

# Service Manual

Stereo Integrated Amplifier

Amplifier

SU-X33

Color

(K) . . . Black Type



Color	Area
(K)	[EX] . . . . Continental Europe
(K)	[EH] . . . . Holland
(K)	[EB] . . . . Belgium
(K)	[EF] . . . . France
(K)	[EK] . . . . United Kingdom
(K)	[EG] . . . . F.R. Germany
(K)	[Ei] . . . . Italy
(K)	[XL] . . . . Australia
(K)	[XA] . . . . Asia, Latin America, Middle Near East, Africa & Oceania
(K)	[PC] . . . . European Audio Club

## SPECIFICATIONS

(DIN 45 500)

### ■ AMPLIFIER SECTION

1 kHz continuous power output both channels driven	2 × 30W (8Ω)
Total harmonic distortion half power at 1 kHz	0.07% (8Ω)
Damping factor	22 (8Ω)
Input sensitivity and impedance PHONO, TUNER, CD, AUX, TAPE	150 mV/22kΩ
S/N rated power (8Ω) PHONO, TUNER, CD, AUX, TAPE	85 dB (IHF, A: 90 dB)
Frequency response PHONO, TUNER, CD, AUX, TAPE	10 Hz~60 kHz (-3 dB)
Graphic equalizer frequency	80 Hz, 250 Hz, 1 kHz, 4 kHz, 12.5 kHz
Graphic equalizer range of variation	±10 dB
Muting	-20 dB
Output voltage REC OUT	150 mV

Channel balance, AUX 250 Hz~6,300 Hz	±1 dB
Channel separation, AUX 1 kHz	55 dB
Headphones output level and impedance	360 mV/330Ω
Load impedance	8Ω~16Ω

### ■ GENERAL

Power consumption	170W
Power supply	
For Australia	AC 50 Hz/60 Hz, 240V
For continental Europe	AC 50 Hz/60 Hz, 220V
For others	AC 50 Hz/60 Hz, 110V/127V/220V/240V
Batteries (Remote-control transmitter)	DC 3.0V (2 "AA" size batteries, R6 or equivalent)
Dimensions (W×H×D)	315 × 75 × 247 mm (12-13/32" × 2-15/16" × 9-23/32")
Weight	3.9 kg (8.6 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.

### NOTES :

1. The power of the tuner in this system are supplied through the amplifier. When servicing these components, prepare an amplifier or an external power supply. (For how to use the fixture, refer to the Service Manual of tuner and tape deck.)
2. Prepare a transmitter and an amplifier when checking each model of system for its performance using the remote control.

# Technics

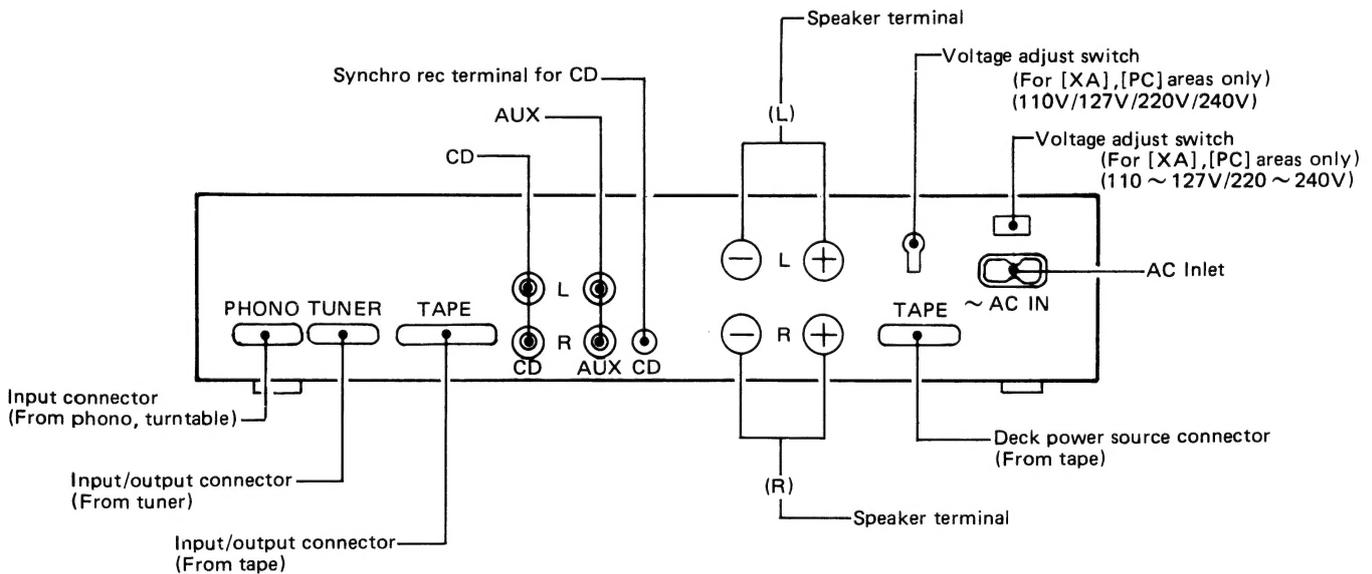
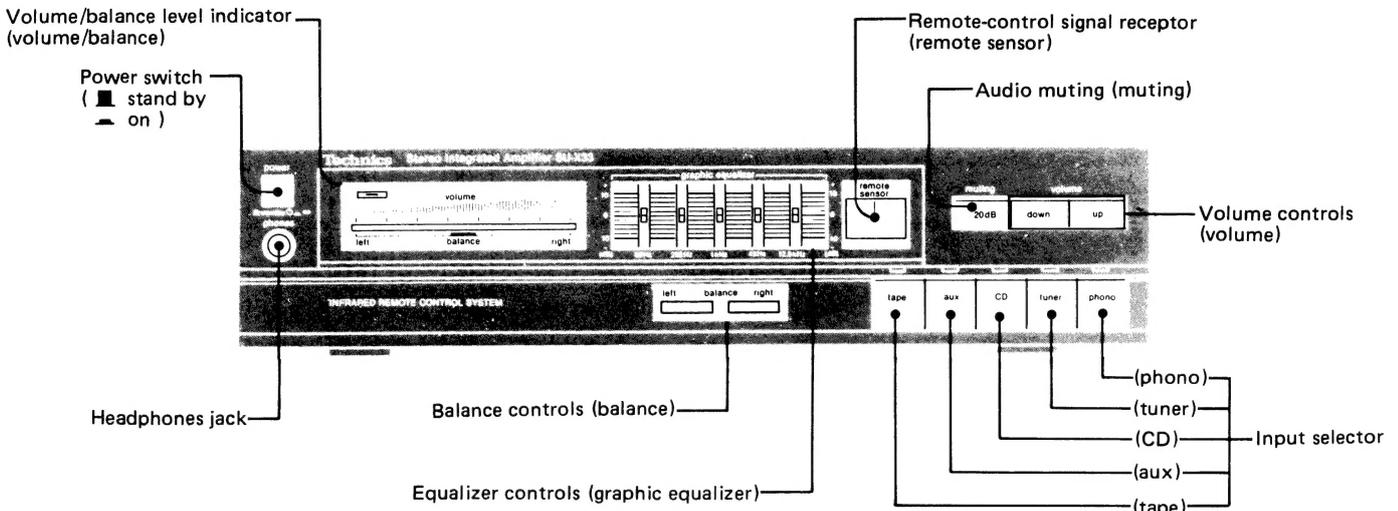
Matsushita Electric Trading Co., Ltd.  
P.O. Box 288, Central Osaka Japan

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## LOCATION OF CONTROLS



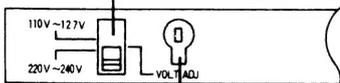
### Before use

**WARNING:** To avoid any serious damages, strongly be sure the voltage setting of the both voltage adjust switches according to the area. Be sure to disconnect the mains cord before adjusting both voltage adjust switches. Use a minus (-) screwdriver to set the voltage adjust switches.

1. This amplifier is already set to the "220 V ~ 240 V" position before shipment.

If the power supply in your areas is 110 V ~ 127 V,

Set to the "110 V ~ 127 V" position.

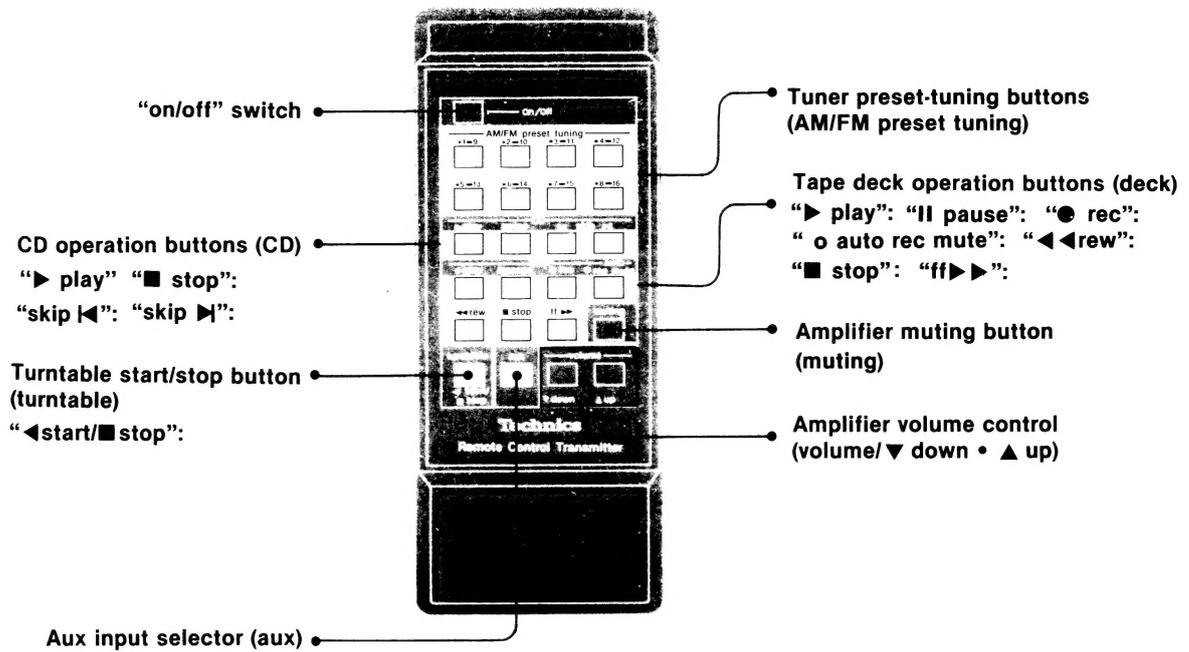


2. Set to the voltage setting for the area in which the unit will be used.

(If the power supply in your area is 117 V or 120 V, set to the "127 V" position.)

#### Note:

There are no voltage adjust switches for some countries; the correct voltage is already set.

