

Service Manual

Computer Drive New Class A Stereo Integrated Amplifier

SU-V8X

Colors

(K)....	Black Type
(S)....	Silver Type

Color	Area
(S)(K) [PC].....	European Audio Club

Please use this manual together with the service manual for Model No. SU-V8X,
Order No. HAD84042754C9.

When servicing model SU-V8X[PC], please refer to the service manual
for model No. SU-V8X[XA].

Technics

Matsushita Electric Trading Co., Ltd.

P.O. Box 288, Central Osaka Japan

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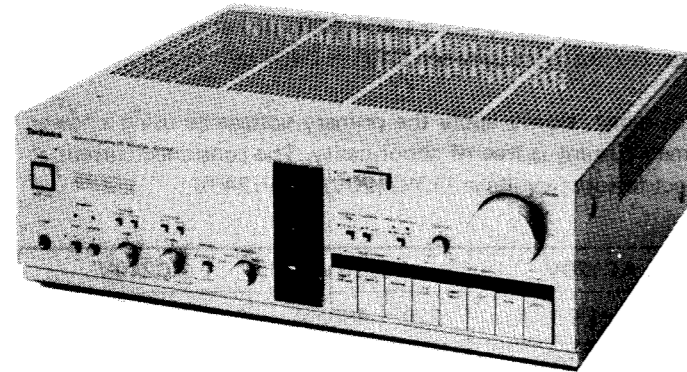
Service Manual

Computer Drive New Class A
Stereo Integrated Amplifier

Amplifier SU-V8X

Color

- (K).....Black Type
- (S).....Silver Type



Color	Area
(K)(S) [D]	Scandinavia
(K)(S) [EF]	France
(K)(S) [Ei]	Italy
(K)(S) [EW]	Switzerland
(K)(S) [EK]	United Kingdom
(K)(S) [EH]	Holland
(K)(S) [EGA]	F. R. Germany
(S) [EB]	Belgium
(K)(S) [XA]	Southeast, Asia, Oceania, Africa, Middle Near East and Central South America
(K)(S) [XL]	Australia
(S) [PA]	Far East PX
(S) [PE]	European Military

SPECIFICATION

(DIN 45 500)

AMPLIFIER SECTION

20 Hz~20 kHz continuous power output both channels driven	2 × 120W (4Ω)
	2 × 120W (8Ω)
40 Hz~16 kHz continuous power output both channels driven	2 × 120W (4Ω)
	2 × 120W (8Ω)
1 kHz continuous power output both channels driven	2 × 120W (4Ω)
	2 × 120W (8Ω)
Total harmonic distortion	
rated power at 20 Hz~20 kHz	0.007% (4Ω)
	0.003% (8Ω)
rated power at 40 Hz~16 kHz	0.007% (4Ω)
	0.003% (8Ω)
rated power at 1 kHz	0.0015% (4Ω)
	0.001% (8Ω)
half power at 20 Hz~20 kHz	0.002% (8Ω)
half power at 1 kHz	0.001% (8Ω)
-26 dB power at 1 kHz	0.01% (4Ω)
50 mW power at 1 kHz	0.01% (4Ω)
Intermodulation distortion	
rated power at 250 Hz: 8 kHz=4:1, 4Ω	0.01%
rated power at 60 Hz: 7 kHz=4:1, SMPTE, 8Ω	0.007%
Power bandwidth	
both channels driven, -3 dB	5 Hz~70 kHz (4Ω, 0.03%)
	5 Hz~70 kHz (8Ω, 0.02%)
Residual hum and noise	0.5 mV
Damping factor	50 (4Ω), 100 (8Ω)

Input sensitivity and impedance

PHONO MM	2.5 mV/47kΩ
MC	170 μV/220Ω
TUNER, CD, TV/AUX 1, VIDEO/AUX 2	150 mV/18kΩ
TAPE 1/DA TAPE, TAPE 2	150 mV/18kΩ
PHONO maximum input voltage (1 kHz, RMS)	
MM	210 mV
MC	15 mV

S/N

rated power (4Ω)	
PHONO MM	78 dB (IHF, A: 88 dB, input 2.5 mV)
MC	72 dB (IHF, A: 72 dB, input 250 μV)
TUNER, CD, TV/AUX 1, VIDEO/AUX 2,	
TAPE 1/DA TAPE, TAPE 2	93 dB (IHF, A: 104 dB)
-26 dB power (4Ω)	
PHONO MM	72 dB
MC	68 dB
TUNER, CD, TV/AUX 1, VIDEO/AUX 2,	
TAPE 1/DA TAPE, TAPE 2	74 dB
50 mW power (4Ω)	
PHONO MM	68 dB
MC	67 dB
TUNER, CD, TV/AUX 1, VIDEO/AUX 2,	
TAPE 1/DA TAPE, TAPE 2	69 dB

Frequency response

PHONO	RIAA standard curve
	±0.5 dB (30 Hz~15 kHz)
TUNER, CD, TV/AUX 1, VIDEO/AUX 2,	
TAPE 1/DA TAPE, TAPE 2	0.7 Hz~140 kHz (-3 dB)
	+0, -0.2 dB (20 Hz~20 kHz)

Tone controls	
BASS	50 Hz, +10 dB~-10 dB
TREBLE	20 kHz, +10 dB~-10 dB
Subsonic filter	30 Hz, -6 dB/oct.
Loudness control (volume at -30 dB)	50 Hz, +9 dB
Output voltage and impedance	
REC OUT	150 mV
Channel balance, CD, AUX 1, 2	250 Hz~6,300 Hz ±1 dB
Channel separation, CD, AUX 1, 2	1 kHz 55 dB
Headphones output level and impedance	740 mV/330Ω
Load impedance	
MAIN or REMOTE	4Ω~16Ω
MAIN and REMOTE	8Ω~16Ω

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FEATURES

- Computer drive, improved version of New Class A.
- Large output amplifier of 120W + 120W, coping with digital source in wide dynamic range.
- Power linear circuit that eliminates distortion due to speaker impedance change.
- Low noise, high gain ICL equalizer circuit that makes direct connection of MC cartridge possible.

GENERAL

Power consumption	670W
Power supply	AC 50 Hz/60 Hz, 110V/120V/220V/240V
Dimensions (W×H×D)	430 × 142 × 380 mm
	(16-15/16" × 5-9/16" × 14-15/16")
Weight	13.1 kg (28.8 lb.)

Note:

Total harmonic distortion is measured by the digital spectrum analyzer (H.P. 3045 system).

(Specifications are subject to change without notice for further improvement.)

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- Electronic protector based on microcomputer, which protects the speaker and amplifier.
- High S/N, low distortion NF-CR type tone control.
- Two tape jacks, 2 Aux jacks, and CD jack to cope with the new media age.
- Exclusive jack for external equipment, which is very convenient when using a graphic equalizer.

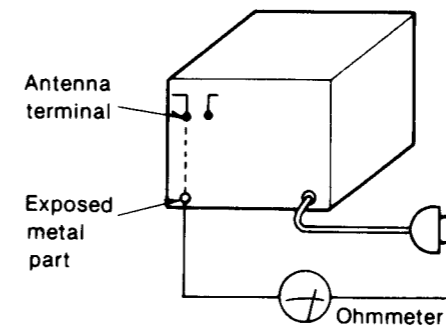
SAFETY PRECAUTION

1. Before servicing, unplug the power cord to prevent an electric shock.
2. When replacing parts, use only manufacturer's recommended components for safety.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.
5. Before returning the serviced equipment to the customer, be sure to make the following insulation resistance test to prevent the customer from being exposed to a shock hazard.

INSULATION RESISTANCE TEST

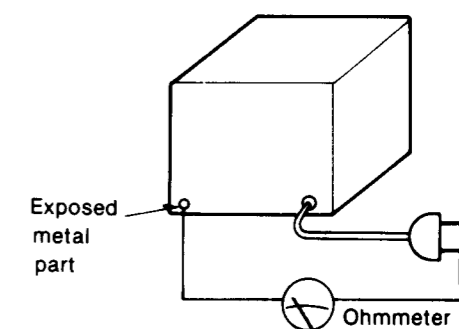
1. Unplug the power cord and short the two prongs of the plug with a jumper wire.
2. Turn on the power switch.
3. Measure the resistance value with ohmmeter between the jumpered AC plug and each exposed metal cabinet part, such as screwheads antenna, control shafts, handle brackets, etc. Equipment with antenna terminals should read between 3MΩ and 5.2MΩ to all exposed parts. (Fig. A) Equipment without antenna terminals should read approximately infinity to all exposed parts. (Fig. B)

Note: Some exposed parts may be isolated from the chassis by design. These will read infinity.



