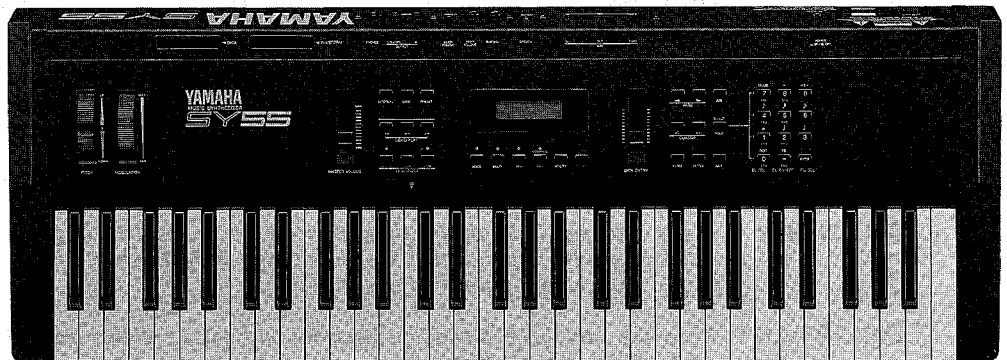


MUSIC SYNTHESIZER

SY55

SERVICE MANUAL



SY55

■CONTENTS (目次)

SPECIFICATIONS (総合仕様)	2
PANEL LAYOUT (パネルレイアウト).....	4
CIRCUIT BOARD LAYOUT & WIRING (ユニットレイアウト & 結線図) ...	6
BLOCK DIAGRAM (ブロックダイアグラム).....	8
DISASSEMBLY PROCEDURE (分解手順).....	10
LSI PIN DESCRIPTION (LSI 端子機能表).....	13
IC BLOCK DIAGRAM (IC ブロック図).....	17
CIRCUIT BOARDS (シート基板図).....	19
TEST PROGRAM (テストプログラム)	30/40
ERROR MESSAGES (エラーメッセージ).....	52
MIDI DATA FORMAT (MIDI データフォーマット)	54
PARTS LIST	

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 principle-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 lithium 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 må kun foretages af en sagkyndig, og som beskrevet i servicemanualen.

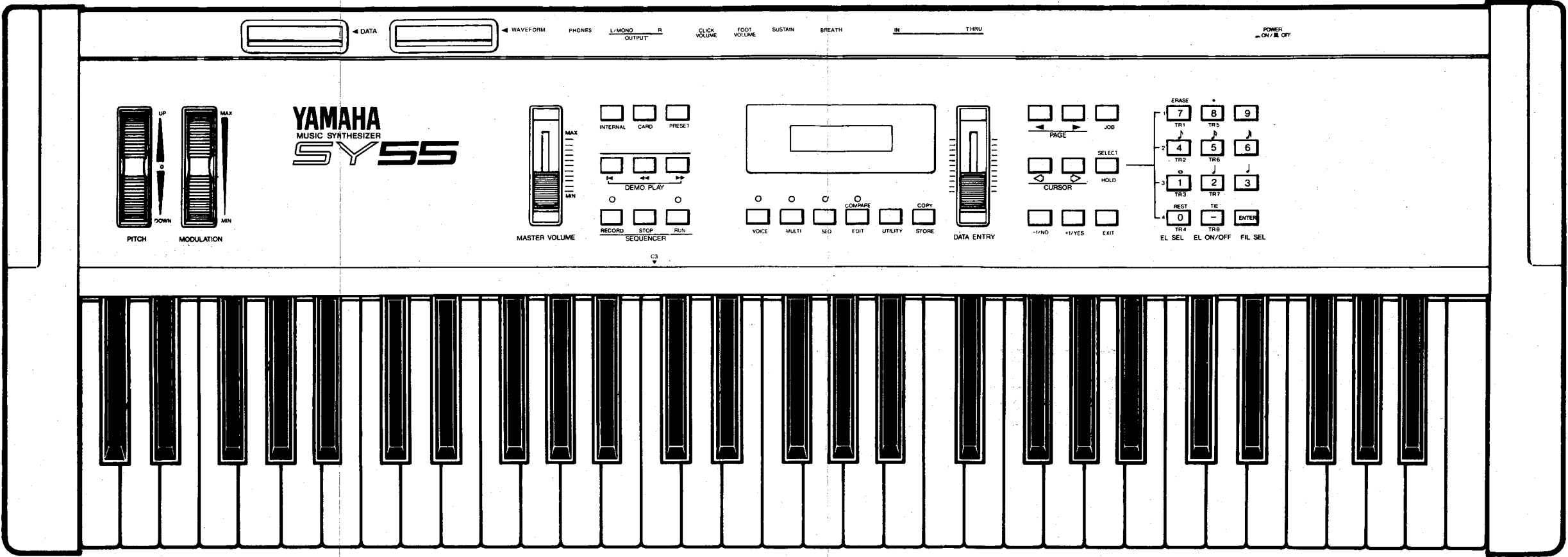
■ SPECIFICATIONS (総合仕様)