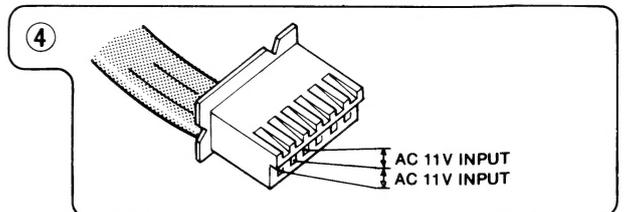
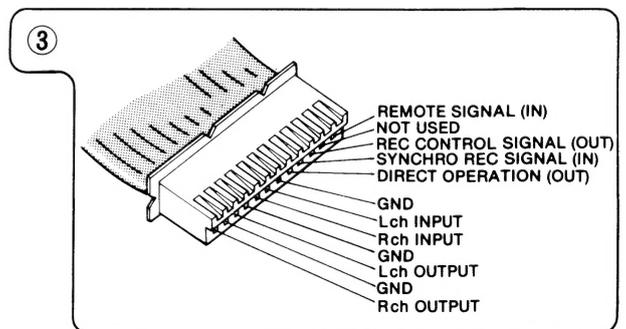
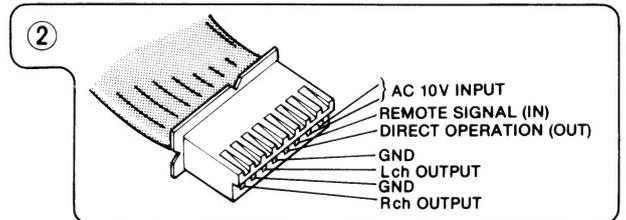
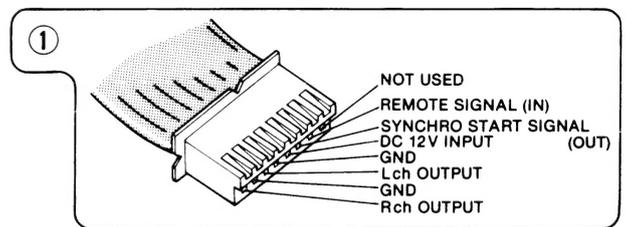
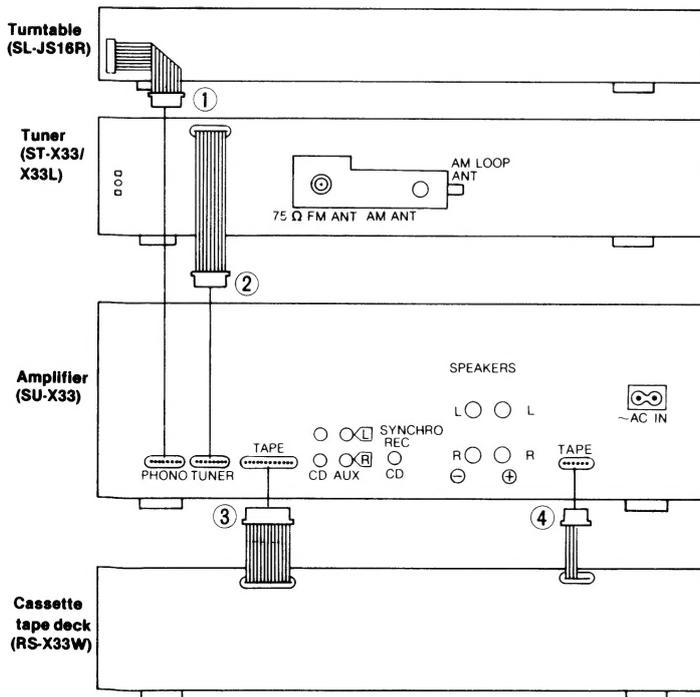


## ■ HOW TO CONNECT

Connect the turntable, tuner, amplifier, and cassette deck as shown.

If the connection is wrong, normal operation will not be attained.

\* Tuner (ST-X33/X33L), Turntable (SL-JS16R) and Cassette deck (RS-X33W) are not equipped with power supply. So the amplifier shown or power supply fixture is necessary for the repair and check to Tuner, Turntable and Cassette deck.



## 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. Using a 10Ω, 5W resistor, shortcircuit both ends of power supply capacitors (C601, C602,) in order to discharge the voltage.
- (2) Before turning the power supply on, after completion of repair, slowly apply the primary voltage by using a power supply voltage controller to make sure that the consumed current at 50/60 Hz in NO SIGNAL mode should be shown below with respect to supply voltage 110V/127V/220V/240V.

Power supply voltage		AC110V	AC127V	AC220V	AC240V
Consumed current	50Hz	130 ~ 210mA	130 ~ 210mA	80 ~ 115mA	65 ~ 125mA
	60Hz	140 ~ 220mA	120 ~ 200mA	75 ~ 120mA	60 ~ 115mA

## DISASSEMBLY INSTRUCTIONS

<b>Ref. No.</b> 1	<b>How to remove the main P.C.B.</b>
<b>Procedure</b> 1	<ol style="list-style-type: none"> <li>1. Remove the cabinet.</li> <li>2. Remove the 2 screws ( ❶ , ❷ ).</li> <li>3. Remove the 3 screws ( ❸ ~ ❺ ).</li> <li>4. Remove the 3 screws ( ❻ ~ ❸ ).</li> <li>5. Remove the main P.C.B. in the direction of the arrow.</li> </ol>

# Parts Change Notice

Model No. SU-X33

Service Manual  
Order No. HAD8605521C8

Please revise the original parts list in the Service Manual to conform to the change (s) shown herein. If new part numbers are shown, be sure to use them when ordering parts.

Reason for Change		*The circled item indicates the reason. If no marking, see the Notes in the bottom column.				
1.	Improve performance					
2.	Change of material or dimension					
3.	To meet approved specification					
4.	Standardization					
5.	Addition					
6.	Deletion					
7.	Correction					
8.	Other					
Interchangeability Code		**The circled item Indicates the interchangeability. If no marking, see the Notes in the bottom column.				
	Parts		Set Production			
A	Original		Early	Original or new parts may be used in early or late production set. Use original parts until exhausted, then stock new parts.		
	New		Late			
B	Original		Early	Original parts may be used in early production sets only. New parts may be used in early or late production sets. Use original parts where possible, then stock new parts.		
	New		Late			
C	Original		Early	New parts only may be used in early or late production sets. Stock new parts.		
	New		Late			
D	Original		Early	Original parts may be used in early production sets only. New parts may be used in late production sets only. Stock both original and new parts.		
	New		Late			
E	Other					
Part Number						
Model No.	Ref. No.	Original Part No.	New Part No.	Notes(****)	Part Name & Descriptions	Pcs/Set
SU-X33	105	UR64BT123A	UR64BT123A UR64BT123DA	7, C	Button (Black) Rec Button (Red)	24 1

File this Parts Change Notice with your copy of the Service Manual.

# Technics

**Matsushita Electric Trading Co., Ltd.**  
 P.O. Box 288, Central Osaka Japan

 Printed in Japan  
 860900270 ® TM

**Ref. No. 2**  
**How to remove the front panel**

**Procedure 2**

1. Remove the cabinet.
2. Remove the connectors. (J1, J7).
3. Remove the 2 screws (1, 2).
4. Remove the 4 lock pins (3 ~ 6).

**Ref. No. 3**  
**How to remove the P.C.B.**

**Procedure 2 → 3**

1. Remove the 6 screws (1 ~ 6).
2. Remove the volume and input selector P.C.B.
3. Remove the 1 screw (7).
4. Remove the power switch P.C.B.

**Ref. No. 4**  
**How to remove the remote control**

**Procedure 4**

1. Remove the battery cover lid.
2. Remove the 2 screws (1, 2).
3. Insert a blade screwdriver between the top and bottom case inside the battery compartment and then slowly loosen the bottom case.

## FUNCTION OF IC TERMINALS

### • IC301 (LC6523C-3068) Microcomputer

Pin No.	Mark	Description	LED																																																												
			-dB	Pin No.	1	2	3	4	5	6	7																																																				
①	LED 4	"L" level output is given to each pin according to the volume attenuation in order to light up the volume level LED.	0 ~ -4dB	②	③	④	⑤	⑥	⑦	⑧																																																					
③	LED 5		-6 ~ -10	②	③	④	⑤	⑥	⑦	⑧																																																					
④	LED 6		-12 ~ -18	②	③	④	⑤	⑥	⑦	⑧																																																					
⑤	LED 7		-20 ~ -26	②	③	④	⑤	⑥	⑦	⑧																																																					
②⑧	LED 1		-28 ~ -36	②	③	④	⑤	⑥	⑦	⑧																																																					
②⑨	LED 2		-38 ~ -52	②	③	④	⑤	⑥	⑦	⑧																																																					
③⑩	LED 3		-54 ~ ∞	②	③	④	⑤	⑥	⑦	⑧																																																					
⑥	BACK-UP	<ul style="list-style-type: none"> <li>When this pin is at "L" level, the microcomputer is operated by the back-up circuit. (No. ①⑨ pin alone receives an input, all the others not.)</li> <li>When this pin is at "H" level, No. ⑨ pin (POWER ON) gives an "L" level output if No. ⑫ pin (POWER SW) is at "H" level. No. ⑨ pin (POWER ON) is at "H" level, however, if the remote control's power on/off RAM data are off.</li> </ul>	<table border="1"> <tr> <th>Function</th> <th>No. of output pulses</th> </tr> <tr> <td>CH 1 (CH 9)</td> <td>0</td> </tr> <tr> <td>CH 2 (CH 10)</td> <td>1</td> </tr> <tr> <td>CH 3 (CH 11)</td> <td>2</td> </tr> <tr> <td>CH 4 (CH 12)</td> <td>3</td> </tr> <tr> <td>CH 5 (CH 13)</td> <td>4</td> </tr> <tr> <td>CH 6 (CH 14)</td> <td>5</td> </tr> <tr> <td>CH 7 (CH 15)</td> <td>6</td> </tr> <tr> <td>CH 8 (CH 16)</td> <td>7</td> </tr> <tr> <td>FM</td> <td>13</td> </tr> <tr> <td>AM</td> <td>15</td> </tr> </table>							Function	No. of output pulses	CH 1 (CH 9)	0	CH 2 (CH 10)	1	CH 3 (CH 11)	2	CH 4 (CH 12)	3	CH 5 (CH 13)	4	CH 6 (CH 14)	5	CH 7 (CH 15)	6	CH 8 (CH 16)	7	FM	13	AM	15																																
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AM	15																																																														
⑦	REMOTE	<ul style="list-style-type: none"> <li>Data codes reach here from the remote control receiver. (For data codes, refer to the remote control transmitter description.)</li> <li>The tape deck data codes are outputted from the light receiver direct to the deck.</li> </ul>																																																													
⑧	AMP	<ul style="list-style-type: none"> <li>When this pin receives an "H" level input, the amplifier turns on to start the operation.</li> <li>When this pin receives an "L" level input, the amplifier turns off to stop receiving the matrix key. Power on/off code alone is used to enable the remote control.</li> <li>Just when this pin's input comes from "H" to "L" level, the LED1 ~ LED7 pins become "H".</li> </ul>																																																													
⑨	POWER ON	<ul style="list-style-type: none"> <li>A rising level ("H" level) is detected at No. ⑩ pin to give an "L" level output to No. ⑨ pin (POWER ON).</li> <li>When No. ⑩ pin is at "L" level, No. ⑨ pin is given an "H" level output (POWER OFF).</li> </ul>																																																													
⑩	POWER SW																																																														
⑪	DECK	Not used.																																																													
⑫	ST/DTS	<ul style="list-style-type: none"> <li>When "Tuner" code is fed from the remote control to No. ⑦ pin, The DTS code is outputted at pin No. ⑫ SELECTOR code is then outputted to make the input selector into TUNER mode.</li> <li>If the remote control's CH button has been kept depressed for longer than 1.5 seconds, 15 output pulses (AM code) are fed to the tuner and the number of pulses for a specified channel is given.</li> <li>If the button has been released within 1.5 seconds 13 output pulses (FM code) are fed to the tuner and the number of pulses for a specified channel is given.</li> </ul>																																																													
⑬	DATA/S1	Together with No. ⑫ pin, Volume UP/DOWN and BALANCE L/R signals are fed to the attenuator IC.																																																													
⑭	CLK																																																														
⑮	OSC 2	Crystal hook-up terminals for internal clock oscillator.																																																													
⑯	OSC 1																																																														
⑰	RES	Reset pulse input terminal. When a reset is made by the back-up circuit using electrolytic capacitors alone, 3 or 4 control RAM data are checked by the program. COLD START is activated when abnormal, HOT START when normal.																																																													
⑳	K2	Input terminals for matrix keys.																																																													
㉑	K1																																																														
㉒	K0																																																														
㉓	D <sub>A</sub> /S <sub>O</sub>	Input selector 4-bits BCD codes are outputted with Remote Control codes. * With Turntable "START" code, the output is given in the order of No. 1 → No. 2 → No. 6 → No. 1.																																																													
㉔	D <sub>B</sub>																																																														
㉕	D <sub>C</sub>																																																														
㉖	D <sub>D</sub>																																																														
㉗	LOUD		Not used.	<table border="1"> <tr> <th>No.</th> <th>Selector</th> <th>D<sub>A</sub></th> <th>D<sub>B</sub></th> <th>D<sub>C</sub></th> <th>D<sub>D</sub></th> </tr> <tr> <td>1</td> <td>---</td> <td>L</td> <td>L</td> <td>L</td> <td>H</td> </tr> <tr> <td>2</td> <td>PHONO</td> <td>L</td> <td>L</td> <td>H</td> <td>L</td> </tr> <tr> <td>3</td> <td>TUNER</td> <td>L</td> <td>L</td> <td>H</td> <td>H</td> </tr> <tr> <td>4</td> <td>CD</td> <td>L</td> <td>H</td> <td>L</td> <td>L</td> </tr> <tr> <td>5</td> <td>TAPE</td> <td>L</td> <td>H</td> <td>H</td> <td>L</td> </tr> <tr> <td>6</td> <td>TURNTABLE START</td> <td>H</td> <td>L</td> <td>L</td> <td>L</td> </tr> <tr> <td>7</td> <td>TURNTABLE STOP</td> <td>H</td> <td>L</td> <td>L</td> <td>H</td> </tr> <tr> <td>8</td> <td>AUX</td> <td>L</td> <td>H</td> <td>L</td> <td>H</td> </tr> </table>							No.	Selector	D <sub>A</sub>	D <sub>B</sub>	D <sub>C</sub>	D <sub>D</sub>	1	---	L	L	L	H	2	PHONO	L	L	H	L	3	TUNER	L	L	H	H	4	CD	L	H	L	L	5	TAPE	L	H	H	L	6	TURNTABLE START	H	L	L	L	7	TURNTABLE STOP	H	L	L	H	8	AUX	L	H	L
No.	Selector	D <sub>A</sub>	D <sub>B</sub>	D <sub>C</sub>	D <sub>D</sub>																																																										
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5	TAPE	L	H	H	L																																																										
6	TURNTABLE START	H	L	L	L																																																										
7	TURNTABLE STOP	H	L	L	H																																																										
8	AUX	L	H	L	H																																																										

Notes:

(A) Key n  
functi

OUT  
S0 No.2  
S1 No.1

(B) Volume

1. Push  
down  
2. Keep  
the v  
matic  
3. An "L"  
accor

(C) Balance

1. Push  
left (

• IC302 (D

The micro  
~ No.  
An "L"  
positions;  
output as  
refer to t  
of IC301.

