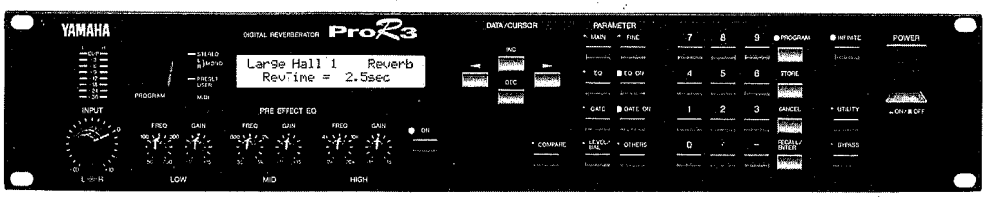
DIGITAL REVERBERATOR

ProR3

SERVICE MANUAL



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PA 011300
19951201-150000

YAMAHA CORP.
HAMAMATSU, JAPAN
2.665K-382 Ⓚ Printed in Japan '95.12

IMPORTANT NOTICE

This manual has been provided for the use of authorized Yamaha Retailers and their service personnel. It has been assumed that basic service procedures inherent to the industry, and more specifically Yamaha Products, are already known and understood by the users, and have therefore not been restated.

WARNING: Failure to follow appropriate service and safety procedures when servicing this product may result in personal injury, destruction of expensive components and failure of the product to perform as specified. For these reasons, we advise all Yamaha product owners that all service required should be performed by an authorized Yamaha Retailer or the appointed service representative.

IMPORTANT: The presentation or sale of this manual to any individual or firm does not constitute authorization, certification, recognition of any applicable technical capabilities, or establish a principal-agent relationship of any form.

The data provided is believed to be accurate and applicable to the unit(s) indicated on the cover. The research, engineering, and service departments of Yamaha are continually striving to improve Yamaha products. Modifications are, therefore, inevitable and changes in specification are subject to change without notice or obligation to retrofit. Should any discrepancy appear to exist, please contact the distributor's Service Division.

WARNING: Static discharges can destroy expensive components. Discharge any static electricity your body may have accumulated by grounding yourself to the ground buss in the unit (heavy gauge black wires connect to this buss).

IMPORTANT: Turn the unit OFF during disassembly and parts replacement. Recheck all work before you apply power to the unit.

This product uses a lithium battery for memory back-up.

WARNING: Lithium batteries are dangerous because they can be exploded by improper handling. Observe the following precautions when handling or replacing lithium batteries.

- Leave battery replacement to qualified service personnel.
- Always replace with batteries of the same type.
- When installing on the PC board, solder using the connection terminals provided on the battery cells. Never solder directly to the cells. Perform the soldering as quickly as possible.
- Never reverse the battery polarities when installing.
- Do not short the batteries.
- Do not attempt to recharge these batteries.
- Do not disassemble the batteries.
- Never heat batteries or throw them into fire.

ADVARSEL!
Lithiumbatteri. Eksplosionsfare.
Udskiftning ma kun foretages af en sagkyndig, og som beskrevet i servicemanualen.

WARNING: CHEMICAL CONTENT NOTICE!

The solder used in the production of this product contains LEAD. In addition, other electrical/electronic and/or plastic (where applicable) components may also contain traces of chemicals found by the California Health and Welfare Agency (and possibly other entities) to cause cancer and/or birth defects or other reproductive harm.

DO NOT PLACE SOLDER, ELECTRICAL/ELECTRONIC OR PLASTIC COMPONENTS IN YOUR MOUTH FOR ANY REASON WHAT SO EVER!

Avoid prolonged, unprotected contact between solder and your skin! When soldering, do not inhale solder fumes or expose eyes to solder/flux vapor!

If you come in contact with solder or components located inside the enclosure of this product, wash your hands before handling food.

■ WARNING

Components having special characteristics are marked ⚠ and must be replaced with parts having specification equal to those originally installed.

⚠ 印の部品は、安全を維持するために重要な部品です。交換する場合は、安全のため必ず指定の部品をご使用下さい。

■SPECIFICATIONS

Audio Characteristics	Frequency response	20 Hz ~ 20 kHz, +1.0 dB, –1.5 dB
	Dynamic range	110 dB (typical), not less than 104 dB
	Hum and noise *1	less than –80 dB *2
	Distortion	less than 0.007% (1 kHz, maximum level)
Input	Number of channels	2 (balanced signal)
	Nominal level	+4 dB / –10 dB *2
	Maximum level	+24 dB (with level switch at +4 dB) *2
	Impedance	20 kΩ
Output	Number of channels	2 (balanced signal)
	Nominal level	+4 dB / –10 dB *2
	Maximum level	+24 dB (with level switch at +4 dB) *2
	Impedance	150 Ω
A/D and D/A Convertors	A/D convertors	20-bit linear
	D/A convertors	20-bit linear
	Sampling frequency	44.1 kHz
Program Memory	Preset programs	1 ~ 90
	User programs	1 ~ 90
MIDI Control	Program change, Control change, Bulk dump, Note ON, Parameter change	
Power Requirements	USA and Canada	120V AC, 60 Hz
	General	230V AC, 50 Hz
Power Consumption	35W	
Dimensions (W × D × H)	480 × 398.5 × 89 mm	
Weight	5.5 kg	
Front panel	Controls	INPUT Level
		PRE EFFECT EQ - FREQ × 3 (LOW, MID, HIGH)
		PRE EFFECT EQ - GAIN × 3 (LOW, MID, HIGH)
	Buttons	ON (PRE EFFECT EQ) *3, ◄ (left CURSOR button), ► (right CURSOR button), INC (DATA button) DEC (DATA button), COMPARE *3, MAIN *3 FINE *3, EQ *3, EQ ON *3, GATE *3, GATE ON *3 LEVEL/BAL *3, OTHERS *3, Numeric keypad (including "-" and "." buttons), PROGRAM *3, STORE, CANCEL RECALL/ENTER, INFINITE *3, UTILITY *3, BYPASS *3
	Switch	POWER
	Displays	24 character × 2 lines LCD 8-segment LED – INPUT level meters × 2 7-segment LED – PROGRAM number 6-segment LED – Status indicators Button LED indicators × 14
Rear Panel	Connectors	INPUT L/R (XLR-3-31 × 2) and (1/4" phone jacks × 2) OUTPUT L/R (XLR-3-32 × 2) and (1/4" phone jacks × 2) MIDI – IN, OUT, THRU (5P DIN × 3)
	Switches	Level switch (+4/–10) × 2

*1 Hum & Noise are measured with a filter equivalent to a 20 Hz to 20 kHz band-pass filter that has an infinite dB/octave attenuation.
*2 0 dB = 0.755 Vrms.
*3 LED above the button.

