

# TA-E90ES

## SERVICE MANUAL

US Model  
AEP Model



PHOTO : BLACK

### SPECIFICATIONS

#### System

Low-noise FET high gain, NFB type equalizer amplifier  
Low noise FET, single stage differential, MOS FET push-pull output, flat amplifier

Total harmonic distortion at rated 20 Hz - 20 kHz  
0.003%

Intermodulation (IM) distortion at rated output 60 Hz : 7 kHz = 4 : 1  
0.003%

Residual noise at network A  
Less than 9  $\mu$ V

Frequency response  
PHONO MM: RIAA equalization curve  $\pm 0.2$  dB  
TAPE1/DAT, TAPE2/MD, AUX, CD,  
TUNER: 3 Hz - 300 kHz  $\pm 3$  dB

S/N (network)  
PHONO MC (0.5 mV): 78 dB (A)  
MM (5 mV): 95 dB (A)  
TAPE1/DAT, TAPE2/MD, AUX, CD,  
TUNER: 105 dB (A)

Muting  
-  $\infty$  dB

#### Input

##### Input sensitivity

PHONO MC: 0.25 mV, 100 ohms  
MM: 2.5 mV, 50 kilohms  
TAPE1/DAT, TAPE2/MD, AUX, CD  
TUNER: 150 mV, 20 kilohms  
CD (BALANCED): 150 mV, 20 kilohms

##### Maximum input capability (1 kHz)

PHONO (1 kHz, THD 0.01%) MC: 10 mV  
MM: 200 mV

#### Output

##### Output voltage impedance

TAPE1/DAT, TAPE2/MD: 150 mV, 1 kilohms  
PRE OUT: 1.5 V, 300 ohms  
BALANCED OUTPUT: 3 V, 600 ohms  
HEADPHONES: 25 milliwatts (at 8 ohms)

#### General

##### Power requirements

U.S.A. model: 120 V AC, 60 Hz  
European countries model: 220 - 230 V AC,  
50/60 Hz

##### Power consumption

20 W

##### Dimensions (approx.) (w/h/d)

430 x 100 x 360 mm (17 x 4 x 14 1/4 inches)  
incl. projecting parts and controls

##### Mass (approx.)

10.3 kg (22 lb. 11 oz)

##### Supplied accessories

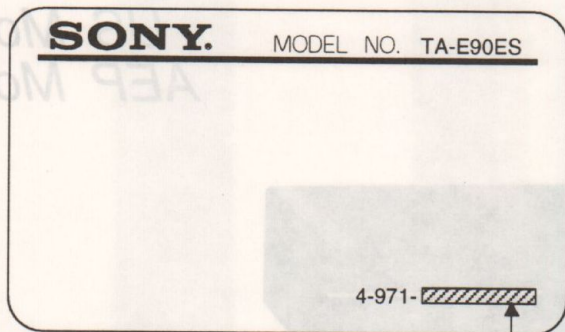
Remote commander (remote) RM-J90(1)  
Sony batteries SUM-3(NS) (2)  
Audio connecting cord (1)

Design and specifications are subject to change without notice.



STEREO PREAMPLIFIER  
**SONY**

— MODEL IDENTIFICATION —  
(Specification Label)



AEP model : 660-xx  
German model : 661-xx  
US model : 662-xx

SAFETY CHECK-OUT

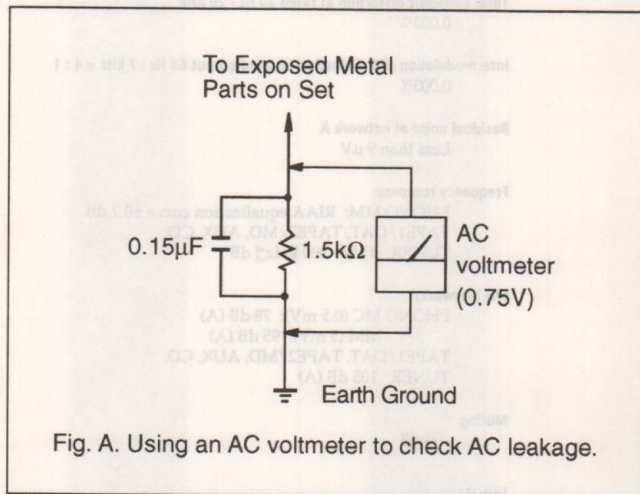
After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microamperes). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2V AC range are suitable. (See Fig. A)



**SAFETY-RELATED COMPONENT WARNING !!**  
COMPONENTS IDENTIFIED BY MARK  $\Delta$  OR DOTTED LINE WITH MARK  $\Delta$  ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

SECTION 1  
SERVICING NOTE

NOTE FOR INSTALLATION OF THE SIDE PANEL

Adjust the aperture to be about 5 mm from the FRONT PANEL when installing the SIDE PANEL.

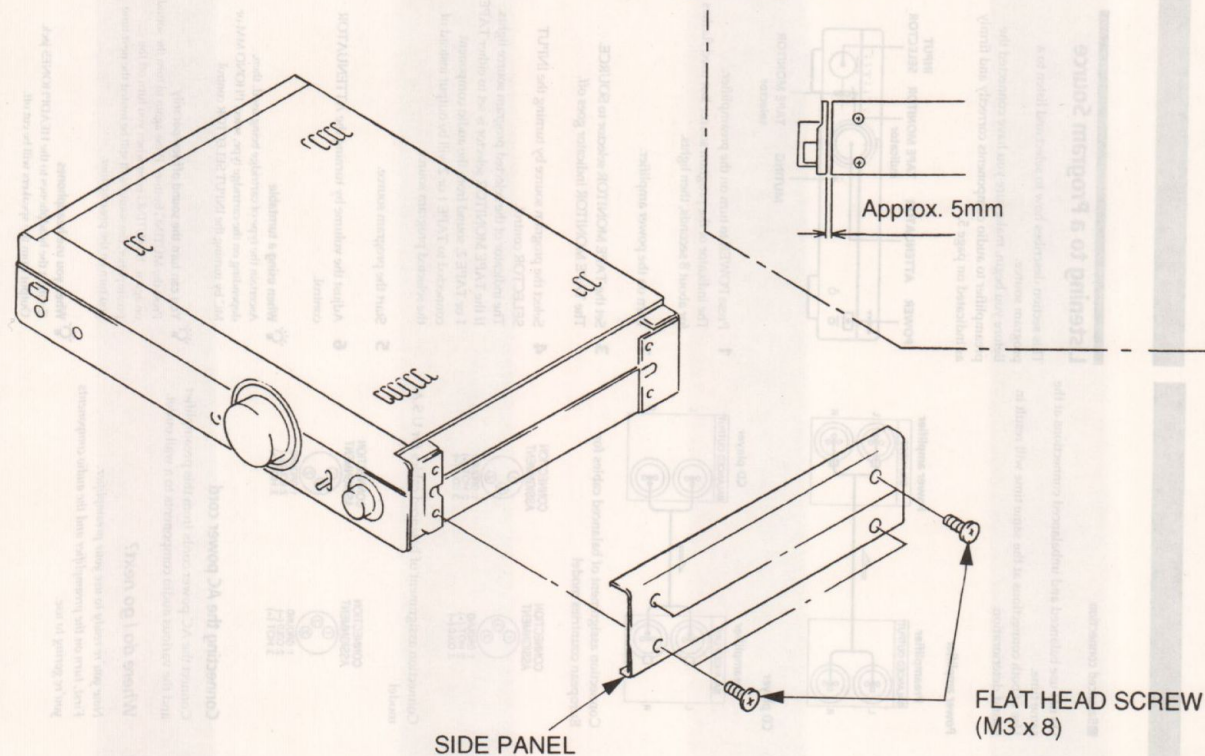


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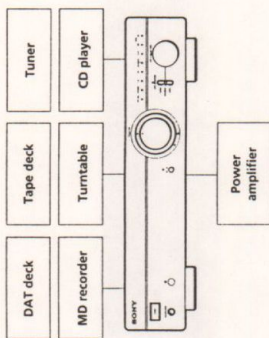
# SECTION 2 GENERAL

This section is extracted from instruction manual.

## Hooking Up the System

### Overview

This section describes how to hook up the preamplifier to a variety of audio components. Hook up your audio components according to the connection diagrams that follow.



### What cords will I need?

The following audio connecting cord (one) comes with your preamplifier:



Use one audio connecting cord to connect the preamplifier to: a power amplifier, a CD player or a tuner.

Use two balanced cables (equivalent to Canon XLR-3), contact your dealer when connecting a CD player with balanced line output connectors or a power amplifier with balanced input connectors.

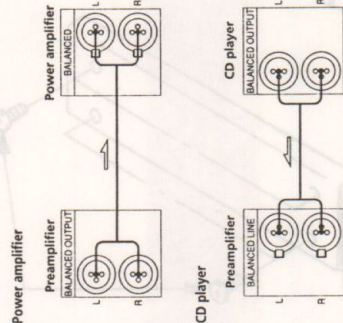
Use two audio connecting cords to connect the preamplifier to: a tape deck, a DAT deck or an MD recorder.

### Hookup procedure

- Turn off the power to all components before making any connections.
- Do not connect the AC power cords until all connections are completed.
- Be sure to make connections firmly to prevent hum and noise.
- When connecting an audio cord, be sure to connect the R(right) and L(left) connectors of the preamplifier to the R and L connectors of the other equipment.

### Balanced connection

Do not use balanced and unbalanced connections at the same time. Use of both connections at the same time will result in sound deterioration.



Connection assignment of balanced cables for European countries model



Connection assignment of balanced cables for U.S.A. model



### Connecting the AC power cord

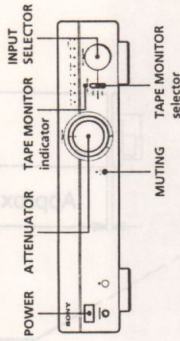
Connect the AC power cords from this preamplifier and the various audio components to a wall outlet.

### Where do I go next?

Now you're ready to use your preamplifier. First, turn on the preamplifier and the audio components you're going to use.

## Listening to a Program Source

This section describes how to select and listen to a program source. Before you begin, make sure you have connected the preamplifier to audio components correctly and firmly as indicated on page 5.



- 1 Press POWER to turn on the preamplifier. The indicator of the program source last used flashes for about 8 seconds, then lights.
- 2 Turn on the power amplifier.
- 3 Set the TAPE MONITOR selector to SOURCE. The TAPE MONITOR indicator goes off.

- 4 Select the program source by turning the INPUT SELECTOR control. The indicator of the selected program source lights. If the TAPE MONITOR selector is set to either TAPE 1 or TAPE 2, sound from the audio component connected to TAPE 1 or 2 will be output instead of the selected program source.
- 5 Start the program source.
- 6 Adjust the volume by turning the ATTENUATOR control.

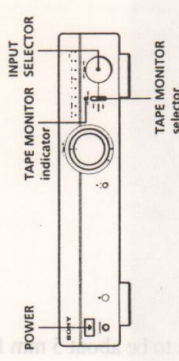
**When using a turntable**  
Ascertain the type of cartridge being used, then, depending on the cartridge type, select PHONO MM or MC by turning the INPUT SELECTOR control.

**You can turn the sound off temporarily**  
Press the MUTING button. Press again to turn the sound on again. If MUTING is on when you turn off the preamplifier, the sound will still be muted the next time you turn on the preamplifier.