• IC101 (E

TUNER

PHONO

CD

AUX

TAPE

PLAYBACK

SOURCE OUT

# FUNCTION OF IC TERMINALS

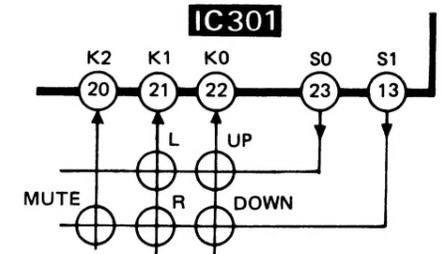
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Pin No.	Mark	Description																																																																								
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④	LED 7																																																																									
⑤	LED 1																																																																									
⑥	LED 2																																																																									
⑦	LED 3																																																																									
⑧	BACK-UP	<ul style="list-style-type: none"> <li>When this pin is at "L" level, the microcomputer is operated by the back-up circuit. (No. ⑩ pin alone receives an input, all the others not.)</li> <li>When this pin is at "H" level, No. ⑨ pin (POWER ON) gives an "L" level output if No. ⑫ pin (POWER SW) is at "H" level. No. ⑨ pin (POWER ON) is at "H" level, however, if the remote control's power on/off RAM data are off.</li> </ul>																																																																								
⑨	REMOTE	<ul style="list-style-type: none"> <li>Data codes reach here from the remote control receiver. (For data codes, refer to the remote control transmitter description.)</li> <li>The tape deck data codes are outputted from the light receiver direct to the deck.</li> </ul>																																																																								
⑩	AMP	<ul style="list-style-type: none"> <li>When this pin receives an "H" level input, the amplifier turns on to start the operation.</li> <li>When this pin receives an "L" level input, the amplifier turns off to stop receiving the matrix key. Power on/off code alone is used to enable the remote control.</li> <li>Just when this pin's input comes from "H" to "L" level, the LED1 ~ LED7 pins become "H".</li> </ul>																																																																								
⑪	POWER ON	<ul style="list-style-type: none"> <li>A rising level ("H" level) is detected at No. ⑩ pin to give an "L" level output to No. ⑨ pin (POWER ON).</li> <li>When No. ⑩ pin is at "L" level, No. ⑨ pin is given an "H" level output (POWER OFF).</li> </ul>																																																																								
⑫	POWER SW																																																																									
⑬	DECK	<ul style="list-style-type: none"> <li>Not used.</li> </ul>																																																																								
⑭	ST/DTS	<ul style="list-style-type: none"> <li>When "Tuner" code is fed from the remote control to No. ⑦ pin, The DTS code is outputted at pin No. ⑫. SELECTOR code is then outputted to make the input selector into TUNER mode.</li> <li>If the remote control's CH button has been kept depressed for longer than 1.5 seconds, 15 output pulses (AM code) are fed to the tuner and the number of pulses for a specified channel is given.</li> <li>If the button has been released within 1.5 seconds 13 output pulses (FM code) are fed to the tuner and the number of pulses for a specified channel is given.</li> </ul> <div style="text-align: center;"> <p>DTS code pulses</p> <table border="1" style="margin-top: 5px;"> <thead> <tr> <th>Function</th> <th>No. of output pulses</th> </tr> </thead> <tbody> <tr><td>CH 1 (CH 9)</td><td>0</td></tr> <tr><td>CH 2 (CH 10)</td><td>1</td></tr> <tr><td>CH 3 (CH 11)</td><td>2</td></tr> <tr><td>CH 4 (CH 12)</td><td>3</td></tr> <tr><td>CH 5 (CH 13)</td><td>4</td></tr> <tr><td>CH 6 (CH 14)</td><td>5</td></tr> <tr><td>CH 7 (CH 15)</td><td>6</td></tr> <tr><td>CH 8 (CH 16)</td><td>7</td></tr> <tr><td>FM</td><td>13</td></tr> <tr><td>AM</td><td>15</td></tr> </tbody> </table> </div>	Function	No. of output pulses	CH 1 (CH 9)	0	CH 2 (CH 10)	1	CH 3 (CH 11)	2	CH 4 (CH 12)	3	CH 5 (CH 13)	4	CH 6 (CH 14)	5	CH 7 (CH 15)	6	CH 8 (CH 16)	7	FM	13	AM	15																																																		
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AM	15																																																																									
⑮	DATA/S1	Together with No. ⑫ pin, Volume UP/DOWN and BALANCE L/R signals are fed to the to the attenuator IC.																																																																								
⑯	CLK																																																																									
⑰	OSC 2	Crystal hook-up terminals for internal clock oscillator.																																																																								
⑱	OSC 1																																																																									
⑲	RES	Reset pulse input terminal. When a reset is made by the back-up circuit using electrolytic capacitors alone, 3 or 4 control RAM data are checked by the program. COLD START is activated when abnormal, HOT START when normal.																																																																								
⑳	K2	Input terminals for matrix keys.																																																																								
㉑	K1																																																																									
㉒	K0																																																																									
㉓	D <sub>A</sub> /S <sub>O</sub>																																																																									
㉔	D <sub>B</sub>	Input selector 4-bits BCD codes are outputted with Remote Control codes. <ul style="list-style-type: none"> <li>* With Turntable "START" code, the output is given in the order of No. 1 → No. 2 → No. 6 → No. 1.</li> </ul> <table border="1" style="margin-top: 10px;"> <thead> <tr> <th>No.</th> <th>Selector</th> <th>D<sub>A</sub></th> <th>D<sub>B</sub></th> <th>D<sub>C</sub></th> <th>D<sub>D</sub></th> </tr> </thead> <tbody> <tr><td>1</td><td>—</td><td>L</td><td>L</td><td>L</td><td>H</td></tr> <tr><td>2</td><td>PHONO</td><td>L</td><td>L</td><td>H</td><td>L</td></tr> <tr><td>3</td><td>TUNER</td><td>L</td><td>L</td><td>H</td><td>H</td></tr> <tr><td>4</td><td>CD</td><td>L</td><td>H</td><td>L</td><td>L</td></tr> <tr><td>5</td><td>TAPE</td><td>L</td><td>H</td><td>H</td><td>L</td></tr> <tr><td>6</td><td>TURNTABLE START</td><td>H</td><td>L</td><td>L</td><td>L</td></tr> <tr><td>7</td><td>TURNTABLE STOP</td><td>H</td><td>L</td><td>L</td><td>H</td></tr> <tr><td>8</td><td>AUX</td><td>L</td><td>H</td><td>L</td><td>H</td></tr> </tbody> </table>	No.	Selector	D <sub>A</sub>	D <sub>B</sub>	D <sub>C</sub>	D <sub>D</sub>	1	—	L	L	L	H	2	PHONO	L	L	H	L	3	TUNER	L	L	H	H	4	CD	L	H	L	L	5	TAPE	L	H	H	L	6	TURNTABLE START	H	L	L	L	7	TURNTABLE STOP	H	L	L	H	8	AUX	L	H	L	H																		
No.	Selector		D <sub>A</sub>	D <sub>B</sub>	D <sub>C</sub>	D <sub>D</sub>																																																																				
1	—		L	L	L	H																																																																				
2	PHONO		L	L	H	L																																																																				
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4	CD	L	H	L	L																																																																					
5	TAPE	L	H	H	L																																																																					
6	TURNTABLE START	H	L	L	L																																																																					
7	TURNTABLE STOP	H	L	L	H																																																																					
8	AUX	L	H	L	H																																																																					
㉕	D <sub>C</sub>																																																																									
㉖	D <sub>D</sub>																																																																									
㉗	LOUD	Not used.																																																																								

### Notes:

(A) Key matrix, scanning signal input/output pins and their functions ("H" level scan)

IN	K0 No.22	K1 No.21	K2 No.20
OUT			
S0 No.23	Volume UP	Balance L	
S1 No.13	Volume DOWN	Balance R	Muting



### (B) Volume UP/DOWN

- Push the key once, and the volume will turn up (or down) by 2dB each steps.
- Keep the key depressed for more than 250msec, and the volume will turn up (or down) all the way automatically.
- An "L" level output is given at LED1 ~ LED7 pins according to the volume attenuation.

"Volume/Balance" indicator (LED1 ~ LED7) is switched to the Balance position. (The Balance indication goes on for about 4 ~ 6 seconds after the Balance key is released.)

- Keep the key depressed for more than 500msec, the automatic shift mode will be invited.

### (C) Balance LEFT/RIGHT

- Push the key once, and the balance will shift to the left (or right) channel by 2dB. At the same time, the

### (D) Mute

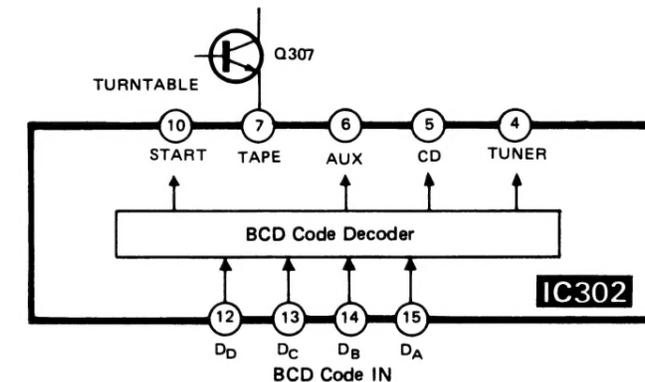
For ON/OFF switching of audio muting function. By a push on this key, the audio muting is turned on and the terminal output of the highest step of volume display LED 1 ~ 7 flashing.

### IC302 (DN74LS145) BCD Decoder

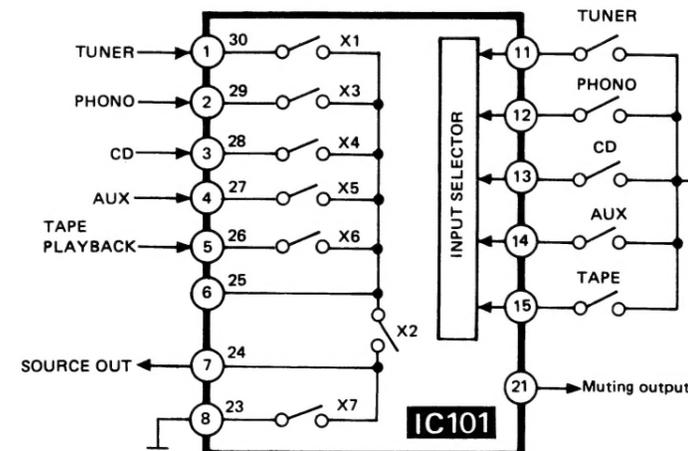
The microcomputer (IC301) codes are fed via its No. ㉓ ~ No. ㉖ pins to the IC252's No. ⑫ ~ No. ⑮ pins. An "L" level output is given according to the selector positions; now the input selector IC (IC101) receives the output as a switching signal. (For the input codes to IC302, refer to the list of codes under No. ㉓ ~ No. ㉖ pins of IC301.)

\* Q307 is a transistor to keep Tape Deck from switching from recording mode to playback mode, which might be otherwise caused by possible error data transfer from the remote control. (An "H" level input comes from the tape deck to the amplifier while in recording mode.)

\* No. ⑨ pin is not used in this model.