■総合仕様

オーディオ特性	周波数特性	20Hz～20kHz, +1.0dB, −1.5dB
	ダイナミックレンジ	110dB Typ(104dB以上)
	HUM&NOISE *1	−80dB以下 *2
	歪率	0.007%以下(MAX. LEVEL 1kHz)
入力	チャンネル数	2(電子バランス)
	定格入力	+4/−10dB(レベル切替SW付)*2
	最大入力	+24dB(レベル切替SW：+4dB時)
	入力インピーダンス	20kΩ
出力	チャンネル数	2(電子バランス)
	定格出力	+4/−10dB(レベル切替SW付)*2
	最大出力	+24dB(レベル切替SW：+4dB時)*2
	出力インピーダンス	150Ω
A/D, D/A変換	A/D変換	20ビットリニア
	D/A変換	20ビットリニア
	サンプリング周波数	44.1kHz
メモリー	プリセット	1～90
	ユーザー	1～90
MIDIコントロール	プログラムチェンジ、コントロールチェンジ、バルクダンプ、ノートON、パラメーターチェンジ	
電源電圧	100V 50/60Hz	
定格消費電力	30W	
最大外形寸法(W×D×H)	480×398.5×89mm	
重量	5.5kg	
フロントパネル	コントロール	INPUT LEVEL PRE EFFECT EQ FREQ×3(LOW, MID, HIGH) PRE EFFECT EQ GAIN×3(LOW, MID, HIGH)
	キー	(PRE EFFECT EQ)ON*, ◄, ►, INC, DEC, COMPARE*, MAIN*, FINE*, GATE*, GATE ON*, LEVEL/BAL*, EQ*, EQ ON*, OTHERS*, テンキー(0～9), ・, −, PROGRAM*, STORE, CANCEL, RECALL/ENTER, INFINITE*, UTILITY*, BYPASS*
	表示	24文字×2行 LCD 8素子LED×2(レベルメーター) 7セグメントLED(プログラムナンバー) 6素子LED(モードインジケーター) キーLED×14(上記＊印参照)
リアパネル	コネクター	INPUT L/R (XLR×2)(フォーンジャック×2) OUTPUT L/R (XLR×2)(フォーンジャック×2) MIDI IN, OUT, THRU (5P DIN×3)
	スイッチ	レベル切替SW×2(+4/−10)

*1 20Hz～20kHzに等価なバンドパスフィルターで測定。

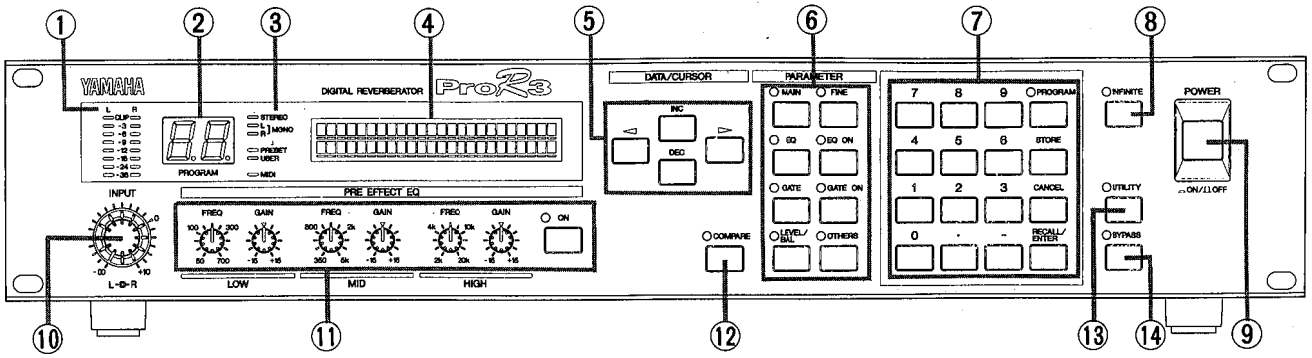
*2 0dB=0.755Vrms

* はキーLED付を表わす

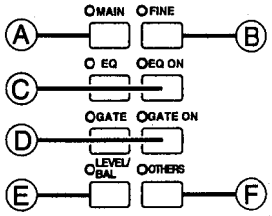
この製品は電気用品取締法の定める技術水準に適してます。

■PANEL LAYOUT(パネルレイアウト)

● Front Panel (フロントパネル)

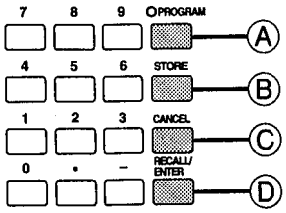


1 INPUT level meters (L/R)
2 PROGRAM number display
3 Status indicators
STEREO, L/R MONO, PRESET/USER, MIDI
4 LCD
5 DATA/CURSOR keys
6 PARAMETER keys
6-A MAIN key
6-B FINE key
6-C EQ, EQ ON keys



	LOW	MID	HIGH
Type	Peaking/Shelving	Peaking	Peaking/Shelving
Gain	±15 dB	±15 dB	±15 dB
Frequency	32 Hz to 2.2 kHz	250 Hz to 5.6 kHz	500 Hz to 20 kHz
Q	0.1 to 5.0	0.1 to 5.0	0.1 to 5.0

6-D GATE, GATE ON keys
6-E LEVEL/BAL key
6-F OTHERS key
7 Numeric keys
7-A PROGRAM key
7-B STORE key
7-C CANCEL key
7-D RECALL/ENTER key



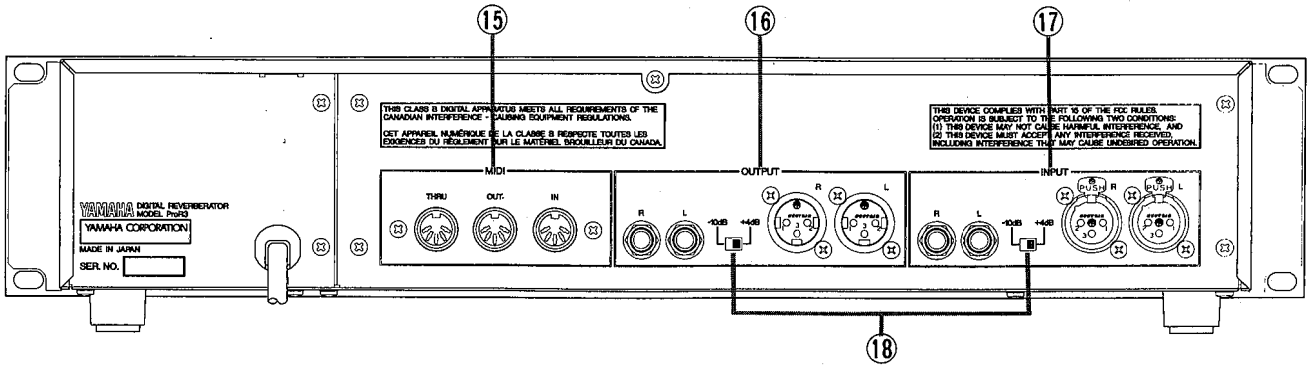
8 INFINITE key
9 POWER switch
10 INPUT level control (L, R)
11 PRE EFFECT EQ, ON controls

	LOW	MID	HIGH
Frequency	50 Hz to 700 Hz	350 Hz to 5 kHz	2 kHz to 20 kHz
Gain	±15 dB	±15 dB	±15 dB

12 COMPARE key
13 UTILITY key
14 BYPASS key

1 INPUTレベルメーター(L/R)
2 PROGRAMナンバー・ディスプレイ
3 ステータス・インジケーター
STEREO, L/R MONO, PRESET/USER, MIDI
4 LCD
5 DATA/CURSORキー
6 PARAMETERキー
6-A MAINキー
6-B FINEキー
6-C EQ、ONキー
6-D GATE、ONキー
6-E LEVEL/BALキー
6-F OTHERSキー
7 テンキー
7-A PROGRAMキー
7-B STOREキー
7-C CANCELキー
7-D RECALL/ENTERキー
8 INFINITEキー
9 POWERスイッチ
10 INPUTレベルコントロール(L、R)
11 PRE EFFECT EQ、ONコントロール
12 COMPAREキー
13 UTILITYキー
14 BYPASSキー