**When you use headphones**  
Connect the headphones to the HEADPHONE jack. Output from the speakers will be cut off.

## Recording

This section describes how to record a program source. Before you begin, make sure you have connected the preamplifier to audio components correctly and firmly as indicated on page 5.



- 1 Press POWER to turn on the preamplifier.
- 2 Turn on the power amplifier.
- 3 Select the program source to be recorded by turning the INPUT SELECTOR control. Make sure to set the TAPE MONITOR selector to SOURCE, otherwise you will not be able to hear the selected program source.
- 4 Place the recording unit into recording pause.
- 5 Make the recording level adjustments on the recording unit with the program source playing.
- 6 Restart the program source.
- 7 Start recording on the recording unit.

**You can monitor the recorded sound**  
If your cassette deck has separate recording and playback heads, you can monitor the recorded sound by setting the TAPE MONITOR selector to either TAPE 1 or TAPE 2, whichever one is your recording unit. The TAPE MONITOR indicator will light.

**When dubbing a tape**  
When dubbing from TAPE 1 to TAPE 2, select TAPE 1 in step 3 of the recording procedure. When dubbing from TAPE 2 to TAPE 1, select TAPE 2 in step 3 of the recording procedure.

**Note**  
If you change the program source by turning the INPUT SELECTOR control during recording, the newly selected program source will be recorded.

SECTION 3 ELECTRICAL ADJUSTMENT

SECTION 4 DIAGRAMS

4-2. BLOCK DIAGRAM

DC Bias Adjustment (with no signal input)

Note: 1. Before measuring, desolder the two test lands of the MAIN board and EQ board (four test lands altogether) and then return the boards to their original positions.

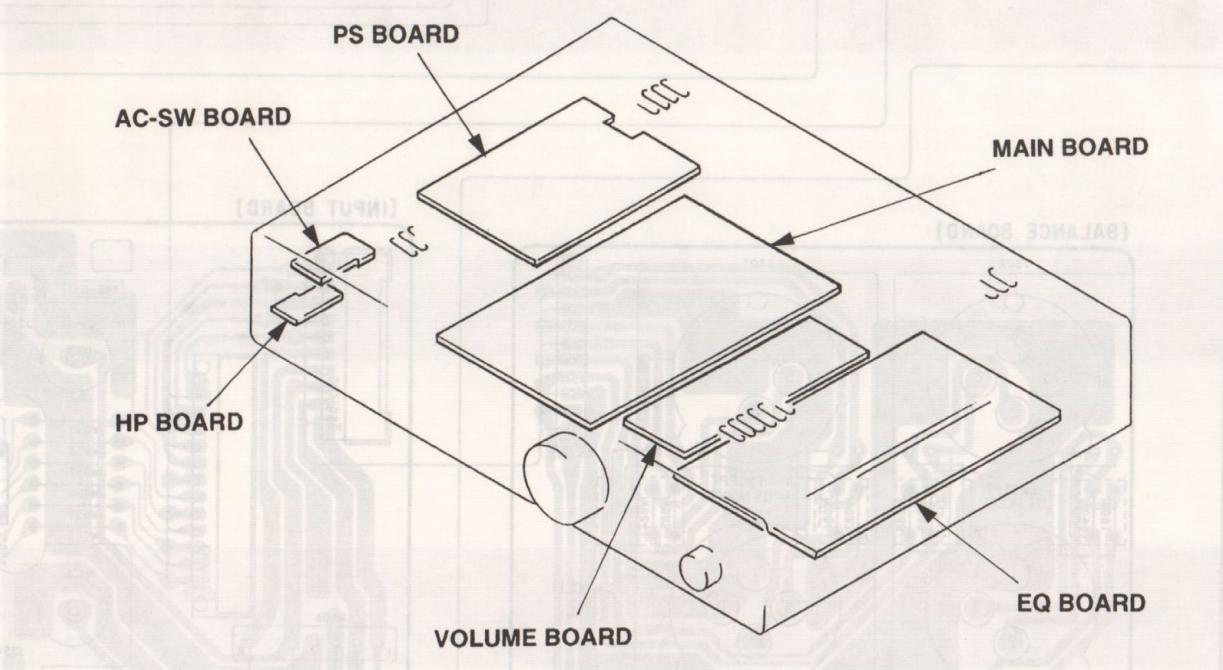
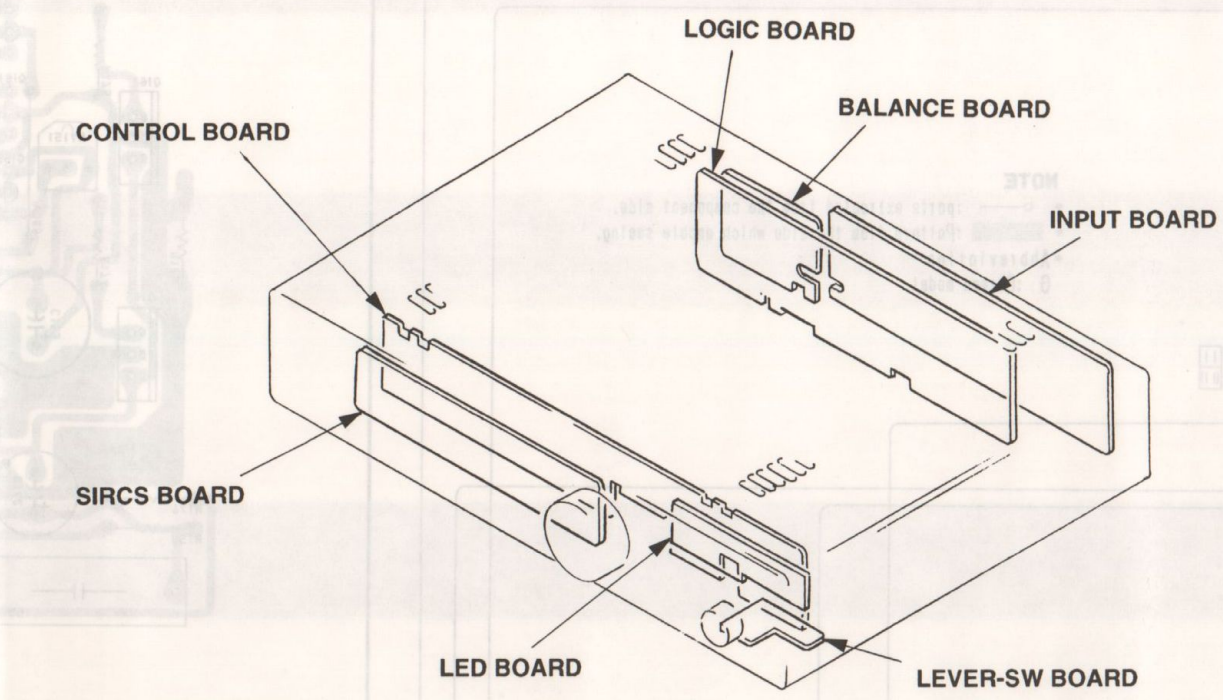
Set up: Volume: minimum

- Adjusting method: 1. Connect a DC volt meter to both edges of the R418 and R468 of the MAIN board and turn on the power supply. Adjust RV401 and RV451 so that the DC volt meter reading satisfies the specified value. 2. Adjust the EQ board in the same way. 3. After completing all adjustments, solder all parts desoldered again.

\* Specified Value: 200 mV ± 20 mV

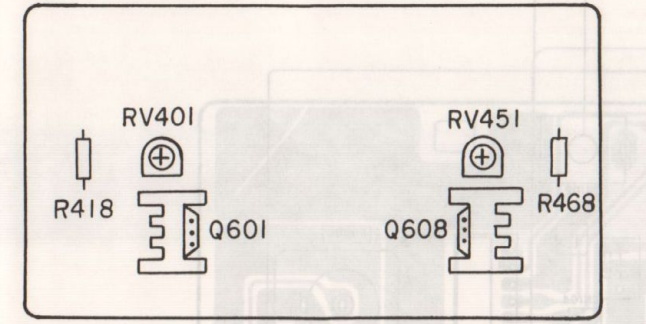
Table with 4 columns: Board Name, Channel, Measurement Point, Adjustment Point. Rows include MAIN BOARD (L-ch, R-ch) and EQ BOARD (L-ch, R-ch).

4-1. CIRCUIT BOARDS LOCATION

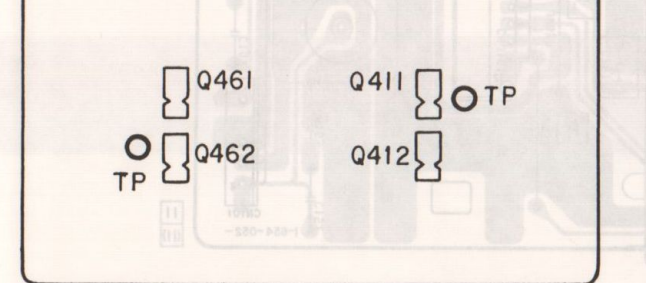


Adjustment Location:

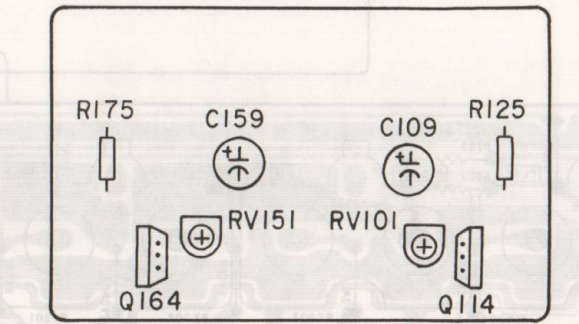
[MAIN BOARD] Component Side



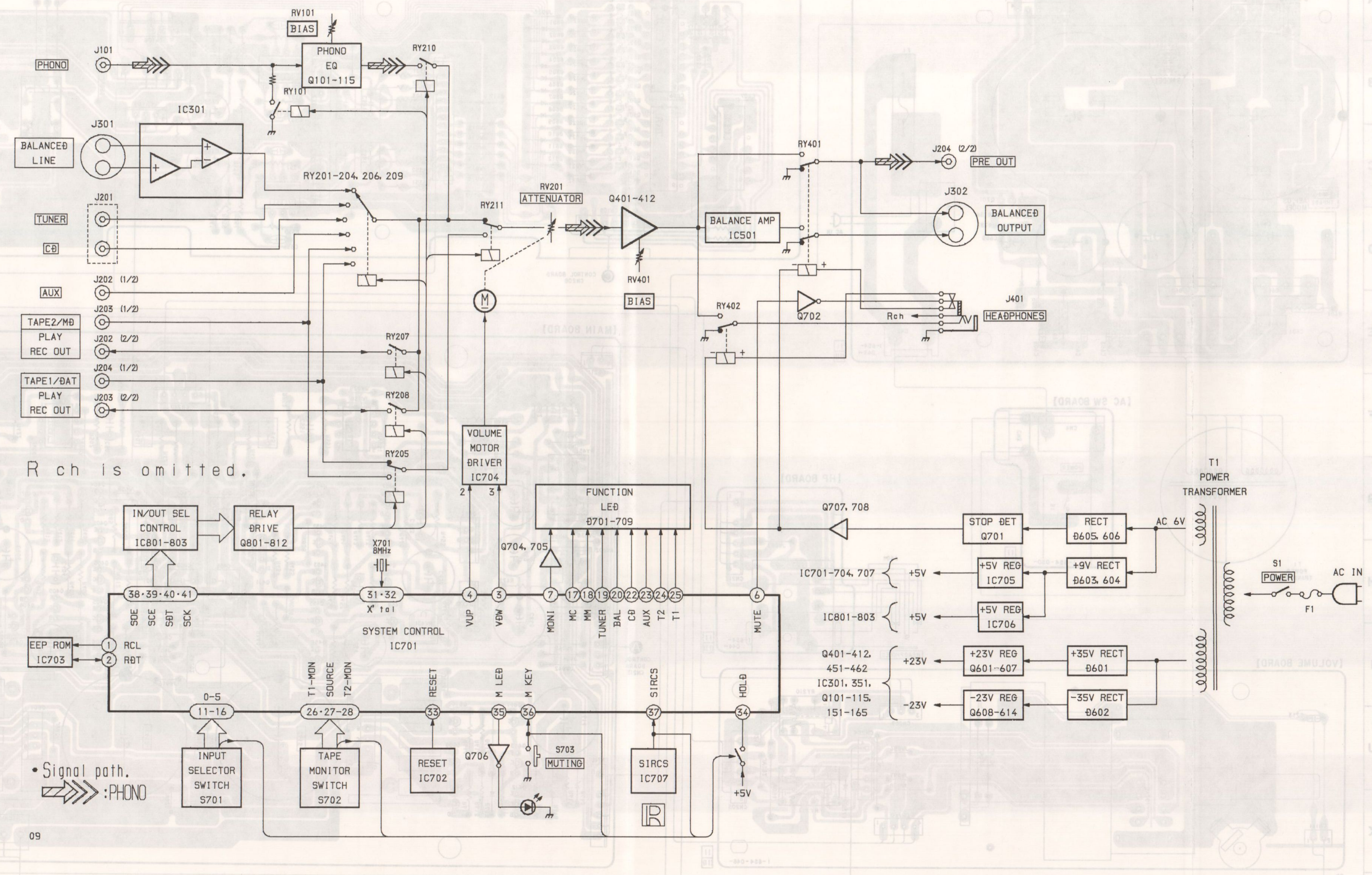
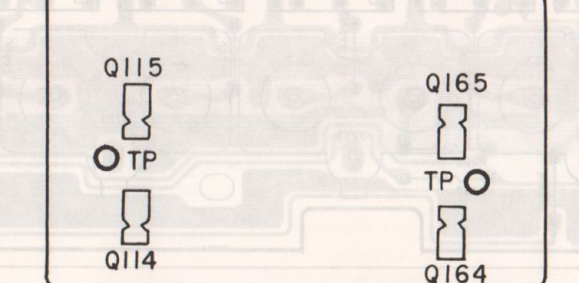
Conductor Side



[EQ BOARD] Component Side



Conductor Side



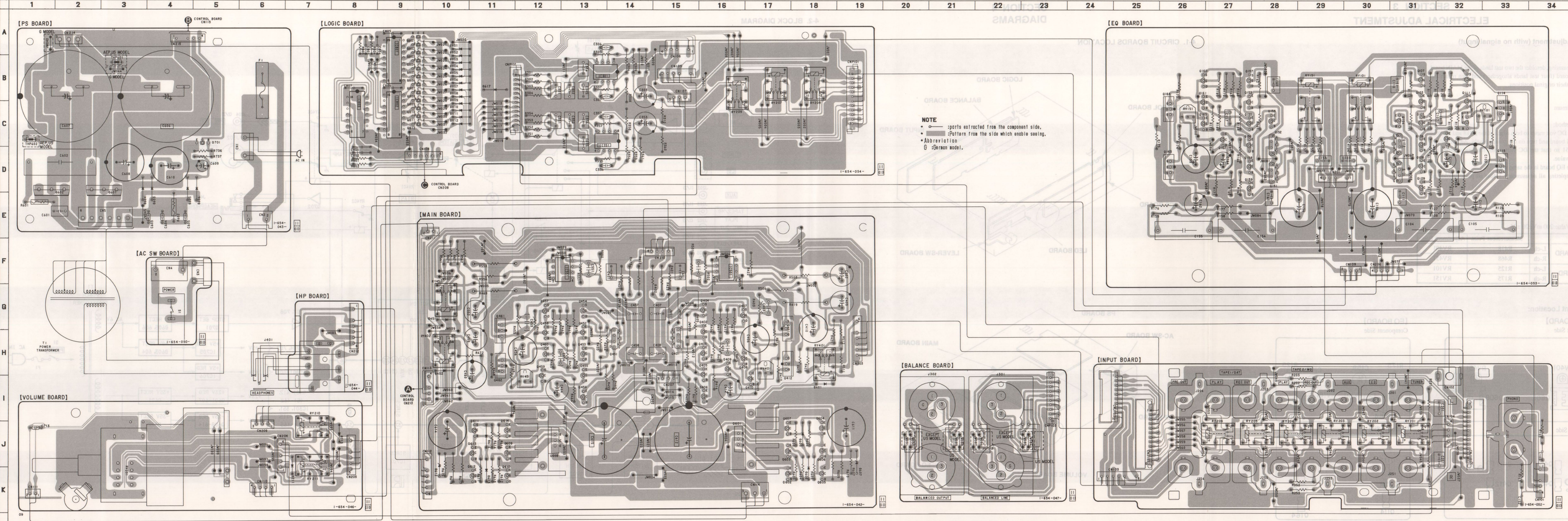
R ch is omitted.

Signal path: PHONO

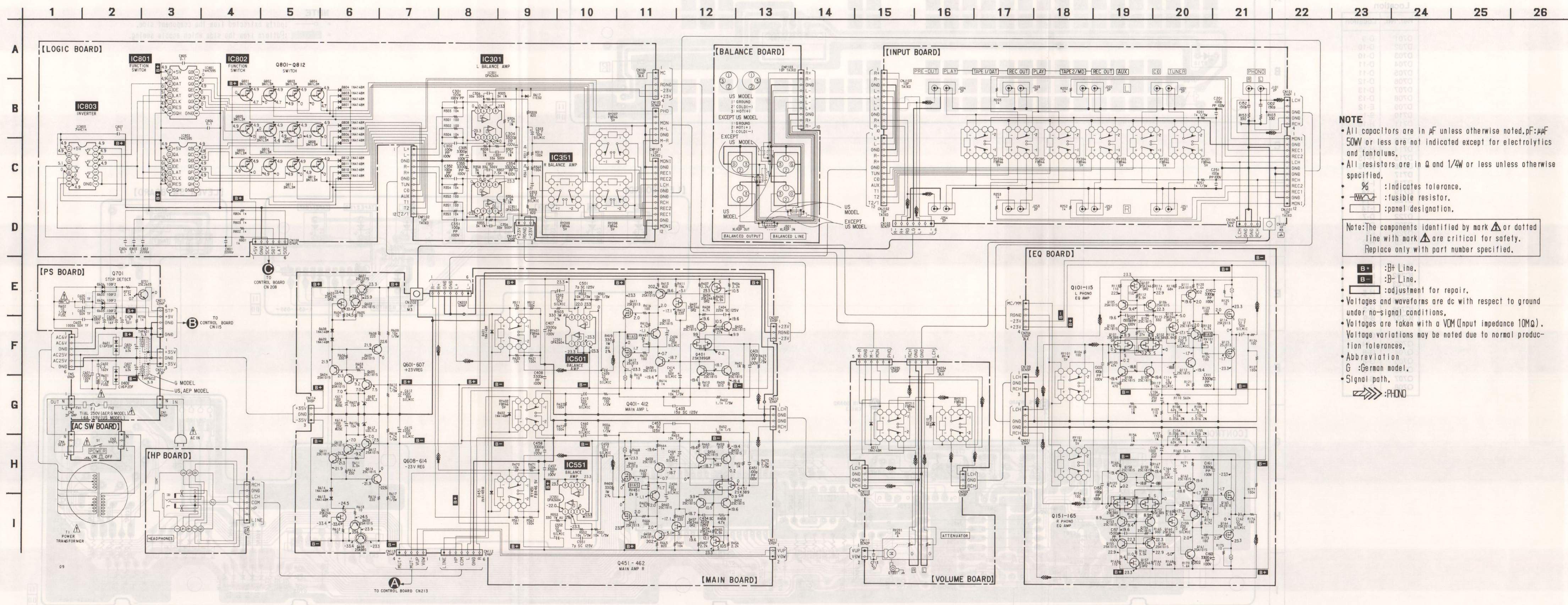
Reference table with 4 columns: Ref. No., Location, Ref. No., Location. Lists component locations across the board grid.

• Semiconductor Location

Ref. No.	Location	Ref. No.	Location
D210	J-8	Q157	B-28
D211	K-7	Q158	D-28
D401	I-18	Q159	D-28
D402	H-10	Q160	B-27
D451	G-10	Q161	B-27
D601	E-3	Q162	D-27
D602	E-2	Q163	C-27
D603	E-4	Q164	B-26
D604	E-3	Q165	D-26
D605	E-4	Q401	H-15
D606	E-5	Q402	G-16
D607	J-19	Q403	H-16
D608	K-18	Q404	G-16
D609	J-18	Q405	H-16
D612	K-10	Q406	I-16
D613	K-11	Q407	G-17
D614	J-11	Q408	H-17
D617	B-11	Q409	H-16
D801	A-10	Q410	I-17
D802	A-10	Q411	H-18
D803	B-10	Q412	I-18
D804	B-10	Q451	H-14
D805	B-10	Q452	G-13
D806	B-10	Q453	H-13
D807	B-10	Q454	G-13
D808	B-10	Q455	H-13
D809	B-10	Q456	I-13
D810	C-10	Q457	G-12
D811	C-10	Q458	G-12
D812	C-10	Q459	H-12
		Q460	H-12
IC301	B-14	Q461	G-11
IC351	C-14	Q462	I-11
IC501	F-16	Q601	J-16
IC551	F-13	Q602	K-18
IC801	A-9	Q603	J-18
IC802	C-9	Q604	I-18
IC803	C-8	Q605	K-18
		Q606	J-18
Q101	D-31	Q607	I-18
Q102	C-31	Q608	J-12
Q103	B-31	Q609	J-11
Q104	C-31	Q610	K-11
Q105	C-31	Q611	J-11
Q106	C-31	Q612	K-11
Q107	B-31	Q613	J-11
Q108	D-31	Q614	J-11
Q109	D-31	Q701	C-5
Q110	B-32	Q801	A-9
Q111	B-32	Q802	A-9
Q112	C-32	Q803	B-9
Q113	C-32	Q804	B-9
Q114	B-33	Q805	B-9
Q115	D-33	Q806	B-9
Q151	D-28	Q807	B-9
Q152	C-28	Q808	B-9
Q153	B-28	Q809	C-9
Q154	C-28	Q810	C-9
Q155	C-28	Q811	C-9
Q156	C-28	Q812	C-9



4-4. SCHEMATIC DIAGRAM — MAIN SECTION —



**NOTE**

- All capacitors are in  $\mu\text{F}$  unless otherwise noted,  $\text{pF} = \mu\text{M}\text{F}$  50W or less are not indicated except for electrolytics and tantalums.
- All resistors are in  $\Omega$  and  $1/4\text{W}$  or less unless otherwise specified.
- $\%$  : Indicates tolerance.
- $\text{---}/\text{---}$  : fusible resistor.
- $\square$  : panel designation.

Note: The components identified by mark  $\Delta$  or dotted line with mark  $\Delta$  are critical for safety. Replace only with part number specified.

