO)

Socket ass'y

P211	2000560	NSAS-6P516
P361	2000752	NSAS-14P708
P501	2000556	NSAS-6P512
P503	2000750	NSAS-20P706

Jumper socket

JL912, JL952	25050270	NSCT-6P98
JL953		

**POWER AMPLIFIER (II) PC BOARD (NAAF-3114-3)
- PARTS LIST**

CIRCUIT NO.	PART NO.	DESCRIPTION
Transistors		
Q517, Q518	2211255 or	2SC1815-GR or
	2210746	2SC945A-P
Q601, Q602	2211634 or	2SC2229-Y or
	2211633	2SC2229-O
Q603, Q604	2211354 or	2SA949-Y or
	2211353	2SA949-O
Q605, Q606	2201644 or	2SC3298-Y or
	2201643	2SC3298-O
Q607, Q608	2201634 or	2SA1306-Y or
	2201633	2SA1306-O
Q615, Q616	2212560	2SC3333
	2211793 or	2SA992-E or
Q617, Q618	2211792	2SA992-F
Diodes		
D513, D514	223163	1SS133
D515, D516	4000120	KB-265, Varistor
Coils		
L601, L602	231134	S-0.8E
Capacitors		
C509, C510	379122235	0.022 μ F, 50V, Film (DEW)
C607, C608	379121045	0.1 μ F, 50V, Film (DEW)
C609, C610	379124735	0.047 μ F, 50V, Film (DEW)
C613~C616	379121045	0.1 μ F, 50V, Film (DEW)

Resistors		
R531, R532	5210062	N06HR4.7KBD, Semi-fixed
R601, R602	442522224	2.2K Ω , 1/2W, Metal oxide film
R603, R604	442522214	220 Ω , 1/2W, Metal oxide film
R607~R610	442520224	2.2 Ω , 1/2W, Metal oxide film
R615~R618	4000078	0.33 Ω , 5W, Metal plate
R619, R620	441720104	1 Ω , 2W, Metal oxide film
R645, R646	441720824	8.2 Ω , 2W, Metal oxide film
Jumper socket		
JL906	25050268	NSCT-4P96
Plate		
	27300877	Bus line

**VIDEO TERMINAL PC BOARD (NAETC-3116-3)
- PARTS LIST**

CIRCUIT NO.	PART NO.	DESCRIPTION
Diodes		
D281~D283	223163	ISS133
Terminals		
P281	25045225	NPJ-3PDBL101
P282	25045181	NPJ-2PDBL71
Relays		
RL281~RL283	25065298	NRL-1PIA-DC12-40

**SPEAKER & PROTECTOR CIRCUIT PC BOARD
(NAETC-3117-3A) - PARTS LIST**

CIRCUIT NO.	PART NO.	DESCRIPTION
IC		
Q851	222584	TA7317P
Diodes		
D852	223145	1S2076TD
D853	224650623 or 224150623 or 224450623	HZ6.2EB3 or 05AZ6.2Z or MTZ6.2C, Zener
D854	223163	ISS133
D931, D961	22380013	RDF02M
Capacitors		
C681~C684	372121024	1000 pF, 50V, Styrene
C687	379122235	0.022 μ F, 50V, Film (DEW)
C851	354722219	220 μ F, 6.3V, Elect.
C852	354742209	22 μ F, 16V, Elect.
C853	354784799	0.47 μ F, 50V, Elect.
C855	354743319	330 μ F, 16V, Elect.
C857	354744719	470 μ F, 16V, Elect.
C858, C859	379122235	0.022 μ F, 50V, Film (DEW)
C961	354741029	1000 μ F, 16V, Elect.
Resistors		
R861, R961	442522294	0.22 Ω , 1/2W, Metal oxide film
R875, R876	441623914	390 Ω , 1W, Metal oxide film
Terminal		
P851	25060124	NTM-8PDMN057
Relay		
RL851	25065316	NRL-2P7A-DC12-43
Switch		
S851a	25065361	NSS-44137
Sockets		
P853	2000794	NSAS-4P750
P854	2000795	NSAS-4P751
Jumper socket		
JL853	25050280	NSCT-3P108

**MUTING SWITCH CIRCUIT PC BOARD (NASW-3121-3)
- PARTS LIST**

CIRCUIT NO.	PART NO.	DESCRIPTION
Capacitors		
C331, C332	354782299	0.22 μ F, 50V, Elect.
C333, C334	354784799	0.47 μ F, 50V, Elect.
Switch		
S331	25035573	NPS-162-L535

**FUSE CIRCUIT PC BOARD (NAETC-3385-3A)
- PARTS LIST**

CIRCUIT NO.	PART NO.	DESCRIPTION
Fuse holder		
F921a	250113	S-N5051 [D] [X]
F922a	25050065	YSH403T [G] [A] [B] [W] [X]
Terminal		
	25060092	NTM-1S33 [G] [A] [B] [W]

