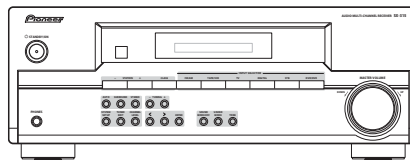


# Service Manual



SX-315

ORDER NO.  
**RRV3071**

AUDIO MULTI-CHANNEL RECEIVER

# SX-315

THIS MANUAL IS APPLICABLE TO THE FOLLOWING MODEL(S) AND TYPE(S).

Model	Type	Power Requirement	Remarks
SX-315	KUCXCN	AC120V	



For details, refer to "Important Check Points for Good Servicing" .

# SAFETY INFORMATION

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual. Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely you, should not risk trying to do so and refer the repair to a qualified service technician.

## WARNING



This product contains and certain electrical parts contain chemicals which are known to the state of California to cause cancer, birth defects or other reproductive harm.

Health & Safety Code Section 25249.6 – Proposition 65

This product contains mercury. Disposal of this material may be regulated due to environmental considerations. For disposal or recycling information, please contact your local authority of the Electronics Industries Alliance : [www.eiae.org](http://www.eiae.org).



## NOTICE

(FOR CANADIAN MODEL ONLY)

Fuse symbols  (fast operating fuse) and/or  (slow operating fuse) on PCB indicate that replacement parts must be of identical designation.

## REMARQUE

(POUR MODÈLE CANADIEN SEULEMENT)

Les symboles de fusible  (fusible de type rapide) et/ou  (fusible de type lent) sur CCI indiquent que les pièces de remplacement doivent avoir la même désignation.

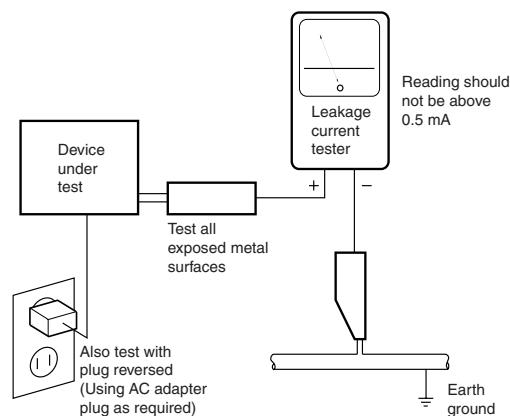
## (FOR USA MODEL ONLY)

### 1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

#### LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60 Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5 mA.



AC Leakage Test

**ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.**

### 2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a  $\Delta$  on the schematics and on the parts list in this Service Manual.

The use of a substitute replacement component which does not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

## [Important Check Points for Good Servicing]

In this manual, procedures that must be performed during repairs are marked with the below symbol.  
Please be sure to confirm and follow these procedures.

### 1. Product safety



Please conform to product regulations (such as safety and radiation regulations), and maintain a safe servicing environment by following the safety instructions described in this manual.

- ① Use specified parts for repair.

Use genuine parts. Be sure to use important parts for safety.

- ② Do not perform modifications without proper instructions.

Please follow the specified safety methods when modification (addition/change of parts) is required due to interferences such as radio/TV interference and foreign noise.

- ③ Make sure the soldering of repaired locations is properly performed.

When you solder while repairing, please be sure that there are no cold solder and other debris.  
Soldering should be finished with the proper quantity. (Refer to the example)

- ④ Make sure the screws are tightly fastened.

Please be sure that all screws are fastened, and that there are no loose screws.

- ⑤ Make sure each connectors are correctly inserted.

Please be sure that all connectors are inserted, and that there are no imperfect insertion.

- ⑥ Make sure the wiring cables are set to their original state.

Please replace the wiring and cables to the original state after repairs.  
In addition, be sure that there are no pinched wires, etc.

- ⑦ Make sure screws and soldering scraps do not remain inside the product.

Please check that neither solder debris nor screws remain inside the product.

- ⑧ There should be no semi-broken wires, scratches, melting, etc. on the coating of the power cord.

Damaged power cords may lead to fire accidents, so please be sure that there are no damages.  
If you find a damaged power cord, please exchange it with a suitable one.

- ⑨ There should be no spark traces or similar marks on the power plug.

When spark traces or similar marks are found on the power supply plug, please check the connection and advise on secure connections and suitable usage. Please exchange the power cord if necessary.

- ⑩ Safe environment should be secured during servicing.

When you perform repairs, please pay attention to static electricity, furniture, household articles, etc. in order to prevent injuries.  
Please pay attention to your surroundings and repair safely.

### 2. Adjustments



To keep the original performance of the products, optimum adjustments and confirmation of characteristics within specification.  
Adjustments should be performed in accordance with the procedures/instructions described in this manual.

### 3. Lubricants, Glues, and Replacement parts



Use grease and adhesives that are equal to the specified substance.  
Make sure the proper amount is applied.

### 4. Cleaning



For parts that require cleaning, such as optical pickups, tape deck heads, lenses and mirrors used in projection monitors, proper cleaning should be performed to restore their performances.

### 5. Shipping mode and Shipping screws



To protect products from damages or failures during transit, the shipping mode should be set or the shipping screws should be installed before shipment. Please be sure to follow this method especially if it is specified in this manual.

# CONTENTS

	SAFETY INFORMATION .....	2
	1. SPECIFICATIONS .....	5
A	2. EXPLODED VIEWS AND PARTS LIST .....	8
	2.1 PACKING .....	8
	2.2 EXTERIOR SECTION .....	10
	2.3 FRONT PANEL SECTION .....	12
	3. BLOCK DIAGRAM AND SCHEMATIC DIAGRAM .....	14
	3.1 BLOCK DIAGRAM .....	14
	3.2 OVERALL WIRING CONNECTION DIAGRAM .....	16
	3.3 MAIN, PROTECTION and POWER ASSYS .....	18
	3.4 DSP ASSY .....	20
	3.5 CNT1, CNT2, FRONT, SW AMP, ST-BY TACT and H/P ASSYS .....	22
	4. PCB CONNECTION DIAGRAM .....	24
	4.1 MAIN ASSY .....	26
B	4.2 PROTECTION ASSY .....	28
	4.3 POWER ASSY .....	29
	4.4 DSP ASSY .....	30
	4.5 CNT1 and CNT2 ASSYS .....	32
	4.6 FRONT, SW AMP, ST-BY TACT and H/P ASSYS .....	34
	5. PCB PARTS LIST .....	38
	6. ADJUSTMENT .....	42
	6.1 IDLE ADJUSTMENT .....	42
	7. GENERAL INFORMATION .....	43
	7.1 DIAGNOSIS .....	43
	7.1.1 TROUBLE SHOOTING .....	43
	7.1.2 PCB LOCATION .....	45
	8. PANEL FACILITIES .....	53
C	8.1 FRONT PANEL SECTION .....	53
	8.2 DISPLAY .....	54
	8.3 REMOTE CONTROL .....	55

# 1. SPECIFICATIONS

## Specifications

### Amplifier section

#### Continuous Power Output

Front . . . 100 W per channel \*(200 Hz – 20 kHz, 1.0%\*\* , 6 Ω)  
Center . . . . . 100 W \*(200 Hz – 20 kHz, 1.0%\*\* , 6 Ω)  
Surround  
          . . . . . 100 W per channel \*(200 Hz – 20 kHz, 1.0%\*\* , 6 Ω)  
Subwoofer . . . . . 100 W \*(45 Hz – 200 Hz, 1.0%\*\* , 6 Ω)

#### RMS Power Output

Front . . . . . 125W per channel (1kHz, THD 10%, 6 Ω)  
Center . . . . . 125W (1kHz, THD 10%, 6 Ω)  
Surround . . . . . 125W per channel (1kHz, THD 10%, 6 Ω)  
Subwoofer . . . . . 125W (100Hz, THD 10%, 6 Ω)

#### Music Power Output

Front . . . . . 167 W per channel (DIN MUSIC, 10%, 6 Ω)  
Center . . . . . 167 W (DIN MUSIC, 10%, 6 Ω)  
Surround . . . . . 167 W per channel (DIN MUSIC, 10%, 6 Ω)  
Subwoofer . . . . . 167 W (DIN MUSIC, 10%, 6 Ω)

\* Measured pursuant to the Federal Trade Commission's  
Trade Regulation rule on Power Output Claims for  
Amplifiers.

\*\* Measured by audio spectrum analyzer.

### FM Tuner Section

Frequency Range . . . . . 87.5 MHz to 108 MHz  
Antenna Input (DIN) . . . . . 75Ω unbalanced

### AM Tuner Section

Frequency Range  
10kHz step . . . . . 530 kHz to 1,700 kHz  
Antenna . . . . . Loop antenna

### Miscellaneous

Power requirements . . . . . AC 120 V / 60Hz  
Power consumption . . . . . 200W  
In standby . . . . . 0.5W  
Dimensions . . . . . 16.5 (W) x 6.2 (H) x 15.7 (D) in.  
                                  420 (W) x 158 (H) x 400 (D) mm  
Weight (without package) . . . . . 20 lb 15 oz  
  9.5 kg

### Furnished Parts

AM loop antenna . . . . . 1  
FM wire antenna . . . . . 1  
Dry cell batteries (AA size IEC R6) . . . . . 2  
Remote control . . . . . 1  
Warranty card . . . . . 1  
Operating instructions

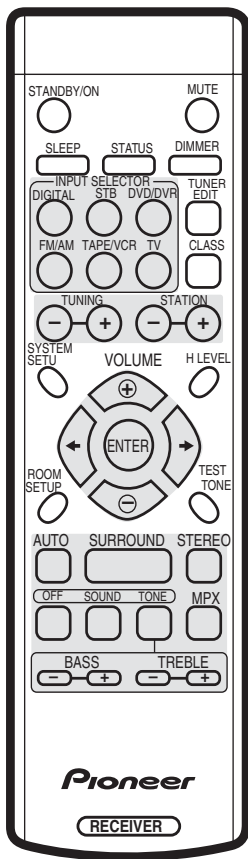


#### Note

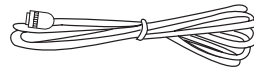
- Specifications and the design are subject to possible modifications without notice, due to improvements.

## ● Accessories

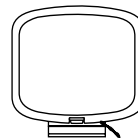
- Remote control ×1  
(8300740600010)



- FM wire antenna  
(ADH7030)

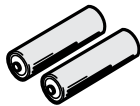


- AM loop antenna  
(ATB7013)



- Warranty Card
- Operating Instructions

- Dry cell batteries ×2  
(AA / IEC R06)



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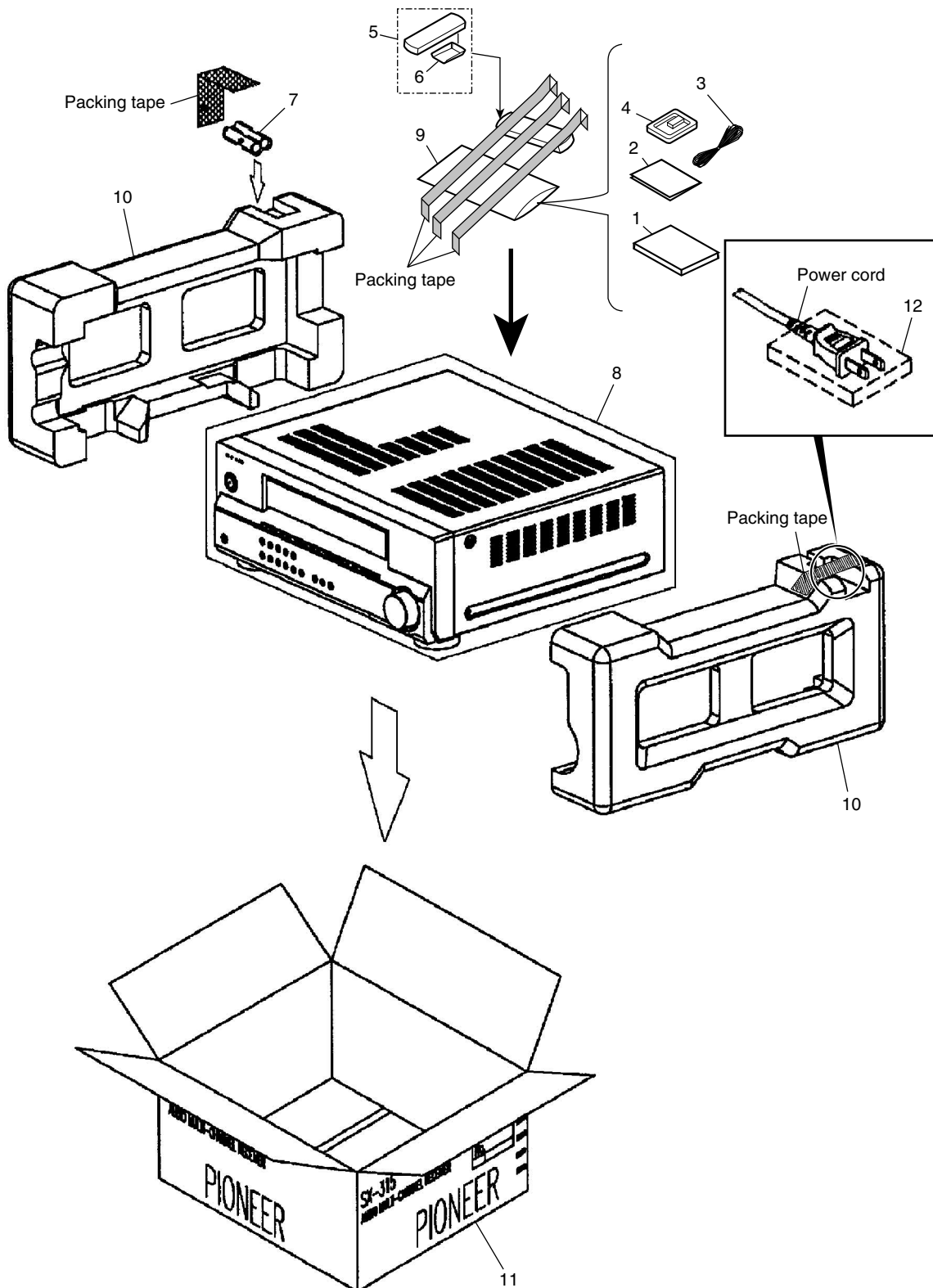
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## 2. EXPLODED VIEWS AND PARTS LIST

NOTES: ● Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.  
● The  mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.  
● Screws adjacent to ▼ mark on product are used for disassembly.  
● For the applying amount of lubricants or glue, follow the instructions in this manual.  
(In the case of no amount instructions, apply as you think it appropriate.)

### 2.1 PACKING





PACKING parts List

<u>Mark No.</u>	<u>Description</u>	<u>Part No.</u>
1	Operating Instructions (English, French)	5707210180491-IL
NSP 2	Warranty Card	5777200140100-IL
3	FM Antenna Assy	ADH7030
4	Loop Antenna Assy	ATB7013
5	Remote Control Unit	8300740600010-IL
6	Battery Cover	VNK4997
NSP 7	Battery	G670001R50190-IL
8	Polyethylene Bag (SET)	6330210019000-IL
NSP 9	Polyethylene Bag (accessory)	6337000240010-IL
10	Pad LR	6230211154000-IL
11	Packing Case	6007210700010-IL
12	Polyethylene Bag	6330210059000-IL

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## 2.2 EXTERIOR SECTION

A

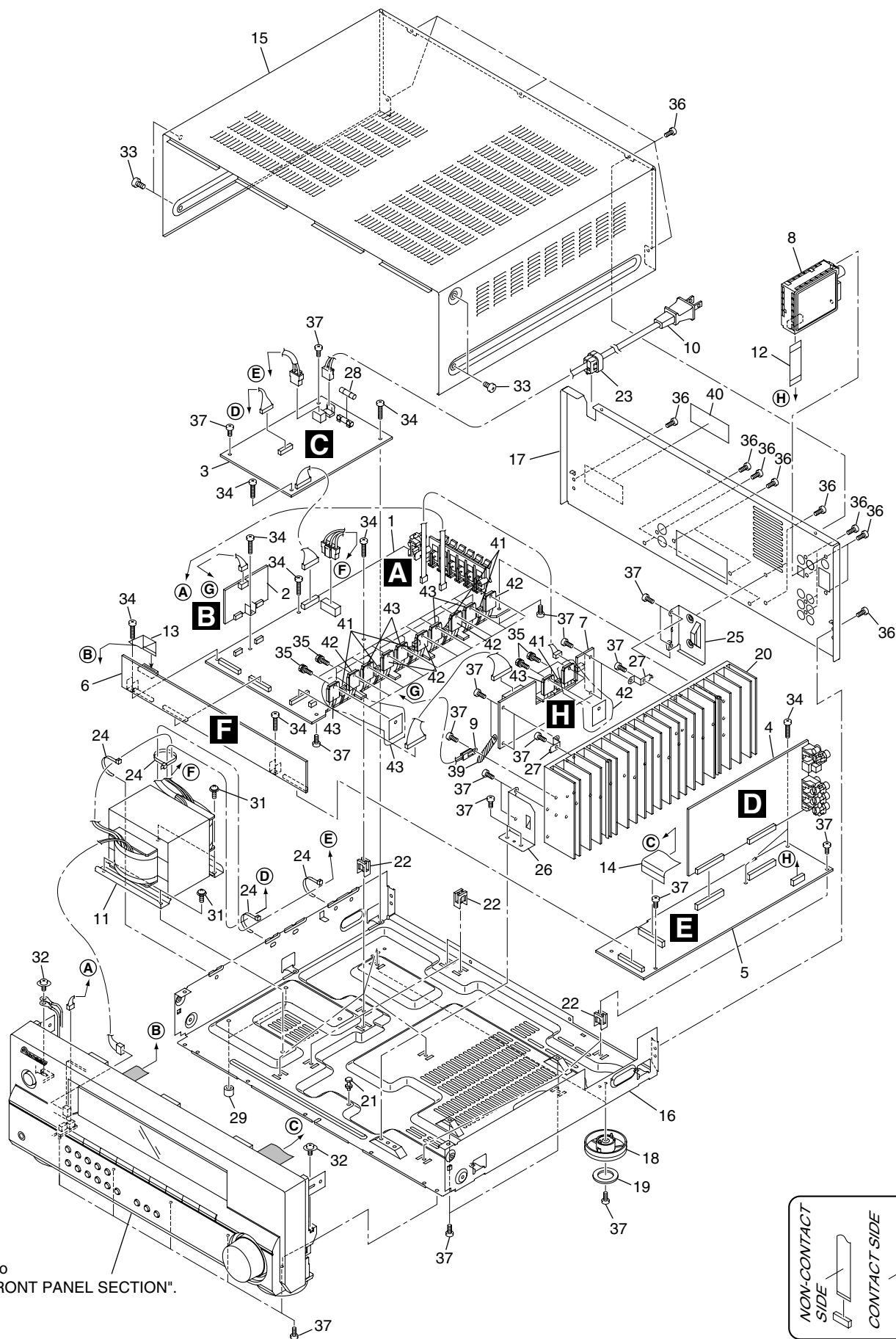
B

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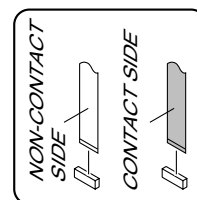
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Refer to  
"2.3 FRONT PANEL SECTION".



