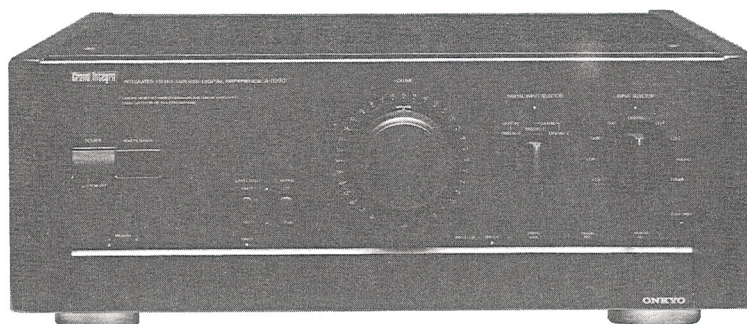


ONKYO® SERVICE MANUAL

Grand Integra Stereo Amplifier MODEL A-8990



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.

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ONKYO
AUDIO COMPONENTS

SPECIFICATIONS

POWER AMPLIFIER SECTION

Power Output:	135 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:	460 watts 2 ohms, 310 watts 4 ohms
Total Harmonic Distortion:	0.008% at rated power 0.008% at 1 watts output
Intermodulation Distortion:	0.005% at rated power
Damping Factor:	150 at 8 ohms
Frequency Response:	CD, Tuner: 2 Hz – 50 kHz (+0, –1 dB)
Signal to Noise Ratio (IHF-A):	SOURCE DIRECT 104 dB

EQUALIZER AMPLIFIER SECTION

Phono Overload:	Phono (MM): 210 mV RMS. at 1 kHz, 0.005% THD. Phono (MC): 9.3 mV RMS. at 1 kHz
RIAA Deviation:	Phono (MM): ± 0.2 dB. 20 Hz – 20 kHz
Signal to Noise Ratio (IHF-A):	Phono (MM): 89 dB (5 mV input) Phono (MC): 85 dB (0.5 mV input)
Total Harmonic Distortion (REC 3 V output) (MM):	0.003%

D/A CONVERTER SECTION

D/A Conversion:	18 bit with eight-times over sampling
Sampling Frequency:	32, 44.1, 48 kHz
Frequency Response:	20 Hz – 20 kHz
Signal to Noise Ratio:	110 dB
Dynamic Range:	103 dB
Total Harmonic Distortion:	0.0015% (at 1 kHz)
Output level:	2 Vrms

OVERALL CHARACTERISTICS

Input Sensitivity/ Impedance:	Phono (MM): 2.5 mV/50 kohms Phono (MC): 110 μ V/100 ohms CD: 150 mV/50 kohms Tape Play: 150 mV/50 kohms VCR Play: 150 mV/50 kohms VDP Play: 150 mV/50 kohms PROCESSOR IN: 150 mV/50 kohms
Output Level/Impedance:	Tape Rec: 150 mV/470 ohms (Phono) PROCESSOR OUT 150 mV/470 ohms (Phono) Pre Out: 1 V/1 kohm COAXIAL: 0.5 Vp-p/75 ohms OPTICAL: –17.5~–27 dBm (Biphase) COAXIAL: 0.5 Vp-p/75 ohms CONTRABASS: +10 dB at 20 Hz BASS: ± 10 dB at 20 Hz TREBLE: ± 8 dB at 20 kHz 6 kHz (6 dB/Octave) (TREBLE min.) –20 dB Muting: Power Supply: AC 220 V, 50 Hz Dimensions: 477(W) $\times$ 183(H) $\times$ 453(D) mm 18-3/4" $\times$ 7-3/16" $\times$ 13/16" Weight: 30 kg, 66.1 lbs
Digital Input:	
Digital Output:	
Tone Control (Vol–20 dB):	
High Cut:	

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
F902	252078 or	5A-SE-EAK Primary fuse
	252078CC	5A-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 R533 so that the voltage at test point VCT-IID on the NAAF-3199 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 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 CD-1 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.

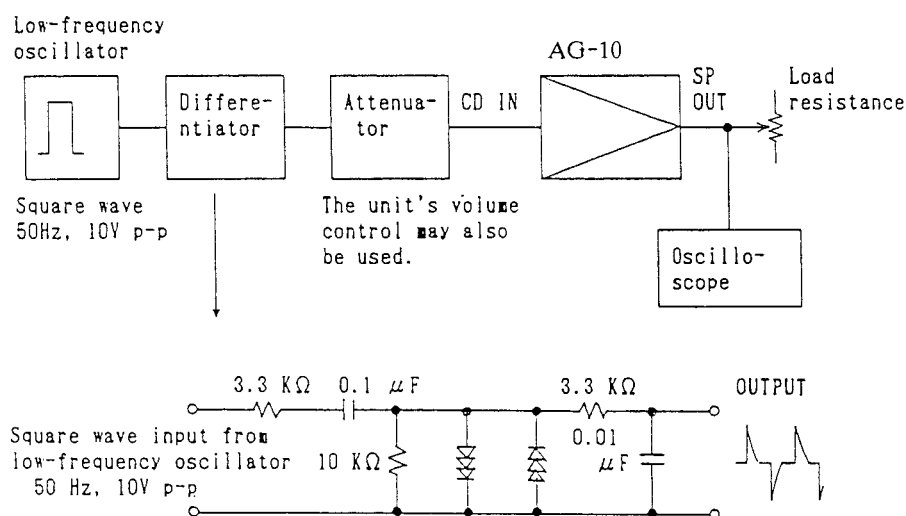
Note) Under no circumstances connect a load or short the speaker terminals when performing the above test.

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 45V 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.



4. DAC block adjustment

1) Confirmation of digital lock indicator

- (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

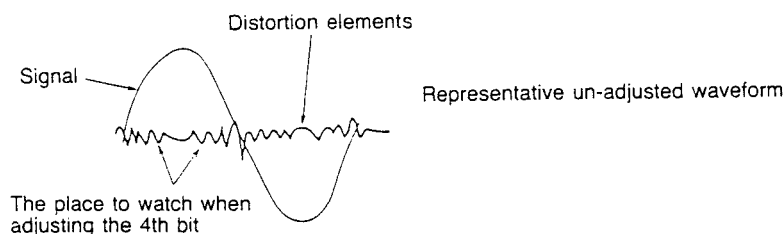
- Connect the digital output terminal of a suitable equipped CD player to the DIGITAL 1 digital input terminal of the A-G10.
- Connect a distortion meter to the analog output of circuit board NADG-3386 or to the unit's analog REC OUT terminal.
- Input the distortion meter signal output and the distortion output to dual-phenomenon oscilloscope.

(2) Turn power ON to the unit.

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

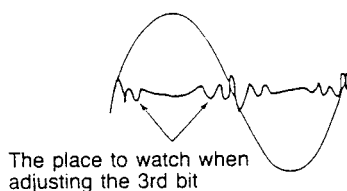
(4) Adjusting the 4th bit.

Adjust semi-fixed resistor R821 (R-822) 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.

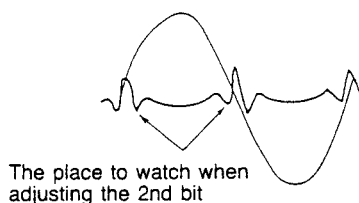
As with (3) above, adjust semi-fixed resistor R823 (R824) so that the non-continuous portion (difference in level) of the distortion elements is as small as possible.



(6) Adjusting the 2nd bit.

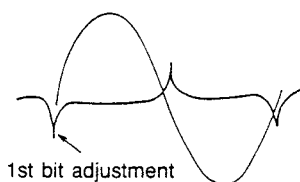
As above, adjust semi-fixed resistor R825 (R826) so that the non-continuous portion (difference in level) of the distortion elements is as small as possible.

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



(7) Adjusting the 1st bit.

Adjust semi-fixed resistor R827 (R828) 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.

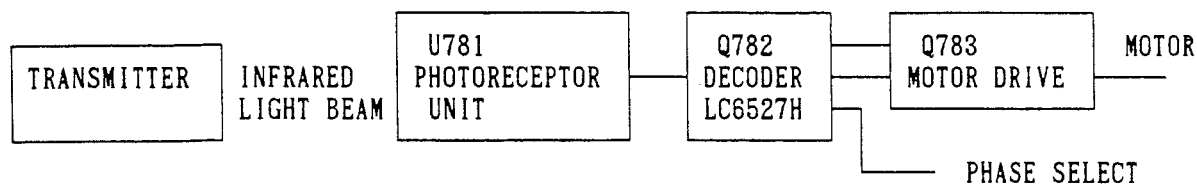
Note) The distortion meter must be accurate to 0.001% or better and possess a distortion output terminal.

Note) Semi-fixed resistors enclosed in parenthesis () are for the right channel.

IC BLOCK DIAGRAM

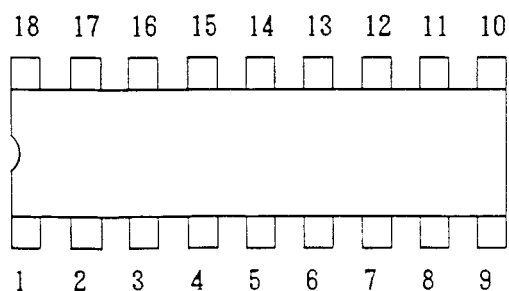
LC6527H-3722 (Infrared remote controller input system decoder)

Connections



Pins

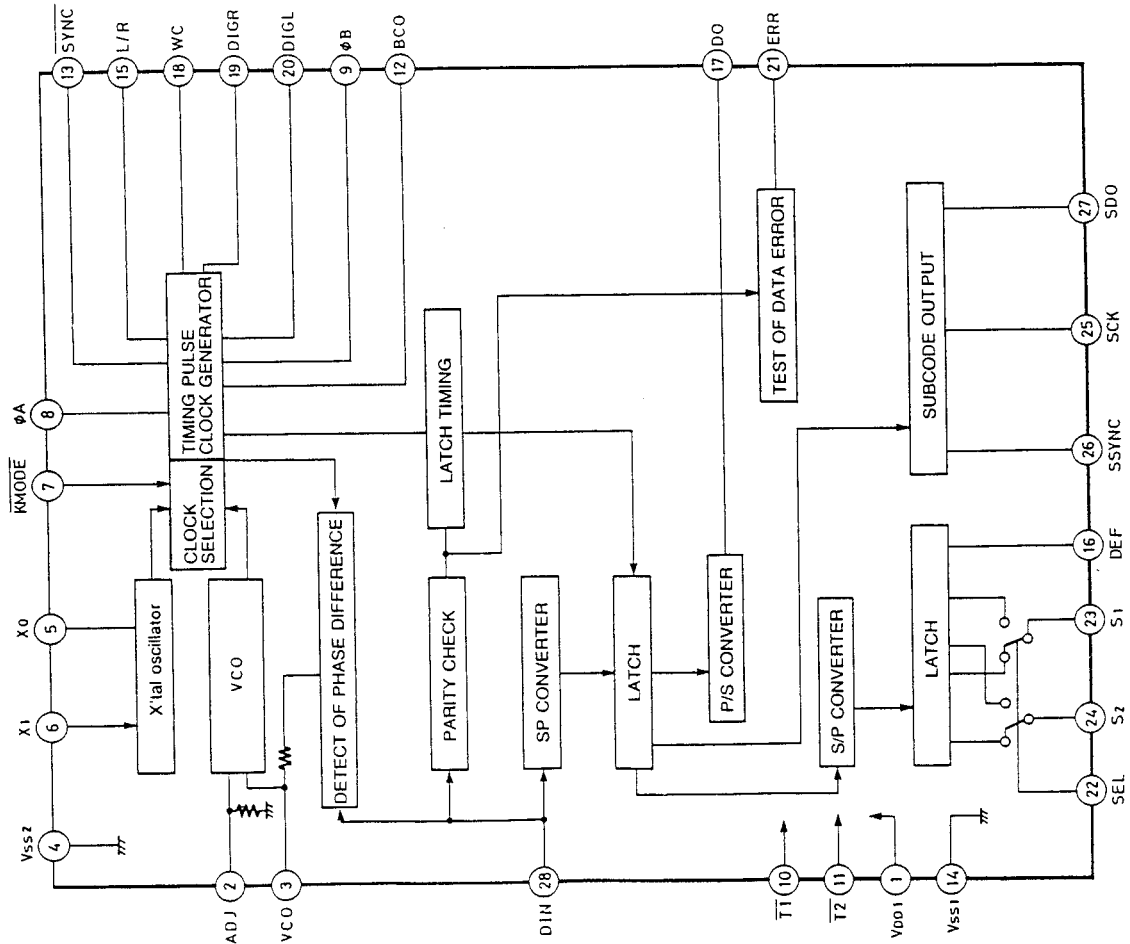
Pin No.	Pin	Function name	Function
1	OSC1	OSC	4 MHz clock input pin
2	TEST	TEST	Test pin – connect to ground
3	Vss	GND	Ground pin
4	RES	RES	Reset pin
5	PA0	NC	Leave open
6	PA1	NC	Connect to ground
7	PA2		4 MHz, 4.23 MHz select – connect to ground
8	PA3	SERIAL IN	Remote controller input
9	Vdd	+B	Connect to +5V
10 11 12 13	PC0 PC1 PC2 PC3	CUSTM	Custom code select
14	PD0	VOL DOWN	Outputs a 120mS pulse when the volume down code is input
15	PD1	VOL UP	Outputs a 120mS pulse when the volume up code is input
16	PD2	NC	(FR). leave open
17	PD3	NC	(FF). leave open
18	PH0	PHASE	Phase select



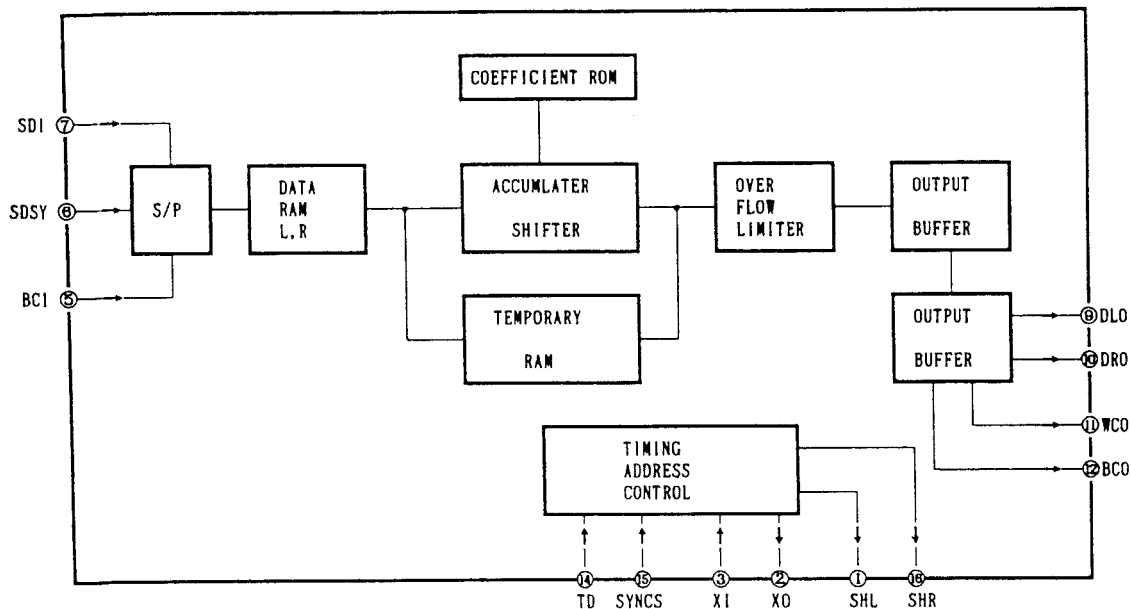
YM3623B (Digital decoder)