**DIGITAL CIRCUIT PC BOARD (NADC-3386-1)
- PARTS LIST**

CIRCUIT NO.	PART NO.	DESCRIPTION
ICs		
Q701	24120017	TORX175
Q702, Q712	222755	TC74HCU04P
Q703, Q710	222740005	74HC00P
Q704, Q706	22240112	TC74HC10P
Q705	22240113	YM3623B
Q707	22240176	YM3414
Q708	222740025	74HC02P
C709	222740275	74HC27P
Q711	222740745	74HC74P
Q801, Q802	22240184	PCM58P
Q803, Q804	222902	NJM5532DD
Q805, Q806, Q984	222570	NJM4560D-X
Q807, Q808	22240201	NJM4565D-B
Q951	222780055	78M05HF
Q982	22240134	NJM2904D
Transistors		
Q713	2211255	2SC1815-GR
Q714, Q811	2213300	DTA124XS
Q715, Q809, Q815	2213290	DTC114ES
Q813, Q814	2212524	2SK363-GR
Q981	226007	TLP531, Photo coupler
Q983	2211256	2SC1815-BL
Q985	2211164 or 2211163	2SC2120-Y or 2SC2120-O
Q986	2211504 or 2211503	2SA950-Y or 2SA950-O
Diodes		
D701~D709	223163	ISS133
D712, D713		
D721~D724		
D791, D801		
D720	224650511 or 224150511 or 224450511	HZ5.1E-B1 or 05AZ5.1X
D981	224650512 or 224150512 or 224450512	MTZ5.1A, Zener
		HZ5.1E-B2 or 0.5AZ5.1Y
		MTZ5.1B, Zener
Coils		
L701	231029	NCH-1068
L702, L705	231054	NCH-5095, Filter
L703	233359	NCH-2163

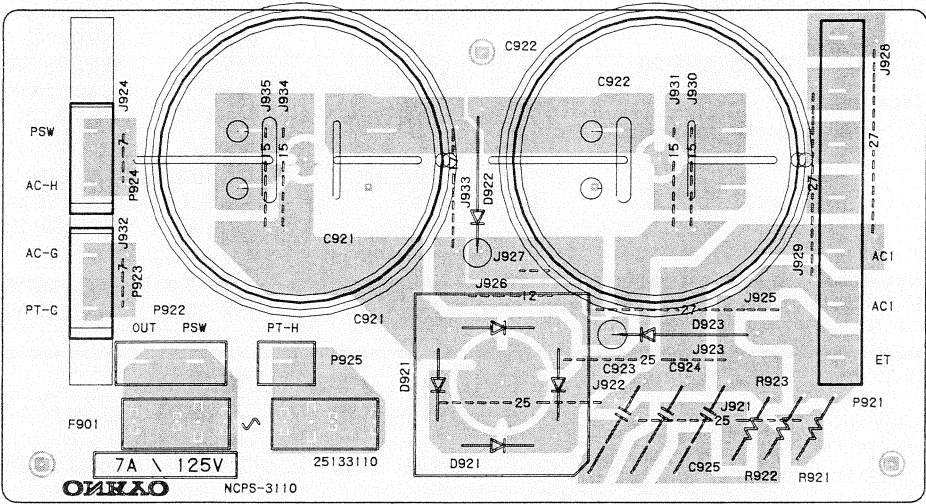
L704	233360	NCH-2164
L709~L712		
L706	230905	BL02RN1-R62, FR core
L707	230906	BL02RN2-R62, FR core
L713	232143	NSRF2047, RF coil
L714	231069A or	NCH-1119 or
	231066	NCH-1118
L715	233357	NCH-2161
	Osc. element	
X701	3010144	CSA18.00MX040
	Capacitors	
C701, C710, C711	354741009	10 μ F, 16V, Elect.
C719, C720, C723		
C724, C727, C729		
C731, C733, C735		
C737		
C801~C804		
C702, C703, C707	354781099	0.1 μ F, 50V, Elect.
C713	379124724	4700 pF, 50V, Film (DEW)
C716	354780109	1 μ F, 50V, Elect.
C717	354782299	0.22 μ F, 50V, Elect.
C718	354780229	2.2 μ F, 50V, Elect.
C805~C808		
C725	354724719	470 μ F, 6.3V, Elect.
C809, C810	372121514	150 pF, 50V, Styrene
C811, C812	379121134	0.011 μ F, 50V, Film (DEW)
C813, C814, C817	379122224	2200 pF, 50V, Film (DEW)
C818, C821, C822		
C825, C826	372124724	4700 pF, 50V, Styrene
C831~C834	391244707	47 μ F, 16V, Elect. (MUSE)
C835~C842	354744709	47 μ F, 16V, Elect.
C843~C846	354742219	220 μ F, 16V, Elect.
C847, C848	391242207	22 μ F, 16V, Elect. (MUSE)
C979, C980	354742229	2200 μ F, 16V, Elect.
C981	354722229	2200 μ F, 6.3V, Elect.
C982	354780229	2.2 μ F, 50V, Elect.
C983, C995	354762209	22 μ F, 35V, Elect.
C984	354721019	100 μ F, 6.3V, Elect.
C985	354744709	47 μ F, 16V, Elect.
C986	354723319	330 μ F, 16V, Elect.
C987, C988	379121035	0.01 μ F, 50V, Film (DEW)
C989	354723319	330 μ F, 6.3V, Elect.
C990, C993, C997	354721019	100 μ F, 6.3V, Elect.
C991, C992	354742219	220 μ F, 16V, Elect.
C993		
	Resistors	
R809~R816	5210070	N06HR100KBD, Semi-fixed
R894	442522414	240 Ω , 1/2W, Metal oxide film
R979	442521224	1.2k Ω , 1/2W, Metal oxide film
R981	442521114	110 Ω , 1/2, Metal oxide film
	Relays	
RL701	25065345	NRL-1P1A-DC05-49
RL731	25065282	NRL-2P1.25A-DC12-39
	Terminals	
P711	25045224	NPJ-2PDOR100
P712	25045251	NPJ-1PDOR123
	Jumper socket	
JL701	25050267	NSCT-3P-95
	Plugs	
P731	25055133	NPLG-3P-117
P232a	25055186	NPLG-5P-170
P952	25055184	NPLG-3P-168
	Plate	
	27160215-1	Bus line