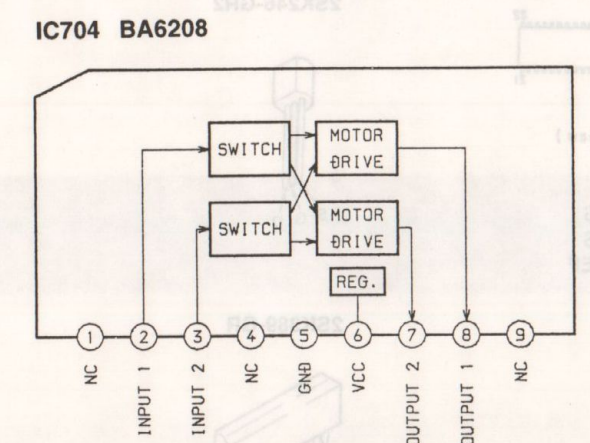
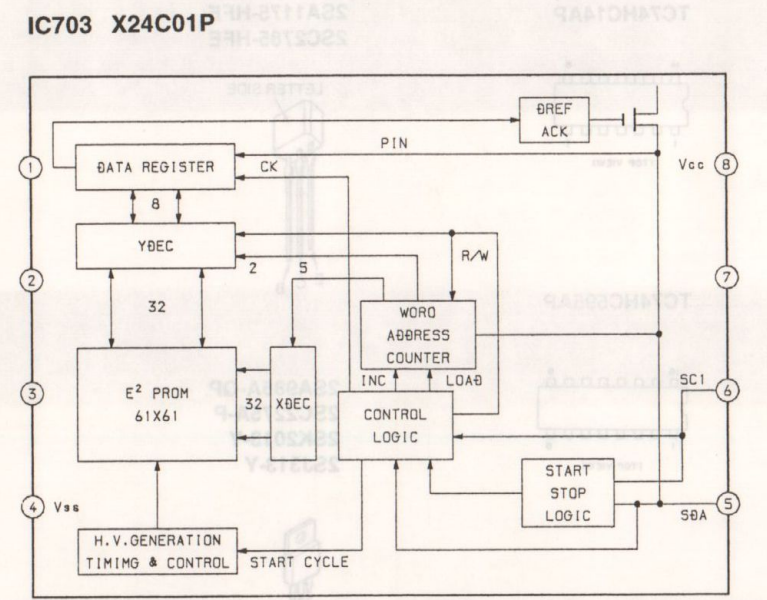
- $\text{B+}$  : B+ Line.
- $\text{B-}$  : B- Line.
- $\text{---}$  : adjustment for repair.

Voltages and waveforms are dc with respect to ground under no-signal conditions.

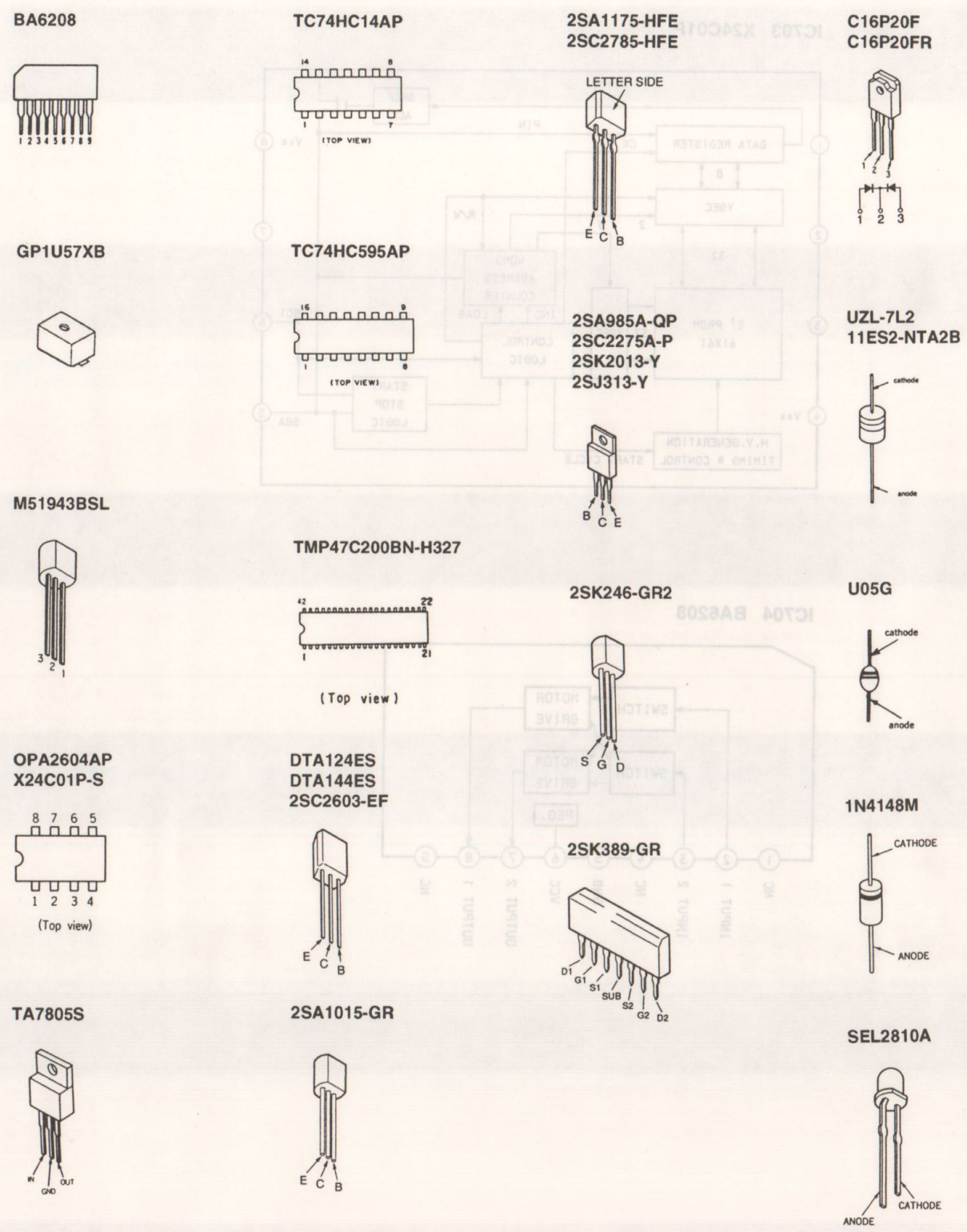
- Voltages are taken with a VOM (input impedance  $10\text{M}\Omega$ ).
- Voltage variations may be noted due to normal production tolerances.
- Abbreviation G : German model.
- Signal path.

$\text{---}$  : PHONO

IC BLOCK DIAGRAMS



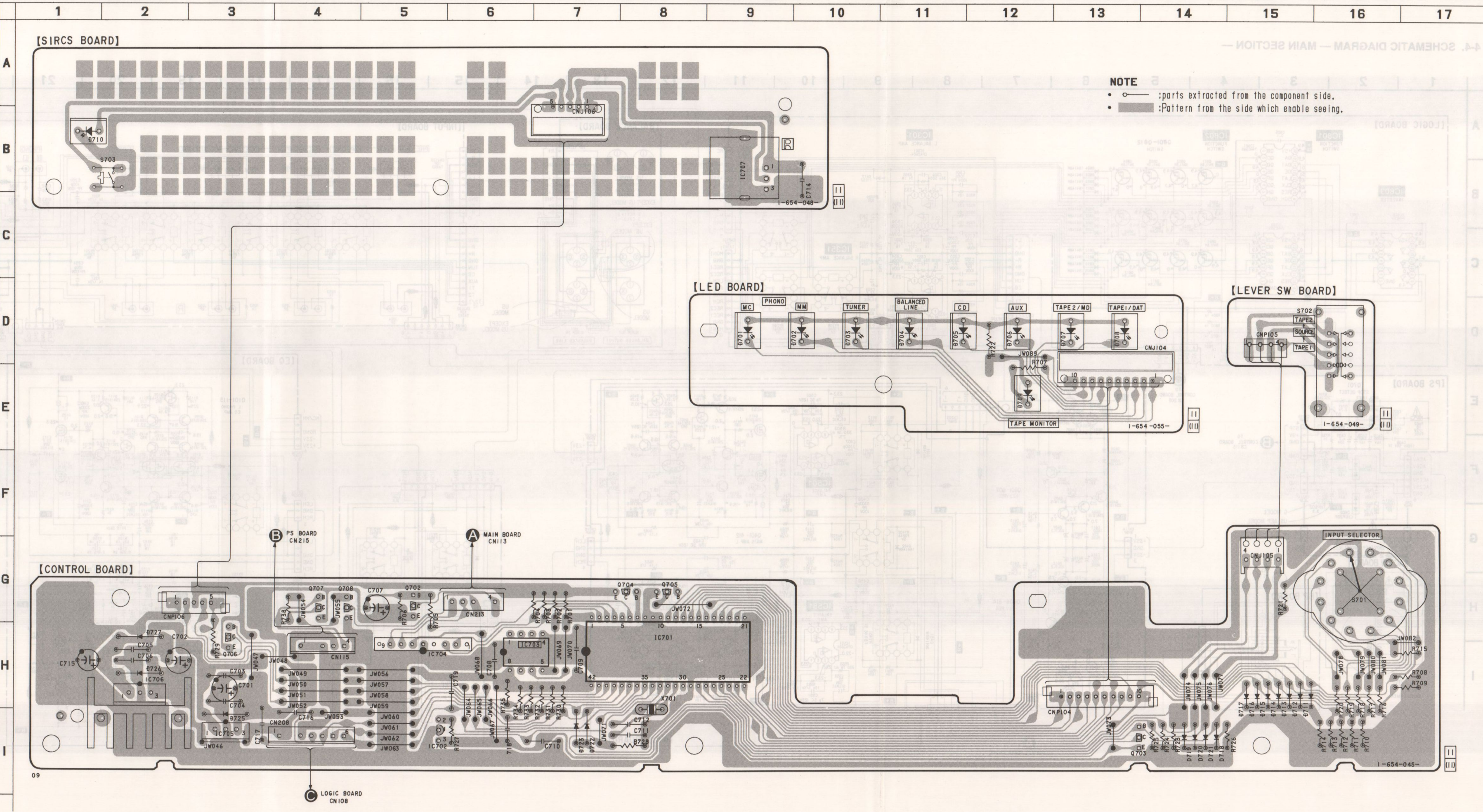
4-5. SEMICONDUCTOR LEAD LAYOUTS



4-6. PRINTED WIRING BOARD — CONTROL SECTION —  
 •See page 6 for Circuit Boards Location.

