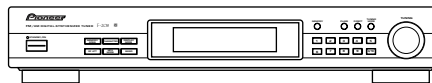


Service Manual

Pioneer



ORDER NO.
RRV2161

FM/AM DIGITAL-SYNTHESIZER TUNER

F-208

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

Type	Model	Power Requirement	Remarks
	F-208		
HL	O	AC220 - 230V	_____
SDB	O	AC110/120 - 127/220/240V	With the voltage selector

CONTENTS

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PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153-8654, Japan
PIONEER ELECTRONICS SERVICE, INC. P.O. Box 1760, Long Beach, CA 90801-1760, U.S.A.
PIONEER ELECTRONIC (EUROPE) N.V. Haven 1087, Keetberglaan 1, 9120 Melsele, Belgium
PIONEER ELECTRONICS ASIACENTRE PTE. LTD. 253 Alexandra Road, #04-01, Singapore 159936
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1. 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 lead in solder 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

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.

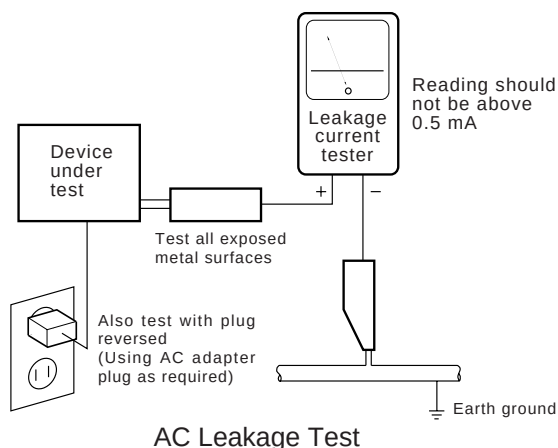
(FOR USA MODEL ONLY)

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.



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  on the schematics and on the parts list in this Service Manual.

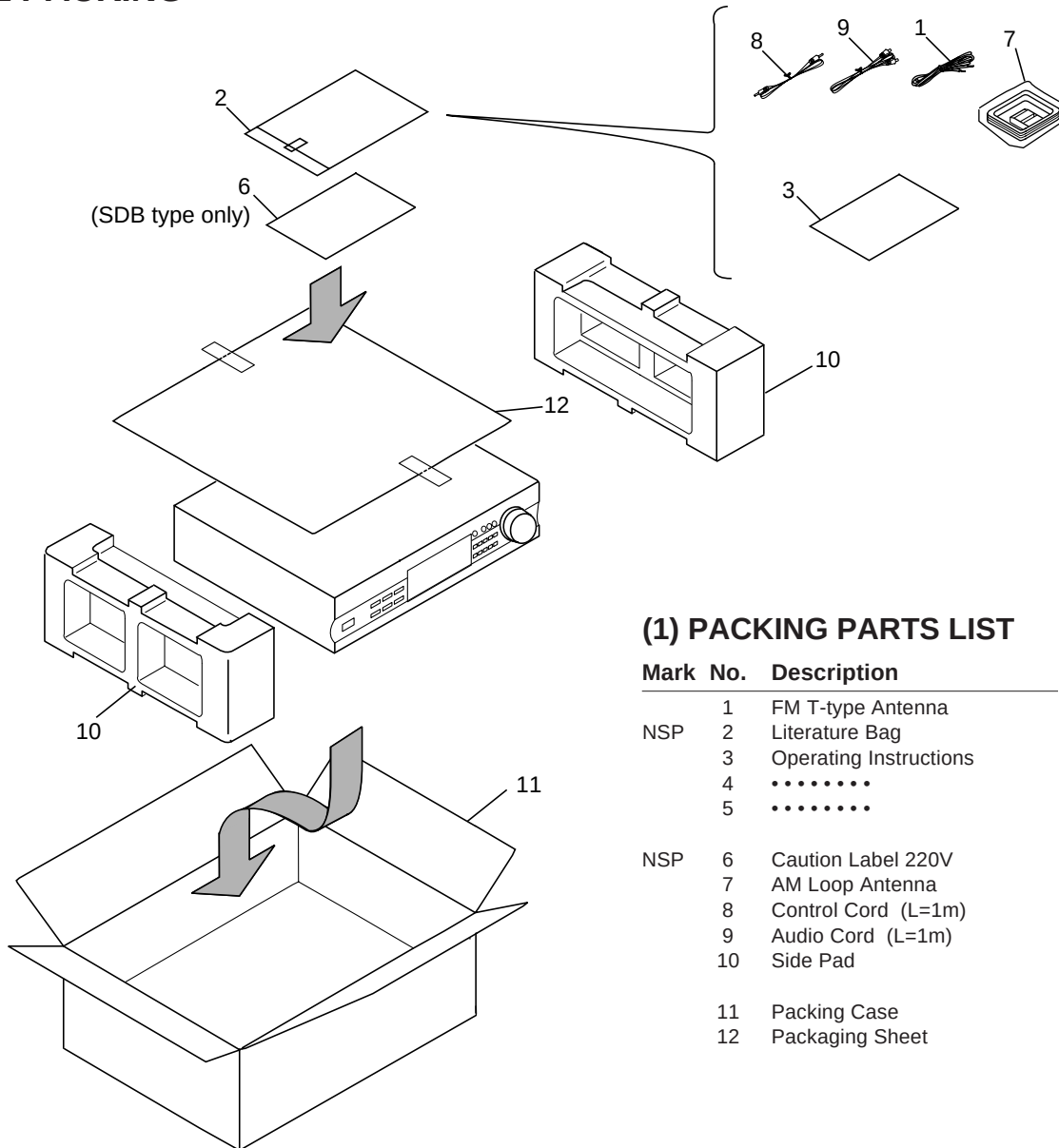
The use of a substitute replacement component which does not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

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.

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.
 - Screw adjacent to ▼ mark on the product are used for disassembly.