(Fig. A)

Resistance = 3 MΩ—5.2 MΩ



(Fig. B)

Resistance = Approx ∞

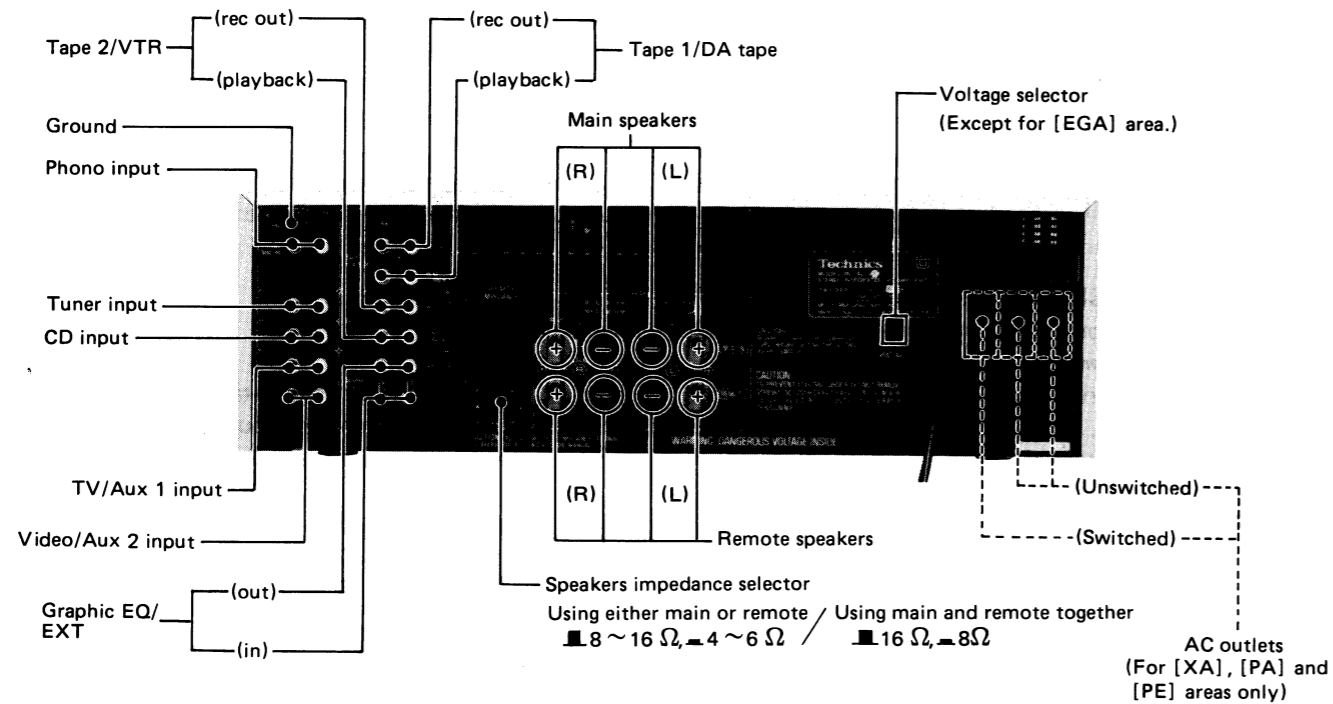
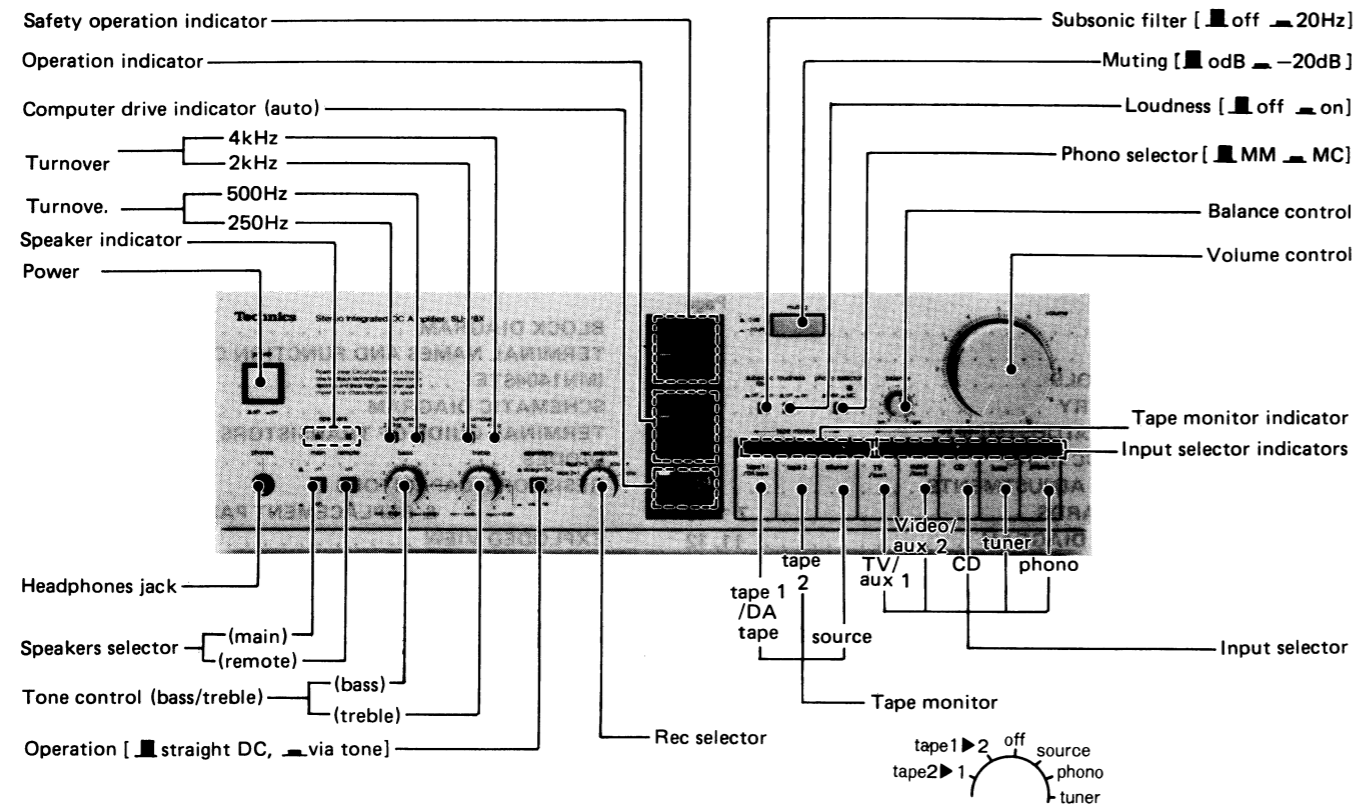
4. If the measurement is outside the specified limits, there is a possibility of a shock hazard. The equipment should be repaired and rechecked before it is returned to the customer.

Technics

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Tokyo 105 Japan

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LOCATION OF CONTROLS



- * [EGA] areas are provided without voltage selector.
- * 240V (50/60Hz) for Australia and United Kingdom.
- * 220V (50/60Hz) for Continental Europe.
- * Phono input capacitance is about 150pF.

PROTECTION CIRCUITRY

The protection circuitry may have operated if either of the following conditions is noticed:

- No sound is heard when the power is turned on.
- Sound stops during a performance.

The function of this circuitry is to prevent circuitry damage if, for example, the positive and negative speaker connection wires are "shorted" or if speaker systems with an impedance less than the indicated rated impedance of this unit are used.

If this occurs, follow the procedure outlines below:

1. Turn off the power.
2. Determine the cause of the problem and correct it.
3. Turn on the power once again after one minute.

Note
When the protection circuitry functions, the unit will not operate unless the power is first turned off and then on again.

BEFORE REPAIR AND ADJUSTMENT

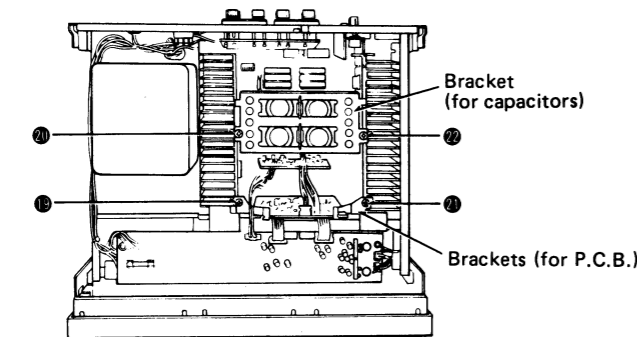
1. Turn off the power supply and short-circuit of power supply capacitors (C401 ~ C404, 8200 μF) at resistance (about 10Ω, 5W) in order to discharge the charged voltage. Do not short between C401 ~ C404 by screwdriver. It may damage the component.
2. Before turning on the power supply after completion of repair, slowly apply the primary voltage by using a power supply voltage controller to make sure that the consumed current is free of abnormality. The consumed current at 60Hz/50Hz in no signal mode is shown below with respect to supply voltage 110V/120V/220V/240V.

Power supply voltage		AC110V	AC120V	AC220V	AC240V
Consumed current	50Hz	420 ~ 950mA	400 ~ 880mA	220 ~ 480mA	200 ~ 440mA
	60Hz	400 ~ 910mA	370 ~ 840mA	200 ~ 460mA	180 ~ 410mA

DISASSEMBLY INSTRUCTIONS

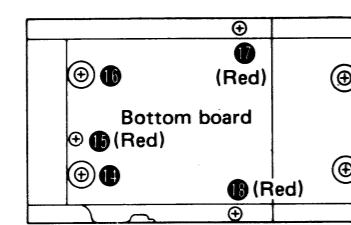
Ref. No.	How to remove the cabinet	Ref. No.	How to remove the front panel
1	<p>Procedure 1</p> <ul style="list-style-type: none"> • Remove the 6 setscrews. 	2	<p>Procedure 1 → 2</p> <ul style="list-style-type: none"> • Remove the 5 setscrews. • Pull out the volume knob and remove the nut. • Pull out the connector terminals (J602 ~ J606, J607) and remove the front panel in the direction of the →

Ref. No. 3	How to remove the power transistors
Procedure 1→3	<ul style="list-style-type: none"> Remove the 4 setscrews and pull out the brackets.



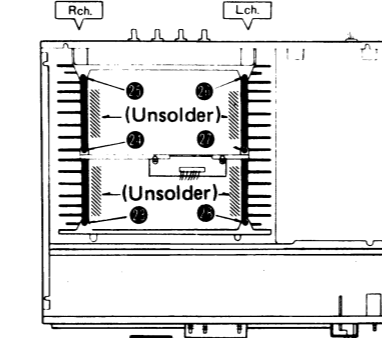
Bracket (for capacitors)
Brackets (for P.C.B.)

Remove the 5 setscrews and pull out bottom board.



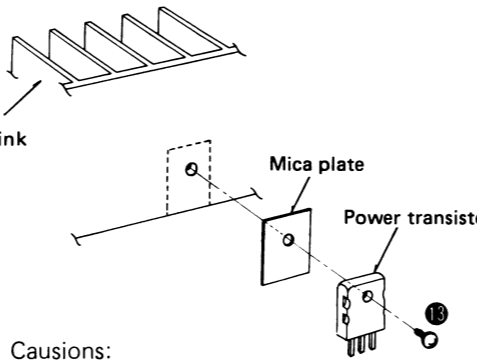
Bottom board (Red)
Front

- Remove the 3 setscrews (LorR channel).
- Unsolder the power transistors (LorR channel) and pull out the heat sink.



(Unsolder)
Heat sink

- Remove the 1 setscrew and pull out the power transistor.