### IC101 (LC7818) Input Selector

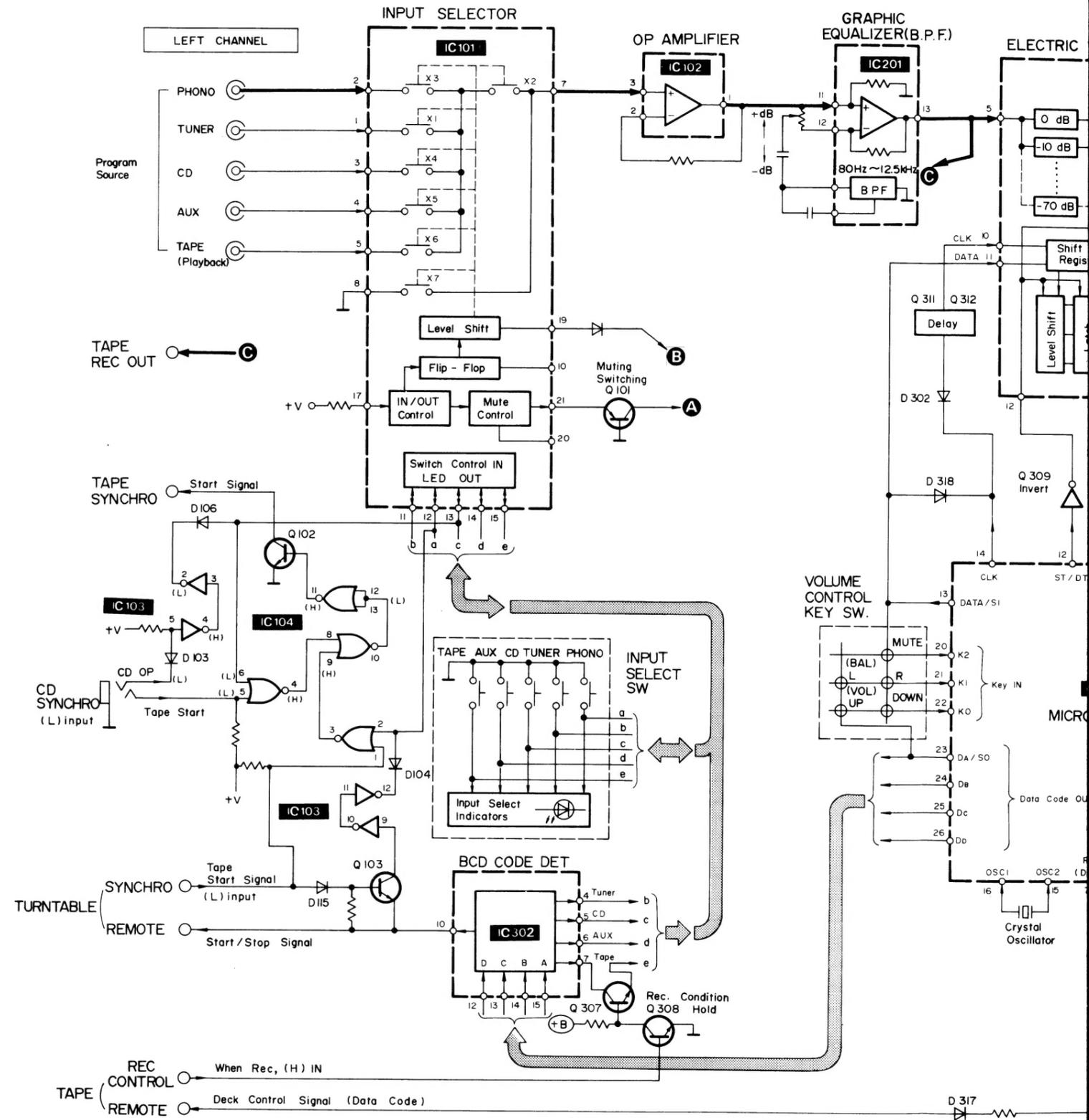


SW	X1	X2	X3	X4	X5	X6	X7
MODE							
PHONO		on	on				
TUNER	on	on					
CD		on		on			
AUX		on			on		
TAPE		on				on	

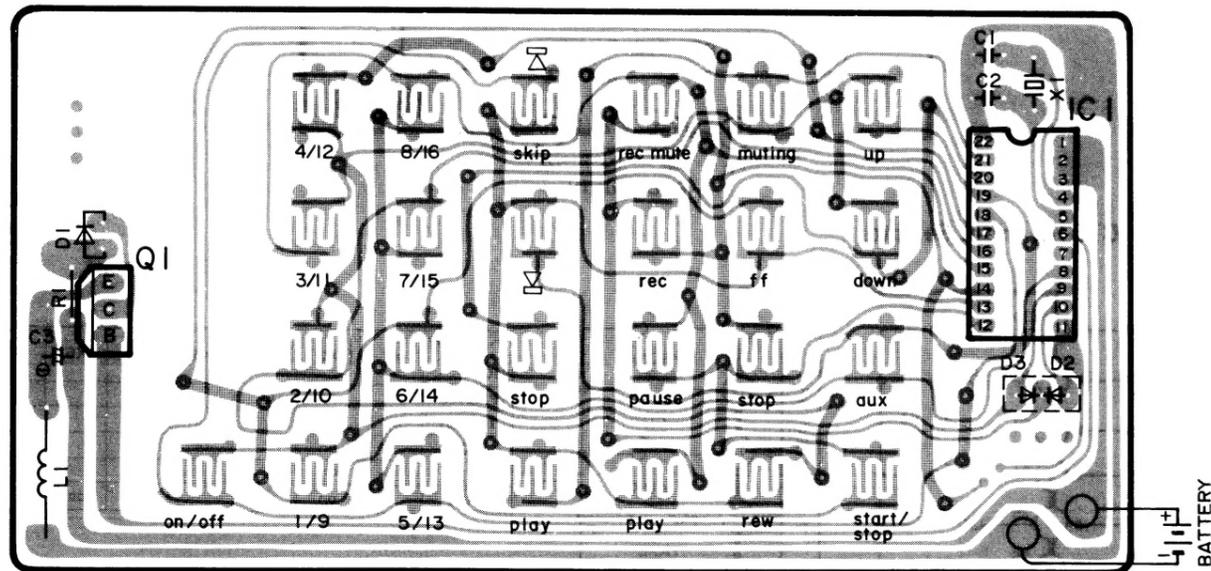
• IC202 (TC9177P) Attenuator

Pin No.	Mark	Description	Pin No.	Mark	Description
1	V <sub>SS</sub>	Power supply (negative).	10	CK	Clock input. Used to take in data at DATA pin.
2, 3 18, 19	CH1-Loudness 1,2 CH2-Loudness 1,2	Loudness terminal.	11	DATA	Attenuation/channel select data input. 20-bits input activated by CK signal.
4 17	CH1-OUT 1 CH2-OUT 1	10dB attenuator output. Signal via IN is attenuated by 8 steps, 10dB each, from 0 ~ 70dB.	12	ST	Strobe input. Attenuation/channel select data from DATA and CK pins are lapped when this pin is at "H" level. Previous data remain the same while this pin does not reach "H" level.
5 16	CH1-IN 1 CH2-IN 1	10dB attenuator input.	20	V <sub>DD</sub>	Power supply (positive).
6 15	A-GND	AC grounding terminal.			
7 14	CH1-IN 2 CH2-IN 2	2dB attenuator input.			
8 13	CH1-OUT 2 CH2-OUT 2	2dB attenuator output. Signal via IN is attenuated by 5 steps, 2dB each, from 0 ~ 8dB.			
9	GND	Grounding terminal.			

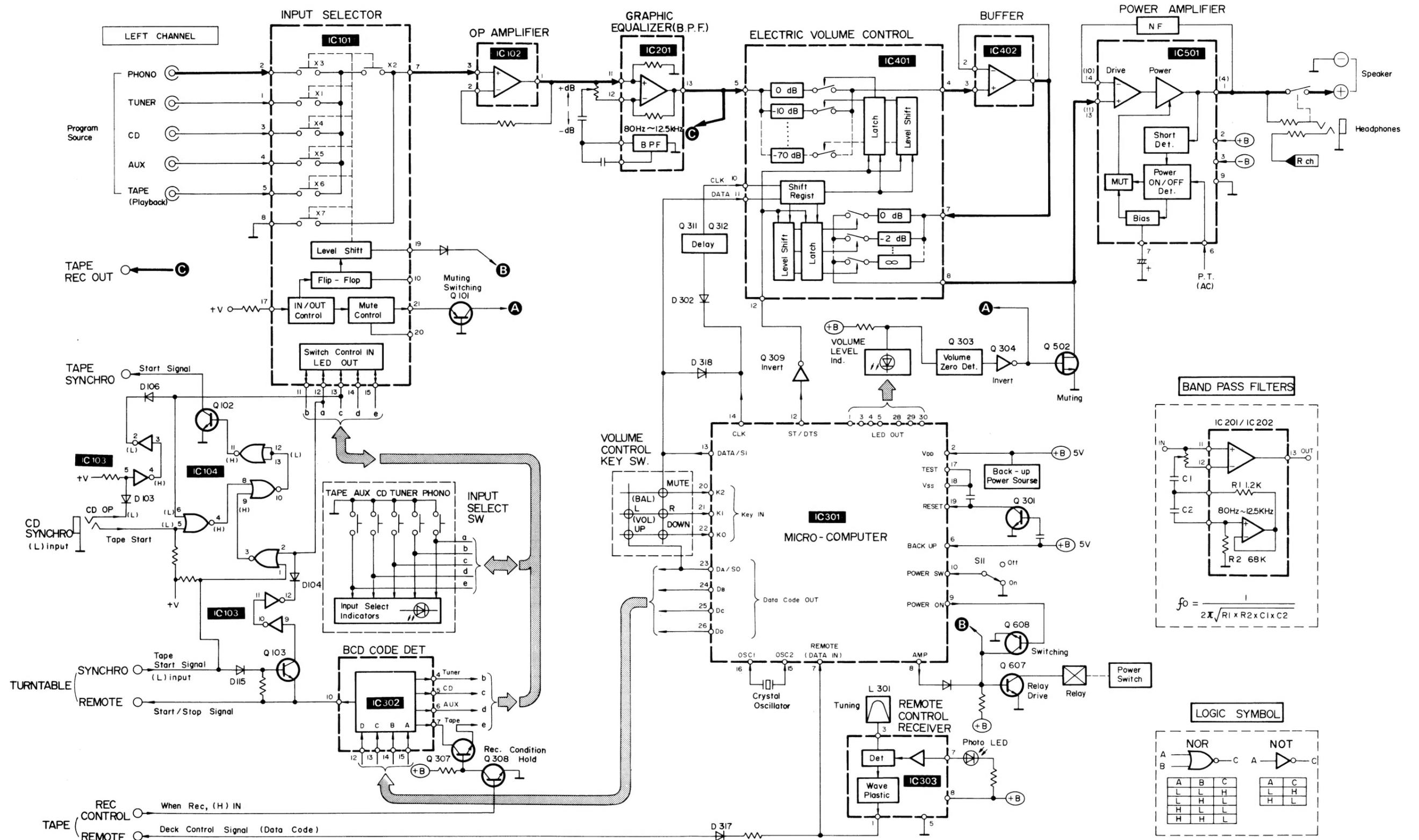
■ BLOCK DIAGRAM



■ CIRCUIT BOARDS OF REMOTE CONTROL UNIT (Transmitter)

