

# PA-200/400 SERVICE NOTES

POWERED MIXER ERRATA & SUPPLEMENT is attached at the end of the page. 最終頁に正誤表&追加情報があります。 Third Edition

\*This Service Notes includes the contents and corrections on the First and Second Editions and make it obsolete.  
\*本サービスノートには第一版、第二版の内容及び訂正が含まれていますので、第一版と第二版は廃版とします。

## NOTICE

This Service Notes covers three types of products which are defined by their serial numbers as indicated below. In this Notes, all explanations are based on the following definitions. For full information on the differences between Types A, B and C, see the "APPENDIX: CROSS-COMPARISON OF BOARDS AND PARTS" (P.30).

Type A: PA-200 (SNo.ZA50100-ZB21049) Type B: PA-200 (SNo.ZB31150-ZC41899) Type C: PA-200 (SNo.ZD11900-up/以降)  
PA-400 (SNo.ZA50100-ZB21149) PA-400 (SNo.ZB31150-ZC52849) PA-400 (SNo.ZC62850-up/以降)

## 注意

本サービスノートには、3タイプの製品が掲載されています。それぞれシリアル・ナンバーで、タイプを分けて下記のように定義します。以後、本文中では下記の定義に従って説明していきます。Type A, Type B, Type C の違いの詳細は、「付録 基板と部品の相関表」(p.30)を参照して下さい。

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## Input/Output Standard/入力/出力 標準値

Input Socket	Input Sensitivity	Rated Input Level	Input Impedance	Recommended Source Impedance	Type of Connectors	
CHANNEL INPUT (SENS=MAX) (PAD=OFF)	CH1-8(6) (XLR-BAL)	-66 dBm (0.39 mV)	-60 dBm (0.78 mV)	3 kΩ	Less than 600 Ω	XLR-3-31 (XLR Connector)
	CH1-8(6) (PHONE-BAL)	-66 dBm (0.39 mV)	-60 dBm (0.78 mV)	8.5 kΩ	Less than 1 kΩ	STEREO PHONE
	CH1-8(6) (PHONE-UNBAL)	-66 dBm (0.39 mV)	-60 dBm (0.78 mV)	5 kΩ	Less than 1 kΩ	STEREO PHONE
STEREO CHANNEL INPUT (SENS=MAX)	AUX1,2,4,5	-26 dBm (38.8 mV)	-20 dBm (77.5 mV)	11 kΩ	Less than 2 kΩ	RCA Phono
	AUX3,6	-26 dBm (38.8 mV)	-20 dBm (77.5 mV)	11 kΩ (STEREO) 5.5 kΩ (MONO)	Less than 2 kΩ (STEREO) Less than 1 kΩ (MONO)	PHONE
INSERT (RETURN)	CH7,8(5,6)	-6 dBm (398 mV)	0 dBm (775 mV)	12 kΩ	Less than 2 kΩ	STEREO PHONE
RETURN	RTN 1	-2 dBm (615 mV)	+4 dBm (1.23 V)	10 kΩ (STEREO) 5 kΩ (MONO)	Less than 2 kΩ (STEREO) Less than 1 kΩ (MONO)	PHONE
	RTN 2	-26 dBm (38.8 mV)	-20 dBm (77.5 mV)	10 kΩ (STEREO) 5 kΩ (MONO)	Less than 2 kΩ (STEREO) Less than 1 kΩ (MONO)	PHONE

Input Socket	Input Sensitivity	Rated Input Level	Input Impedance	Recommended Source Impedance	Type of Connectors
POWER AMP IN (L, R, MONO)	-2 dBm (615 mV)	+4 dBm (1.23 V)	18 kΩ	Less than 2 kΩ	PHONE

Output Socket	Rated output Sensitivity	Non-Clip Max. Output	Output Impedance	Recommended Load Impedance	Type of Connectors	
MASTER OUT UNBALANCED	+4 dBm (1.23 V)	+20 dBm (7.75 V)	300 Ω	More than 3 kΩ	PHONE	
SUB OUT	L, R	+4 dBm (1.23 V)	+20 dBm (7.75 V)	300 Ω	More than 3 kΩ	PHONE
	MONO	+4 dBm (1.23 V)	+20 dBm (7.75 V)	3 kΩ	More than 10 kΩ	PHONE
INSERT (SEND)	CH7,8(5,6)	0 dBm (0.775 V)	+20 dBm (7.75 V)	300 Ω	More than 3 kΩ	STEREO PHONE
SEND	EFF,REV, MON	+4 dBm (1.23 V)	+20 dBm (7.75 V)	300 Ω	More than 3 kΩ	PHONE
REC OUT	-10 dBm (0.245 V)	+20 dBm (7.75 V)	300 Ω	More than 3 kΩ	RCA Phono	
PHONES	—	100 mW ± 100 mW <sup>*1</sup>	100 Ω	More than 8 Ω	STEREO PHONE	

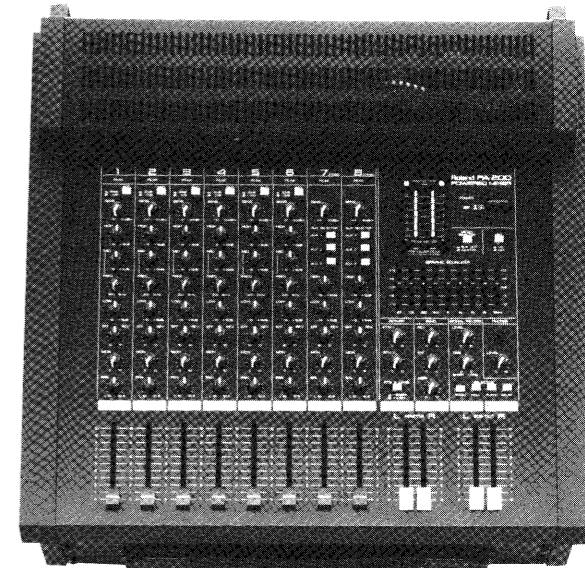
Output Socket	Rated output Sensitivity	Non-Clip Max. Output	Recommended Load Impedance	Type of Connectors
SPEAKERS OUT	STEREO 200W (100W) *2	28.3 (20) Vrms (4Ω) 32.2 (21.8) Vrms (8Ω)	More than 4 Ω	PHONE, BINDING POST
	BTL 400W (200W) *3	56.5 Vrms (8Ω) (40 Vrms (8Ω))	More than 8 Ω	BINDING POST

{ : PA-200 \*1 : Both Channels 100 Ω Loaded  
@ : 0 dBm=0.775 Vrms \*2 : Both Channels 4 Ω Loaded  
\*3 : 8 Ω Loaded

## PA-200 SPECIFICATION

- Mixer Section (ミキサー部)**
    - Frequency Response/ 周波数特性 ..... 15Hz - 25kHz +1/-2dB (SENS = min.)
    - Total Harmonic Distortion/ 全高調波歪 ..... 0.05% or less (20Hz - 20kHz rated output)
    - Noise Level/ ノイズ・レベル (Input Shorted/ 入力ショート, IHF-A, Typ.)
    - Equivalent Input Noise/ 入力換算ノイズ・レベル ..... -128dBm
    - Residual Noise/ 残留ノイズ・レベル ..... -98dBm [All Fader :min.] -82dBm [Master Fader :max.] -76dBm [All channel Fader :min.] -50dBm [All channel Fader :max.] [All SENS. :min.] [All channel Fader :max.] [All SENS. :max.]
  - Crosstalk/ クロストーク** ..... -70dB or less (1kHz Between channels) -60dB or less (1kHz Between L and R)
  - Equalizer/ イコライザー**
    - Normal Channel/ ノーマル・チャンネル
    - HIGH EQ ..... ±15dB (10kHz shelving type)
    - MID EQ ..... ±15dB (0.2 - 5kHz peaking type)
    - LOW EQ ..... ±15dB (100Hz shelving type)
    - Stereo Channel/ ステレオ・チャンネル
    - HIGH EQ ..... ±15dB (10kHz shelving type)
    - LOW EQ ..... ±15dB (100Hz shelving type)
  - Graphic Equalizer/ グラフィック・イコライザー**
    - Frequencies/ 周波数 ..... 63, 125, 250, 500, 1k, 2k, 4k, 8k, 16k [Hz]
    - Variable Width/ 可変幅 ..... ±12dB
  - Digital Reverb/ デジタル・リバーブ**
    - Sampling Frequency/ サンプル周波数 ..... 31.25 kHz
    - Signal Processing/ 信号処理 ..... 16bits
    - Delay Time/ デレイ・タイム ..... 50 ms - 480 ms
- Power Amplifier Section (パワー・アンプ部)**
    - Rated Output/ 定格出力
    - Stereo, both chan. 40hm load/ 4Ω負荷時 ..... 100W x 2
    - Stereo, both chan. 8ohm load/ 8Ω負荷時 ..... 65W x 2
    - BTL, 8ohm load/8Ω負荷時 ..... 200W
    - Recommended load impedance/ 推奨負荷インピーダンス
    - Stereo ..... more than 4ohms
    - BTL ..... more than 8ohms
    - Frequency Response/ 周波数特性 ..... 10Hz - 50kHz (±1dB 1W/8ohm)

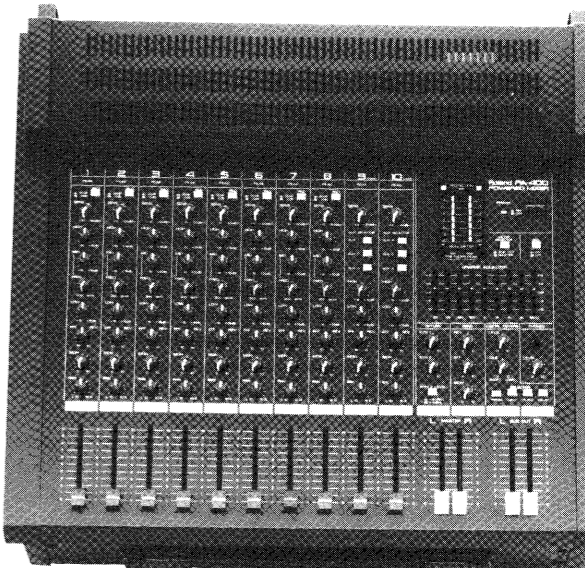
- Total Harmonic Distortion/ 全高調波歪
- Stereo, both chan. 8ohm load/ 8Ω負荷時 ..... 0.1% or less (8ohm, 1kHz)
- S/N Ratio/ S/N 比 ..... 102dB or greater (main in shorted/ パワー・アンプ・イン・ショート, IHF-A, Typ.)
- Others**
- Power/ 電源 ..... AC 100/117/220/240V (50/60Hz)
- Power Consumption/ 消費電力 ..... 140W (100V) 270VA, 220W (117V) 500VA (220/240V)
- Dimensions ..... 460(W) x 501(D) x 235(H) mm 18-1/4(W) x 19-23/32(D) x 9-1/4 inch.
- Weight ..... 14.7kg / 32 lb 7oz.
- Accessories ..... Owner's Manual (English/Japanese common/共通):26035261



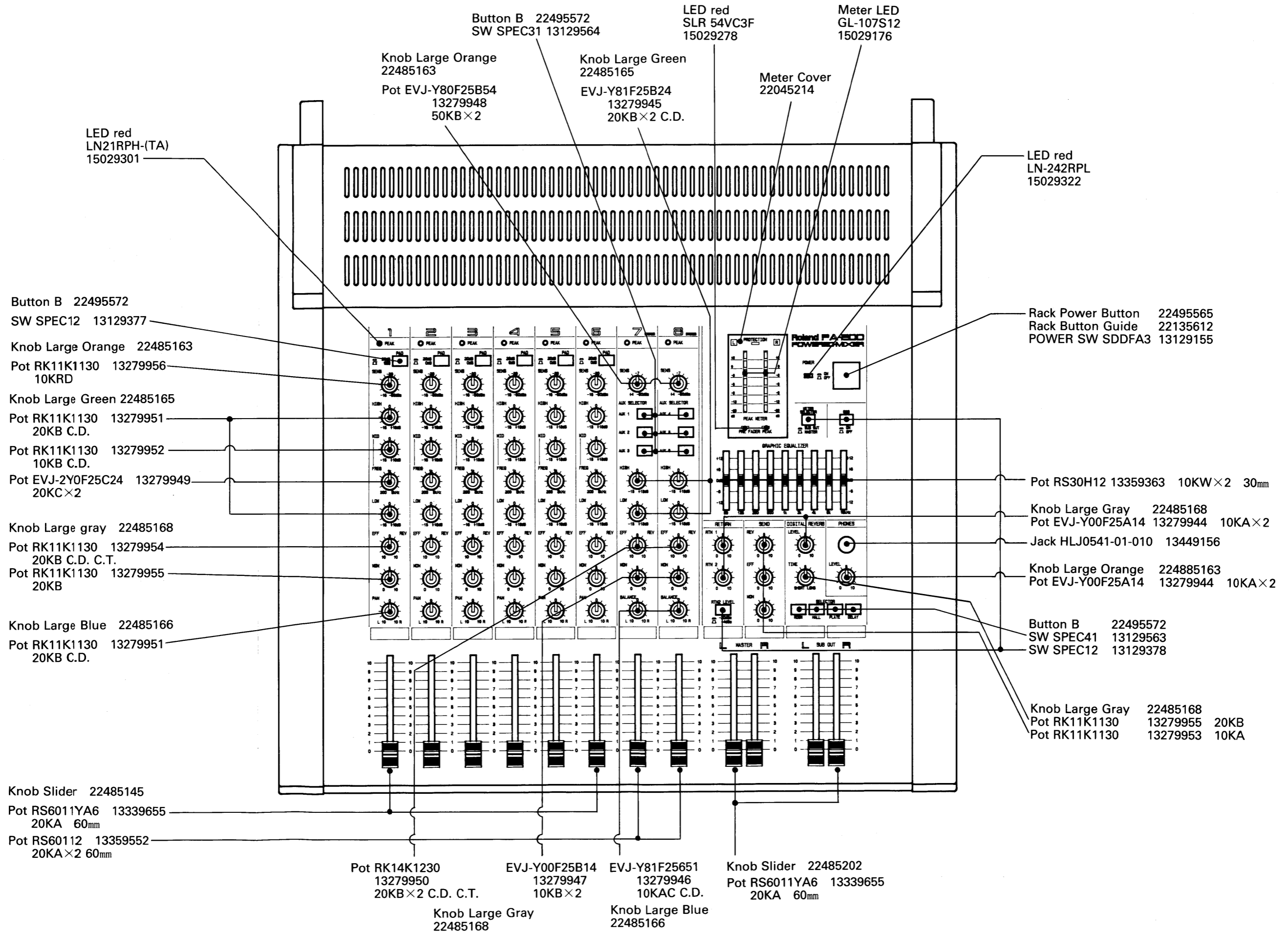
## PA-400 SPECIFICATION

- Mixer Section (ミキサー部)**
    - Frequency Response/ 周波数特性 ..... 15Hz - 25kHz +1/-2dB (SENS-min.)
    - Total Harmonic Distortion/ 全高調波歪 ..... 0.05% or less (20Hz - 20kHz rated output)
    - Noise Level/ ノイズ・レベル (Input Shorted/ 入力ショート, IHF-A, Typ.)
    - Equivalent Input Noise/ 入力換算ノイズ・レベル ..... -128dBm
    - Residual Noise/ 残留ノイズ・レベル ..... -98dBm [All Fader :min.] -81dBm [Master Fader :max.] -75dBm [All channel Fader :min.] -48dBm [All channel Fader :max.] [All SENS. :min.] [All channel Fader :max.] [All SENS. :max.]
  - Crosstalk/ クロストーク** ..... -70dB or less (1kHz Between channels) -60dB or less (1kHz Between L and R)
  - Equalizer/ イコライザー**
    - Normal Channel/ ノーマル・チャンネル
    - HIGH EQ ..... ±15dB (10kHz shelving type)
    - MID EQ ..... ±15dB (0.2 - 5kHz peaking type)
    - LOW EQ ..... ±15dB (100Hz shelving type)
    - Stereo Channel/ ステレオ・チャンネル
    - HIGH EQ ..... ±15dB (10kHz shelving type)
    - LOW EQ ..... ±15dB (100Hz shelving type)
  - Graphic Equalizer/ グラフィック・イコライザー**
    - Frequencies/ 周波数 ..... 63, 125, 250, 500, 1k, 2k, 4k, 8k, 16k [Hz]
    - Variable Width/ 可変幅 ..... ±12dB
  - Digital Reverb/ デジタル・リバーブ**
    - Sampling Frequency/ サンプル周波数 ..... 31.25 kHz
    - Signal Processing/ 信号処理 ..... 16bits
    - Delay Time/ デレイ・タイム ..... 50 ms - 480 ms
- Power Amplifier Section (パワー・アンプ部)**
    - Rated Output/ 定格出力
    - Stereo, both chan. 40hm load/ 4Ω負荷時 ..... 200W x 2
    - Stereo, both chan. 8ohm load/ 8Ω負荷時 ..... 130W x 2
    - BTL, 8ohm load/8Ω負荷時 ..... 400W
    - Recommended load impedance/ 推奨負荷インピーダンス
    - Stereo ..... more than 4ohms
    - BTL ..... more than 8ohms
    - Frequency Response/ 周波数特性 ..... 10Hz - 50kHz (±1dB 1W/8ohm)