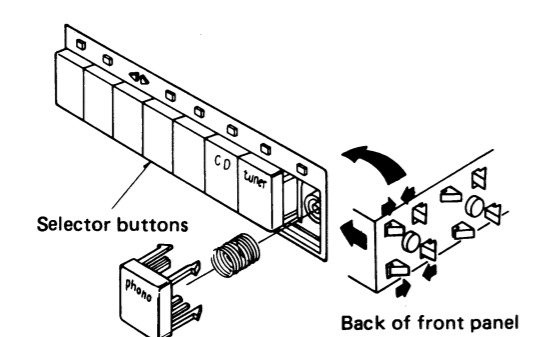


Mica plate
Power transistor

Cautions:
When mounting the power transistor onto the heat-sink, especially keep the following points in mind.

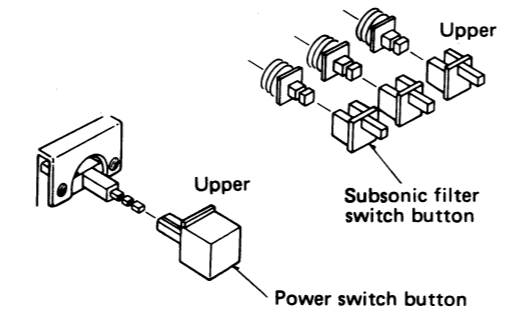
- Clean the area on the heat-sink side.
- Be sure to use new mica plate.
- Apply silicone compound (SZZOL15) to the both sides of mica plate.

Ref. No. 4	How to remove the selector buttons and push button
Procedure 1→2→4	<ul style="list-style-type: none"> Remove the claw that fastens the selector button from the back of front panel, and push it forward.



Selector buttons
Back of front panel

- Fit the power switch button and subsonic filter switch button in the position as fig.



Upper
Subsonic filter switch button
Upper
Power switch button

MEASUREMENTS AND ADJUSTMENTS

1. Idling (ICQ) Adjustment (after repairing the main amp.)

- After the repair, set the sound volume to maximal before tuning on the power switch, and connect nothing to the speaker terminals.
- Completely turn ICQ control (VR301, VR302) counter clockwise.
- Increase the voltage applied to the amplifier gradually from 0V by means of a power supply voltage controller, and make sure of the value in the Figure on page 4 before starting the adjustment.
- Connect the DC electronic voltmeter to TP301 (+) and TP303 (-) (Lch) or TP302 (+) and TP304 (-) (Rch).
- Adjust VR301 (Lch) or VR302 (Rch) so that the voltage is 23mV about 15 ~ 20 min. after power switch "on".

In this set, ICQ is controlled by microcomputer, and ICQ a little more than the normal level is applied by "PREHEAT" for about 15 sec. after power ON. After that, the output level and transistor temperature are detected by "AUTO", thereby automatically controlling ICQ.

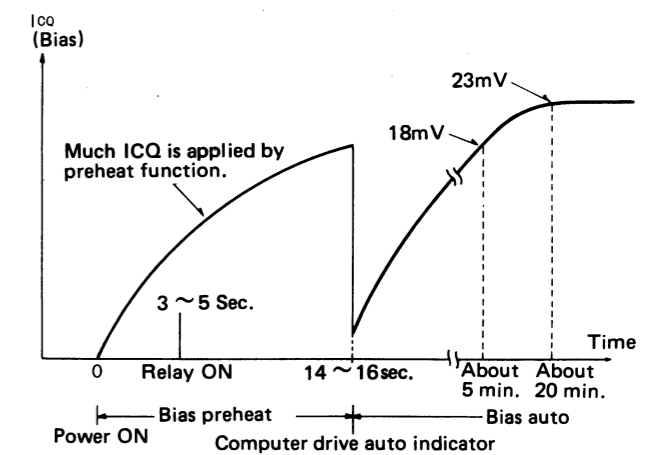
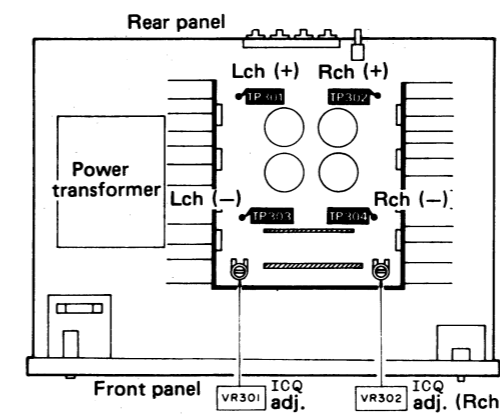
2. Check of DC Detection Circuit

- Set the input selector to the "tuner" position.
- Apply DC voltage +1V (to Lch) to the playback terminal of tape 1, -1V (to Rch) to the playback terminal of tape2.
- Set the input selector to the "tape 1" position.
- Make sure
 - relay is off.
 - "auto" indicator "on" goes out.
 - "safety operation" indicator blinks.

3. Check of Overload Detection and Protection Circuit

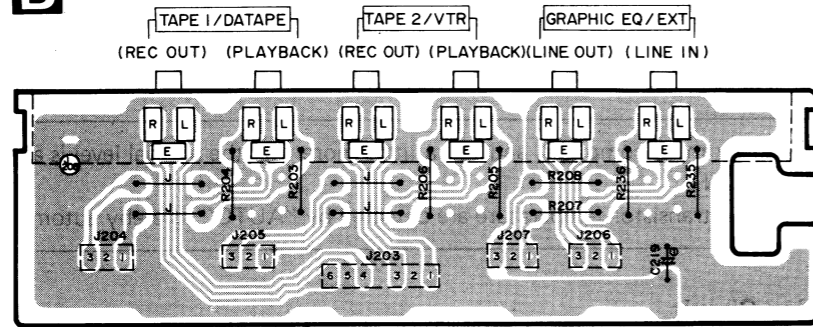
- Connect the audio oscillator to the aux1 terminals and apply the input signal of 1kHz to the terminals. Then adjust the output level of the audio oscillator so that the output level of the speaker terminals becomes 3V.
- Connect 0.33 Ω (5W) resistor to the remote speaker terminal.
- Make sure
 - relay is off.
 - "auto" indicator "on" goes out.
 - "safety operation" indicator blinks.

Adjustments points

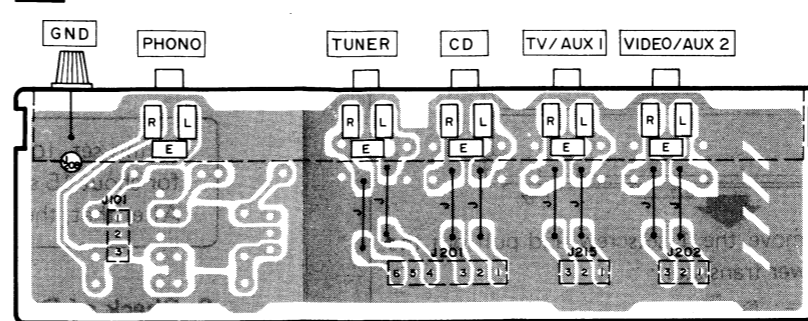


PRINTED CIRCUIT BOARDS

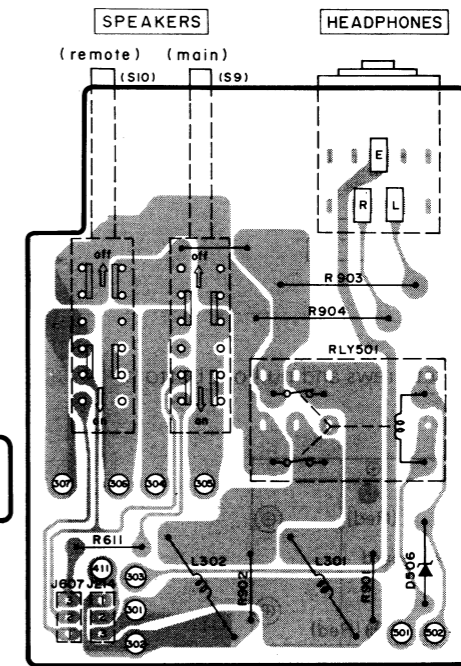
B In-Output circuit P.C.B.



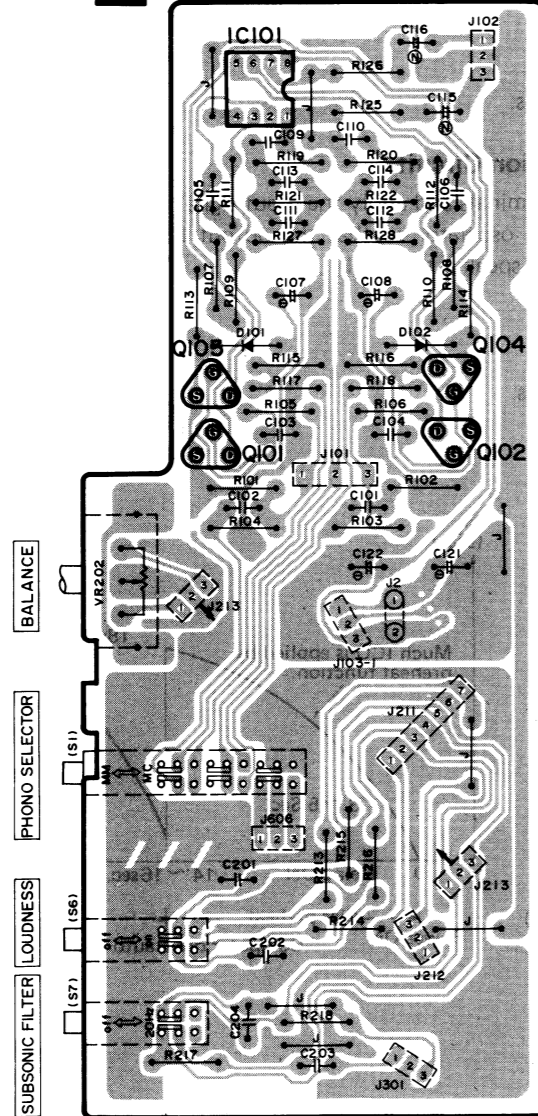
A Input circuit P.C.B.