2.1 PACKING



(1) PACKING PARTS LIST

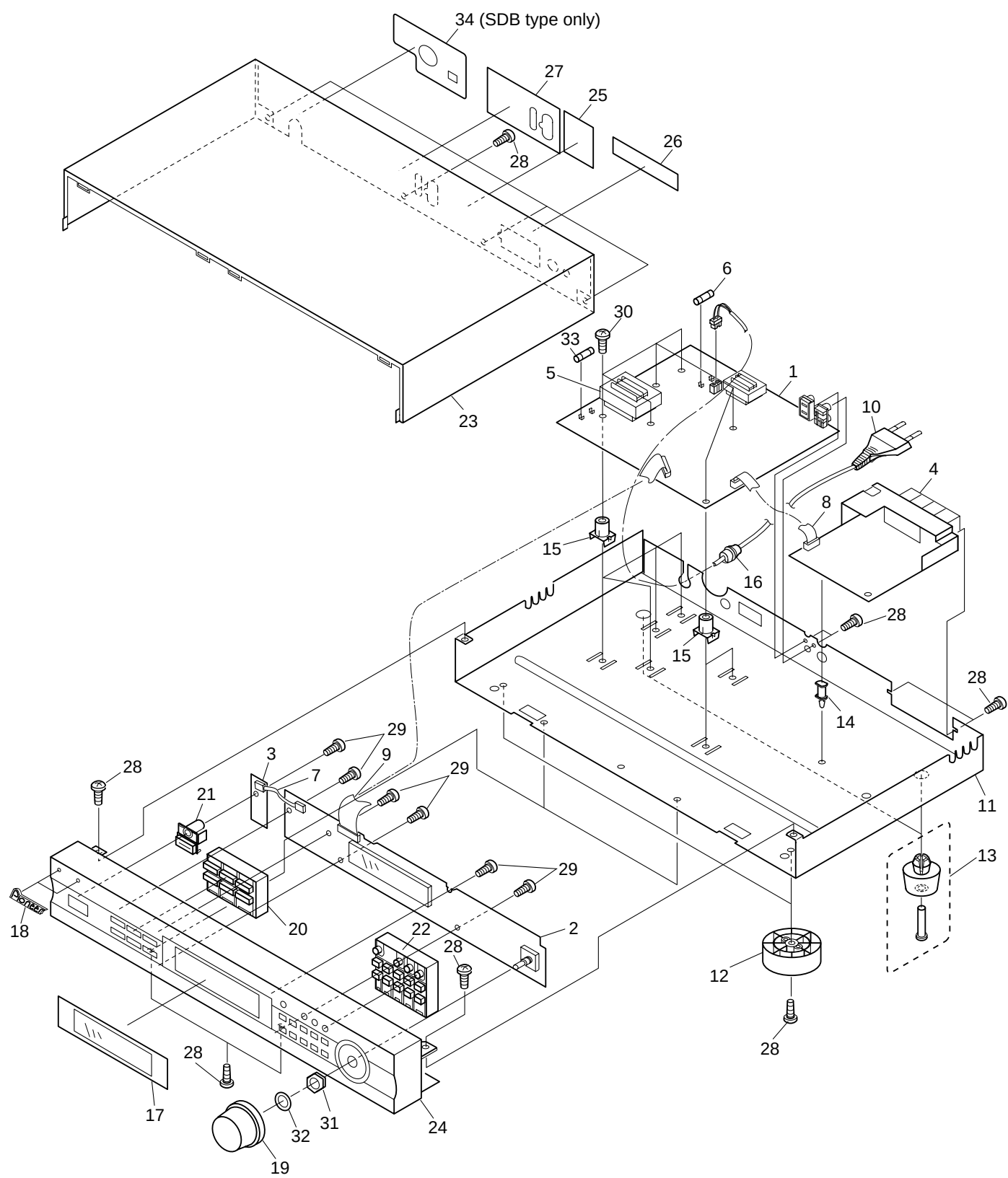
Mark	No.	Description	Part No.
NSP	1	FM T-type Antenna	ADH7007
	2	Literature Bag	AHG-117
	3	Operating Instructions	See Contrast table (2)
	4		
	5		
NSP	6	Caution Label 220V	See Contrast table (2)
	7	AM Loop Antenna	ATB7009
	8	Control Cord (L=1m)	PDE1247
	9	Audio Cord (L=1m)	PDE1249
	10	Side Pad	AHA7233
	11	Packing Case	AHD7737
	12	Packaging Sheet	AHG1017

(2) CONTRAST TABLE

F-208/HL and SDB are constructed the same except for the following:

Mark	No.	Symbol and Description	Part No.		Remarks
			HL type	SDB type	
NSP	3	Operating Instructions (English/Trad-Chinese)	ARE7210	Not used	
	3	Operating Instructions (English/Spanish/Trad-Chinese)	Not used	ARE7209	
	6	Caution Label 220V	Not used	ARR7003	

2.2 EXTERIOR



(1) EXTERIOR PARTS LIST

Mark	No.	Description	Part No.
	1	MAIN ASSY	See Contrast table (2)
	2	DISPLAY ASSY	See Contrast table (2)
NSP	3	STANDBY ASSY	AWX7265
	4	FM/AM TUNER ASSY	AXX7054
△	5	Power Transformer (T102)	See Contrast table (2)
△	6	Fuse (250mA: FU101)	REK-094
	7	3P F.F.C /30V (J1)	ADD7151
	8	13P F.F.C /30V (J2)	ADD7152
	9	20P F.F.C /30V (J3)	ADD7153
△	10	AC Power cord	See Contrast table (2)
NSP	11	Chassis	ANA7081
	12	Insulator	AMR7198
	13	Foot	REC1263
	14	PCB Spacer	AEC1372
NSP	15	PCB Mould	AMR1525
	16	Strain Relief	CM-22B
	17	FL Panel	AAK7654
	18	Name Plate	PAM1776
	19	Rotary Knob	AAA7004
	20	Hinge Button	AAD7521
	21	Hinge Button	AAD7503
	22	Hinge Button	AAD7523
	23	Bonnet	See Contrast table (2)
	24	Front Panel	AMB7611
NSP	25	Name Label	See Contrast table (2)
	26	Antenna Label	AAX7693
	27	Caution Label	AAX7695
	28	Screw	BBZ30P080FCC
	29	Screw	BPZ30P080FMC
	30	Screw	IBZ30P180FMC
	31	Nut	NK90FMC
	32	Washer	WA65F115M080
△	33	Fuse (160mA: FU102)	REK1014
NSP	34	Switch Label	See Contrast table (2)