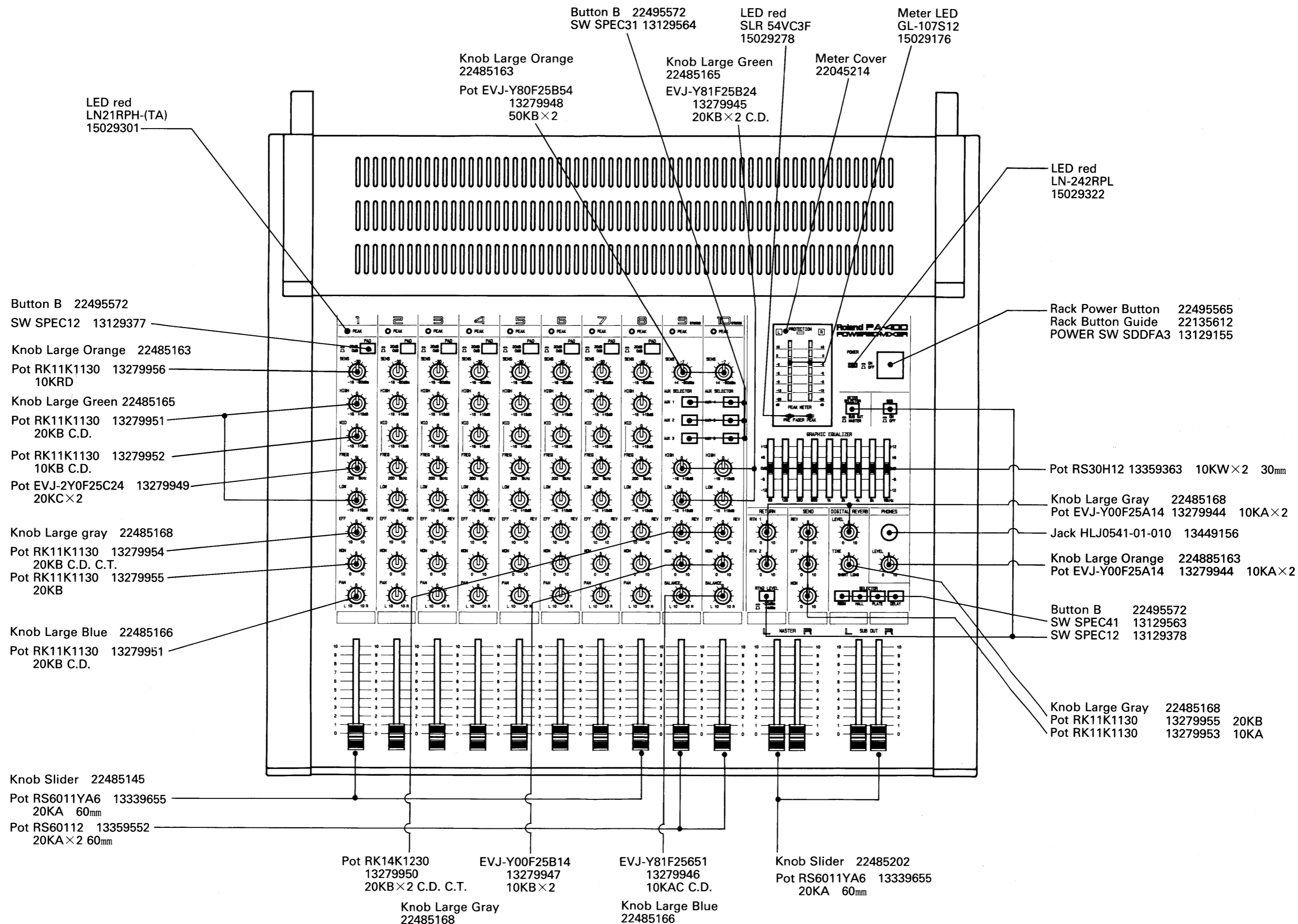
- Total Harmonic Distortion/ 全高調波歪
- Stereo, both chan. 8ohm load/ 8Ω負荷時 ..... 0.1% or less (8ohm, 1kHz)
- S/N Ratio/ S/N 比 ..... 104dB or greater (main in shorted/ パワー・アンプ・イン・ショート, IHF-A, Typ.)
- Others**
- Power/ 電源 ..... AC 100/117/220/240V (50/60Hz)
- Power Consumption/ 消費電力 ..... 250W (100V) 400VA, 310W (117V) 1000VA (220/240V)
- Dimensions ..... 488(W) x 501(D) x 235(H) mm 19-1/4(W) x 19-23/32(D) x 9-1/4 inch.
- Weight ..... 18.1kg / 39 lb 15oz.
- Accessories ..... Owner's Manual (English/Japanese common/共通):26035261



# PA-200 FRONT PANEL



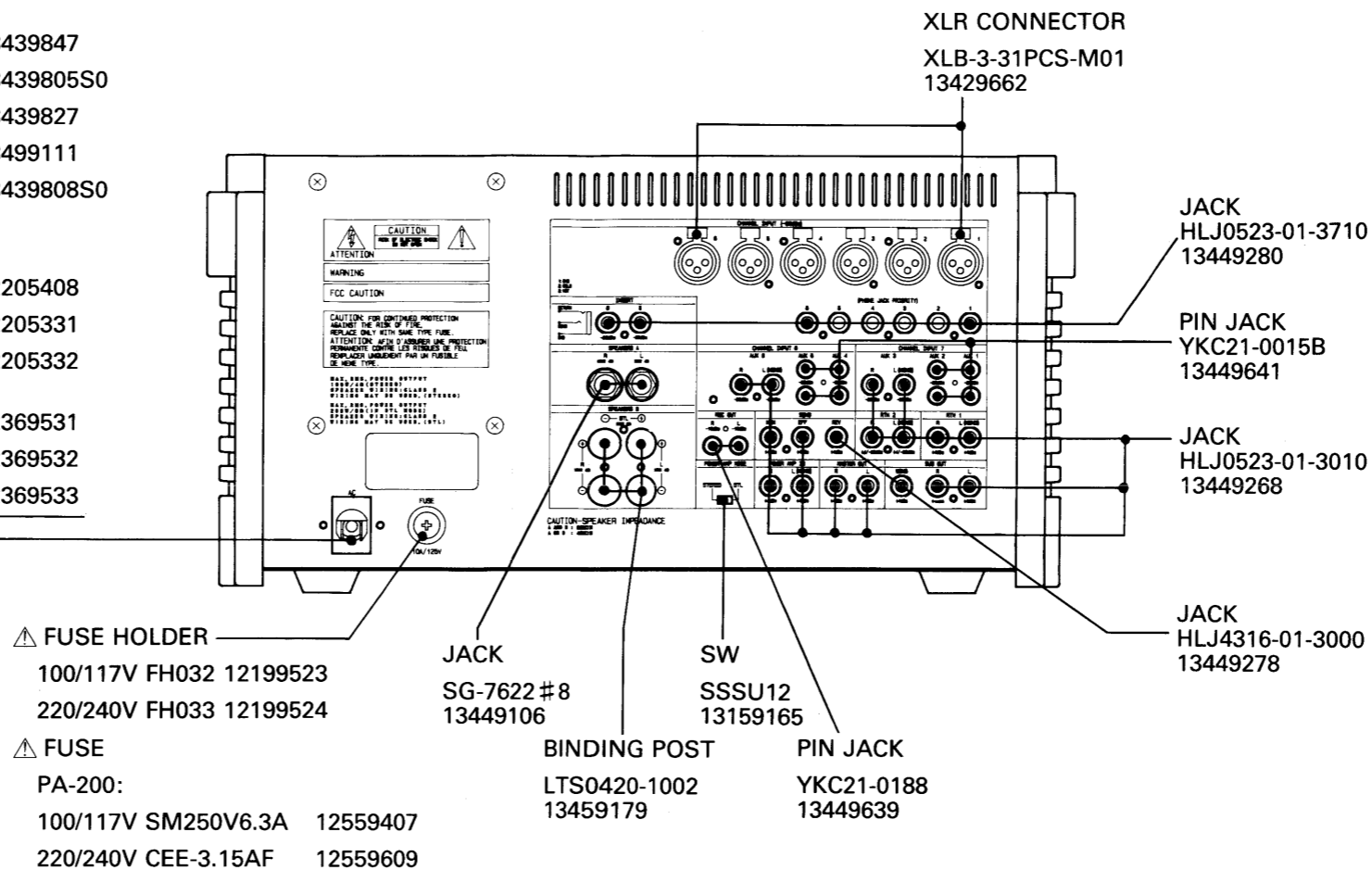
# PA-400 FRONT PANEL





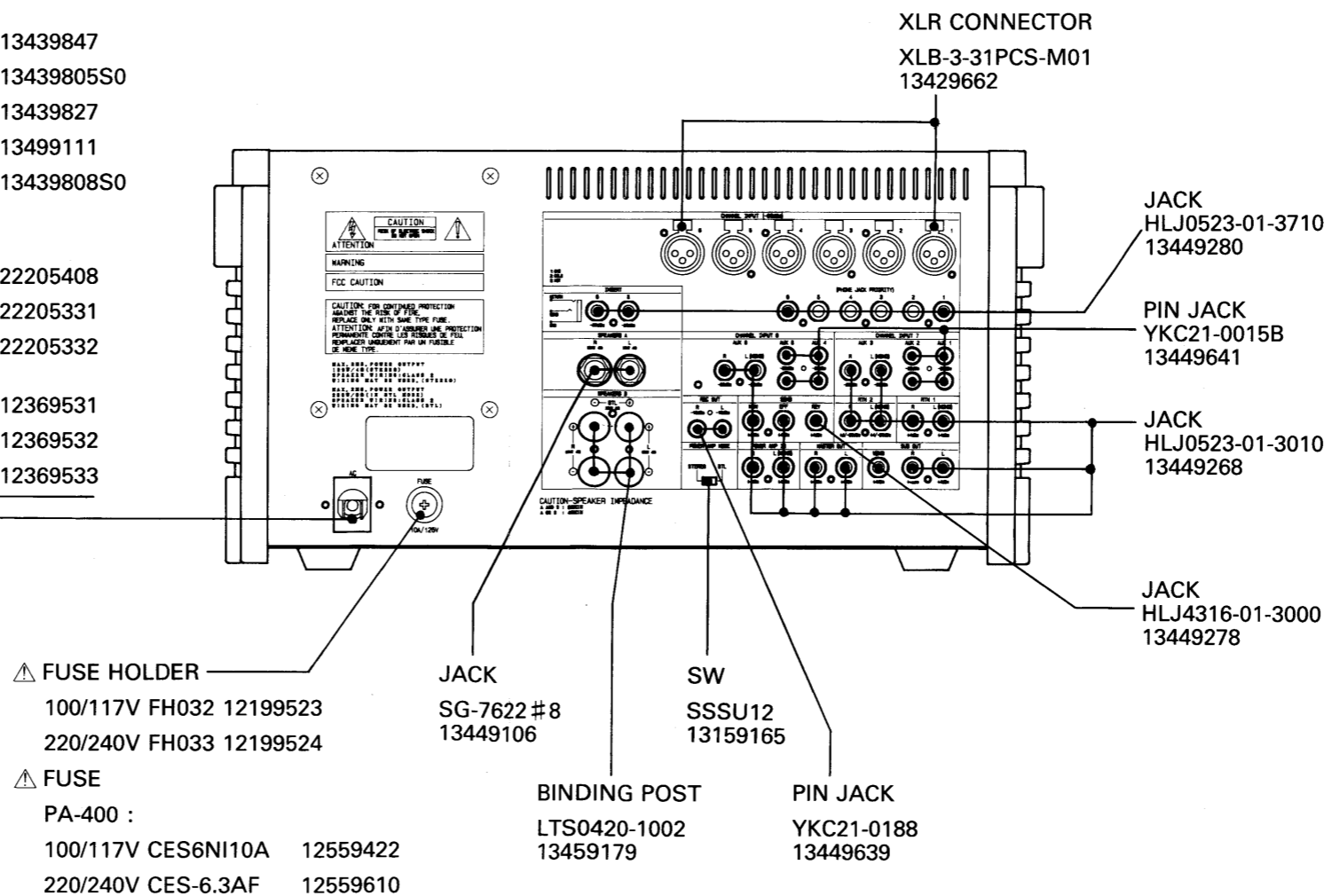
**PA-200 REAR PANEL**

△ AC CORD		
100V	VCTF 2.5M BLACK 2×1.25	13439847
117V	SJT # 18 3P	13439805S0
220V	EP-528-E05	13439827
240VE	5722-660-4527	13499111
240VA	SP-305	13439808S0
△ CORD BUSHING/BLACKET		
100V, 240VE	CORD BUSH HOLDER	22205408
117V	CORD BUSH HOLDER	22205331
220V, 240VA	CORD BUSH HOLDER	22205332
100V, 240VE, 240VA	KR-51	12369531
117V	KR-61	12369532
220V	KR-41	12369533



**PA-400 REAR PANEL**

△ AC CORD		
100V	VCTF 2.5M BLACK 2×1.25	13439847
117V	SJT # 18 3P	13439805S0
220V	EP-528-E05	13439827
240VE	5722-660-4527	13499111
240VA	SP-305	13439808S0
△ CORD BUSHING/BLACKET		
100V, 240VE	CORD BUSH HOLDER	22205408
117V	CORD BUSH HOLDER	22205331
220V, 240VA	CORD BUSH HOLDER	22205332
100V, 240VE, 240VA	KR-51	12369531
117V	KR-61	12369532
220V	KR-41	12369533



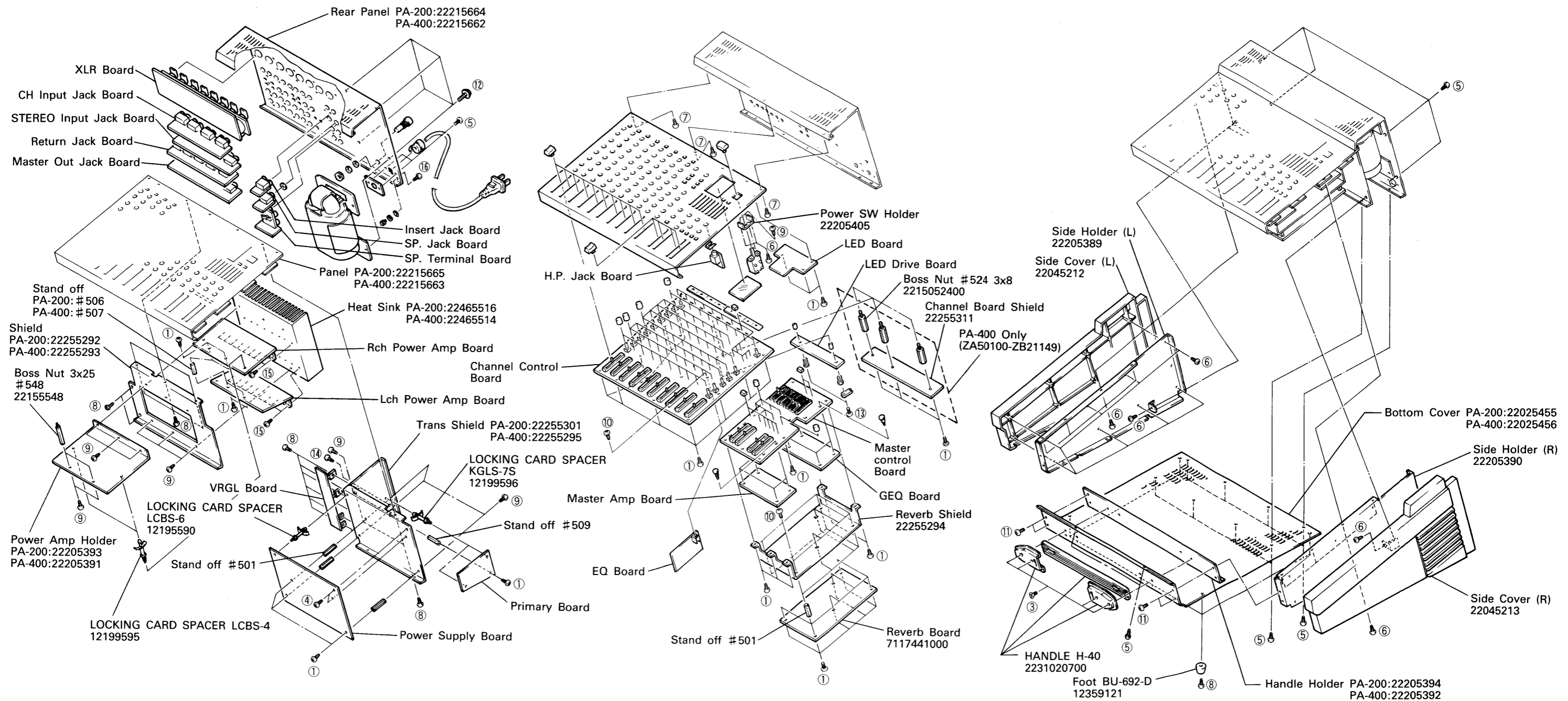
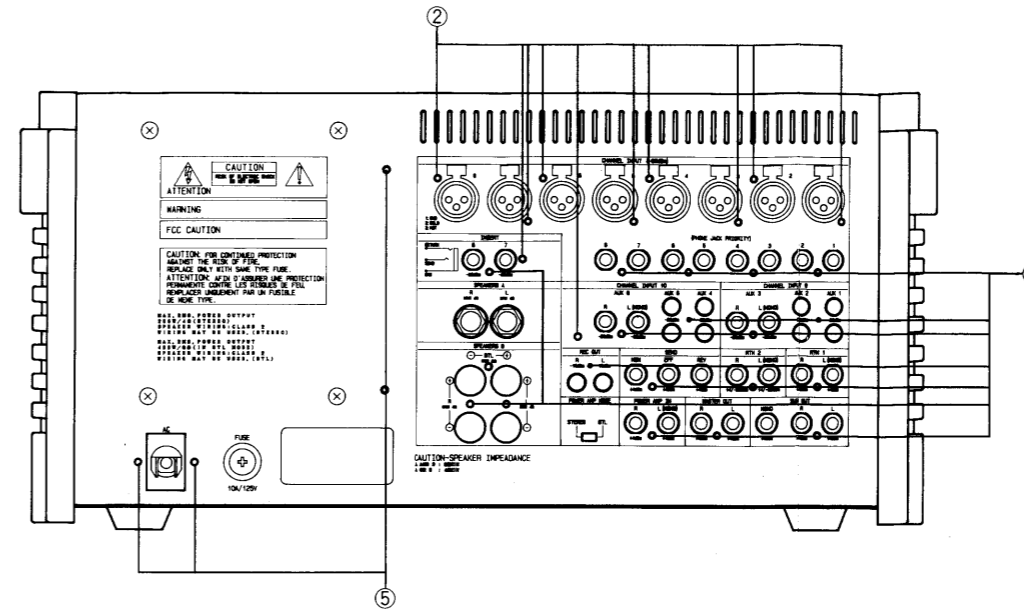
# PA-200/400 EXPLODED VIEW