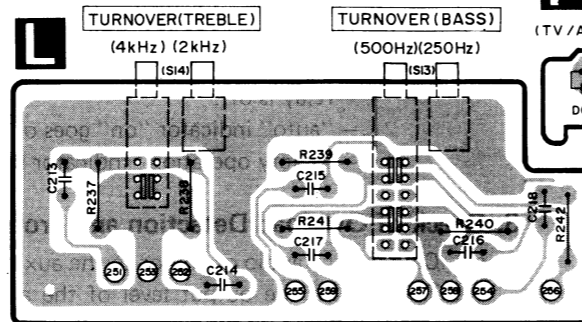
P Headphones / Speaker selector circuit P.C.B.



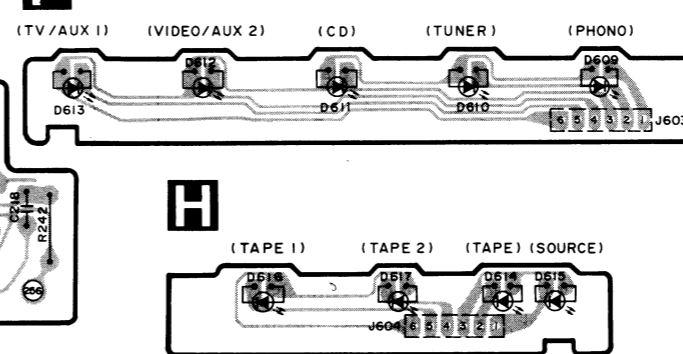
I Equalizer / Cartridge selector / Filter circuit P.C.B.



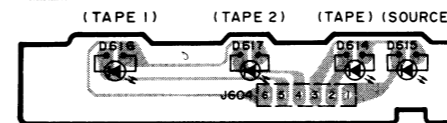
Turn over selector circuit P.C.B.



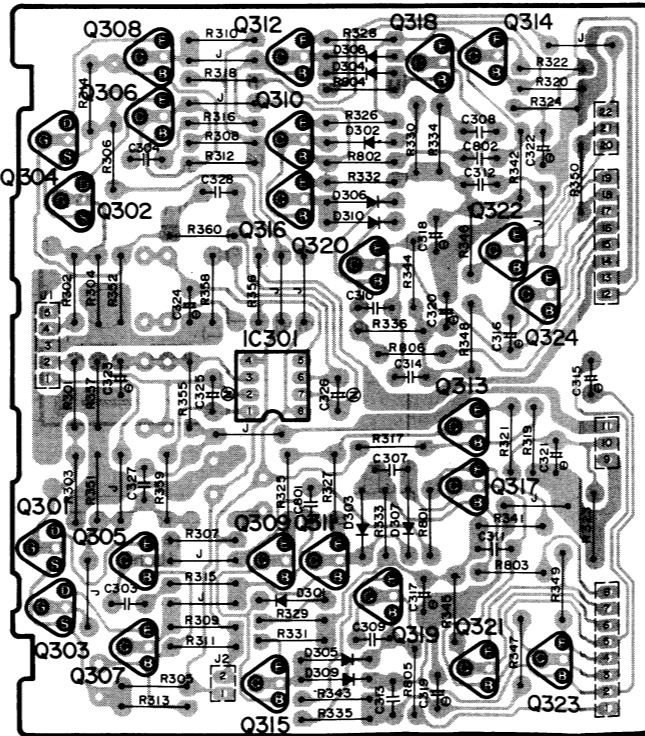
F



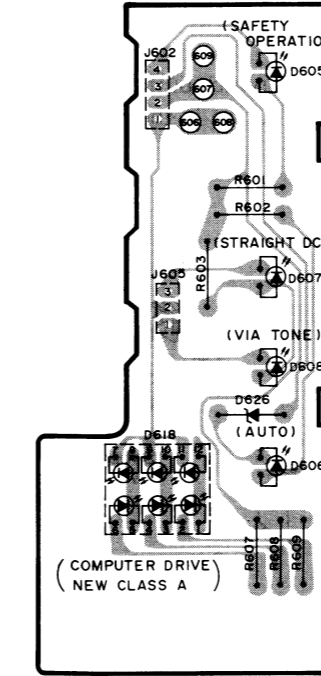
H



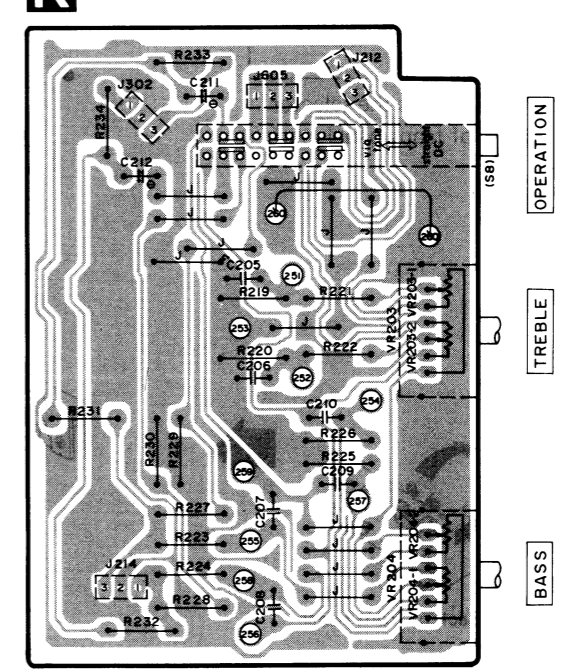
M Differential amp. / Cascade DC servo / Pri drive amp. P.C.B.