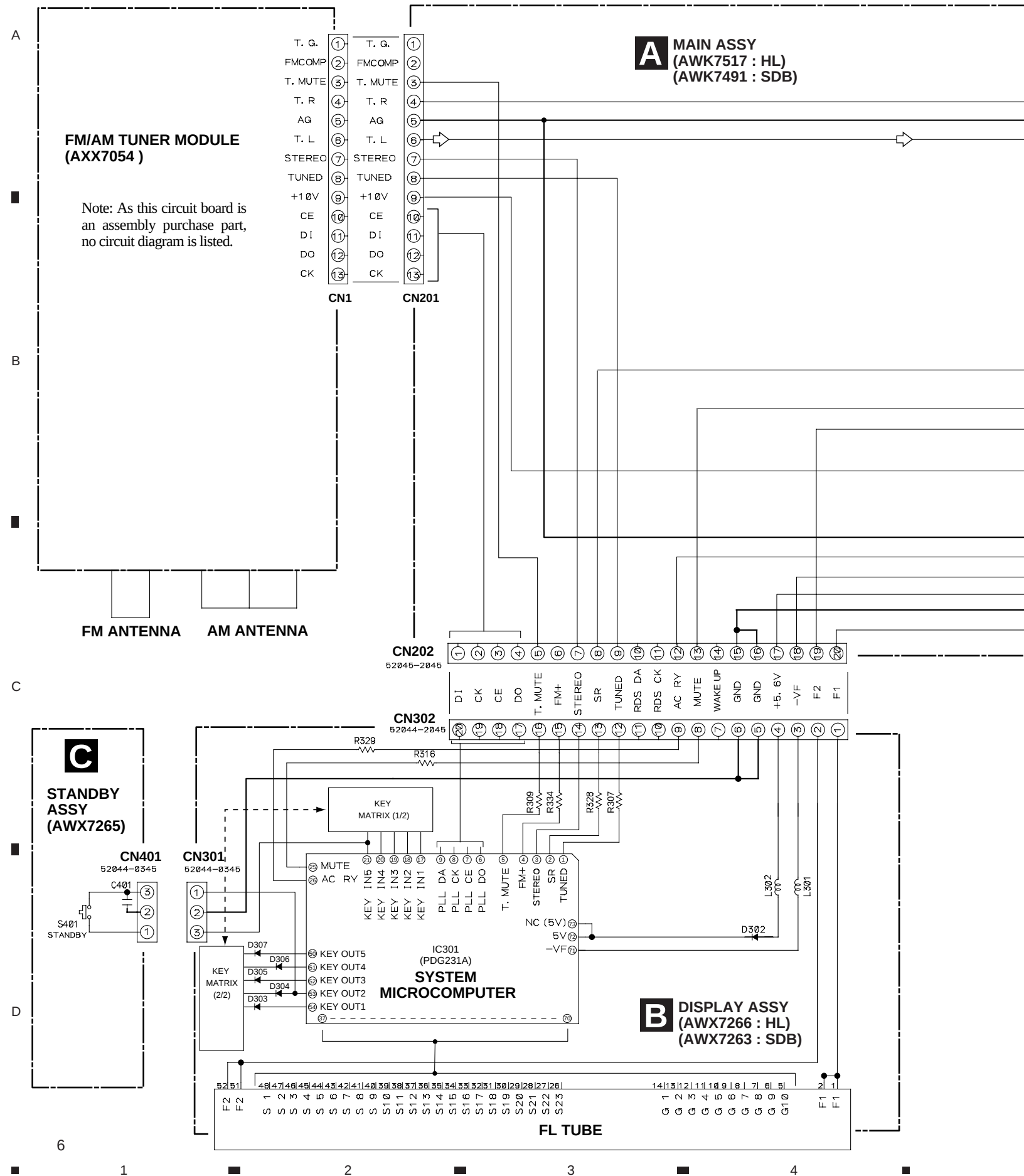
(2) CONTRAST TABLE

F-208/HL and SDB are constructed the same except for the following:

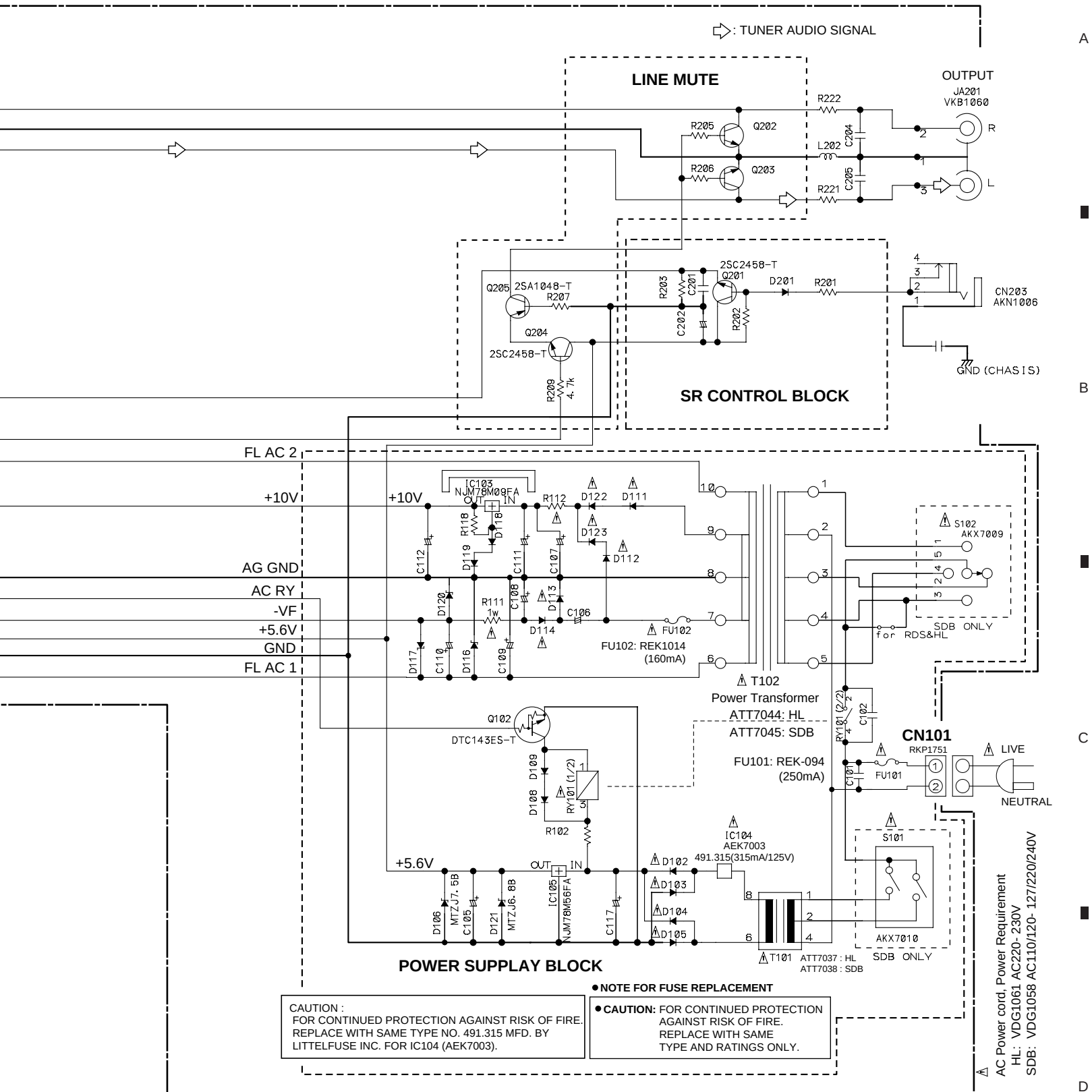
Mark	No.	Symbol and Description	Part No.		Remarks
			HL type	SDB type	
△	1	MAIN ASSY	AWK7517	AWK7491	
	2	DISPLAY ASSY	AWX7266	AWX7263	
	5	Power Transformer (T102)	ATT7044	ATT7045	
	10	AC Power cord	VDG1061	VDG1058	
	23	Bonnet	ANE7237	ANE7230	
NSP	25	Name Label	AAL7224	AAL7223	
NSP	34	Switch Label	not used	AAX7694	

3.1 BLOCK DIAGRAM and OVERALL CONNECTION DIAGRAM

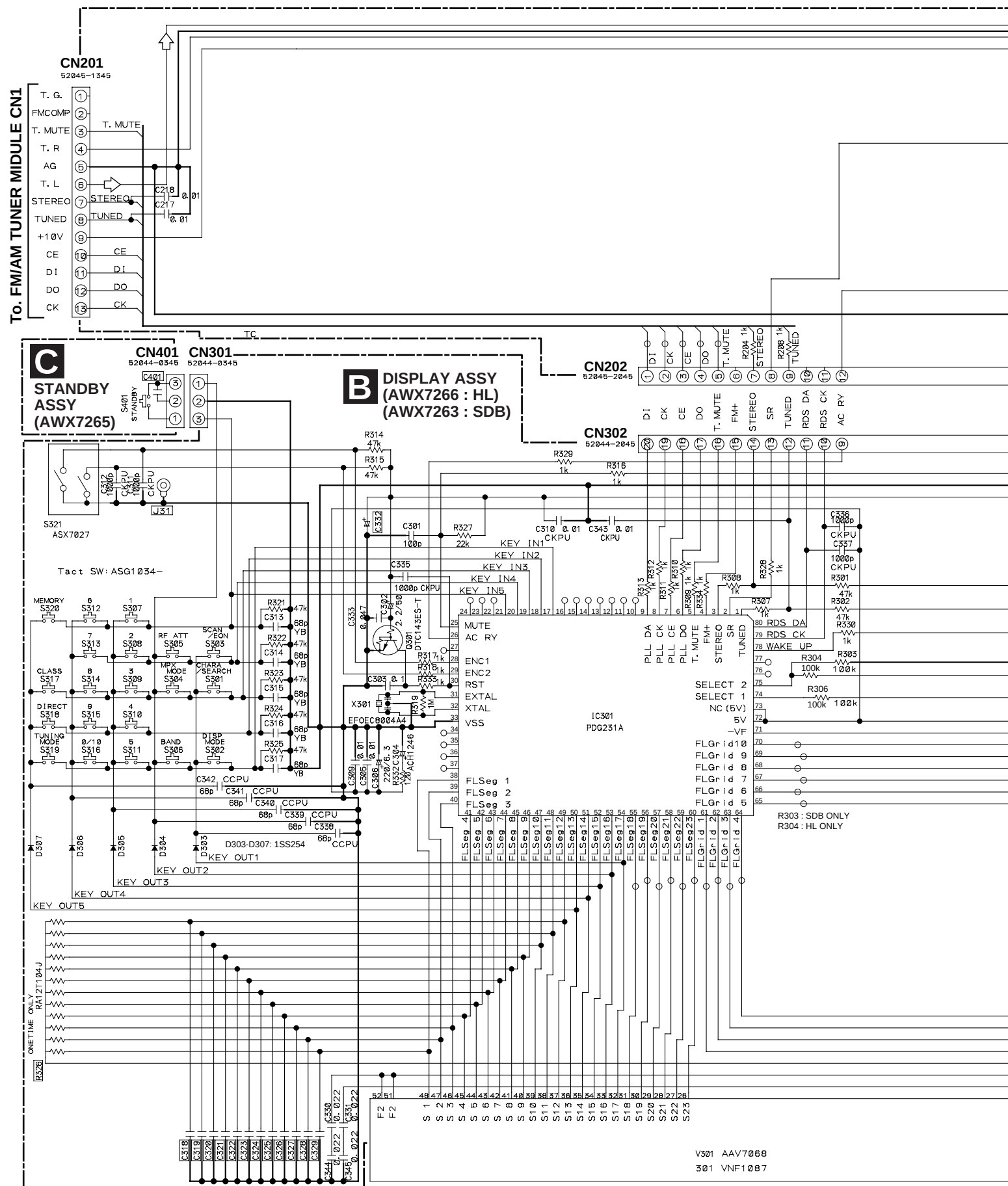
3.1 BLOCK DIAGRAM and OVERALL CONNECTION DIAGRAM