## PA-200/400 分解図

**SCREWS**

- ① 3 x 6 mm Binding Machine FeCm w/ External tooth
- ② 3 x 8 mm Binding Machine FeBc w/ Internal tooth
- ③ 5 x 25 mm Flat FeBc
- ④ 3 x 16 mm Binding B-tight FeCm
- ⑤ 3 x 6 mm Binding B-tight FeBc
- ⑥ 3 x 6 mm Binding B-tight FeCm
- ⑦ 3 x 8 mm Binding B-tight FeBc
- ⑧ 3 x 8 mm Binding B-tight FeCm
- ⑨ 3 x 6 mm SEMS FeCm
- ⑩ 3 x 8 mm SEMS FeCm
- ⑪ 4 x 8 mm W-SEMS FeBc
- ⑫ 5 x 10 mm W-SEMS FeBc
- ⑬ 3 x 20 mm W-SEMS FeCm
- ⑭ 3 x 18 mm Binding B-tight FeCm (PA-200 only)
- ⑮ 3 x 10 mm W-SEMS FeCm
- ⑯ 4 x 8 mm Binding Machine FeBc

NOTE : Refer to the "DISASSEMBLING PROCEDURE" about removing PA-200/400 Bottom Cover.  
 注 : PA-200/400 ボトム・カバーの外し方は、分解手順を参照して下さい。

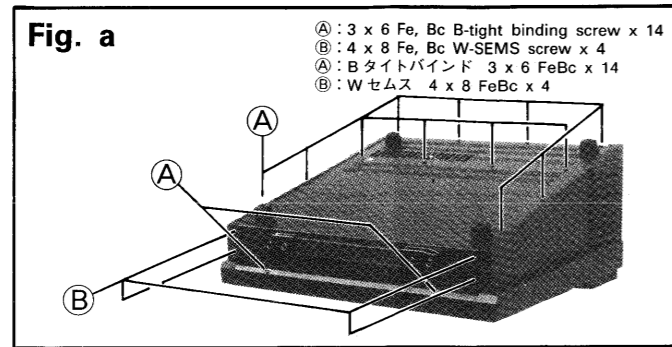


# PA-200/400 DISASSEMBLING AND REASSEMBLING PROCEDURE

## PA-200/400 分解, 組立手順

### Disassembling procedure

◎Removal of Bottom Cover  
Remove screws A and B in Fig.a. And then remove the bottom cover.



### 分解手順

◎Bottom Cover の外し方  
Fig.a のネジ (A, B) を外し, Bottom Cover をとる。

• Refer to "Disassembling procedure of each PCB" for details about internal disassembling procedure.

• 内部の詳細な分解手順は, "各基板の分解手順" を参照して下さい。

### ◎Disassembling procedure of each PCB.

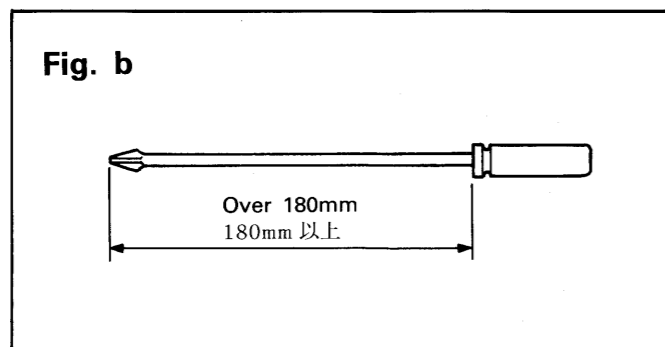
- How to remove MASTER BOARD. (P.6)
- How to remove MAIN AMP BOARD. (P.7)
- How to remove POWER SUPPLY BOARD. (P.7)
- How to remove VRGL BOARD. (P.8)
- How to remove CHANNEL BOARD. (P.8)

### ◎各基板の分解手順

- MASTER BOARD の外し方 (P. 6)
- MAIN AMP BOARD の外し方 (P. 7)
- POWER SUPPLY BOARD の外し方 (P. 7)
- VRGL BOARD の外し方 (P. 8)
- CHANNEL BOARD の外し方 (P. 8)

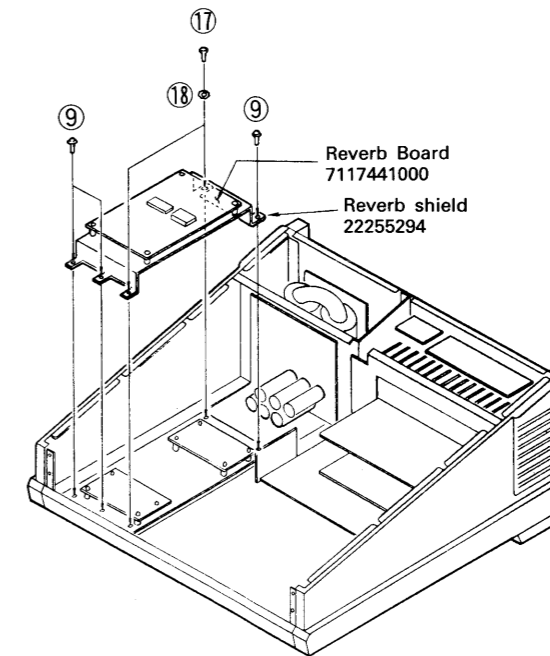
NOTE: When removing the power amp block, prepare the philips driver as shown in Fig.b.

注: パワー・アンプ・ブロックを外す時, Fig.b のような (+) ドライバー (No.2) が必要です。

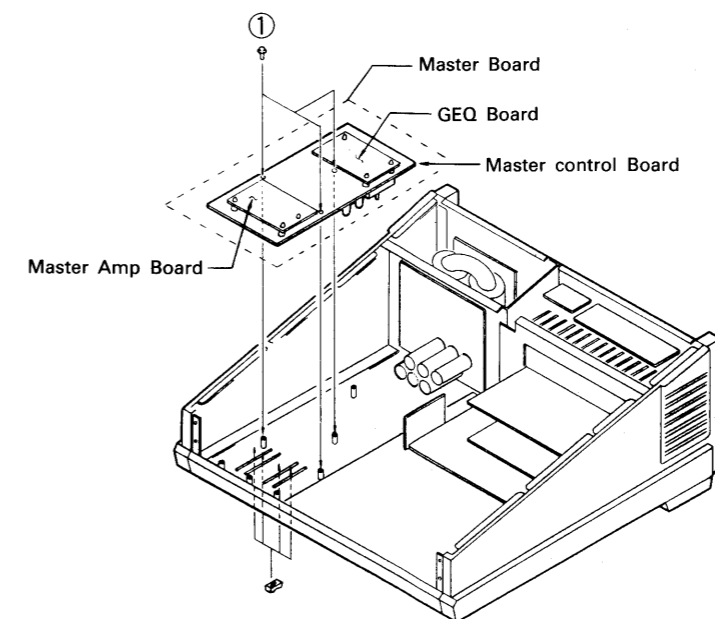


## HOW TO REMOVE MASTER BOARD MASTER BOARD の外し方

1 Remove the reverb shield.  
リバーブ・シールドを外す。



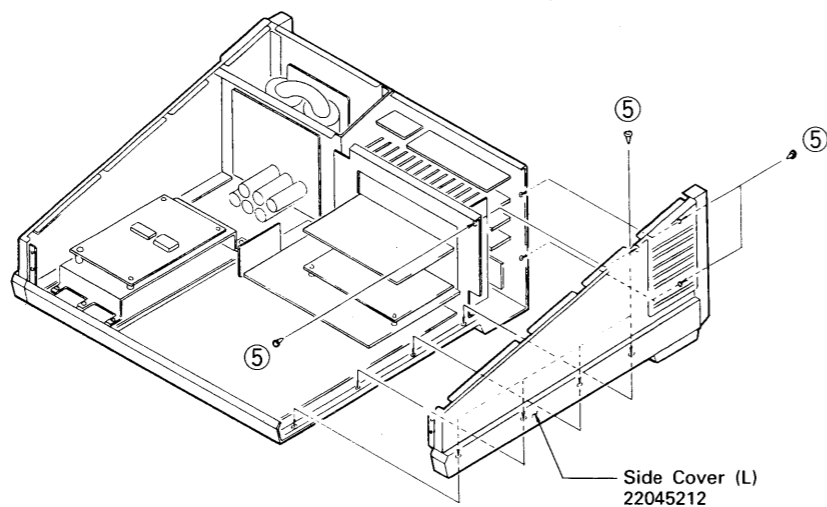
2 Remove the Master Board.  
マスター・ボードを外す。



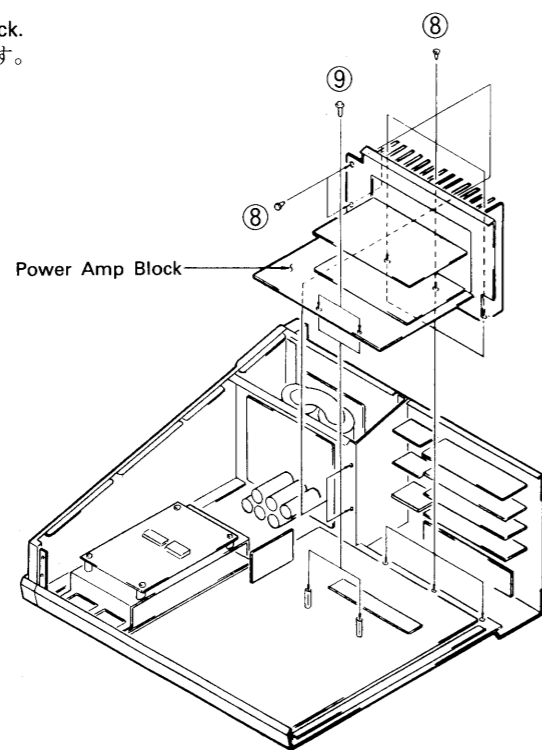
- SCREWS**
- ① 3 x 6 mm Binding Machine FeCm w/External tooth.
  - ⑨ 3 x 6 mm SEMS FeCm.
  - ⑰ 3 x 6 mm Binding Machine FeCm.
  - ⑱ External tooth washer.

### HOW TO REMOVE MAIN AMP BOARD MAIN AMP BOARD の外し方

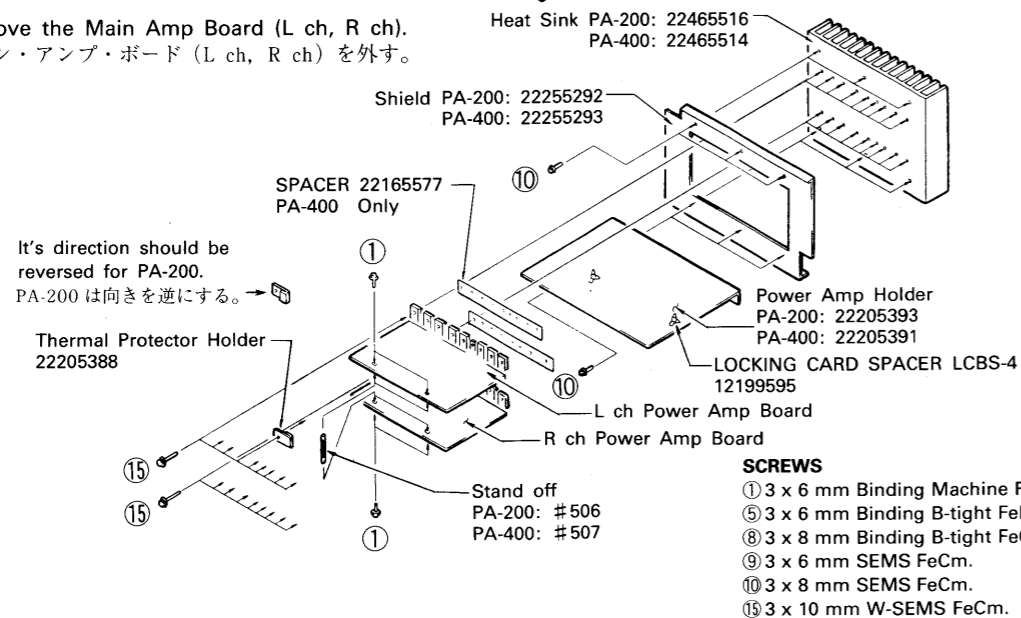
**1** Remove the Side Cover (L).  
サイド・カバー (L) を外す。



**2** Remove the Power Amp Block.  
パワー・アンプ・ブロックを外す。

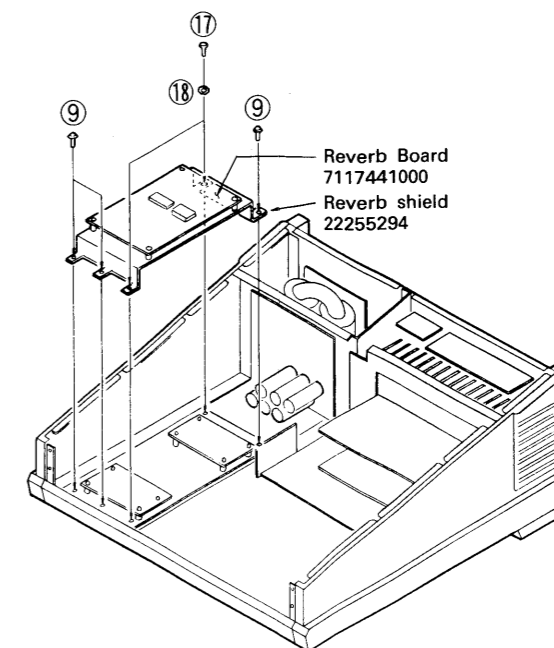


**3** Remove the Main Amp Board (L ch, R ch).  
メイン・アンプ・ボード (L ch, R ch) を外す。

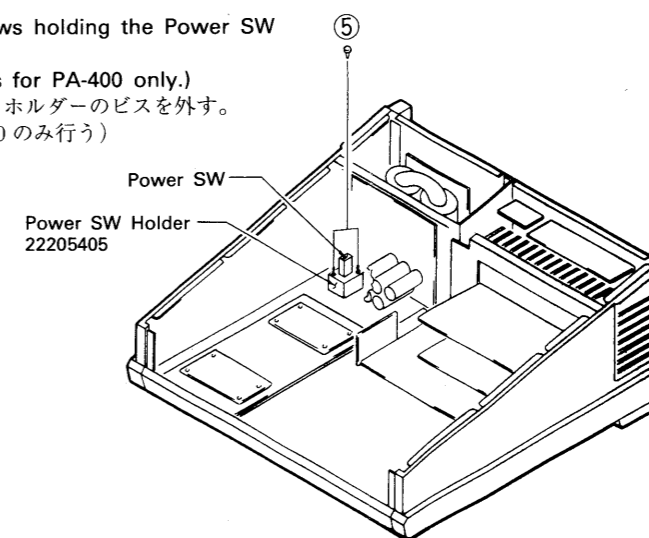


### HOW TO REMOVE POWER SUPPLY BOARD POWER SUPPLY BOARD の外し方

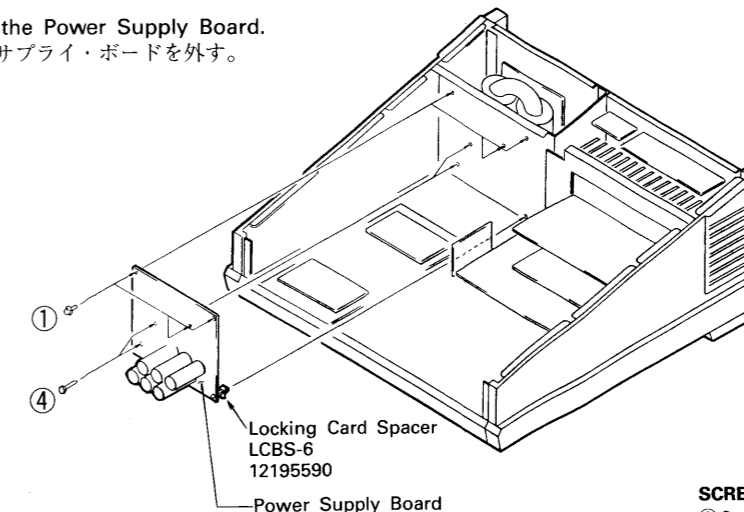
**1** Remove the reverb shield.  
リバーブ・シールドを外す。