EXTERIOR SECTION parts List

Mark No.	Description	Part No.
1	MAIN Assy	7028063491010-IL
2	PROTECTION Assy	7028063504010-IL
3	POWER Assy	7028063521010-IL
4	DSP Assy	7028063511010-IL
5	CNT1 Assy	7028063492010-IL
6	CNT2 Assy	7028063502010-IL
7	SW AMP Assy	7028063503010-IL
8	FM/AM TUNER Unit	AXX7172
9	Posistor	F320730100010-IL
⚠ 10	Power Cord	L068040250010-IL
⚠ 11	Power Transformer	8200858630180-IL
12	Flat Card Cable (11P)	N712110734810-IL
13	Flat Card Cable (14P)	N712141234810-IL
14	Flat Card Cable (20P)	N71201834810-IL
15	Bonnet	3000210556000-IL
NSP 16	Chassis	3200211556000-IL
17	Rear Panel	3207211566000-IL
18	Foot	4000000601010-IL
19	Cushion for Foot	4050211175000-IL
NSP 20	Heatsink	2120210778000-IL
21	PCB Spacer	4300210062000-IL
22	Supporter	4070001601010-IL
23	Stopper	4380210002000-IL
24	Clamp (Binder)	4330040343010-IL
25	Heatsink Bracket L	4010210386000-IL
26	Heatsink Bracket R	4010210396000-IL
27	Bracket	4010210186000-IL
⚠ 28	Fuse (8A/125V)	REK1086
29	Cushion	4050211205000-IL
30	.....	
31	Screw	B028940101B10-IL
32	Screw	1500001206010-IL
33	Screw	1500040084B10-IL
34	Screw	B020030171B10-IL
35	Screw	B018230141H11-IL
36	Screw	B020030104B10-IL
37	Screw	BBZ30P080FTC
38	.....	
NSP 39	Steel Wire	1050040016010-IL
NSP 40	Serial BAR-CODE Label	5507030010120-IL
41	Transistor (Q517,518,525,526,537,Q205)	J503947F00000-IL
⚠ 42	Transistor (Q519,520,528,538,527,Q207)	J5032390Y0000-IL
⚠ 43	Transistor (Q521,530,539,529,522,Q206)	J5011560Y0000-IL

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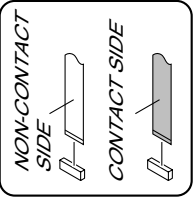
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1 2 3 4

# 2.3 FRONT PANEL SECTION

A



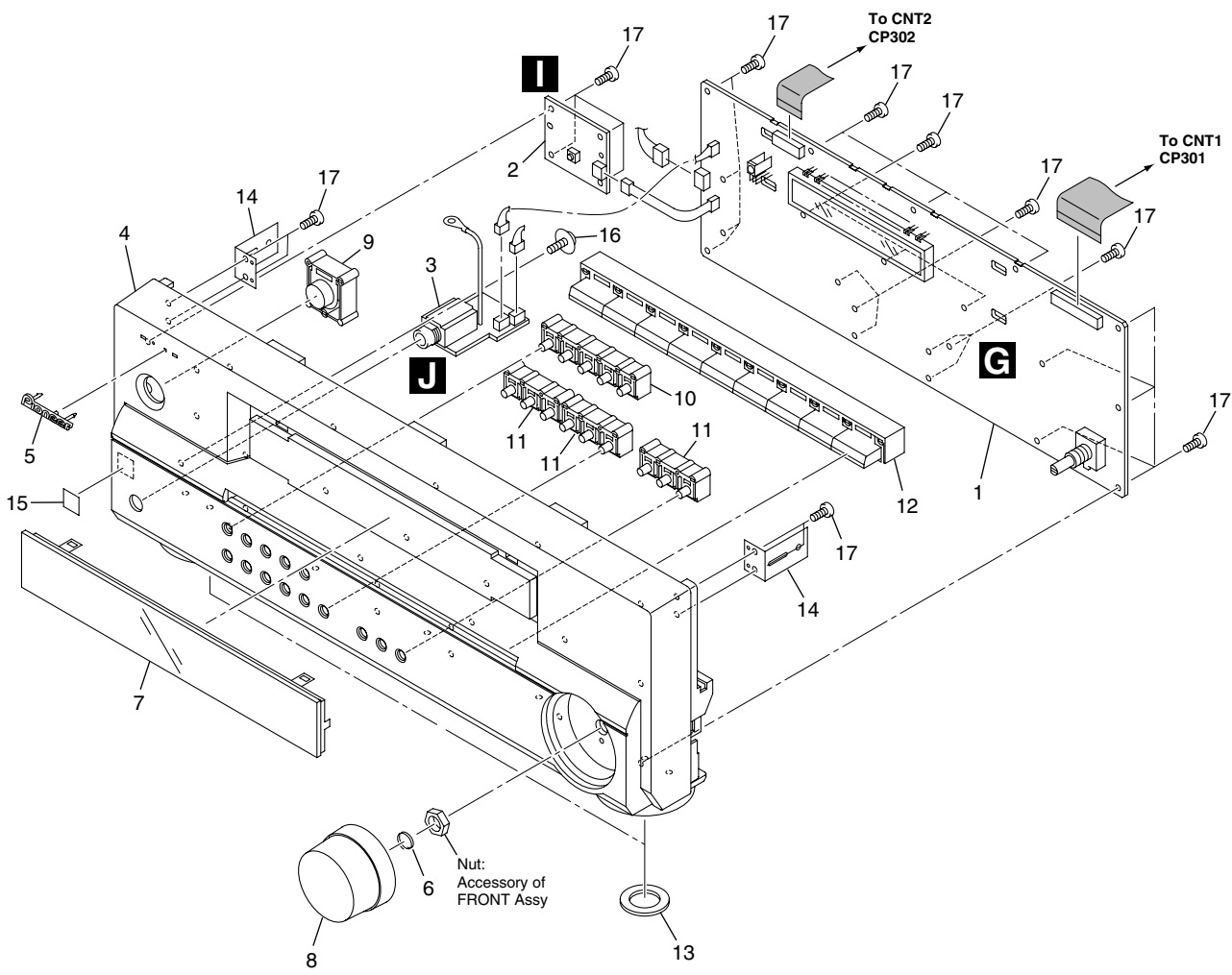
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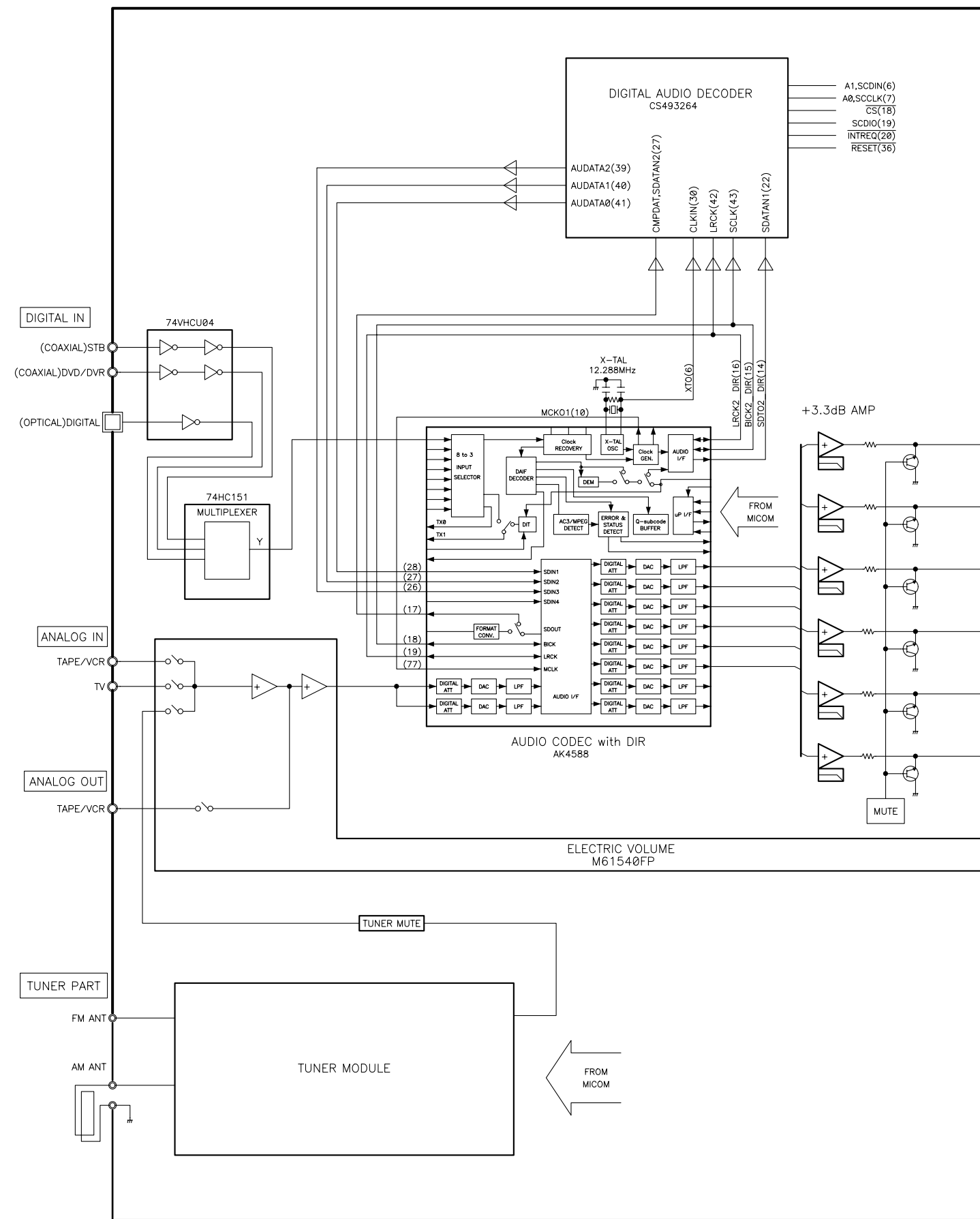
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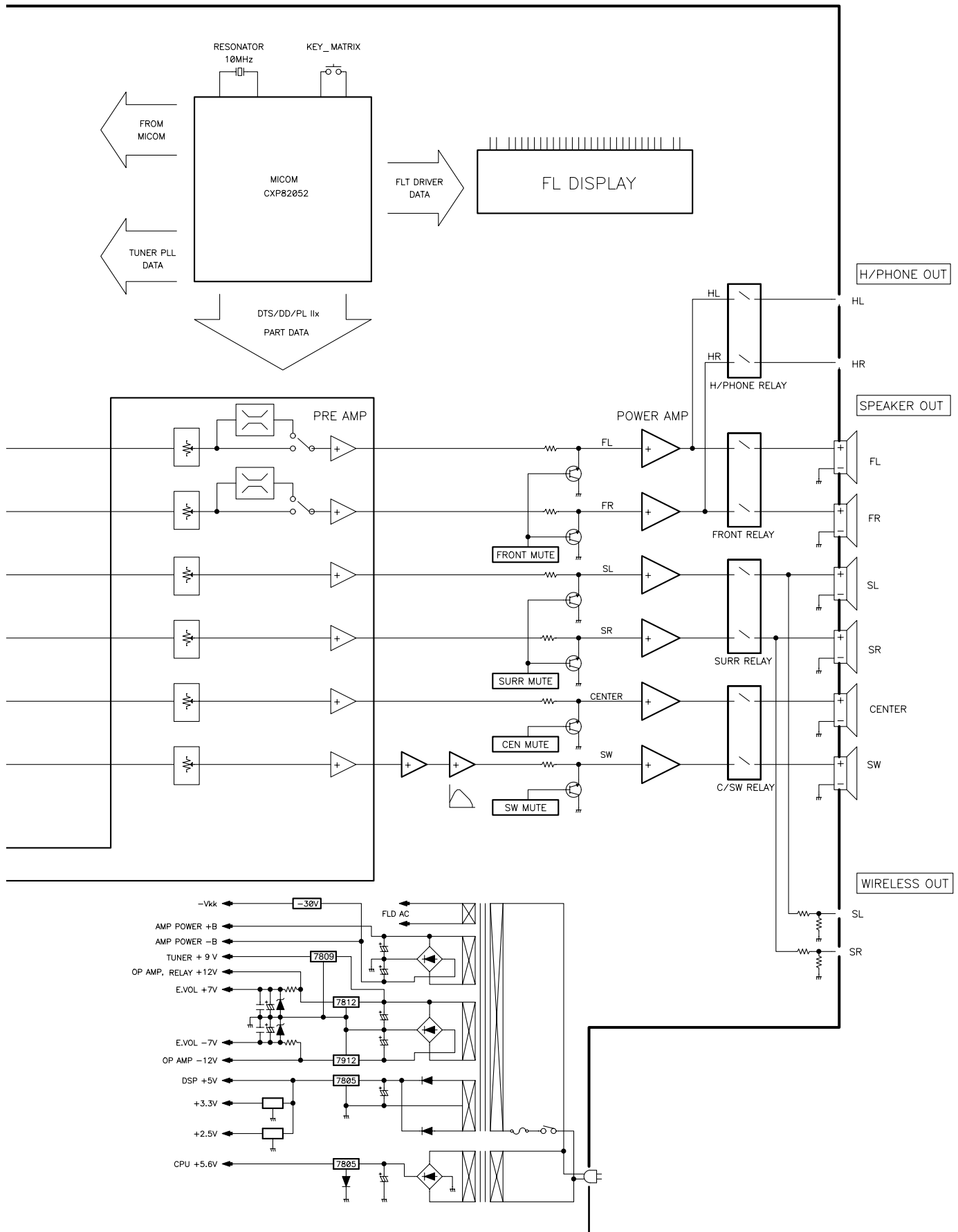


# FRONT PANEL SECTION parts List


Mark No.	Description	Part No.	
1	FRONT Assy	7028063501010-IL	
2	ST-BY TACT Assy	7028063506010-IL	A
3	H/P Assy	7028063505010-IL	
4	Front Panel	3067212041000-IL	
5	Pioneer Badge	VAM1129	
6	Spring	3720210276000-IL	
7	Window	5070212073000-IL	
8	Knob	5087211121000-IL	
9	SB Button	5097212581000-IL	
10	FUNC Button	5097212591000-IL	
11	SU Button	5097212601000-IL	B
12	SL Button	5097212611000-IL	
13	Cushion for Foot	4050211175000-IL	
14	Bracket L/R	4010211986000-IL	
NSP 15	Energy Star Label	AAX8022	
16	Screw	1500001456010-IL	
17	Screw	BBZ30P080FTC	