DIGITAL POWER SUPPLY CIRCUIT BOARD
(NAPS-3387-1) – PARTS LIST

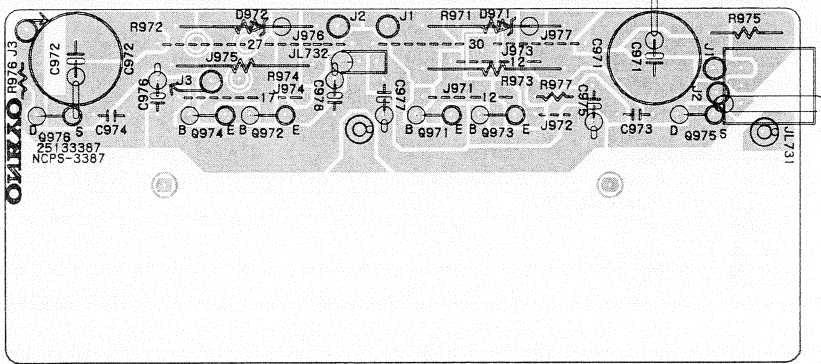
CIRCUIT NO.	PART NO.	DESCRIPTION
	Transistors	
Q971	2201444 or	2SD1408-Y or
	2201443	2SD1408-O
Q972	2201434 or	2SB1017-Y or
	2201433	2SB1017-O
Q973	2211255	2SC1815-GR
Q974	2211455	2SA1015-GR
Q975, Q976	2213335	2SK373-GR
	Diodes	
D971, D972	224651602 or	HZ16E-B2 or
	224151602 or	05AZ16Y or
	224451602	MTZ16B, Zener
	Capacitors	
C971, C972	354774719	470 μ F, 63V, Elect.
C975, C976	354751019	100 μ F, 25V, Elect.
C977, C978	354744709	47 μ F, 16V, Elect.
	Resistors	
R971~R974	441724314	430 Ω , 2W, Metal oxide film
	Jumper socket	
JL731	25050280	NSCT-3P108