**2** Remove two screws holding the Power SW Holder.  
(This procedure is for PA-400 only.)  
パワー・スイッチ・ホルダーのビスを外す。  
(この作業は PA-400 のみ行う)



**3** Remove the Power Supply Board.  
パワー・サプライ・ボードを外す。

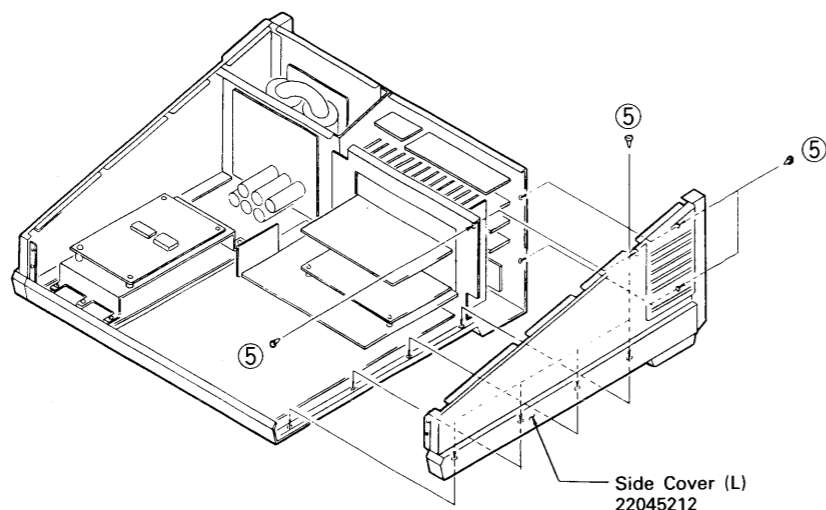


- SCREWS**
- ① 3 x 6 mm Binding Machine FeCm w/External tooth.
  - ② 3 x 16 mm Binding B-tight FeCm.
  - ③ 3 x 6 mm Binding B-tight FeBc.
  - ④ 3 x 6 mm SEMS FeCm.
  - ⑤ 3 x 6 mm Binding Machine FeCm.
  - ⑥ External tooth washer.

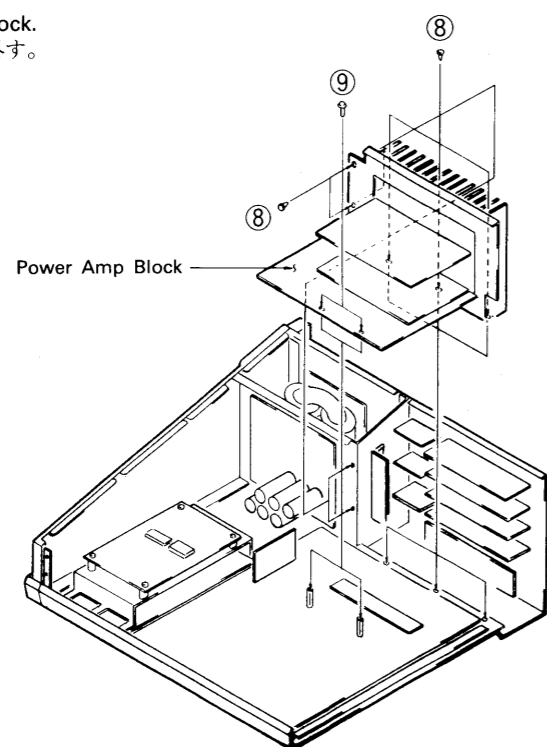
\* Also to remove the VRGL Board. The Power Amp Block must be removed first. (Refer to "HOW TO REMOVE VRGL BOARD".)  
\* VRGL (3端子レギュレーター)・ボードも外したい場合は、パワー・アンプ・ブロックを外さなければならない。(「VRGL・ボードの外し方」を参照のこと。)

**HOW TO REMOVE VRGL BOARD**  
VRGL (3 端子レギュレーター) BOARD の外し方

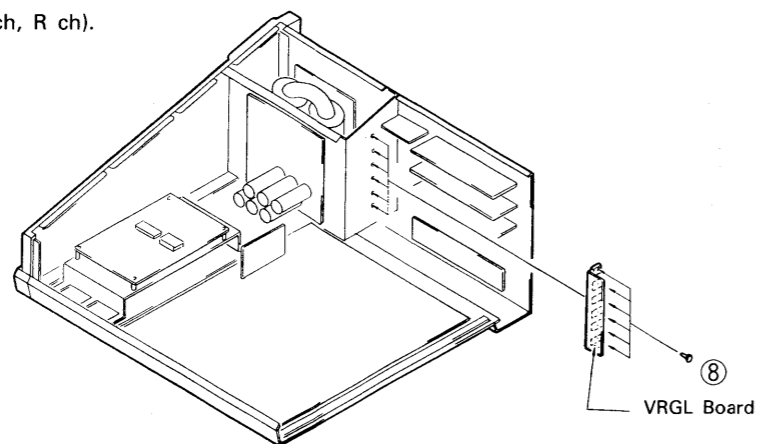
- 1** Remove the Side Cover (L).  
サイド・カバー (L) を外す。



- 2** Remove the Power Amp Block.  
パワー・アンプ・ブロックを外す。



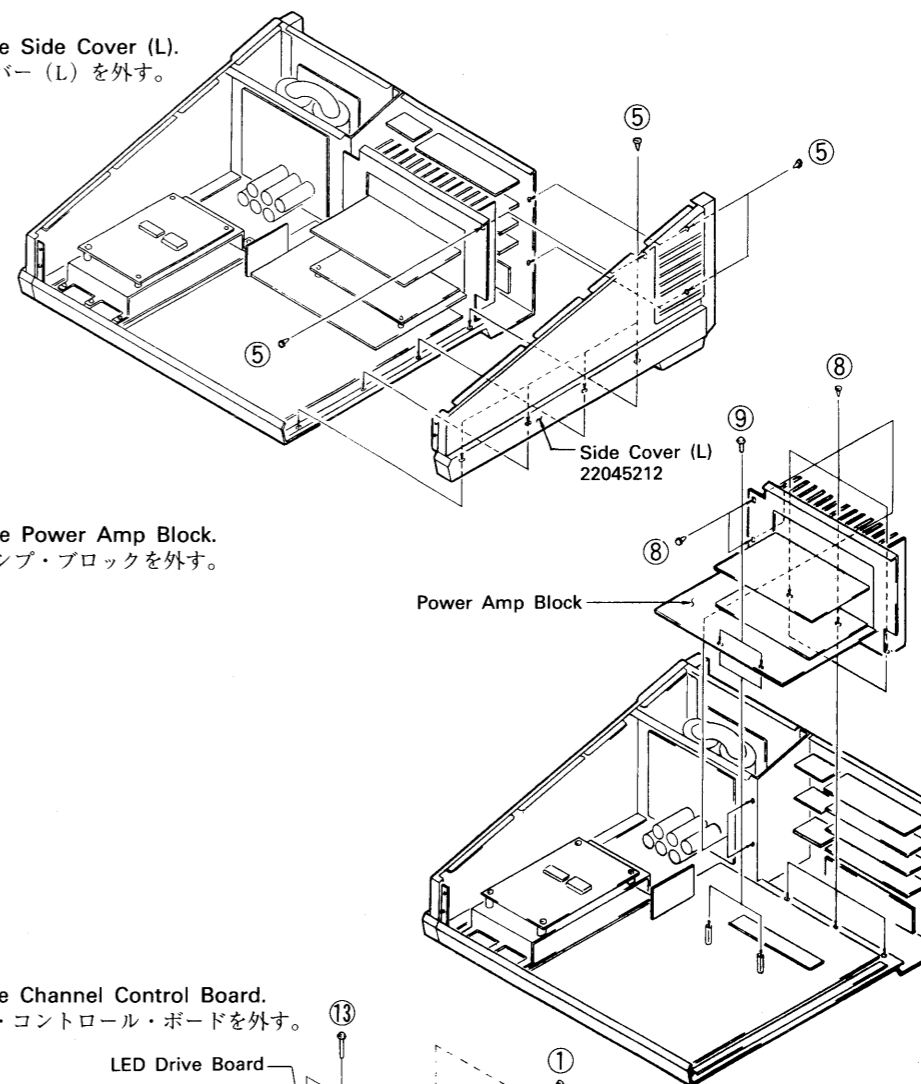
- 3** Remove the VRGL Board (L ch, R ch).  
VRGL・ボードを外す。



- SCREWS**  
⑤ 3 x 6 mm Binding B-tight FeBc.  
⑧ 3 x 8 mm Binding B-tight FeCm.  
⑨ 3 x 6 mm SEMS FeCm.

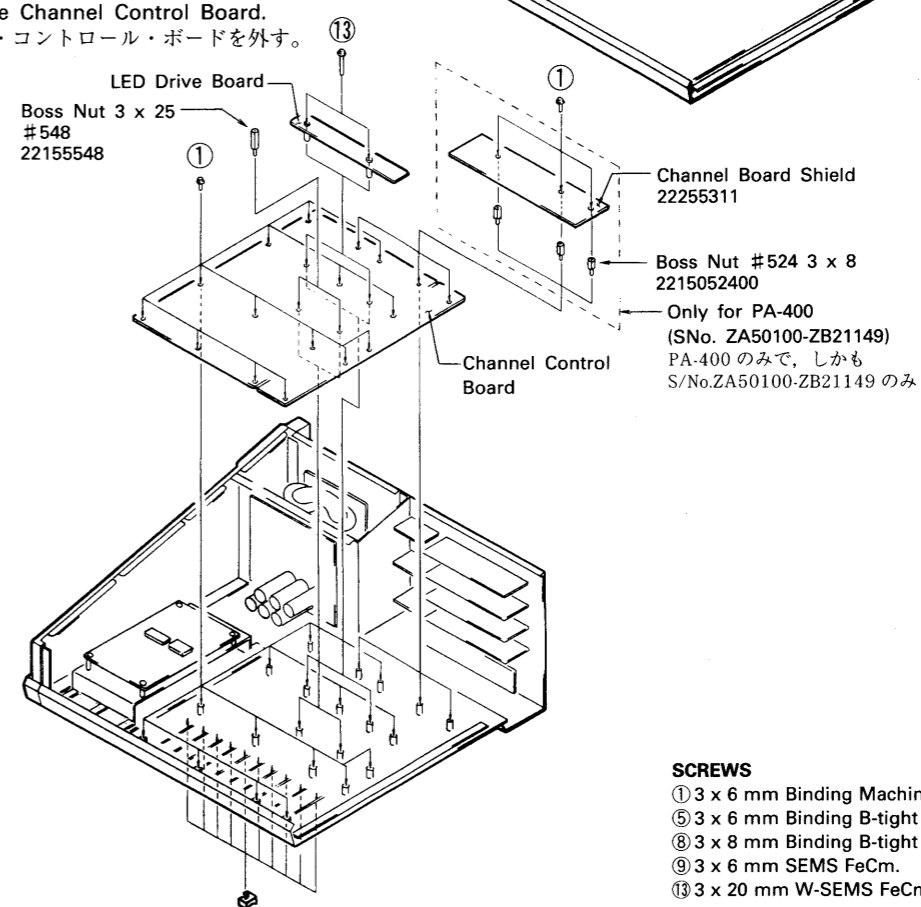
**HOW TO REMOVE CHANNEL BOARD**  
CHANNEL BOARD の外し方

- 1** Remove the Side Cover (L).  
サイド・カバー (L) を外す。



- 2** Remove the Power Amp Block.  
パワー・アンプ・ブロックを外す。

- 3** Remove the Channel Control Board.  
チャンネル・コントロール・ボードを外す。



- SCREWS**  
① 3 x 6 mm Binding Machine FeCm w/External tooth.  
⑤ 3 x 6 mm Binding B-tight FeBc.  
⑧ 3 x 8 mm Binding B-tight FeCm.  
⑨ 3 x 6 mm SEMS FeCm.  
⑬ 3 x 20 mm W-SEMS FeCm.



**Reassembling procedure**

◎Caution on reassembling

Before assembling PA-200/400 after repairing which needed disassembling, be sure to dress wirings and clamp them in place as shown in below figure.

PA-200: SNo. ZA50100 - ZB21049

PA-400: SNo. ZA50100 - ZB21149

\*Refer to Fig.c, d, e

PA-200: SNo. ZB31050 -up

PA-400: SNo. ZB31150 -up

\*Refer to Fig.f, g, h

**組立手順**

◎組立上の注意

PA-200/400 を分解して修理した後、組み立てる時、クランプ、ワイヤリングの位置は、必ず下図の様にして下さい。

PA-200 : SNo. ZA50100 - ZB21049

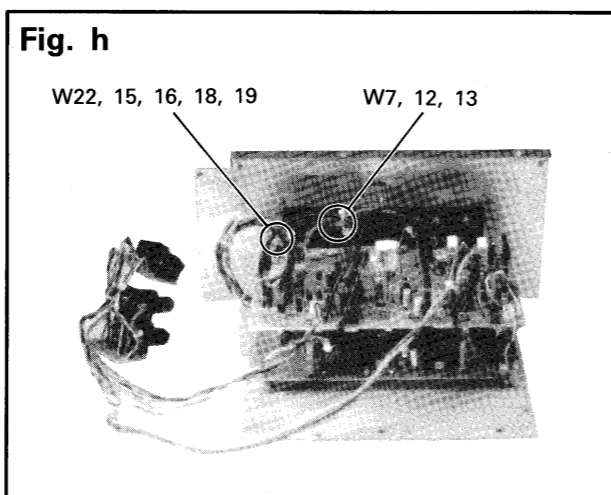
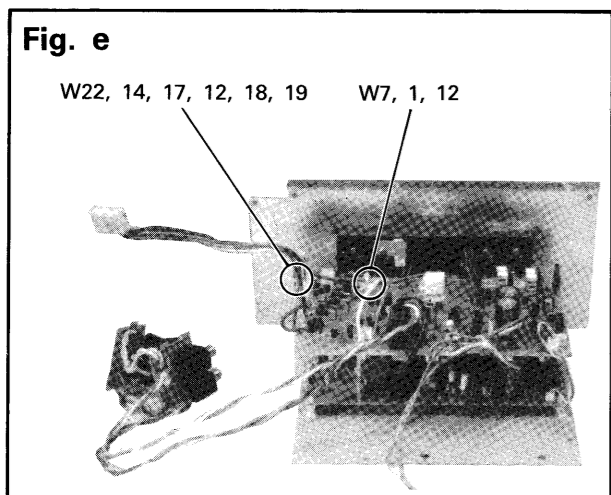
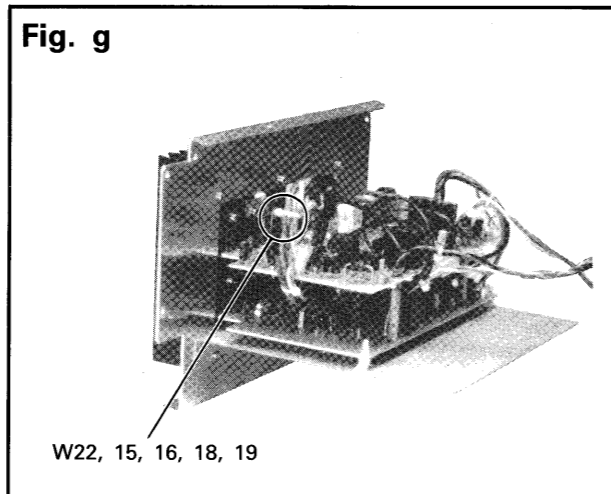
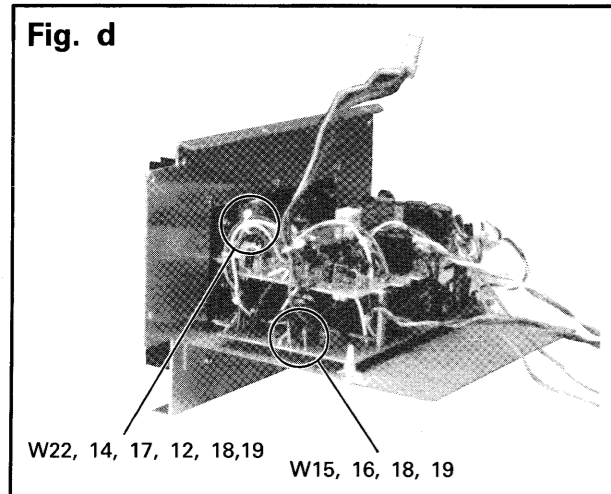
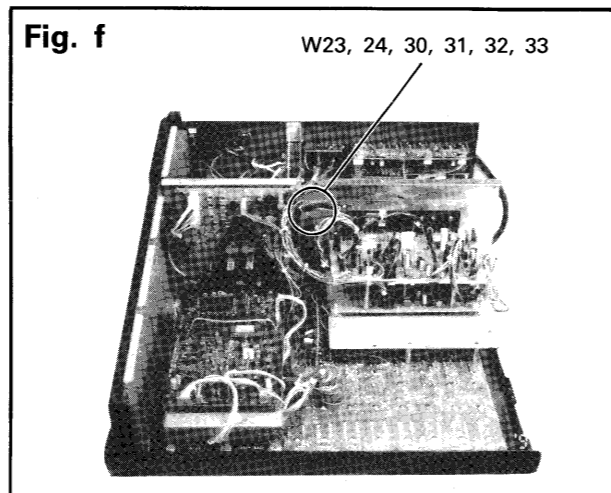
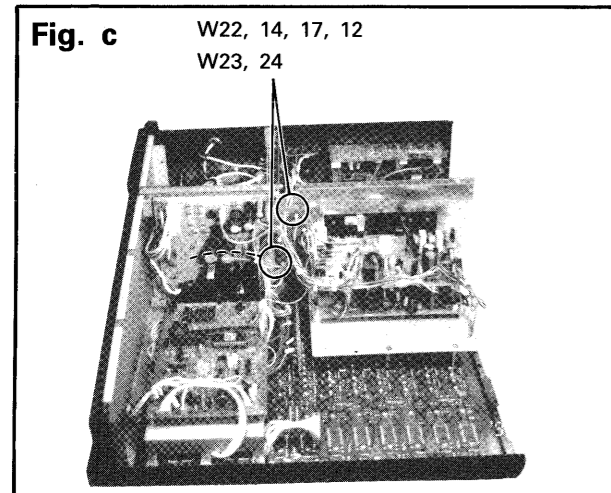
PA-400 : SNo. ZA50100 - ZB21149

\*Fig.c, d, e 参照

PA-200 : SNo. ZB31050 以降

PA-400 : SNo. ZB31150 以降

\*Fig.f, g, h 参照



**PA-200 PARTS LIST/パーツリスト**

**SAFETY PRECAUTIONS:**

The parts marked Δ have safety-related characteristics. Use only listed parts for replacement.