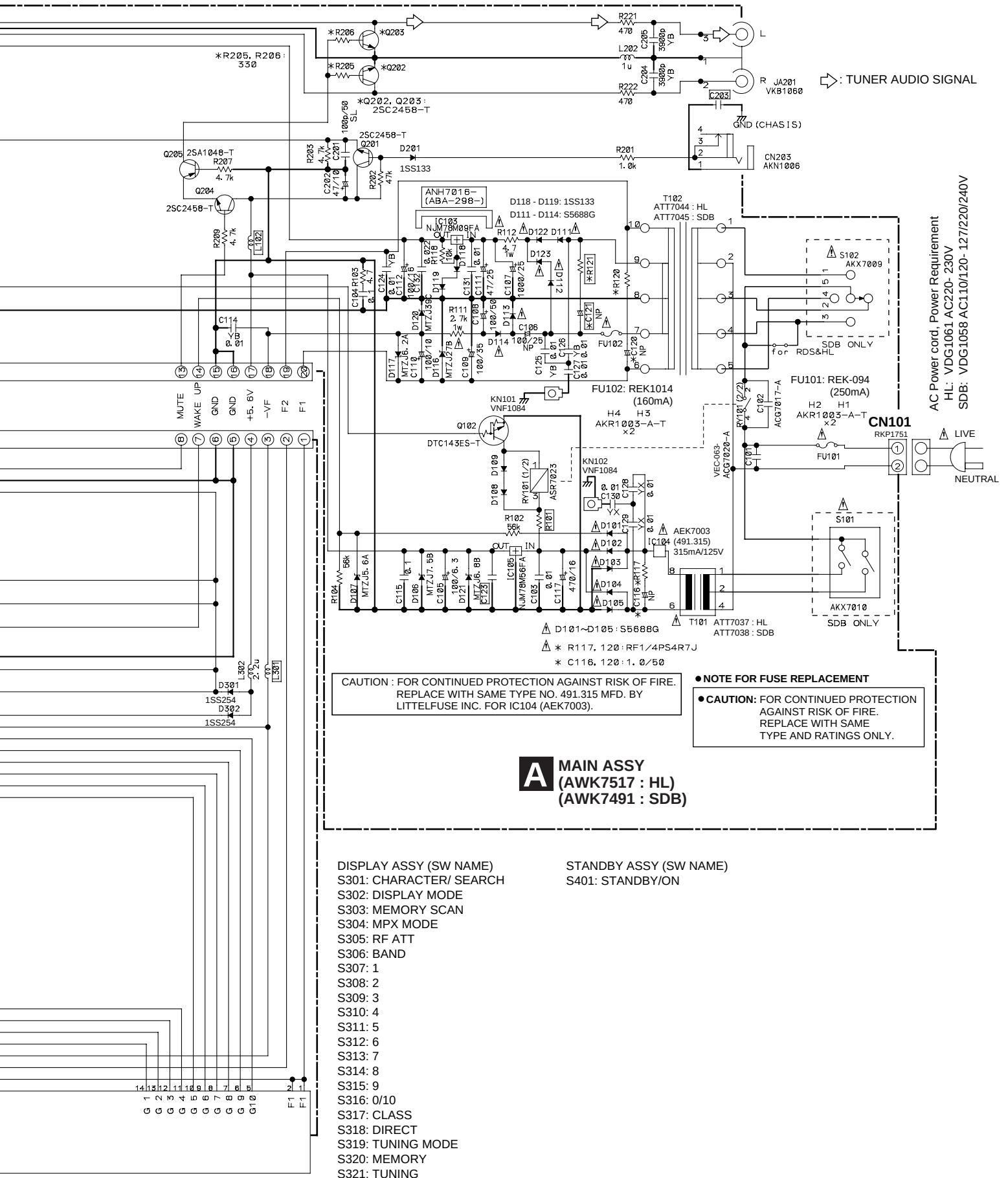


Note : When ordering service parts, be sure to refer to "EXPLODED VIEWS and PARTS LIST" or "PCB PARTS LIST".



3.2 MAIN, DISPLAY and STANDBY ASSYS

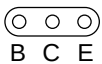
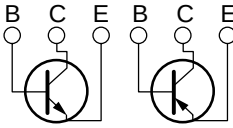
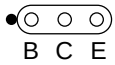
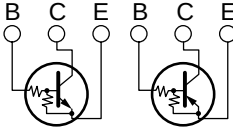
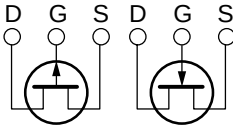
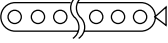
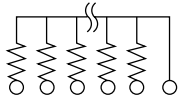
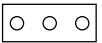
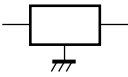




4. PCB CONNECTION DIAGRAM

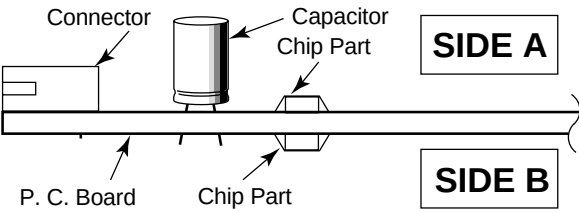
NOTE FOR PCB DIAGRAMS:

- 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
		Transistor
		Transistor with resistor
		Field effect transistor
		Resistor array
		3-terminal regulator

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

4. Viewpoint of PCB diagrams



A MAIN ASSY

SIDE A

CN302



4

A

B



C

STANDBY ASSY
AWX7265

KEY OUT
KEY IN

STANDBY

S401

F401

CN01

SIDE A



8

5. PCB PARTS LIST

NOTES : ● Parts marked by “NSP” are generally unavailable because they are not in our Master Spare Parts List.