Pin No.	Pin	Function
1	VDD1	System power supply (+5V)
2	ADJ	VCO oscillation frequency adjustment pin (not connected)
3	VCO	External capacitor pin for VCO circuit
4	VSS2	VCO circuit GND. Should be converted in common with the GND inside LSI.
5	XO	Crystal oscillator pin (18 MHz)
6	XI	Crystal oscillator pin
7	KMODE	H: If there is an input at the DIN pin, it activates the PLL circuit, but if there is no input, it is activated by the crystal oscillator L: The crystal oscillator is used regardless of the voltage at the DIN terminal.
8	ϕA	18 MHz when the crystal oscillator is used, and varied by the DIN pin input data speed when activated by the PLL circuit. (Approx 16.9344 MHz when $f_s=44.1$ kHz)
9	ϕB	1/3 of ϕA when the crystal oscillator is used. Varied by the DIN pin input data speed when activated by the PLL circuit. (Approx 5.6448 MHz when $f_s=44.1$ kHz)
10	$\overline{T1}$	Internal circuit test pin
11	$\overline{T2}$	Internal circuit test pin
12	BCO	Timing clock for the signals output from the DO pin
13	$\overline{SYNC}$	Synchronizing signal
14	VSS1	System GND (+0V)
15	L/R	H=L channel is output from the DO pin L=R channel is output from the DO pin
16	DEF	H= Emphasis is given to the input data L= Emphasis is not given to the input data
17	DO	16 bit data output
18	WC	Indicates that data is output from the DO pin
19	DIGR	R channel de-glitch signal
20	DIGL	L channel de-glitch signal
21	ERR	H= Parity error or crystal functioning L= No error
22	SEL	Mode select
23	S1	Mode select
24	S2	Mode select
25	SCK	Subcode output clock
26	SSYNC	Subcode signal
27	SDO	Subcode data output pin
28	DIN	Data input pin

YM3623B (Digital decoder)

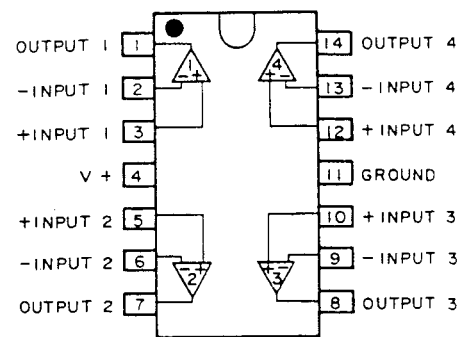


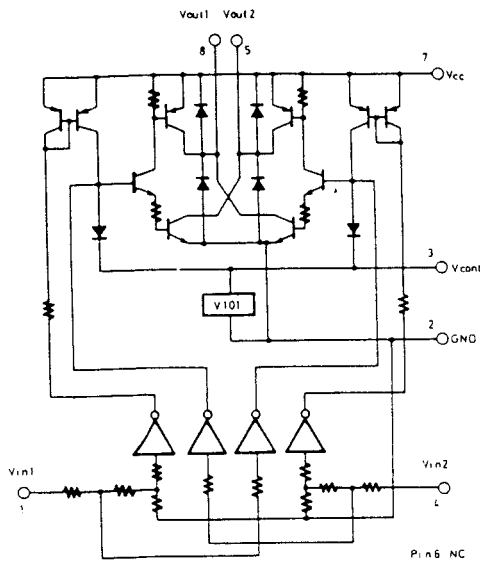
YM3414 (Eight times over sampling digital filter)



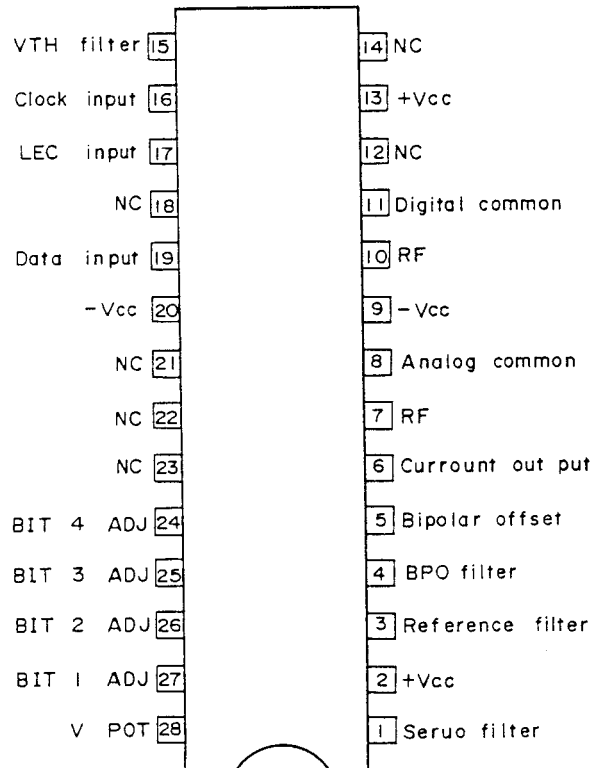
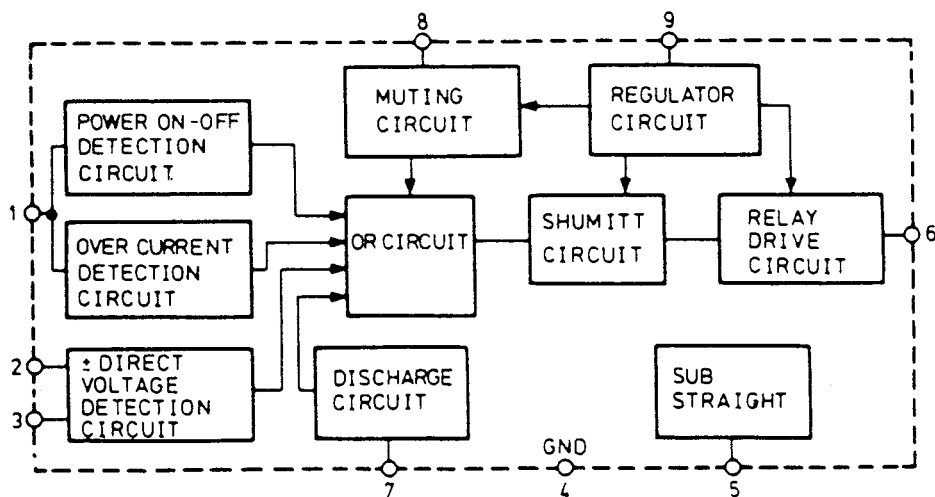
PIN NO.	TERMINAL	I/O	DESCRIPTION
1	SHL	O	When one DAC(TD=L):Deglitching signal of left channel (when four times) When two DAC(TD=H):Deglitching signal of left and right channels(when eight times)
2	XO	O	Connect the x'tal oscillator between XI and XO. The clock frequency is 384×Fs.
3	XI	I	
4	VDD2		+5V:Power supply terminal for x'tal oscillator and deglitching signal.
5	BCI	I	Bit clock input terminal. Clock shown L/Rch division of input data and input timing. 16 bits serial data input terminal.
6	SDSY	I	
7	SDI	I	
8	VDD1		+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. Word clock of output data DLO/DRO. Bit clock of output data.
11	WCO	O	
12	BCO	O	
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.

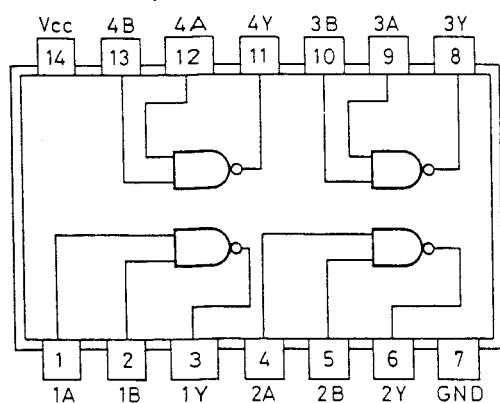
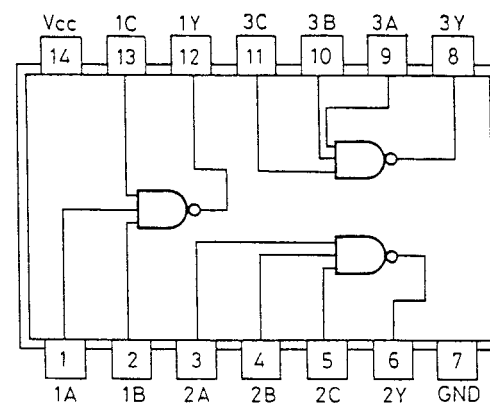
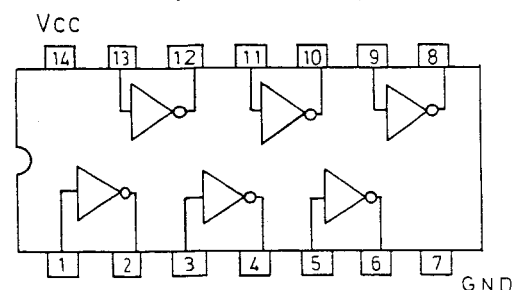
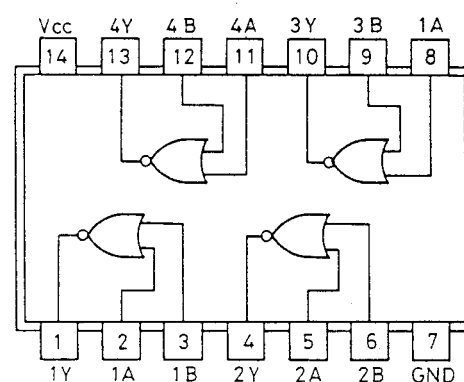
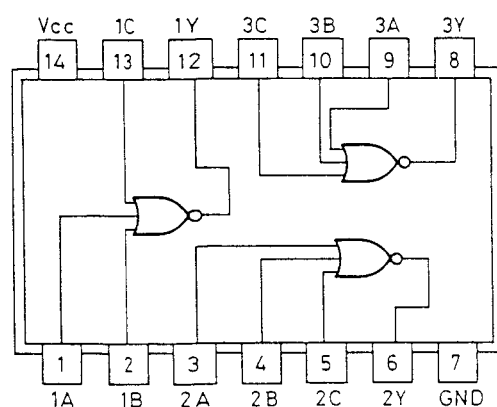
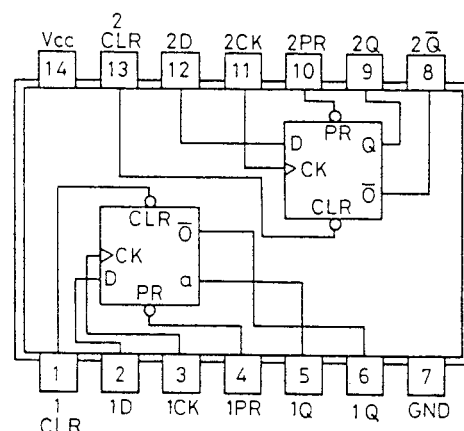
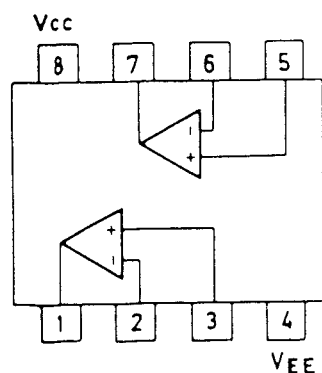
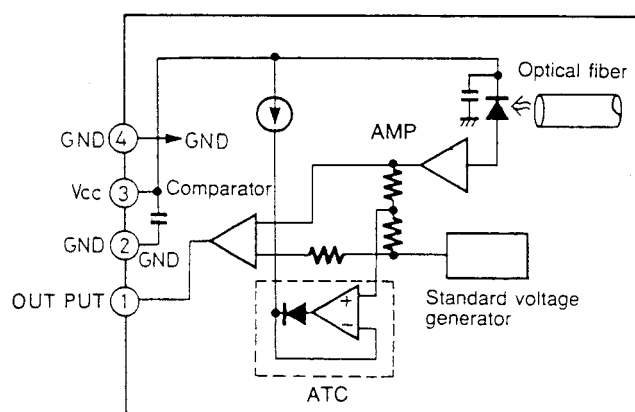
NJM2902N (OP Amp)



LB1630 (Motor drive)

IN1	IN2	OUT1	OUT2	Normal
H	L	H	L	Motor
L	H	L	H	Reverse
H	H	OFF	OFF	Wait
L	L	OFF	OFF	Wait

PCM58P (D/A converter)**TA7317P (Protective circuit)**

74HC00P (NAND gate)**74HC10P (NAND gate)****74HCU04P (Hex inverter)****74HC02P (NOR gate)****74HC27P (NOR gate)****74HC74P (D-FF)****NJM4560D (OP Amp.)****NJM4565D****NJM2904D****NJM5532D, MPC4570****TORX175 (Optical receiver)**

CHASSIS-EXPLODED VIEW

This diagram illustrates the exploded view of a chassis assembly, showing the relationship between various components. The main assembly includes a base chassis (A300) with a front panel (A312) and a rear panel (A311). Key components include:

- Power Section:** Power transformer (P901), power switch (P903), and power cord (P904).
- Control Section:** Control panel (A003) with various switches (S203a, S205a, S205b, S206a, S206b, S206c, S206d, S206e, S206f, S206g, S206h, S206i, S206j, S206k, S206l, S206m, S206n, S206o, S206p, S206q, S206r, S206s, S206t, S206u, S206v, S206w, S206x, S206y, S206z) and indicators (A004, A005, A006, A007, A008, A009, A010, A011, A012, A013, A014, A015, A016, A017, A018, A019, A020, A021, A022, A023, A024, A025, A026, A027, A028, A029, A030, A031, A032, A033, A034, A035, A036, A037, A038, A039, A040, A041, A042, A043, A044, A045, A046, A047, A048, A049, A050, A051, A052, A053, A054, A055, A056, A057, A058, A059, A060, A061, A062, A063, A064, A065, A066, A067, A068, A069, A070, A071, A072, A073, A074, A075, A076, A077, A078, A079, A080, A081, A082, A083, A084, A085, A086, A087, A088, A089, A090, A091, A092, A093, A094, A095, A096, A097, A098, A099, A100).
- Mounting and Structural Components:** Mounting brackets (A001, A002, A003, A004, A005, A006, A007, A008, A009, A010, A011, A012, A013, A014, A015, A016, A017, A018, A019, A020, A021, A022, A023, A024, A025, A026, A027, A028, A029, A030, A031, A032, A033, A034, A035, A036, A037, A038, A039, A040, A041, A042, A043, A044, A045, A046, A047, A048, A049, A050, A051, A052, A053, A054, A055, A056, A057, A058, A059, A060, A061, A062, A063, A064, A065, A066, A067, A068, A069, A070, A071, A072, A073, A074, A075, A076, A077, A078, A079, A080, A081, A082, A083, A084, A085, A086, A087, A088, A089, A090, A091, A092, A093, A094, A095, A096, A097, A098, A099, A100), screws (A001, A002, A003, A004, A005, A006, A007, A008, A009, A010, A011, A012, A013, A014, A015, A016, A017, A018, A019, A020, A021, A022, A023, A024, A025, A026, A027, A028, A029, A030, A031, A032, A033, A034, A035, A036, A037, A038, A039, A040, A041, A042, A043, A044, A045, A046, A047, A048, A049, A050, A051, A052, A053, A054, A055, A056, A057, A058, A059, A060, A061, A062, A063, A064, A065, A066, A067, A068, A069, A070, A071, A072, A073, A074, A075, A076, A077, A078, A079, A080, A081, A082, A083, A084, A085, A086, A087, A088, A089, A090, A091, A092, A093, A094, A095, A096, A097, A098, A099, A100), and nuts (A001, A002, A003, A004, A005, A006, A007, A008, A009, A010, A011, A012, A013, A014, A015, A016, A017, A018, A019, A020, A021, A022, A023, A024, A025, A026, A027, A028, A029, A030, A031, A032, A033, A034, A035, A036, A037, A038, A039, A040, A041, A042, A043, A044, A045, A046, A047, A048, A049, A050, A051, A052, A053, A054, A055, A056, A057, A058, A059, A060, A061, A062, A063, A064, A065, A066, A067, A068, A069, A070, A071, A072, A073, A074, A075, A076, A077, A078, A079, A080, A081, A082, A083, A084, A085, A086, A087, A088, A089, A090, A091, A092, A093, A094, A095, A096, A097, A098, A099, A100).
- Bottom Board:** A separate view of the bottom board (A801) is shown in the bottom right corner, detailing the internal layout of components and mounting points.