安全上の注意:

Δが付いている部品は、安全上特別な規格でつくられたものです。交換の際は、指定された部品番号以外の部品は使わないようにして下さい。

**CONSIDERATIONS ON PARTS ORDERING**

When ordering any parts listed in the parts list, please specify the following items in the order sheet.

Ex.	QTY	PART NUMBER	DESCRIPTION	MODEL NUMBER
	10	22575241	Sharp Key	C-20/50
	15	2247017300	Knob (orange)	DAC-15D

Failure to completely fill the above items with correct number and description will result in delayed or even undelivered replacement.

パーツ発注に関するお願い

オーダーシートには、必ず下記の4項目は正確に記入して下さい。(例外は除く)

必要数	パーツナンバー	品名	使用機種
例) 10	22575241	Sharp Key	C-20/50
15	2247017300	Knob (orange)	DAC-15D

もし記入漏れ、誤記等がある場合、必要部品が発送出来なかったり、大幅な遅れの原因になります。御協力をお願いします。

**CASING/ケース**

22215665	Panel
22215664	Rear Panel
22025455	Bottom Cover
22045212	Side Cover (L)
22045213	Side Cover (R)
22045214	Meter Cover
22045192	Ch LED Lens
12359121	Rubber Foot BU-692-D
2231020700	HANDLE H-40

**CHASSIS/シャーシ**

22205389	Side Holder (L)
22205390	Side Holder (R)
22205405	Power SW Holder
2205394	Handle Holder
22205393	Power Amp Holder
22205388	Thermal Switch Holder
22255292	Shield
22255294	Reverb Shield
22255301	Trans Shield
22135612	Rack Botton Guide
22205954	VRGL Holder (Use for Type C)

**KNOB, BOTTON/ツマミ, ボタン**

22485163	Knob Large (大) orange (橙)	SENS, PHONES
22485165	Knob Large (大) green (緑)	CH EQ
22485166	Knob Large (大) blue (青)	PAN, BALANCE
22485168	Knob Large (大) gray (灰色)	EFF, MON, etc.
22485145	Knob Slider	CHANNEL
22485202	Knob Sllder	MASTER, SUBOUT
22495572	Button B	PAD, SELECTOR (ROOM, HALL, PLATE, DELAY), RTN 2 LEVEL, METER SELECTOR GEQ, AUX SELECTOR (AUX 1, AUX 2, AUX 3, AUX 4, AUX 5, AUX 6)
22495565	Rack Power Botton	POWER SW

**SWITCH/スイッチ**

13129377	SPEC12 (push) 2 poles, shorting	CH1-6 PAD
13129378	SPEC12 (push) 2 poles, nonshorting	GEQ, etc.
13129564	SPEC31 (push) 3 keys, shorting	AUX SELECTOR (AUX 1, AUX 2, AUX 3, AUX 4, AUX 5, AUX 6)
13129563	SPEC41 (push) 4 keys, shorting	SELECTOR (ROOM, HALL, PLATE, DELAY)
13159165	SSSU12 (slide)	POWER AMP MODE
13129155	SDDFA3 (push)	POWER SW

**JACK, SOCKET/ジャック, ソケット**

13449268	HLJ0523-01-3010	AUX 3 (R/L), AUX 6 (R/L), RTN 1 (R/L), RTN 2 (R/L), SUB OUT (R/L), MASTER OUT (R/L), POWER AMP IN (R/L), SEND (MON/EFF) (PHONE JACK PRIORITY) (ch 1-6), INSERT
13449280	HLJ0523-01-3710	PHONES
13449156	HLJ0541-01-010	PHONES
13449278	HLJ4316-01-3000	SUBOUT (MONO), SEND (REY)
13449106	SG-7622 #8	SPEAKERS A (R/L)
13449639	YKC21-0188 (pin)	REC OUT
13449641	YKC21-0015B (pin)	AUX 1 (R/L), AUX 2 (R/L), AUX 4 (R/L), AUX 5 (R/L)

**PCB ASSY/基板組立**

7117441000	Reverb Board (pcb 2292579400)
7117542002	Master Board

NOTE: Master Board consists of the following 12 PCBs.

注: マスター基板は下記の12点から構成されます。

Master Contorol Board	(pcb 2292579502 1/12)
Master Amp Board	(pcb 2292579502 2/12)
GEQ Board	(pcb 2292579502 3/12)
LED Board	(pcb 2292579502 4/12)
Master Out Jack Board	(pcb 2292579502 5/12)
Return Jack Board	(pcb 2292579502 6/12)
H.P. Jack Board	(pcb 2292579502 7/12)
EQ Board	(pcb 2292579502 8/12)
XLR Board B	(pcb 2292579502 9/12)
XLR Board A	(pcb 2292579502 10/12)
Spacer Board	(pcb 2292579502 11/12)
Spacer Board	(pcb 2292579502 12/12)

7117543002 Channel Board

NOTE: Channel Board consists of the following 8 PCBs.

注:チャンネル基板は下記の8点から構成されます。

- Channel Contorol Board A (pcb 2292579602 1/8)
- Channel Contorol Board B (pcb 2292579602 2/8)
- LED Drive Board A (pcb 2292579602 3/8)
- LED Drive Board B (pcb 2292579602 4/8)
- Channel Input Jack Board B (pcb 2292579602 5/8)
- Channel Input Jack Board A (pcb 2292579602 6/8)
- Stereo Input Jack Board (pcb 2292579602 7/8)
- Insert Jack Board (pcb 2292579602 8/8)

7117554400 Main Amp Board 230/240V (Type A: SNo.ZA50100 - ZB21049)

7117554401 Main Amp Board 230/240V (Type B: SNo.ZB31050 - ZC41899)

7117554402 Main Amp Board 230/240V (Type C: SNo.ZD11900 -up/以降)

NOTE: Type A, Type B and Type C of replacement Main Amp Board (230/240V) is incompatible for wiring.

Refer to the "RE: TYPE A, TYPE B AND TYPE C OF MAIN AMP BOARD (230/240V)" (P.13, 14) for details and below documents are common to Type A, Type B and Type C.

注:補修用 Main Amp Board (230/240V) の Type A, Type B, Type C は、ワイヤリングのため互換性がありません。

詳細は、"Main Amp Board (230/240V) の Type A, Type B, Type C について" (P.13, 14) を参照して下さい。また、以下の文章は Type A, Type B, Type C に共通の内容です。

NOTE: Main Amp Board (220/240V) consists of the following 9 PCBs.

注:メイン・アンプ基板は下記の9点から構成されます。

- L ch Power Amp Board (pcb 22925797\*\* 1/10)
- R ch Power Amp Board (pcb 22925797\*\* 2/10)
- Power Supply Board (pcb 22925797\*\* 3/10)
- SP Jack Board (pcb 22925797\*\* 4/10)
- SP Terminal Board (pcb 22925797\*\* 5/10)
- VRGL Board (pcb 22925797\*\* 6/10)
- Primary Board (pcb 22925797\*\* 7/10)
- Spacer Board (pcb 22925797\*\* 8/10)
- Spacer Board (pcb 22925797\*\* 9/10)

\*\*=00 (Type A) \*\*=01 (Type B) \*\*=02 (Type C)

NOTE: Replacement Main Amp Board is 230/240V versions only 230/240V version differs from 100/117V version only in fuse system.

Order proper fuses and fuse labels separately if necessary. (Refer to the table below)

注:補修用 Main Amp Board として 230/240V が共通使用されます。

電圧区分による違いはヒューズ値、ヒューズ貼マークのみです。

100/117V 用のヒューズ、ヒューズ貼マークが必要な場合は別途発注して下さい。(下表参照)

	Fuse	Parts No.	Fuse Label	Parts No.
100/117V	F1, F2	GGL-8A (12559421)	8.0A 250V	(41015174)
	F3, F4	T-GGS1A (12559335)	1.0A 250V	(41015163)
	F5, F6	TSC3A-N1 (12559402)	3.0A 125V	(41015119)
	F7	T-GGS1A (12559335)	1.0A 250V	(41015163)
	220/240V	F1, F2	SF8A (12559608)	8.0A 60V
F3, F4		CEE-400MAT (12559563)	T400mA 250V	(41015212)
F5, F6		CEE-2.5AT (12559571)	T 2.5A 250V	(41015220)
F7		CEE-250MAT (12559561)	T250mA 250V	(41015210)

IC/集積回路

15189189	uPC4570HA	OP Amp	
15189192	NJM2068SD	OP Amp	
15189201	NJM4565S	OP Amp	
15189235	BA15218N	OP Amp	
15189242	NJM4565SD	OP Amp	
15189188	M5238L	OP Amp	
15189111J1	NJM-311D	Comparator	
15189202	M5239L	Comparator	
15209130	IR2E28	LED Driver	
15159110D0	BU4030BP	Quad EX OR gate	
15159129D0	BU4053BP	Analog SW	
1522986301	HG61H20R36FS	Reverb chip	IC10 on RB
15179376	MB81416-10	16Kx4 D RAM	IC11-14 on RB
15219162	PCM54	D/A CONVERTER	IC7 on RB
15449197	M5M27C128K-2	EP ROM (programed)	IC8 on RB
15179799	M5M27C128K-2	EP ROM (blank)	IC8 on RB
15199207	TA7805S	+5V voltage regulator	
15199208	NJM7915FA	+15V voltage regulator	
15199209	NJM7815FA	-15V voltage regulator	

TRANSISTOR/トランジスタ

15119111	2SA970-GR	
15119113	2SA1015-GR	
15119715	2SA1673-O	Power Tr.
15119602	2SB647-C	
15119825	2SB1186A-E	Power Tr.
15129114	2SC1815-GR	
15129120	2SC2240GR	
15129136	2SC2878-A	
15129418	2SC3421-Y	Power Tr.
15129723	2SC4388-O	Power Tr.
15129602	2SD667-C	
15129842	2SD1763A-E	Power Tr.
15139137	2SK381-E	

on REVERB BOARD

DIODE/ダイオード

15019125	1SS-133		
15019103	1S-2473		
15019252	1SS-84		
15019165	EU1Z250V 0.25A		
15019166	RU4Z250V 2A		
15039134	FMU-32S	D15, 18 on POWER AMP BOARD (Use for Type B, C)	
15039118	S5688G		
15019209T0	S-5500G		
15019530	RD-6.8EB2	Zener Diode	
15019529	RD-12EB1	Zener Diode	
15019424	MTZ3.3B	Zener Diode	on REVERB BOARD
15039105	1B4B1 LC-2	Bridge Diode	
15019272	2B4B41 LC-2	Bridge Diode	
15039123	10D4B41	Bridge Diode 200V 10A	
15029278	SLR 54VC3F	LED (red)	PROTECTION PRE FADER PEAK
15029176	GL-107512	Meter LED	PEAK METER
15029301	LN21RPH-(TA)	LED (red)	CHANNEL
15029322	LN-242RPL	LED (red)	POWER

RESISTOR/抵抗

△12559717	FRN12N (Fusible)	3.3Ω 1/2W
△12559703	FRN12N (Fusible)	33Ω 1/2W
△12559808	FRN12N (Fusible)	150Ω 1/2W
△12559821	FRN12N (Fusible)	330Ω 1/2W
△12559811	FRN12N (Fusible)	2.2Ω 1/2W
△13829845	CRH50FH01J	27Ω 1/2W
△13829860	CRH50FH01J	100Ω 1/2W
△13829162	CRH100FH11J	100Ω 1W
△13869301	MPC740.	33Ω 5W

POTENTIOMETER/ポリューム

13279944	EVJ-Y00F25A14	10KAx2	RETURN1, 2, PHONES
13279945	EVJ-Y81F25B24	20KBx2 C.D.	CH7, 8 HIGH, LOW
13279946	EVJ-Y81F25651	10KAC C.D.	CH7, 8 BALANCE
13279947	EVJ-Y00F25B14	10KBx2	CH7, 8 MON
13279948	EVJ-Y80F25B54	50KBx2	CH7, 8 SENS
13279949	EVJ-2Y0F25C24	20KCx2	CH1-6 MID FREQ
13279950	RK14K1230	20KBx2 C.D. C.T.	CH7, 8 EFF/REV
13279951	RK11K1130	20KB C.D.	CH1-6 HIGH, LOW, PAN
13279952	RK11K1130	10KB C.D.	CH1-6 MID LEVEL
13279953	RK11K1130	10KA	SEND (REV, EFF, MON)
13279954	RK11K1130	20KB C.D. C.T.	CH1-6 EFF/REV
13279955	RK11K1130	20KB	CH1-6 MON, REV TIME
13279956	RK11K1130	10KRD	CH1-6 SENS
13359363	RS30H12	10KWx2 Slide 30mm	GEQ
13339655	RS6011YA6	20KAx2 Slide 60mm	CH1-6, MASTER, SUBOUT
13359552	RS60112	20KAx2 Slide 60mm	CH7, 8
13299315	EVND2AA00B52	500B trimme	VR1 on L POWER AMP BOARD VR1 on R POWER AMP BOARD VR1 on REVERB BOARD
13299197	EVND4AA00B15	100KB trimmer	
		C.D.: Center Detent	
		C.T.: Center Tap	

CAPACITOR/コンデンサ

△13639155J0	SME16VB2200	2200uF/ 16V
△13649688	SME35VB3300	3300uF/ 35V
△13639256	SME100VB220	220uF/100V
△13639257	SME100VB470	470uF/100V
△13669223	ECOS1VP1033BA	10000uF/ 35V
△13659248	SMH63VNSN3900	3900uF/ 63V
13639158	NS-1	10uF/ 16V
13639159	NS-1	33uF/ 16V
13639122	NS-1	100uF/ 10V
13619704	NODN1VR33K	0.33uF/ 35V
13619706	NODN1VR68K	0.68uF/ 35V
13619708	NODN1V1R5K	1.5uF/ 35V
13619710	NODN1V3R3K	3.3uF/ 35V
13629150J0	SRA16VB100	100uF/ 16V
13629616	SRA35VB3R3	3.3uF/ 35V
13639274J0	SRA50VB	11uF/ 50V
13629203J0	SRA50VB2R2	2.2uF/ 50V
△13549401	ECQ-M1223KZ	0.022uF/100V
△13589445	ECQ-E1224KN	0.22uF/100V
△13529104	DE7150F472MVA1	0.0047uF
13639922M0	16N10CEA1CN100S (Nonpolar)	10uF/ 16V
13639944M0	50N10CEA1HN100S (Nonpolar)	10uF/ 50V
△13519738	DD06SL100D500V	10pF/500V
△13519739	DD06SL220K500V	22pF/500V
△13519721	DD06SL101K500V	100pF/500V
△13519741	DD11SL471K500V	470pF/500V
△13639227J0	SME63VB22	22uF/ 63V
△13639187J0	SME35VB22	22uF/ 35V

INDUCTOR, COIL/インダクタ, コイル

△2244021600	#216 1uH	INDUCTOR
13529180	EXC-EMT103DC	EMI FILTER

CRYSTAL, RESONATOR/クリスタル, 発振子

12389716	CSA8.00MS11 (8MHz)	Ceramic
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RELAY/リレー

13439228	AJY23295	
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FUSE, FUSE HOLDER/ヒューズ, ヒューズホルダー

△12559407	SM250V6.3A	100/117V
△12559421	GGL-8A	100/117V
△12559402	TSC3A-N1	100/117V
△12559335	T-GGS1A	100/117V
△12559609	CEE-3.15AF	230/240V
△12559608	SF8A	230/240V
△12559571	CEE-2.5AT	230/240V
△12559561	CEE-250MAT	230/240V
△12559563	CEE-400MAT	230/240V
△12199550	H0466	fuse holder φ 5.2
△12199593	H0105	fuse holder φ 6.3
△12199523	FH032	fuse holder 100/117V
△12199524	FH033	fuse holder 230/240V