Keyboard	61 keys, initial and after-touch response.
Tone Generator System	AWM2 (2nd-generation 16-bit Advanced Wave Memory).
Internal Memory	Wave ROM: 74 preset waveforms. Preset ROM: 64 preset voices & 16 preset multi-play setups. Internal RAM: 64 user voices & 16 user multi-play setups.
External Memory	Voice data: MCD64 or MCD32 memory cards — write & read. Wave data: YAMAHA waveform cards — read only.
Sequencer	8 songs/8 tracks per song. Approx. 8,000 notes max.
Display	16-character x 2-line backlit LCD.
Controls	DATA ENTRY, MASTER VOLUME, PITCH, MODULATION, CLICK VOLUME (Sequencer.)
Keys & Switches	POWER, INTERNAL, CARD, PRESET, VOICE, MULTI, SEQ, EDIT/COMPARE, UTILITY, STORE/COPY, -1/NO, +1/YES, PAGE -, PAGE +, ◀, ▶, EXIT, SELECT, ENTER, JOB, numeric 0 — 9, -, ⏮, ⏪, ⏩, ⏭, RECORD, STOP, RUN.
Output Connectors	PHONES, OUTPUT L/MONO & R, BREATH CONTROLLER, SUSTAIN, FOOT VOLUME.
MIDI Connectors	IN, OUT, THRU.
Power Requirements/ Consumption	US & Canadian models: 120 V / 15 W General model: 220—240 V / 15 W
Dimensions (W x H x D)	911 x 90 x 325 mm (35-7/8" x 3-1/2" x 12-3/4")
Weight	9.7 kg (21 lbs. 6 oz)
Output Levels	OUTPUTS: +2 dBm (10 kohm load) HEADPHONES: +6 dBm (150 ohm load)

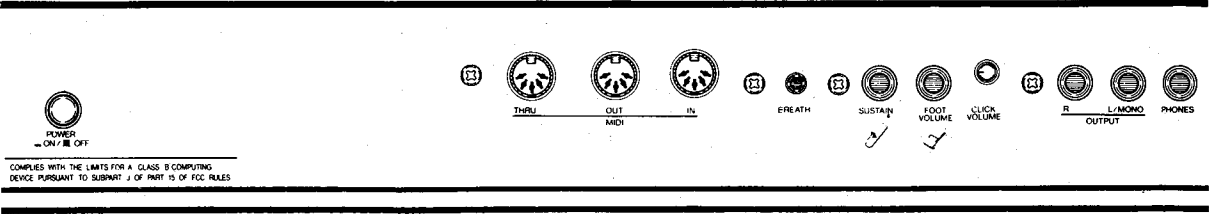
鍵盤	61キー, イニシャルタッチ, アフタータッチ付
音源	AWM 2 (16ビット, Advanced Wave Memory)
内部メモリー	ウェーブROM : 74プリセット波形 プリセットROM : 64プリセットボイス, 6プリセットマルチプレイセットアップ インターナルRAM : 64ユーザーボイス, 16ユーザーマルチプレイセットアップ
外部メモリー	ボイスデータ : MCD64またはMCD32メモリーカード ウェーブデータ : ウェーブカード
シーケンサー	8 ソング, 8 ボイス / 1 ソング 最大記憶発音数 約8,000音
ディスプレイ	LCD 16文字×2行 (バックライト付)
コントロール	DATA ENTRY, MASTER VOLUME, PITCH, MODULATION, CLICK VOLUME (シーケンサー用)
キー・スイッチ	POWER, INTERNAL, CARD, PRESET, VOICE, MULTI, SEQ, EDIT/COMPARE, UTILITY, STORE/COPY, - 1 / NO, + 1 / YES, PAGE -, PAGE +, ◀, ▶, EXIT, SELECT, ENTER, JOB, 数字キー 0 ~ 9, -, ◀◀, ▶▶, RECORD, STOP, RUN
出力端子	PHONES, OUTPUT L/MONO & R, BREATH CONTROL, SUSTAIN, FOOT VOLUME
MIDI端子	IN, OUT, THRU
カードスロット	DATA, WAVEFORM
出力レベル	OUTPUT : + 2 dBm (10k Ω 負荷) HEADPHONES : + 6 dBm (150 Ω 負荷)
消費電力	10W
電源電圧	100V, 50/60Hz
寸法 (W×H×D)	911×90×325mm
重量	9.7kg