PRINTED CIRCUIT BOARD VIEW FROM BOTTOM SIDE

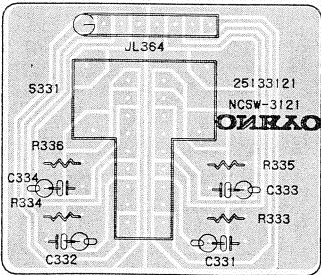
NAPS-3110-3



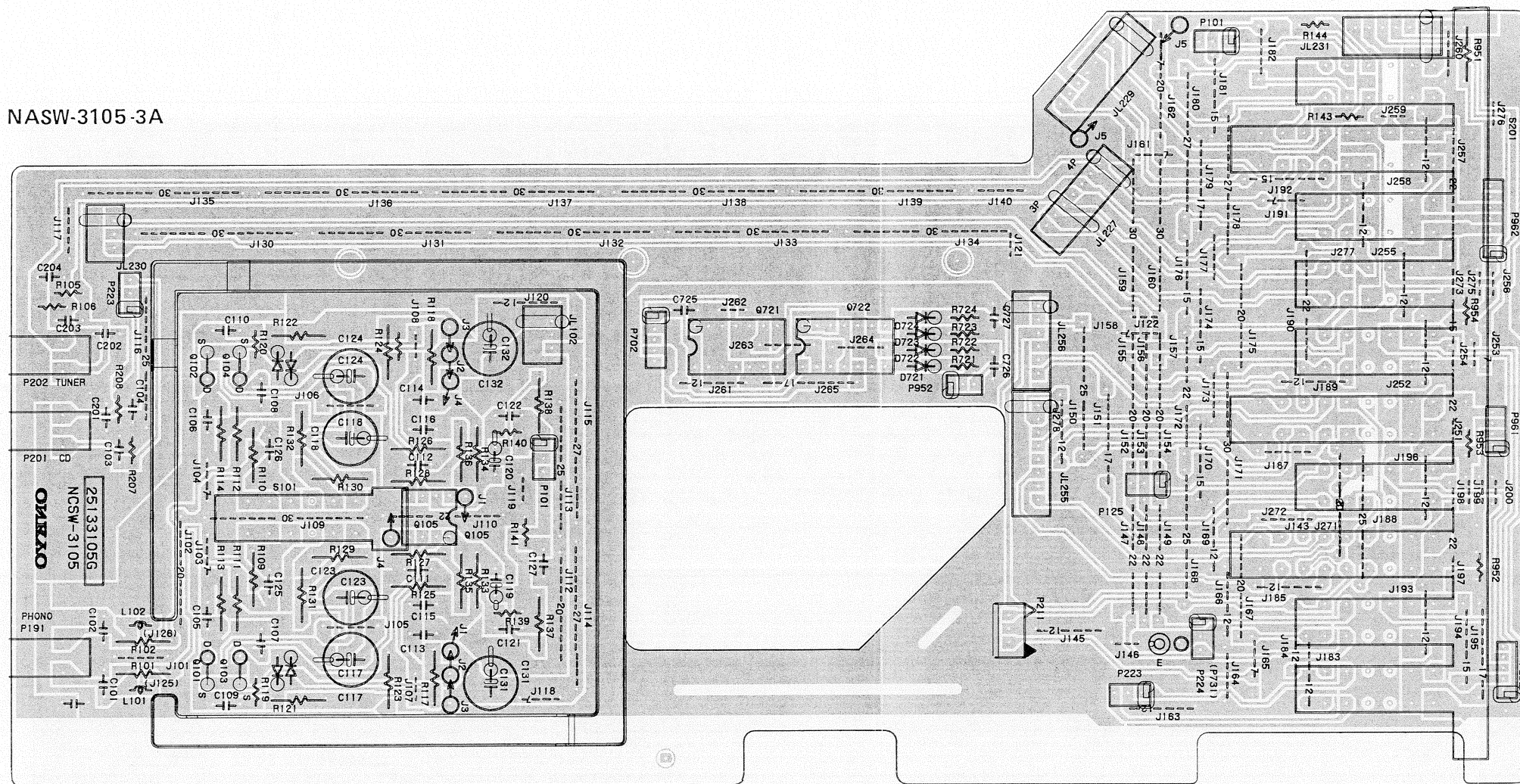
NADIS-3387-1



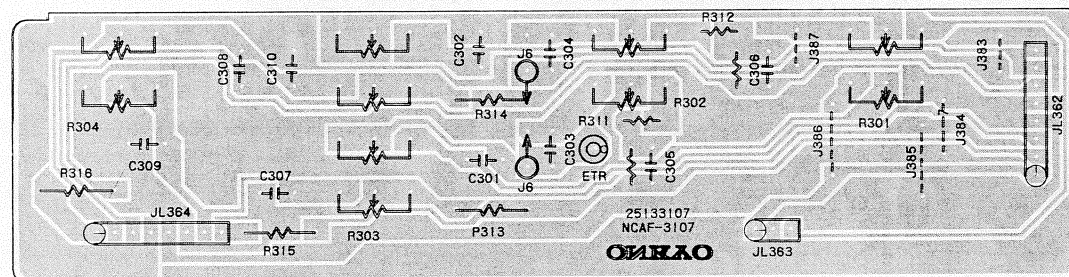
NASW-3121-3