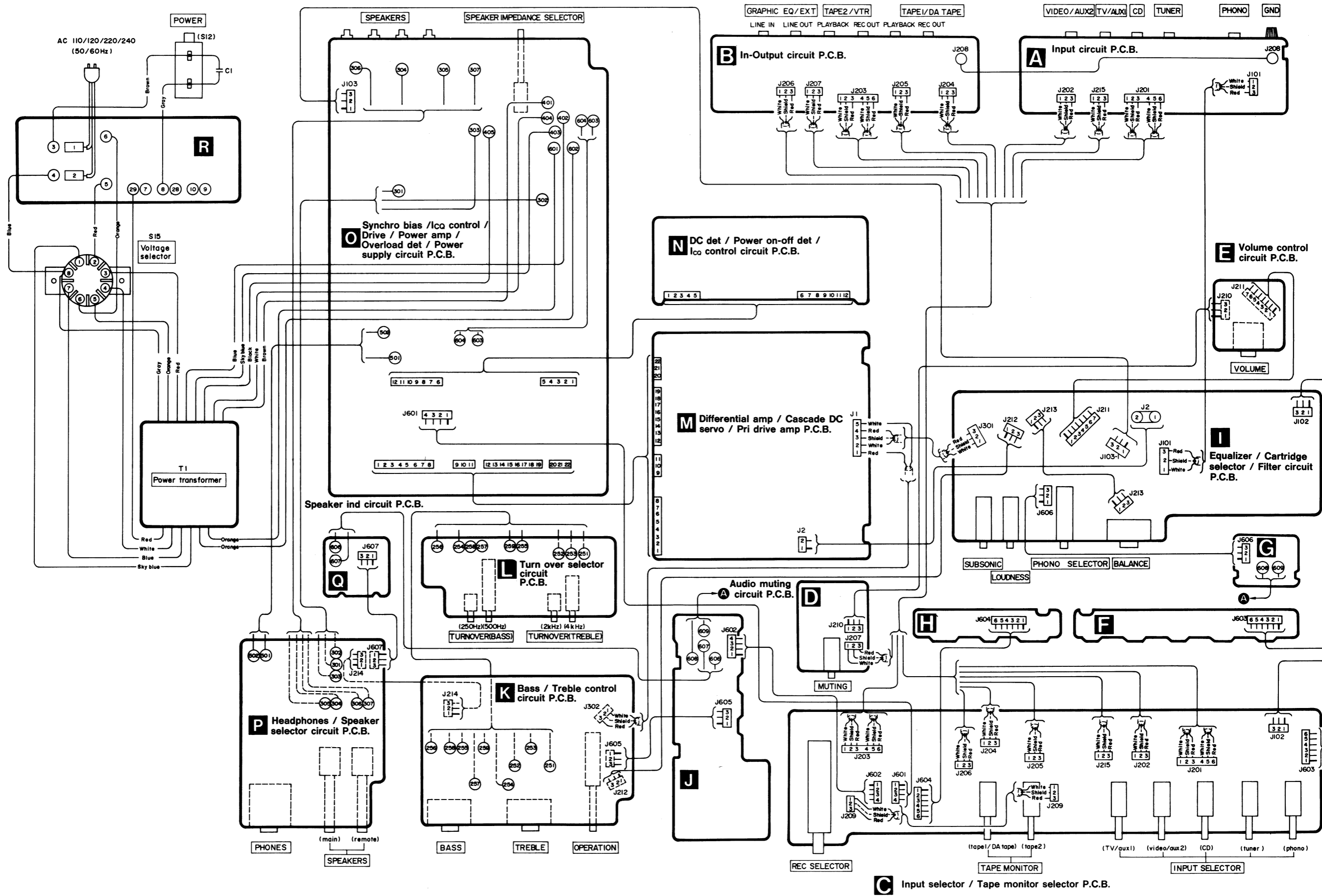
J



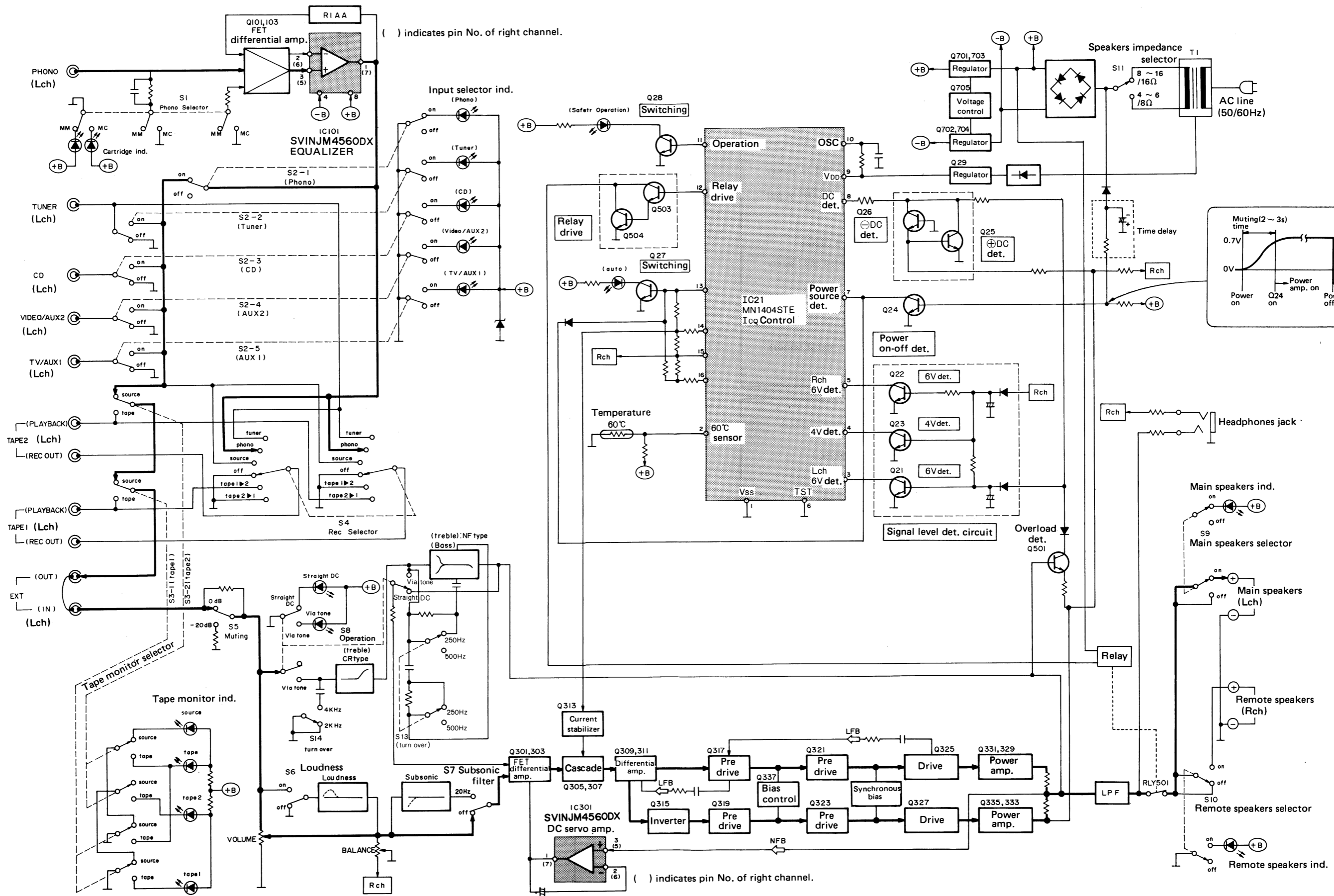
K Bass / Treble control circuit P.C.B.



WIRING CONNECTION DIAGRAM

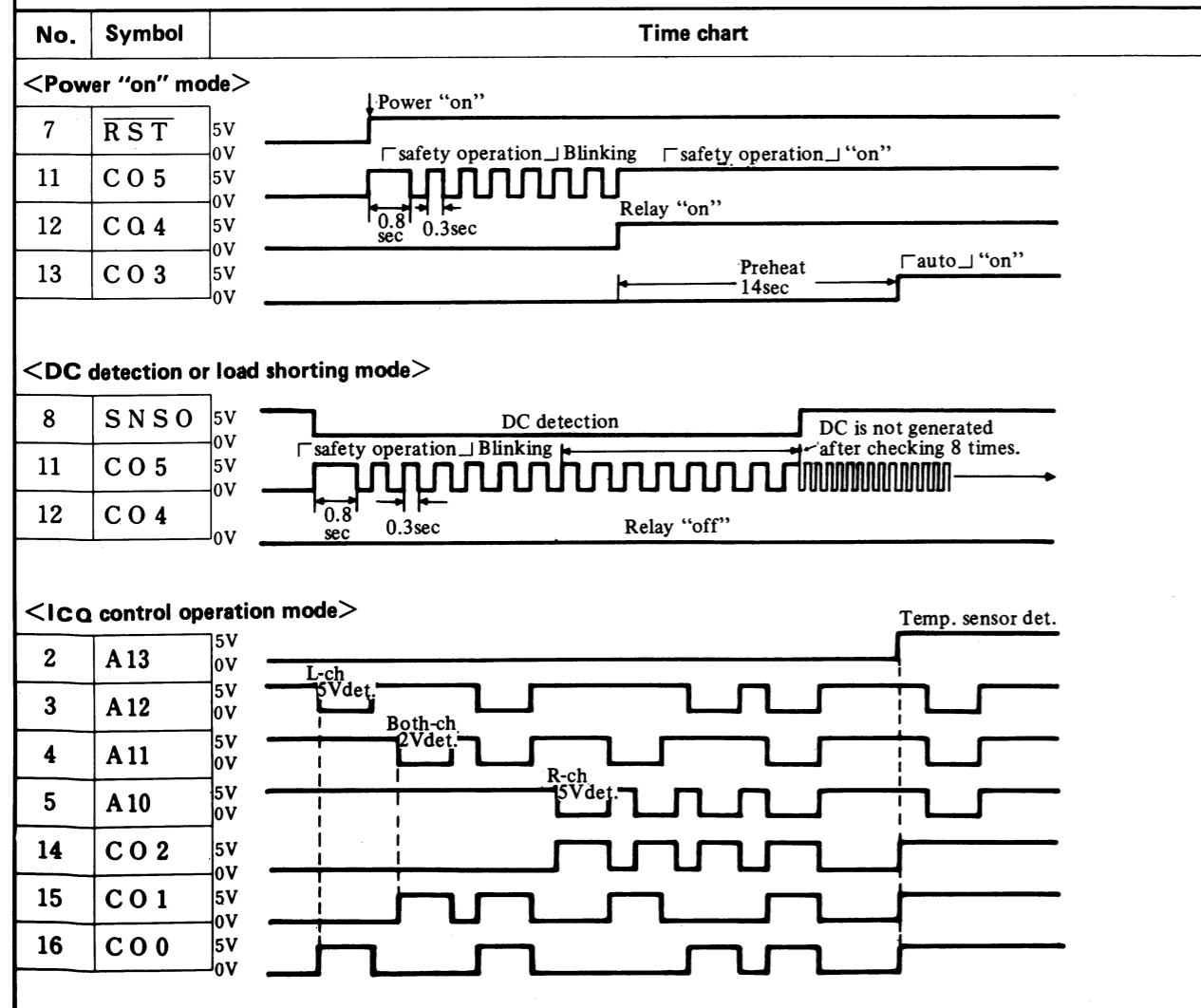


■ BLOCK DIAGRAM



■ TERMINAL NAMES AND FUNCTION OF I_{CC} CONTROL (MN1404STE)

No.	Symbol	Name of block	Description of terminal
1	VSS	Power supply input terminal	Grounded. (0V)
2	A13	Input port A	Temperature detection circuit. When 60°C (140°F) sensor of power amplifier operates, "H" is put in causing the outputs of terminals 14 ~ 16 to go "H".
3	A12		When effective output 6V signal sensor of L-ch power amplifier operates, "L" is put in causing the output of terminal 14 to go "H".
4	A11		When effective output 4V signal sensors of both-ch power amplifiers operate, "L" is put in causing the output of terminal 15 to go "H".
5	A10		When effective output 6V signal sensor of R-ch power amplifier operates, "L" is put in causing the output of terminal 16 to go "H".
6	TST	Test input terminal	Terminal for testing LSI. (Ground)
7	RST	Reset input terminal	All outputs are cleared or reset with input at "L". (It is connected to power supply circuit)
8	SNSO	Sensor input terminal	When overload detection circuit of power amplifier output operates, "H" is put in causing the output of terminal 12 to go "L".
9	VDD	Power supply input terminal	Apply 5V.
10	OSC	OSC input terminal	Clock signal (about 415kHz) can be obtained by internal oscillation circuit.
11	CO5	Output port C	When protection circuit operates, "H" and "L" outputs are repeated and "safety operation" indicator blinks.
12	CO4		Output relay and meter relay turn ON with "H" output.
13	CO3		Indicator "auto" lights up at "H".
14	CO2		I _{CC} control signal is emitted from A input port (temp. sensor, signal sensor). ("H" output)
15	CO1		
16	CO0		



■ SCHEMATIC DIAGRAM

(This schematic diagram may be modified at any time with the development of new technology.)