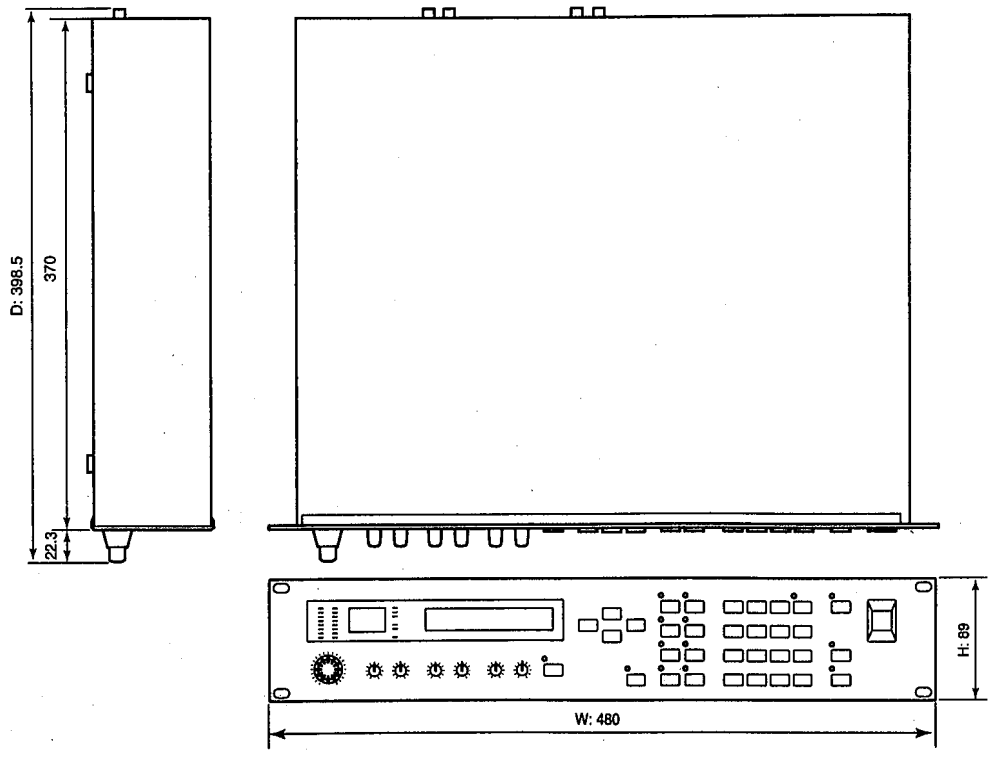
● Rear Panel（リアパネル）



15 MIDI connectors
16 OUTPUT jacks
17 INPUT jacks
18 Level select switches

15 MIDI端子
16 OUTPUT端子
17 INPUT端子
18 レベル切り替えスイッチ

■DIMENSIONS（寸法図）



Unit: mm
（単位）

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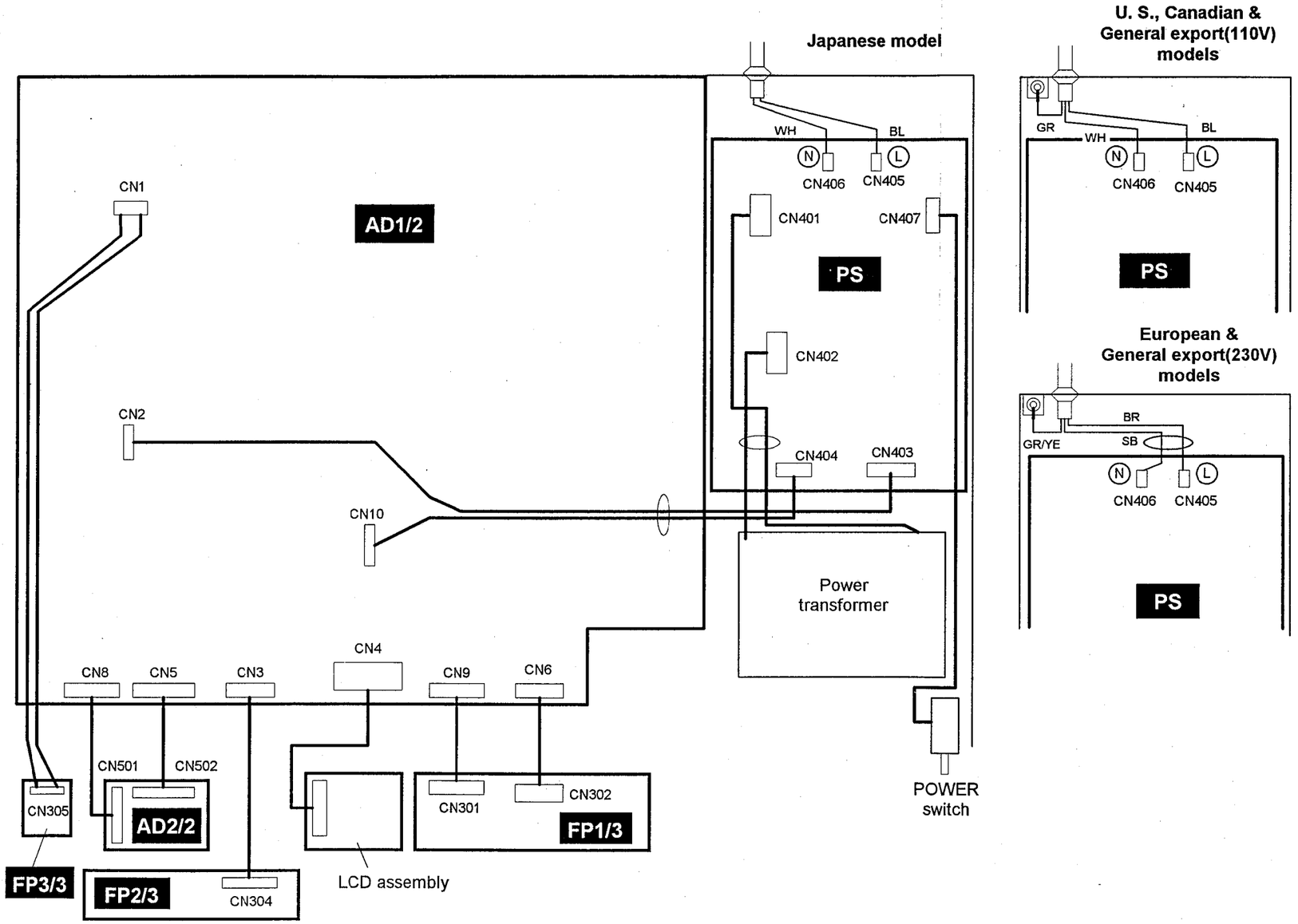
■CIRCUIT BOARD LAYOUT（ユニットレイアウト）