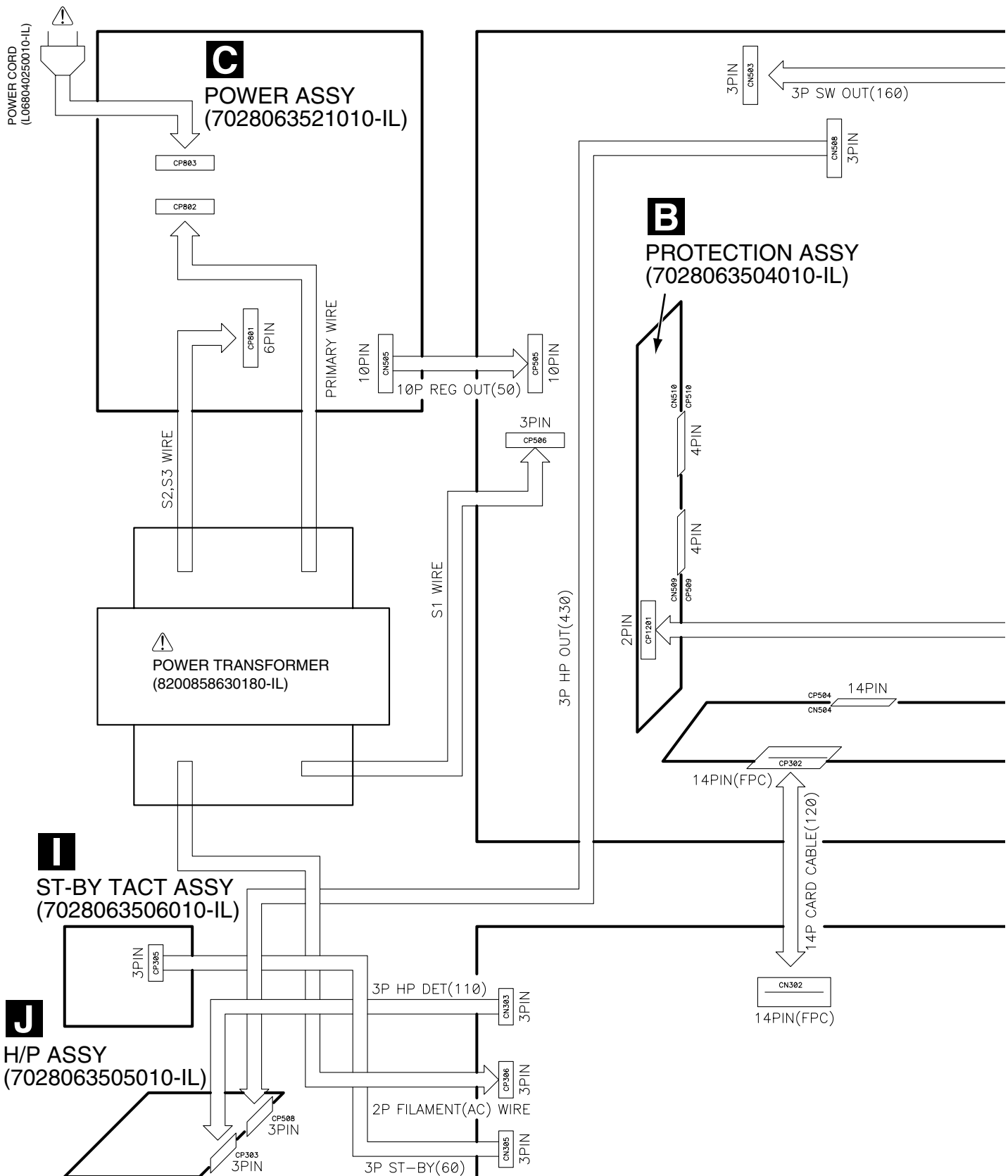
### 3.1 BLOCK DIAGRAM



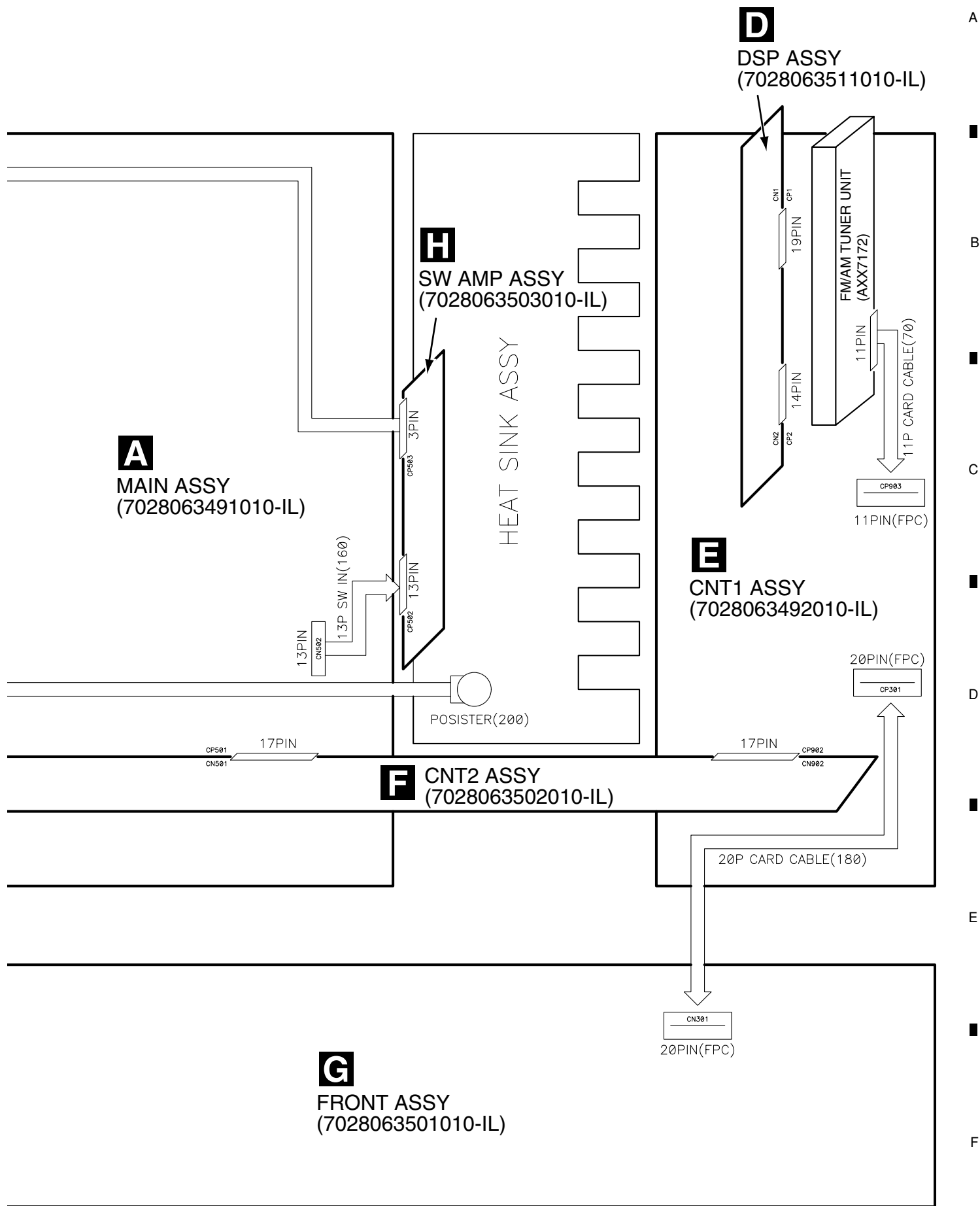


## 3.2 OVERALL WIRING CONNECTION DIAGRAM

- When ordering service parts, be sure to refer to "EXPLODED VIEWS and PARTS LIST" or "PCB PARTS LIST".
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
-  : The power supply is shown with the marked box.

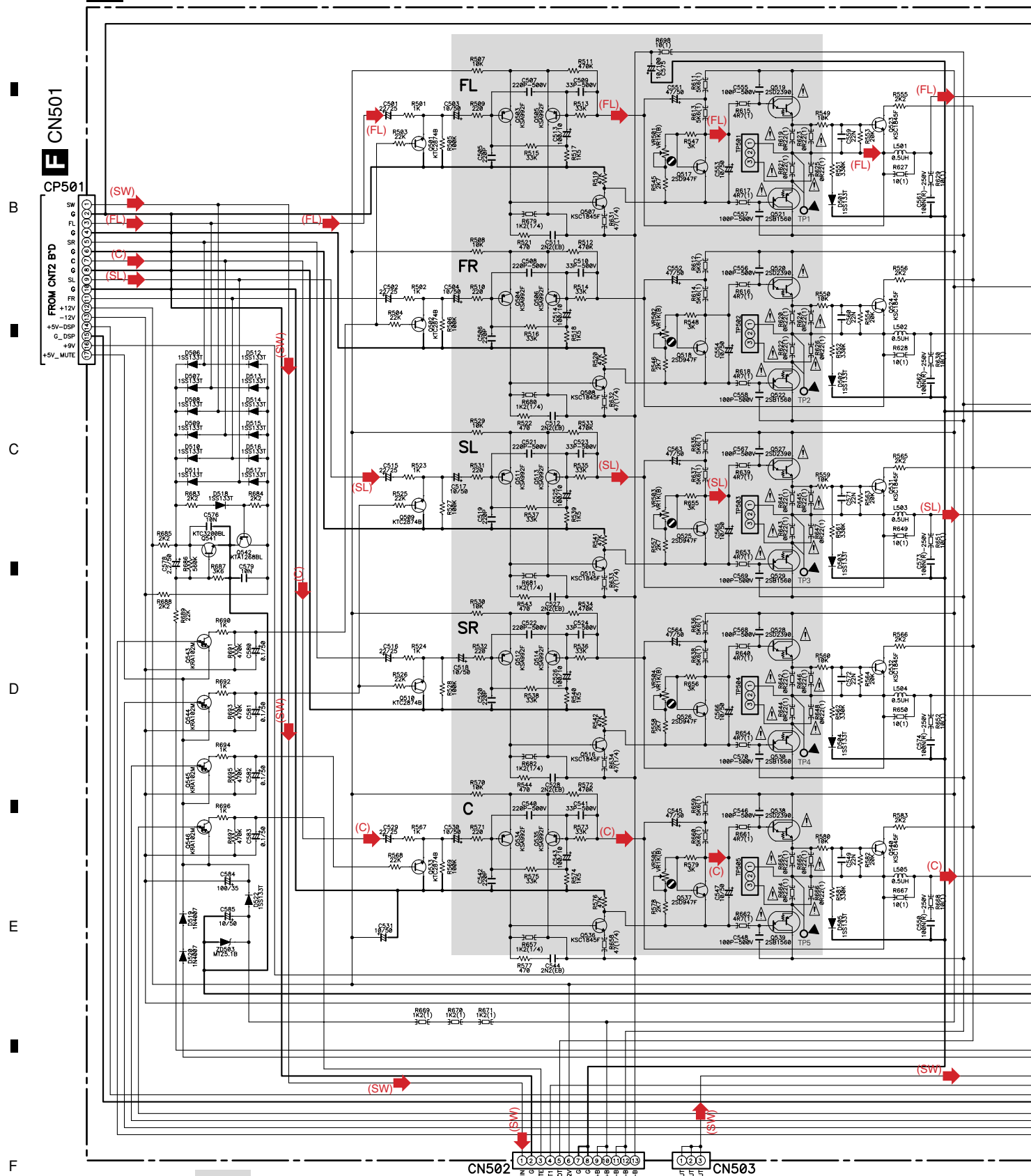






### 3.3 MAIN, PROTECTION and POWER ASSYS

#### A MAIN ASSY (7028063491010-IL)

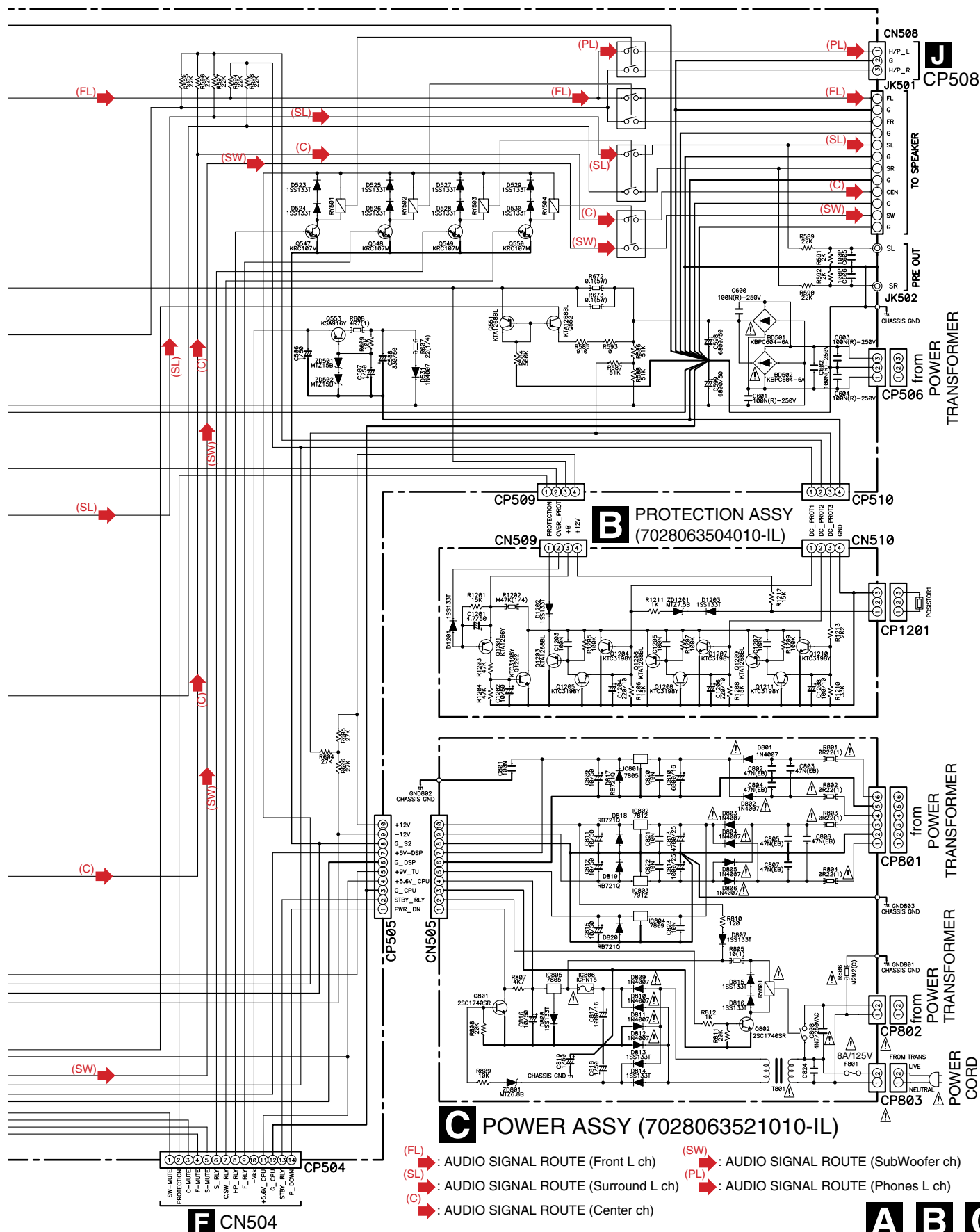


: Refer to  
"6.1 IDLE ADJUSTMENT"

H CP502

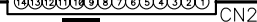
H CP503

**CAUTION** -FOR CONTINUED PROTECTION AGAINST RISK OF FIRE.  
REPLACE WITH SAME TYPE AND RATINGS ONLY.



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CNT1 ASSY (7028063492010-IL)



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**G H I J**



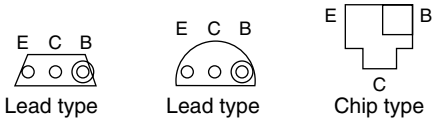
# 4. PCB CONNECTION DIAGRAM

## NOTE FOR PCB DIAGRAMS :

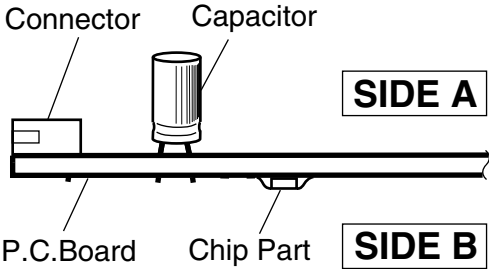
- 1. Part numbers in PCB diagrams match those in the schematic diagrams.
- 2. A comparison between the main parts of PCB and schematic diagrams is shown below.

Symbol In PCB Diagrams	Symbol In Schematic Diagrams	Part Name
		3-terminal regulator

- 3. Polarity indications of transistors on the PC board  
Although polarity indications are not provided for each transistor on the PC board, the following indications are provided on a blank space of the board:



- 3. The parts mounted on this PCB include all necessary parts for several destinations.  
For further information for respective destinations, be sure to check with the schematic diagram.
- 4. View point of PCB diagrams.