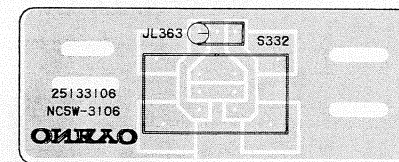
NASW-3105-3A



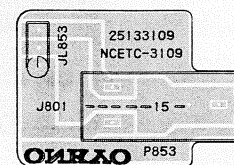
NAAF-3107-3



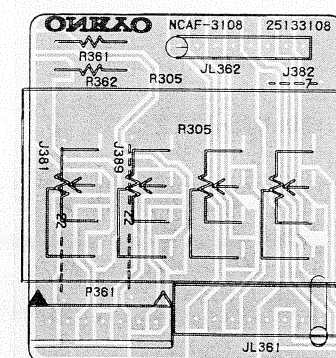
NASW-3106-3

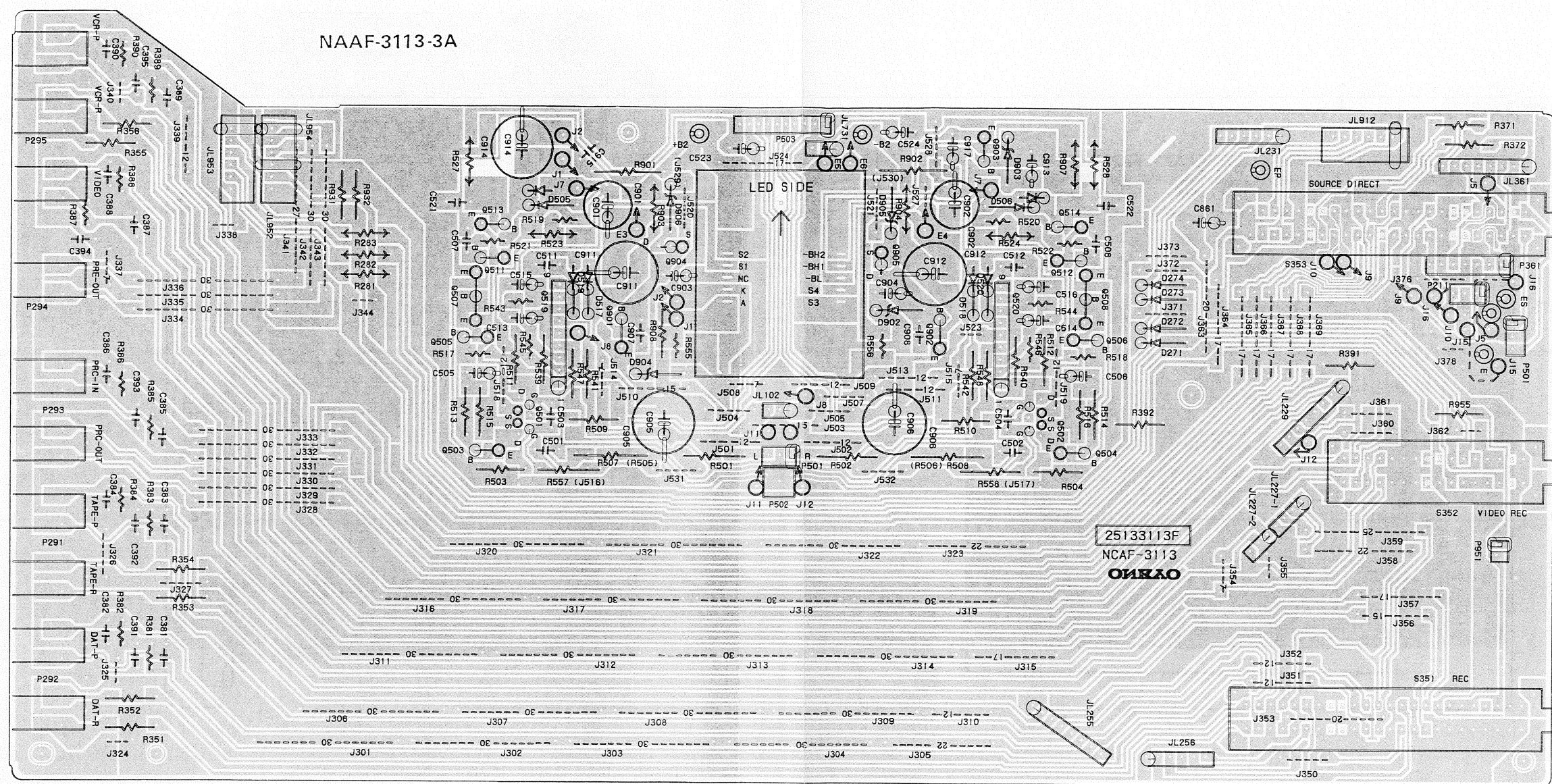