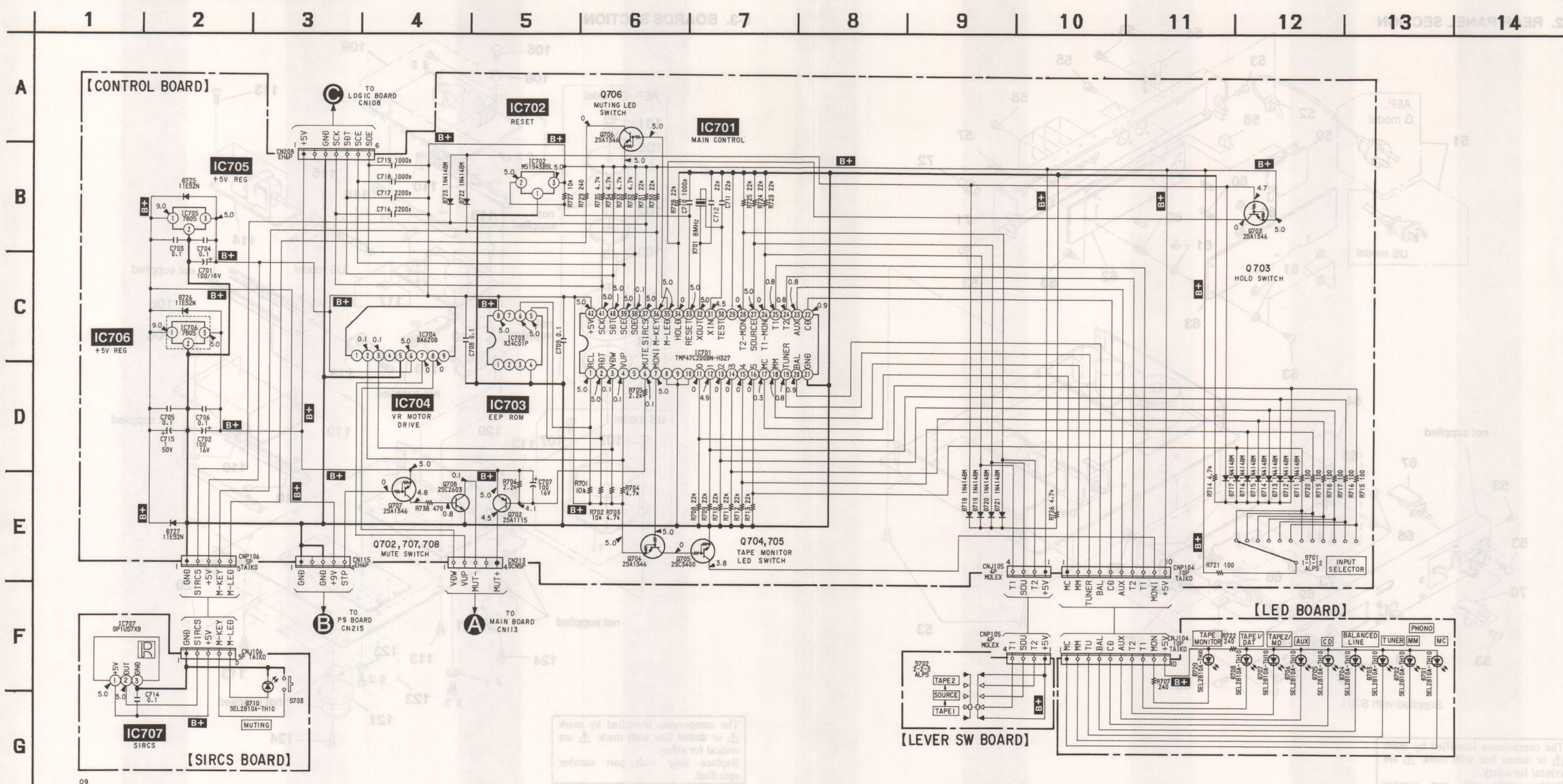
• Semiconductor Location

Ref. No.	Location
D701	D-9
D702	D-10
D703	D-10
D704	D-11
D705	D-11
D706	D-12
D707	D-13
D708	D-13
D709	E-12
D710	B-1
D711	H-16
D712	H-15
D713	H-15
D714	H-15
D715	H-15
D716	H-15
D717	H-15
D718	I-15
D719	I-14
D720	I-14
D721	I-14
D722	D-7
D723	D-7
D725	I-3
D726	H-2
D727	H-2
IC701	H-8
IC702	I-5
IC703	H-7
IC704	H-5
IC705	I-3
IC706	H-2
IC707	B-9
Q702	G-5
Q703	I-14
Q704	G-8
Q705	G-8
Q706	H-3
Q707	G-4
Q708	G-4



NOTE  
 • —○— : parts extracted from the component side.  
 • —■— : Pattern from the side which enable seeing.

4-7. SCHEMATIC DIAGRAM — CONTROL SECTION —



NOTE

- All capacitors are in  $\mu\text{F}$  unless otherwise noted,  $\text{pF}:\mu\text{F}$  50W or less are not indicated except for electrolytics and tantalums.
- All resistors are in  $\Omega$  and  $1/4\text{W}$  or less unless otherwise specified.
- : panel designation.
- **B+** :B+ Line.
- **B-** :B- Line.
- Voltages and waveforms are dc with respect to ground under no-signal conditions.
- Voltages are taken with a VOM (Input impedance  $10\text{M}\Omega$ ). Voltage variations may be noted due to normal production tolerances.

4-8. IC PIN FUNTION

IC701 TMP47C200BN-H327

Pin No.	Pin Name	I/O	Function
1	RCL	O	Clock
2	RDT	I/O	Data
3	VUP	O	Up
4	VDW	O	Down
5	—	—	Not Used. (Open)
6	MUT	O	Mute control signal output when switching. (Mute : H)
7	MONI	O	TAPE MONITOR LED display signal. (L : Function LED is turned on.)
8	—	I	Not Used. (Pull down to GND.)
9	—	I	Not Used. (Pull down to GND.)
10	—	I	Not Used. (Pull down to GND.)
11	SW0	I	Relativity position detection signal of rotary switch. (one of them terminal : H, the other terminal : L) Direction from SW5 to SW0, CD → AUX → TAPE2 → TAPE1 → MC → MM → TUNER → BALANCE → CD ...
12	SW1	I	
13	SW2	I	
14	SW3	I	
15	SW4	I	
16	SW5	I	Function LED drive signal. (ON : L)
17	MC	O	
18	MM	O	
19	TUNER	O	Function LED drive signal. (ON : L)
20	BAL	O	
21	GND	—	GND terminal.
22	CD	O	Function LED drive signal. (ON : L)
23	AUX	O	
24	TAPE 2	O	
25	TAPE 1	O	Signal of TAPE MONITOR SWITCH (one of them : H, the other : L)
26	TAPE 1M	I	
27	SOURCE	I	Signal of TAPE MONITOR SWITCH (one of them : H, the other : L)
28	TAPE 2M	I	
29	—	I	Not Used. (Pull down to GND.)
30	TEST	—	Test terminal. (Open)
31	XIN	—	Oscillation signal. 8.19MHz
32	XOUT	—	
33	RESET	I	Reset signal. (Reset : L)
34	HOLD	I	Cancellation of hold mode signal. (Start : H)
35	M-LED	O	MUTING LED drive signal. (ON : L)
36	M-KEY	I	MUTING Switch signal. (Active : L)
37	SIRCS	I	SIRCS signal (Active : L)
38	SOE	O	Serial control signal to function IC. (IC801, 802)
39	SCE	O	
40	SDT	O	
41	SCK	O	
42	VDD	—	Power supply (+5V) terminal.



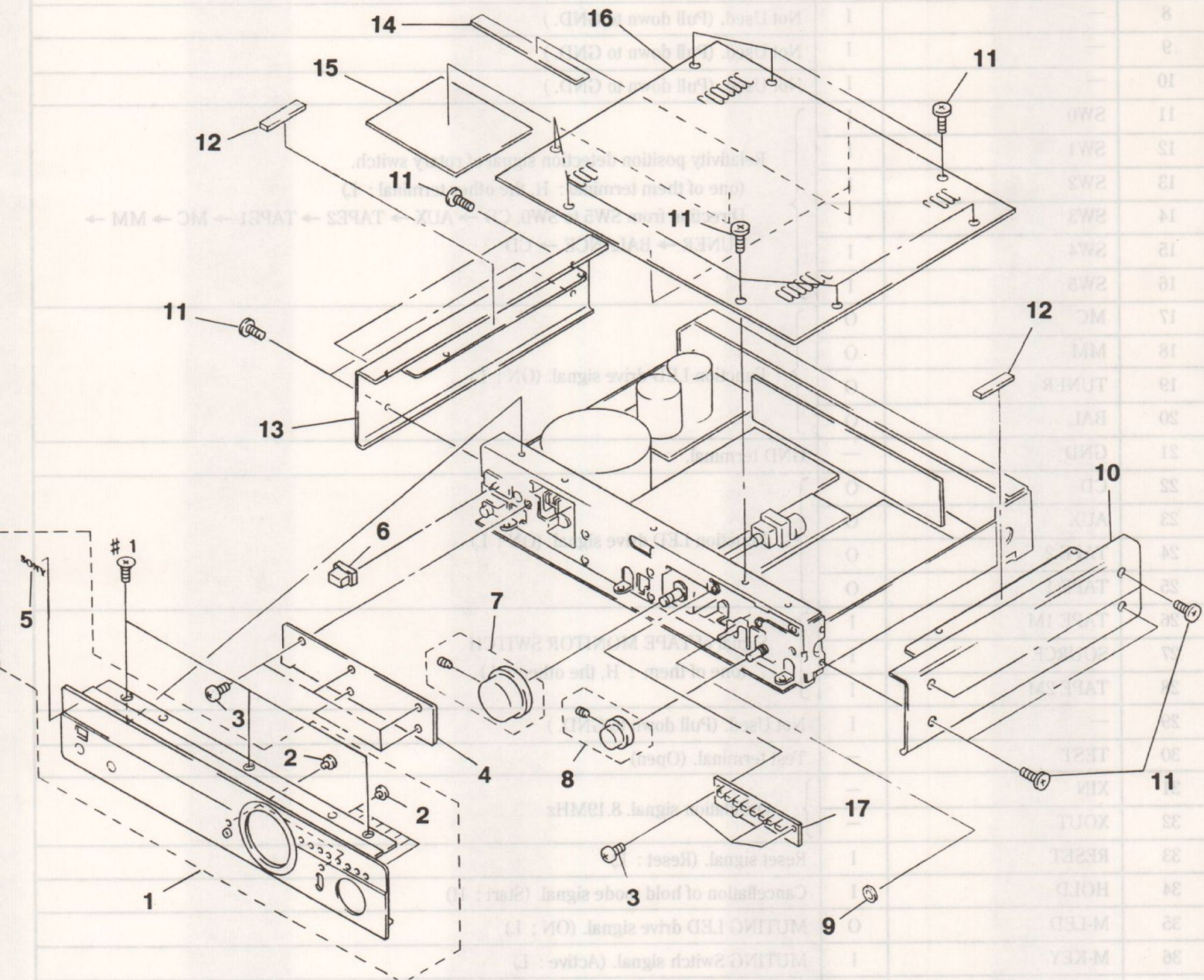
### SECTION 5 EXPLODED VIEWS

NOTE:

- Items marked " \* " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.
- Abbreviation G : German model