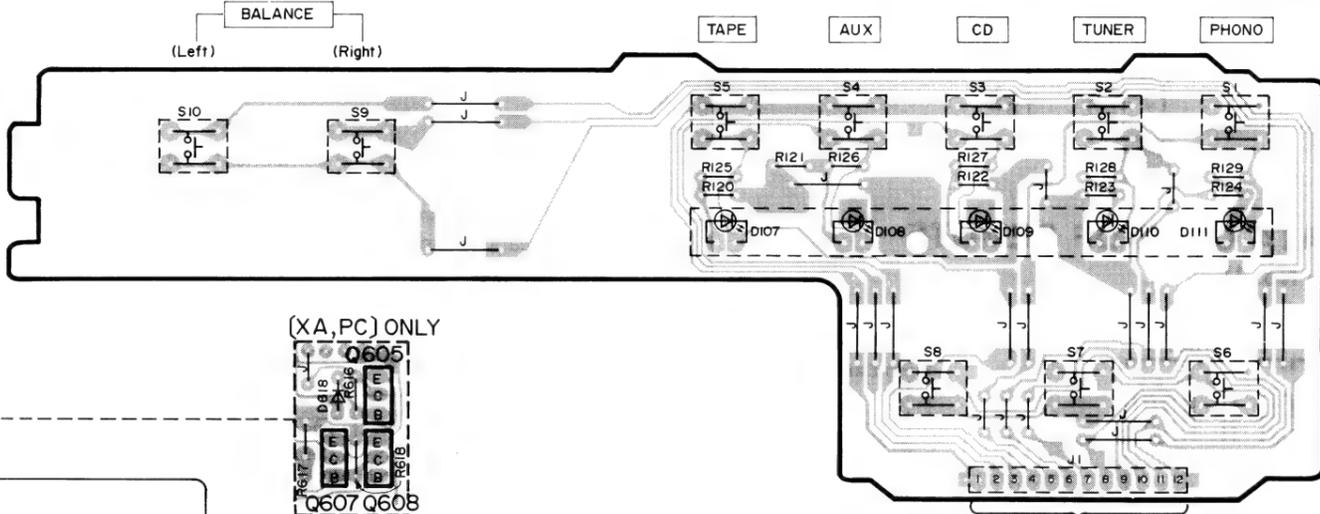
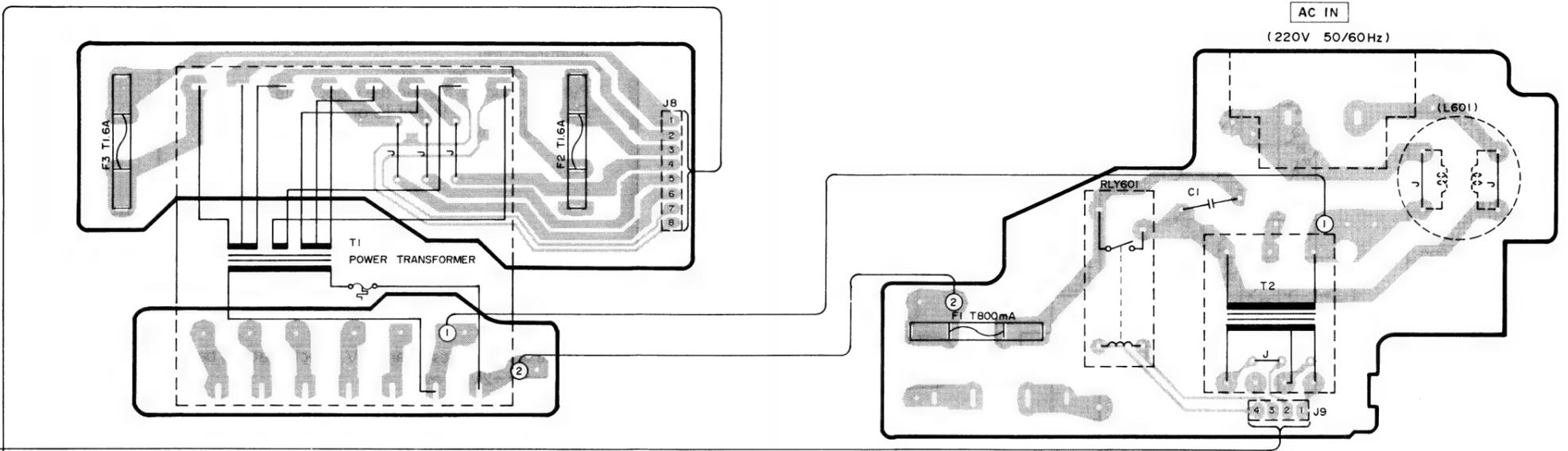
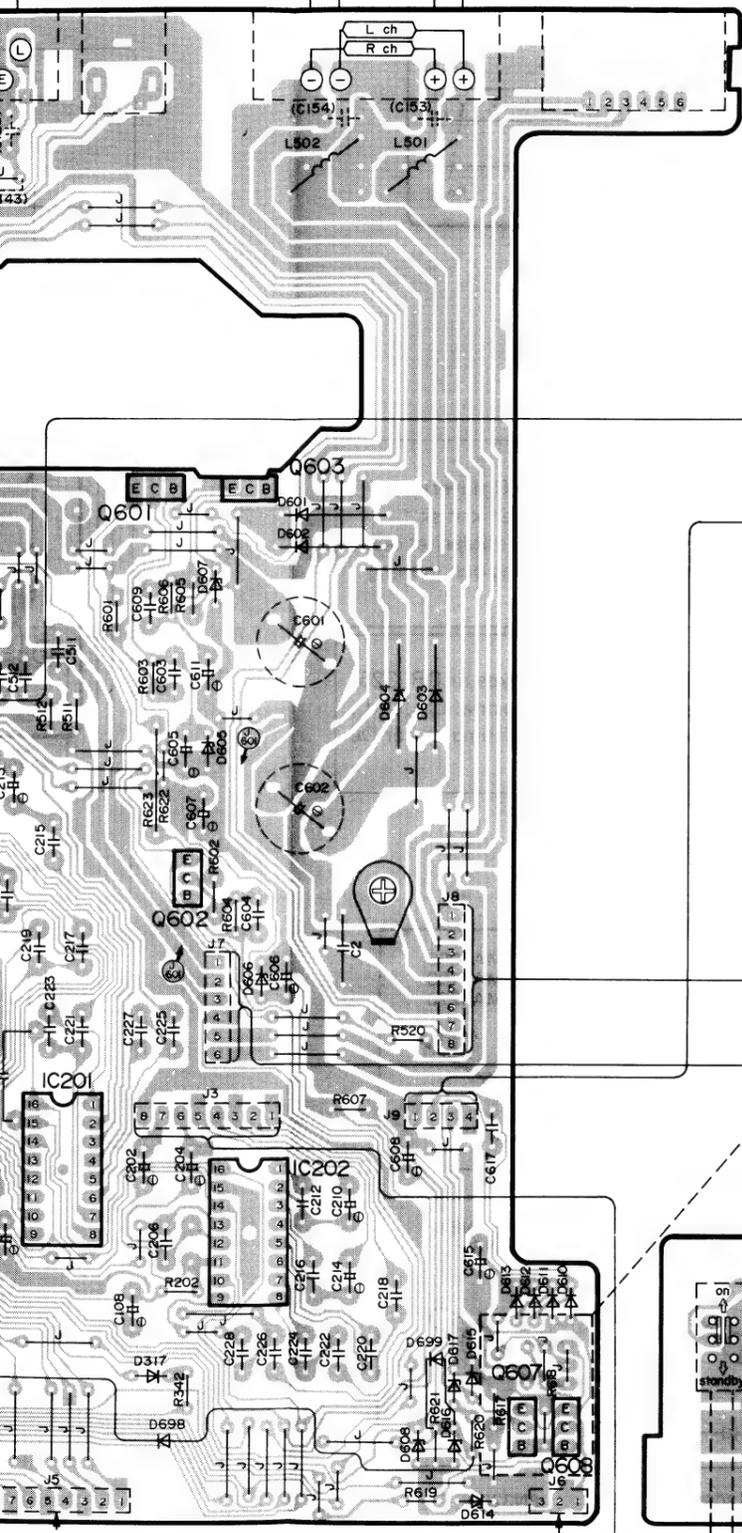


# BLOCK DIAGRAM

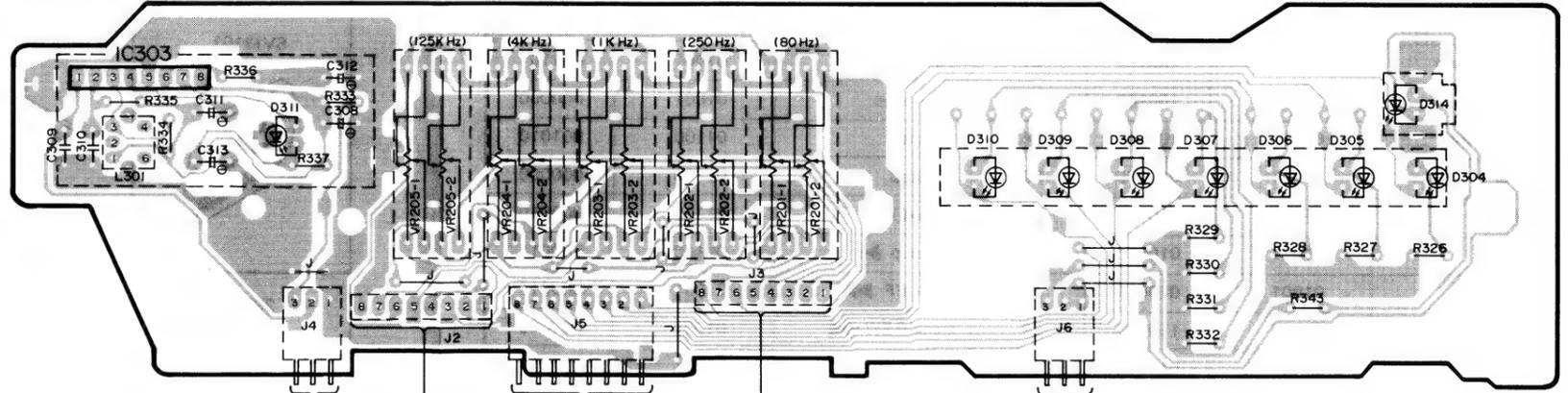
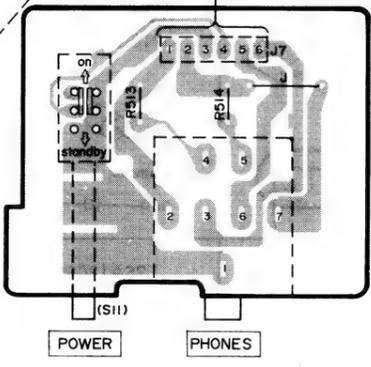