● The $\triangle$ 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 $K = 10\%$).

$560 \Omega \rightarrow 56 \times 10^1 \rightarrow 561 \dots\dots\dots RD1/4PU \boxed{5} \boxed{6} \boxed{1} J$

$47k \Omega \rightarrow 47 \times 10^3 \rightarrow 473 \dots\dots\dots RD1/4PU \boxed{4} \boxed{7} \boxed{3} J$

$0.5 \Omega \rightarrow R50 \dots\dots\dots RN2H \boxed{R} \boxed{5} \boxed{0} K$

$1 \Omega \rightarrow 1R0 \dots\dots\dots RS1P \boxed{1} \boxed{R} \boxed{0} K$

Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

$5.62k \Omega \rightarrow 562 \times 10^1 \rightarrow 5621 \dots\dots\dots RN1/4PC \boxed{5} \boxed{6} \boxed{2} \boxed{1} F$

■ LIST OF WHOLE PCB ASSEMBLIES

Mark	Symbol and Description	Part No.		Remarks
		HL type	SDB type	
	MAIN ASSY	AWK7517	AWK7491	
NSP	CONTROL ASSY	AWP7023	AWP7019	
	└ DISPLAY ASSY	AWX7266	AWX7263	
NSP	└ STANDBY ASSY	AWX7265	AWX7265	

■ CONTRAST OF PCB ASSEMBLIES

A MAIN ASSY

AWK7517 and AWK7491 are constructed the same except for the following:

Mark	Symbol and Description	Part No.		Remarks
		AWK7517	AWK7491	
$\triangle$	S101	Not used	AKX7010	
$\triangle$	S102	Not used	AKX7009	
$\triangle$	T101 STANDBY TRANSFORMER	ATT7037	ATT7038	

B DISPLAY ASSY

AWX7266 and AWX7263 are constructed the same except for the following:

Mark	Symbol and Description	Part No.		Remarks
		AWX7266	AWX7263	
	R303	Not used	RD1/4PU104J	
	R304	RD1/4PU104J	Not used	

■ PARTS LIST FOR F-208/HL

Mark	No.	Description	Part No.
A MAIN ASSY			
SEMICONDUCTORS			
⚠	IC104 (491.315: 315mA/125V)	AEK7003	
	IC103	NJM78M09FA	
	IC105	NJM78M56FA	
	Q205	2SA1048	
	Q201–Q204	2SC2458	
	Q102	DTC143ES	
	D108, D109, D118, D119, D201	1SS254	
	D116	MTZJ27B	
	D120	MTZJ39C	
	D107	MTZJ5.6A	
	D117	MTZJ6.2A	
	D121	MTZJ6.8B	
	D106	MTZJ7.5B	
⚠	D101–D105, D111–D114	S5688G	
⚠	D122, D123	S5688G	
COILS AND FILTERS			
	L202	LAU1R0J	
TRANSFORMERS			
⚠	T101 STANDBY TRANSFORMER	ATT7037	
SWITCHES AND RELAYS			
⚠	RY101	ASR7023	
CAPACITORS			
⚠	C102 (3300pF/AC125V)	ACG7017	
⚠	C101 (10000pF/AC125V)	ACG7020	
	C201	CCCSL101J50	
	C106	CEANP101M25	
	C116, C120	CEANP1R0M50	
	C110	CEAT101M10	
	C112	CEAT101M16	
	C109	CEAT101M35	
	C108	CEAT101M50	
	C105	CEAT101M6R3	
	C107	CEAT102M25	
	C202	CEAT470M10	
	C111	CEAT470M25	
	C117	CEAT471M16	
	C103, C127–C131, C217, C218	CGCYX103K25	
	C104, C115	CGCYX104M16	
	C132	CGCYX223K25	
	C114, C124–C126	CKCYB103K50	
	C204, C205	CKCYB392K50	
RESISTORS			
⚠	R117, R120	RF1/4PS4R7J	
⚠	R111	RS1LMF272J	
⚠	R112	RS1LMF4R7J	
	Other Resistors	RD1/4PU□□□J	

Mark	No.	Description	Part No.
OTHERS			
	CN201 CONNECTOR		52045-1345
	CN202 CONNECTOR		52045-2045
	CN203 JACK		AKN1006
	H1–H4 FUSE CLIP		AKR1003
	CN101 AC CODE SOCKET		RKP1751
	JA201 JACK		VKB1060
	KN101, KN102 EARTH METAL FITTING		VNF1084

B DISPLAY ASSY

SEMICONDUCTORS

IC301	PDG231A
Q301	DTC143ES
D301–D307	1SS254

COILS AND FILTERS

L302	LAU2R2J
------	---------

SWITCHES AND RELAYS

S301–S320	ASG1034
S321	ASX7027

CAPACITORS

C304 (0.047F/5.5V)	ACH1246
C301	CCCSL101J50
C313–C317	CCCSL680J50
C338–C342	CCPUSL680J50
C306	CEAT221M6R3
C302	CEAT2R2M50
C305	CGCYX103K25
C303	CGCYX104K25
C330, C331, C344, C345	CGCYX223K25
C333	CGCYX473K25
C311, C312, C335–C337	CKPUYB102K50
C309, C310, C343	CKPUYY103M16

RESISTORS

All Resistors	RD1/4PU□□□J
---------------	-------------

OTHERS

CN301 CONNECTOR	52044-0345
CN302 20P CONNECTOR	52044-2045
V301 FL TUBE	AAV7068
X301 (8.00MHz)	EFOEC8004A4

C STANDBY ASSY

SWITCHES AND RELAYS

S401	ASG1034
------	---------

OTHERS

CN401 CONNECTOR	52044-0345
-----------------	------------

6. ADJUSTMENT

There is no information to be shown in this chapter.