CHASSIS-EXPLODED VIEW-PARTS LIST

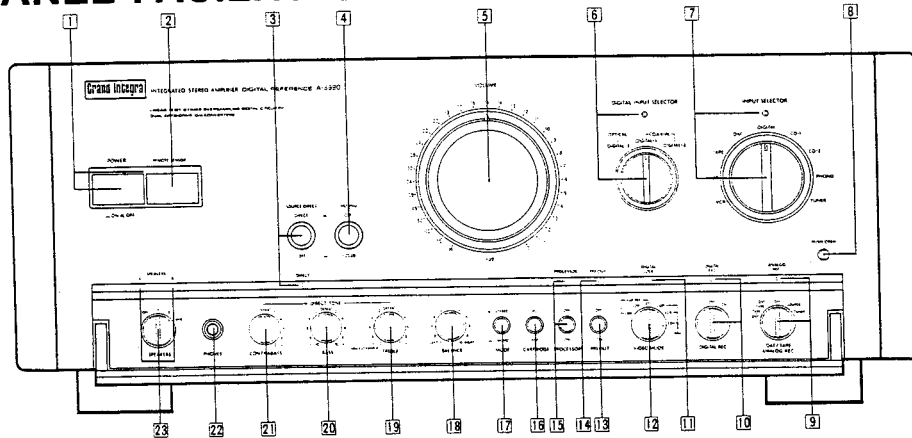
REF NO.	PART NO.	DESCRIPTION	REF NO.	PART NO.	DESCRIPTION
A001	271 10386A	FRONT BRACKET	(A507)	27265161	COSMETIC RING (IN)
A002	271 00152A	CHASSIS	(A508)	28198697	FACET (IN)
A003	271 21214	BACK PANEL	(A510)	27267528	GUIDE (MUT)
A004	271 15234B	SIDE BRACKET	(A513)	27262498	PLATE
A007	271 30515B	BRACKET (CT)	(A514)	27267529	GUIDE (BAL)
A009	271 41201	BRACKET (VOL)	(A515)	27267530	GUIDE (SEL)
A010	271 50244	SHIELD PLATE	(A516)	27267531	GUIDE (PUSH)
A012	271 30516-1	BRACKET (L)	(A517)	281986960A	PACKET
A013	271 30520-1	BRACKET (R)	(A519)	27190569A	HOLDER (L)
A014	271 41260	BRACKET (T)	(A520)	27190597	HOLDER (R)
A015	281 40844	CUSHION	(A521)	28140846	CUSHION
A016	272 05034-1	DRIVE SHAFT ASS'Y	(A522)	27211046	FRONT PANEL (DOOR)
A022	272 05035	SHAFT ASS'Y, LEFT	(A523)	27190598	HOLDER (DOOR)
A025	272 73092A	JOINT	(A524)	27301083	GEAR (DOOR)
A026	271 41202B	BRACKET (FU)	(A525)	28400363	DAMPER
A027	281 75159-1	INSULATING PLATE	(A526)	27180427	SPRING
A028	271 80394A	SPRING (LOCK)	(A527)	27301086	GEAR (LOCK)
A031	880009	RIVET	(A528)	27301087	ARM
A032	271 60237	HEATSINK	(A529)	27180381A	SPRING
A033	271 41204B	BRACKET (HF)	(A530)	27180385	SPRING
A034	271 41205B	BRACKET (HB)	(A531)	833420068	2TTP-6BBC, TAPPING SCREW
A035	271 41206	BRACKET (PCF)	(A532)	833426060	2.6TTP+6PBC, TAPPING SCREW
A036	271 41207	BRACKET (PCB)			
A039	271 41208C	BRACKET (HT)	(A533)	87642607	W2.6x7FBC, WASHER
A040	271 41251B	BRACKET (B)	(A534)	833430080	3TTP+8PBC, TAPPING SCREW
A041	271 41210A	BRACKET (U)			
A043	271 30518C	BRACKET (B)	(A535)	870071	WW-6, WAVE WASHER
A045	271 30519B	BRACKET (DB)	A536	28140804	0.5t x 3x6, CUSHION
A046	272 25090-1	SHIELD CASE (B)	A537	28140848	CUSHION (A)
A048	271 30521	BRACKET (DF)	A538	28140787	CUSHION (SEL)
A049	272 25091	SHIELD CASE (D)	A539	28175151	INSULATING PLATE
A050	272 25093-1	SHIELD CASE (L)	A540	27270257	SPACER (B)
A051	271 50250A	SHIELD PLATE (H)	A541	28140831	6t x 20x20, CUSHION
A052	281 40843	CUSHION	A542	28140838	4t x 27x10, CUSHION
A053	27300750	BUSHING (CORD)	A601	27170247-2	BOTTOM BOARD
A055	271 90062	LCBS-12NS, HOLDER	A602	27175171A	BOTTOM REG ASS'Y
A057	281 40814	CUSHION	A606	831430088	3TTW+8BBC, TAPPING SCREW
A059	873 13006	M-3B, TOOTHED WASHER			
A060	271 90428A	KGLS-10RT, HOLDER	A607	834440128	4TTS+12BBC, TAPPING SCREW
A301	281 45134	TOP COVER			
A302	281 45127A	TOP PLATE (F)	A608	838440089	4TTB-8CBC, TAPPING SCREW
A303	281 40836	0.5t x 350x10, CUSHION	A801	28323201	KNOB ASS'Y (VOL)
A304	281 40837	0.96t x 250x10, CUSHION	A803	28323202B	KNOB (A-SEL)
A305	271 41153A	BRACKET (T)	A804	28323203A	KNOB (D-SEL)
A306	801 403	5 x 12BC, SPECIAL SCREW	A805	28323204	KNOB (POW)
A307	272 65159	COSMETIC RING (F)	A806	28323205	KNOB (MUT)
A308	801 230	3TTS+8BQBC, TAPPING SCREW	A807	28323206	KNOB (EJECT)
			A808	28323207A	KNOB (SEL)
A309	1A074609	SIDE BOARD ASS'Y, LEFT	A809	28323208	KNOB (BAL)
A310	1A074610	SIDE BOARD ASS'Y, RIGHT	A810	28323209	KNOB (PUSH)
(A312)	281 85352	SIDE BOARD	A811	87314006	M-4B, TOOTHED WASHER
(A078)	281 40854	CUSHION	A812	281 40881	CUSHION
(A313)	281 40546	0.5t x 390x10, CUSHION	A813	281 40373	CUSHION
(A314)	281 40835	0.5t x 135x10, CUSHION	A815	250153	P0107, (SHORTED PLUG)
(A315)	281 40855	CUSHION (ONLY RIGHT CHANNEL)	Q515, Q516	2212864 or 2212863	2SC3419-Y or 2SC3419-O, TRANSISTOR
(A511)	271 41269	BRACKET (SIDE)	Q537, Q538	2201803 or 2201806 or 2201804	2SC3857-O or 2SC3857-P or 2SC3857-Y, TRANSISTOR
(A512)	851 43113	M3.1x13FBC, WOOD SCREW	Q541, Q542	2201793 or 2201796 or 2201794	2SA1493-O or 2SA1493-P or 2SA1493-Y, TRANSISTOR
A311	870086	4x12BC, SPECIAL WASHER	Q539, Q540	2201793 or 2201796 or 2201794	2SA1493-O or 2SA1493-P or 2SA1493-Y, TRANSISTOR
A312	836 440303	4STV+30CQBC, TAPPING SCREW	Q543, Q544	2201793 or 2201796 or 2201794	2SA1493-O or 2SA1493-P or 2SA1493-Y, TRANSISTOR
A500	1A127121	FRONT PANEL ASS'Y			
(A501)	27211049	FRONT PANEL	Δ T901	2300394A	NPT-983G, TRANSFORMER
(A502)	27267527	GUIDE (POW)	Δ T902	2300398A	NPT-984G, TRANSFORMER
(A503)	28198695	FACET (POW)	Δ C925	3500065A	0.01μF, AC400V/125V, CAPACITOR
(A504)	28191444A	CLEAR PLATE (R)			
(A505)	28135125A	NAME PLATE	S101b	25065158	REMOTE SWITCH, WIRE SECTION
(A506)	27265160	COSMETIC RING (VOL)			

REF. NO.	PART NO.	DESCRIPTION
S203a	25030298A	NRSM-105-15BU, REMOTE SWITCH, OPERATION SECTION
S205a	25030300A	NRSM-106-15BU, REMOTE SWITCH, OPERATION SECTION
S601a	25030301B	NRSM-104-15BU, REMOTE SWITCH, OPERATION SECTION
Δ S901	25035345A	NPS-111-L308P, POWER SWITCH
Δ P903	253148 or 253150	AS-CEE or AS-CEE, POWER SUPPLY CABLE
P904	25060041	GROUND TERMINAL
Δ P907	27300601	SB-1925, COVER (CAPACITOR)
Δ F902	252078 or 252078CC	5A-SE-EAK or 5A-SE-EAK, PRIMARY FUSE
U001	1A127590-1A	NADG-3490-1A, DIGITAL INPUT TERMINAL PC BOARD ASS'Y
U002	1A127591-1B	NAAF-3491-1B, TAPE INPUT TERMINAL PC BOARD ASS'Y
U003	1A127592-1A	NASW-3492-1A, CD INPUT TERMINAL PC BOARD ASS'Y
U004	1A127593-1	NAETC-3493-1, VIDEO TERMINAL PC BOARD ASS'Y
U005	1A127594-1A	NADG-3494-1A, DIGITAL CIRCUIT PC BOARD ASS'Y
U006	1A127595-1	NAPS-3495-1, DIGITAL POWER SUPPLY PC BOARD ASS'Y
U007	1A127596-1	NASW-3496-1, DIGITAL INPUT SELECTOR SWITCH PC BOARD ASS'Y

REF. NO.	PART NO.	DESCRIPTION
U008	1A127597-1A	NAETC-3497-1A, REMOTE CONTROL CIRCUIT PC BOARD ASS'Y
U009	1A127599-1	NASW-3499-1, DIGITAL REC SWITCH PC BOARD ASS'Y
U011	1A127583-2B	NAAR-3183-2B, SPEAKER CIRCUIT PC BOARD ASS'Y
U012	1A127584-2A	NASW-3184-2A, PREOUT SWITCH PC BOARD ASS'Y
U013	1A127586-2	NAAF-3186-2, VOLUME CONTROL PC BOARD ASS'Y
U014	1A127587-2	NAAF-3187-2, TONE CONTROL CIRCUIT PC BOARD ASS'Y
U015	1A127588-2A	NAAF-3188-2A, SOURCE DIRECT SWITCH PC BOARD ASS'Y
U016	1A127590-2	NAPS-3190-2, POWER SUPPLY CIRCUIT PC BOARD ASS'Y
U017	1A127591-2	NAETC-3191-2, CAPACITOR PC BOARD ASS'Y
U018	1A127592-2A	NAETC-3192-2A, FUSE PC BOARD ASS'Y
U019	1A127593-2	NAAF-3193-2, HEAD PHONE TERMINAL PC BOARD ASS'Y
U020	1A127594-2	NADIS-3194-2, DIGITAL/ANALOG DISPLAY PC BOARD ASS'Y
U021	1A127595-2A	NADIS-3195-2A, LED PC BOARD ASS'Y
U022	1A127596-2	NADIS-3196-2, DIRECT DISPLAY PC BOARD ASS'Y
U023	1A128597-2A	NAAF-3197-2A, MAIN CIRCUIT PC BOARD ASS'Y
U024	1A127599-2	NAAF-3199-2, POWER AMPLIFIER CIRCUIT PC BOARD ASS'Y

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

FRONT PANEL FACILITIES



1. Power switch (POWER)
2. Remote control sensor
3. Source direct switch (SOURCE DIRECT)
DIRECT, OFF
4. Muting switch (MUTING)
OFF, ON (-20 dB)
5. Volume control (VOLUME)
6. Digital input selector switch (DIGITAL INPUT
SELECTOR)
COAXIAL → DIGITAL 1, DIGITAL 2
OPTICAL → DIGITAL 3
7. Input selector switch (INPUT SELECTOR)
VCR, VDP, TAPE, DAT, DIGITAL, CD-1, CD-2,
PHONO, TUNER
8. Open button (PUSH OPEN)
9. Analog recording source selector switch (DAT/TAPE
ANALOG REC)
TAPE ▶ DAT, DAT ▶ TAPE, OFF, SOURCE,
TUNER
10. Digital recording source selector switch (DIGITAL
REC)
ON, OFF
11. Digital lock indicator (DIGITAL LOCK)
12. Video mode switch (VIDEO MODE)
VCR REC → CDV, VDP, OFF
BGV → VDP, VCR, CDV
13. 14. Pre-out ON/OFF switch (PRE OUT)
15. Processor ON/OFF switch (PROCESSOR)
16. Cartridge selector switch (CARTRIDGE)
MC, MM
17. Mode selector switch (MODE)
STEREO, MONO
18. Balance control knob (BALANCE)
19. Treble control knob (TREBLE)
20. Bass control knob (BASS)
21. Contrabass control knob (CONTRABASS)
22. Headphone jack (PHONES)
23. Speaker selector switch (SPEAKERS)
OFF, A, B, A+B

PRINTED CIRCUIT BOARD – PARTS LIST

DIGITAL INPUT TERMINAL PC BOARD (NADG-3490-1A) – PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION	CIRCUIT NO.	PART NO.	DESCRIPTION
					Coils
			L701, L712	231029	NCH-1068
			L702, L711	231054	NCH5095, Filter
			L703, L705, L901	231069A	NCH-1119
			L704	232143	NSRF-2047, RF coil
					Capacitors
Q701	24120017	TORX175	C181, C182	391252217	220 μ F, 25V, Elect. (MUSE)
Q702	222755	TC74HCU04P	C183, C184	354764709	47 μ F, 35V, Elect.
Q703	222740005	74HC00P	C185, C186	3504231	3300 μ F, 35V, Elect.
Q704	22240112	TC74HC10P	C700	379124735	0.47 μ F, 50V, Film (DEW)
Q705	222755	TC74HCU04P	C702, C709, C711	354741009	10 μ F, 16V, Elect.
Q901	222780052	NEC78M05	C713, C715, C931		
			C704, C706, C708	354781099	0.1 μ F, 50V, Elect.
			C932	354724719	470 μ F, 6.3V, Elect.
					Resistors
Q181	2201444	2SD1408-Y	R739	441722204	22 Ω , 2W, Metal oxide film
Q182	2201434	2SB1017-Y			Jumper sockets
Q183	2211254 or	2SC1815-Y or	JC103, JC208	25050267	NSCT-3P95
	2211255	2SC1815-GR			Radiator
Q1842211454 or	2SA1015-Y or			27160176	RAD-56
	2211455	2SA1015-GR			Relay
Q185, Q186	2211945	2SK246-GR	RL701	25065362	NRL-1P1A-DC12-053
Q706, Q707	2211455 or	2SA1015-GR or			Plugs
	2211456	2SA1015-BL	P704a	25055132	NPLG-2P116
			P707a	25055184	NPLG-3P168
D181, D182	224452401 or	MTZ24A or			
	224652401	HZ24E-B1			
D701, D710, D729	223163	1SS133			
D728	224450562 or	MTZ5.6B or			
	224650562	HZ5.6E-B2			

CIRCUIT NO.	PART NO.	DESCRIPTION
P708	2000947	NSAS-6P899
P709	2000918	NSAS-6P871
P711	2000950	NSAS-6P902
	Terminals	
P701	25045251	NPJ-1PDOR123
P702	25045224	NPJ-2PDOR100

TAPE INPUT TERMINAL PC BOARD (NAAF-3491-1B)
- PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q153, Q154	22240216	NJM4560DH
	Transistors	
Q151, Q152	2211535 or 2211536	2SK146-GR or 2SK146-BL
	Diodes	
D201, D209	223163	1SS133
	Capacitors	
C155, C156	372121814	180 pF, 50V, Styrene
C159, C160	379122024	2000 pF, 50V, Film (DEW)
C161, C162, C163 C164	379122434	0.024 μ F, 50V, Film (DEW)
C165, C166	379124334	0.043 μ F, 50V, Film (DEW)
C167~C170	391254707	47 μ F, 25V, Elect. (MUSE)
C171, C172	379122024	2000 PF, 50V, Film (DEW)
C173~C176	354754719	470 μ F, 25V, Elect.
C217~C222	372121014	100 pF, 50V, Styrene
C225~C228		
C157, C158	372126804	68 pF, 50V, Styrene
	Switches	
S101	25065111A	NSS-4257, Slide
S203	25065332	NSS-65129, Slide
S205	25065079	NSS-4643, Slide
	Relaies	
RL201	25065335	NRL-2P1.25A-DC5-045
RL209	25065282	NRL-2P1.25A-DC12-39
	Terminals	
P203	25045201	NPJ-4PDBL82
P204~P205	25045199	NPJ-6PDBL80
P206	25045202	NPJ-4PDBL83
	Jumper sockets	
JC210, JC454 JC656	25050267	NSCT-3P95
	Plug	
P104a	25055133	NPLG-3P117
	Sockets ass'y	
P217	2000870	NSAS-6P826
P218	2000871	NSAS-6P827
P219	2000804	NSAS-6P760