NAETC-3109-3

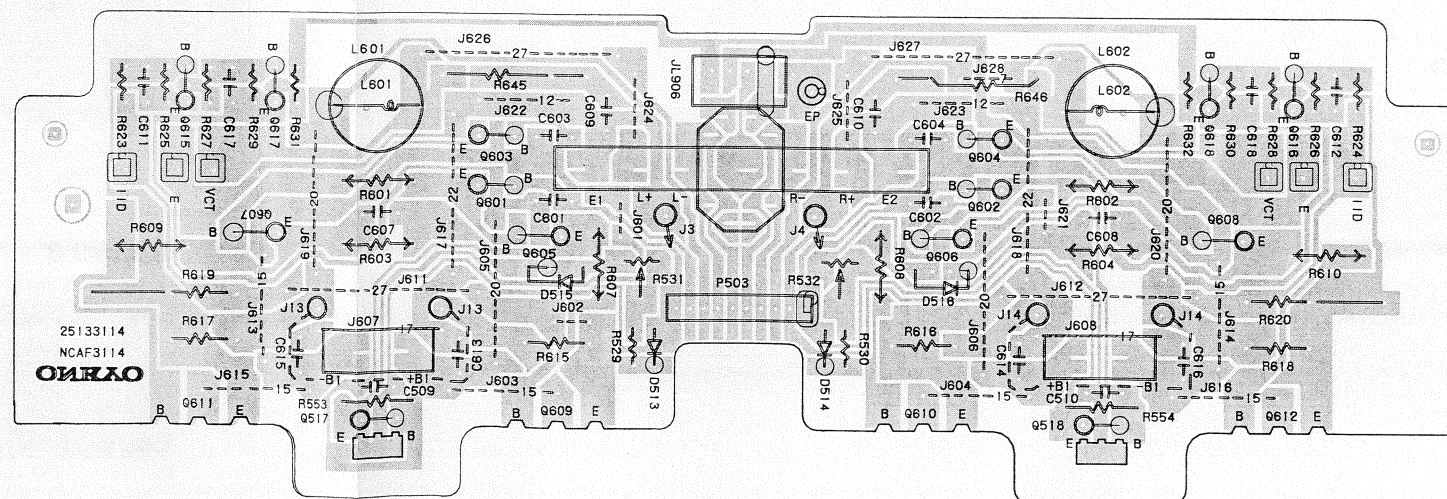


NAAF-3108-3

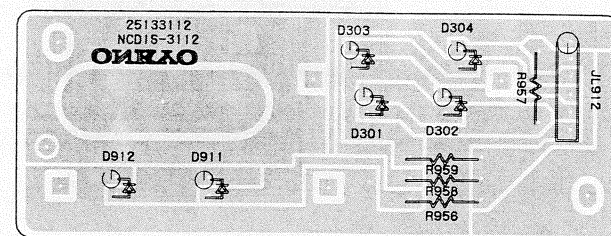




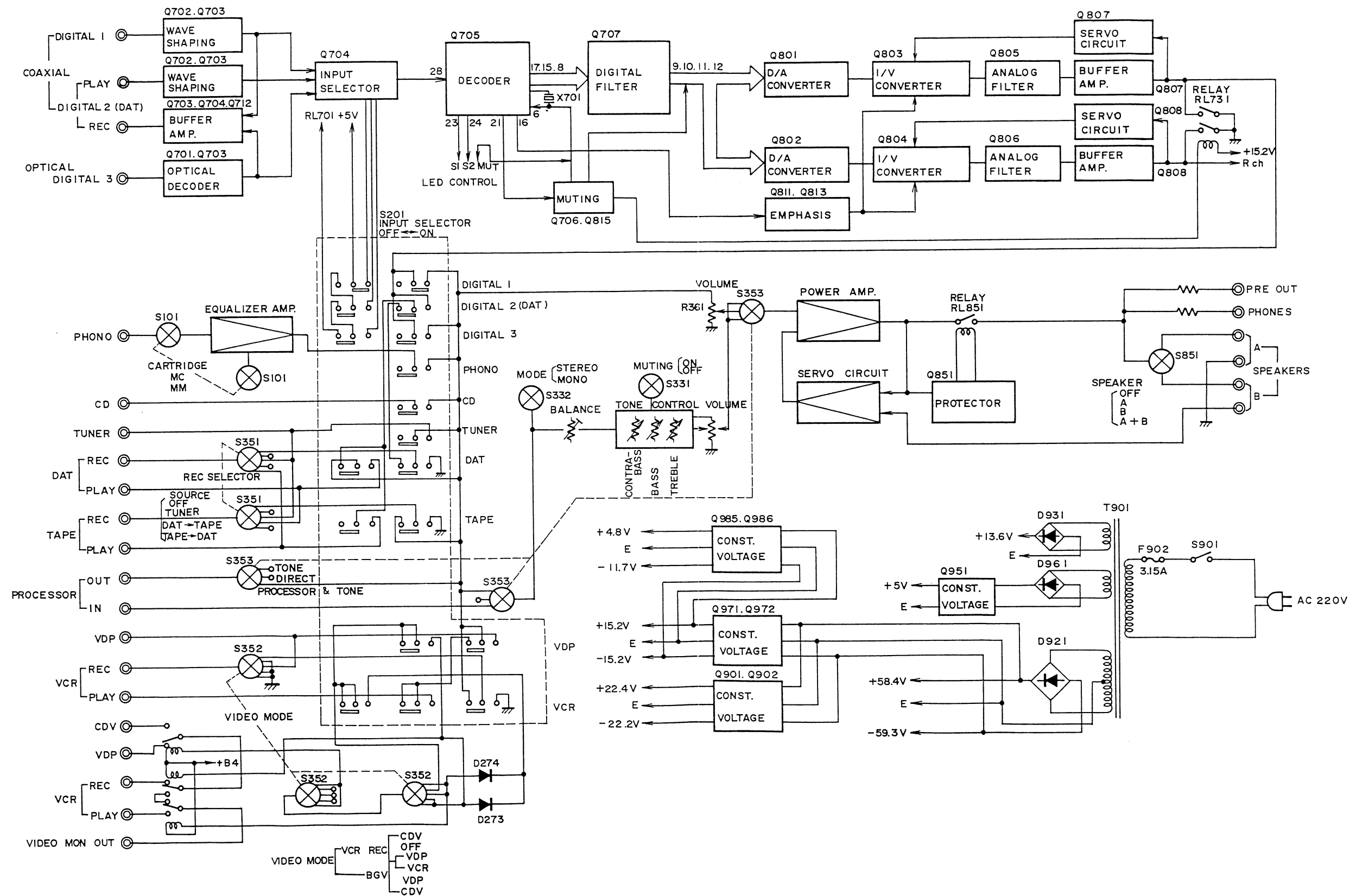
NAAF-3114-3



NADIS-3112-3