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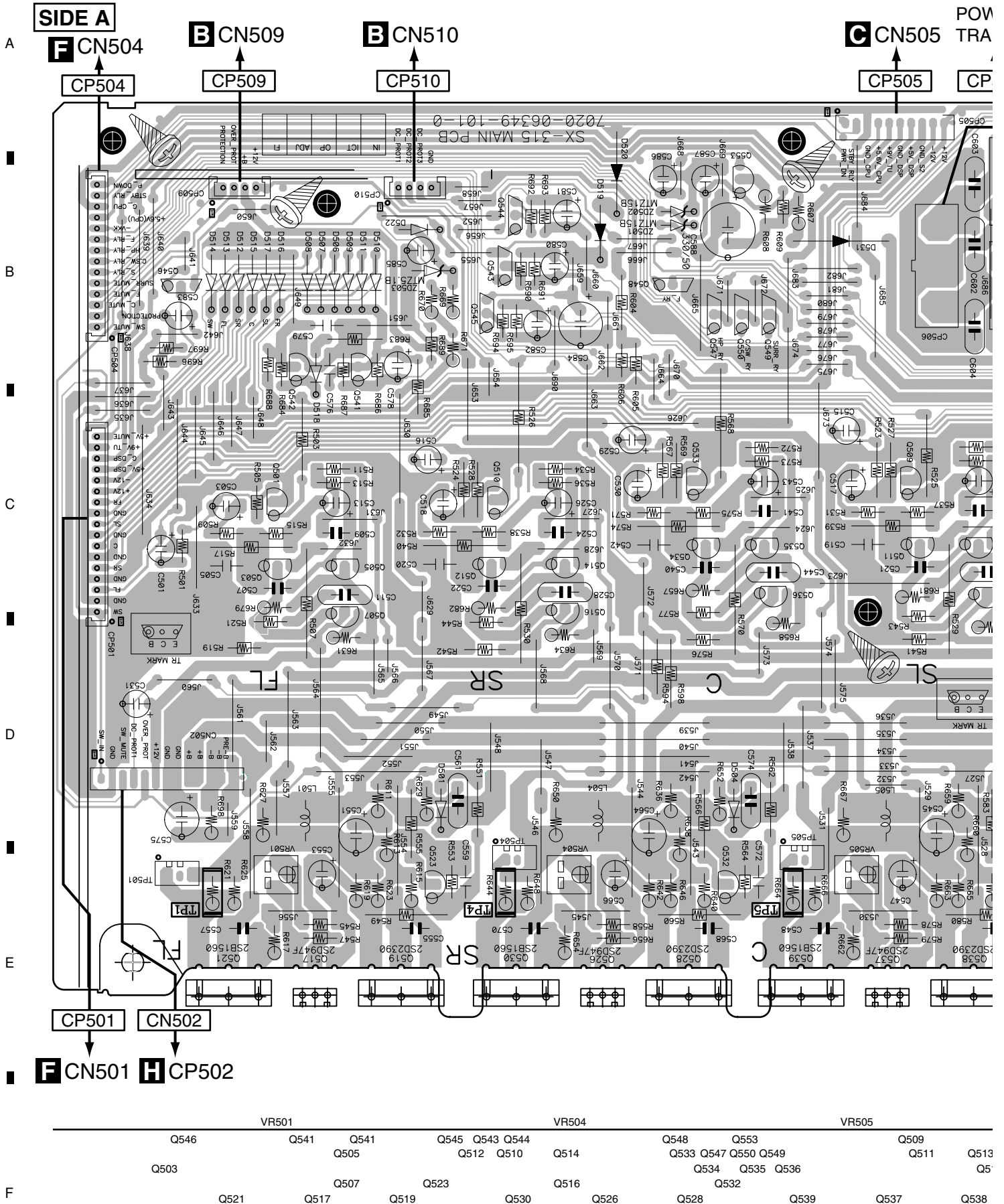
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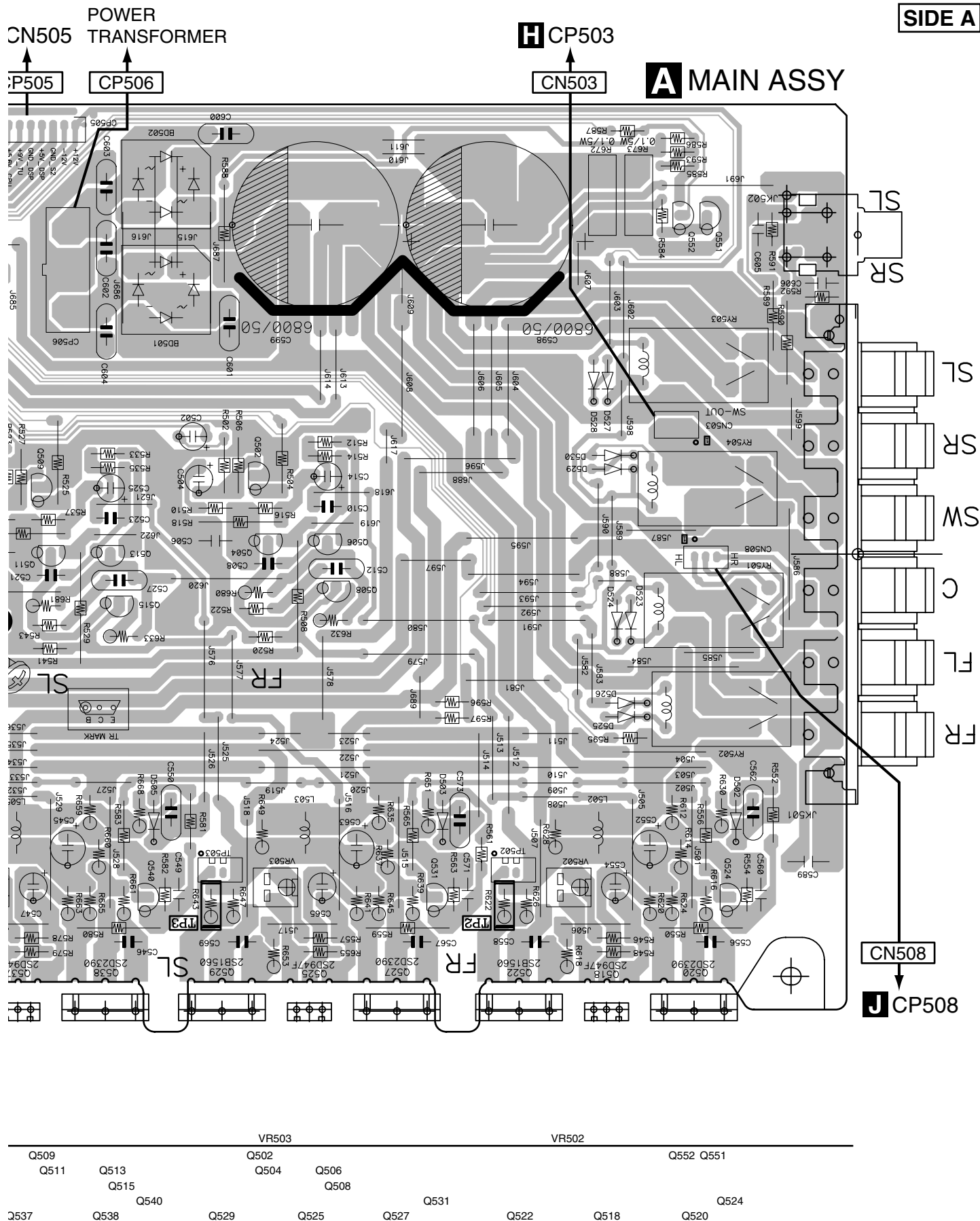
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SX-315

# 4.1 MAIN ASSY





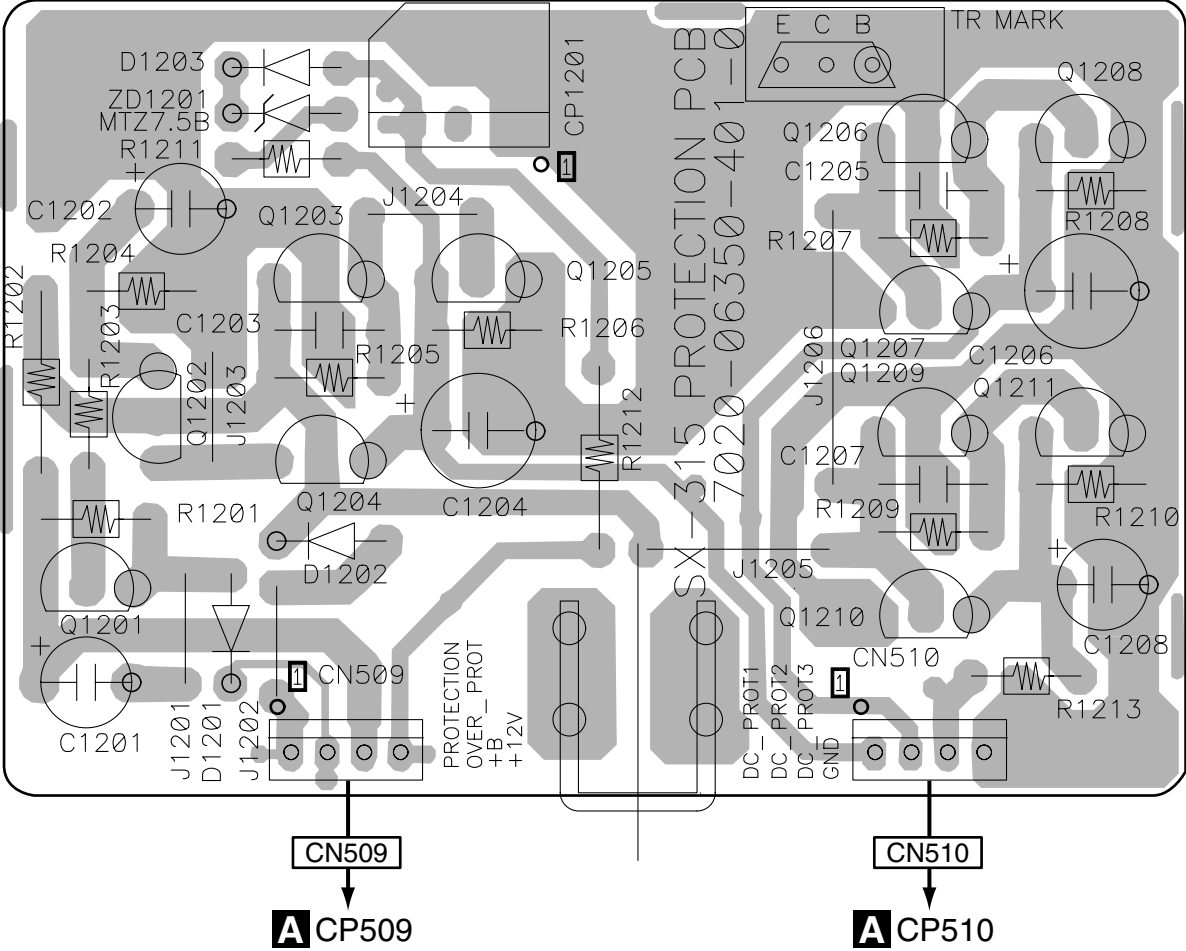
1 2 3 4

4.2 PROTECTION ASSY

SIDE A

SIDE A

**B** PROTECTION ASSY



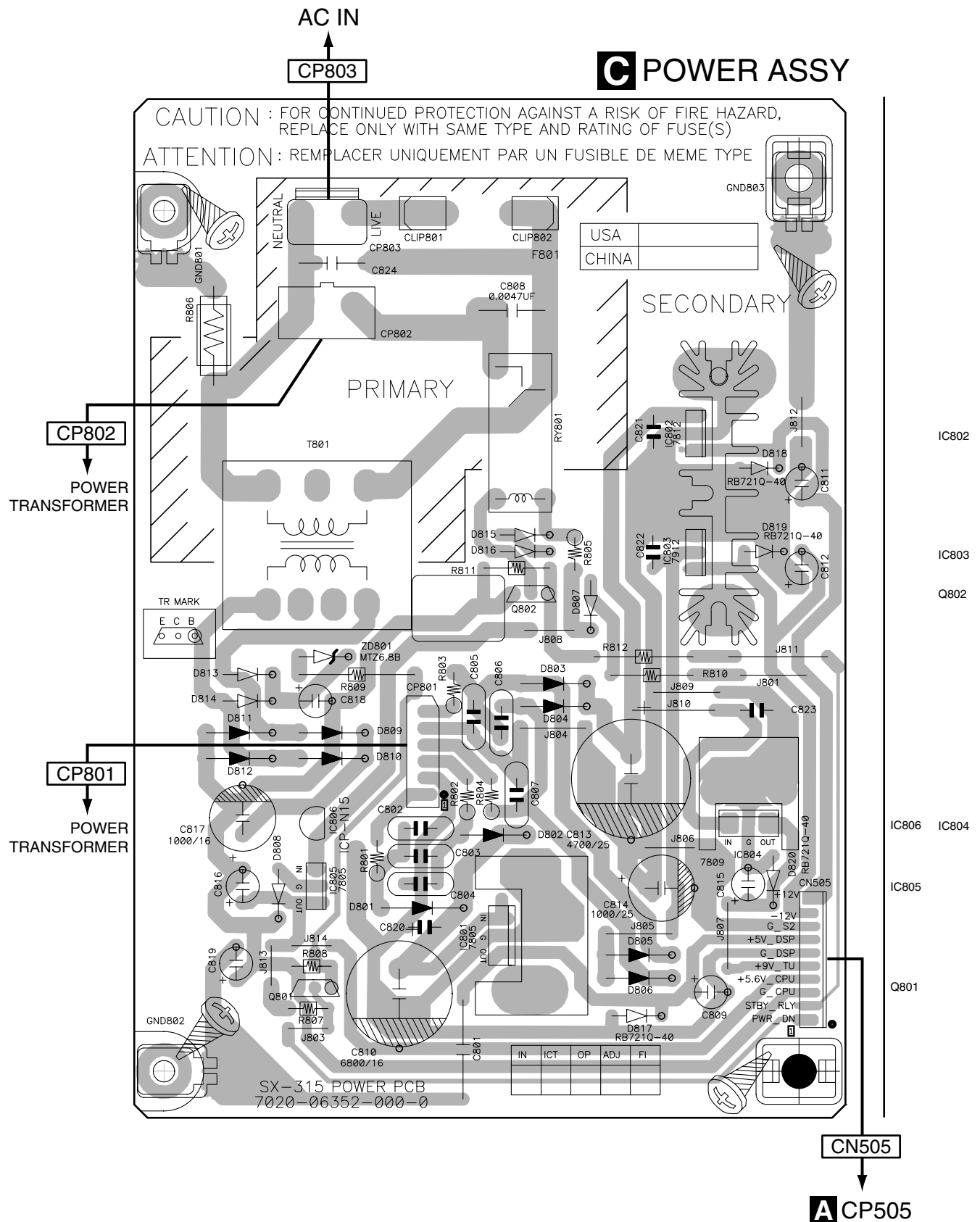
	Q1202	Q1203	Q1205	Q1206	Q1208
		Q1204		Q1207	
	Q1201			Q1209	Q1211
				Q1210	