CD INPUT TERMINAL PC BOARD (NASW-3492-1A)
- PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q121	222780055MIT M5F78M05L	
Q123	222790055MIT 79M05L	

CIRCUIT NO.	PART NO.	DESCRIPTION
	Transistors	
Q101~Q104	2213536 or 2213535	2SB737-E or 2SB737-S
Q105~Q108	2213546 or 2213545	2SD786-E or 2SD786-S
Q109, Q110, Q113 Q114	2213534 or 2213535	2SB737-R or 2SB737-S
Q111, Q112, Q115 Q116	2213544 or 2213545	2SD786-R or 2SD786-S
Q117, Q118	2211164 or 2213544 or 2213545	2SC2120-Y or 2SD786-R or 2SD786-S
Q119, Q120	2211504 or 2213534 or 2213535	2SA950-Y or 2SB737-R or 2SB737-S
	Diodes	
D101~D106 D206, D208	225251 223163	TLR112, LED 1SS133
	Capacitors	
C101, C102	379121524	1500 pF, 50V, Film (DEW)
C125, C126	379121024	1000 pF, 50V, Film (DEW)
C103, C104	379121034	0.01 μ F, 50V, Film (DEW)
C107~C110	354721019	100 μ F, 6.3V, Elect.
C111~C114	372124704	47 pF, 50V, Styrene
C115~C118	354743319	330 μ F, 16V, Elect.
C119, C120	354721019	100 μ F, 6.3V, Elect.
C121~C124	391221027	1000 μ F, 6.3V, Elect. (MUSE)
C127~C130	391280477	4.7 μ F, 50V, Elect. (MUSE)
C131, C132	379126824	6800 pF, 50V, Film (DEW)
C135~C140	354744719	470 μ F, 16V, Elect.
C211~C216	372121014	100 pF, 50V, Styrene
	Resistors	
R135, R137	441721214	120 Ω , 2W, Metal oxide film
	Coils	
L101, L102 L151, L152	230905 231030	BL02RN1-R62, Core NCH-1070
	Switch	
S201	25030296C	NRS-689-20J
	Terminals	
P101, P102, P201 P202	25045233 25045201	NPJ-2PDBL107 NPJ-4PDBL82
	Sockets	
P103	2000949	NSAS-6P901
P104	2000948	NSAS-6P900
P211	2000800	NSAS-6P756
P212	2000673	NSAS-6P629
P213	2000557	NSAS-6P557
P214	2000764	NSAS-6P720
P215	2000803	NSAS-6P759
P216	2000804	NSAS-6P760

VIDEO TERMINAL PC BOARD (NAETC-3493-1)
- PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
	Diodes	
D203, D205, D207	223163	1SS133
	Terminals	
P207	25045197	NPJ-2PDBL78
P208	25045231	NPJ-3PDBL106
	Relaies	
RL203, RL205 RL207	25065298	NRL-1P1A-DC12-40

DIGITAL CIRCUIT PC BOARD (NADG-3494-1A)
- PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
ICs		
Q708	22240113	YM3623B
Q709	22240176	YM3414
Q710	22240112	TC74HC10P
Q711	222740025	74HC02P
Q712	222740275	74HC27P
Q713	222740005	74HC00P
Q714	222740745	74HC74P
Q803, Q804	22240184	PCM58P
Q805~Q808	222902	NJM5532D-D
Q809, Q810	22240201	NJM4565D-B
Q812, Q814	2252173	TLP532
Q904	222570	NJM4560D-X
Q906	22240134	NJM2904D
Q907	226007	TLP-531, PHOTO COUPLER
Transistors		
Q715, Q813, Q815	2213300	DTA124XS
Q716, Q811	2213290	DTC114ES
Q902	2211164 or 2211163	2SC2120-Y or 2SC2120-O
Q903	2211504 or 2211503	2SA950-Y or 2SA950-O
Q905	2211256	2SC1815-BL
Diodes		
D711~D717	223163	1SS133
D723~D727		
D730		
D811~D813	224651203 or 224451203	HZ12E-B3 or MTZ12C, Zener
D931	224650502 or 224450512	HZ5.1E-B2 or MTZ5.1B
Osc. element		
X701	3010134	KD0602FUA
Capacitors		
C719, C725	354780109	1 μ F, 50V, Elect.
C720, C723, C727	354741009	10 μ F, 16V, Elect.
C728, C730, C732		
C734, C736		
C821~C824		
C833, C834, C837		
C838		
C722	372124724	4700 pF, 50V, Styrene
C726, C835, C836	354780229	2.2 μ F, 50V, Elect.
C839, C840	379121034	0.01 μ F, 50V, Film (DEW)
C841, C842	372126214	620 pF, 50V, Styrene
C843~C846	354744709	47 μ F, 16V, Elect.
C851~C854		
C847~C850	379122224	2200 pF, 50V, Film (DEW)
C855, C856		
C857~C860	391244707	47 μ F, 16V, Elect. (MUSE)
C861~C864	354742219	220 μ F, 16V, Elect.
C865, C866	391242207	22 μ F, 16V, Elect. (MUSE)
C867, C868	372124724	4700 pF, 50V, Styrene
C933, C934	3504231	3300 μ F, 35V, Elect.
C935	354722229	2200 μ F, 6.3V, Elect.
C936	354780229	2.2 μ F, 50V, Elect.
C937	354762209	22 μ F, 35V, Elect.
C938	354721019	100 μ F, 6.3V, Elect.
C939, C940, C943	354744709	47 μ F, 16V, Elect.
C944		
C941, C942	379121034	0.01 μ F, 50V, Film (DEW)
C945, C946	354742219	220 μ F, 16V, Elect.
C869, C870	372121014	100 pF, 50V, Styrene
C871, C872	391251017	100 μ F, 25V, Elect. (MUSE)

CIRCUIT NO.	PART NO.	DESCRIPTION
Resistors		
R821~R828	5210019	N06HR100KBDM, Semi-fixed
R858	442525114	510 Ω , 1/2W, Metal oxide film
R878	442521524	1.5k Ω , 1/2W, Metal oxide film
R931	442521324	1.3k Ω , 1/2W, Metal oxide film
R932	442521114	110 Ω , 1/2W, Metal oxide film
Coils		
L713	233360	NCH-2164
L714	231030	NCH-1070
Relaies		
RL803, RL804	25065362	NRL-1P1A-DC12-053
RL805	25065282	NRL-2P1.25A-DC12-39
Jumper sockets		
JC707a, JC708a	25050267	NSCT-3P95
Plugs		
P216a, P711a	25055133	NPLG-3P117
P710a	25055185	NPLG-4P169
Bracket (Buss)		
	27160215-1	

DIGITAL POWER SUPPLY PC BOARD (NAPS-3495-1)
- PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
ICs		
Q908	222780155MIT	M5F78M15L
Q909	222790155MIT	M5F79M15L
Capacitors		
C947, C948	354744709	47 μ F, 16V, Elect.
C949, C950	354764719	470 μ F, 35V, Elect.
Jumper socket		
JC305	25050280	NSCT-3P108
Radiator		
	27160176	RAD-56

DIGITAL INPUT SELECTOR SWITCH PC BOARD (NASW-3496-1) - PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
Switch		
S701	25030308	NRSM-113-35J
Jumper socket		
JC706	25050268	NSCT-4P96

REMOTE CONTROL CIRCUIT PC BOARD (NAETC-3497-1A) - PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
Photo receiving unit		
U781	24130001	GP1U501S
ICs		
Q781	222755	TC74HCU04P
Q782	22240173	LC6527H-3722
Q783	222963	LB1630
Q784	222780052	78M05
Q786	22240018	M51943ASL
Diodes		
D531, D532	225137DG or 225137DY or 225137CG or 225137CY	SEL2413E-DG or SEL2413E-DY or SEL2413E-CG or SEL2413E-CY, LED
D781, D782	223163	1SS133
D921, D922	225142DX1 or 225142DX2 or 225142CX1 or 225142CX2	SEL2913K-DX1 or SEL2913K-DX2 or SEL2913K-CX1 or SEL2913K-CX2, LED
Coils		
L781~L784	231054	NCH5095, Filter
L785	230905	BL02RN1-R62, FR Core
Osc. element		
X781	3010099	CSA4.00MG
Capacitors		
C784	353784799	0.47 μ F, 50V, Elect.
C786	353734709	47 μ F, 10V, Elect.
C787	354744709	47 μ F, 16V, Elect.
C788	354741009	10 μ F, 16V, Elect.
C791, C792, C794	379121035	0.01 μ F, 50V, Film (DEW)
C795		
Switch		
S702	25030309	NRSM-122-15U
Plug		
P709a	25055184	NPLG-3P168
P781a	25055132	NPLG-3P116
Socket		
P782	2000589A	NSAS-6P545
Jumper socket		
JC655	25050280	NSCT-3P-108
Rivet		
	880011	NRP-355
Holders		
	27190454A	(PLED)
	27190599	(LED)

DIGITAL REC SWITCH PC BOARD (NASW-3499-1) - PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
Switch		
S702	25030309	NRSM-122-15U
Plug		
P709a	25055184	NPLG-3P168

ABSOLUTE PHASE CIRCUIT PC BOARD (NAAF-3500-1) - PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
ICs		
Q451, Q452	22240050	MPC4570C
Diodes		
D451, D453	223163	1SS133
D455, D456	224651203 or 224451203	HZ12E-B3 or MTZ12C, Zener
Capacitors		
C451, C452	391280227	2.2 μ F, 50V, Elect.
C453, C454	372126804	68 pF, 50V, Styrene
C455~C458	391244707	47 μ F, 16V, Elect. (MUSE)
C459~C462	372121014	100 pF, 50V, Styrene
C465, C466	354744719	470 μ F, 16V, Elect.
Resistors		
R479, R480	442525614	560 Ω , 1/2W, Metal oxide film
Relays		
RL451	25065335	NRL-2P1.25A-DC5-045
RL453	25065282	NRL-2P1.25A-DC12-39
Plugs		
P210a, P219a	25055133	NPLG-3P117
P406a, P407a		
Jumper socket		
JC454	25050267	NSCT-3P95

SPEAKER CIRCUIT PC BOARD (NAAR-3183-2B) - PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
IC		
Q801	222584	TA7317P
Diodes		
D801, D803	223163	1SS133
D802	224650623 or 2243463	HZ6.2E-B3 or MTZ6.2C
D910, D911	223894	1N4002F
Coils		
L501, L502	231134S	S-0.8E
Capacitors		
C601~C604	372121024	1000 pF, 50V, Styrene
C801, C802	354722219	220 μ F, 6.3V, Elect.
C803, C804, C806	354742209	22 μ F, 16V, Elect.
C807	354784799	0.47 μ F, 50V, Elect.
C809	354743319	330 μ F, 16V, Elect.
C810~C812	379121035	0.01 μ F, 50V, Film (DEW)
C919	354741029	1000 μ F, 16V, Elect.
C920	354780479	4.7 μ F, 50V, Elect.
C921	354744719	470 μ F, 16V, Elect.
Resistors		
R655, R656	441723914	390 Ω , 2W, Metal oxide film
R657, R658	442520564	5.6 Ω , 1/2W, Metal oxide film
R807, R808	442520334	3.3 Ω , 1/2W, Metal oxide film
Terminal		
P601	25060124	NTM-8PDMN057
Switches		
S601	25065333A	NSS-64130
Relay		
RL801	25065316	NRL-2P7A-DC12-43
Clamp		
	27190540	UAMS-03-0

CIRCUIT NO. PART NO. DESCRIPTION

P219a Plug 25055133 NPLG-3P117

PRE/MAIN SWITCH PC BOARD (NASW-3184-2A) – PARTS LIST

CIRCUIT NO. PART NO. DESCRIPTION

D441 Diode 223163 1SS133
Switches 25035580A NPS-100-222-162-L542
Jumper socket 25050267 NSCT-3P95
Plugs 25055133 NPLG-3P117
Shield 2050006 NCS-8P4E17

VOLUME CONTROL PC BOARD (NAAF-3186-2) – PARTS LIST

CIRCUIT NO. PART NO. DESCRIPTION

D431, D432 Diodes 223163 1SS133
Resistor 5104219 N27DQL100KT30M, Variable
Jumper socket 25050273 NSCT-9P101
Plugs 25055133 NPLG-3P117

TONE CONTROL CIRCUIT PC BOARD (NAAF-3187-2) – PARTS LIST

CIRCUIT NO. PART NO. DESCRIPTION

Capacitors 379125624 5600 pF, 50V, Film (DEW)
379121024 1000 pF, 50V, Film (DEW)
379128224 8200 pF, 50V, Film (DEW)
379123934 0.039 μF, 50V, Film (DEW)
379128234 0.082 μF, 50V, Film (DEW)
Resistors 5104220 N27DGLC250KMN20, Variable
5104222 N27DQL11C139K176K20, Variable
5104223 N27DGL6C176K20, Variable
5104221 N27DGL11C219K20, Variable
Shield plate 2050004A NCS-7P4E15
2050003A NCS-9P5E20

MUTING SWITCH CIRCUIT PC BOARD (NAAF-3188-2A) – PARTS LIST

CIRCUIT NO. PART NO. DESCRIPTION

S401, S407 Switches 25035579 NPS-122-162-L541
P215a Plug 25055133 NPLG-3P117
Sockets 2000624 NSAS-6P580
2000802 NSAS-6P758
2000896 NSAS-6P852
2000788A NSAS-4P744
2000789 NSAS-4P745
Jumper sockets 25050271 NSCT-7P99
25050272 NSCT-8P100

POWER SUPPLY CIRCUIT PC BOARD (NAPS-3190-2) – PARTS LIST

CIRCUIT NO. PART NO. DESCRIPTION

Diodes D901, D902 22380014AF PB102F
D903, D904 22380003 1N5402F
D907, D908 22380013 RDF02M
D909 223890 W01RL
D912, D913 22380003 1N5402F
D951 223889 RC202
Capacitors C909, C910 375103345 0.33 μF, 125V, Film (ME)
C911, C912 375104745 0.047 μF, 125V, Film (ME)
C913, C914 354762229 2200 μF, 35V, Elect.
C915~C918 379121035 0.01 μF, 50V, Film (DEW)
C922, C923 354744709 47 μF, 16V, Elect.
C924 3504216 10000 μF, 16V, Elect.
C951 379121035 0.01 μF, 50V, Film (DEW)
C952
Resistors R901, R902 442525104 51 Ω, 1/2W, Metal oxide film
R905~R908 442522294 0.22Ω, 1/2W, Metal oxide film
R911~R917 442520104 1Ω, 1/2W, Metal oxide film

P704, P781 2000789 NSAS-4P745

JC102, JC310 25050267 NSCT-3P95
JC801

CAPACITOR PC BOARD (NAETC-3191-2) – PARTS LIST

CIRCUIT NO. PART NO. DESCRIPTION

Capacitors C901~C908 3504215A 12000 μF, 80V, Elect.
Bracket 27130517A Bracket (K)
Plate 27301084 BUS (A)
27301085 BUS (B)
Ribet 880011 NRP-355