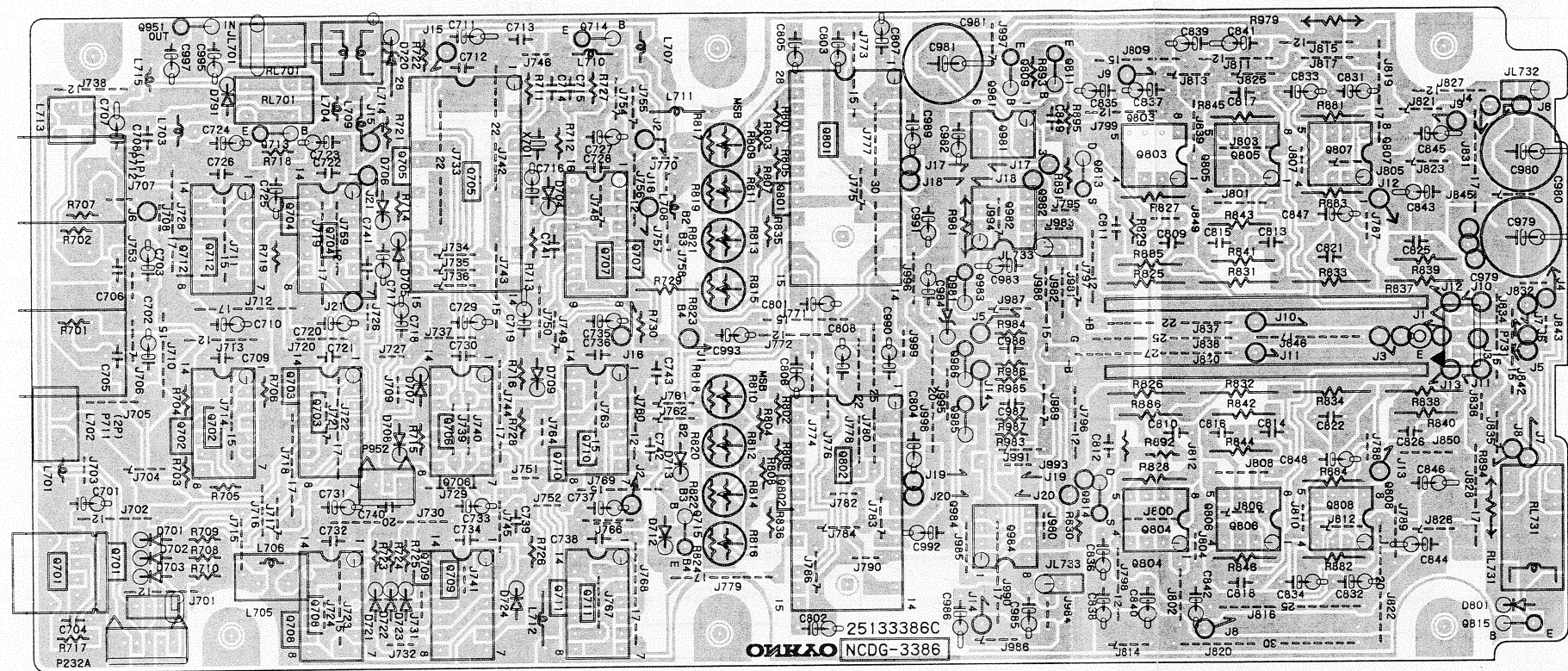
BLOCK DIAGRAM



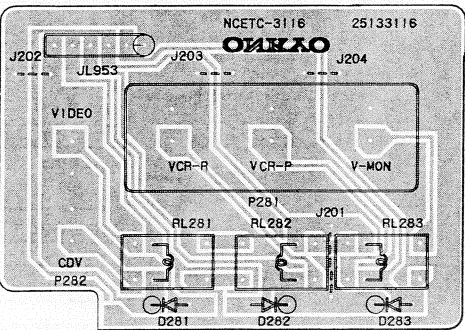
A-8690

A-8690

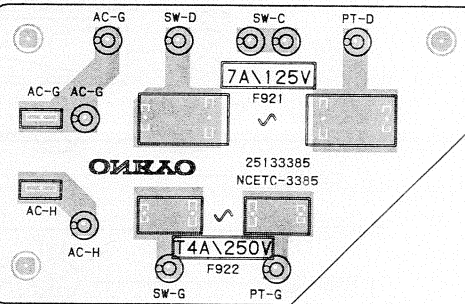
NADG-3386-1



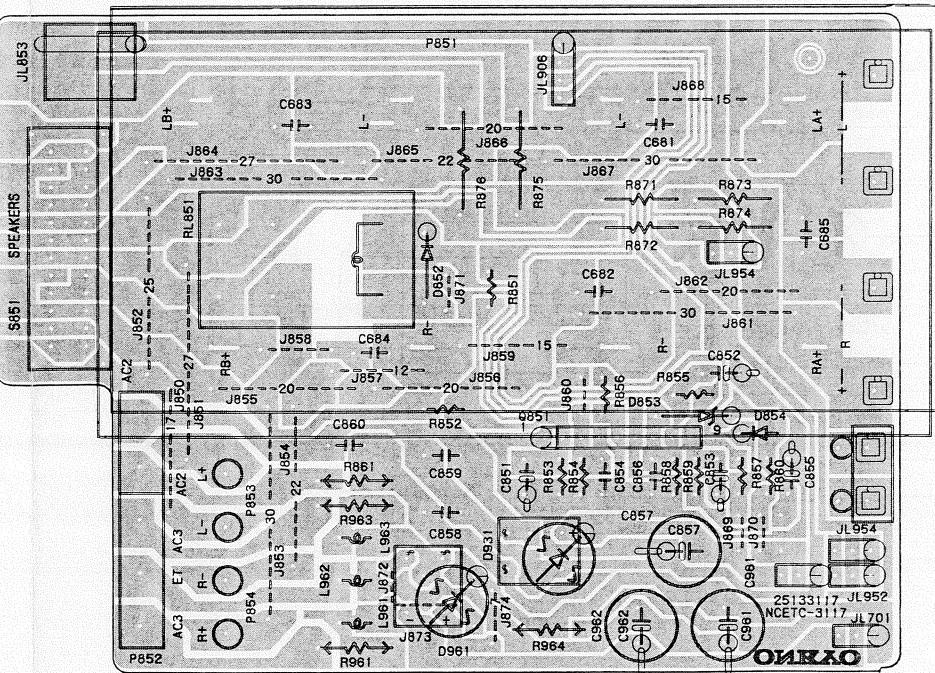