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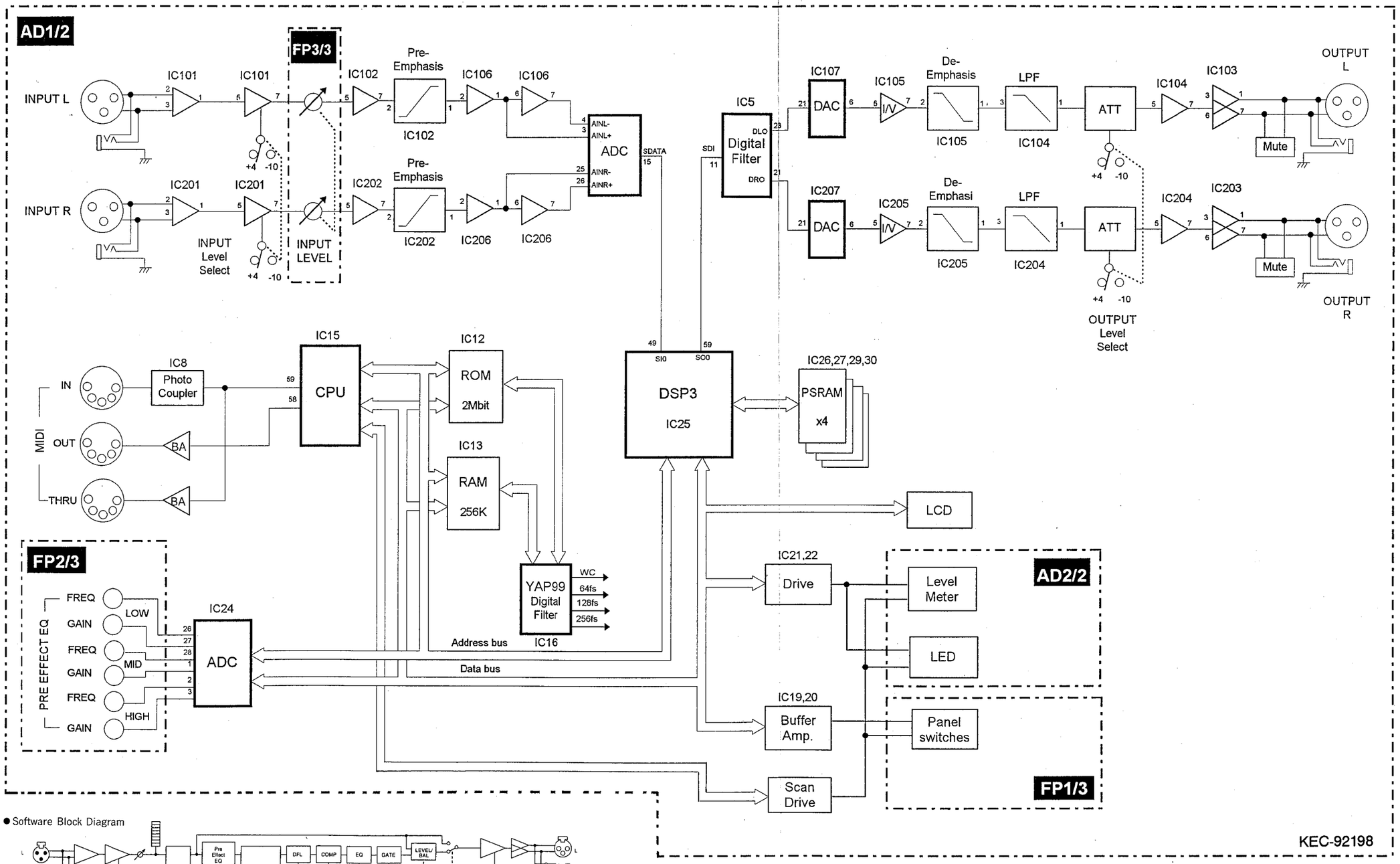
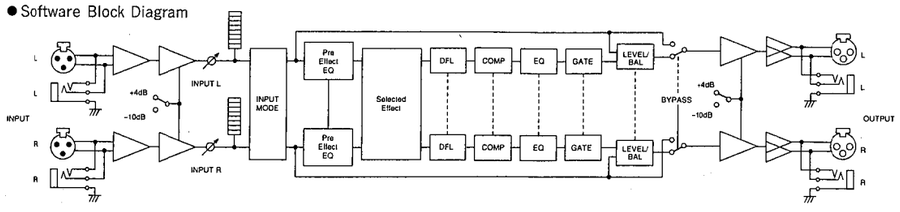
■BLOCK DIAGRAM（ブロックダイアグラム）



● Software Block Diagram



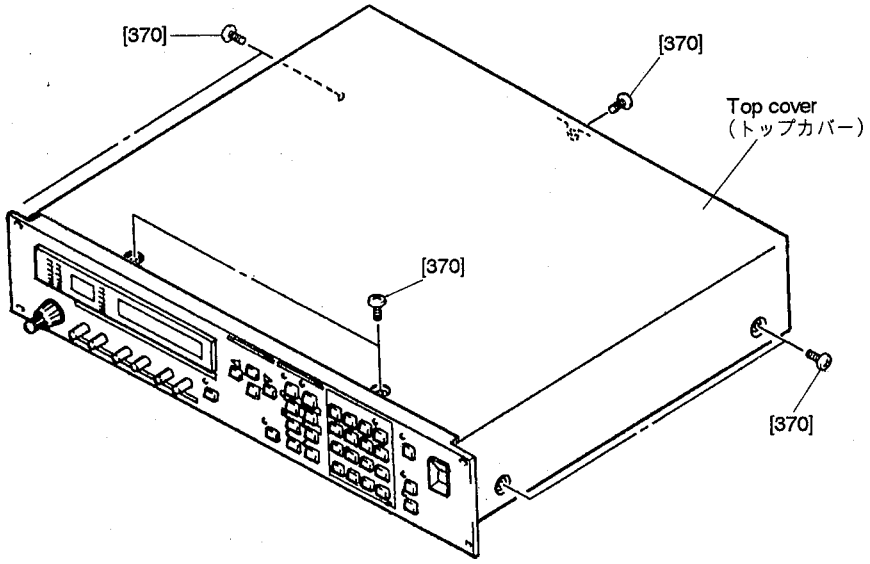
■DISASSEMBLY PROCEDURE（分解手順）

1 Top Cover

1-1 Remove the seven (7) screws marked as [370], then the top cover can be removed. (Fig. 1)

1 トップカバー

1-1 [370]のネジ 7 本を外して、トップカバーを外します。（図 1）



[370]: Bonding Tapping Screw-B 3.0X8 MFZN2BL (VN413300) +ボンディングBタイト

(Fig. 1)

2 Bottom Cover

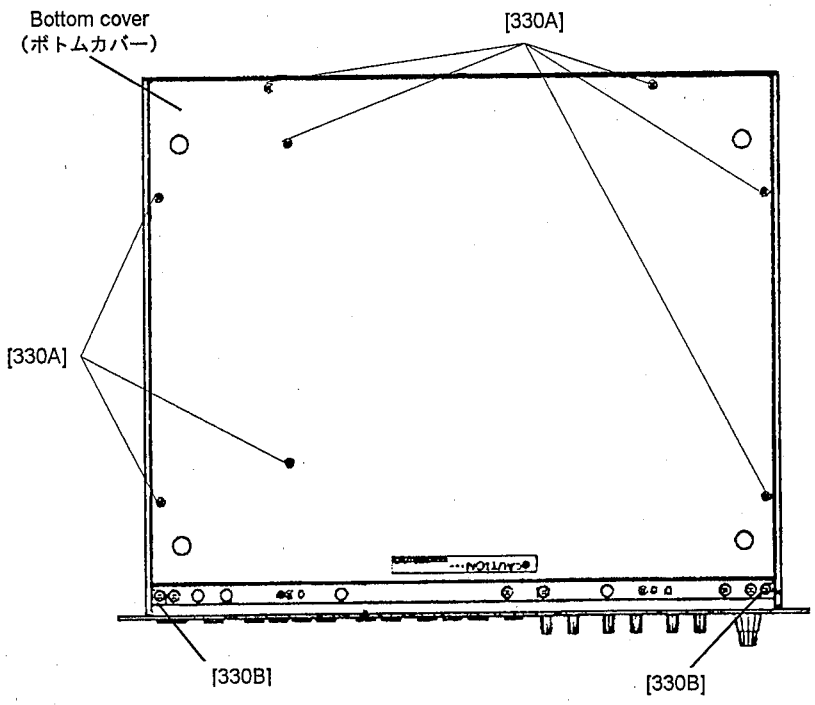
2-1 Remove the two (2) screws marked as [330A] and six (6) screws marked as [330B], then the bottom cover can be removed. (Fig. 2)

※ This will give you access to the pattern side of the AD1/2 and PS circuit boards.