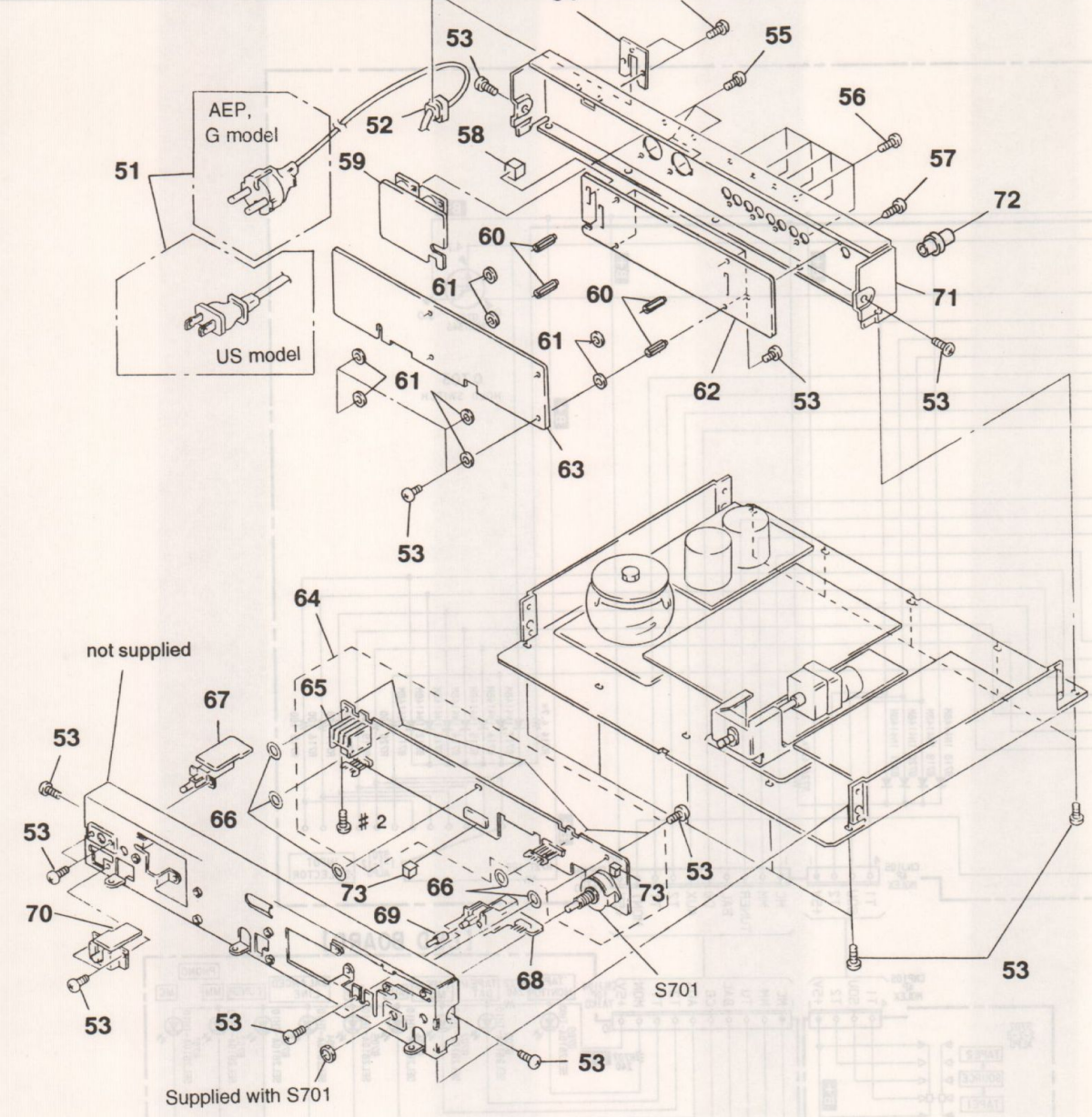
The components identified by mark  $\Delta$  or dotted line with mark  $\Delta$  are critical for safety. Replace only with part number specified.

#### 5-1. FRONT AND SIDE PANEL SECTION



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
1	A-4361-172-A	PANEL ASSY, FRONT (US, AEP, G(BLACK))		9	4-971-312-01	SHEET (DIA. 8), BLIND	
1	A-4361-174-A	PANEL ASSY, FRONT (G(GOLD))		* 10	4-969-320-01	PANEL (R), SIDE (US, AEP, G(BLACK))	
2	4-969-325-01	LENS, LED		* 11	4-969-320-11	PANEL (R), SIDE (G(GOLD))	
3	4-967-961-01	SCREW (3X8) (SPECIAL)		11	4-924-242-11	SCREW (M3X6), FLAT HEAD (US, AEP, G(BLACK))	
* 4	1-654-048-11	SIRCS BOARD		11	4-924-242-61	SCREW (M3X6), FLAT HEAD (G(GOLD))	
5	4-942-568-01	EMBLEM (NO. 5), SONY (US, AEP, G(BLACK))		* 12	4-971-317-01	CUSHION (C)	
5	4-942-568-21	EMBLEM (NO. 5), SONY (G(GOLD))		* 13	4-969-319-01	PANEL (L), SIDE (US, AEP, G(BLACK))	
6	4-969-330-01	KNOB (POWER) (US, AEP, G(BLACK))		* 13	4-969-319-11	PANEL (L), SIDE (G(GOLD))	
6	4-969-330-11	KNOB (POWER) (G(GOLD))		14	4-969-347-01	CUSHION	
7	4-969-322-01	KNOB (DIA. 55) (US, AEP, G(BLACK))		15	4-971-316-21	DAMPER	
		(ATTENUATOR)		16	4-969-318-01	PLATE, TOP (US, AEP, G(BLACK))	
7	4-969-322-11	KNOB (DIA. 55) (G(GOLD)) (ATTENUATOR)		16	4-969-318-11	PLATE, TOP (G(GOLD))	
8	4-969-323-01	KNOB (DIA. 34) (US, AEP, G(BLACK))		* 17	1-654-055-11	LED BOARD	
		(INPUT SELECT)					
8	4-969-323-11	KNOB (DIA. 34) (G(GOLD)) (INPUT SELECT)					

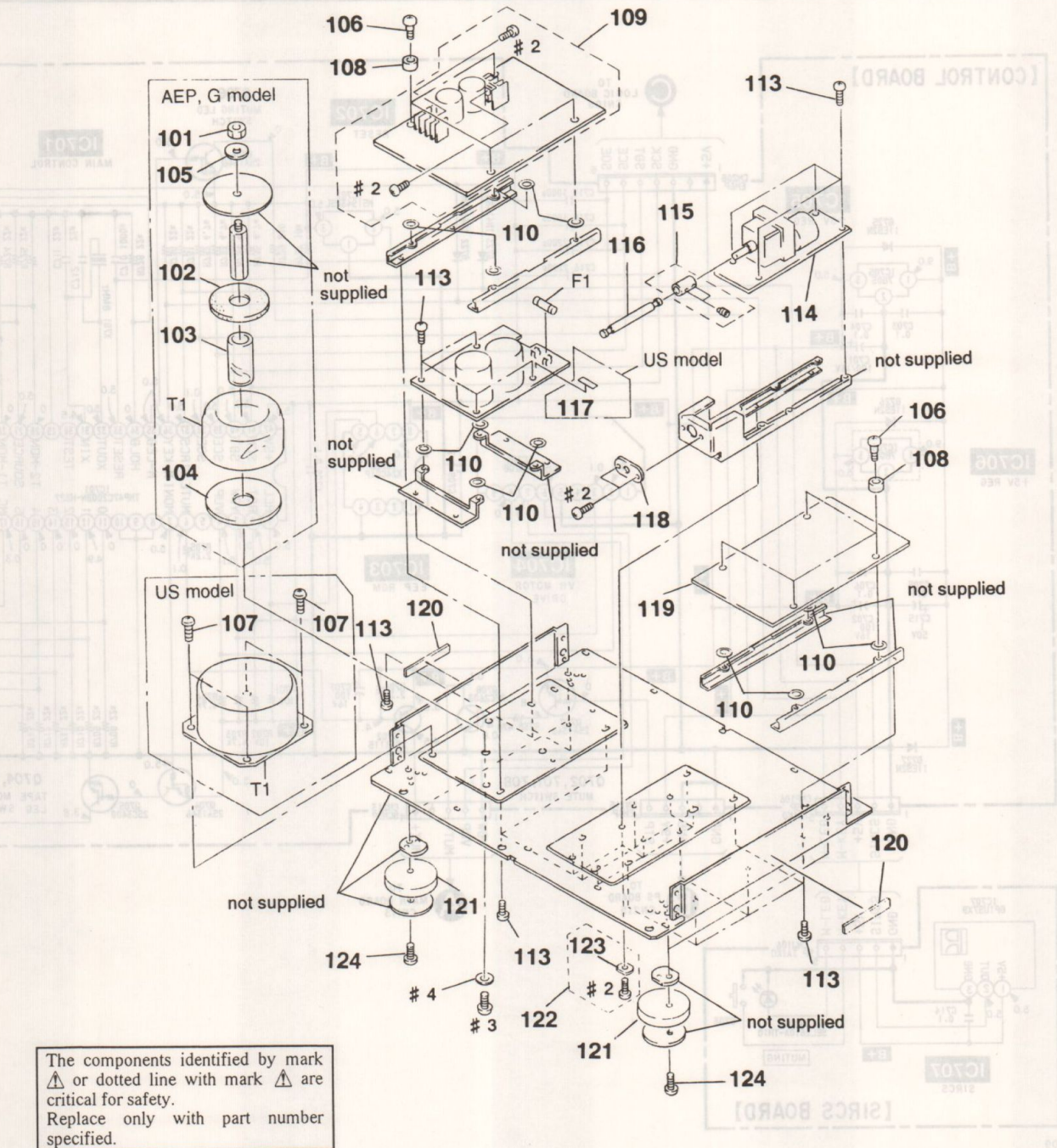
#### 5-2. REAR PANEL SECTION



The components identified by mark  $\Delta$  or dotted line with mark  $\Delta$  are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
$\Delta$ 51	1-559-479-11	CORD, POWER (US)		* 64	A-4371-725-A	CONTROL BOARD, COMPLETE	
$\Delta$ 51	1-575-953-11	CORD, POWER (AEP, G)		* 65	4-363-146-00	HEAT SINK, V. OUT	
* 52	3-703-244-00	BUSHING (2104), CORD		66	4-971-099-01	WASHER (P)	
53	4-967-961-01	SCREW (3X8) (SPECIAL)		* 67	1-654-050-11	AC-SW BOARD	
* 54	4-923-873-01	BRACKET, CORD STOPPER		* 68	1-654-049-11	LEVER-SW BOARD	
				69	4-969-328-01	KNOB, LEVER	
55	4-967-959-01	SCREW (3X6)		* 70	1-654-044-11	HP BOARD	
56	4-968-977-11	SCREW (3X10), +BVTP		* 71	4-969-315-01	PANEL, BACK (AEP, G)	
57	3-704-515-41	SCREW (BV/RING)		* 71	4-969-315-11	PANEL, BACK (US)	
58	4-971-108-01	CUSHION (H)		72	1-506-113-00	SHORT PLUG	
* 59	1-654-047-11	BALANCE BOARD		73	4-971-313-11	CUSHION (A)	
60	4-969-324-01	BOSS		S701	1-572-095-21	SWITCH, ROTARY	
61	4-971-658-01	CUSHION (DIA. 10)					
* 62	A-4371-732-A	INPUT BOARD, COMPLETE					
* 63	A-4371-734-A	LOGIC BOARD, COMPLETE					