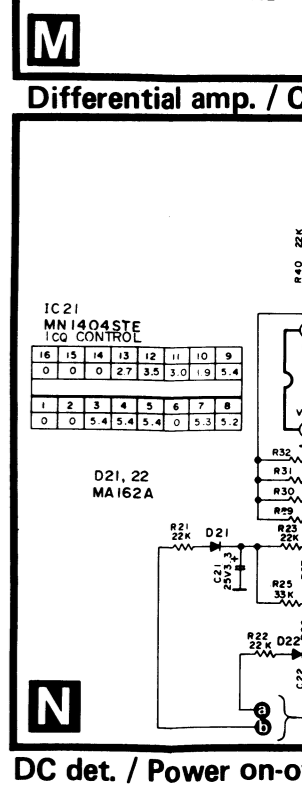
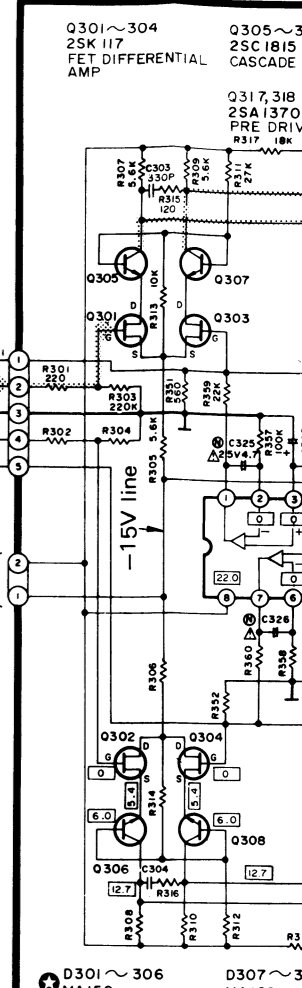
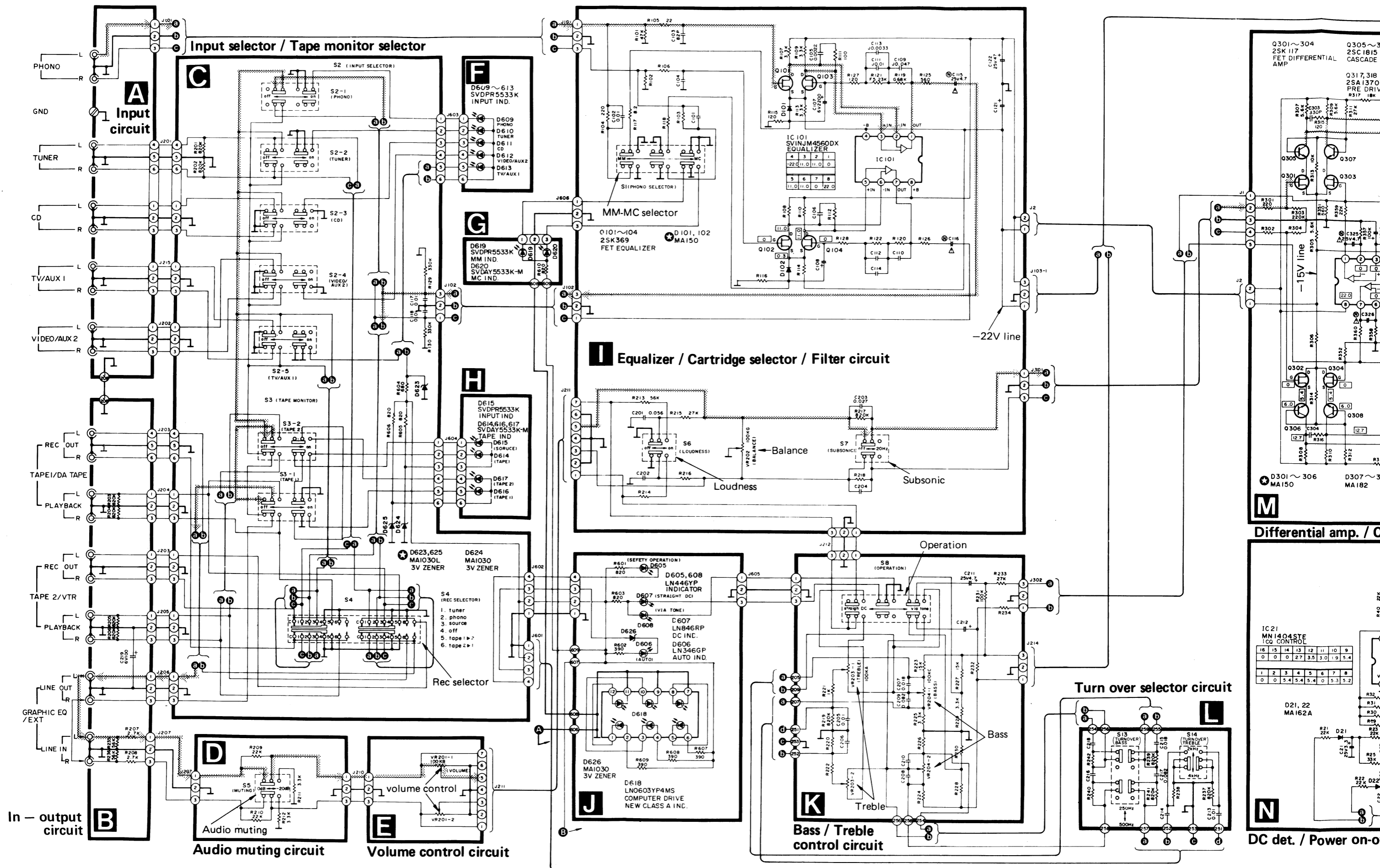
* The part No. of transistors, IC and diodes mentioned in the schematic diagram stand for production part No. with mark, the production part No. are different from the replacement part No. Therefore, when placing an order for replacement part please use the part No. in the replacement part list.

Note :

- S 1** : Phono selector (Cartridge) switch in "MM" position.
- S2-1 ~ S2-5** : Input selector switch in "phono" position.
S2-1 : phono, S2-2 : tuner, S2-3 : CD, S2-4 : video/aux 2, S2-5 : TV/aux 1
- S3-1 ~ S3-2** : Tape input selector switch in "off" position.
S3-1 : tape 1/Digital /audio tape
S3-2 : tape 2
- S 4** : Rec selector switch in "off" position. (tape 2 ▶ 1 ↔ tape 1 ▶ 2 ↔ off ↔ source ↔ phono ↔ tuner)
- S 5** : Muting switch in "OdB" position. (OdB ↔ 20dB)
- S 6** : Loudness switch in "off" position.
- S 7** : Subsonic filter switch in "off" position. (off ↔ 20Hz)
- S 8** : Operation switch in "straight DC" position. (straight DC ↔ via tone)
- S 9** : Main speaker selector switch in "on" position.
- S10** : Remote speaker selector switch in "off" position.
- S11** : Impedance selector switch in "4/8 Ω" position. (4/8 Ω ↔ 6 ~ 16/12 ~ 16 Ω)
- S12** : Power switch in "on" position.
- S13** : Turnover (low) selector switch in "500Hz" position.
- S14** : Turnover (High) selector switch in "2kHz" position.
- S15** : Voltage selector switch in "220V" position. (110V ↔ 120V ↔ 220V ↔ 240V)
- This is the basic circuit diagram (For continental Europe) of this unit.
Note that part of the circuit is subject to change depending on the areas.
- Regarding the circuits to be changed in the basic circuit diagram (For continental Europe) and related areas [XA], [PA], [PE] and [EGA] refer to the separate service manual (Order No. HAD84042754C9-A).

■ TERMINAL GUIDE OF TRANSISTORS, IC'S AND DIODE

 MN1404STE 16 pin SVINJM4560DX 8 pin	2SK369, 2SK117	SVDAY5533K SVDPR5533K
	 D, S, G	 A, K
2SA1112, 2SC2592	2SK34-D1	MA1062, MA182 MA1030
 B, C, E	 G, S, D	 K, A
2SA1370, 2SC1815 2SC1845, 2SC3467	2SA1301, 2SC3280	SVDSR1K2, SVDS3V20
 E, C, B	 B, C, E	 K, A
LN0603GP3G, LN0603YP4MS	MA162, MA27W-A	2SC3298A, 2SA1306
 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1	 K, A	 B, C, E
		MA150 OA90A-R
		 K, A



RESISTORS, CAPACITORS & REPLACEMENT PARTS LIST

Notes:

- Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
- Important safety notice: Components identified by Δ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
- The "S" mark is service standard parts and may differ from production parts.
- The unit of resistance is Ω (ohm). K=1000 Ω , M=1000k Ω .
- The unit of capacitance is μF (microfarad). P=10⁻⁶ μF .
- \ominus -marked parts are used for black only, while \circ -marked parts are for silver type only.
- Part other than \ominus - and \circ -marked are used for both black and silver type.
- Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.
- The parenthesized numbers in the column of description stand for the quantity per set.

Numbering System of Resistor

Example

ERD	25	F	J	101
Type	Wattage	Shape	Tolerance	Value
ERG	2	AN	J	2R2
Type	Wattage	Shape	Tolerance	Value

Resistor Type	Wattage	Tolerance
ERD : Carbon	10 : 1/8W	J : $\pm 5\%$
ERG : Metal Oxide	25 : 1/4W	G : $\pm 2\%$
ERO : Metal Film	S1 : 1/2W	K : $\pm 10\%$
	2 : 2W	
ERF : Non-flammable	3 : 3W	

ERD10TLJ□□□ → Chip type carbon.

Numbering System of Capacitor

Example

ECKD	1H	103	Z	F
Type	Voltage	Value	Tolerance	Peculiarity
ECEA	50	M	R47	R
Type	Voltage	Peculiarity use	Value	Special use

Capacitor Type	Voltage		Tolerance
	ECEA Type	Others	
ECEA : Electrolytic	0J : 6.3V	1H : 50V DC	C : $\pm 0.25\mu F$
ECET : Electrolytic	1A : 10V	KC : 400V AC	K : $\pm 10\%$
ECEA...N : Non Polar Electrolytic	1C : 16V	2H : 500V DC	Z : +80%, -20%
ECCD : Ceramic	1E : 25V		P : +100%, -0%
ECKD : Ceramic	1V : 35V		D : $\pm 0.5\mu F$
ECQM : Polyester	1H : 50V		J : $\pm 5\%$
ECQE : Polyester	50 : 50V		
	2 : 100V		