2 ボトムカバー

2-1 [330A]のネジ 8 本を外して、ボトムカバーを外します。（図 2）

※ ボトムカバーを外すと、AD シートと PS シートをパターン側からチェックすることができます。



[330]: Bonding Tapping Screw-B 3.0X8 MFZN2BL (VN413300) +ボンディングBタイト

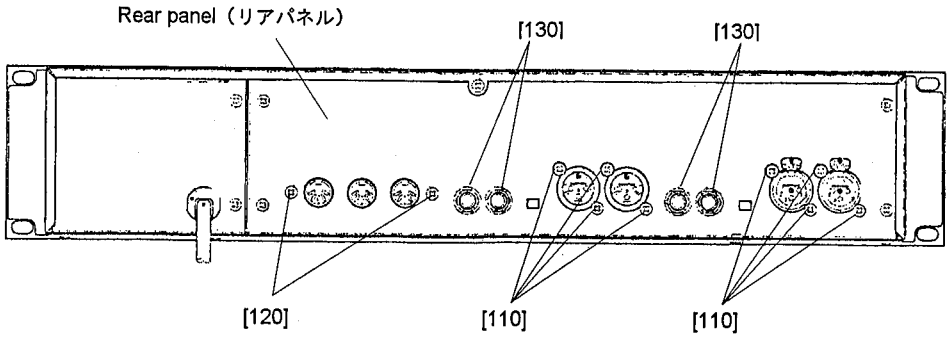
(Fig. 2)

3 AD1/2 Circuit Board

3-1 Remove the top cover. (See procedure 1.)
3-2 Remove the eight (8) screws marked as [110] and two (2) screws marked as [12A] and four (4) hexagonal nuts marked as [130]. (Fig. 3)
3-3 After the four (4) screws marked as [150] have been removed, then the AD1/2 circuit board can be removed. (Fig. 4)

3 AD1/2 シート

3-1 トップカバーを外します。（1 項参照）
3-2 [110]のネジ 8 本と[120A]のネジ 2 本と[130]の六角ナット 4 個を外します。（図 3）
3-3 [150]のネジ 4 本を外して、AD1/2 シートを外します。（図 4）



[110]: Bonding Tapping Screw-B 3.0X6 MFZN2BL (VR144900) ボンディングBタイト
[120]: Bind Head Tapping Screw-B 3.0X8 MFZN2BL (EP600190) ＋バインドBタイト
[130]: Hexagonal Nut 9.0 12X2 MFNI33 (LX200060) 特殊六角ナット

(Fig. 3)

4 PS Circuit Board

4-1 Remove the top cover. (See procedure 1.)
4-2 Remove the three (3) screws marked as [170] and two (2) screws marked as [175], then the PS circuit board can be removed. (Fig. 4)

5 Power Transformer

5-1 Remove the top cover. (See procedure 1.)
5-2 Remove the three (3) screws marked as [210], then remove the power transformer with the holder. (Fig. 4)
5-3 Remove the two (2) screws marked as [200], then the holder can be removed from the power transformer. (Fig. 4)

6 Front Panel Assembly

6-1 Remove the top cover. (See procedure 1.)
6-2 Remove the bottom cover. (See procedure 2.)
6-3 Remove the two (2) screws marked as [90] and three (3) screws marked as [95], then disconnect the connectors, then the front panel assembly can be removed. (Fig. 4)

4 PS シート

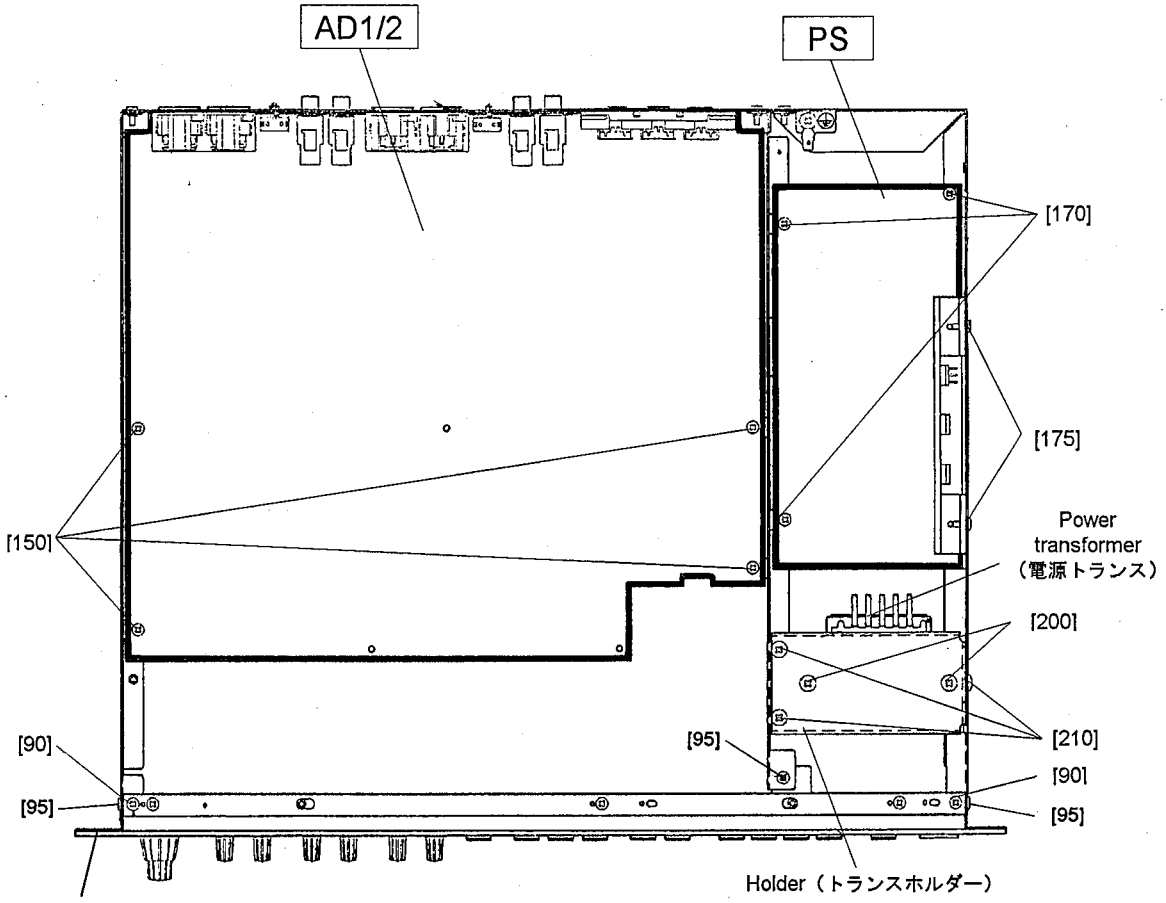
4-1 トップカバーを外します。（1 項参照）
4-2 [170]のネジ 3 本と[175]のネジ 2 本を外して、PS シートを外します。（図 4）

5 電源トランス

5-1 トップカバーを外します。（1 項参照）
5-2 [210]のネジ 3 本を外して、トランスホルダーと共に電源トランスを外します。（図 4）
5-3 [200]のネジ 2 本を外して、電源トランスからトランスホルダーを外します。（図 4）

6 フロントパネル Ass'y

6-1 トップカバーを外します。（1 項参照）
6-2 ボトムカバーを外します。（2 項参照）
6-3 [330B]のネジ 2 本を外します。（図 2）
6-4 [90]のネジ 2 本と[95]のネジ 3 本を外し、コネクターを外してフロントパネル Ass'y を外します。（図 4）



The lithium battery is not a part of the AD1/2 circuit board. When you replace the circuit board, you must install a battery in the battery holder.