#### 5-3. BOARDS SECTION



The components identified by mark  $\Delta$  or dotted line with mark  $\Delta$  are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
101	4-960-914-01	NUT (M10) (AEP, G)		* 116	4-969-326-01	SHAFT (VOL)	
102	4-971-092-01	CUSHION (T1) (AEP, G)		* 117	3-701-946-22	LABEL, FUSE RATING (US)	
* 103	4-971-105-01	CUSHION (DIA. 22)		118	4-970-441-01	BRACKET (VOL)	
104	4-971-093-01	CUSHION (T2) (AEP, G)		* 119	A-4371-733-A	EQ BOARD, COMPLETE	
105	3-376-862-01	WASHER (AEP, G)		* 120	4-971-317-11	CUSHION (C)	
106	4-971-720-01	SCREW, (+) STEP		121	4-970-487-01	FOOT (F50180S)	
107	4-967-960-01	SCREW (4X8) (US)		122	X-4944-262-1	SCREW(3X8)ASSY, BARREL W +BVTT	
108	4-969-896-01	SPACER		123	4-908-961-01	WASHER	
* 109	A-4371-722-A	MAIN BOARD, COMPLETE		124	4-968-979-01	SCREW (4X20), +B	
110	4-971-099-01	WASHER (P)		$\Delta$ F1	1-532-078-00	FUSE, TIME LAG (T1AL 250V) (AEP, G)	
* 112	1-654-043-11	PS BOARD		$\Delta$ F1	1-532-742-11	FUSE, GLASS TUBE (1.6A 125V) (US)	
113	4-967-961-01	SCREW (3X8) (SPECIAL)		$\Delta$ T901	1-427-641-11	TRANSFORMER, POWER (AEP, G)	
* 114	1-654-046-11	VOLUME BOARD		$\Delta$ T901	1-427-642-11	TRANSFORMER, POWER (US)	
* 115	4-969-329-01	SHAFT, RELAY					

SECTION 6

ELECTRICAL PARTS LIST

NOTE:

The components identified by mark  $\Delta$  or dotted line with mark  $\Delta$  are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- Items marked "\*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.
- Abbreviation  
G : German model

- RESISTORS  
All resistors are in ohms  
METAL: Metal-film resistor  
METAL OXIDE: Metal Oxide-film resistor  
F : nonflammable
- SEMICONDUCTORS  
In each case, u:  $\mu$ , for example:  
uA...:  $\mu$ A..., uPA...:  $\mu$ PA..., uPB...:  $\mu$ PB...,  
uPC...:  $\mu$ PC..., uPD...:  $\mu$ PD...
- CAPACITORS  
uF :  $\mu$ F
- COILS  
uH :  $\mu$ H

Ref. No.	Part No.	Description	Remark
*	1-654-050-11	AC-SW BOARD ***** < CONNECTOR >	
* CN3	1-568-226-11	PIN, CONNECTOR 2P	
CN4	1-580-629-11	PIN, CONNECTOR 2P < SWITCH >	
$\Delta$ S1	1-554-920-11	SWITCH, PUSH (AC POWER) (1 KEY) (POWER)	
*****			
*	1-654-047-11	BALANCE BOARD ***** < CONNECTOR >	
CNP103	1-766-802-11	PIN, CONNECTOR 10P < JACK >	
J301	1-750-786-11	CONNECTOR (XLR TYPE) 3P(BALANCED LINE)	
J302	1-750-785-11	CONNECTOR (XLR TYPE) 3P(BALANCED OUTPUT)	
*****			
*	A-4371-725-A	CONTROL BOARD, COMPLETE *****	
*	4-363-146-00	HEAT SINK, V. OUT < CAPACITOR >	
C701	1-126-101-11	ELECT 100uF 20% 16V	
C702	1-126-101-11	ELECT 100uF 20% 16V	
C703	1-164-159-11	CERAMIC 0.1uF 50V	
C704	1-164-159-11	CERAMIC 0.1uF 50V	
C705	1-164-159-11	CERAMIC 0.1uF 50V	
C706	1-164-159-11	CERAMIC 0.1uF 50V	
C707	1-126-101-11	ELECT 100uF 20% 16V	
C708	1-164-159-11	CERAMIC 0.1uF 50V	
C709	1-164-159-11	CERAMIC 0.1uF 50V	
C710	1-162-294-31	CERAMIC 0.001uF 10% 50V	
C711	1-162-207-31	CERAMIC 22PF 5% 50V	
C712	1-162-207-31	CERAMIC 22PF 5% 50V	
C715	1-124-903-11	ELECT 1uF 20% 50V	
C716	1-162-302-11	CERAMIC 0.0022uF 30% 16V	

Ref. No.	Part No.	Description	Remark
C717	1-162-302-11	CERAMIC 0.0022uF 30% 16V	
C718	1-162-294-31	CERAMIC 0.001uF 10% 50V	
C719	1-162-294-31	CERAMIC 0.001uF 10% 50V < CONNECTOR >	
CN115	1-691-766-11	PLUG (MICRO CONNECTOR) 4P	
CN208	1-691-768-11	PLUG (MICRO CONNECTOR) 6P	
CNJ105	1-562-087-00	SOCKET, CONNECTOR 4P	
CNP104	1-766-800-11	CONNECTOR, BOARD TO BOARD 10P	
CNP106	1-766-801-11	CONNECTOR, BOARD TO BOARD 5P	
< DIODE >			
D711	8-719-987-63	DIODE 1N4148M	
D712	8-719-987-63	DIODE 1N4148M	
D713	8-719-987-63	DIODE 1N4148M	
D714	8-719-987-63	DIODE 1N4148M	
D715	8-719-987-63	DIODE 1N4148M	
D716	8-719-987-63	DIODE 1N4148M	
D717	8-719-987-63	DIODE 1N4148M	
D718	8-719-987-63	DIODE 1N4148M	
D719	8-719-987-63	DIODE 1N4148M	
D720	8-719-987-63	DIODE 1N4148M	
D721	8-719-987-63	DIODE 1N4148M	
D722	8-719-987-63	DIODE 1N4148M	
D723	8-719-987-63	DIODE 1N4148M	
D725	8-719-024-99	DIODE 11ES2-NTA2B	
D726	8-719-024-99	DIODE 11ES2-NTA2B	
D727	8-719-024-99	DIODE 11ES2-NTA2B	
< IC >			
IC701	8-759-325-18	IC TMP47C200BN-H327	
IC702	8-759-635-63	IC M51943BSL	
IC703	8-759-188-67	IC X24C01P-S	
IC704	8-759-962-08	IC BA6208	
IC705	8-759-231-53	IC TA7805S	
IC706	8-759-231-53	IC TA7805S	
< TRANSISTOR >			
Q702	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q703	8-729-900-63	TRANSISTOR DTA124ES	
Q704	8-729-900-63	TRANSISTOR DTA124ES	
Q705	8-729-900-36	TRANSISTOR DTC124ES	

Table with 4 columns: Ref. No., Part No., Description, Remark. Contains parts like Q706, R701, C103, Q101, Q151, etc.

Table with 4 columns: Ref. No., Part No., Description, Remark. Contains parts like Q156, R169, C102, Q102, Q152, etc.

**INPUT LED LEVER-SW LOGIC**

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
J201	1-766-795-21	JACK (CD, TUNER)		*	1-654-049-11	LEVER-SW BOARD *****	
J202	1-766-795-21	JACK (TAPE2/MD REC OUT, AUX)				< CONNECTOR >	
J203	1-766-795-21	JACK (TAPE1/DAT REC OUT, TAPE2/MD PLAY)					
J204	1-766-795-21	JACK (PRE-OUT, TAPE1/DAT PLAY)					
J251	1-766-795-31	JACK (CD, TUNER)		CNP105	1-560-941-00	PIN, CONNECTOR 4P	
J252	1-766-795-31	JACK (TAPE2/MD REC OUT, AUX)				< SWITCH >	
J253	1-766-795-31	JACK (TAPE1/DAT REC OUT, TAPE2/MD PLAY)					
J254	1-766-795-31	JACK (PRE-OUT, TAPE1/DAT PLAY)		S702	1-762-165-11	SWITCH, LEVER SLIDE (TAPE1/TAPE2/SOURCE)	
		< RESISTOR >		*****			
R103	1-259-416-11	CARBON	330 5% 1/6W	*	A-4371-734-A	LOGIC BOARD, COMPLETE *****	
R153	1-259-416-11	CARBON	330 5% 1/6W			< CAPACITOR >	
R201	1-249-210-11	CARBON	1K 5% 1/3W				
R202	1-247-713-11	CARBON	1K 5% 1/4W F	C301	1-136-808-11	FILM 100PF 5% 100V	
R203	1-247-713-11	CARBON	1K 5% 1/4W F	C302	1-136-808-11	FILM 100PF 5% 100V	
R251	1-249-210-11	CARBON	1K 5% 1/3W	C303	1-124-916-11	ELECT 22uF 20% 63V	
R252	1-247-713-11	CARBON	1K 5% 1/4W F	C304	1-136-817-91	FILM 0.0033uF 5% 100V	
R253	1-247-713-11	CARBON	1K 5% 1/4W F	C305	1-136-817-91	FILM 0.0033uF 5% 100V	
		< RELAY >		C306	1-102-233-00	CERAMIC 33PF 10% 500V	
RY201	1-515-622-11	RELAY		C307	1-102-233-00	CERAMIC 33PF 10% 500V	
RY202	1-515-622-11	RELAY		C351	1-136-808-11	FILM 100PF 5% 100V	
RY203	1-515-622-11	RELAY		C352	1-136-808-11	FILM 100PF 5% 100V	
RY204	1-515-622-11	RELAY		C353	1-124-916-11	ELECT 22uF 20% 63V	
RY205	1-515-622-11	RELAY		C354	1-136-817-91	FILM 0.0033uF 5% 100V	
RY206	1-515-622-11	RELAY		C355	1-136-817-91	FILM 0.0033uF 5% 100V	
		*****		C356	1-102-233-00	CERAMIC 33PF 10% 500V	
*	1-654-055-11	LED BOARD *****		C357	1-102-233-00	CERAMIC 33PF 10% 500V	
		< CONNECTOR >		C801	1-162-302-11	CERAMIC 0.0022uF 30% 16V	
CNJ104	1-766-797-11	CONNECTOR, BOARD TO BOARD 10P		C802	1-162-302-11	CERAMIC 0.0022uF 30% 16V	
		< DIODE >		C803	1-164-159-11	CERAMIC 0.1uF 50V	
D701	8-719-301-49	DIODE SEL2810A (PHONO/MC)		C804	1-164-159-11	CERAMIC 0.1uF 50V	
D702	8-719-301-49	DIODE SEL2810A (PHONO/MM)		C805	1-164-159-11	CERAMIC 0.1uF 50V	
D703	8-719-301-49	DIODE SEL2810A (TUNER)		C806	1-164-159-11	CERAMIC 0.1uF 50V	
D704	8-719-301-49	DIODE SEL2810A (BALANCED LINE)		C807	1-164-159-11	CERAMIC 0.1uF 50V	
D705	8-719-301-49	DIODE SEL2810A (CD)				< CONNECTOR >	
D706	8-719-301-49	DIODE SEL2810A (AUX)		CN106	1-691-766-21	PLUG (MICRO CONNECTOR) 4P	
D707	8-719-301-49	DIODE SEL2810A (TAPE2/MD)		* CN107	1-564-506-11	PLUG, CONNECTOR 3P	
D708	8-719-301-49	DIODE SEL2810A (TAPE1/DAT)		* CN108	1-564-521-11	PLUG, CONNECTOR 6P	
D709	8-719-301-49	DIODE SEL2810A (TAPE MONITOR)		CNP101	1-766-799-11	CONNECTOR, BOARD TO BOARD 12P	
		< RESISTOR >		CNP102	1-766-799-11	CONNECTOR, BOARD TO BOARD 12P	
R707	1-247-816-11	CARBON	240 5% 1/4W			< DIODE >	
R722	1-247-816-11	CARBON	240 5% 1/4W	D617	8-719-024-99	DIODE 11ES2-NTA2B	
		*****		D801	8-719-987-63	DIODE 1N4148M	
				D802	8-719-987-63	DIODE 1N4148M	
				D803	8-719-987-63	DIODE 1N4148M	
				D804	8-719-987-63	DIODE 1N4148M	