FUSE PC BOARD (NAETC-3192-2A) – PARTS LIST

CIRCUIT NO. PART NO. DESCRIPTION

F902a Fuse holder 25050065 YSH-403T
Terminal 25060092 NTM-1S33

HEAD PHONE TERMINAL PC BOARD (NAAF-3193-2) – PARTS LIST

CIRCUIT NO. PART NO. DESCRIPTION

Terminal 25045229 HLJ4317-01-3120
Jumper socket 25050268 NSCT-4P96

DIGITAL/ANALOG DISPLAY PC BOARD (NADIS-3194-2) – PARTS LIST

CIRCUIT NO. PART NO. DESCRIPTION

Transistors Q204, Q205 2211255 or 2SC1815GR or 2211254 2SC1815-Y
Q206, Q207 2211455 or 2SA1015GR or 2211454 2SA1015Y
Diodes D213 225137DG or SEL2413E-DG or 225137DY or SEL2413E-DY or 225137CG or SEL2413E-CG or 225137CY SEL2413E-CY, LED
D214 224650472 or HZ4.7E-B2 or 224450472 or MTZ4.7B or 224650473 or HZ4.7E-B3 or 224450473 MTZ4.7C, Zener
D215 225142DX1 or SEL2913K-DX1 or 225142DX2 or SEL2913K-DX2 or 225142CX1 or SEL2913K-CX1 or 225142CX2 SEL2913K-CX2, LED
Capacitors C202 379121035 0.01 μF, 50V, Film (DEW)
C203 354721019 100 μF, 6.3V, Elect.
Jumper socket JC203 25050268 NSCT-4P96
Socket P707 2000946 NSAS-6P898
Holder 27190599 Holder (LED)

LED PC BOARD (NADIS-3195-2A) – PARTS LIST

CIRCUIT NO. PART NO. DESCRIPTION

Diodes D216, D722 225142DX1 or SEL2913K-DX1 or 225142DX2 or SEL2913K-DX2 or 225142CX1 or SEL2913K-CX1 or 225142CX2 SEL2913K-CX2, LED
D402, D721 225137DG or SEL2413E-DG or 225137DY or SEL2413E-DY or 225137CG or SEL2413E-CG or 225137CY SEL2413E-CY, LED
225248 GL5ED5, LED
Jumper sockets JC209 25050267 NSCT-3P95
JC451 25050268 NSCT-4P96
Plug P708a 25055184 NPLG-3P168
Socket P710 2000986 NSAS-8P938
Holder 27190600A Holder (LED6)

DIRECT DISPLAY PC BOARD (NADIS-3196-2) – PARTS LIST

CIRCUIT NO. PART NO. DESCRIPTION

Diodes D401 225137DG or SEL2413E-DG or 225137DY or SEL2413E-DY or 225137CG or SEL2413E-CG or 225137CY SEL2413E-CY, LED
Holder 7190599 Holder (LED)

MAIN CIRCUIT PC BOARD (NAAF-3197-2A) – PARTS LIST

CIRCUIT NO. PART NO. DESCRIPTION

IC Q549 222652 M5218L
Transistors Q501 2212005 or 2SK389-GR or 2212806 2SK389-BL
Q503, Q505 2211732 or 2SC1845-F or 2211733 2SC1845-E
Q507 2211515 or 2SA995-F or 2211516 2SA996-G
Q509 2211455 or 2SA1015-GR or 2211454 2SA1015-Y
Q511, Q519 2211359 or 2SA949-Y(ONK) or 2211358 2SA949-O(ONK)
Q513 2211255 2SC1815-GR
Q517 2211639 2SC2229-Y(ONK) or 2211638 2SC2229-O(ONK)
Q521 2211639 2SC2229-Y(ONK)
Q523 2211359 2SA949-Y(ONK)
Q525 2211515 or 2SA995-F or 2211516 2SA995-G
Q527 2211445 or 2SC2291-F or 2211446 2SC2291-G
Q529 2211359 2SA949-Y(ONK)
Q531 2211639 2SC2229-Y(ONK)
Q533 2201644 or 2SC3298-Y or

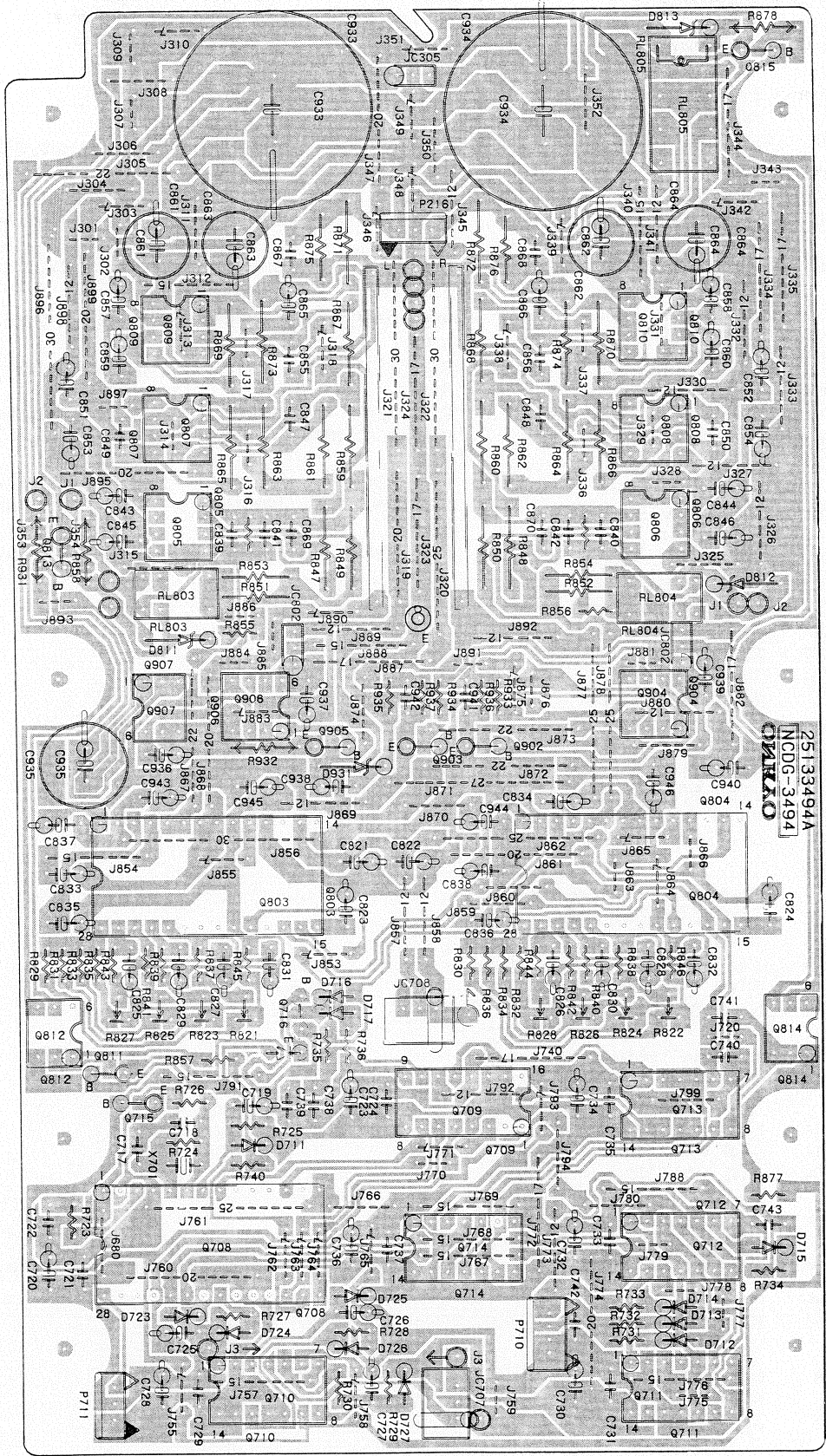
CIRCUIT NO.	PART NO.	DESCRIPTION
	2201643	2SC3298-O
Q535	2201634 or	2SA1306-Y or
	2201633	2SA1306-O
Q551	2211732 or	2SC1845-F or
	2211733	2SC1845-E
Q553	2211792 or	2SA992-F or
	2211793	2SA992-E
Q555	2201444 or	2SD1408-Y or
	2201443	2SD1408-O
Q557	2201434 or	2SB1017-Y or
	2201433	2SB1017-O
Q559~Q565	2213334	2SK373-Y
Diodes		
D503	224650622 or	HZ6.2E-B2 or
	224450622	MTZ6.2B, Zener
D505, D519, D521	225232	LTZ-R15, Zener
D507	4000120	KB-265, Varistor
D509, D511, D513	223163	1SS133
D515, D517		
D523, D525	224651802 or	HZ18E-B2 or
	224451802	MTZ18B, Zener
PAC ass'y		
U026	1A127700	
Capacitors		
C501	372123304	33 pF, 50V, Styrene
C503	354741009	10 μ F, 16V, Elect.
C505	372121014	100 pF, 50V, Styrene
C509, C511	3500110	220 μ F, 100V, Elect.
C513	3500113	470 μ F, 35V, Elect.
C515, C525	354721019	100 μ F, 6.3V, Elect.
C517	3500111	2200 μ F, 6.3V, Elect.
C527, C529	372121024	1000 pF, 50V, Styrene
C543, C545	391252207	22 μ F, 25V, Elect.(MUSE)
C547	372123304	33 pF, 50V, Styrene
C549, C551	3500112	330 μ F, 63V, Elect.
C557, C559	354764709	47 μ F, 35V, Elect.
C561, C563	3500114	470 μ F, 25V, Elect.
C567	391254707	47 μ F, 25V, Elect. (MUSE)
C569	372123304	33 pF, 50V, Styrene
C571, C573	373304714	470 pF, 125V, Film (PP)
C575	372126804	68 pF, 50V, Styrene
Resistors		
R511	441623014	300 Ω , 1W, Metal oxide film
R521	442520684	6.8 Ω , 1/2W, Metal oxide film
R523	441721334	13 k Ω , 2W, Metal oxide film
R525	442523624	3.6k Ω , 1/2W, Metal oxide film
R527	441625134	51 k Ω , 1W, Metal oxide film
R533	5221025	N10HR2.2KBEM, Semi-fixed
R535, R537	442520564	5.6 Ω , 1/2W, Metal oxide film
R539	442521224	1.2k Ω , 1/2W, Metal oxide film
R541, R543, R545	442524714	470 Ω , 1/2W, Metal oxide film
R547		
R549	442528214	820 Ω , 1/2W, Metal oxide film
R551, R553	442524314	430 Ω , 1/2W, Metal oxide film
R555, R557, R559	442522204	22 Ω , 1/2W, Metal oxide film
R561		
R563	442521014	100 Ω , 1/2W, Metal oxide film
R633, R635	441628214	820 Ω , 1W, Metal oxide film
R669, R671	442524704	47 Ω , 1/2W, Metal oxide film
Radiator		
	27160223	RAD-75(B)
Plugs		
P501, P505	25055328	NPLG-3P311
P503	25055335	NPLG-10P318
P507	25055132	NPLG-2P116

POWER AMPLIFIER CIRCUIT PC BOARD (NAAF-3199-2) – PARTS LIST

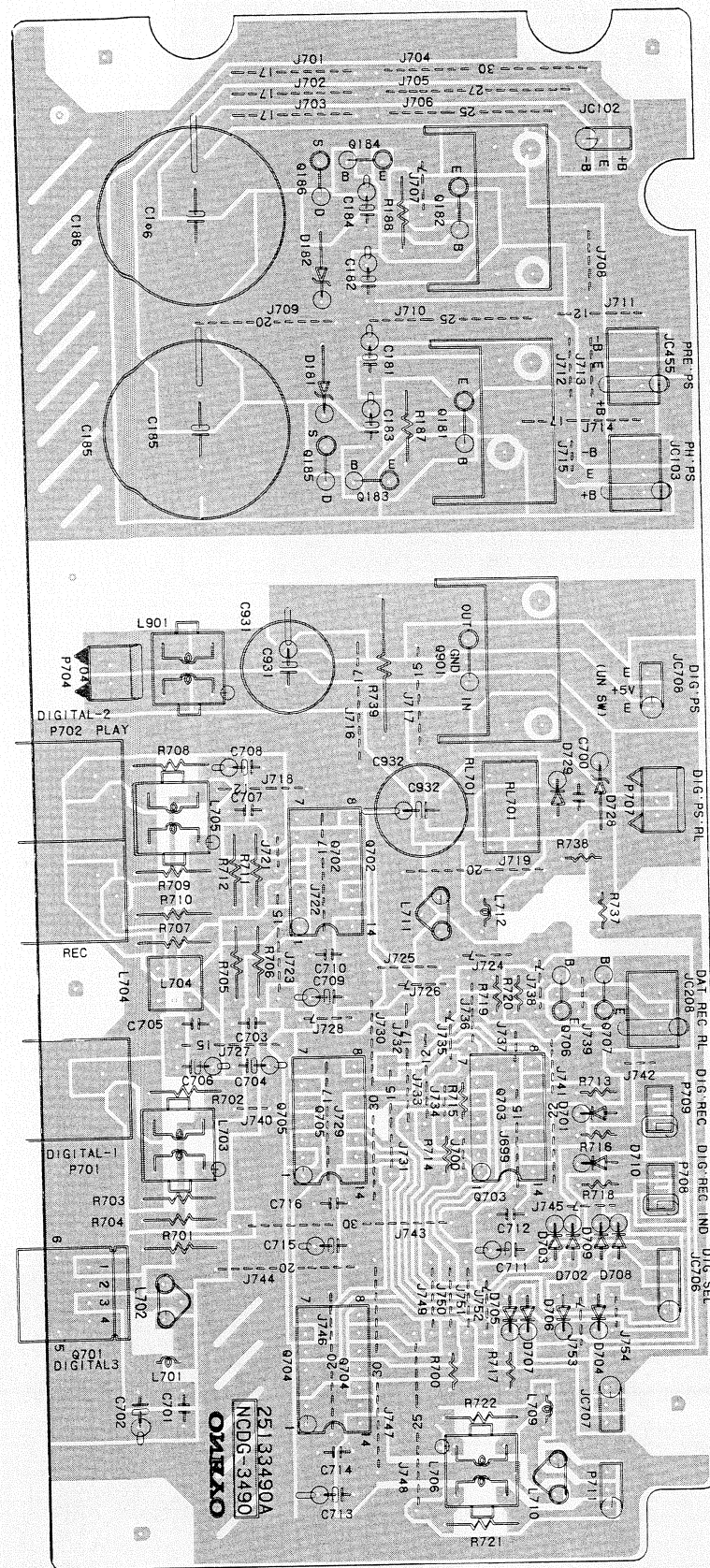
CIRCUIT NO.	PART NO.	DESCRIPTION
Transistors		
Q545	2212560	2SC3333
Q547	2211792 or	2SA992-F or
	2211793	2SA992-E
Diodes		
D527	223153	1SS81
Capacitors		
C519	379122235	0.022 μ F, 50V, Film (DEW)
C531	379121045	0.1 μ F, 50V, Film (DEW)
C533	379136835	0.068 μ F, 100V, Film (DEW)
C535, C537	379132245	0.22 μ F, 100V, Film (DEW)
C539	379124735	0.047 μ F, 50V, Film (DEW)
C541	379121035	0.01 μ F, 50V, Film (DEW)
Resistors		
R565, R567, R569	442520224	2.2 Ω , 1/2W, Metal oxide film
R571		
R573, R575, R577	4000079	0.39 Ω , 5W, Metal plate
R579		
R581, R583	4000067	1 Ω , 2W, Metal plate
R585, R587, R589	442521004	10 Ω , 1/2W, Metal oxide film
R591		
R593, R595	442523304	33 Ω , 1/2W, Metal oxide film
R597, R599, R601	442521014	100 Ω , 1/2W, Metal oxide film
R613		
R609, R611	441621204	12 Ω , 1W, Metal oxide film