リチウム電池は、AD1/2シートの構成部品ではありません。シート交換時には、リチウム電池を取り付けて下さい。

[90]: Bind Head Tapping Screw-B 3.0X8 MFZN2BL (EP600190) ＋バインドBタイト
[95]: Bonding Tapping Screw-B 3.0X8 MFZN2BL (VN413300) ＋ボンディングBタイト
[150]: Bind Head Tapping Screw-B 3.0X8 MFZN2BL (EP600190) ＋バインドBタイト
[170]: Bind Head Tapping Screw-B 3.0X8 MFZN2BL (EP600190) ＋バインドBタイト
[175]: Bonding Tapping Screw-B 3.0X8 MFZN2BL (VN413300) ＋ボンディングBタイト
[200]: Bind Head Tapping Screw-C 4.0X6 MFZN2BL (VR414400) ＋バインドCタイト
[210]: Bind Head Tapping Screw-C 4.0X6 MFZN2BL (VR414400) ＋バインドCタイト

(Fig. 4)

7 FP1/3, FP2/3, FP3/3, AD2/2, LCD Assembly and POWER switch

7-1 Remove the top cover. (See procedure 1.)
7-2 Remove the bottom cover. (See procedure 2.)
7-3 Remove the front panel assembly. (See procedure 6.)
7-4 Remove the six (6) screws marked as [140], then remove the front panel. (Fig. 5)
7-5 Remove the two (2) screws marked as [80], then the FP1/3 circuit board can be removed. (Fig. 5)

7 FP1/3 シートと FP2/3 シートと FP3/3 シートと AD2/2 シートと LCD Ass'y と POWER スイッチ

7-1 トップカバーを外します。（1 項参照）
7-2 ボトムカバーを外します。（2 項参照）
7-3 フロントパネル Ass'y を外します。（6 項参照）
7-4 [140]のネジ 6 本を外し、フロントパネルを外します。（図 5）

7-6 Remove the INPUT level control knobs, and remove the hexagonal nut marked as [130], then the FP3/3 circuit board can be removed. (Fig. 5)

7-7 Remove the screw marked as [120B], then the AD2/2 circuit board can be removed. (Fig. 5)

7-8 Remove the POWER switch knob, and remove the two (2) screws marked as [60], then the POWER switch can be removed. (Fig. 5)

7-9 Remove the screw marked as [100], then the LCD assembly can be removed. (Fig. 5)

7-10 Pull off the FREQ and GAIN control knobs, and remove the two (2) screws marked as [170], then remove the FP2/3 circuit board with the sub-chassis. (Fig. 5)
Remove the six (6) hexagonal nuts marked as [160], then the sub-chassis can be removed from the FP2/3 circuit board. (Fig. 5)

7-5 [80]のネジ 2 本を外して、FP1/3 シートを外します。（図 5）

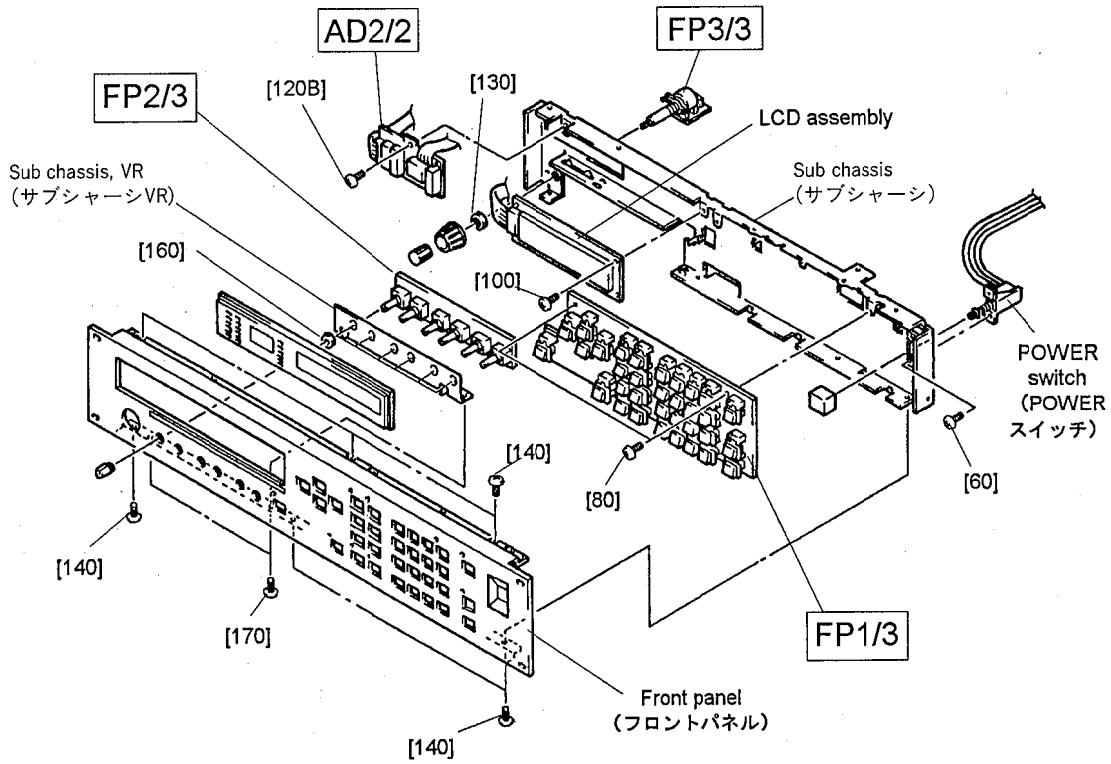
7-6 INPUT レベルコントロールツマミ 2 個を外し、[130]の特殊六角ナット 1 個を外して、FP3/3 シートを外します。（図 5）

7-7 [120B]のネジ 1 本を外して、AD2/2 シートを外します。（図 5）

7-8 POWER スイッチツマミを外し、[60]のネジ 2 本を外して、POWER スイッチを外します。（図 5）

7-9 [100]のネジ 1 本を外して、LCD Ass'y を外します。（図 5）

7-10 FREQ と GAIN コントロールのツマミ各々3 個を外し、[170]のネジ 2 本を外してサブシャーシと共に FP2/3 シートを外します。（図 5）
[160]の特殊六角ナット 6 個を外し、FP2/3 シートからサブシャーシを外します。（図 5）



[60]: Bind Head Screw 3.0X8 MFZN2BL (VB659000) +バインド小ネジ
[80]: Bind Head Tapping Screw-B 3.0X8 MFZN2BL (EP600190) +バインドBタイト
[100]: Pan Head Screw 2.6X5 MFZN2BL (VR144700) +ナベ小ネジ
[120]: Bind Head Tapping Screw-B 3.0X8 MFZN2BL (EP600190) +バインドBタイト
[130]: Hexagonal Nut 9.0X11X2 MFZN2BL (VJ388000) 特殊六角ナット
[140]: Bonding Tapping Screw-B 3.0X8 MFZN2BL (VN413300) +ボンディングBタイト
[160]: Hexagonal Nut 9.0X11X2 MFZN2BL (VJ388000) 特殊六角ナット
[170]: Bind Head Tapping Screw-B 3.0X8 MFZN2BL (EP600190) +バインドBタイト

(Fig. 5)

■LSI PIN DESCRIPTION (LSI 端子機能表)

• HD6435208A00P (XK278A00) CPU <H8/520>

PIN NO.	NAME	I/O	FUNCTION	PIN NO.	NAME	I/O	FUNCTION
1	EXT	I	Clock	33	A7	O	Address bus
2	EXTAL	I		34	A8	O	
3	/WAIT	I	Bus cycle wait	35	A9	O	
4	/IRQ0	O	Interrupt request	36	A10	O	
5	A18	O	Address bus	37	A11	O	
6	A17	O		38	A12	O	
7	A16	O		39	A13	O	
8	/AS	O	Address strobe	40	A14	O	
9	/RD	O	Read strobe	41	A15	O	
10	/WR	O	Write strobe	42	AVCC		Analog power supply
11	VCC		Power supply	43	P50	O	Port 5
12	MD0	I	Mode select	44	P51	O	
13	MD1	I		45	P52	O	
14	MD2	I		46	P53	O	
15	/RES	I	Reset	47	P54	O	
16	NMI	I	Non-maskable interrupt request	48	P55	O	
17	VSS		Ground	49	P56	O	
18	D0	I/O	Data bus	50	P57	O	
19	D1	I/O		51	VSS		Ground
20	D2	I/O		52	AVSS		Analog ground
21	D3	I/O		53	AN0	I	Analog data input
22	D4	I/O		54	AN1	I	
23	D5	I/O		55	AN2	I	
24	D6	I/O		56	AN3	I	
25	D7	I/O		57	AVCC		Analog power supply
26	A0	O	Address bus	58	TXD2	O	Transmit data
27	A1	O		59	RXD2	I	Receive data
28	A2	O		60	A19	O	Address bus
29	A3	O		61	TXD1	O	Transmit data
30	A4	O		62	RXD1	I	Receive data
31	A5	O		63	SCLK	I	Clock for serial operation
32	A6	O		64	VSS		Ground