NAETC-3116 -3



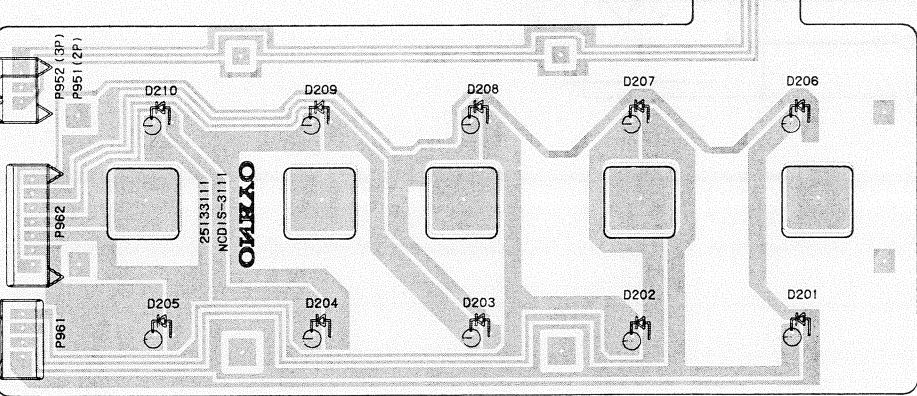
NAETC-3385-3A



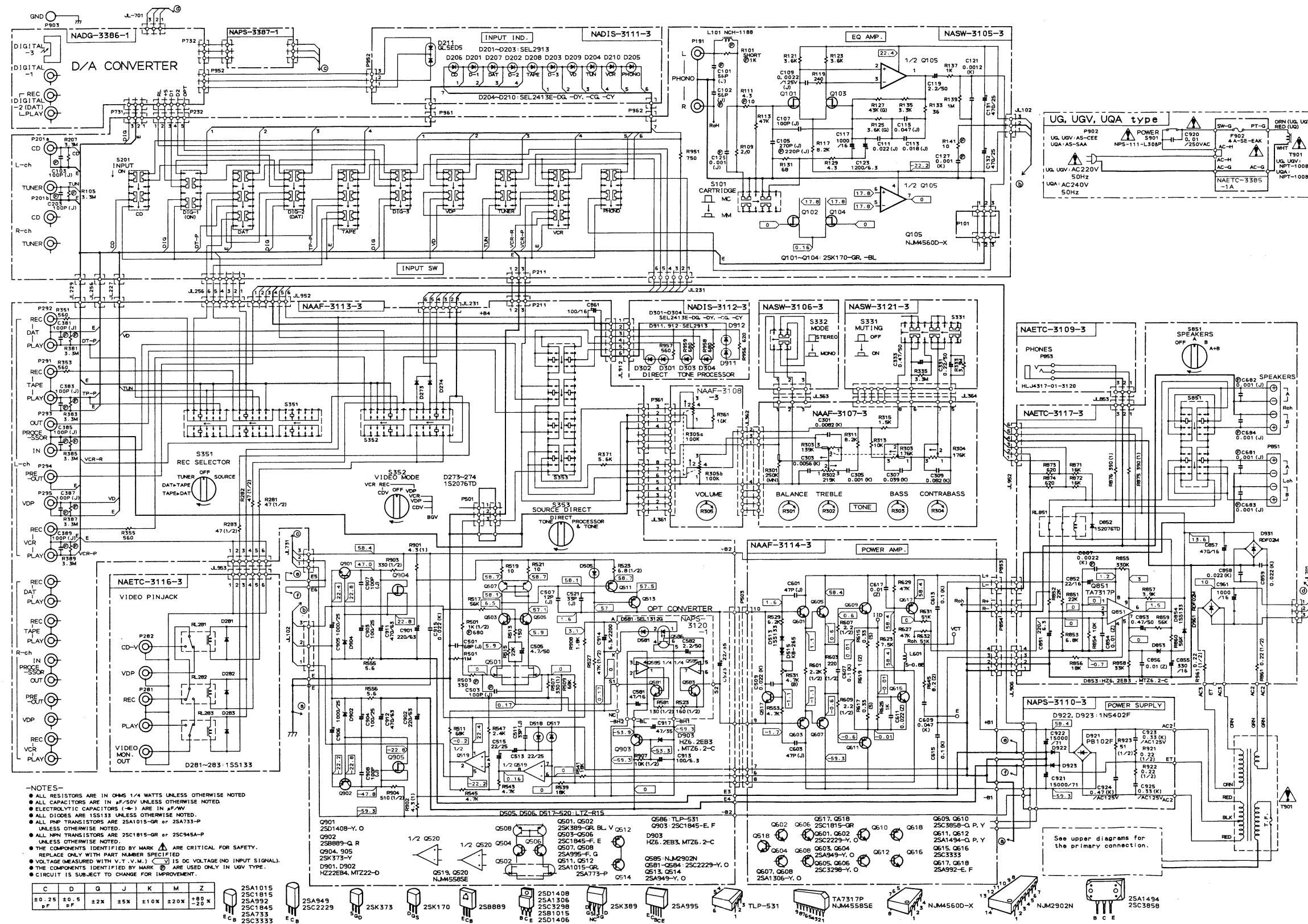
NAAF-3117-3A



NADIS-3111-3



SCHEMATIC DIAGRAM (1/2)



ONKYO CORPORATION

ONKYO CORPORATION