CONNECTOR/コネクタ

13439370	5483-02AX	(2P)	
13439371	5483-03AX	(3P)	
13439372	5483-04AX	(4P)	
13439373	5483-05AX	(5P)	
13439374	5483-06AX	(6P)	
13439375	5483-07AX	(7P)	
13439377	5483-09AX	(9P)	
13439333	ILS-2P-S2T2-EF	(2P)	CH7, 8
13439330	ILS-3P-S2T2-EF	(3P)	CH5, 6
13439335	ILS-6P-S2T2-EF	(6P)	CH7, 8
13439296	ILS-7P-S2T2-EF	(7P)	
13429306	53025-0310	(3P)	CH5, 6
13429310	53025-0910	(9P)	CH7, 8
13369501	MDF7-25P-2.54DS	(25P)	CN36 on EQ Board
13429816	MDF7-25S-2.54DSA	(25P)	CN15 on CH CONTROL BOARD
13439313	5566-02A	(2P)	CN12 on POWER SUPPLY BOARD
13439326	5219-02A	(2P)	CN5 on L ch POWER AMP BOARD (Use for Type A)
13439306	5566-06A	(6P)	CN5 on L ch POWER AMP BOARD (Use for Type B)
13439494	5285-04A	(4P)	CN6 on POWER SUPPLY BOARD (Use for Type A)
13439497	5285-07A	(7P)	CN13 on POWER SUPPLY BOARD
13429662	XLB-3-31PCS-M01 (XLR connector)		CHANNEL INPUT (1-6ch)
13369581	B2B-EH		CN3, 7, 12, 15, 16 on MASTER BOARD (Use for Type C) CN9 on POWER SUPPLY BOARD
13369580	B3B-EH		CN5, 9, 10, 21, 28 on MASTER BOARD (Use for Type C) CN3 on CHANNEL CONTROL BOARD A/B CN1 - 3 on CHANNEL INPUT JACK BOARD A/B CN14 on VRGL BOARD
13369579	B4B-EH		CN24, 32 on MASTER BOARD (Use for Type C)
13369578	B5B-EH		CN2, 25 on MASTER BOARD (Use for Type C)
13369555	B6B-EH		CN13, 14, 18 on MASTER BOARD (Use for Type C) CN11 on POWER SUPPLY BOARD
13369576	B7B-EH		CN5 on INSERT JACK BOARD (Use for Type C)
13369575	B8B-EH		CN20 on MASTER BOARD (Use for Type C)
13369574	B9B-EH		CN1, 8 on MASTER BOARD (Use for Type C)
13369897	B14B-EH		CN4 on MASTER BOARD (Use for Type C)
13369563	B14B-PH-K-S		CN6 on MASTER BOARD (Use for Type C)
13369595	B3B-XH-A		CN16 on VRGL BOARD (Use for Type C)
13369540	B6B-XH-A		CN15 on VRGL BOARD (Use for Type C) CN10 on POWER SUPPLY BOARD
13369898	B2P3-VH		CN18 on Lch POWER AMP BOARD (Use for Type C) CN19 on Rch POWER AMP BOARD
13369899	B4P7-VH		CN17 on SP JACK BOARD

POWER TRANSFORMER/電源トランス

△22455587N0	100/117V
△22455588D0	230/240V

AC CORD (Installed)/ACコード (据え付け式)

13439847	VCTF2.5M BLACK 2x1.25	100V
△13439805S0	SJT# 18 3P	117V
△13439827	EP-528-E05	230V
△13499111	5722-660-4527	240VE (England)
△13439808S0	SP-305	240VA (Australia)

SCREWS/ネジ類

Table listing various screws with specifications like '3x 6 mm Binding Machine FeCm w/External tooth'.

MISCELLANEOUS/その他

Table listing miscellaneous parts such as 'CORD BUSH HOLDER', 'SNAP PLATE', 'STAND OFF', etc.

ACCESSORIES/標準付属品

Table listing accessories like 'Owner's Manual (English/Japanese common/共通)'.

PA-400 PARTS LIST/パーツリスト

SAFETY PRECAUTIONS and CONSIDERATIONS ON PARTS ORDERING sections with detailed instructions.

CASING/ケース

Table listing casing parts like 'Panel', 'Rear Panel', 'Bottom Cover', etc.

CHASSIS/シャーシ

Table listing chassis parts like 'Side Holder (L)', 'Power Sw Holder', 'Handle Holder', etc.

KNOB, BOTTON/ツマミ, ボタン

Table listing knob and button parts like 'Knob Large (大) orange (橙)', 'Knob Slider', etc.

SWITCH/スイッチ

Table listing switch parts like 'SPEC12 (push) 2 poles, shorting', 'SPEC31 (push) 3 keys, shorting', etc.

JACK, SOCKET/ジャック, ソケット

Table listing jack and socket parts like 'HLJ0523-01-3010', 'HLJ0523-01-3710', etc.

PCB ASSY/基板組立

Table listing PCB assembly parts like 'Reverb Board (pcb 2292579400)', 'Master Board', etc.

7117443002 Channel Board

NOTE: Channel Board consists of the following 8 PCBs. 注: チャンネル基板は下記の8点から構成されます.

Table listing channel board components like 'Channel Contorol Board A (pcb 2292579602 1/8)'.

NOTE: Type A, Type B and Type C of replacement Main Amp Board (220/240V) is incompatible for wiring.

Refer to the "RE: TYPE A, TYPE B AND TYPE C OF MAIN AMP BOARD (230/240V)" (P.13, 14) for details and below documents are common to Type A, Type B and Type C.

注: 補修用 Main Amp Board (230/240V) の Type A, Type B, Type C, ワイヤリングのため互換性がありませ...

NOTE: Main Amp Board (230/240V) consists of the following 9 PCBs.

Table listing main amp board components like 'L ch Power Amp Board (pcb 22925797\*\* 1/10)', 'R ch Power Amp Board', etc.

\*\*=00 (Type A) \*\*=01 (Type B) \*\*=02 (Type C)

NOTE: Replacement Main Amp Board is 230/240V versions only. 230/240V Version differs from 100/117V version only in fuse system.

Order proper fuses and fuse labels separately if necessary. (Refer to the table below) 注: 補修用 Main Amp Board として 230/240V が共通使用されます.

Table listing fuse and parts information for 100/117V and 220/240V versions.

IC/集積回路

Table listing IC components like 'uPC4570HA', 'NJM2068SD', 'NJM4565S', etc.

TRANSISTOR/トランジスタ

Table listing transistor components like '2SA970-GR', '2SA1015-GR', '2SA1265N-O', etc.

**DIODE/ダイオード**

15019125	1SS-133		
△15019103	1S-2473		
△15019252	1SS-84		
△15019165	EU1Z250V 0.25A		
△15019166	RU4Z250V 2 A		
△15039134	FMU-32S	D15, 18 on POWER AMP BOARD (Use for Type B, C)	
△15039118	S5688G		
△15019209T0	S-5500G		
△15019530	RD-6.8EB2	Zener Diode	
△15019529	RD-12EB1	Zener Diode	
15019424	MTZ3.3B	Zener Diode	Reverb Board
△15039105	1B4B1 LC-2	Bridge Diode	
△15019272	2B4B41 LC-2	Bridge Diode	
△15039123	10D4B41	Bridge Diode 200V 10A	
15029278	SLR 54VC3F	LED (red)	PROTECTION, PRE FADER PEAK
15029176	GL-107S12	Meter	LEDPEAK METER
15029301	LN21RPH-(TA)	LED (red)	CHANNEL
15029322	LN-242RPL	LED (red)	POWER

**RESISTOR/抵抗**

△12559717	FRN12N Fusible	3.3Ω 1/2W	
△12559703	FRN12N Fusible	33Ω 1/2W	
△12559808	FRN12N Fusible	150Ω 1/2W	
△12559821	FRN12N Fusible	330Ω 1/2W	
△12559707	FRN1/4W Fusible	100Ω 1/4W	
△13829845	CRH50FH01J	27Ω 1/2W	
△13829860	CRH50FH01J	100Ω 1/2W	
△13829162	CRH100FH11J	100Ω 1W	
△13829271	CRH200FH24J	270Ω 2W	
△13869301	MPC74	0.33Ω 5W	

**POTENTIOMETER/ポリューム**

13279944	EVJ-Y00F25A14	10KAx2	RETURN1, 2, PHONES
13279945	EVJ-Y81F25B24	20KBx2 C.D.	CH9, 10 HIGH, LOW
13279946	EVJ-Y81F25651	10KAC C.D.	CH9, 10 BALANCE
13279947	EVJ-Y00F25B14	10KBx2	CH9, 10 MON
13279948	EVJ-Y80F25B54	50KBx2	CH9, 10 SENS
13279949	EVJ-2Y0F25C24	20KCx2	CH1-8 MID FREQ
13279950	RK14K1230	20KBx2 C.D. C.T.	CH9, 10 EFF/REV
13279951	RK11K1130	20KB C.D.	CH1-8 HIGH, LOW
13279952	RK11K1130	10KB C.D.	CH1-8 MID LEVEL
13279953	RK11K1130	10KA	SEND (REV, EFF, MON)
13279954	RK11K1130	20KB C.D. C.T.	CH1-8 EFF/REV
13279955	RK11K1130	20KB	CH1-8 MON, REV TIME
13279956	RK11K1130	10KRD	CH1-8 SENS
13359363	RS30H12	10KWx2 30mm Slide	GEQ
13339655	RS6011YA6	20KAx2 60mm Slide	CH1-8, MASTER, SUBOUT
13359552	RS60112	20KAx2 60mm Slide	CH9, 10
13299315	EVND2AA00B52	500B trimmer	VR1 on Lch POWER AMP BOARD VR1 on Rch POWER AMP BOARD
13299197	EVND4AA00B15	100KB trimmer C.D.: Center Detent C.T.: Center Tap	VR1 on REVERB BOARD

**CAPACITOR/コンデンサ**

△13639155J0	SME16VB2200	2200uF/ 16V	
△13659239	SMG50VB3300	3300uF/ 50V	
△13639256	SME100VB220	220uF/100V	
△13639257	SME100VB470	470uF/100V	
△13659273	ECOS1HP103CA	10000uF/ 50V	
△13659248	SMH80VNSN3900	3900uF/ 80V	
13639158	NS-1	10uF/ 16V	
13639159	NS-1	33uF/ 16V	
13639122	NS-1	100uF/ 10V	
13619704	N0DN1VR33K	0.33uF/ 35V	
13619706	N0DN1VR68K	0.68uF/ 35V	
13619708	N0DN1V1R5K	1.5uF/ 35V	
13619710	N0DN1V3R3K	3.3uF/ 35V	
13629150J0	SRA16VB100	100uF/ 16V	
13629616	SRA35VB3R3	3.3uF/ 35V	
13639274J0	SRA50VB1	1uF/ 50V	
13629203J0	SRA50VB2R2	2.2uF/ 50V	
△13549401	ECQ-M1223KZ	0.022uF/100V	
△13589445	ECQ-E1224KN	0.22uF/100V	
△13529104	DE7150F472MVA1	0.0047uF	
13639922M0	16N10ECEA1CN100S (Nonpolar)	10uF/ 16V	
13639944M0	50N10ECEA1HN100S (Nonpolar)	10uF/ 50V	
△13519738	DD06SL100D500V	10pF/500V	
△13519742	DD07SL151K500V	150pF/500V	
△13519741	DD11SL471K500V	470pF/500V	
△13639241J0	SME100VB22	22uF/100V	
△13639207J0	SME50VB22	22uF/ 50V	
△13519743	ECKD2H221KB5	220pF/500V	

**INDUCTOR, COIL/インダクタ, コイル**

2244021600	#216 1uH	INDUCTOR	
13529180	EXC-EMT103DC	EMI FILTER	

**CRYSTAL, RESONATOR/クリスタル, 発振子**

12389716	CSA8.00MS11 (8MHz)	Ceramic	
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**RELAY/リレー**

13439228	AJY23295		
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**FUSE, FUSE HOLDER/ヒューズ, ヒューズホルダー**

△12559422	CES6N10A	100/117V	
△12559384	GGL-10A	100/117V	
△12559402	TSC3A-N1	100/117V	
△12559335	T-GGS1A	100/117V	
△12559610	CEE-6.3AF	230/240V	
△12559607	SF10A	230/240V	
△12559571	CEE-2.5AT	230/240V	
△12559561	CEE-250MAT	230/240V	
△12559563	CEE-400MAT	230/240V	
△12199550	H0466	fuse holder φ5.2	
△12199593	H0105	fuse holder φ6.3	
△12199523	FH032	fuse holder 100/117V	
△12199524	FH033	fuse holder 230/240V	

**CONNECTOR/コネクタ**

13439370	5483-02AX	(2P)	
13439371	5483-03AX	(3P)	
13439372	5483-04AX	(4P)	
13439373	5483-05AX	(5P)	
13439374	5483-06AX	(6P)	
13439375	5483-07AX	(7P)	
13439377	5483-09AX	(9P)	
13439333	ILS-2P-S2T2-EF	(2P)	
13439330	ILS-3P-S2T2-EF	(3P)	
13439335	ILS-6P-S2T2-EF	(6P)	
13439296	ILS-7P-S2T2-EF	(7P)	
13429306	53025-0310	(3P) CH7, 8	
13429310	53025-0910	(9P) CH9, 10	
13369501	MDF7-25P-2.54DS	(25P) CN36 on EQ BOARD	
13429816	MDF7-25S-2.54DSA	(25P) CN15 on CH CONTROL BOARD	
13439313	5566-02A	(2P) CN12 on POWER SUPPLY BOARD	
13439326	5219-02A	(2P) CN5 on Lch POWER AMP BOARD (Use for Type A)	
13439306	5566-06A	(6P) CN5 on Lch POWER AMP BOARD (Use for Type B)	
13439494	5285-04A	(4P) CN6 on POWER SUPPLY BOARD (Use for Type A)	
13439497	5285-07A	(7P) CN13 on POWER SUPPLY BOARD	
13429662	XLB-3-31PCS-M01 (XLR connector)	CHANNEL INPUT (1-8ch)	
13369581	B2B-EH	CN3, 7, 12, 15, 16 on MASTER BOARD (Use for Type C) CN9 on POWER SUPPLY BOARD	
13369580	B3B-EH	CN5, 9, 10, 21, 28 on MASTER BOARD (Use for Type C)	
13369579	B4B-EH	CN24, 32 on MASTER BOARD (Use for Type C)	
13369578	B5B-EH	CN2, 25 on MASTER BOARD (Use for Type C)	
13369555	B6B-EH	CN13, 14, 18 on MASTER BOARD (Use for Type C) CN11 on POWER SUPPLY BOARD	
13369576	B7B-EH	CN5 on INSERT JACK BOARD (Use for Type C)	
13369575	B8B-EH	CN20 on MASTER BOARD (Use for Type C)	
13369574	B9B-EH	CN1, 8 on MASTER BOARD (Use for Type C)	
13369897	B14B-EH	CN4 on MASTER BOARD (Use for Type C)	
13369567	B14B-PH-K-S	CN6 on MASTER BOARD (Use for Type C)	
13369595	B3B-XH-A	CN16 on VRGL BOARD (Use for Type C)	
13369540	B6B-XH-A	CN15 on VRGL BOARD (Use for Type C) CN10 on POWER SUPPLY BOARD	
13369898	B2P3-VH	CN18 on Lch POWER AMP BOARD (Use for Type C) CN19 on Rch POWER AMP BOARD	
13369899	B4P7-VH	CN17 on SP JACK BOARD (Use for Type C)	

**POWER TRANSFORMER/電源トランス**

22455586N0	100/117V		
22455589D0	230/240V		

**AC CORD (Installed)/ACコード (据え付け式)**

△13439847	VCTF2.5M BLACK 2x1.25	100V	
△13439805S0	SJT #18 3P	117V	
△13439827	EP-528-E05	230V	
△13499111	5722-660-4527	240VE (England)	
△13439808S0	SP-305	240VA (Australia)	

**SCREWS/ネジ類**

*****	3x 6 mm Binding Machine FeCm w/External tooth		
*****	3x 8 mm Binding Machine FeBC w/Internal tooth		
*****	5x 25 mm Flat FeBC		
*****	3x 16 mm Binding B tight FeCm		
*****	3x 6 mm Binding B tight FeBC		
*****	3x 6 mm Binding B tight FeCm		
*****	3x 8 mm Binding B tight FeBC		
*****	3x 8 mm Binding B tight FeCm		
*****	3x 6 mm SEMS FeCm		
*****	3x 8 mm SEMS FeCm		
*****	4x 8 mm W-SEMS FeBC		
*****	5x 10 mm W-SEMS FeBC		
*****	3x 20 mm W-SEMS FeCm		
*****	3x 10 mm W-SEMS FeCm		
*****	4x 8 mm Binding Machine FeBC		