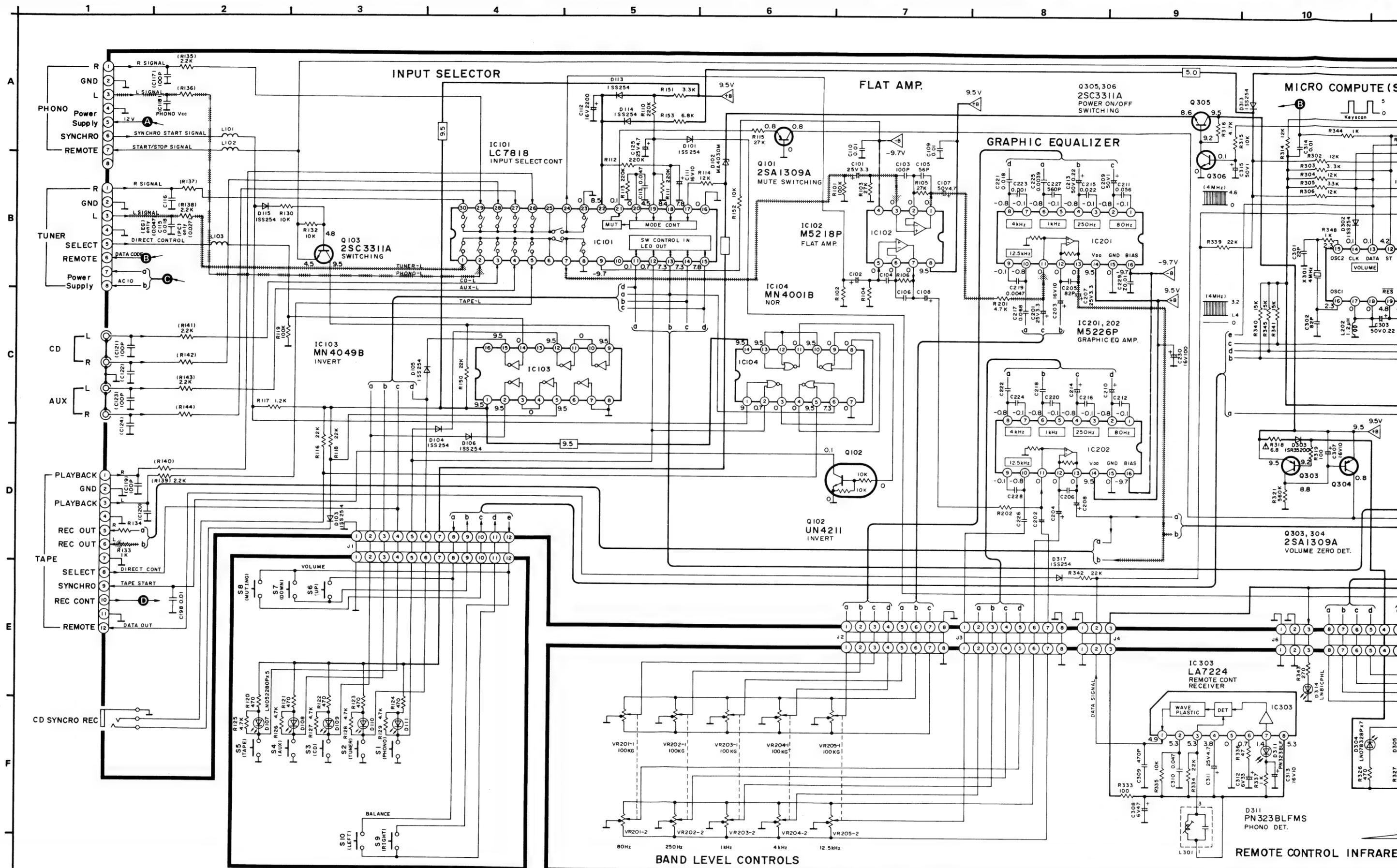


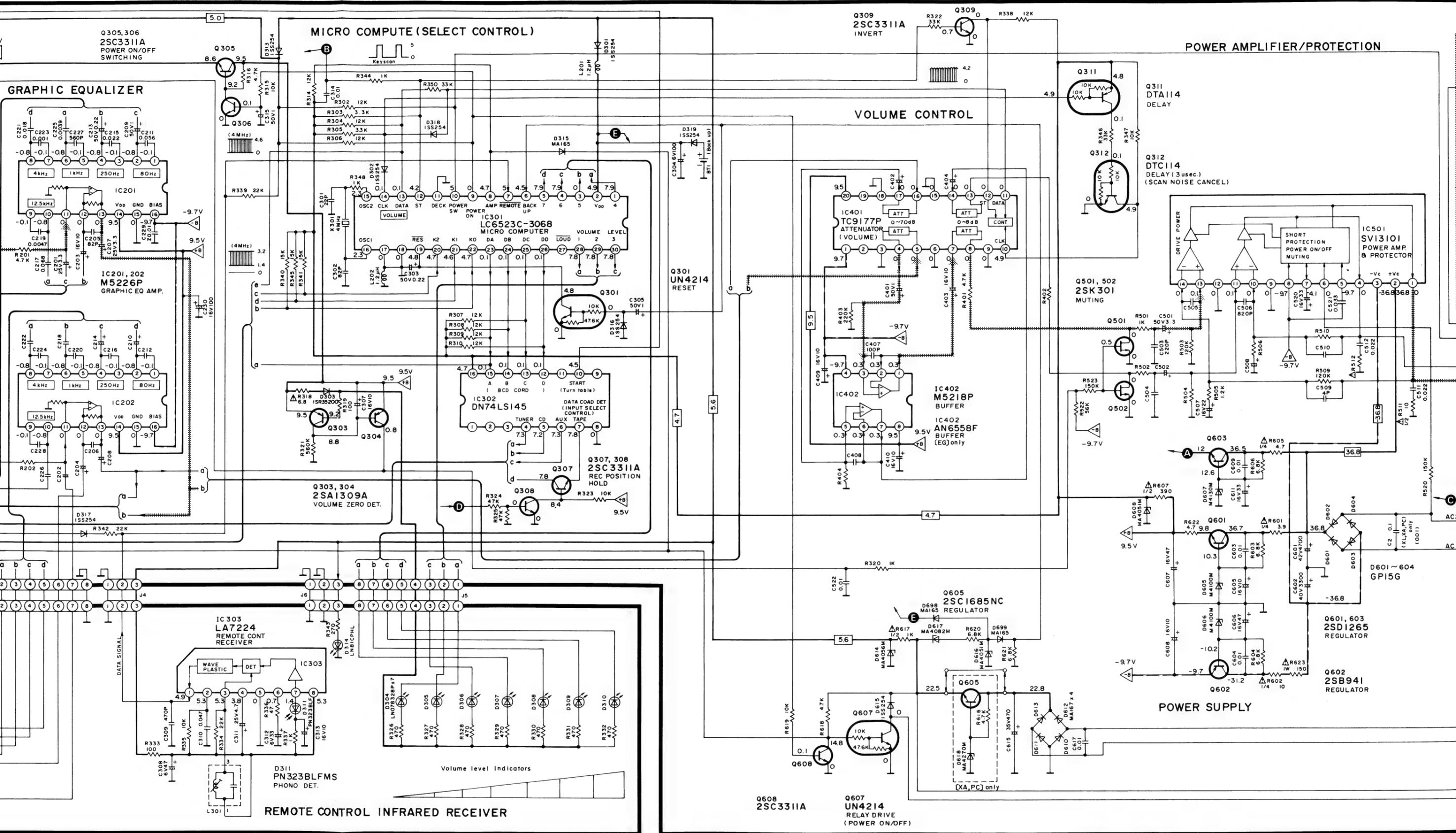
JX CD SYNCRO REC SPEAKERS TAPE (From tape)



(XA, PC) ONLY  
Q605  
Q607 Q608

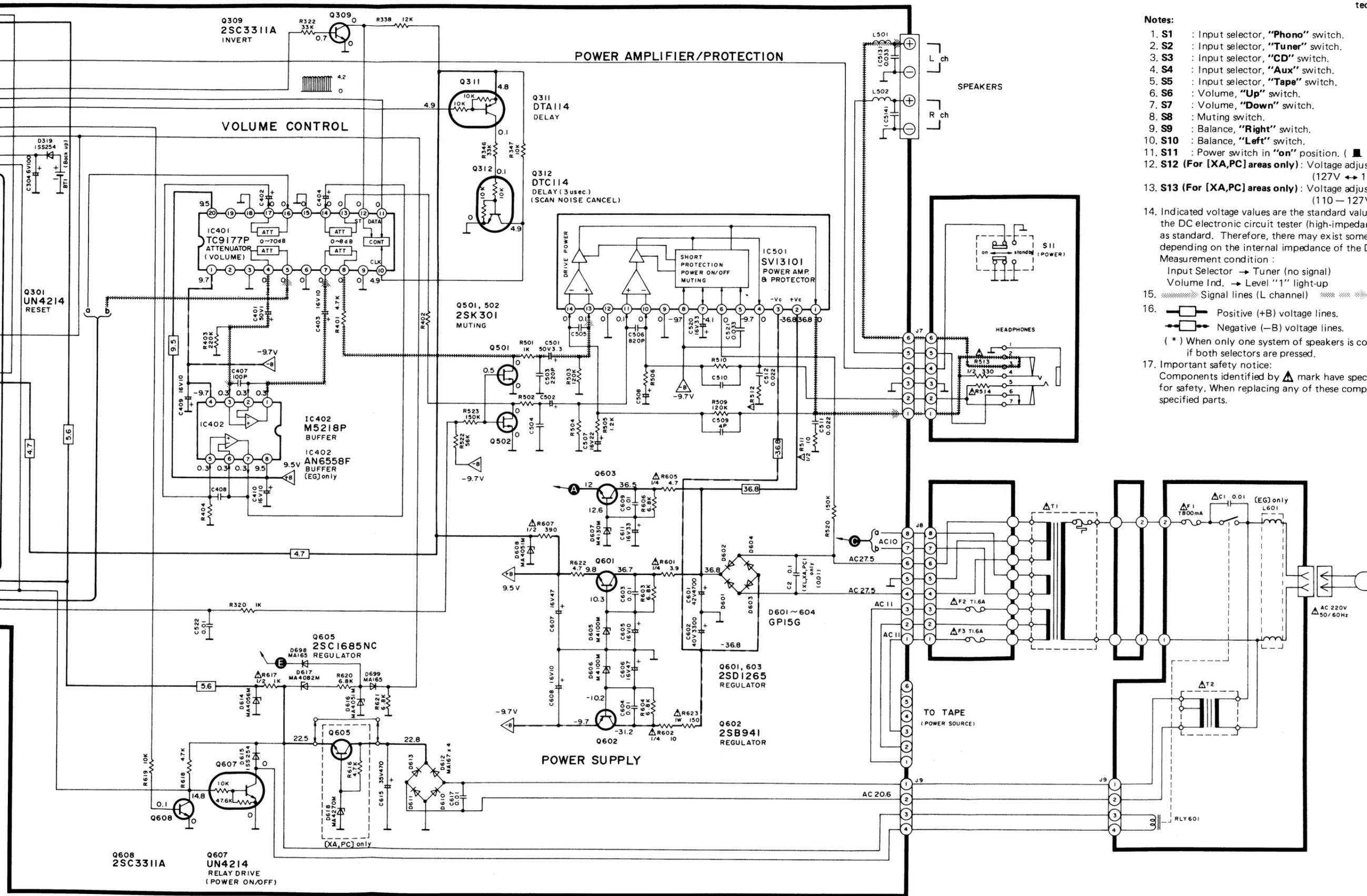






# SCHEMATIC DIAGRAM

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



### Notes:

1. S1 : Input selector, "Phono" switch.
2. S2 : Input selector, "Tuner" switch.
3. S3 : Input selector, "CD" switch.
4. S4 : Input selector, "Aux" switch.
5. S5 : Input selector, "Tape" switch.
6. S6 : Volume, "Up" switch.
7. S7 : Volume, "Down" switch.
8. S8 : Muting switch.
9. S9 : Balance, "Right" switch.
10. S10 : Balance, "Left" switch.
11. S11 : Power switch in "on" position. ( ▣ standby, ▣ on/standby)
12. S12 (For [XA,PC] areas only): Voltage adjust switch "220V" position. (127V ↔ 110V ↔ 220V ↔ 240V)
13. S13 (For [XA,PC] areas only): Voltage adjust switch "220 - 240V" position. (110 - 127V ↔ 220 - 240V)
14. Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.  
Measurement condition :  
Input Selector → Tuner (no signal)  
Volume Ind. → Level "1" light-up
15. Signal lines (L channel) Phono
16. Positive (+B) voltage lines.  
Negative (-B) voltage lines.  
(\* ) When only one system of speakers is connected, no sound will be if both selectors are pressed.
17. Important safety notice:  
Components identified by  $\Delta$  mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

# 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  $\Delta$  mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
  - 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.
  - The unit of resistance is OHM ( $\Omega$ ).  
K = 1000 $\Omega$ , M = 1000K $\Omega$
  - The unit of capacitance is MICROFARAD ( $\mu$ F).  
P = 10<sup>-6</sup>  $\mu$ F

## Numbering System of Resistor

**Example**

ERD	25	F	J	101
Type	Wattage	Shape	Tolerance	Value

Resistor Type	Wattage	Tolerance
ERD : Carbon	12 : 1/2W	J : $\pm$ 5%
ERG : Metal Oxide	2A : 2W	K : $\pm$ 10%
ERC : Solid	S2 : 1/4W	
	25 : 1/4W	
	S1 : 1/2W	

## Numbering System of Capacitor

**Example**

ECKD	1H	102	Z	F
Type	Voltage	Value	Tolerance	Peculiarity

Capacitor Type	Voltage	Tolerance
ECE : Electrolytic	OJ : 6.3V 66V : 66V	K : $\pm$ 10%
ECC : Ceramic	1V : 35V 1J : 63V	Z : $\pm$ 80%, -20%
ECK : Ceramic	1C : 16V KC : 400V AC	M : $\pm$ 20%
ECF : Semi-conductor	1E : 25V 2A : 100V	P : +100%, -0%
ECQ : Polyester	D : 25V 2H : 500V	
	1H : 50V	