PRINTED CIRCUIT BOARD VIEW FROM BOTTOM SIDE

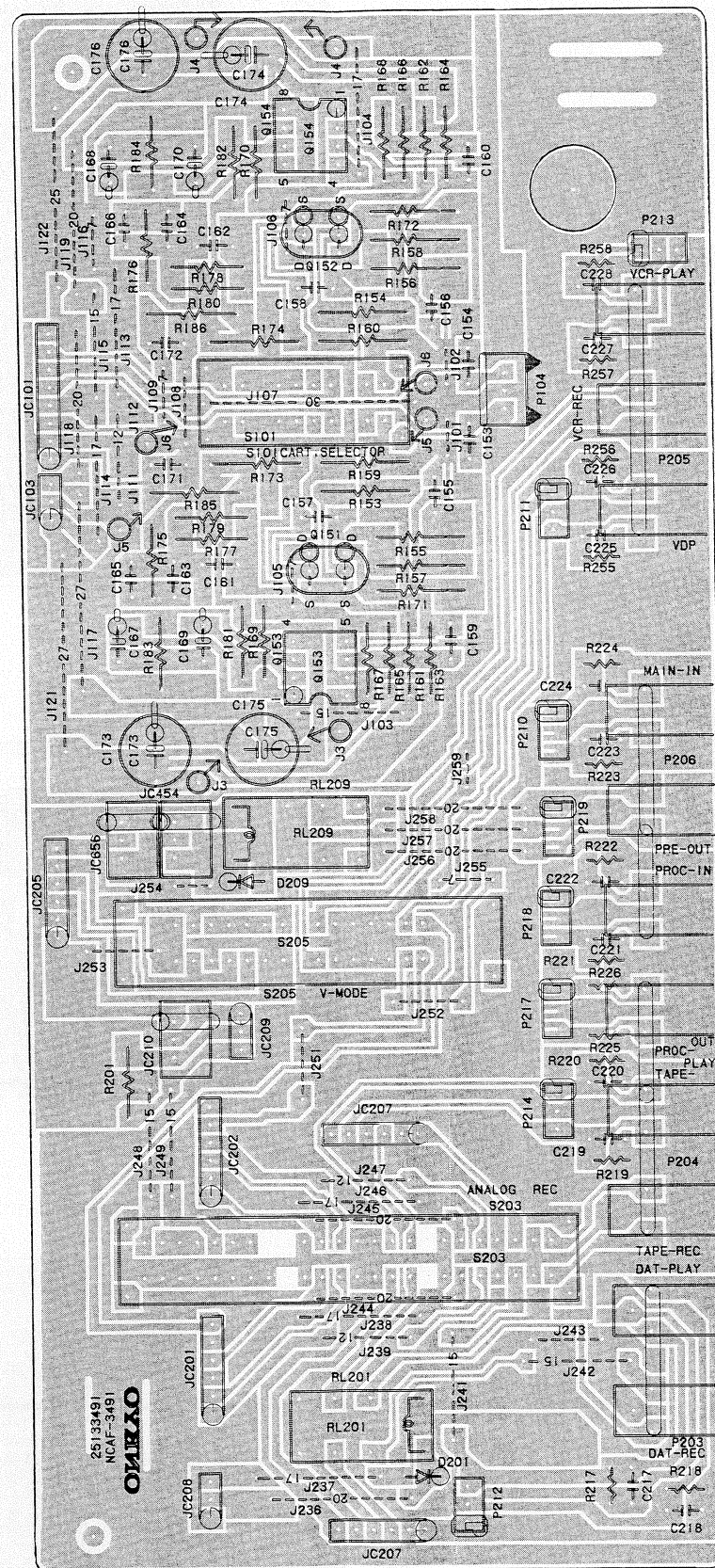
NADG-3494-1A



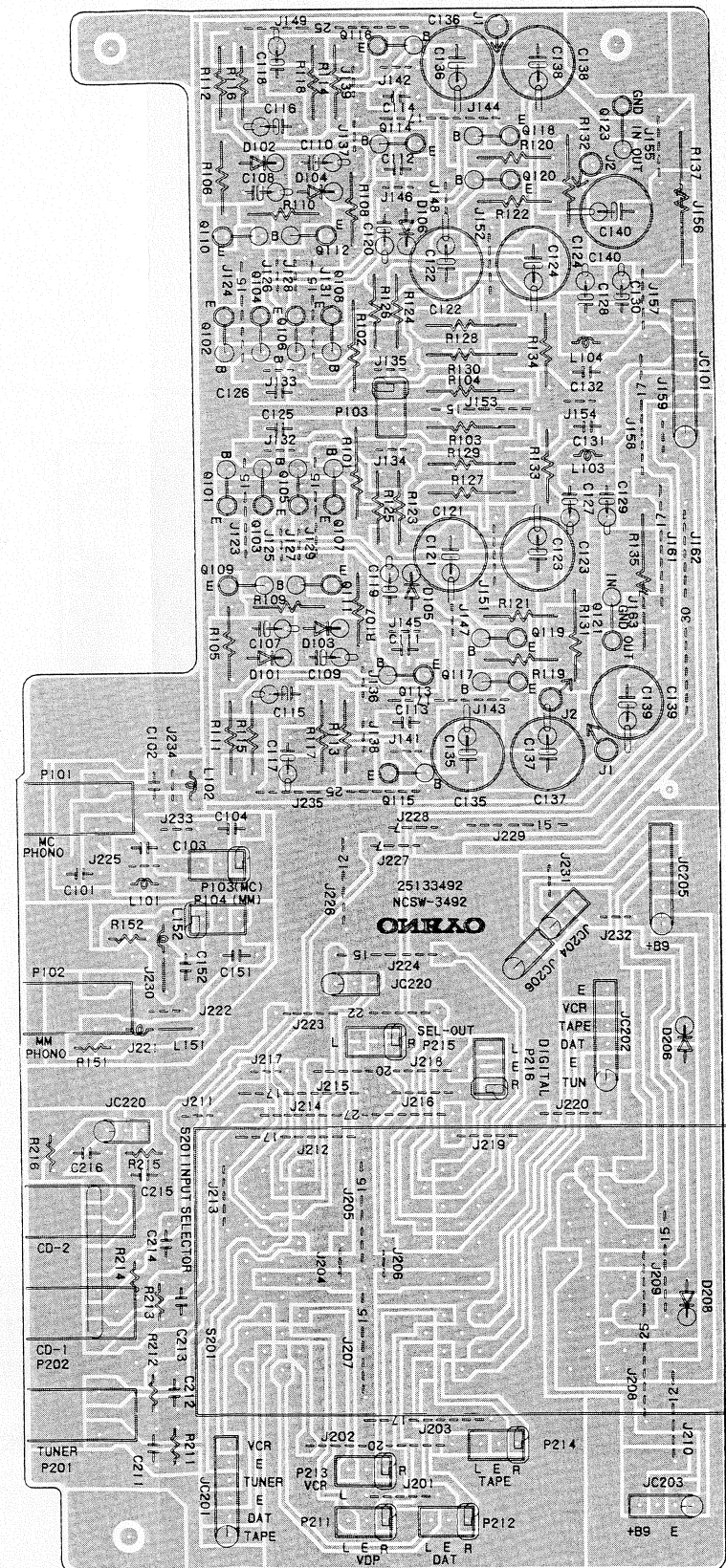
NADG-3490-1A



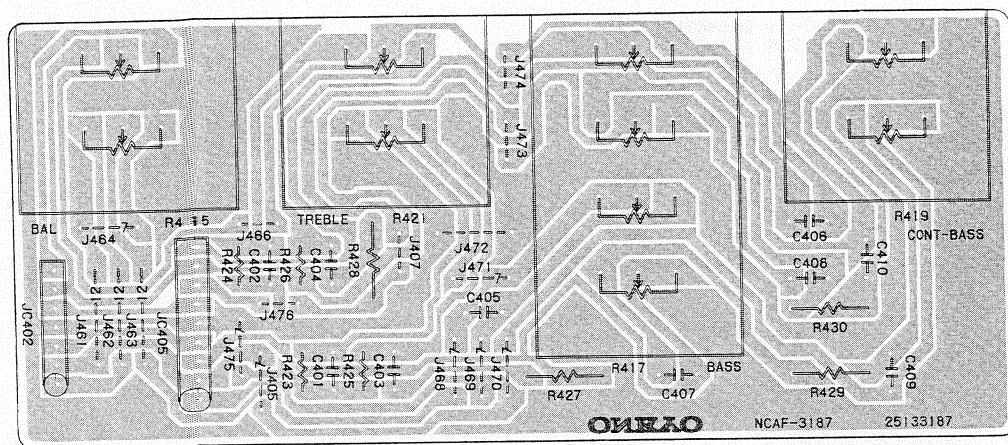
NAAF-3491-1B



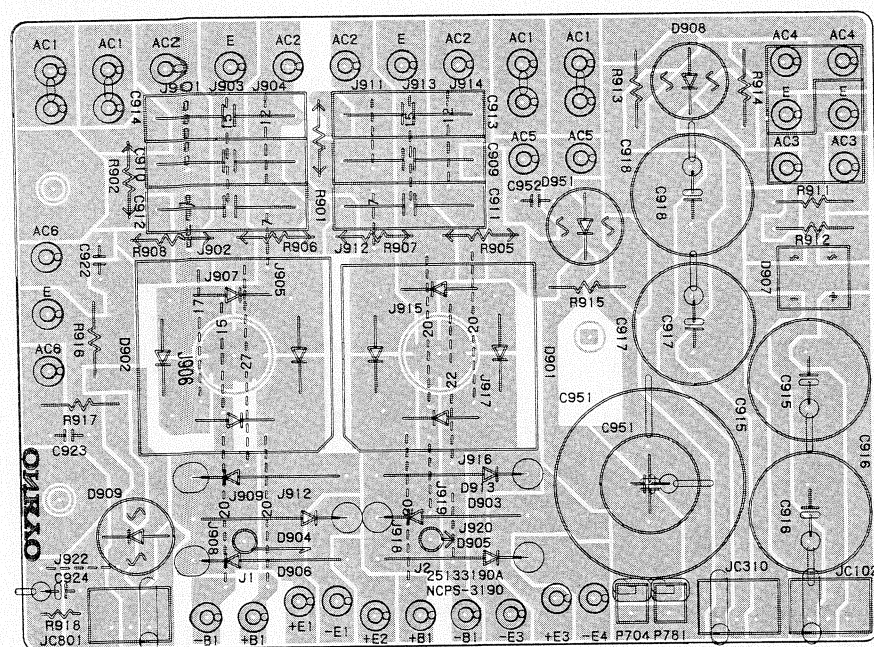
NASW-3492-1A



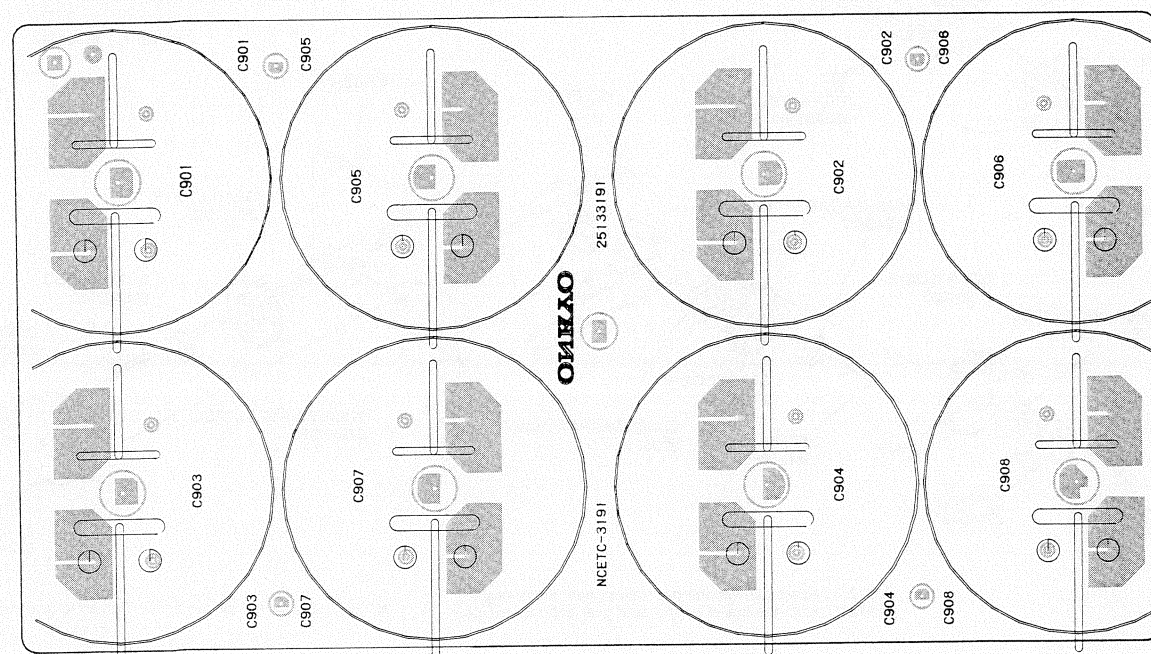
NAAF-3187-2



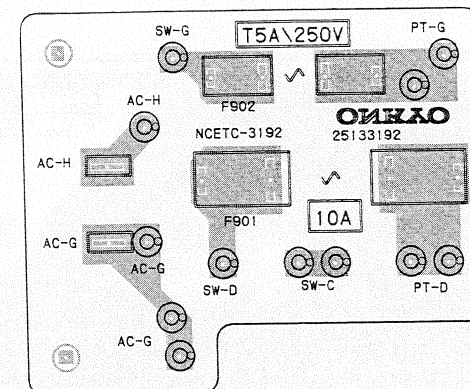
NAPS-3190-2



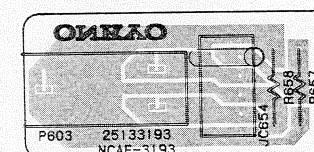
NAETC-3191-2



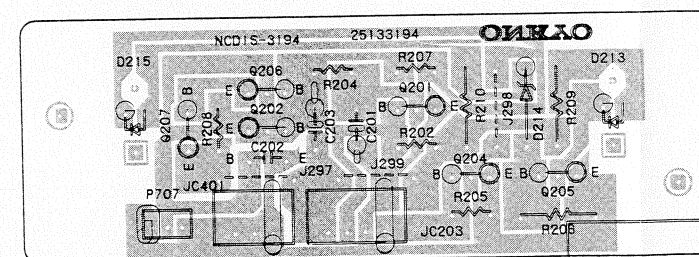
NAETC-3192-2A



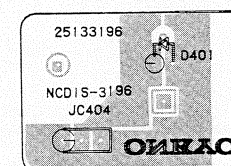