**MISCELLANEOUS/その他**

△22205408	CORD BUSH HOLDER	100V, 240VE (England)	
△22205331	CORD BUSH HOLDER	117V	
22205332	CORD BUSH HOLDER	230V, 240VA (Australia)	
△12369531	KR-51 CORD BUSHING	100V, 240VE (England), 240VA (Australia)	
△12369532	KR-61 CORD BUSHING	117V	
△12369533	KR-41 CORD BUSHING	230V	
*****	SNAP PLATE	HLJ-0999-01-480	PHONES JACK
2215050100	STAND OFF	#501 3 x 10mm	
2215050900	STAND OFF	#509 3 x 13mm	
2215050700	STAND OFF	3 x 52mm	
2215052400	BOSS NUT	#524 3 x 8mm	
22155548	BOSS NUT	#548 3 x 25mm	
12195590	LOCKING CARD SPACER	LCBS-6	
12199596	LOCKING CARD SPACER	KGLS-7S	
12199569	LOCKING CARD SPACER	KGLS-12RT (black)	
12199594	LOCKING CARD SPACER	KGLS-8K	
12199595	LOCKING CARD SPACER	LCBS-4	
12199584	TERMINAL	M1698	
12159715	TB-300	COLLER/BUSHING (MALE)	
12159734	TA-307	COLLER/BUSHING (FEMALE)	
22245549	MASTER FADER MASK		
22245551	GEQ VR MASK		
22245553	CHANNEL FADER MASK		
22165577	SPACER 216-577		
12559734	THERMAL PROTECTOR	T100BR1U1	SW1 on POWER AMP BOARD
12469158	HEAT SINK	SL-7-BS-T	Lch, Rch POWER AMP BOARD
22465514	HEAT SINK		
13459179	BINDING POST/ スピーカー・ターミナル	LTS0420-1002	SPEAKERS B
22245563	VR MASK A (Use for Type C)		
22245576	VR MASK B (Use for Type C)		
22245577	VR MASK C (Use for Type C)		
22245578	VR MASK D (Use for Type C)		
22245215	FADER MASK (Use for Type C)		
12159904	EDGE HOLDER EH-11V (Use for Type C)		
12159905	EDGE HOLDER EH-18V (Use for Type C)		

**ACCESSORIES/標準付属品**

26035261	Owner's Manual (English/Japanese common/共通)		
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# RE: TYPE A, TYPE B AND TYPE C OF MAIN AMP BOARD (230/240V)

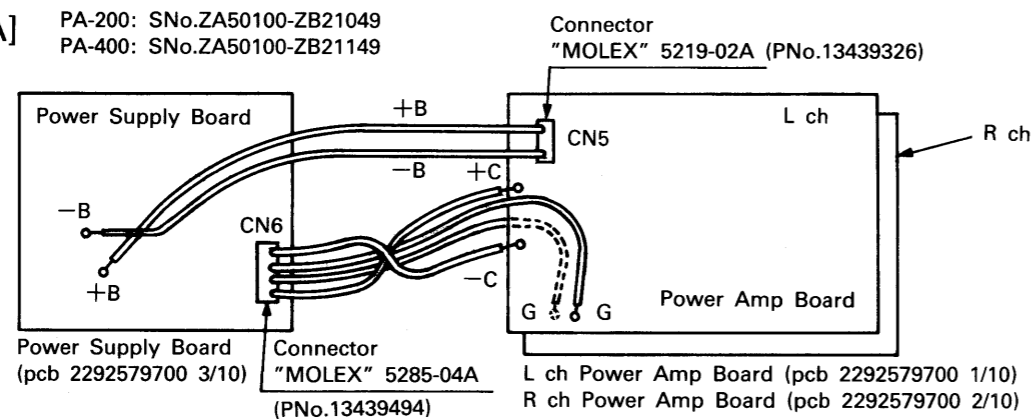
The following sentences apply to both the PA-200 and PA-400:

—Differences between Types A, B and C—

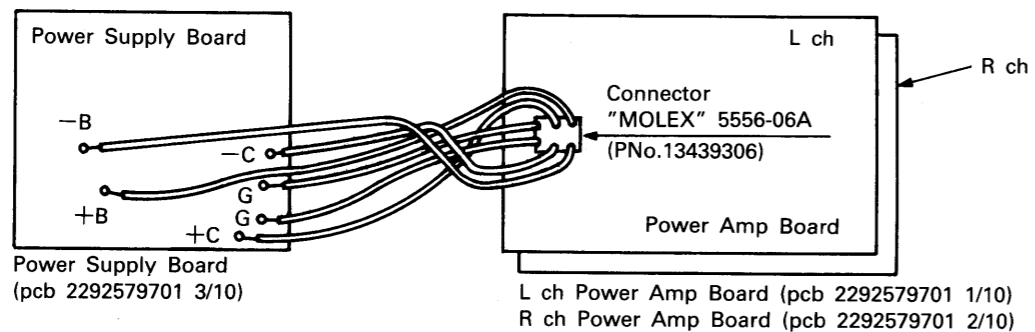
a) Type A and Type B are different in wiring connecting the "Power Supply Board" and "L and R ch Power Amp Boards" and in diodes on the "L and R ch Power Amp Boards". (See Fig. 1.) Due to the incompatibility of the "Power Supply Board" and "L and R ch Power Amp Boards", these boards must be changed with care, i.e. Type A cannot be used instead of Type B and vice versa. The other boards comprising the Main Amp Board are common to Types A and B.

1. Change of "Power Supply Board—L, R ch Power Amp Board" wiring.

[Type A] PA-200: SNo.ZA50100-ZB21049  
PA-400: SNo.ZA50100-ZB21149

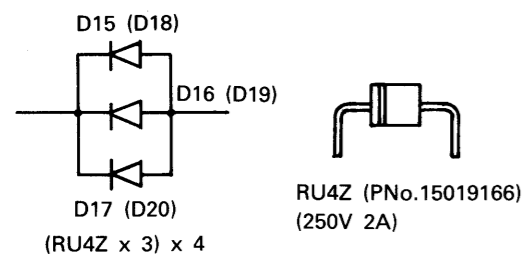


[Type B] PA-200: SNo.ZB31050-up/以降  
PA-400: SNo.ZB31150-up/以降



2. Change of Diodes (D15 - D20) on the L, R ch Power Amp Board.

[Type A] PA-200: SNo.ZA50100-ZB21049  
PA-400: SNo.ZA50100-ZB21149



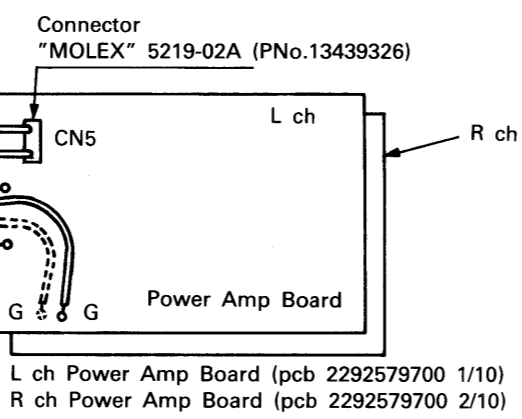
# Main Amp Board (230/240V)の Type A, Type B, Type C について

以下の文章は、PA-200、PA-400 に共通の内容です。

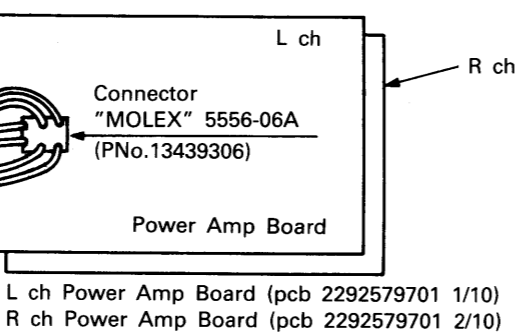
—Type A, Type B, Type C の相違点—

a) Type A と Type B は、"Power Supply Board" と "L, R ch Power Amp Board" を接続するワイヤリングと "L, R ch Power Amp Board" 上のダイオードが違います。(図1参照) "Power Supply Board" と "L, R ch Power Amp Board" には、相性がありますので基板交換時には注意が必要です。つまり、Type A と Type B の混用は不可ですので注意して下さい。他の Main Amp Board を構成する基板は、Type A, Type B 共通です。

1. "Power Supply Board" と "L, R ch Power Amp Board" を接続するワイヤリングを変更。

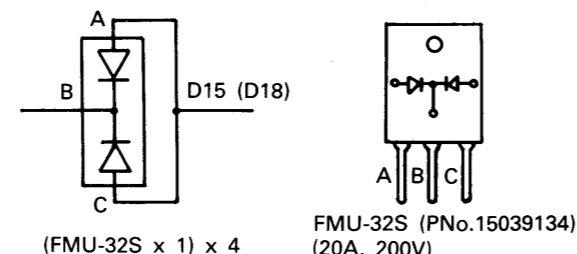


[Type B, C] PA-200: SNo.ZB31050-up/以降  
PA-400: SNo.ZB31150-up/以降



2. "L, R ch Power Amp Board" 上のダイオード (D15～D20) を変更。

[Type B, C] PA-200: SNo.ZB31050-up/以降  
PA-400: SNo.ZB31150-up/以降



b) Type B and Type C are different in wiring and connectors connecting the "Power Supply Board", "L and R ch Power Amp Boards", "SP Jack Board", "SP Terminal Board" and "VRGL Board". (See Fig. 2.)

Note that Type B cannot be used instead of Type C and vice versa.

The other boards comprising the Main Amp Board are common to Types B and C.

b) Type B と Type C は、"Power Supply Board", "L, R ch Power Amp Board", "SP Jack Board", "SP Terminal Board", "VRGL Board" を、それぞれ接続するワイヤリング、コネクタが違います。(図2参照)

Type B と Type C の混用は不可ですので注意して下さい。

その他の Main Amp Board を構成する基板は、Type B, Type C 共通です。

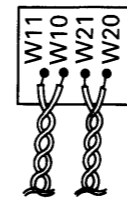
## SP Jack Board

## Lch Power Amp Board

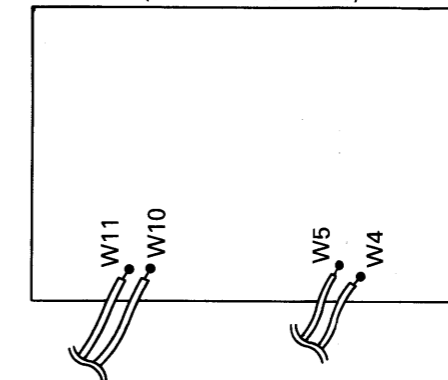
## Rch Power Amp Board

[Type B] PA-200: SNo.ZB31150-ZC41899  
PA-400: SNo.ZB31150-ZC52849

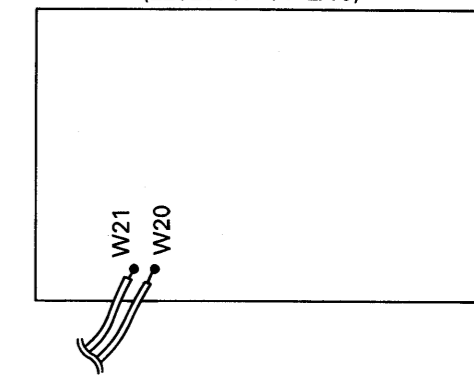
(22925797 01 4/10)



(22925797 01 1/10)

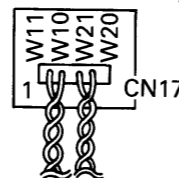


(22925797 01 2/10)

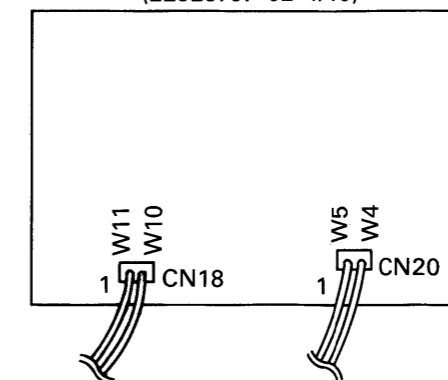


[Type C] PA-200: SNo.ZD11900-up/以降  
PA-400: SNo.ZC62850-up/以降

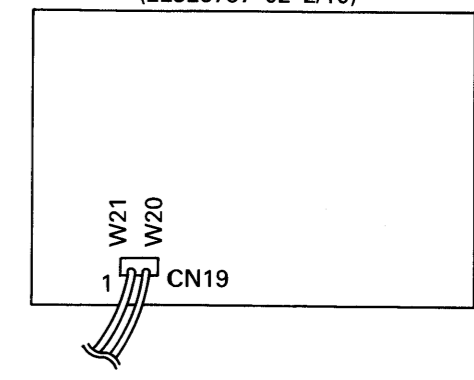
(22925797 02 4/10)



(22925797 02 1/10)



(22925797 02 2/10)



c) Since Types A and C are incompatible, Type A cannot be used in place of Type C and vice versa.

c) Type A と Type C は、全く互換性はありませんので、Type A と Type C の混用は不可です。



Parts Ordering Information

\* Types A, B and C of the repair boards are incompatible because of their wiring. Please order any repair board after checking its serial number.

	PA-200	PA-400
Type A	SNo.ZA50100 - ZB21049 (PNo.7117554400)	SNo.ZA50100 - ZB21149 (PNo.7117454400)
Type B	SNo.ZB31150 - ZC41899 (PNo.7117554401)	SNo.ZB31150 - ZC52849 (PNo.7117454401)
Type C	SNo.ZD11900 -up/以降 (PNo.7117554402)	SNo.ZC62850 -up/以降 (PNo.7117454402)

\* If Type A or B specified in your purchase order is out of stock, the board of Type C will be supplied. In this case, change the board with the following precautions:

(Note: When the board of Type B is used with the product of Type A, change the "Power Supply Board" and "L and R ch Power Amp Boards" at the same time.)

- Step 1. Change the "L and R ch Power Amp Boards", "SP Jack Board" and "SP Terminal Board" as a set at the same time.
- Step 2. Change the "Power Supply Board" and "VRGL Board" as a set at the same time.
- Step 3. If, in step 1, the "Shield" is not provided with an "edge holder", tear the tube of Type A, Type B, wind it around the wiring area contacting the "Shield", and fix it to the "Shield" with a sub-tie.

\* If the repair board of Type C is used with the product of Type A or B, the product specifications remain unchanged.

オーダー上の注意点

補修用基板の Type A, B, C は、ワイヤリングのため互換性がありません。  
補修用基板をオーダーする場合は、シリアル・ナンバーを確認してオーダーして下さい。

\*また、Type A, B をオーダーされても、当社に在庫が無い場合は Type C の基板を供給しますので、下記の点に注意して交換して下さい。

(注: Type A の製品に Type B の基板を使用する場合は、"Power Supply Board" と "L, R ch Power Amp Board" を同時に交換して下さい。)

- 手順 1. "L, R ch Power Amp Board", "SP Jack Board", "SP Terminal Board" は、セットで同時に交換して下さい。
- 手順 2. "Power Supply Board", "VRGL Board" は、セットで同時に交換して下さい。
- 手順 3. 手順 1 をおこなう場合、"Shield" に "エッジ・ホルダー" が付いていない製品に関しては、Type A, Type B のチューブを裂いて、それを "Shield" に接触する部分のワイヤリングに巻きサブタイで "Shield" に固定して下さい。

\*Type C の補修用基板を、Type A, B の製品に使用しても、製品の仕様は変わりません。

ADJUSTMENT

1. IDOLING (Lch/Rch Power Amp Board)

- Keep AC source to the rated voltage on the unit's nameplate during adjustments.
- Dieconnect the DC voltmeter to be used from any ground points (IDRING only)
- Do not attempt adjustment while the unit is overlated (above 50°C or 120°F) at the power heatsinks.
- Allow at least 10 for warm up period
- INPUT ..... no signal
- SP OUT ..... no load
- MASTER FADER ..... MIN

Connect the DC voltmeter between any pair of test points of a channel. Adjust the VR1 for 10mV reading. (The locations of test points and "VR1" is common) to both Type A, Type B and Type C.