RESISTORS

Ref. No.	Part No.	Value	Ref. No.	Part No.	Value	Ref. No.	Part No.	Value	Ref. No.	Part No.	Value
R21, 22	ERD10TLJ223U	22K	R205, 206	ERD25FJ824	820K	R307, 308	ERD25FJ562	5.6K	R387, 388	ERD2FCJ2R2	2.2
R23, 24	ERD10TLJ223U	22K	R207, 208	ERD25FJ272	2.7K	R309, 310	ERD25FJ562	5.6K	R391, 392	ERG2ANJ100	10
R25, 26	ERD10TLJ333U	33K	R209, 210	ERD25TJ223	22K	R311, 312	ERD25TJ273	27K	R393, 394	ERD25FJ100	10
R27, 28	ERD10TLJ123U	12K	R211, 212	ERD25FJ332	3.3K	R313, 314	ERD25FJ103	10K	R395, 396	ERD25FJ561	560
R29	ERD25FJ472	4.7K	R213, 214	ERD25FJ563	56K	R315, 316	ERD25FJ121	120	R397, 398	ERD25FJ182	1.8K
R30, 31	ERD10TLJ103U	10K	R215, 216	ERD25TJ273	27K	R317, 318	ERD25TJ183	18K	R401, 402	ERD25FJ2R2	2.2
R32	ERD25FJ103	10K	R217, 218	ERD25TJ824	820K	R319, 320	ERD25FJ103	10K	R403, 404	ERD25FJ2R2	2.2
R33	ERD10TLJ102U	1K	R219, 220	ERD25TJ824	820K	R321, 322	ERD25FJ102	1K	R501, 502	ERD25FJ222	2.2K
R34, 35	ERD10TLJ104U	100K	R221, 222	ERD25FJ102	1K	R323, 324	ERD25FJ222	2.2K	R503, 504	ERD25FJ681	680
R36	ERD10TLJ333U	33K	R223, 224	ERD25TJ153	15K	R325, 326	ERD25FJ270	27	R505, 506	ERD25FJ331	330
R37, 38	ERD25FJ822	8.2K	R225, 226	ERD25FJ332	3.3K	R327, 328	ERD25FJ270	27	R509	ERD25TJ223	22K
R39	ERD25TJ394	390K	R227, 228	ERD25TJ153	15K	R329, 330	ERD25FJ102	1K	R510	ERG3ANJ102	1K
R40	ERD25TJ223	22K	R229, 230	ERD25FJ332	3.3K	R331, 332	ERD25FJ102	1K	R511	ERD25TJ153	15K
R41, 42	ERD10TLJ223U	22K	R231, 232	ERD25TJ104	100K	R333, 334	ERD25FJ102	1K	R512	ERD25TJ104	100K
R43	ERD10TLJ223U	22K	R233, 234	ERD25TJ273	27K	R335, 336	ERD25FJ102	1K	R601	ERD25FJ821	820
R44, 45	ERD25TJ223	22K	R235, 236	ERD25TJ563	56K	R341, 342	ERDS1FJ101	100	R602	ERD25FJ391	390
R46	ERD10TLJ392U	3.9K	R237, 238	ERD25TJ824	820K	R343, 344	ERDS1FJ101	100	R603	ERD25FJ821	820
R47	ERD25FJ472	4.7K	R239, 240	ERD25TJ824	820K	R345, 346	ERD2FCJ6R8	6.8	R604	ERD25FJ681	680
R48	ERD10TLJ392U	3.9K	R241, 242	ERD25TJ824	820K	R347, 348	ERD2FCG101	100	R605, 606	ERD25FJ821	820
R49	ERD10TLJ153U	15K	R251, 252	ERD25FJ122	1.2K	R349, 350	ERD25FJ102	1K	R607, 608	ERD25FJ391	390
R50	ERD10TLJ103U	10K	R253, 254	ERD25FJ122	1.2K	R351, 352	ERD25FJ561	560	R609	ERD25FJ391	390
R101, 102	ERD25TJ473	47K	(EGA)only	ERD25FJ122	2.2K	R355, 356	ERD25TJ104	100K	R610, 611	ERD25FJ821	820
R103, 104	ERD25FJ221	220	R255, 256	ERD25FJ222	2.2K	R357, 358	ERD25TJ104	100K	R612	ERD25FJ821	820
R105, 106	ERD25FJ220	22	(EGA)only	ERD25FJ222	2.2K	R359, 360	ERD25TJ223	22K	R613	ERD25FJ470	47
R107, 108	ERD25FJ332	3.3K	R257, 258	ERD25FJ222	2.2K	R361, 362	ERD25TJ823	82K	R701, 702	ERG3ANJ561	560
R109, 110	ERD25FJ332	3.3K	(EGA)only	ERD25FJ222	2.2K	R363, 364	ERD25FJ331	330	R705	ERD25FJ101	100
R111, 112	ERD25FJ101	100	R259, 260	ERD25FJ222	2.2K	R365, 366	ERD25FJ2R2	2.2	R706	ERD25TJ153	15K
R113, 114	ERD25FJ332	3.3K	(EGA)only	ERD25FJ222	2.2K	R367, 368	ERD25FJ2R2	2.2	R707	ERD25FJ681	680
R115, 116	ERD25FJ121	120	R261, 262	ERD25FJ222	2.2K	R369, 370	ERD25FJ2R2	2.2	R708	ERD25TJ153	15K
R117, 118	ERD25FJ8R2	8.2	(EGA)only	ERD25FJ222	2.2K	R371, 372	ERD25FJ2R2	2.2	R709, 710	ERD2FCJ6R8	6.8
R119, 120	ERD25TKG802	68K	R263, 264	ERD25FJ222	2.2K	R373, 374	ERF3RKR33	0.33	R711, 712	ERG2ANJ2R2	2.2K
R121, 122	ERD25TKF5231	5.23K	(EGA)only	ERD25FJ222	2.2K	R375, 376	ERF3RKR33	0.33	R801, 802	ERD25TJ273	27K
R125, 126	ERD25FJ561	560	R265, 266	ERD25FJ222	2.2K	R377, 378	ERF3RKR33	0.33	R803, 804	ERD25TJ333	33K
R127, 128	ERD25FJ121	120	(EGA)only	ERD25FJ222	2.2K	R379, 380	ERF3RKR33	0.33	R805, 806	ERD25TJ333	33K
R129, 130	ERD25TJ334	330K	R301, 302	ERD25FJ221	220	R381, 382	ERD25TJ474	470K	R901, 902	ERD2FCG100	10
R201, 202	ERD25TJ824	820K	R303, 304	ERD25TJ224	220K	R383, 384	ERD25TJ474	470K	R903, 904	ERG2ANJ331	330
R203, 204	ERD25TJ824	820K	R305, 306	ERD25FJ562	5.6K	R385, 386	ERD2FCJ2R2	2.2			

CAPACITORS

Ref. No.	Part No.	Value	Ref. No.	Part No.	Value	Ref. No.	Part No.	Value	Ref. No.	Part No.	Value
C1	ECKDKC103PF	0.01	C115, 116	ECEA1E4N7S	4.7	C303, 304	ECKD1H331KB	330P	C353	ECCD1H150K	15P
C2(EGA)only	ECKDKC103PF	0.01	C117, 118	ECQM1H103JV	0.01	C307, 308	ECCD2H070D	7P	(EGA)only	ECCD2H070D	7P
C4, 5	ECKDKC222MF	0.0022	C121, 122	ECEA1VU470	47	C309, 310	ECCD2H070D	7P	C354(EGA)only	ECQM1H222KV	0.0022
(EGA)only	ECKDKC222MF	0.0022	C201, 202	ECQM1H563KV	0.056	C311, 312	ECCD2H560K	56P	C355, 356	ECQM1H103KV	0.01
C6, 7	ECKDKC222MF	0.0022	C203, 204	ECQM1H273KV	0.027	C313, 314	ECCD2H560K	56P	(EGA)only	ECQM1H103KV	0.01
(EGA)only	ECKDKC222MF	0.0022	C205, 206	ECQM1H103KV	0.01	C315, 316	ECEA1HU330	33	C357, 358	ECQM1H103KV	0.01
C21, 22	ECEA1EU3R3	3.3	C207, 208	ECQM1H183KV	0.018	C317, 318	ECEA2AU4R7	4.7	(EGA)only	ECQM1H103KV	0.01
C23	ECEA1CU100	10	C209, 210	ECQM1H823KV	0.082	C319, 320	ECEA2AU010	1	C401, 402	ECET1KV822Z	8200
C24	ECEA1CU101	100	C211, 212	ECEA1EU4R7	4.7	C321, 322	ECEA1CU100	10	C403, 404	ECET1KV822Z	8200
C25	ECEA1HUR47	0.47	C213, 214	ECQM1H103KV	0.01	C323, 324	ECEA1CU100	10	C405	ECEA2AU220	22
C26	ECCD1H121K	120P	C215, 216	ECQM1H183KV	0.018	C325, 326	ECEA1E4N7S	4.7	C501	ECEA1EU3R3	3.3
C27	ECEAOJU101	100	C217, 218	ECQM1H823KV	0.082	C327, 328	ECCD1H404CC	4P	C601	ECEA1CG102	1000
C28	ECKD1H223ZF	0.022	C219	ECEAOJU101	100	C331, 332	ECKD1H681KB	680P	C602	ECKD1H103ZF	0.01
C101, 102	ECKD1H103ZF	0.01	C233, 234	ECKD1H331KB	330P	C333, 334	ECKD1H681KB	680P	C703, 704	ECEA1J5100	10
C103, 104	ECCD1H820K	82P	(EGA)only	ECKD1H331KB	330P	C335, 336	ECCD1H820K	82P	C707	ECEA1HU100	10
C105, 106	ECKD1H222KB	0.0022	C235, 236	ECKD1H331KB	330P	C337, 338	ECCD1H820K	82P	C708	ECEA1HG100S	10
C107, 108	ECEAOJU222	2200	(EGA)only	ECKD1H331KB	330P	C339, 340	ECQM1H473KV	0.047	C709	ECEA1EU100	10
C109, 110	ECQM1H473JV	0.047	C237, 238	ECKD1H331KB	330P	C341, 342	ECQM1H473KV	0.047	C710(EGA)only	ECQE2104KS	0.1
C111, 112	ECQM1H103JV	0.01	C239, 240	ECKD1H331KB	330P	C351, 352	ECQM1H222KV	0.0022	C801, 802	ECCD1H220K	22P
C113, 114	ECQM1H332JV	0.0033	(EGA)only	ECKD1H331KB	330P						

INTEGRATED CIRCUITS

Ref. No.	Part No.	Part Name & Description
IC21	MNI404STE	ICQ Control
IC101, 301	SVINJM4560DX	Equalizer, DC Servo