NAAF-3193-2



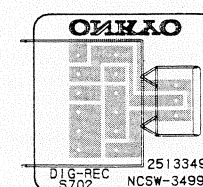
NADIS-3194-2



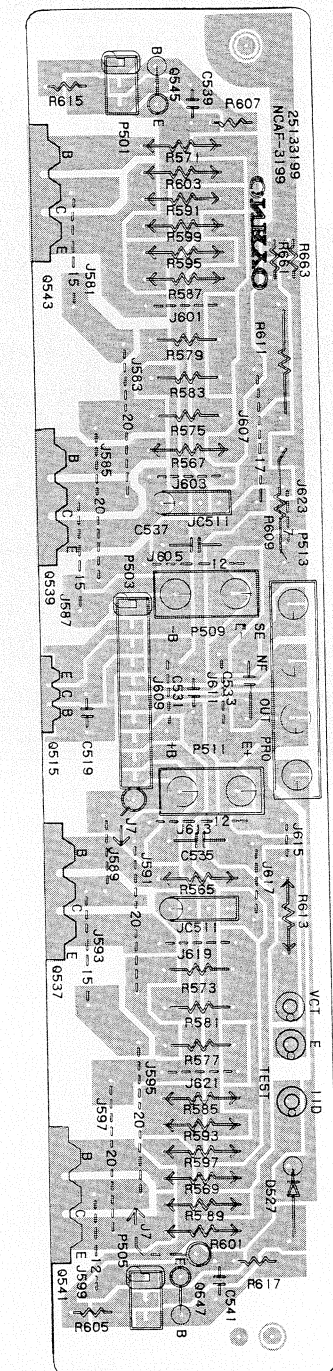
NADIS-3196-2



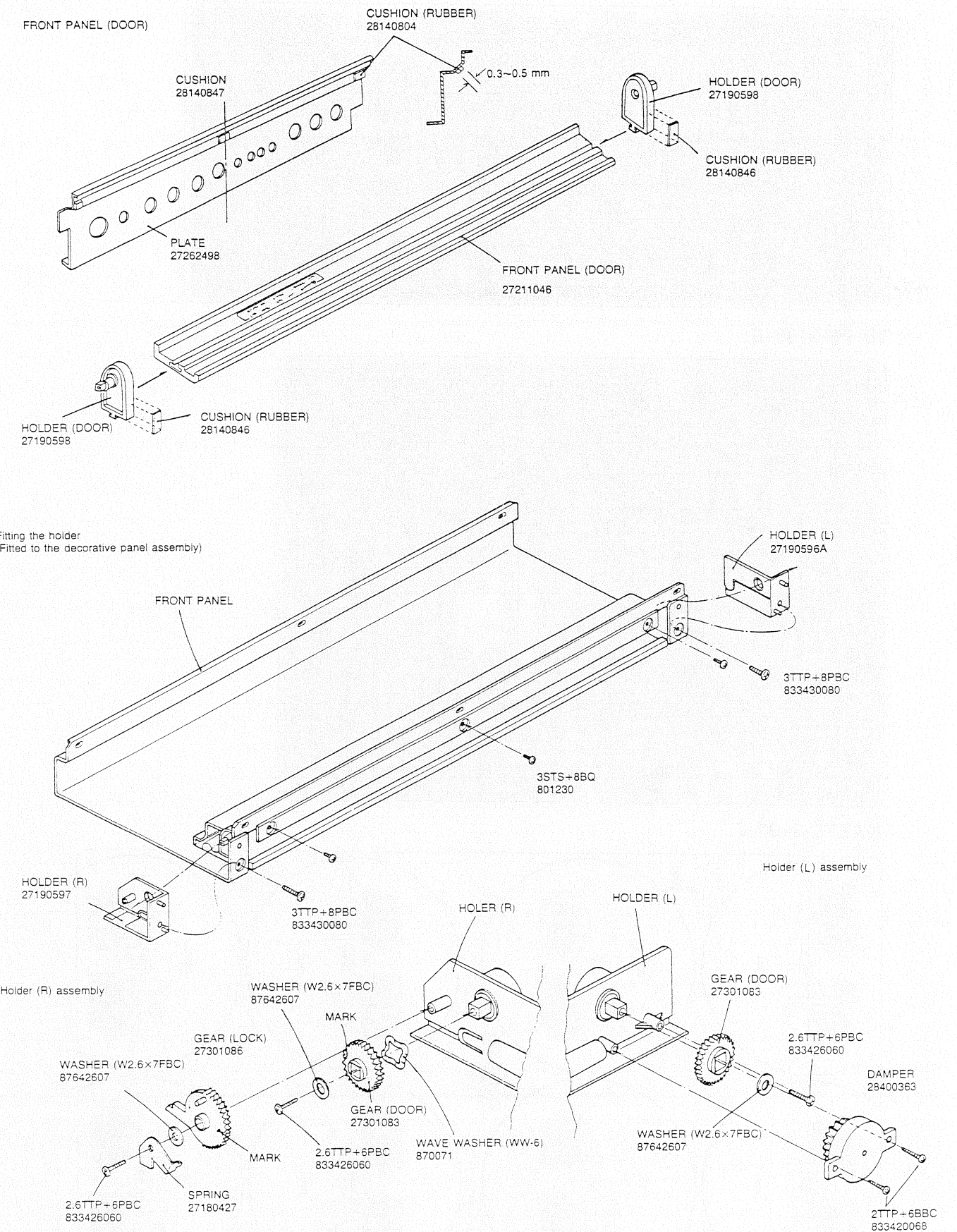
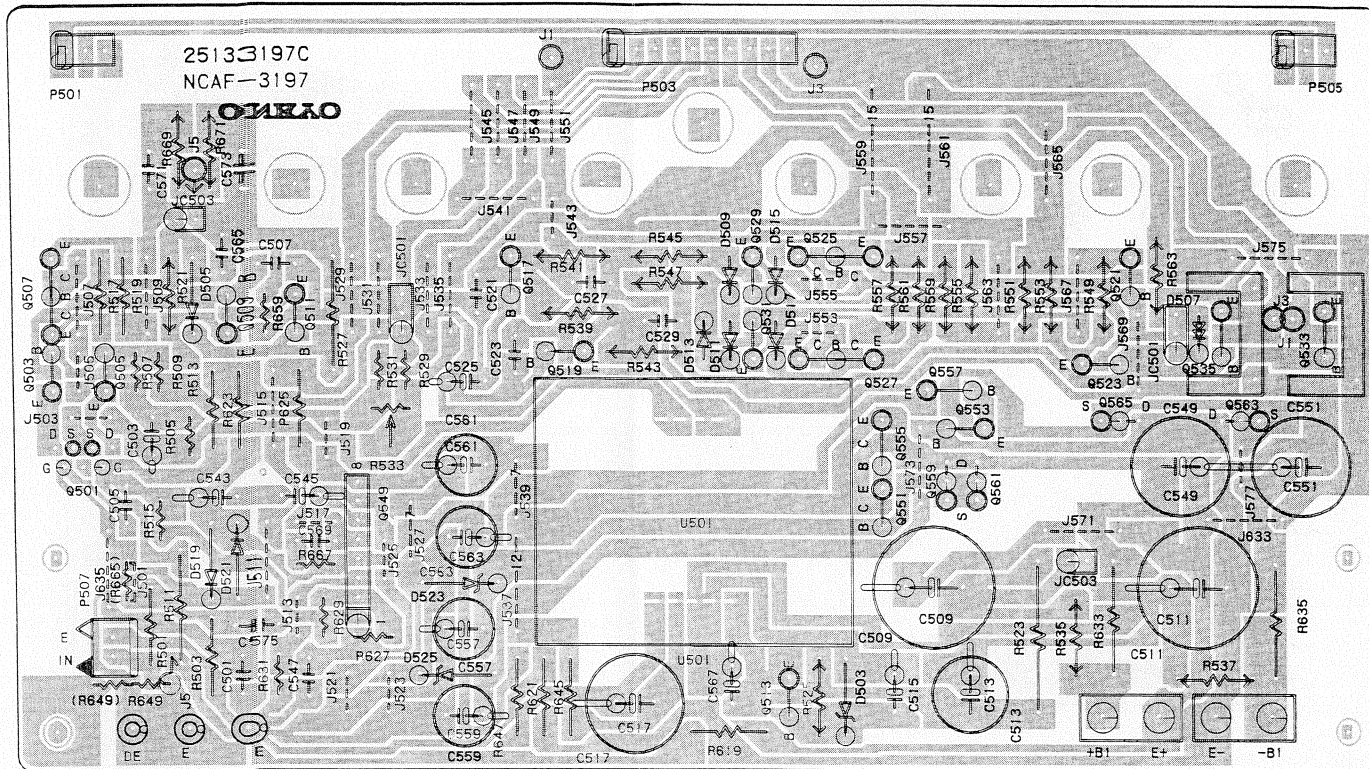
NASW-3499-1



NAAF-3199-2



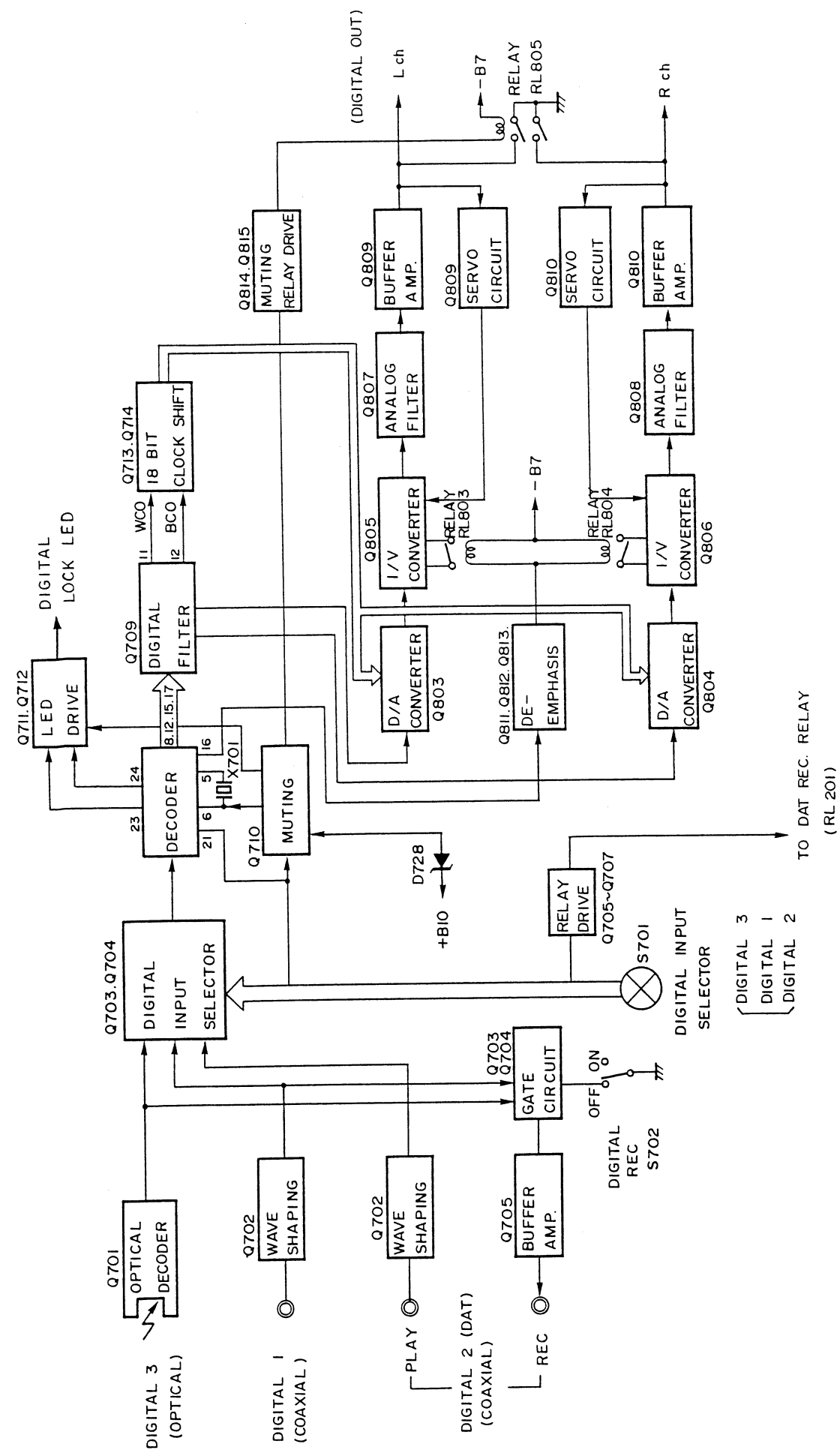
SERVICE PROCEDURES



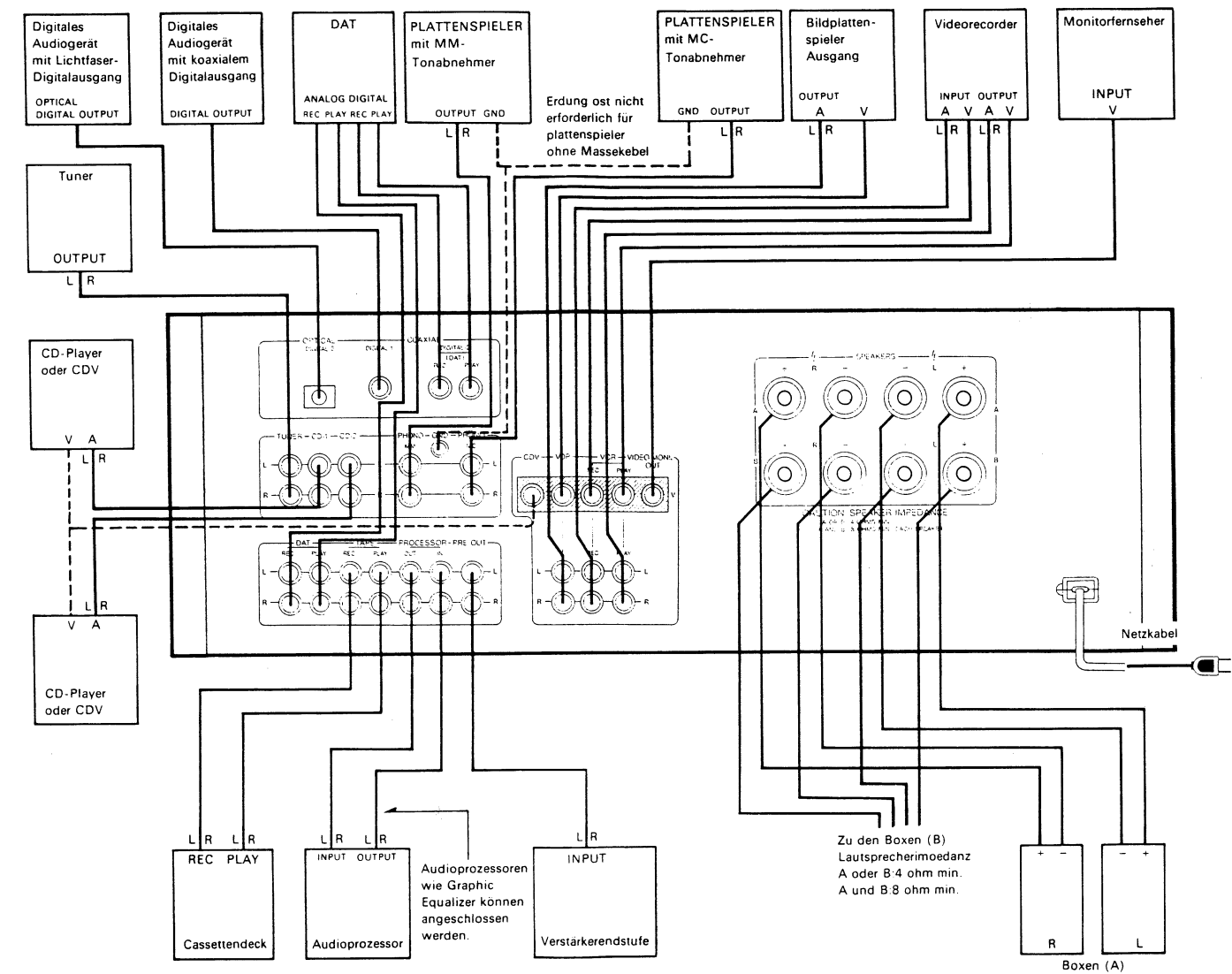
NOTE 1: Assemble with the decorative panel (door) open.
NOTE 2: Align the marks on the door gear and the lock gear.

NOTE 3: Do not tighten too firmly. Tighten to a torque of 1 kg.