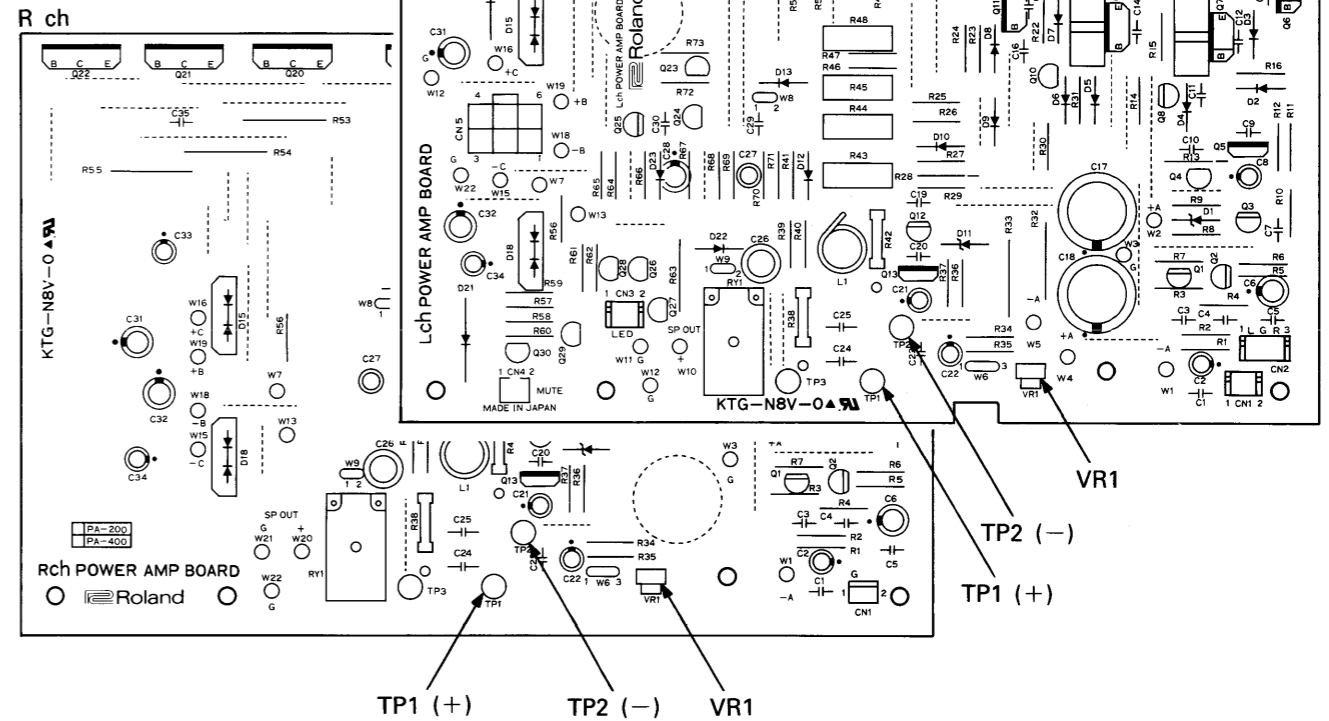
調整仕様

1. アイドリング (Lch/Rch Power Amp Board)

- 注) •長時間又は過負荷使用で、ヒートシンクが過熱している場合は50°C以下になってから行うこと。  
•測定器のGNDはアースされていないこと。(アイドル調整のみ)

電源電圧を定格電圧に合わせる  
 入力 ..... 無信号  
 SP-OUT ..... 無負荷  
 MASTER FADER ..... MIN  
 電源 SW ON してから10秒後に、下表の各テスト・ポイント間の電圧が、10mVDC になる様に各 Ch の VR1 を調整する。(テスト・ポイントと "VR1" の位置は、Type A, Type B, Type C とも共通です。)

Fig. A. Power Amp Board



2. A/D/A BIAS (Reverb Board)

- 2-1. Connect an oscilloscope to TP1 on Reverb board (GND → Chassis) (RANGE :50mV/div. 5us/div .AC coupling)
- 2-2. Adjust VR1 on Reverb Board for A ≤10mV as shown in Fig. C.

オシロスコープを Reverb Board の TP1 に接続する。(グラウンドはシャーシからとること) (レンジ:50mV/div. 5us/div, AC 接続)

Fig. C の "A" (電位差) が 10mV 以下になる様に基板上の VR1 を調整する。

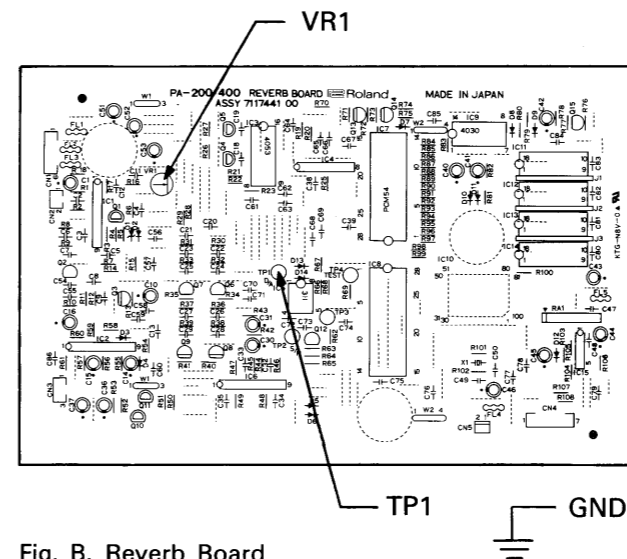


Fig. B. Reverb Board

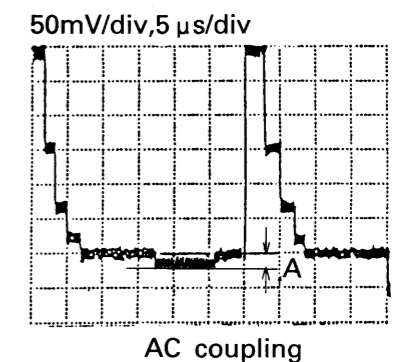
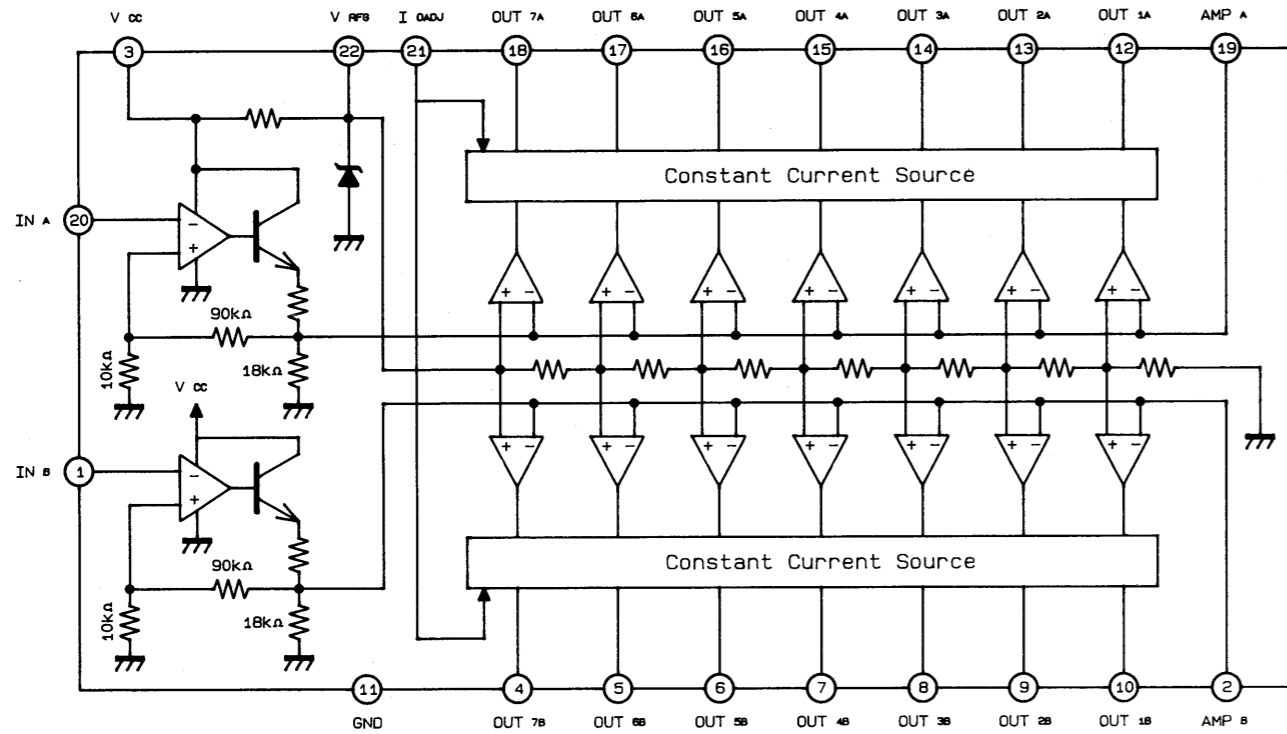


Fig. C (DA OUT)

IC DATA

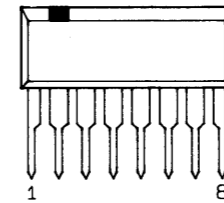
7-Dotx2-Channel  
LED Display Driver  
IR2E28 (15209130)



Note: Each OP amp is electrically incompatible with the others though pin-for-pin compatible. Replacement must be only the OP amp specified on the circuit diagram.

注: 各OP .ampは、足ピン配置は同じですが、性能の互換性はありません。修理する際は、回路図で指定されたOP .ampを使用して下さい。

OP Amp  
BA15218N (15189235)  
M5238L (15189188)

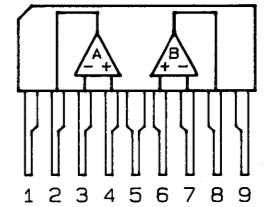


- 1. OUTPUT A
- 2. -INPUT A
- 3. +INPUT A
- 4. V-
- 5. +INPUT B
- 6. -INPUT B
- 7. OUTPUT B
- 8. V+

Note: Each OP amp is electrically incompatible with the others though pin-for-pin compatible. Replacement must be only the OP amp specified on the circuit diagram.

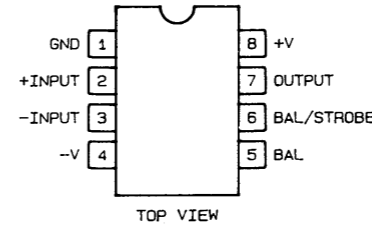
注: 各OP .ampは、足ピン配置は同じですが、性能の互換性はありません。修理する際は、回路図で指定されたOP .ampを使用して下さい。

OP Amp  
uPC4570HA (15189189),  
NJM4556S (15189201),  
NJM4565SD (15189242),  
NJM2068SD (15189192)

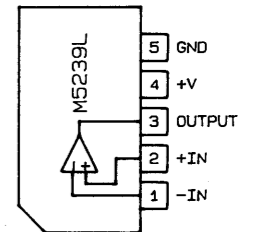


- 1. V+
- 2. OUTPUT A
- 3. -INPUT A
- 4. +INPUT A
- 5. V-
- 6. +INPUT B
- 7. -INPUT B
- 8. OUTPUT B
- 9. V+

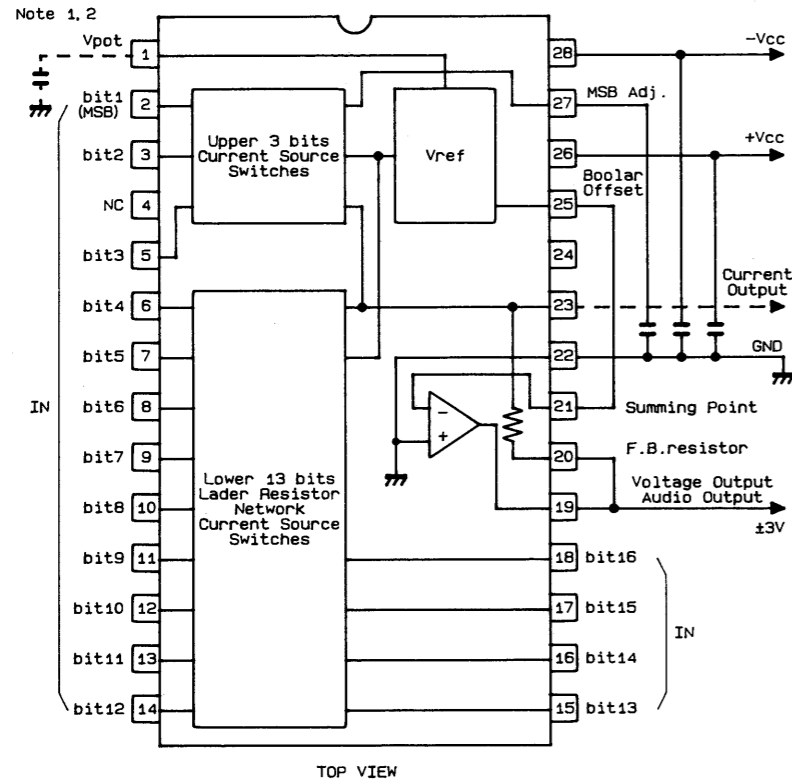
Comparator  
NJM311D  
(15189111J1)



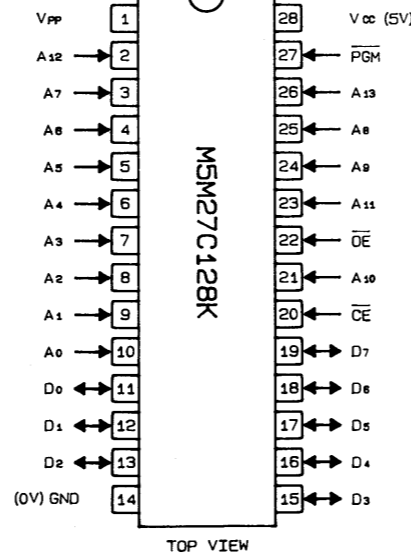
Comparator  
M5239L  
(15189202)



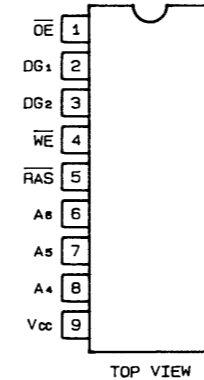
D/A Converter  
(IC7 on Reverb Board)  
PCM54 (15219162)



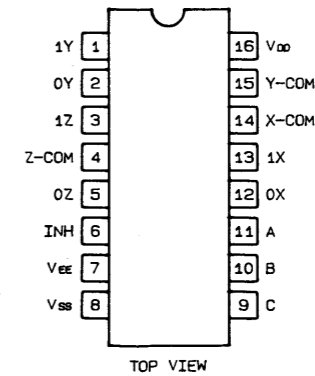
EP ROM  
(IC8 on Reverb Board)  
M5M27C128K-2  
(15449197: program)  
(15179799: blank)



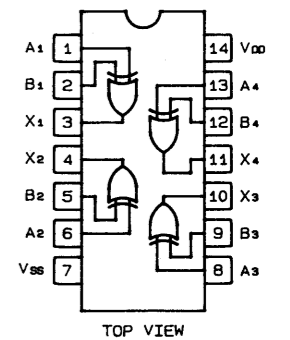
D RAM  
(IC11-14 on RB)  
MB81416-10  
(15179376)



Analog SW  
BU4053BP  
(15159129D0)



Quad EX OR Gate  
BU4030BP  
(15159110D0)



**CHANGE INFORMATION**

**変更案内**

—MAIN AMP BOARD—

—MAIN AMP BOARD—

◎Main Amp Board:  
Relayout of pattern and change of components and deleted surface parts and components.

◎Main Amp Boardのパターン修正, 部品変更, 部品削除, 裏付け部品の削除

Changed parts: Wiring,  
Connector  
(5219-02A (PNo.13439326)  
→ 5566-06A (PNo.13439306))  
Diode  
(RU4Z (PNo.15019166)  
→ FMU-32S (PNo.15039134))

部品変更: ワイヤリング,  
コネクター  
(5219-02A (PNo.13439326)  
→ 5566-06A (PNo.13439306))  
ダイオード  
(RU4Z (PNo.15019166)  
→ FMU-32S (PNo.15039134))

Deleted parts: Connector  
5285-04A

部品削除: コネクター 5285-04A  
実施製番: ZB31050 以降 (PA-200)  
ZB31150 以降 (PA-400)

EFF. SNo. : ZB31050 -up (PA-200)  
ZB31150 -up (PA-400)

理由 : 発振対策のため。

Reason : To prevent unusual oscillation.

◎SP Jack Board (pcb 2292579700 4/10):

◎SP Jack Board (pcb 2292579700 4/10):

Relayout of foil pattern and surface mounting of jumper wire on rear side.  
(See Fig. A for details.)

パターン修正とジャンパー線の裏付け。  
(詳細は, Fig. A 参照)

EFF. SNo. : ZA50100—ZB21049 (PA-200)  
ZA50100—ZB21149 (PA-400)

実施製番: ZA50100—ZB21049 (PA-200)  
ZA50100—ZB21149 (PA-400)

Reason : To improve circuit response characteristic.

理由 : 特性改善のため。

—CHANNEL BOARD—

—CHANNEL BOARD—

◎Channel Board:  
Relayout of pattern, addition of components and surface mount. (See Fig. B for details.)

◎Channel Boardのパターン修正, 部品追加(裏付け)  
(詳しくは, Fig. B 参照)

Added parts: R1 (47Ω), R30 (1kΩ), C37 (0.0012μF) and jumper.

部品追加: R1(47Ω), R30(1kΩ), C37(0.0012μF),  
ジャンパー線

EFF. SNo. : ZA50100—ZB21049 (PA-200)  
ZA50100—ZB21149 (PA-400)

実施製番: ZA50100—ZB21049 (PA-200)  
ZA50100—ZB21149 (PA-400)

Reason : To improve circuit response characteristic.

理由 : 特性改善のため。

◎Channel Board:

◎Channel Boardのパターン修正

Relayout of pattern.

EFF. SNo. : ZB31050 -up (PA-200)  
ZB31150 -up (PA-400)

実施製番: ZB31050 以降 (PA-200)  
ZB31150 以降 (PA-400)

Reason : To delete surface parts.

理由 : 裏付け部品の削除のため。

—MASTER BOARD—

—MASTER BOARD—

◎GEQ Board (pcb 2292579500 3/12):  
Relayout of pattern and addition of components.

◎GEQ Board (pcb 2292579500 3/12):  
パターン修正と部品追加

Added parts: C151-154 (0.1uF/25V)

部品追加: C151-154(0.1uF/25V)

EFF. SNo. : ZB31050 -up (PA-200)  
ZB31150 -up (PA-400)

実施製番: ZB31050 以降 (PA-200)  
ZB31150 以降 (PA-400)

Reason : To prevent unusual oscillation.

理由 : 発振対策のため。