TRANSISTORS

Ref. No.	Part No.	Value	Ref. No.	Part No.	Value
Q21~29	2SC1815-Y	Switching, Cascade, Current Stabilizer Bias Control, Regulator	Q309~312	2SC1845-E	Differential Amp, Overload Detector, Switching
305~308, 313			501~504		
314, 337, 338					
705					
Q101~104	2SK369-GR	FET Equalizer	Q315, 316, 323, 324	2SA1370-D	Current Mirror, Drive
Q301~304	2SK117-GR	FET Differential Amp	Q317, 318	2SA1370-D	Pre Drive
			Q319, 320	2SC3467-D	Pre Drive
			Q321, 322	2SC3467-D	Drive
			Q325, 326	2SC3298A-Y	Drive
			Q327, 328	2SA1306A-Y	Drive
			Q329~332	2SC3280-R	Power Amp.
			Q333~336	2SA1301-R	Power Amp.
			Q701	2SC2592-R	Regulator
			Q702	2SA1112-R	Regulator
			Q703, 704	2SK34-D1	FET Regulator

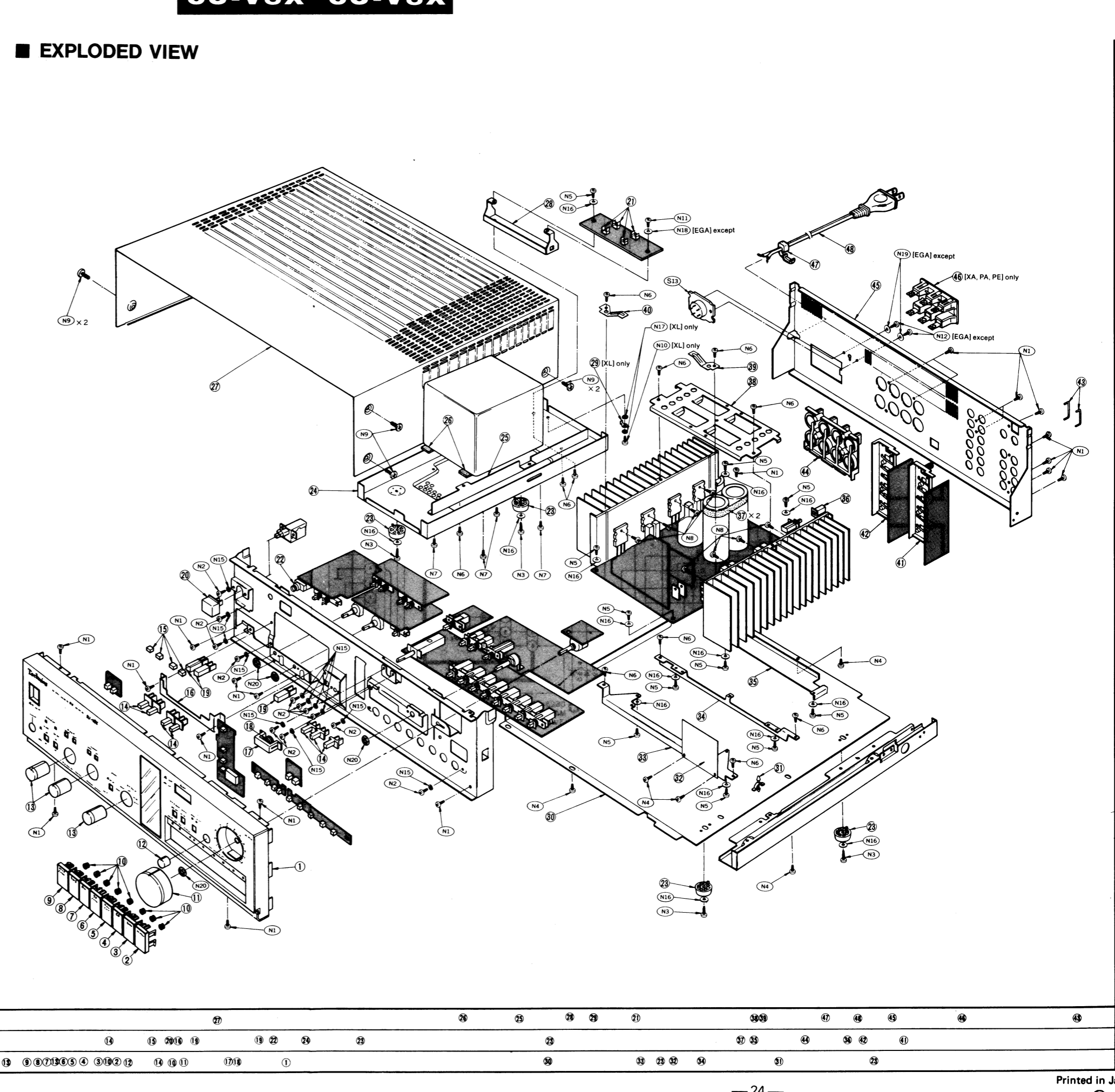
DIODES

Ref. No.	Part No.	Value	Ref. No.	Part No.	Value
D21, 22	MA162A	Zener, 6.2V			

EXPLODED VIEW

Ref. No.	Part No.	Part Name & Description
CABINET and CHASSIS PARTS		
17	SBC643	Button, Muting (Silver Type) (1)
17	SBC643-2	Button, Muting (Black Type) (1)
18	SUS123-3	Spring, Button (1)
19	SBC399T	Button, Speaker Operation (3)
20	SBC627	Button, Power (1)
21 (EGA) only	SJT347	Holder, Fuse (2)
21 Other areas	SJT347	Holder, Fuse (4)
22	SJJ71B	Jack, Headphone (1)
23	SKL249	Foot (4)
24	SML107-8	Bracket, Power Transformer (1)
25	SUW2163-1	Bracket (1)
26	SHG6355	Rubber, Power Transformer (2)
27 (EK) only	SKCUV8X-SK	Cabinet (Silver Type) (1)
27 Other areas	SKC1590S2	Cabinet (Silver Type) (1)
27 (EK) only	SKCUV8X-KK	Cabinet (Black Type) (1)
27 Other areas	SKC1590BB2	Cabinet (Black Type) (1)
28	SUW2828	Bracket, P. C. B. (1)
29 (XL) only	RJT202B	Terminal (1)
30	SKU8990-4	Bottom Board (1)
31	SHR9720	Holder, P. C. B. (1)
32	SMC1137	Bracket (1)
33	SUW2159	Bracket (1)
34	SUW2165	Bracket (1)
35	SUW2161	Bracket (1)
36	SBC527	Button, Speaker Impedance (1)
37	SHS2445	Spacer (2)
38	SMN1895-1	Bracket, Electrolytic Capacitor (1)
39	SUW2153-2	Bracket (1)
40	SUW2153-3	Bracket (1)
41	SJF3059-8N	Terminal Board (1)
42	SJF3059-2N	Terminal Board (1)
43	SJP9205-2	Pin (2)
44	SJF4815-1	Terminal, Speaker (1)
45 (EK) only	SGPUV8X-SK	Rear Panel, Ass'y (1)
45 (EGA) only	SGPUV8X-SG	Rear Panel, Ass'y (1)
45 (XL) only	SGPUV8X-SL	Rear Panel, Ass'y (1)
45 (XA, PA, PE)	SGPUV8X-SX	Rear Panel, Ass'y (1)
45 Other areas	SGPUV8X-SE	Rear Panel, Ass'y (1)
46 (XA, PA, PE) only	SJS601-3	Socket, AC Outlet (1)
47 (EK)	SHR129	Bushing, AC Cord (1)
47 (XL)	SHR131	Bushing, AC Cord (1)
47 Other areas	SHR127	Bushing, AC Cord (1)
48 (EW, XA)	SJA111	AC Cord (1)
48 (EK)	QFC1205M	AC Cord (1)
48 (XL)	QFC1207MA	AC Cord (1)
48 (PA, PE)	RJA52Z	AC Cord (1)
48 Other areas	SJA97	AC Cord (1)
49	SHR301	Clamper (10)

Ref. No.	Part No.	Part Name & Description
SCREWS		
N8	XTW3+12J	Tapping, $\varnothing 3 \times 12$ (8)
N9	SNE2095-4	Tapping (Silver Type) (6)
N9	SNE2095-5	Tapping (Black Type) (6)
N10 (XL) only	XTN3+8B	Tapping, $\varnothing 3 \times 8$ (1)
N11 (EGA) only	XTBS3+8BFZ1	Tapping with Detent, $\varnothing 3 \times 8$ (1)
N11 Other areas	XTN3+8B	Tapping, $\varnothing 3 \times 8$ (1)
N12 (EGA) except	XSN3+6S	$\varnothing 3 \times 6$ (2)
WASHERS		
N15	XWA3B	Spring, $\varnothing 3$ (12)
N16	XWG3	Plain, $\varnothing 3$ (15)
N17 (XL) only	XWC3B	External Toothed Lock, $\varnothing 3$ (2)
N18 (EGA) except	XWG3	Plain, $\varnothing 3$ (1)
N19 (EGA) except	XWA3B	Spring, $\varnothing 3$ (2)
NUT		
N20	SNE4021	(4)
ACCESSORIES		
A1 (XA) only	SJP5213-1	Plug (1)
A2 (XA) only	SJP5215	Plug (1)
A3 (PA, PE) only	SJP9215	Plug (1)
A4 (EGA) only	SQF12057	Instruction Book (1)
A4 (XA) only	SQF12058	Instruction Book (1)
A4 (PA, PE) only	SQF12059	Instruction Book (1)
A4 Other areas	SQF12056	Instruction Book (1)
PACKING PARTS		
P1	SPP730	Polyethylene Bag (1)
P2 (EH, EK, XA, PA, PE)	SPS4289-1	Pad, Left Side (1)
P2 Other areas	SPS4289-6	Pad, Left Side (1)
P3 (EH, EK, XA, PA, PE)	SPS4291-2	Pad, Right Side (1)
P3 Other areas	SPS4291-6	Pad, Right Side (1)
P4 (EF) only	SPG4822	Carton Box (1)
P4 (EW, XA, PA, PE)	SPG4823	Carton Box (1)
P4 Other areas	SPG4821	Carton Box (1)
P4 (EK) only	SPG4838	Carton Box (Silver Type) (1)
P4 (EK) only	SPG4838-1	Carton Box (Black Type) (1)
P5	SGK1411	Label (Silver Type only) (2)



13	9	8	7	13	6	5	4	3	10	2	12	14	10	11	17	18	1	20	26	25	28	29	21	33	39	47	48	45	46	43	