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
D805	8-719-987-63	DIODE 1N4148M		R360	1-249-469-11	CARBON 100K 5%	1/4W
D806	8-719-987-63	DIODE 1N4148M		R361	1-247-138-00	CARBON 2K 5%	1/4W
D807	8-719-987-63	DIODE 1N4148M		R801	1-249-417-11	CARBON 1K 5%	1/4W F
D808	8-719-987-63	DIODE 1N4148M		R802	1-249-417-11	CARBON 1K 5%	1/4W F
D809	8-719-987-63	DIODE 1N4148M		R803	1-249-417-11	CARBON 1K 5%	1/4W F
D810	8-719-987-63	DIODE 1N4148M		R804	1-249-417-11	CARBON 1K 5%	1/4W F
D811	8-719-987-63	DIODE 1N4148M		< RELAY >			
D812	8-719-987-63	DIODE 1N4148M		RY207	1-515-622-11	RELAY	
< IC >				RY208	1-515-622-11	RELAY	
IC301	8-759-259-12	IC OPA2604AP		RY209	1-515-622-11	RELAY	
IC351	8-759-259-12	IC OPA2604AP		*****			
IC801	8-759-233-43	IC TC74HC595AP		* A-4371-722-A	MAIN BOARD, COMPLETE		
IC802	8-759-233-43	IC TC74HC595AP		*****			
IC803	8-759-232-15	IC TC74HC14AP		< CAPACITOR >			
< TRANSISTOR >				C401	1-136-808-11	FILM 100PF 5%	100V
Q801	8-729-900-65	TRANSISTOR DTA144ES		C403	1-104-263-00	POLYSTYRENE 15PF 10%	125V
Q802	8-729-900-65	TRANSISTOR DTA144ES		C404	1-104-233-00	POLYSTYRENE 220PF 5%	125V
Q803	8-729-900-65	TRANSISTOR DTA144ES		C406	1-110-495-51	ELECT 220uF 20%	25V
Q804	8-729-900-65	TRANSISTOR DTA144ES		C407	1-136-817-91	FILM 0.0033uF 5%	100V
Q805	8-729-900-65	TRANSISTOR DTA144ES		C408	1-136-817-91	FILM 0.0033uF 5%	100V
Q806	8-729-900-65	TRANSISTOR DTA144ES		C409	1-124-916-11	ELECT 22uF 20%	63V
Q807	8-729-900-65	TRANSISTOR DTA144ES		C410	1-110-495-51	ELECT 220uF 20%	25V
Q808	8-729-900-65	TRANSISTOR DTA144ES		C414	1-124-918-11	ELECT 47uF 20%	63V
Q809	8-729-900-65	TRANSISTOR DTA144ES		C451	1-136-808-11	FILM 100PF 5%	100V
Q810	8-729-900-65	TRANSISTOR DTA144ES		C453	1-104-263-00	POLYSTYRENE 15PF 10%	125V
Q811	8-729-900-65	TRANSISTOR DTA144ES		C454	1-104-233-00	POLYSTYRENE 220PF 5%	125V
Q812	8-729-900-65	TRANSISTOR DTA144ES		C456	1-110-495-51	ELECT 220uF 20%	25V
< RESISTOR >				C457	1-136-817-91	FILM 0.0033uF 5%	100V
R301	1-247-700-11	CARBON 100 5%	1/4W F	C458	1-136-817-91	FILM 0.0033uF 5%	100V
R302	1-247-700-11	CARBON 100 5%	1/4W F	C459	1-124-916-11	ELECT 22uF 20%	63V
R303	1-247-725-11	CARBON 10K 5%	1/4W F	C460	1-110-495-51	ELECT 220uF 20%	25V
R304	1-247-725-11	CARBON 10K 5%	1/4W F	C464	1-124-918-11	ELECT 47uF 20%	63V
R305	1-249-934-11	CARBON 3K 1%	1/4W	C501	1-104-326-11	POLYSTYRENE 7PF 1PF	125V
R306	1-249-944-11	CARBON 7.5K 1%	1/4W	C502	1-124-916-11	ELECT 22uF 20%	63V
R307	1-249-944-11	CARBON 7.5K 1%	1/4W	C551	1-104-326-11	POLYSTYRENE 7PF 1PF	125V
R308	1-249-934-11	CARBON 3K 1%	1/4W	C552	1-124-916-11	ELECT 22uF 20%	63V
R309	1-247-712-11	CARBON 820 5%	1/4W F	C611	1-124-557-11	ELECT 1000uF 20%	25V
R310	1-249-469-11	CARBON 100K 5%	1/4W	C612	1-110-494-11	CAP, ELECT 2200uF	
R311	1-247-138-00	CARBON 2K 5%	1/4W	C614	1-124-557-11	ELECT 1000uF 20%	25V
R351	1-247-700-11	CARBON 100 5%	1/4W F	C615	1-110-494-11	CAP, ELECT 2200uF	
R352	1-247-700-11	CARBON 100 5%	1/4W F	< CONNECTOR >			
R353	1-247-725-11	CARBON 10K 5%	1/4W F	CN112	1-691-768-11	PLUG (MICRO CONNECTOR) 6P	
R354	1-247-725-11	CARBON 10K 5%	1/4W F	CN113	1-691-766-11	PLUG (MICRO CONNECTOR) 4P	
R355	1-249-934-11	CARBON 3K 1%	1/4W	* CN114	1-564-104-00	PIN, CONNECTOR (B3P-VH) 3P	
R356	1-249-944-11	CARBON 7.5K 1%	1/4W	* CN202	4-924-264-21	TERMINAL, MOUNT	
R357	1-249-944-11	CARBON 7.5K 1%	1/4W	CN203	1-691-768-11	PLUG (MICRO CONNECTOR) 6P	
R358	1-249-934-11	CARBON 3K 1%	1/4W				
R359	1-247-712-11	CARBON 820 5%	1/4W F				



US Model  
AEP Model

## SONY SERVICE MANUAL

### CORRECTION-1

Correct your service manual as shown below.

— : indicates corrected portion.

Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
*	1-654-048-11	SIRCS BOARD ***** < CAPACITOR >				MISCELLANEOUS *****	
C714	1-164-159-11	CERAMIC 0.1uF	50V	△51	1-559-479-11	CORD, POWER (US)	
		< CONNECTOR >		△51	1-575-953-11	CORD, POWER (AEP,G)	
CNJ106	1-766-798-11	CONNECTOR, BOARD TO BOARD 5P		△F1	1-532-078-00	FUSE, TIME LAG (T1AL 250V) (AEP,G)	
		< DIODE >		△F1	1-532-742-11	FUSE, GLASS TUBE (1.6A 125V) (US)	
D710	8-719-301-49	DIODE SEL2810A (MUTING)		S701	1-572-095-21	SWITCH, ROTARY	
		< IC >		△T901	1-427-641-11	TRANSFORMER, POWER (AEP,G)	
IC707	8-749-923-43	IC GPIU57XB		△T901	1-427-642-11	TRANSFORMER, POWER (US)	
		< SWITCH >		*****			
S703	1-554-303-21	SWITCH, TACTILE (MUTING)		ACCESSORIES & PACKING MATERIALS *****			
*****							
*	1-654-046-11	VOLUME BOARD *****		1-467-890-11	COMMANDER, STANDARD (RM-J90)		
		< CAPACITOR >			(US, AEP, G(BLACK))		
*	4-942-204-01	PLATE, GROUND (ET201)		1-467-890-21	COMMANDER, STANDARD (RM-J90) (G(GOLD))		
		< CAPACITOR >		1-558-271-11	CORD, CONNECTION (AUDIO 108cm)		
C713	1-136-165-00	FILM 0.1uF 5%	50V	3-759-991-11	MANUAL, INSTRUCTION (US, AEP)		
		< CONNECTOR >			(ENGLISH, FRENCH, SPANISH, PORTUGUESE)		
CN204	1-691-766-11	PLUG (MICRO CONNECTOR) 4P		3-759-991-41	MANUAL, INSTRUCTION (AEP,G)		
CN205	1-691-767-11	PLUG (MICRO CONNECTOR) 5P			(GERMAN, DUTCH, SWEDISH, ITALIAN)		
* CN209	1-564-506-11	PLUG, CONNECTOR 3P		4-962-615-01	COVER, BATTERY (for RM-J90)		
		< DIODE >			(US, AEP, G(BLACK))		
D210	8-719-987-63	DIODE IN4148M		4-962-615-11	COVER, BATTERY (for RM-J90) (G(GOLD))		
D211	8-719-987-63	DIODE IN4148M		* 4-970-081-01	INDIVIDUAL CARTON		
		< VARIABLE RESISTOR >		* 4-970-082-01	CUSHION		
RV201	1-223-758-11	RES, VAR, CARBON 20K/20K (ATTENUATOR)		*****			
		< RELAY >		***** HARDWARE LIST *****			
RY210	1-515-622-11	RELAY		#1	7-682-247-09	SCREW +K 3X6	
RY211	1-515-622-11	RELAY		#2	7-682-548-09	SCREW (3X8)	
*****							

The components identified by mark △ or dotted line with mark △ are critical for safety. Replace only with part number specified.

Page	INCORRECT				CORRECT			
	No.	Part No.	Description	Remark	Part No.	Description	Remark	
33	***** LOGIC BOARD *****				***** LOGIC BOARD *****			
	Q801	8-729-900-65	TRANSISTOR DTA144ES		8-729-029-46	TRANSISTOR DTA143ESA		
	Q802	8-729-900-65	TRANSISTOR DTA144ES		8-729-029-46	TRANSISTOR DTA143ESA		
	Q803	8-729-900-65	TRANSISTOR DTA144ES		8-729-029-46	TRANSISTOR DTA143ESA		
	Q804	8-729-900-65	TRANSISTOR DTA144ES		8-729-029-46	TRANSISTOR DTA143ESA		
	Q805	8-729-900-65	TRANSISTOR DTA144ES		8-729-029-46	TRANSISTOR DTA143ESA		
	Q806	8-729-900-65	TRANSISTOR DTA144ES		8-729-029-46	TRANSISTOR DTA143ESA		
	Q807	8-729-900-65	TRANSISTOR DTA144ES		8-729-029-46	TRANSISTOR DTA143ESA		
	Q808	8-729-900-65	TRANSISTOR DTA144ES		8-729-029-46	TRANSISTOR DTA143ESA		
	Q809	8-729-900-65	TRANSISTOR DTA144ES		8-729-029-46	TRANSISTOR DTA143ESA		
	Q810	8-729-900-65	TRANSISTOR DTA144ES		8-729-029-46	TRANSISTOR DTA143ESA		
	Q811	8-729-900-65	TRANSISTOR DTA144ES		8-729-029-46	TRANSISTOR DTA143ESA		
	Q812	8-729-900-65	TRANSISTOR DTA144ES		8-729-029-46	TRANSISTOR DTA143ESA		

(SPM-96032)