## RESISTORS

Ref. No.	Part No.	Value	Ref. No.	Part No.	Value	Ref. No.	Part No.	Value	Ref. No.	Part No.	Value
R1	ERDS2TJ1R0	1	R139, 140 [EG]	ERDS2TJ222	2.2K	R322	ERDS2TJ333	33K	R401, 402	ERDS2TJ472	4.7K
R101, 102	ERDS2TJ104	100K	R141, 142 [EG]	ERDS2TJ222	2.2K	R323	ERDS2TJ103	10K	R403, 404	ERDS2TJ224	220K
R103, 104	ERDS2TJ273	27K	R143, 144 [EG]	ERDS2TJ222	2.2K	R324, 325	ERDS2TJ473	47K	R501, 502	ERDS2TJ102	1K
R105, 106	ERDS2TJ273	27K	R150	ERDS2TJ223	22K	R326, 327	ERDS2TJ471	470	R503, 504	ERDS2TJ124	120K
R110, 111	ERDS2TJ224	220K				R328, 329	ERDS2TJ471	470	R505, 506	ERDS2TJ122	1.2K
R112, 113	ERDS2TJ224	220K	R151	ERDS2TJ332	3.3K	R330, 331	ERDS2TJ471	470	R509, 510	ERDS2TJ124	120K
R114	ERDS2TJ123	12K	R152	ERDS2TJ103	10K	R332	ERDS2TJ471	470	R511, 512 $\Delta$	ERDS1FJ100	10
R115	ERDS2TJ273	27K	R153	ERDS2TJ682	6.8K	R333	ERDS2TJ101	100	R513, 514 $\Delta$	ERDS1FJ331	330
R116	ERDS2TJ223	22K	R201, 202	ERDS2TJ472	4.7K	R334	ERDS2TJ223	22K	R520	ERDS2TJ154	150K
R117	ERDS2TJ122	1.2K	R302	ERDS2TJ123	12K	R335	ERDS2TJ103	10K	R522	ERDS2TJ563	56K
R118	ERDS2TJ223	22K	R303	ERDS2TJ332	3.3K	R336	ERDS2TJ470	47	R523	ERDS2TJ154	150K
R119	ERDS2TJ104	100K	R304	ERDS2TJ123	12K	R337	ERDS2TJ102	1K	R601 $\Delta$	ERD25FJ3R9	3.9
R120, 121	ERDS2TJ471	470	R305	ERDS2TJ332	3.3K	R338	ERDS2TJ123	12K	R602 $\Delta$	ERD25FJ100	10
R122, 123	ERDS2TJ471	470				R339	ERDS2TJ223	22K	R603, 604 $\Delta$	ERDS2TJ682	6.8K
R124	ERDS2TJ471	470	R306, 307	ERDS2TJ123	12K	R340, 341	ERDS2TJ153	15K	R605 $\Delta$	ERD25FJ4R7	4.7
R125, 126	ERDS2TJ472	4.7K	R308, 309	ERDS2TJ123	12K	R342	ERDS2TJ223	22K	R606	ERDS2TJ682	6.8K
R127, 128	ERDS2TJ472	4.7K	R310	ERDS2TJ123	12K	R343	ERDS2TJ271	270	R607 $\Delta$	ERDS1FJ391	390
R129	ERDS2TJ472	4.7K	R314	ERDS2TJ123	12K	R344	ERDS2TJ102	1K	R616 [XA, PC]	ERDS2TJ472	4.7K
R130	ERDS2TJ103	10K	R315	ERDS2TJ103	10K	R345	ERDS2TJ153	15K	R617 $\Delta$	ERDS1FJ102	1K
R132	ERDS2TJ103	10K	R316	ERDS2TJ472	4.7K	R346	ERDS2TJ333	33K	R618	ERDS2TJ472	4.7K
			R318 $\Delta$	ERD25FJ6R8	6.8				R619	ERDS2TJ103	10K
			R319	ERDS2TJ101	100				R620, 621	ERDS2TJ682	6.8K
R133, 134	ERDS2TJ102	1K	R320	ERDS2TJ102	1K	R347	ERDS2TJ103	10K	R622	ERDS2TJ4R7	4.7
R135, 136 [EG]	ERDS2TJ222	2.2K	R321	ERDS2TJ564	560K	R348	ERDS2TJ102	1K	R623	ERGIANJ151	150
R137, 138 [EG]	ERDS2TJ222	2.2K									

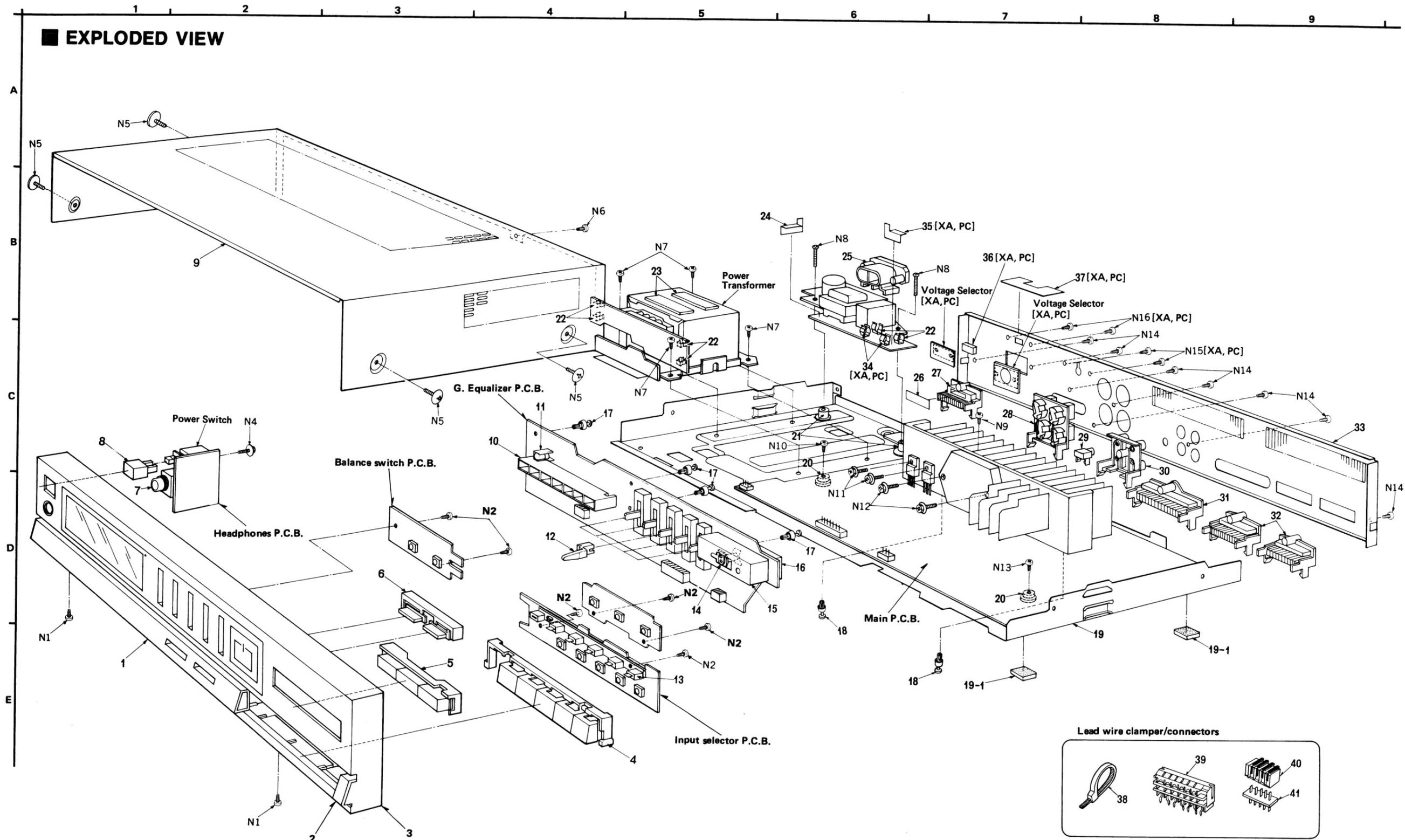
## CAPACITORS

Ref. No.	Part No.	Value	Ref. No.	Part No.	Value	Ref. No.	Part No.	Value	Ref. No.	Part No.	Value
C1	ECKDKC103PF2	0.01	C121, 122 [EG]	ECCD1H101K	100P	C301	ECCD1H220K	22P	C507, 508	ECEA1CK220	22
C2 [XL, XA, PC]	ECKD2H103PE	0.01	C123, 124 [EG]	ECCD1H101K	100P	C302	ECCD1H820K	82P	C509, 510	ECCD1H040CC	4P
C2 [Other]	ECQE1104KN	0.1	C125	ECEA1EK4R7	4.7	C303	ECEA1HKR22	0.22	C511, 512	ECKD1H223FZ	0.022
C101, 102	ECEA1EK3R3	3.3	C198, 199	ECKD1H103ZF	0.01	C304	ECEA0JU101	100	C513, 514 [EG]	ECKD1H102ZF	0.001
C103, 104	ECCD1H101K	100P	C201, 202	ECEA1EK3R3	3.3	C305	ECEA1HK010	1	C520	ECEA1CU330	33
C105, 106	ECCD1H560K	56P	C203, 204	ECEA1CKS100	10	C307	ECEA1CKS100	10	C521	ECKD1H333ZF	0.033
C107, 108	ECEA1HK4R7	4.7	C205, 206	ECCD1H820K	82P	C308	ECEA0JK470	47	C522	ECKD1H103ZF	0.01
C109, 110	ECKD1H103ZF	0.01	C207, 208	ECEA1EK3R3	3.3	C309	ECKD1H471KB	470P	C601	ECETS42V472U	4700
C111	ECEA1CKS100	10	C209, 210	ECEA1HK010	1	C310	ECFTD473KXL	0.047	C602	ECETS40V332X	3300
C112	ECEA1CU222	2200	C211, 212	ECFTD563KXL	0.056	C311	ECEA1EK4R7	4.7	C603, 604	ECKD1H103ZF	0.01
C113	ECFTD473KXL	0.047	C213, 214	ECEA1HKR22	0.22	C312	ECEA0JK330	33	C605	ECEA1CKS100	10
C115, 116 [PC]	ECFTD273KXL	0.027	C215, 216	ECFTD223KXL	0.022	C313	ECEA1CKS100	10	C606, 607	ECEA1CU470	47
C115, 116 [EG]	ECFTD472KXL	0.0047	C217, 218	ECFTD683KXL	0.068	C314	ECKD1H103ZF	0.01	C608	ECEA1CKS100	10
C115, 116 [Other]	ECFTD183KXL	0.018	C219, 220	ECFTD472KXL	0.0047	C315	ECEA1HK010	1	C609	ECKD1H103ZF	0.01
C117, 118 [EG]	ECFTD183KXL	0.018	C221, 222	ECFTD183KXL	0.018	C401, 402	ECEA1HK010	1	C611	ECEA1CU330	33
C117, 118 [Other]	ECFTD183KXL	0.018	C223, 224	ECFTD102KXL	0.001	C403, 404	ECEA1CKS100	10	C615	ECEA1VU471	470
C119, 120 [EG]	ECCD1H101K	100P	C225, 226	ECFTD392KXL	0.0039	C407, 408	ECCD1H101K	100P	C617	ECKD1H103ZF	0.01
			C227, 228	ECKD1H561KB	560P	C409, 410	ECEA1CKS100	10	C1A	ECKD1H471KB	470P
			C229	ECKD1H103ZF	0.01	C501, 502	ECEA1HK3R3	3.3	C2A	ECKD1H121KB	120P
			C230	ECEA1CU101	100	C503, 504	ECKD1H21KB	220P	C3A	ECEA0JK101	100

Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC1	MN6013D	IC
IC101	LC7818	IC
IC102	M5218P	IC
IC103	MN4049B	IC
IC104	MN4001B	IC
IC201, 202	M5226P	IC
IC301	LC6523C-3068	IC
IC302	DN74LS145	IC
IC303	LA7224	IC
IC401	TC9177P	IC
IC402 [EG]	AN6558F	IC
IC402 [Other]	M5218P	IC
IC501	SVI3101	IC
TRANSISTORS		
Q1	UN1231	Transistor
Q101, 303, 304	2SA1309Q	Transistor
Q102	UN4211	Transistor
Q103, 305~309, 608	2SC3311-Q	Transistor
Q301, 607	UN4214	Transistor
Q311	DTA114ESTP	Transistor
Q312	DTA114ESTP	Transistor
Q501, 502	2SK301-QRS	Transistor
Q601, 603	2SD1265-0	Transistor
Q602	2SB941P	Transistor
Q605 [XA, PC]	2SC1685-QNC	Transistor
DIODES		
D1	LN66	LED
D2, 3	MA154WK	Diode
D101, 103~106, 113, 114, 115, 301, 302, 313, 315~319, 615, 698, 699	MA165	Diode
D102	MA4030M	Diode, 3V Zener
D107~111	LN224WP	LED
D303	1SR35200	Diode
D305~310	LN863RCP	LED
D311	PN323BLFMS	Diode, Photo
D314	LN81CPHL	LED
D601~604 $\Delta$	GP15GLF	Rect
D605, 606	MA4100M	Diode, 10V Zener
D607	MA4130M	Diode, 13V Zener
D608, 616	MA4051M	Diode, 5.1V Zener
D610~613	MA167	Diode
D614	MA4056-M	Diode, 5.6V Zener
D617	MA4082M	Diode, 8.2V Zener
D618 [XA, PC]	MA4270	Diode, 27V Zener
COILS		
L1	ELEA101JA	Coil
L101, 102, 103	ELEPH101KA	Coil
L201, 202	ELEPG1R2MA	Coil
L301	SLD9B3-Z	Coil
L501, 502	SLQY07G-40	Coil
L601 [EG]	SLQZ650MH49	Coil
TRANSFORMERS		
T1 [EK, XL] $\Delta$	SLT5M474-W	Power
T1 [XA, PC] $\Delta$	SLT5M475-W	Power
T1 [Other] $\Delta$	SLT5M473-W	Power
T2 [XA, PC] $\Delta$	SLT5i25	Stand by
T2 [Other] $\Delta$	SLT5i24	Stand by
CRYSTAL		
X1	CSB420PB1	420kHz
X301	SVFCSA400MG	4MHz
VARIABLE RESISTORS		
VR201~205	EWG00110G15S	Graphic Equalizer
FUSES		
F1 [EK] $\Delta$	XBA2C08TB0	250V, T0.8A
F1 [Other] $\Delta$	XBA2C08TR0	250V, T0.8A
F2, 3 [EK] $\Delta$	XBA2C16TB0	250V, T1.6A
F2, 3 [Other] $\Delta$	XBA2C16TR0	250V, T1.6A
F4 [XA, PC] $\Delta$	XBA2C16TR0	250V, T1.6A
SWITCHES		
S1~10	SSG13	Key
S11	SSH1159	Power
S12 [XA, PC] $\Delta$	ESE37263	Voltage Selector, (Rotary Type)
S13 [XA, PC] $\Delta$	ESD39108S	Voltage Selector, (Slide Type)
RELAY		
RL601	SSY123	Power
BATTERY		
BAT1	BR2325-1VC	Lithium Battery