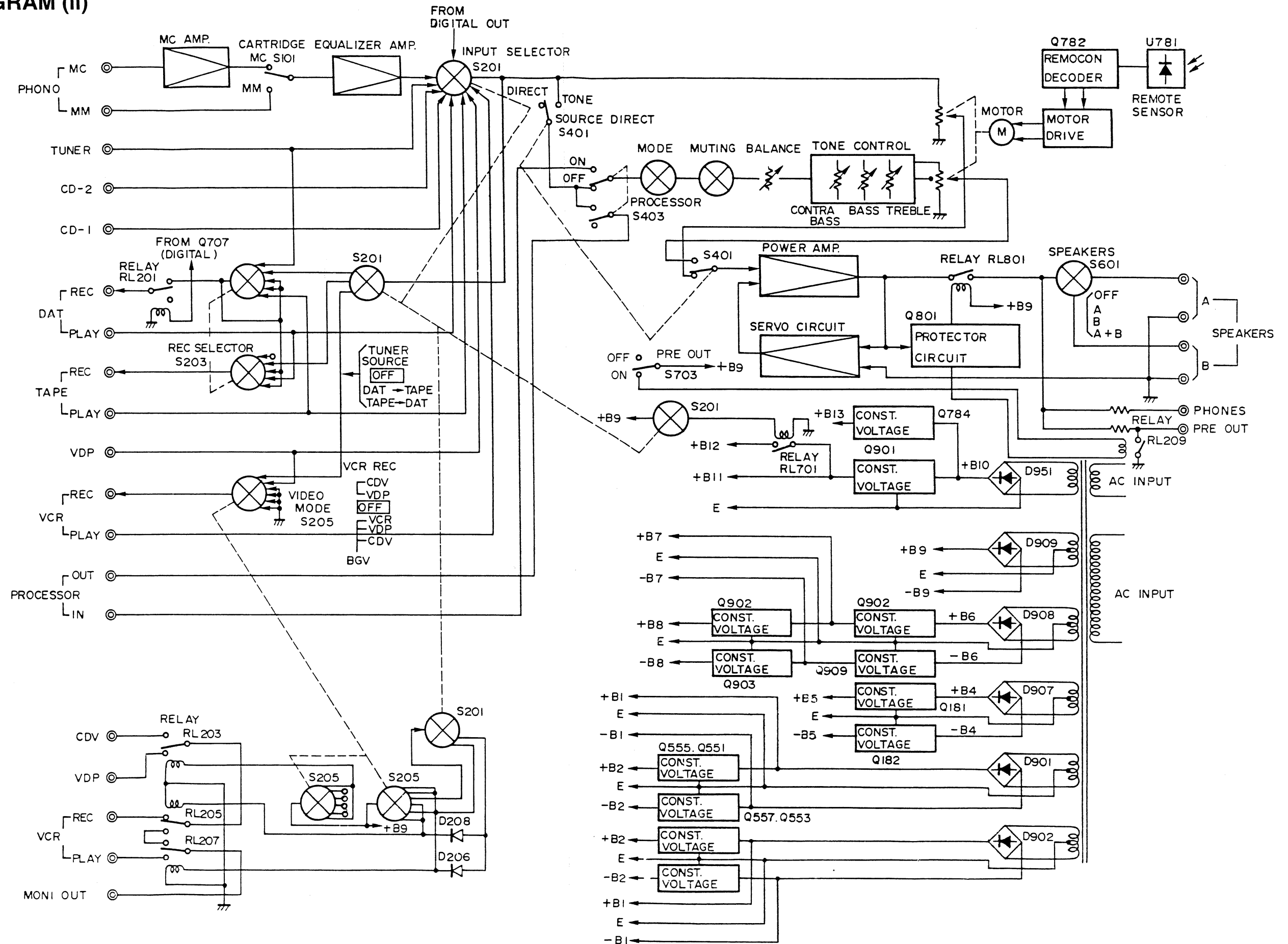
BLOCK DIAGRAM (I)



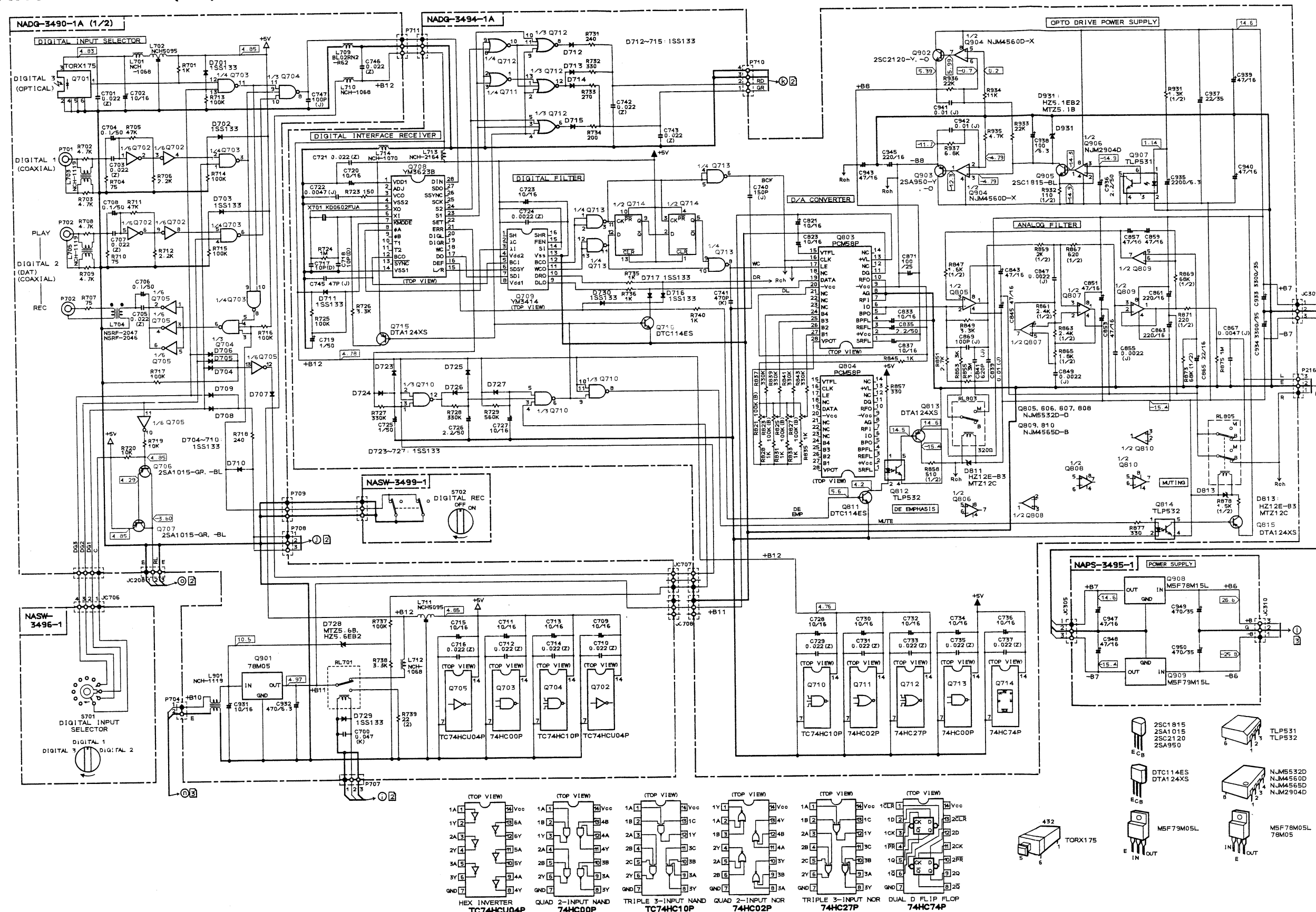
SYSTEM CONNECTIONS



BLOCK DIAGRAM (II)

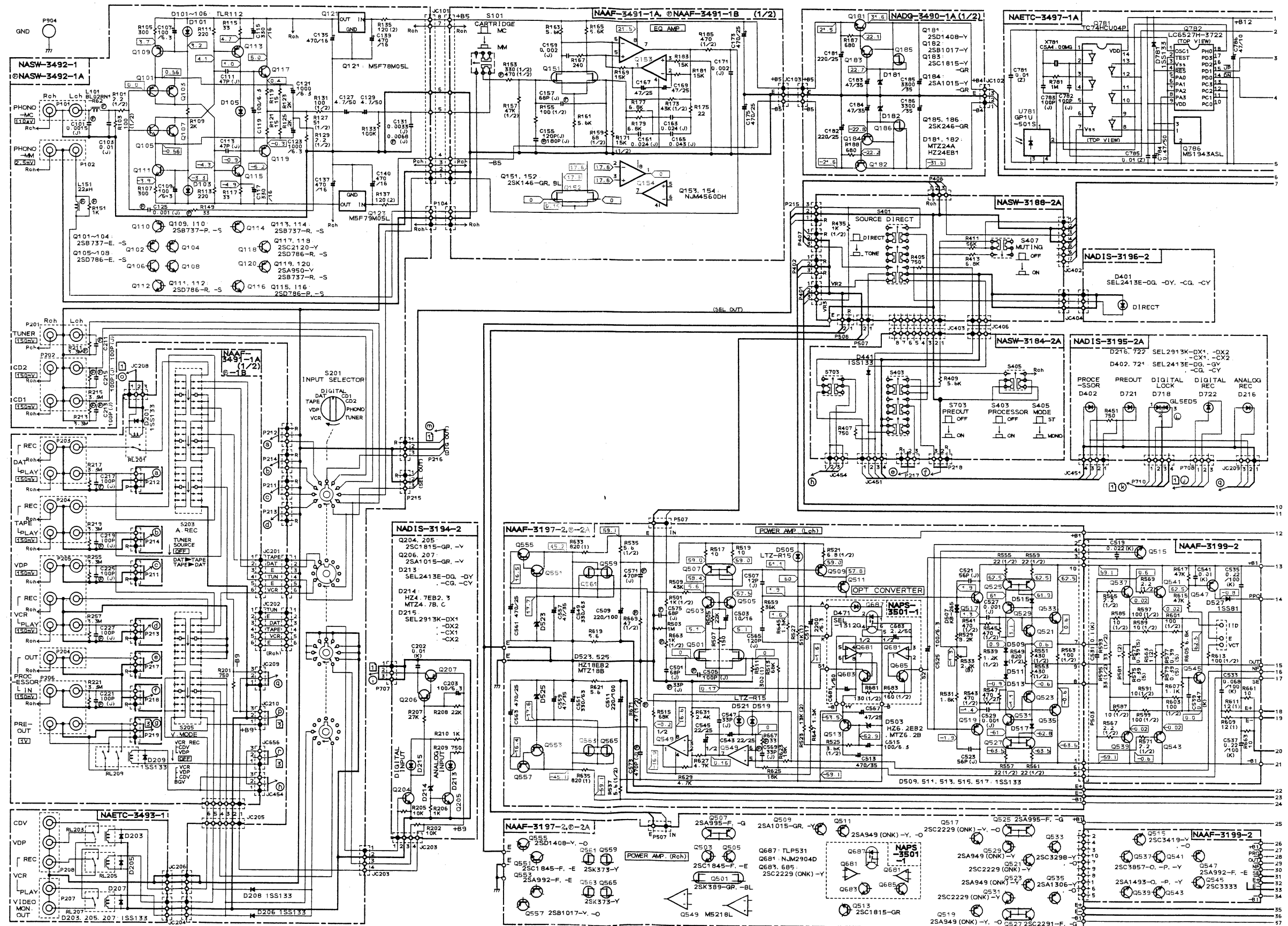


SCHEMATIC DIAGRAM (1/3)

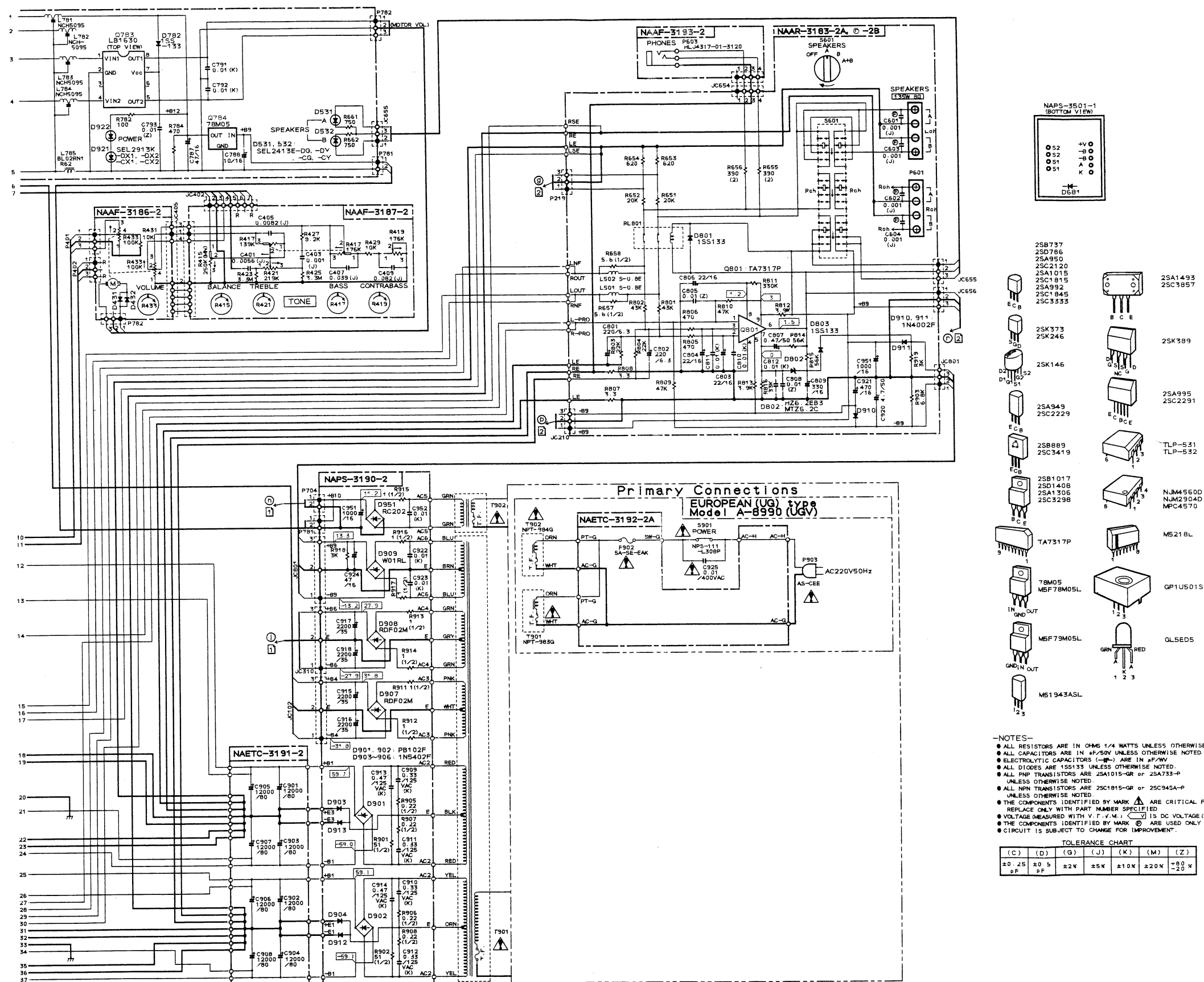


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SCHEMATIC DIAGRAM (2/3)

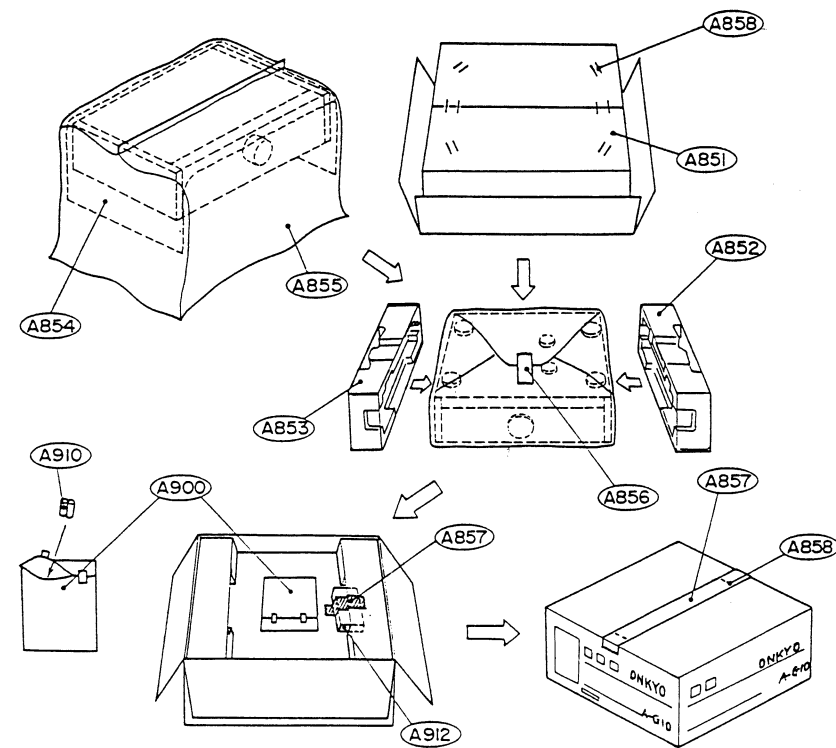


SCHEMATIC DIAGRAM (3/3)



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PACKING PROCEDURES



REF. NO.	PART NO.	DESCRIPTION
A851	29051847	MASTER CARTON BOX
A852	29091243	PAD ASS'Y, LEFT
A853	29091244	PAD ASS'Y, RIGHT
A854	29095508	600×1300. PROTECTION SHEET
A855	29100038A	720×950. POLY-VINYL BAG
A856	261504	PAPER TAPE
A857	260012	(80 mm) DAMPLON TAPE
A858	282301	SEALING HOOK
	29355150	CAUTION (SHORT PIN)
	29355133	CAUTION (DBP)
A900	ACCESSORY BAG ASS'Y	
	29341367	INSTRUCTION MANUAL
	29365020	WARRANTY CARD
	29100094A	POLY-VINYL BAG

ONKYO CORPORATION

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Tel: 089 84 93 20 Fax: 089 84 93 226