7. GENERAL INFORMATION

7.1 IC

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

■ PDG231A (DISPLAY ASSY : IC301)

• System Control IC

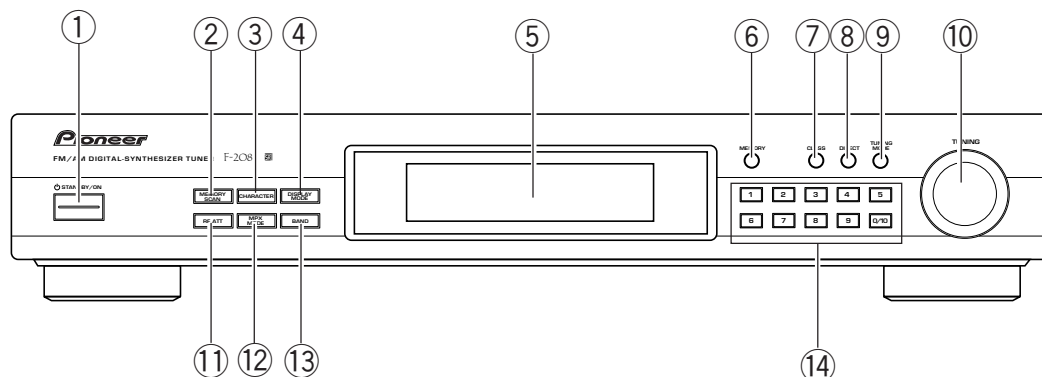
●Pin Function

No.	Name	I/O	Description
1	TUNED	I	TUNE indicator signal input
2	SR	I	SR signal input
3	STEREO	I	STEREO indicator signal input
4	FM+	O	RDS decoder ON/OFF (VDD ON/OFF)
5	T.MUTE	O	TUNER mute control output
6	PLL DO	I	PLL IC data input
7	PLL CE	O	PLL IC serial control chip enable output
8	PLL CK	O	PLL IC serial control clock output
9	PLL DA	O	PLL IC serial control data output
10	NC	-	-
11	NC	-	-
12	NC	-	-
13	NC	-	-
14	NC	-	-
15	NC	-	-
16	NC	-	-
17	KEY IN1	I	Keyscan input
18	KEY IN2	I	Keyscan input
19	KEY IN3	I	Keyscan input
20	KEY IN4	I	Keyscan input
21	KEY IN5	I	Keyscan input
22	NC	-	-
23	NC	-	-
24	NC	-	-
25	MUTE	O	MUTE control output
26	AC RY	O	AC power relay ON/OFF
27	NC	-	-
28	ENCORDER1	I	Encoder data input
29	ENCORDER2	I	Encoder data input
30	RST	-	Reset input
31	EXTAL	-	Oscillator pulses (8MHz)
32	XTAL	-	
33	Vss	-	GNDD
34	NC	-	-
35	NC	-	-
36	NC	-	-
37	NC	-	-
38	FLSeg1	O	Segment indication output
39	FLSeg2	O	Segment indication output
40	FLSeg3	O	Segment indication output

No.	Name	I/O	Description
41	FLSeg.4	O	Segment indication output
42	FLSeg.5	O	Segment indication output
43	FLSeg.6	O	Segment indication output
44	FLSeg.7	O	Segment indication output
45	FLSeg.8	O	Segment indication output
46	FLSeg.9	O	Segment indication output
47	FLSeg.10	O	Segment indication output
48	FLSeg.11	O	Segment indication output
49	FLSeg.12	O	Segment indication output
50	FLSeg.13/KO5	O	Segment indication output / Keyscan output
51	FLSeg.14/KO4	O	Segment indication output / Keyscan output
52	FLSeg.15/KO3	O	Segment indication output / Keyscan output
53	FLSeg.16/KO2	O	Segment indication output / Keyscan output
54	FLSeg.17/KO1	O	Segment indication output / Keyscan output
55	FLSeg.18	O	Segment indication output
56	FLSeg.19	O	Segment indication output
57	FLSeg.20	O	Segment indication output
58	FLSeg.21	O	Segment indication output
59	FLSeg.22	O	Segment indication output
60	FLSeg.23	O	Segment indication output
61	FL Grid.1	O	Grid FL indication output
62	FL Grid.2	O	Grid FL indication output
63	FL Grid.3	O	Grid FL indication output
64	FL Grid.4	O	Grid FL indication output
65	FL Grid.5	O	Grid FL indication output
66	FL Grid.6	O	Grid FL indication output
67	FL Grid.7	O	Grid FL indication output
68	FL Grid.8	O	Grid FL indication output
69	FL Grid.9	O	Grid FL indication output
70	FL Grid.10	O	Grid FL indication output
71	VFDP	O	- 27V
72	VDD	-	+5.0V
73	NC	-	-
74	SELECT1	I	Model type select input
75	SELECT2	I	Model type select input
76	NC	-	-
77	NC	-	-
78	WAKE UP	I	WAKE UP AC pulse input
79	RDS CK	I	RDS clock input
80	RDS DA	I	RDS data input

8. PANEL FACILITIES AND SPECIFICATIONS

8.1 PANEL FACILITIES



① **STANDBY/ON switch**

This is the switch for electric power.

ON When set to ON position, power is supplied and the unit becomes operational.

STANDBY When set to STANDBY position, the main power flow is cut and the unit is no longer fully operational. A minute flow of power feeds the unit to maintain operation readiness.