Ref. No.	Part No.	Description
CABINET AND CHASSIS PARTS		
1	SGX9023A	Ornament, A (1)
2	SGX9024	Ornament, B (1)
3	SGYUX33-KE	Front Panel Ass'y (1)
4	SBC765-1A	Button, Selector (1)
5	SBC762-2B	Button, Volume (1)
6	SBC764-2	Button, Balance (1)
7	SJJ63E	Headphone Jack (1)
8	SBC807-5	Button, Power (1)
9 [EK]	SKCUX33-KK	Cabinet Ass'y (1)
9 [Other]	SKCUX33-KE	Cabinet Ass'y (1)
10	LN078328P	LED Ass'y (1)
11	SMP386-1	LED Holder (1)
12	SBD105-4	Knob, Graphic Equalizer (5)
13	LN052280P	LED Ass'y (1)
14	SHR9797	Diode Holder (1)
15	SMC1223-1	Shield Cover, Upper (1)
16	SMC6406	Shield Cover, Bottom (1)
17	SHR415	Nylon Pin (4)
18	SHR411	Nylon Pin (2)
19 [EK]	SKUUX33-KK	Bottom Board Ass'y (1)
19 [EG]	SKUUX33-KG	Bottom Board Ass'y (1)
19-1	SKL293	Foot (4)
19 [XL]	SKUUX33-KL	Bottom Board Ass'y (1)
19 [XA, PC]	SKUUX33-KX	Bottom Board Ass'y (1)
19 [Other]	SKUUX33-KE	Bottom Board Ass'y (1)
20	SHE170-1	P.C.B. Holder (2)
21	SHE181	P.C.B. Holder (2)
22	SJT390	Fuse Holder (6)
23	SHG6219	Rubber (2)

EXPLODED VIEW

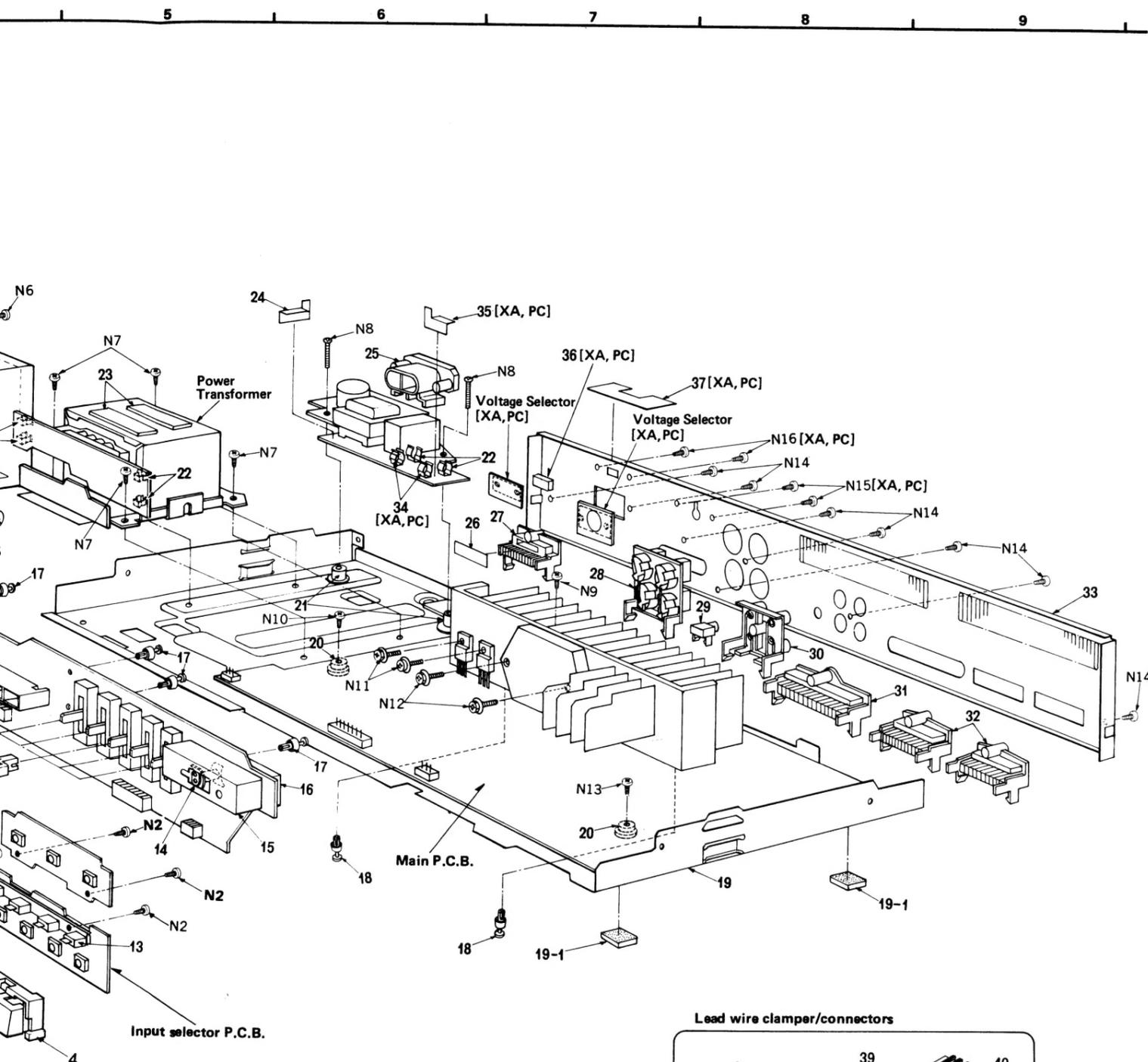


Ref. No.	Part No.	Description
<b>PACKING PARTS</b>		
P1[EK]	SPG5708	Carton Box (1)
P1[EF]	SPG5707	Carton Box (1)
P1[Other]	SPG5706	Carton Box (1)
P2	SPS4657-1	Pad, Left (1)
P3	SPS4658-3	Pad, Right (1)
P4	SPS4754	Pad, Remote Control (1)
P5	SPS4775	Pad, Upper (1)
P6	SPP741	Polyethylene Bag (1)

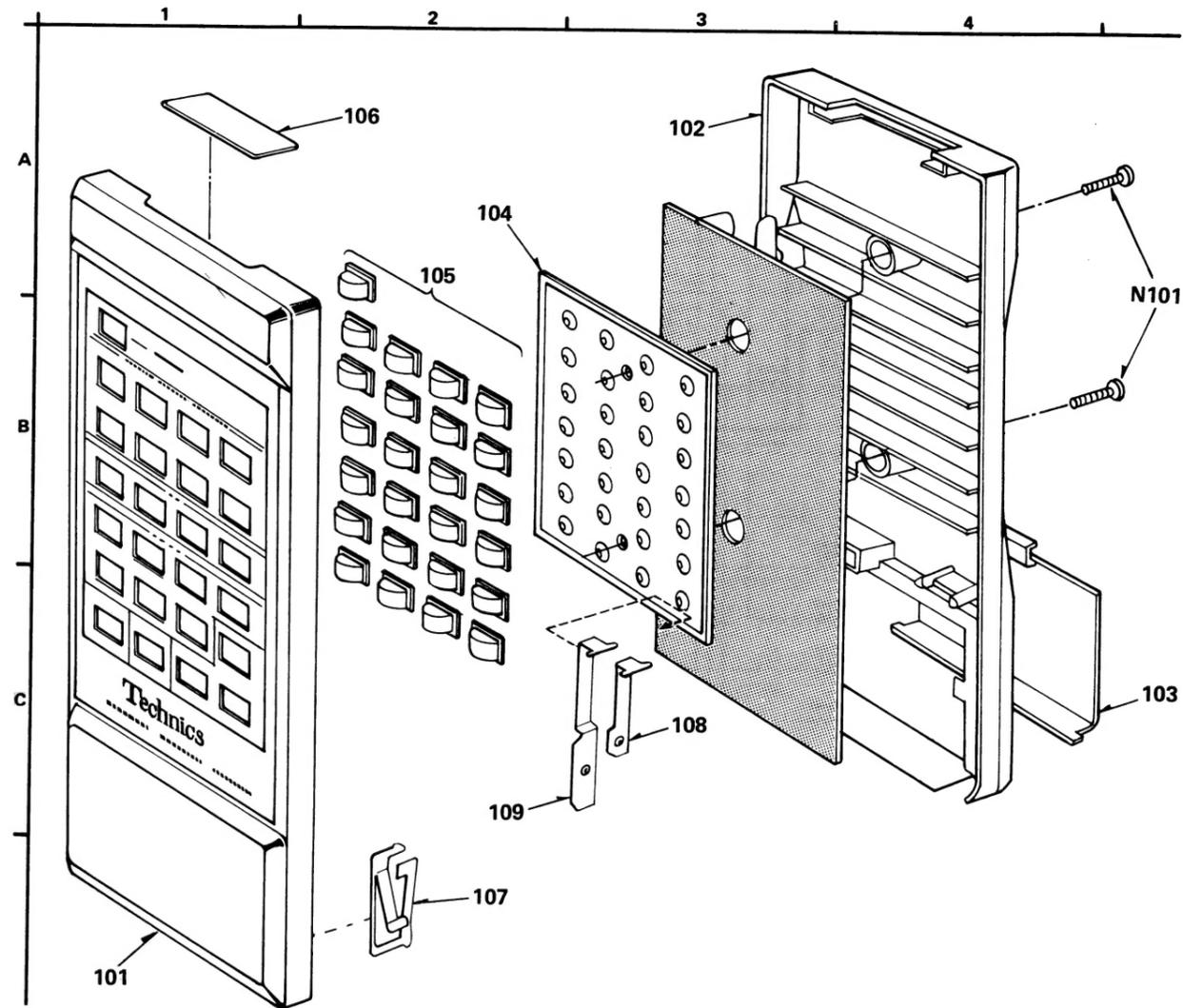
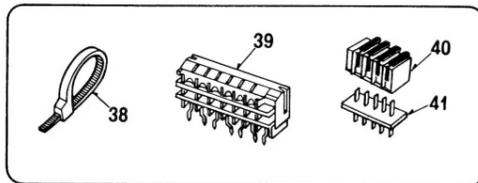
• REMO

Ref. No.
REMOTE
101
102
103
104
105
106
107
108
109
SCREW
N101

• Remote Control Unit (Transmitter)



Lead wire clasper/connectors



• REMOTE CONTROL UNIT

Ref.No.	Part No.	Description
REMOTE CONTROL		
101	UR64VCS104	Top Case Ass'y (1)
102	UR64VCS105	Bottom Case Ass'y (1)
103	UR64EC121	Battery Cover (1)
104	UR64CT122	Rubber Contact (1)
105	UR64BT123A	Button Contact (25)
106	UR64SB125	Tinted Plate (1)
107	UR64TD127	Battery Terminal, (1)
		⊕
108	UR64TD128	Battery Terminal, (1)
		⊖
109	UR52TD101	Battery Terminal, (1)
		⊕, ⊖
SCREW		
N101	XTS26+12GFZ	Tapping, ⊕ 2.6x12 (2)