• YSF210 (XK280A00) 8 time Over Sampling Digital Filter

PIN NO.	NAME	I/O	FUNCTION	PIN NO.	NAME	I/O	FUNCTION
1	XO	O	System clock	13	OBIT1	I	Output bit selection
2	XI	I		14	OBIT2	I	
3	Vss2		Ground				
4	BCI	I	Bit clock				
5	SDSY	I	L/R select and input timing				
6	IBIT1	I	Input bit selection	15	NC	—	No connection
7	IBIT2	I		16	ASY	I	Synchronous/Asynchronous system clock selection
8	IBIT3	I		17	Vss1		Ground
9	MUTE	I	Mute	18	BCO	O	Bit clock of DLO, DRO
10	NC	—	No connection	19	WCO	O	Word clock of DLO, DRO
11	SDI	I	Input data	20	SHL	O	Deglich signal of L/R channel
12	VDD2		Power supply	21	DRO	O	Output data of R channel
				22	NC	—	No connection
				23	DLO	O	Output data of L channel
				24	VDD1		Power supply

Input bit selection

	22 bit	20 bit	18 bit	16 bit	AV-DSP	MEL
IBIT1	H	L	H	L	H	L
IBIT2	H	H	L	L	H	H
IBIT3	H	H	H	H	L	L

Output bit selection

	22 bit	20 bit	18 bit	no output
OBIT1	H	L	H	L
OBIT2	H	H	L	L

• YSS228-F (XQ962A00) DSP3 (Digital Signal Processor)

PIN NO.	NAME	I/O	FUNCTION	PIN NO.	NAME	I/O	FUNCTION
1	VSS		Ground	81	VSS		Ground
2	XI	I	System master clock input(60M or 30MHz)	82	DB13	I/O	
3	XO	O	System master clock output(60M or 30MHz)	83	DB14	I/O	
4	VDD		Power supply	84	DB15	I/O	
5	/SYNCI	I	System synch. signal input	85	DB16	I/O	
6	/SYNCO	O	System synch. signal output	86	DB17	I/O	
7	CKI	I	System clock input (30MHz)	87	DB18	I/O	
8	CKO	O	System clock output (30MHz)	88	DB19	I/O	
9	CKSEL	I	System master clock select(0:60MHz,1:30MHz)	89	DB20	I/O	
10	VSS		Ground	90	DB21	I/O	
11	MCKS	I	Master clock for serial I/O(128xFs)	91	DB22	I/O	Parallel data bus
12	/SSYNC	I	Synch. signal for serial I/O	92	DB23	I/O	
13	/IC	I	Initial clear	93	DB24	I/O	
14	/TEST	I	Test mode setting	94	DB25	I/O	
15	BTYP	I	CPU data bus 8/16 bit select(0:8,1:16)	95	DB26	I/O	
16	/IRQ	O	Interrupt request	96	DB27	I/O	
17	TRIG	I/O	Trigger signal	97	DB28	I/O	
18	VDD		Power supply	98	DB29	I/O	
19	VSS		Ground	99	DB30	I/O	
20	/CS	I	Chip select	100	DB31	I/O	
21	/DS	I	Data strobe	101	TIMO/DBOE	I/O	Timing signal/Parallel data bus control
22	R/W	I	Read/Write select	102	VSS		Ground
23	CA7	I		103	VDD		Power supply
24	CA6	I		104	DA00	I/O	
25	CA5	I		105	DA01	I/O	
26	CA4	I	CPU address bus	106	DA02	I/O	
27	CA3	I		107	DA03	I/O	
28	CA2	I		108	DA04	I/O	
29	CA1	I		109	DA05	I/O	
30	CA0/CD15	I/O	CPU address/data bus	110	DA06	I/O	
31	CD14	I/O		111	DA07	I/O	External memory data bus
32	CD13	I/O		112	DA08	I/O	
33	CD12	I/O		113	DA09	I/O	
34	CD11	I/O		114	DA10	I/O	
35	CD10	I/O	CPU data bus	115	DA11	I/O	
36	CD09	I/O		116	DA12	I/O	
37	CD08	I/O		117	DA13	I/O	
38	CD07	I/O		118	DA14	I/O	
39	CD06	I/O		119	DA15	I/O	
40	VSS		Ground	120	VSS		Ground
41	VDD		Power supply	121	VDD		Power supply
42	CD05	I/O		122	DA16	I/O	
43	CD04	I/O		123	DA17	I/O	
44	CD03	I/O	CPU data bus	124	DA18	I/O	
45	CD02	I/O		125	DA19	I/O	
46	CD01	I/O		126	DA20	I/O	
47	CD00	I/O		127	DA21	I/O	
48	/DTACK	O	DTACK signal output	128	DA22	I/O	
49	SI0	I		129	DA23	I/O	External memory data bus
50	SI1	I		130	DA24	I/O	
51	SI2	I		131	DA25	I/O	
52	SI3	I	Serial data input	132	DA26	I/O	
53	SI4	I		133	DA27	I/O	
54	SI5	I		134	DA28	I/O	
55	SI6	I		135	DA29	I/O	
56	SI7	I		136	DA30	I/O	
57	VSS		Ground	137	DA31	I/O	
58	VDD		Power supply	138	VDD		Power supply
59	SO0	O		139	VSS		Ground
60	SO1	O		140	A00	O	
61	SO2	O		141	A01	O	
62	SO3	O	Serial data output	142	A02	O	
63	SO4	O		143	A03	O	
64	SO5	O		144	A04	O	
65	SO6	O		145	A05	O	
66	SO7	O		146	A06	O	External memory address bus
67	DB00	I/O		147	A07	O	
68	DB01	I/O		148	A08	O	
69	DB02	I/O		149	A09	O	
70	DB03	I/O		150	A10	O	
71	DB04	I/O		151	A11	O	
72	DB05	I/O	Parallel data bus	152	A12	O	
73	DB06	I/O		153	A13	O	
74	DB07	I/O		154	A14	O	
75	DB08	I/O		155	A15/RAS	O	External memory address bus/Row address strobe
76	DB09	I/O		156	A16/CAS	O	External memory address bus/Column address strove
77	DB10	I/O		157	A17/CE	O	External memory address bus/Chip enable
78	DB11	I/O		158	/WE	O	External memory write enable
79	DB12	I/O		159	/OE	O	External memory output enable
80	VDD		Power supply	160	VDD		Power supply