**B**

# 4.3 POWER ASSY

SIDE A

SIDE A

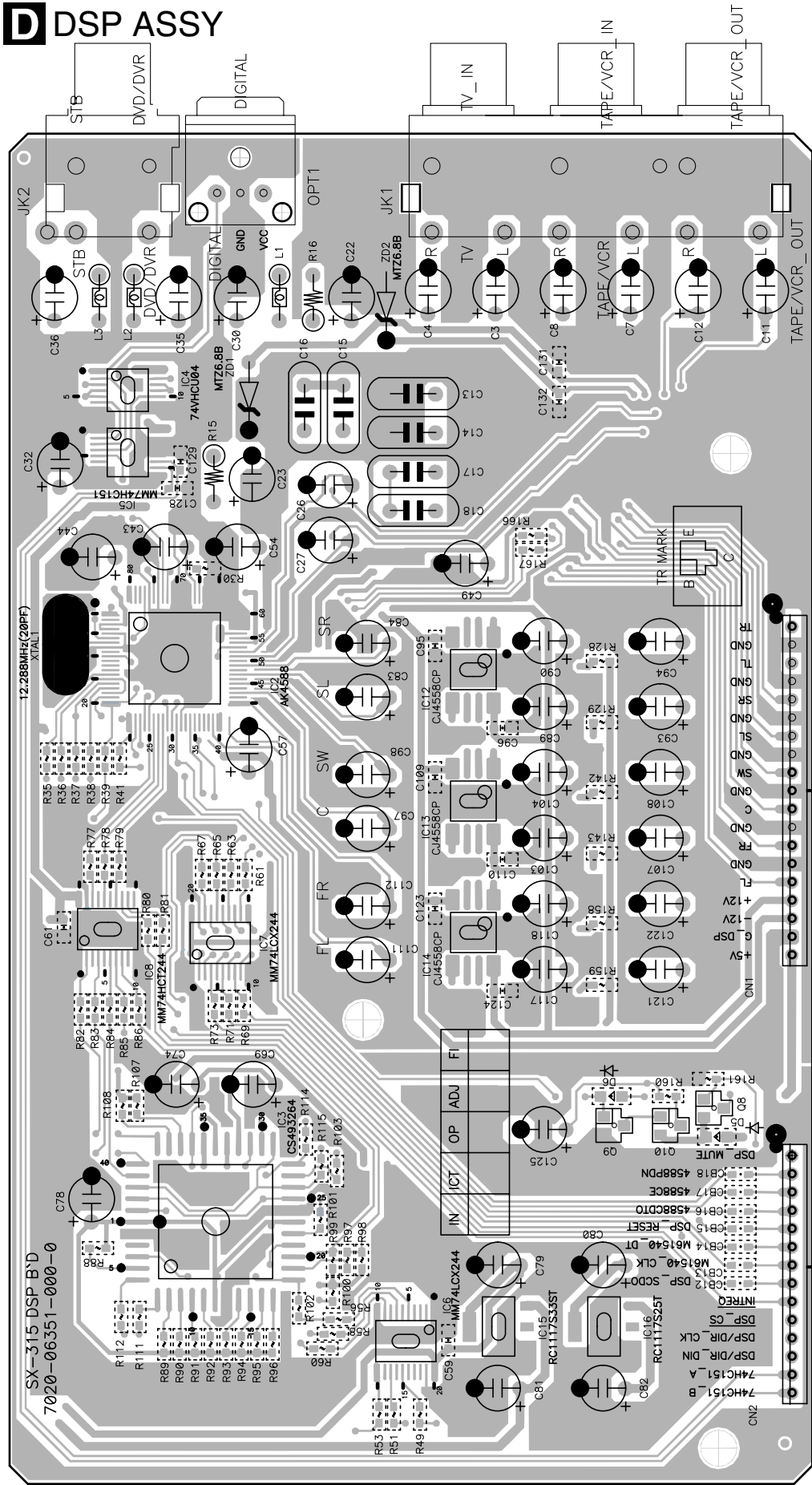


C

4.4 DSP ASSY

SIDE A

DSP ASSY



CP1

CP2





△

A





IC901

Q905

Q904

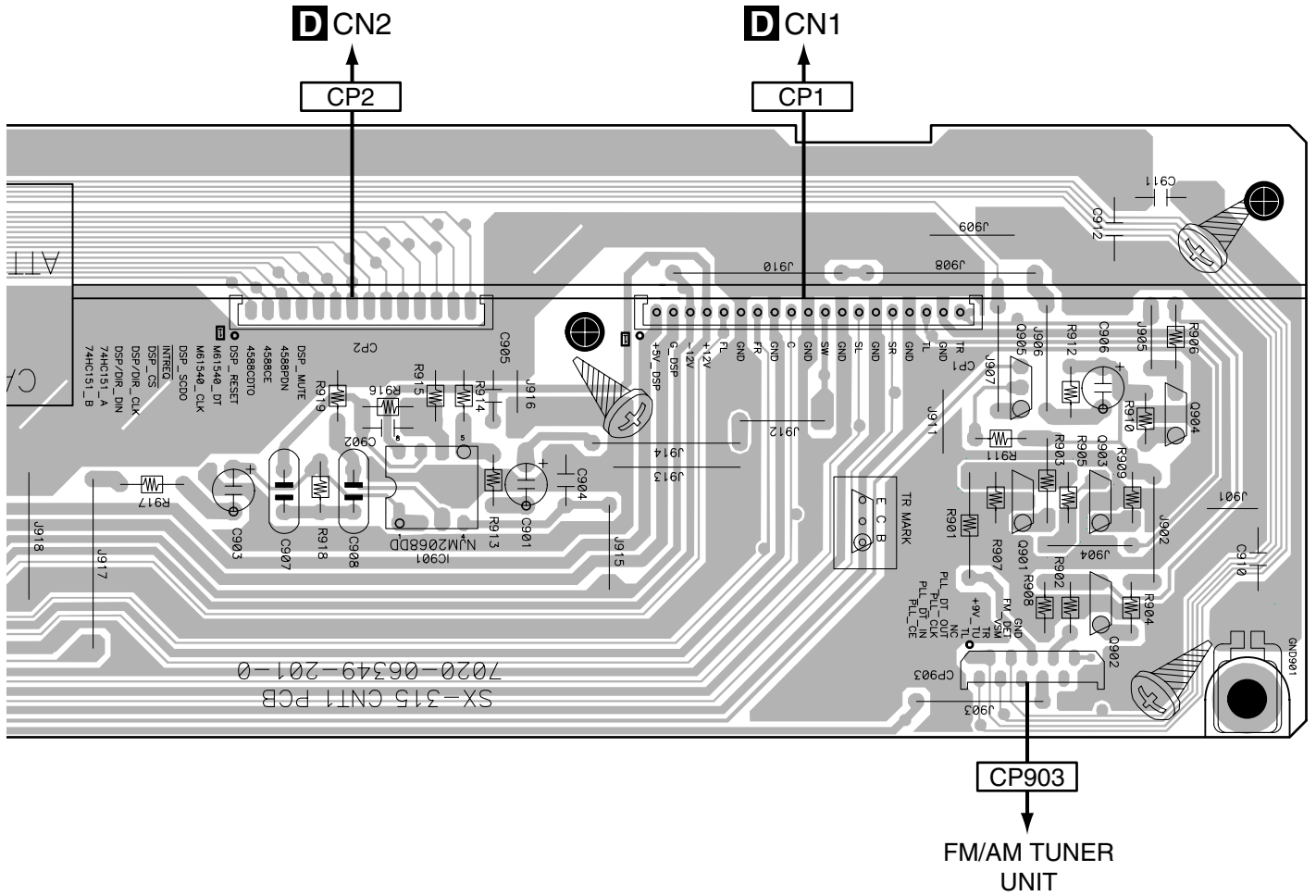
**SIDE A**

Q901

Q903

Q902

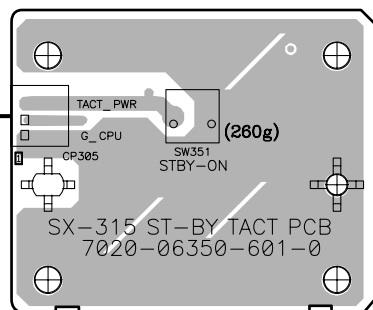
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## 4.6 FRONT, SW AMP, ST-BY TACT and H/P ASSYS

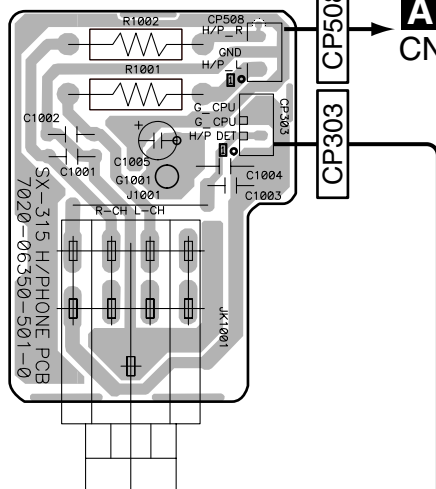
A

### I ST-BY TACT ASSY



B

### J H/P ASSY



A  
CN508

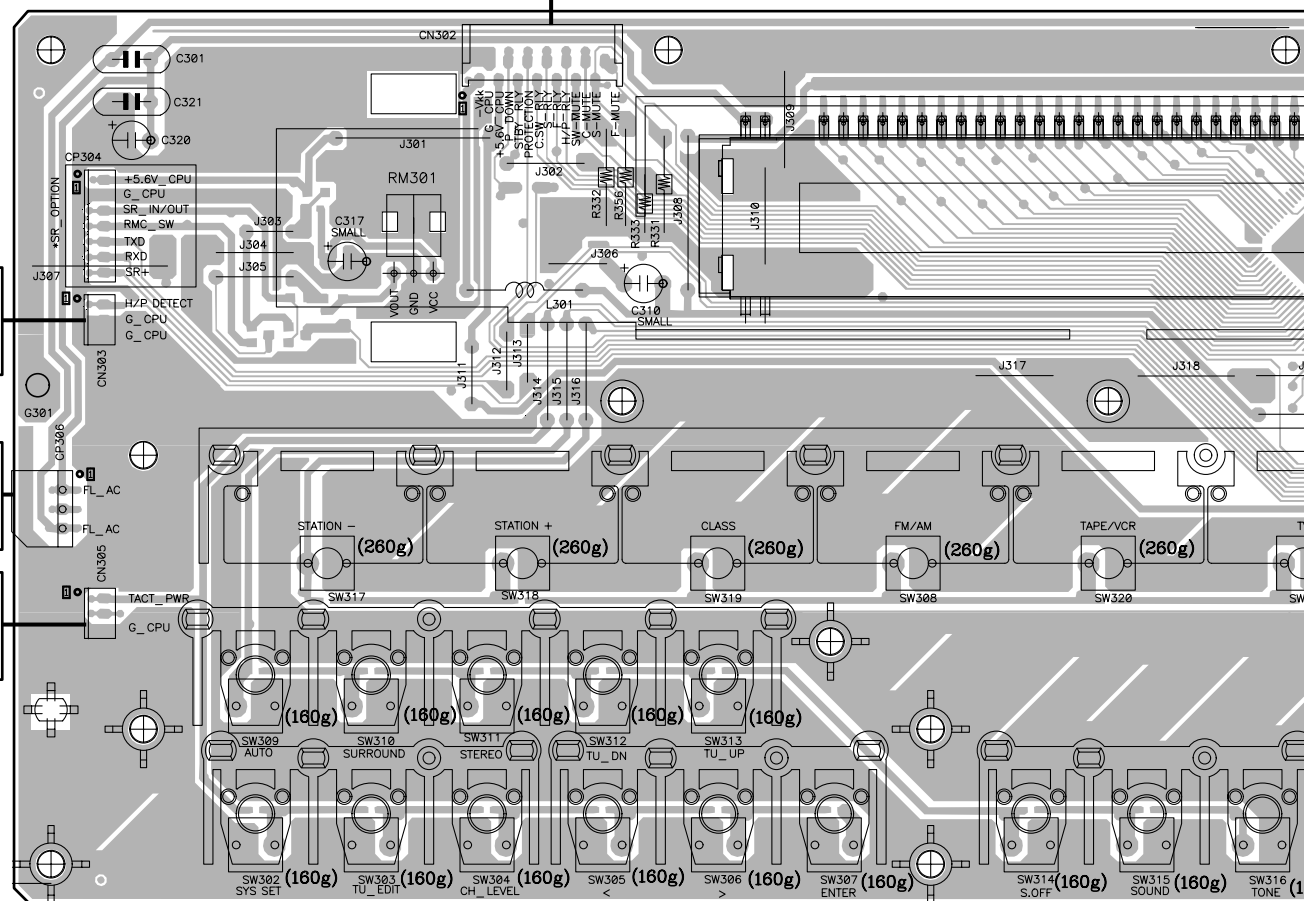
CN5

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### F CP302

CN302

### G FRONT ASSY



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POWER  
TRANSFORMER

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G I J



SIDE B

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B

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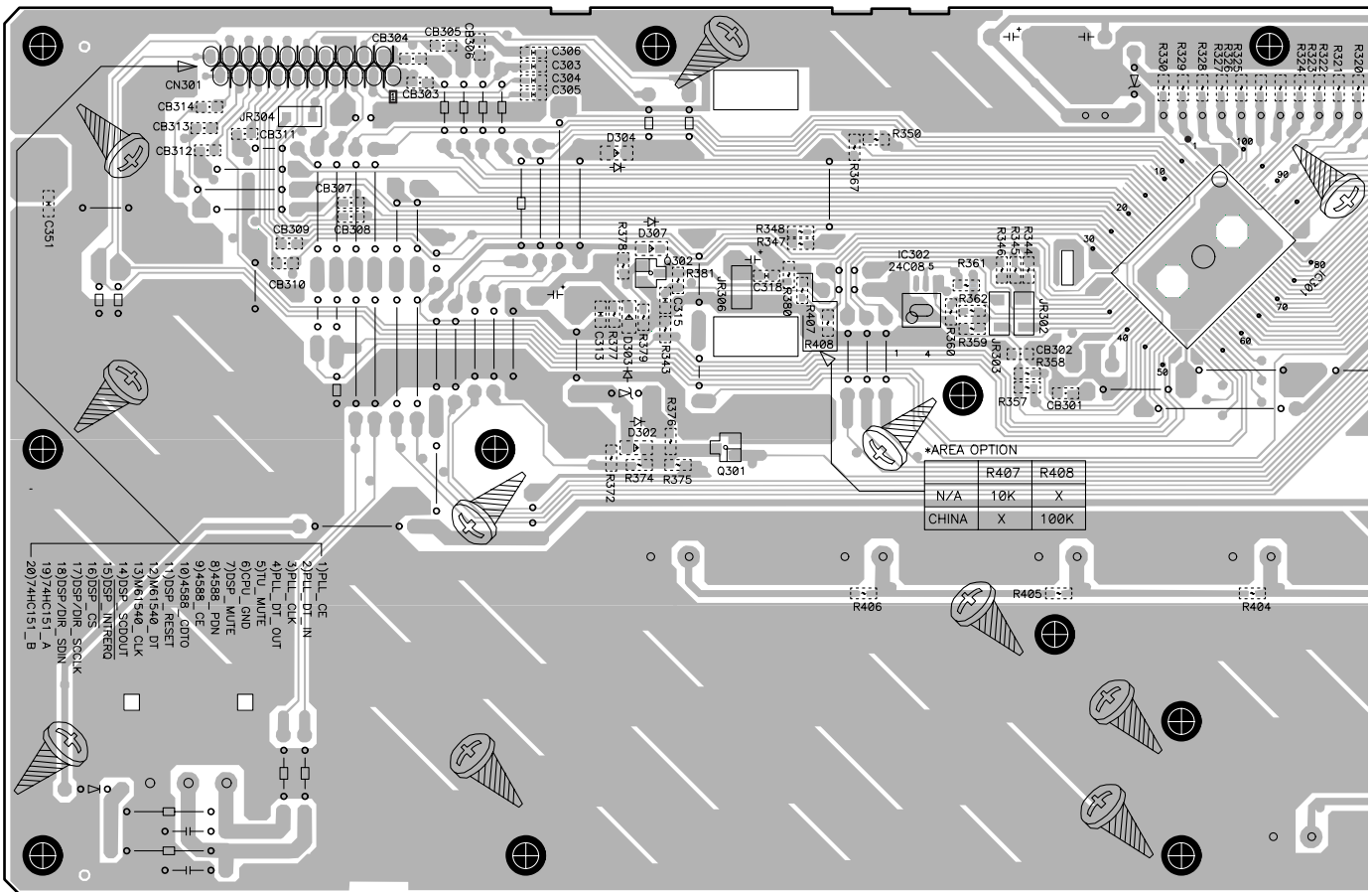
FRONT ASSY

CN301

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\*AREA OPTION

	R407	R408
N/A	10K	X
CHINA	X	100K

Q302    Q301    IC302    IC301



SIDE B

A

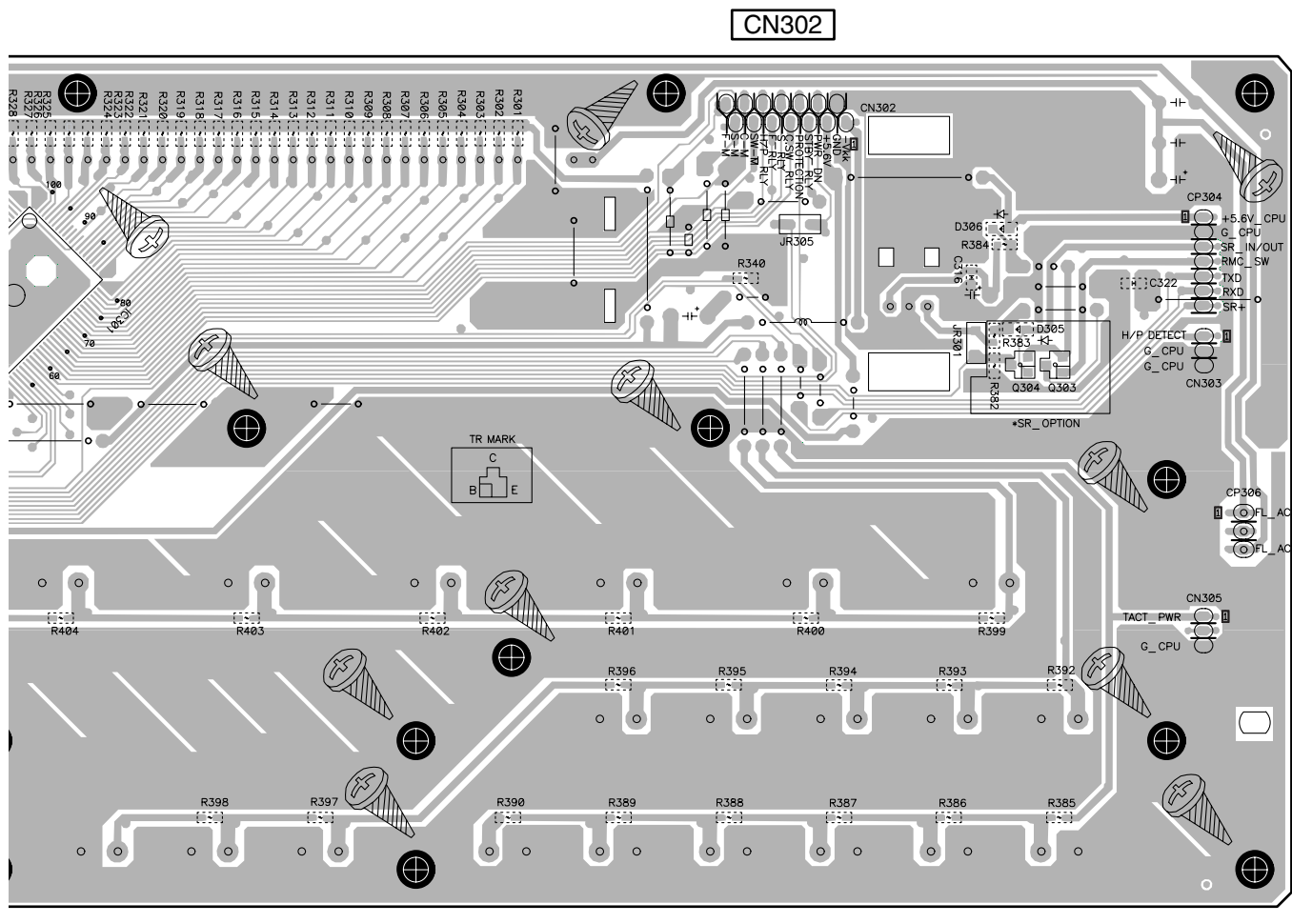
B

C

D

E

F



301

Q304 Q303



1234

# 5. PCB PARTS LIST

NOTES: ●Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.  
●The ⚠ mark found on some component parts indicates the importance of the safety factor of the part.  
Therefore, when replacing, be sure to use parts of identical designation.  
●When ordering resistors, first convert resistance values into code form as shown in the following examples.  
Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%).  
560 Ω → 56 x 10<sup>1</sup> → 561 ..... RD1/4PU561J  
47k Ω → 47 x 10<sup>3</sup> → 473 ..... RD1/4PU473J  
0.5 Ω → R50 ..... RN2H50K  
1 Ω → 1R0 ..... RS1P1R0K  
Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).  
5.62k Ω → 562 x 10<sup>1</sup> → 5621 ..... RN1/4PC5621F

● Conversion list of Ref. Nos. in the circuit diagram and parts list  
Some Ref. Nos. in the circuit diagram and parts list are not identical, as indicated in the table below:

Ref. Nos. in the Schematic Diagram	1	Ref. Nos. in the Parts List
ZD	1	D2000-D2999 (The last three digits are identical.)
BD	1	D3000-D3999 (The last three digits are identical.)
CP	1	CN2000-CN2999 (The last three digits are identical.)
TP	1	CN3000-CN3999 (The last three digits are identical.)
RM	1	No Ref. Nos.
SW	1	S
FL	1	V
XTAL	1	X
CJ	1	R2000-R2999 (The last three digits are identical.)
JR	1	R3000-R3999 (The last three digits are identical.)
GND	1	No Ref. Nos.
JK	1	JA2000-JA2999 (The last three digits are identical.)
OPT	1	JA3000-JA3999 (The last three digits are identical.)
CB	1	L2000-L2999 (The last three digits are identical.)