NOTES:

- The memory will be backed up so long as the power cord is unplugged.
- If the power cord is unplugged, the memory will be retained for several days.
- When not using the unit for a long period, disconnect the power cord.

② **MEMORY SCAN button**

When this button is pressed, preset stations within a class (A, B or C) are received in order.

③ **CHARACTER button**

You can use it to input station names manually. (see page 12)

④ **DISPLAY MODE button**

When in the Preset Station Selection mode, pressing this button changes display indications. If no station names are memorized, this button has no function.

When no station name is memorized, the DISPLAY MODE button becomes invalid.

⑤ **Operating display**

⑥ **MEMORY button**

Use to preset stations. This is also used for FM or AM broadcast manual station name character selection.

⑦ **CLASS button**

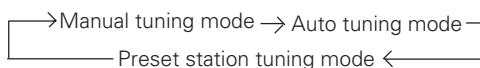
Use to switch between preset memory classes A to C. In each class, 10 stations can be memorized using the STATION CALL buttons, enabling a total of 30 stations to be memorized.

⑧ **DIRECT button**

When this button is pressed, the STATION CALL buttons function as ten-key number buttons for direct input of the desired reception frequency. Press again to cancel this mode.

⑨ **TUNING MODE button**

Each time you press this button, the TUNING knob's function changes as follows.



⑩ **TUNING knob**

Use for tuning. To raise the frequency, turn in a clockwise direction; to lower the frequency, turn counterclockwise. In the Station Name input mode, the TUNING knob is used to select characters. When presetting a station or selecting a preset station, you can also turn this knob to select a desired station number.

■ Front View

⑪ RF ATT button

Set this button to on when receiving strong FM signals (nearby stations) to reduce sound distortion (RF ATT indicator lights).

Normally, this button should be set to off.

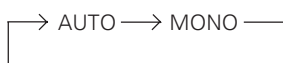
This button does not affect AM reception.

NOTE:

This button's status is preset for each station in station memory.

⑫ MPX (multiplex) MODE button

Mode changes as follows each time this button is pressed.



This button does not affect AM reception.

AUTO:

"AUTO" is not displayed.

Normally leave in this mode for reception. When a stereo FM broadcast is received, it will be automatically reproduced in stereo sound and the STEREO indicator lights up.

MONO:

MONO indicator lights up.

To receive stereo broadcasts in monaural.

If there is too much noise during stereo reception of a weak signal, you can reduce the level of noise by switching to MONO.

NOTES:

- This button's status is preset for each station in station memory.
- When the signal level is too weak for reception, sound output is automatically muted. If sound is muted when the selected mode is AUTO, switching to MONO lets you hear the broadcast.

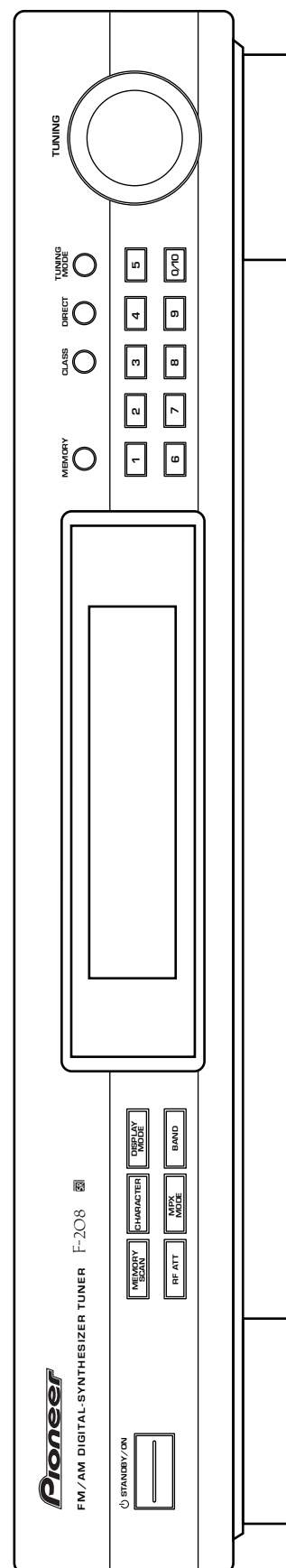
⑬ BAND button

The button is used to select either FM or AM reception.

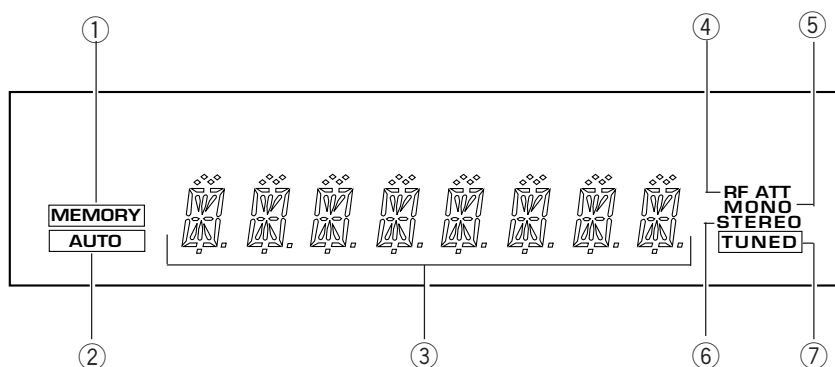
⑭ STATION CALL buttons

Use these buttons to preset stations and to receive the already preset stations.

These are also used when performing direct access tuning.



Operating display



① MEMORY indicator

Lights when presetting stations.

② AUTO indicator

Lights during auto tuning mode.

③ Frequency and character display section

Band and frequency data is displayed.

④ RF ATT indicator

Stays lit while RF ATT button is on.

⑤ MONO indicator

Stays lit while MPX MODE button is set to MONO.

⑥ STEREO indicator

Lights up when a stereo broadcast is received (the indicator does not light when the MPX MODE button is set to MONO).

⑦ TUNED indicator

Lights when a broadcast is received.