• YSP99 LZ95D59 (XM047A00) Gate Array

PIN NO.	NAME	I/O	FUNCTION	PIN NO.	NAME	I/O	FUNCTION
1	NC			41	A9	I	} CPU address bus
2	MCLK	O	Master clock	42	A8	I	
3	DESYN	O	Sync for DEQIC	43	CD2	I	} CARD page select
4	CDO4	I	} Control data input	44	CD1	I	
5	CDO3	I		45	CDROM	I	CARD/ROM select
6	CDO2	I		46	ROM4	I	} ROM page control
7	CDO1	I		47	ROM3	I	
8	CDI4	O	Control data output (DSP2)	48	ROM2	I	
9	CDI3	O	Control data output (MOD)	49	ROM1	I	
10	CDI2	O	Control data output (DEQ IC17)	50	YY2	I	} Dividing select
11	CDI1	O	Control data output (DEQ IC19)	51	YY1	I	
12	+Vcc			52	GND		
13	GND			53	+Vcc		
14	L4	O	} LED scan pulse	54	SEL2	I	} Control data select
15	L3	O		55	SEL1	I	
16	L2	O		56	XX2	I	LED scan data
17	L1	O		57	XX1	I	
18	LCD	O	LCD enable	58	MDCK	O	MIDI clock
19	KEYN	O	KEY enable	59	TRGO	O	Trigger out
20	LED	O	LED enable	60	E	I	
21	CDA14	O	} CARD address	61	RWN	I	Read write pulse
22	CDA13	O		62	ICN	I	Initial clear
23	CARDN	O	CARD enable	63	ACIA	O	ACIA enable
24	GND			64	GND		
25	RAWN	O	RAM write enable	65	TXD	I	DSP control data input
26	RAON	O	RAM read enable	66	RXD	O	DSP control data output
27	RMA16	O	} ROM address bank select	67	XCLK	O	Transfer clock
28	RMA15	O		68	WCLK	O	Word clock
29	RMA14	O		69	SCLK	O	Serial data transfer clock 64fs
30	RMA13	O		70	FSYNC	O	NC
31	+Vcc			71	ADLR	O	NC
32	GND			72	GND		
33	ROMN	O	ROM read enable	73	+Vcc		
34	A15	I	} CPU address bus	74	SCLKN	O	Serial data sift clock
35	A14	I		75	DCLK	O	256fs clock
36	A13	I		76	XI	I	Clock input/(Xtal)
37	A12	I		77	XO	O	/(Xtal)
38	A11	I		78	GND		
39	A10	I		79	TRGI	I	Trigger input
40	NC			80	SYNCN	O	Sync clock

● PCM63P-J (XN558A00) DAC (Digital to Analog Converter)

PIN NO.	NAME	I/O	FUNCTION	PIN NO.	NAME	I/O	FUNCTION
1	DC		Servo filter	15	NC3		} No connection
2	+VCCA		Power supply	16	NC4		
3	REF		Reference voltage	17	NC5		
4	BPODC		BPO reference	18	CX	I	Bit clock
5	BPO		Bipolar offset	19	CLK		Clock
6	IOUT	O	Current output	20	LE	I	LEC input
7	AGND		Analog ground	21	DATA	I	Data input
8	NC1		No connection	22	NC		No connection
9	RFB1		} Feedback resistor	23	ADJB		Bit 2A adjustment
10	REB2			24	ADJA		Bit 2Badjustment
11	+VDDL		Power supply	25	VPOT		Potentiometer connection
12	DGND		Digital ground	26	NC6		} No connection
13	+VCCL		Power supply	27	NC7		
14	NC2		No connection	28	-VCCA		Power supply

• AK5390-VP (XQ199A00) ADC (Analog Digital Converter)

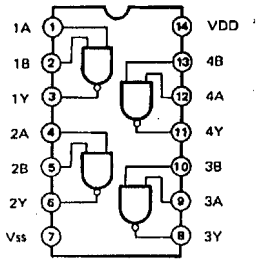
PIN NO.	NAME	I/O	FUNCTION	PIN NO.	NAME	I/O	FUNCTION
1	AGND		Analog ground	15	SDATA	O	Serial data output
2	APD	I		16	FSYNC	I/O	Frame synch. clock
3	AINL+	I	Analog signal input (L channel -)	17	VD+		Digital power supply (+)
4	AINL-	I	Analog signal input (L channel +)	18	DGND		Digital ground
5	ACAL	I	Analog calibration	19	CLK	I	Master clock
6	LGND		Analog logic ground	20	OCLK	O	128 fs clock output
7	VL+		Analog logic power supply	21	NC		
8	NC			22	ICLK	I	128 fs clock input
9	DACL	O	Digital calibration	23	VA+		Analog power supply (+)
10	DPD	I	Digital power down	24	VA-		Analog power supply (-)
11	CMODE	I	Master clock select (L: CLK=256fs, H:CLK=384fs)	25	AINR-	I	Analog signal input (R channel -)
12	SMODE	I	Interface clock select (L: slave mode, H: master mode)	26	AINR+	I	Analog signal input (R channel +)
13	L//R	I/O	Input channel select	27	VREF-	O	Reference voltage (-)
14	SCLK	I/O	Serial data clock	28	VREF+	O	Reference voltage (+)

• ADC0809CCN (XG740A00) ADC (Analog to Digital Converter)

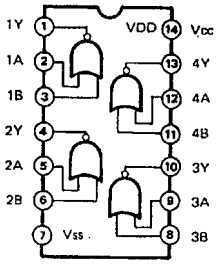
PIN NO.	NAME	I/O	FUNCTION	PIN NO.	NAME	I/O	FUNCTION
1	IN4	I	}	15	D2	O	Digital data output
2	IN5	I	}	16	VREF(-)		
3	IN6	I	} Analog input	17	D0	O	
4	IN7	I	}	18	D4	O	}
5	IN8	I	}	19	D5	O	} Digital data output
6	START	I	Start data input	20	D6	O	}
7	EOC	O	End of conversion data output	21	D7	O	}
8	D3	O	Digital data output	22	ALE	I	Address latch enable
9	OE	I	Output enable	23	AD2	I	}
10	CLK	I	Clock	24	AD1	I	} Address data
11	VCC		Power supply	25	AD0	I	}
12	VREF(+)		Reference voltage (+)	26	IN1	I	}
13	VSS		Ground	27	IN2	I	} Analog input
14	D1	O	Digital data output	28	IN3	I	}

■IC BLOCK DIAGRAM (IC ブロック図)

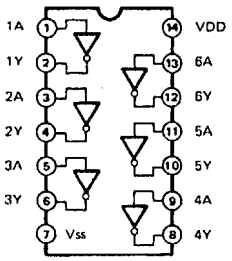
● **SN74HC00N** (IR000050)
Quad 2 Input NAND



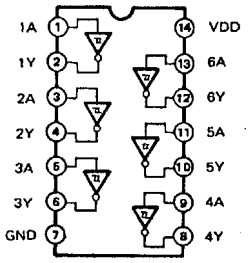
● **SN74HC02N** (IR000250)
Quad 2 Input NOR



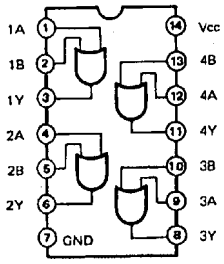
● **SN74HC04N** (IR000450)
Hex Inverter



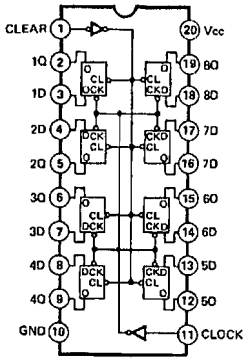
● **SN74HC14N** (IR001450)
Hex Inverter



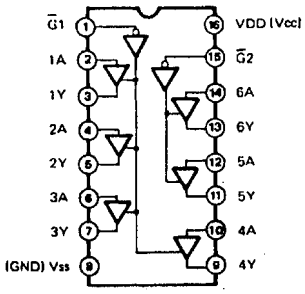
● **SN74HC32N** (IR003250)
Quad 2 Input OR



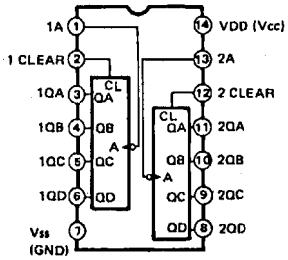
● **SN74HC273N** (IR027350)
Octal D-Type Flip-Flop



● **SN74HC367N** (IR036750)
Hex 3-State Bus Buffer



● **SN74HC393N** (IR039350)
Dual 4-Bit Binary Counter



● **NE5532P** (IG102500)
M5238AP (XM085A00)
Dual Operational Amplifier