Mark No.	Description	Part No.	Mark No.	Description	Part No.
LIST OF ASSEMBLIES			Q534,Q535		J5000992F0050-IL
NSP	1..MAIN BOARD ASSY	7025HK0409010-IL	Q542,Q551,Q552		J5001268B0050-IL
	2..MAIN ASSY	7028063491010-IL	Q507,Q508,Q515,Q516		J5021845F0000-IL
	2..CNT1 ASSY	7028063492010-IL	Q523,Q524,Q531,Q532,Q536		J5021845F0000-IL
NSP	1..FRONT BOARD ASSY	7025HK0409011-IL	Q540		J5021845F0000-IL
	2..PROTECTION ASSY	7028063504010-IL	Q501,Q502,Q509,Q510,Q533		J502287400010-IL
	2..CNT2 ASSY	7028063502010-IL	Q541		J5023200B0050-IL
	2..FRONT ASSY	7028063501010-IL	Q543-Q546		J6002202M0010-IL
	2..SW AMP ASSY	7028063503010-IL	Q547-Q550		J6020107M0010-IL
	2..ST-BY TACT ASSY	7028063506010-IL	D501-D518,D522-D530		1SS133
	2..H/P ASSY	7028063505010-IL	D519,D520,D531		K000400700520-IL
NSP	1..POWER BOARD ASSSY	7025HK0409013-IL	⚠D3561,D3562		K047604000020-IL
	2..POWER ASSY	7028063521010-IL	D2551,D2552		MTZJ15(B)
NSP	1..DSP BOARD ASSY	7025HK0409012-IL	D2553		MTZJ5R1(B)
	2..DSP ASSY	7028063511010-IL			

Mark No.	Description	Part No.	SWITCHES AND RELAYS	
			RY501-RY504	ASR7017
MAIN ASSY			COILS AND FILTERS	
			L501-L505	D330R50000000-IL
SEMICONDUCTORS			CAPACITORS	
Q553		J5000916Y0050-IL	C575	CEAT100M2A
Q503-Q506,Q511-Q514		J5000992F0050-IL		





**Mark No. Description****Part No.****Mark No. Description****Part No.**

CP801 CONNECTOR  
 ▲ CP802 CONNECTOR  
 ▲ CP803 CONNECTOR  
 ▲ FU801 FUSE (8A)

L102526700600-IL  
 L104353280200-IL  
 L108202000220-IL  
 REK1086

C91,C92,C105,C119,C120

CKSRYB102K50

C128-C132,C37,C38,C62  
 C71,C75  
 C109,C110,C123,C124,C19  
 C24,C25,C28,C31  
 C41,C42,C46,C53,C55

CKSRYB103K50  
 CKSRYB103K50  
 CKSRYB104K50  
 CKSRYB104K50  
 CKSRYB104K50

C58-C61,C64,C66,C73  
 C77,C95,C96  
 C106

CKSRYB104K50  
 CKSRYB104K50  
 CKSRYB332K50

**RESISTORS**

R15,R16  
 Other Resistors

RS1PMF101J  
 RS1/16S####J

**OTHERS**

JA3001 OPTICAL RECEIVER  
 X1 CRYSTAL RESONATOR  
 JA2002 RCA JACK  
 JA2001 RCA JACK  
 CN2002 CONNECTOR

E100116500040-IL  
 E80012R288080-IL  
 G601207AE060Y-IL  
 G603603B09000-IL  
 L101100031410-IL

CN2001 CONNECTOR

L101100031910-IL

**CNT1 ASSY SEMICONDUCTORS**

IC901  
 Q901-Q904  
 Q905

NJM2068DD  
 J502287400010-IL  
 J6002202M0010-IL

**CAPACITORS**

C903  
 C901  
 C906  
 C908  
 C907

CEAT100M50  
 CEAT4R7M50  
 CEATR10M50  
 CFTLA154J50  
 CFTLA274J50

C902  
 C909- C912  
 C904,C905

CKPUYB101K50  
 CKPUYF104Z50  
 CKPUYF104Z50

**RESISTORS**

All Resistors

RD1/4PU####J

**OTHERS**

CN902 PCB CONNECTOR  
 CN1 PCB CONNECTOR  
 CN2 PCB CONNECTOR  
 CN903 CONNECTOR  
 CN301 CONNECTOR

L101100041710-IL  
 L101100041910-IL  
 L101100041410-IL  
 L131111100010-IL  
 L131112000010-IL

**CNT2 ASSY****OTHERS**

1301,1302 BRACKET  
 CN504 PCB CONNECTOR  
 CN501,CN902 PCB CONNECTOR  
 CN2302 CONNECTOR

4010210196000-IL  
 L101100031410-IL  
 L101100031710-IL  
 L131101400010-IL

**FRONT ASSY SEMICONDUCTORS**

IC301  
 IC302

J020820521590-IL  
 J000240860010-IL

**DSP ASSY SEMICONDUCTORS**

IC4  
 IC5  
 IC6,IC7  
 IC8  
 IC2

J040740400270-IL  
 J040741510050-IL  
 J040742440180-IL  
 J040742440190-IL  
 J080458800010-IL

IC3  
 IC1  
 IC12-IC14  
 IC16  
 IC15

J080493260040-IL  
 J084615400010-IL  
 J121455800150-IL  
 J126111725020-IL  
 J126111733020-IL

Q10  
 Q8  
 Q9  
 Q1-Q6  
 D1-D6

J520010200210-IL  
 J520011100210-IL  
 J522010200210-IL  
 J5222875B0010-IL  
 K005041480020-IL

D2001,D2002

MTZJ6R8(B)

**COILS AND FILTERS**

L2,L3  
 L1  
 L2001,L2004-L2008  
 L2009,L2010-L2014,L2016,L2017

D3302R2000150-IL  
 D3304R7000150-IL  
 D340160800060-IL  
 D340160800060-IL

**CAPACITORS**

C39,C40  
 C1,C10,C2,C20,C21  
 C5,C50-C52,C6,C9  
 C29,C33,C34  
 C47,C48

CCSRCH100D50  
 CCSRCH101J50  
 CCSRCH101J50  
 CCSRCH220J50  
 CCSRCH240J50

C102  
 C45,C56,C65,C67,C70  
 C72,C76  
 C85,C86,C99,C113,C114  
 C100,C101,C115,C116

CCSRCH361J50  
 CCSRCH471J50  
 CCSRCH471J50  
 CCSRCH561J50  
 CCSRCH681J50

C87,C88  
 C103,C104,C107,C108  
 C111,C112,C117,C118  
 C121,C122,C26,C27,C43  
 C79,C80,C83,C84

CCSRCH681J50  
 CEAT100M50  
 CEAT100M50  
 CEAT100M50  
 CEAT100M50

C89,C90,C93,C94  
 C97,C98  
 C44  
 C81,C82  
 C54,C57,C78

CEAT100M50  
 CEAT100M50  
 CEAT101M10  
 CEAT1R0M50  
 CEAT221M10

C11,C12,C3,C4,C69  
 C7,C8  
 C22,C23,C30,C32,C49  
 C74  
 C125,C35,C36

CEAT2R2M50  
 CEAT2R2M50  
 CEAT470M16  
 CEAT470M16  
 CEATR10M50

C16,C18  
 C15,C17  
 C13,C14  
 C68

CFTLA153J2A  
 CFTLA473J2A  
 CFTLA563J2A  
 CKSRYB102K50



Figure 1: Schematic diagram of the experimental setup. A participant is seated at a table, viewing a screen. The screen displays a sequence of stimuli: a fixation cross, a target stimulus (a black dot), and a response stimulus (a red dot). The participant's response is recorded by a computer. The diagram shows the participant's eye, the screen, and the response button.

# 6. ADJUSTMENT

## 6.1 IDLE ADJUSTMENT



### Idle Current Adjustment

**Purpose :** If the one of the following TR (Transistor) is replaced, this adjustment is required.  
Q206, Q207, Q519-Q522, Q527-Q530, Q538 and Q539

**Equipment :** Digital voltmeter

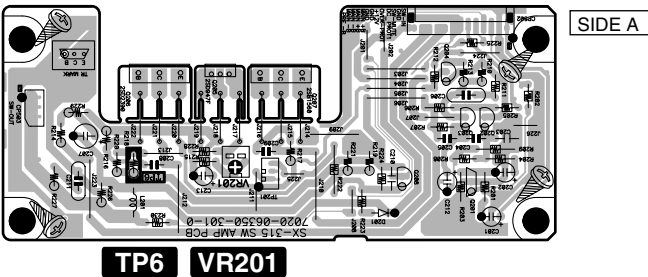
Adjustment Name	Adjustment VR	Measurement Points
Front L ch	VR501 (MAIN Assy)	TP1 (R621)
Front R ch	VR502 (MAIN Assy)	TP2 (R622)
Surround L ch	VR503 (MAIN Assy)	TP3 (R643)
Surround R ch	VR504 (MAIN Assy)	TP4 (R644)
Center ch	VR505 (MAIN Assy)	TP5 (R664)
SubWoofer ch	VR201 (SW AMP Assy)	TP6 (R621)

### ● Procedure

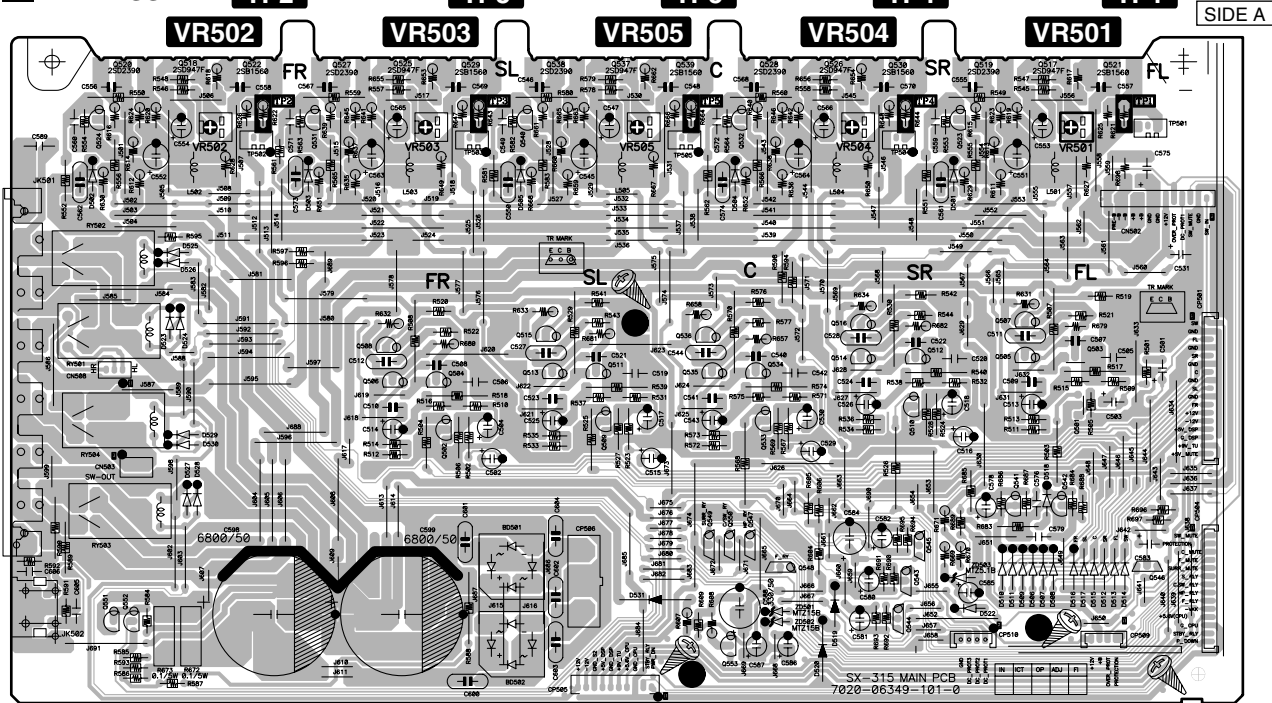
1. Fully turn the adjustment VR counterclockwise.
2. Connect a digital voltmeter to both ends of resistor of the measurement point. (TP1 - TP6)
3. Turn on the power, and perform aging for more than one minute.
4. Slowly turn the adjustment VR clockwise so that the voltage becomes in the range of  $2.5\text{mV} \pm 0.5\text{mV}$ .

### ● Adjustment Points

**H** SW AMP ASSY



**A** MAIN ASSY



## 7. GENERAL INFORMATION

### 7.1 DIAGNOSIS

#### 7.1.1 TROUBLE SHOOTING

The Protection circuit is activated by DC or overcurrent detection.

**Detection method:** The voltage at the Protection port (Pin 7) of the microcomputer becomes low.

**Time required for detection:** 2.5 sec after the power is turned on

**Operation when the Protection circuit is activated:**

- Mute: ON
- Speaker Relay: OFF
- The unit immediately enters Standby mode.

**Recovery method:** Press the STANDBY key twice.

#### ● When the DC detection circuit is not normal

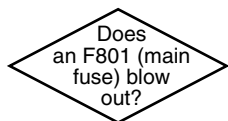
- BD501 and BD502 are in failure or their peripheral circuits are short-circuited.
- Power amp section is in failure.
- Protection circuit is in failure.
- Microcomputer is in failure. (pin 7: protection)

#### ● When the overcurrent detection circuit is not normal

- Power amp section is in failure.
- Protection circuit is in failure.
- Microcomputer is in failure. (pin 7: protection)
- Only when the signal is output, short-circuiting of the output circuit is suspected.

**Symptoms****Diagnosis description**

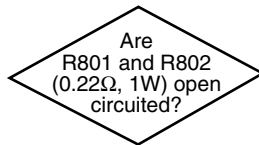
A



Yes

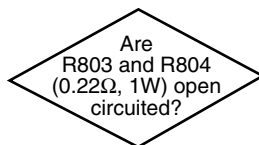
- The wires of primary and secondary sides of the main transformer are short-circuited. Transformer is in failure.
- BD501 and BD502 are in failure.
- Power transistors are in failure (short-circuited).

B



Yes

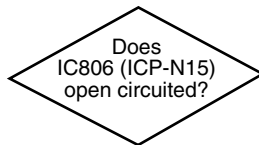
- D801 and D802 are in failure.
- IC801 is in failure.
- Short-circuiting of these peripheral circuits.



Yes

- D803-D806 are in failure.
- IC802 and IC803 are in failure.
- Short-circuiting of these peripheral circuits.

C



Yes

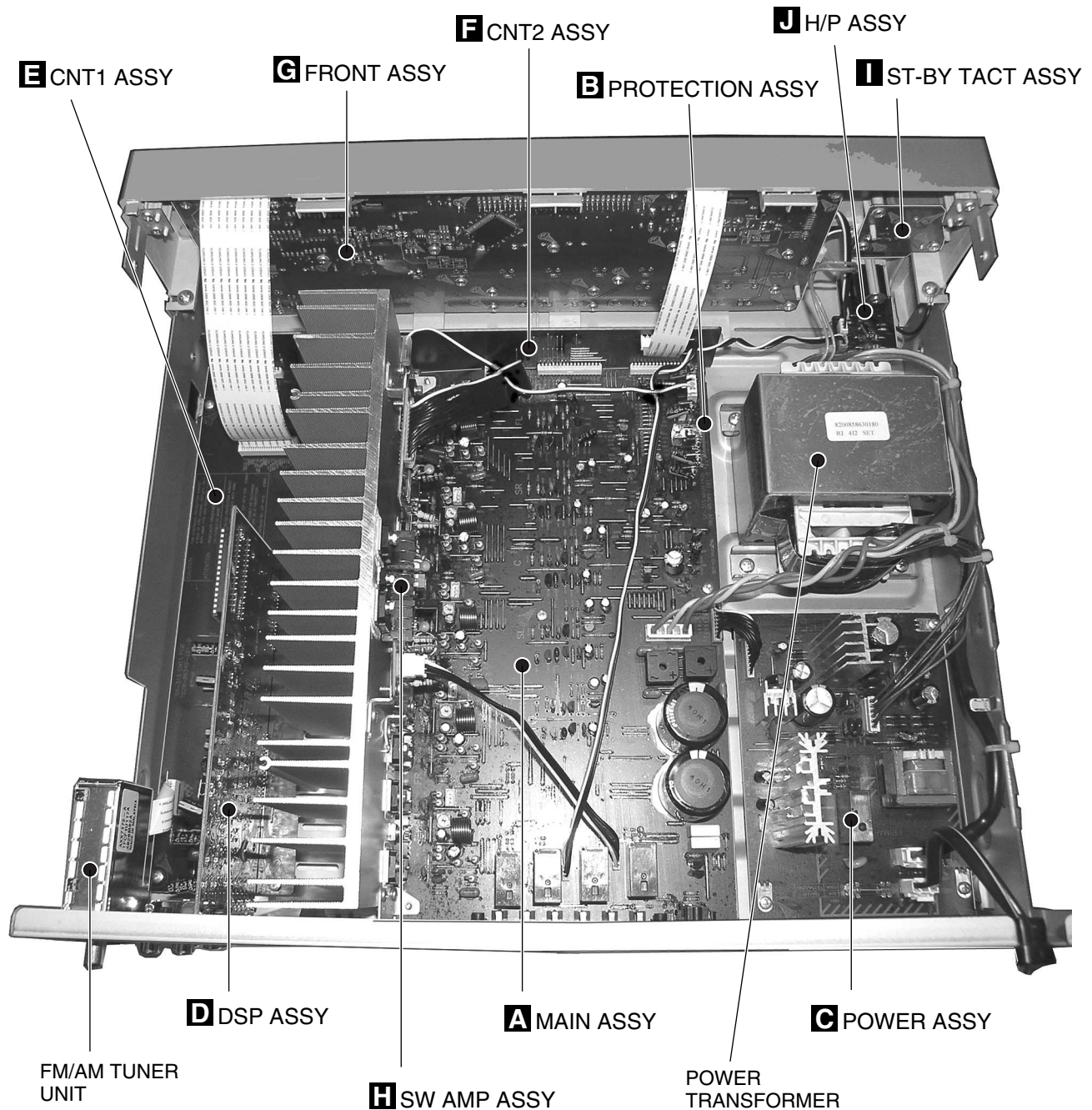
- IC805 is in failure or its peripheral circuits are short-circuited.

D

E

F

## 7.1.2 PCB LOCATION



## 7.2 IC INFORMATION

• The information shown in the list is basic information and may not correspond exactly to that shown in the schematic diagrams.

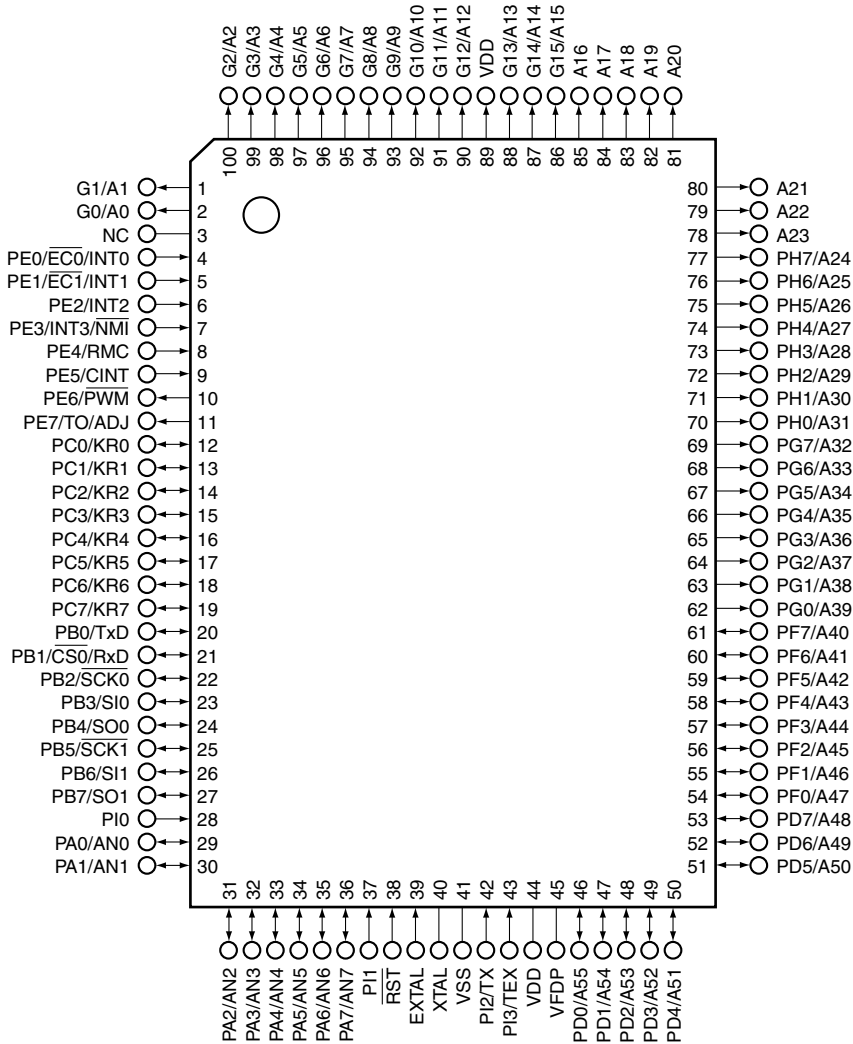
### ● List of IC

CXP82052, AK4588, CS493264CLZ

### ■ CXP82052 (FRONT ASSY: IC301)

• Microcomputer

### ● Pin Arrangement (Top view)



### ● Pin Function

No.	Port Name	Signal Name	I/O	Function
1	G1/A1	2G	O	Display
2	G0/A0	1G	O	Display
3	NC	NC	–	Non Connection
4	PE0/ $\overline{\text{EC0}}$ /INT0	P.DOWN	I	Power down detection
5	PE1/ $\overline{\text{EC1}}$ /INT1	VOL_UP	I	Encoder volume up control
6	PE2/INT2	VOL_DOWN	I	Encoder volume down control
7	PE3/INT3/ $\overline{\text{NMI}}$	$\overline{\text{PROTECTION}}$	I	Protection detection
8	PE4/PMC	RMC	I	Remocon input
9	PE5/CINT	+5V	–	Vdd connection (Connect to Vdd at no use)
10	PE6/PWM	NC	–	No Use



No.	Port Name	Signal Name	I/O	Function
11	PE7/TO/ADJ	NC	–	No Use
12	PC0/KR0	PLL_CE	–	Chip select signal for tuner control
13	PC1/KR2	PLL_DT_OUT	I	Data input signal for tuner control
14	PC2/KR2	PLL_CLK	O	Clock signal for tuner control
15	PC3/KR3	PLL_DT_IN	O	Data output signal for tuner control
16	PC4/KR4	NC	–	No Use
17	PC5/KR5	NC	–	No Use
18	PC6/KR6	DSP_SCDOUT	O	Data input signal for communication with DSP
19	PC7/KR7	DSP_CS	O	Chip select signal for communication with DSP
20	PB0/TxD	TXD	–	No Use
21	PB1/ $\overline{\text{CS0}}$ /RxD	RXD	–	No Use
22	PB2/ $\overline{\text{SCK0}}$	DSP_DIR_SDIN	O	Data output signal for communication with DSP and DIR
23	PB3/SI0	DSP_DIR_SCCLK	O	Clock signal for communication with DSP and DIR
24	PB4/SO0	4588_CE	O	Chip select signal for communication with DIR/DAC
25	PB5/ $\overline{\text{SCK1}}$	4588_CDTO	I	Data input signal for communication with DIR/DAC
26	PB6/SI1	4588_PDN	O	Power down signal for DIR/DAC
27	PB7/SO1	HP_DET	I	HP Detect
28	PI0	+5V	–	Vdd connection (Connect to Vdd at no use)
29	PA0/AN0	M61540_CLK	O	Clock signal for VOLUME IC
30	PA1/AN1	M61540_DT	O	Data output signal for VOLUME IC
31	PA2/AN2	OPTION	I	OPTION
32	PA3/AN3	KEY1	I	KEY1
33	PA4/AN4	KEY2	I	KEY2
34	PA5/AN5	KEY3	I	KEY3
35	PA6/AN6	EEPROM_CLK	O	Clock signal for EEPROM
36	PA7/AN7	EEPROM_DATA	O	Data output signal for EEPROM
37	PI1	+5V	–	Vdd connection (Connect to Vdd at no use)
38	$\overline{\text{RST}}$	RESET	–	
39	EXRAL	EXTAL	–	
40	XTAL	XTAL	–	
41	VSS	VSS	–	GND
42	PI2/TX	TXD	–	
43	PI3/TEX	TEX	–	
44	VDD	VDD	–	VDD
45	VFDP	VFDP	–	-VKK
46	PD0/A55	$\overline{\text{DSP\_RESET}}$	–	Reset signal for DSP
47	PD1/A54	$\overline{\text{DSP\_INTREQ}}$	I	Interrupt Request signal for DSP
48	PD2/A53	NC	–	Non Connection
49	PD3/A52	74HC151_B	O	Data select for Multiplexer
50	PD4/A51	74HC151_A	O	Data select for Multiplexer
51	PD5/A50	NC	–	No Use
52	PD6/A49	NC	–	No Use
53	PD7/A48	NC	–	No Use
54	PF0/A47	TU_MUTE	O	Tuner mute control
55	PF1/A46	DSP_MUTE	O	Dsp mute control

A

B

C

D

E

F

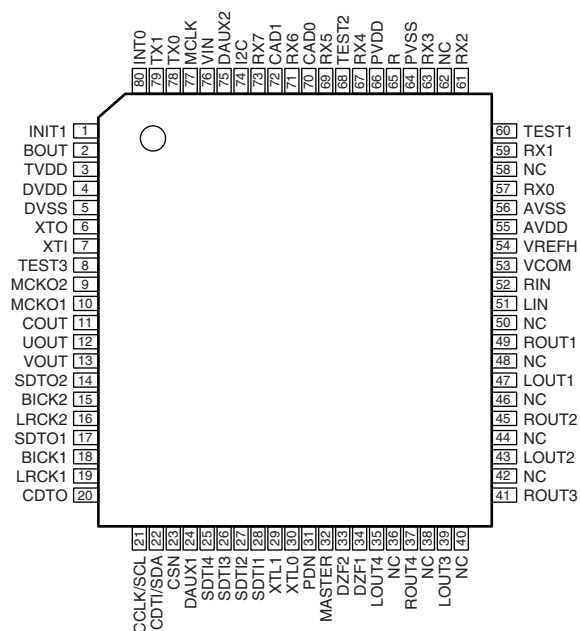
No.	Port Name	Signal Name	I/O	Function
56	PF2/A45	NC	–	No Use
57	PF3/A44	NC	–	No Use
58	PF4/A43	NC	–	No Use
59	PF5/A42	SR+	–	No Use
60	PF6/A41	NC	–	No Use
61	PF7/A40	C.SW_RELAY	O	C.SW_RELAY control
62	PG0/A39	SURR_RELAY	O	SURR_RELAY control
63	PG1/A38	FRONT_RELAY	O	FRONT_RELAY control
64	PG2/A37	H/P_RELAY	O	H/P_RELAY control
65	PG3/A36	ST/BY_RLY	O	ST/BY_RLY control
66	PG4/A35	SW_MUTE	O	SW_MUTE control
67	PG5/A34	CENTER_MUTE	O	CENTER_MUTE control
68	PG6/A33	FRONT_MUTE	O	FRONT_MUTE control
69	PG7/A32	SURR_MUTE	O	SURR_MUTE control
70	PH0/A31	P20	O	Display
71	PH1/A30	P19	O	Display
72	PH2/A29	P18	O	Display
73	PH3/A28	P17	O	Display
74	PH4/A27	P16	O	Display
75	PH5/A26	P15	O	Display
76	PH6/A25	P14	O	Display
77	PH7/A24	P13	O	Display
78	A23	P12	O	Display
79	A22	P11	O	Display
80	A21	P10	O	Display
81	A20	P9	O	Display
82	A19	P8	O	Display
83	A18	P7	O	Display
84	A17	P6	O	Display
85	A16	P5	O	Display
86	G15/A15	P4	O	Display
87	G14/A14	P3	O	Display
88	G13/A13	P2	O	Display
89	VDD	VDD	–	VDD
90	G12/A12	P1	O	Display
91	G11/A11	NC	–	No Use
92	G10/A10	NC	–	No Use
93	G9/A9	10G	O	Display
94	G8/A8	9G	O	Display
95	G7/A7	8G	O	Display
96	G6/A6	7G	O	Display
97	G5/A5	6G	O	Display
98	G4/A4	5G	O	Display
99	G3/A3	4G	O	Display
100	G2/A2	3G	O	Display



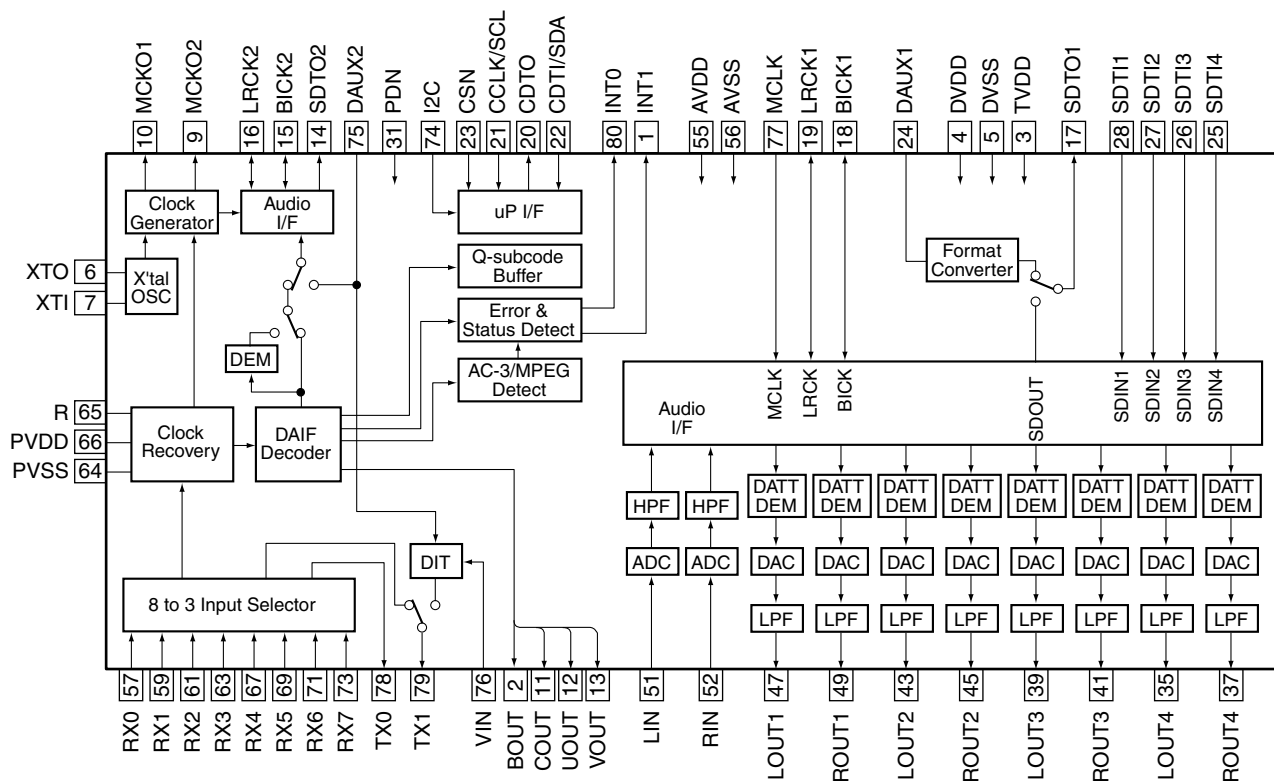
## AK4588 (DSP ASSY : IC2)

- Audio Codec with DIR

### • Pin Arrangement (Top view)



### • Block Diagram



## ● Pin Function

A

B

C

D

E

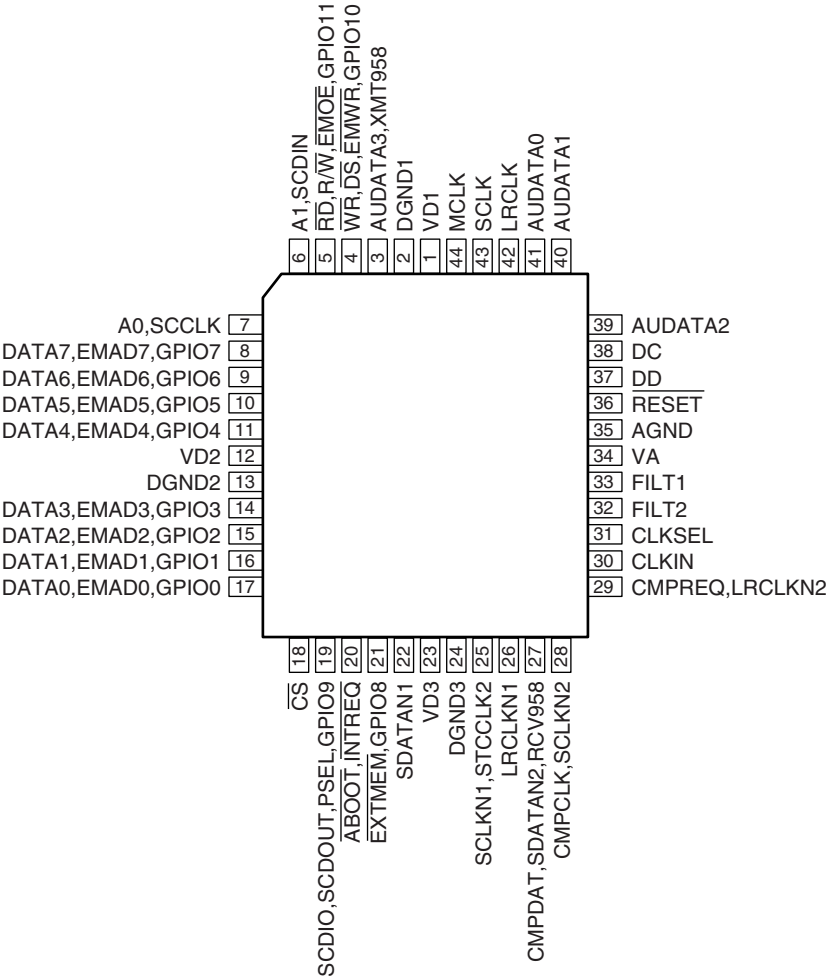
F

No.	Pin Name	I/O	Function
1	VD1	–	Digital Positive Supply: Pins1,12,23
2	DGND1	–	Digital Supply Ground: Pins 2,13,24
3	AUDATA3,XMT958A	O	SPDIF Transmitter Output, Digital Audio Output 3
4	$\overline{WR}, \overline{DS}, \overline{EMWR}$ ,GPIO10	I/O	Host Write Strobe or Host Data Strobe or External Memory Write Enable or General Purpose Input & Output Number 10
5	$\overline{RD}, \overline{R\overline{W}}, \overline{EMOE}$ ,GPIO11	I/O	Host Parallel Output Enable or Host Parallel R/W or External Memory Output Enable or General Purpose Input & Output Number 11
6	A1, SCDIN	I	Host Address Bit One or SPI Serial Control Data Input
7	A0, SCCLK	I	Host Paralle Address Bit Zero or Serial Control Port Clock
8	DATA7,EMAD7,GPIO7	I/O	Pin8
9	DATA6,EMAD6,GPIO6	I/O	Pin9
10	DATA5,EMAD5,GPIO5	I/O	Pin10
11	DATA4,EMAD4,GPIO4	I/O	Pin11
12	VD2	–	Digital Positive Supply: Pins1,12,23
13	DGND2	–	Digital Supply Ground: Pins 2,13,24
14	DATA3,EMAD3,GPIO3	I/O	Pin14
15	DATA2,EMAD2,GPIO2	I/O	Pin15
16	DATA1,EMAD1,GPIO1	I/O	Pin16
17	DATA0,EMAD0,GPIO0	I/O	Pin17
18	$\overline{CS}$	I	Host Parallel Chip Select, Host Serial SPI Chip Select
19	SCDIO,SCDOUT,PSEL,GPIO9	O	Serial Control Port Data Input and Output, Parallel Port Type Select
20	ABOOT,INTREQ	I/O	Control Por Interrupt Request, Automatic Boot Enable
21	EXTMEM,GPIO8	I/O	External Memory Chip Select or General Purpose Input & Output Number 8
22	SDATAN1	I	PCM Audio Data Input Number One
23	VD3	–	Digital Positive Supply: Pins1,12,23
24	DGND3	–	Digital Supply Ground: Pins 2,13,24
25	SCLKN1,STCCLK2	I	PCM Audio Input Bit Clock
26	LRCLKN1	I	PCM Audio Input Sample Rate Clock
27	CMPDAT, SDATAN2, RCV958	I	PCM Audio Input Number Tow
28	CMPCLK, SCLKN2	I	PCM Audio Input Bit Clock
29	CMPREQ, LRCLKN2	I	PCM Audio Input Sample Rate Clock
30	CLKIN	I	Master Clock Input
31	CLKSEL	–	DSP Clock Select
32	FILT2	–	Phase-Locked Loop Filter
33	FILT1	–	Phase Locked Loop Filter
34	VA	–	Analog Positive Supply
35	AGND	–	Analog Supply Ground
36	RESET	I	Master Reset Input
37	DD	–	Reserved
38	DC	–	Reserved
39	AUDATA2	O	Digital Audio Output 2
40	AUDATA1	O	Digital Audio Output 1
41	AUDATA0	O	Digital Audio Output 0
42	LRCLK	O	Audio Output Sample Rate Clock
43	SCLK	O	Audio Output Bit Clock
44	MCLK	–	Audio Master Clock

CS493264CLZ (DSP ASSY : IC3)

• Digital Audio Decoder

• Pin Arrangement (Top view)



## ● Pin Function

A

B

C

D

E

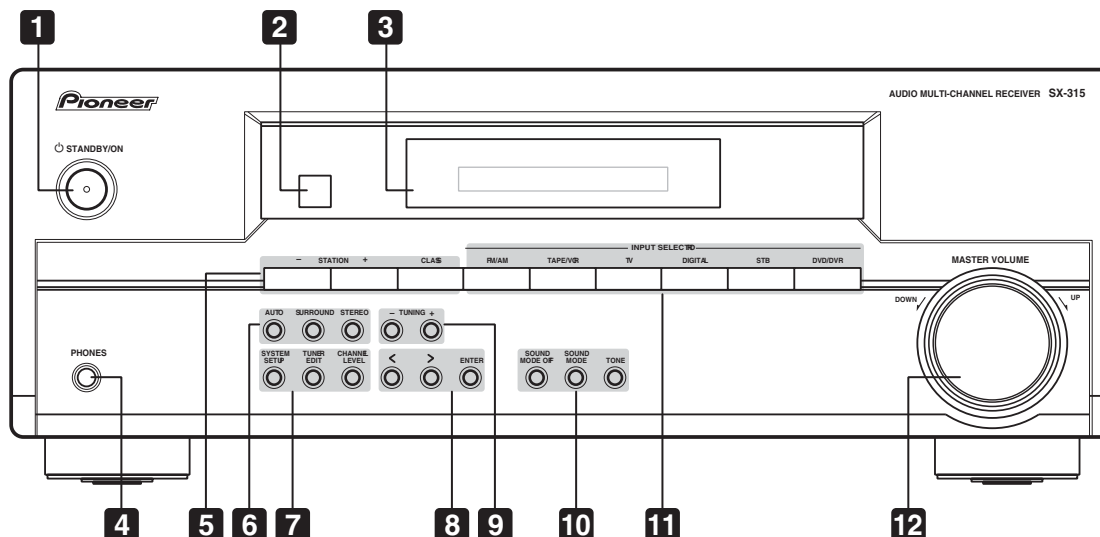
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No.	Pin Name	I/O	Function
1	VD1	–	Digital Positive Supply: Pins1,12,23
2	DGND1	–	Digital Supply Ground: Pins 2,13,24
3	AUDATA3,XMT958A	O	SPDIF Transmitter Output, Digital Audio Output 3
4	$\overline{WR}, \overline{DS}, \overline{EMWR}$ ,GPIO10	I/O	Host Write Strobe or Host Data Strobe or External Memory Write Enable or General Purpose Input & Output Number 10
5	$\overline{RD}, \overline{R\overline{W}}, \overline{EMOE}$ ,GPIO11	I/O	Host Parallel Output Enable or Host Parallel R/W or External Memory Output Enable or General Purpose Input & Output Number 11
6	A1, SCDIN	I	Host Address Bit One or SPI Serial Control Data Input
7	A0, SCCLK	I	Host Paralle Address Bit Zero or Serial Control Port Clock
8	DATA7,EMAD7,GPIO7	I/O	Pin8
9	DATA6,EMAD6,GPIO6	I/O	Pin9
10	DATA5,EMAD5,GPIO5	I/O	Pin10
11	DATA4,EMAD4,GPIO4	I/O	Pin11
12	VD2	–	Digital Positive Supply: Pins1,12,23
13	DGND2	–	Digital Supply Ground: Pins 2,13,24
14	DATA3,EMAD3,GPIO3	I/O	Pin14
15	DATA2,EMAD2,GPIO2	I/O	Pin15
16	DATA1,EMAD1,GPIO1	I/O	Pin16
17	DATA0,EMAD0,GPIO0	I/O	Pin17
18	$\overline{CS}$	I	Host Parallel Chip Select, Host Serial SPI Chip Select
19	SCDIO,SCDOUT,PSEL,GPIO9	O	Serial Control Port Data Input and Output, Parallel Port Type Select
20	ABOOT,INTREQ	I/O	Control Por Interrupt Request, Automatic Boot Enable
21	EXTMEM,GPIO8	I/O	External Memory Chip Select or General Purpose Input & Output Number 8
22	SDATAN1	I	PCM Audio Data Input Number One
23	VD3	–	Digital Positive Supply: Pins1,12,23
24	DGND3	–	Digital Supply Ground: Pins 2,13,24
25	SCLKN1,STCCLK2	I	PCM Audio Input Bit Clock
26	LRCLKN1	I	PCM Audio Input Sample Rate Clock
27	CMPDAT, SDATAN2, RCV958	I	PCM Audio Input Number Tow
28	CMPCLK, SCLKN2	I	PCM Audio Input Bit Clock
29	CMPREQ, LRCLKN2	I	PCM Audio Input Sample Rate Clock
30	CLKIN	I	Master Clock Input
31	CLKSEL	–	DSP Clock Select
32	FILT2	–	Phase-Locked Loop Filter
33	FILT1	–	Phase Locked Loop Filter
34	VA	–	Analog Positive Supply
35	AGND	–	Analog Supply Ground
36	RESET	I	Master Reset Input
37	DD	–	Reserved
38	DC	–	Reserved
39	AUDATA2	O	Digital Audio Output 2
40	AUDATA1	O	Digital Audio Output 1
41	AUDATA0	O	Digital Audio Output 0
42	LRCLK	O	Audio Output Sample Rate Clock
43	SCLK	O	Audio Output Bit Clock
44	MCLK	–	Audio Master Clock

## 8. PANEL FACILITIES

### 8.1 FRONT PANEL SECTION

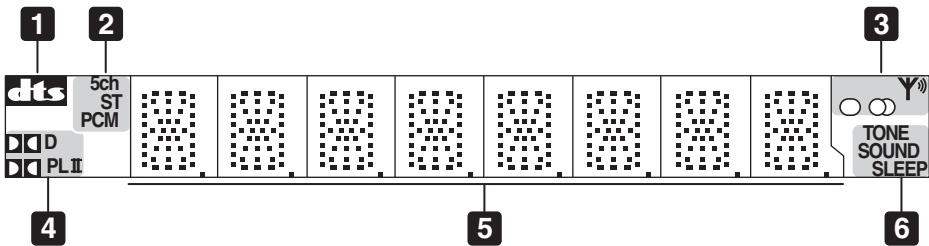
#### Front panel



- 1 **⏻ STANDBY/ON**  
Switches the receiver between on and standby.
- 2 **Remote sensor**  
Receives the signals from the remote control.
- 3 **Display**  
Display.
- 4 **PHONES jack**  
Use to connect headphones. When the headphones are connected, there is no sound output from the speakers.
- 5 **Tuner preset selection buttons**  
**STATION +/-**  
Selects station presets when using the tuner.  
**CLASS**  
Switches between the three banks (classes) of station presets.
- 6 **Listening mode buttons**  
**AUTO**  
Press for automatic decoding .  
**SURROUND**  
Use to switch between the various surround modes.  
**STEREO**  
Switches to stereo playback.
- 7 **SYSTEM SETUP**  
Press to access the System Setup menu.  
**TUNER EDIT**  
Use to memorize and name a station for recall using the **STATION +/-** buttons.  
**CH LEVEL**  
Press to set up the channel levels for surround sound.
- 8 **< / > and ENTER**  
Use to navigate menus and change settings.
- 9 **TUNING +/-**  
Use to tune to radio stations.
- 10 **Listening mode buttons**  
**SOUND MODE OFF**  
Press to turn off the current Sound mode.  
**SOUND MODE**  
Press to select a Sound mode.  
**STONE**  
Press to access the bass and treble controls, which you can then adjust with the remote's **BASS** and **TREBLE** buttons.
- 11 **Input select buttons**  
Press to select an input source.
- 12 **MASTER VOLUME**

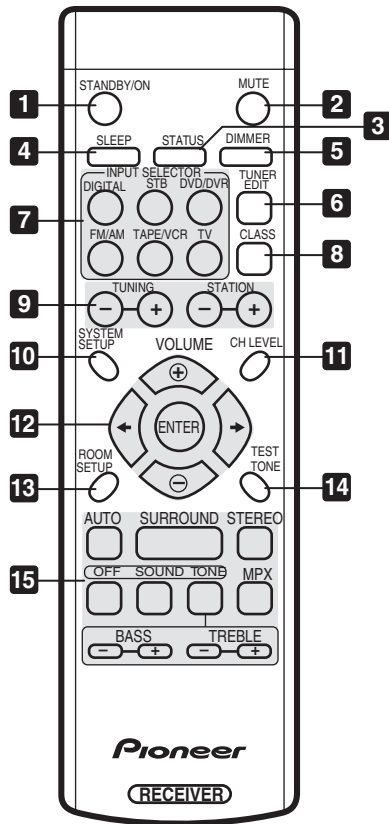
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Display window



- 1 **dts**  
Lights when the receiver is decoding a DTS signal.
- 2 **5ch**  
Lights when the receiver is in 5ch stereo mode.
- ST**  
Lights when the receiver is in Stereo mode.
- PCM**  
Lights when the digital input is Linear PCM format (CD Audio, etc.).
- 3 **TUNER indicators**
- Lights when a stereo FM broadcast is being received in auto stereo mode.
- Lights when the mono mode is set using the **MPX** button.
- Y<sup>®</sup>  
Lights when a broadcast is being received.
- 4 **D**  
Lights when the receiver is decoding a Dolby Digital signal.
- PL II**  
Lights when the receiver is using Dolby Pro Logic II decoding.
- 5 **Character display**
- 6 **TONE**  
Lights when the receiver is in tone mode.
- SOUND**  
Lights when the receiver is in sound mode.
- SLEEP**  
Lights when the receiver is in sleep mode.

## Remote control



### 1 STANDBY/ON

This switches between standby and on for this receiver.

### 2 MUTE

Press to mute the sound (press again, or adjust the volume, to restore the sound).

### 3 STATUS

Press to display the current surround mode and sound mode.

### 4 SLEEP

Use to put the receiver in sleep mode and select the amount of time before the receiver turns off.

### 5 DIMMER

Press repeatedly to set the front panel display brightness.

### 6 TUNER EDIT

Use to memorize and name a station for recall using the **STATION +/-** buttons.

### 7 INPUT SELECTOR buttons

Press to select an input source.

#### DIGITAL

Press to select the optical digital input.

#### STB

Press to select the STB (set-top box) input (for cable/satellite receivers, etc.).

#### DVD/DVR

Press to select the DVD player/recorder input.

#### FM/AM

Press to select the FM or AM band for the built-in tuner.

#### TAPE/VCR

Press to select the analog tape/VCR input.

#### TV

Press to select the TV audio input.

### 8 CLASS

Switches between the three banks (classes) of radio station presets.

### 9 Radio tuning controls

#### TUNING +/-

Use to manually tune into radio stations.

#### STATION +/-

Use to tune to preset stations.

### 10 SYSTEM SETUP

Press to access the System Setup menu.

### 11 CH LEVEL

Press to set up the channel levels for surround sound.

## Remote control 2

A

### 12 ⇐/⇒(cursor left/right), VOLUME +/- and ENTER

Use to navigate menus and adjust the volume.

### 13 ROOM SETUP

Press to set up surround sound using the Room Setup presets.

### 14 TEST TONE

Sounds the test tone when setting up the surround sound of the receiver.

B

### 15 Listening mode buttons

#### AUTO

Press for automatic decoding based on the source material.

#### SURROUND

Press to switch between the various Pro Logic II and other listening mode options.

#### STEREO

Switches to stereo playback using only the front left and right speakers.

#### OFF

Switches off the Sound mode.

#### SOUND

Press to select a Sound mode.

#### TONE

Use in conjunction with the **BASS** and **TREBLE** buttons below.

#### MPX

Switches between stereo and mono reception of FM broadcasts. If the signal is weak then switching to mono will improve the sound quality.

#### BASS +/-

Use with the **TONE** button above to adjust the bass.

#### TREBLE +/-

Use with the **TONE** button above to adjust the treble.

E

F