■PANEL LAYOUT (パネルレイアウト)

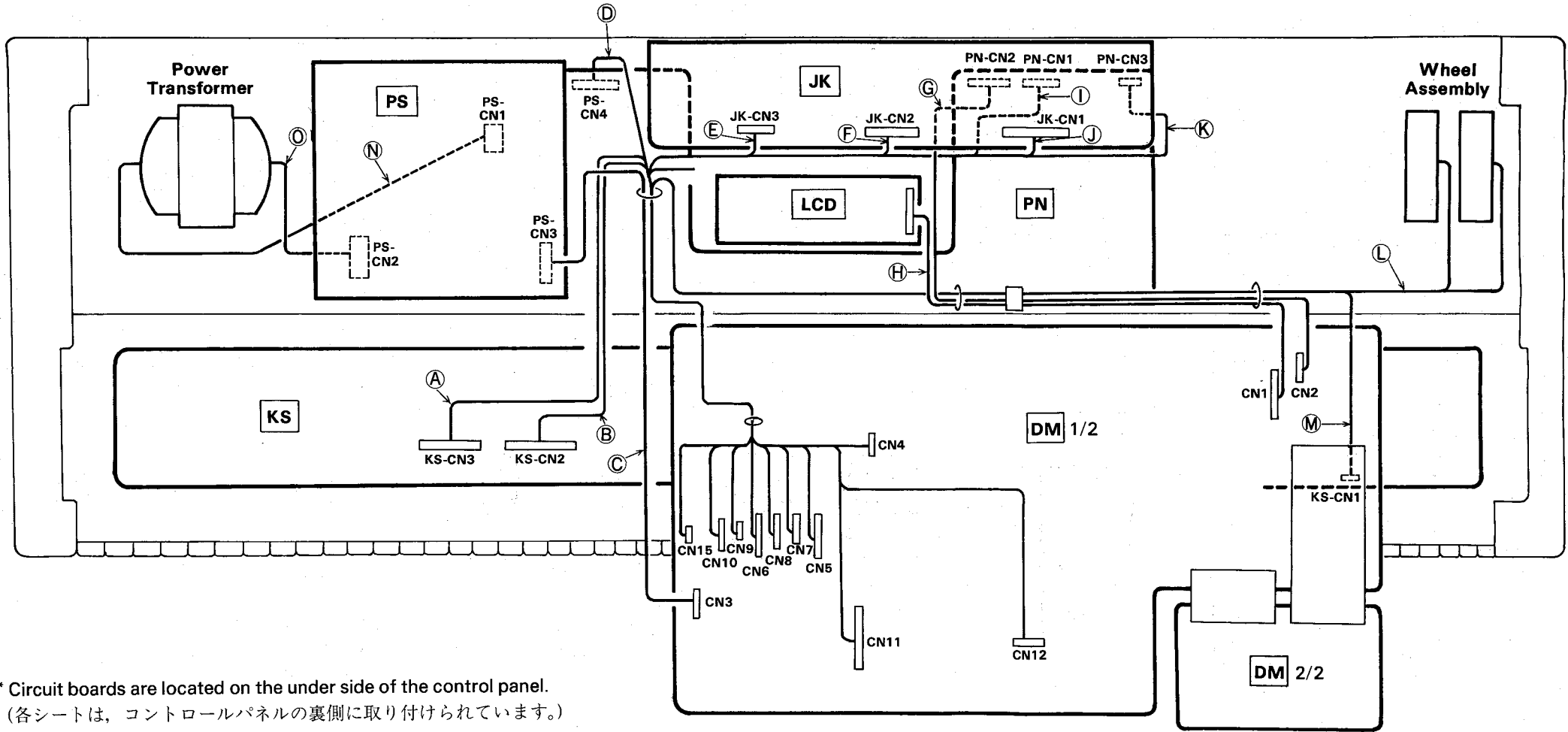
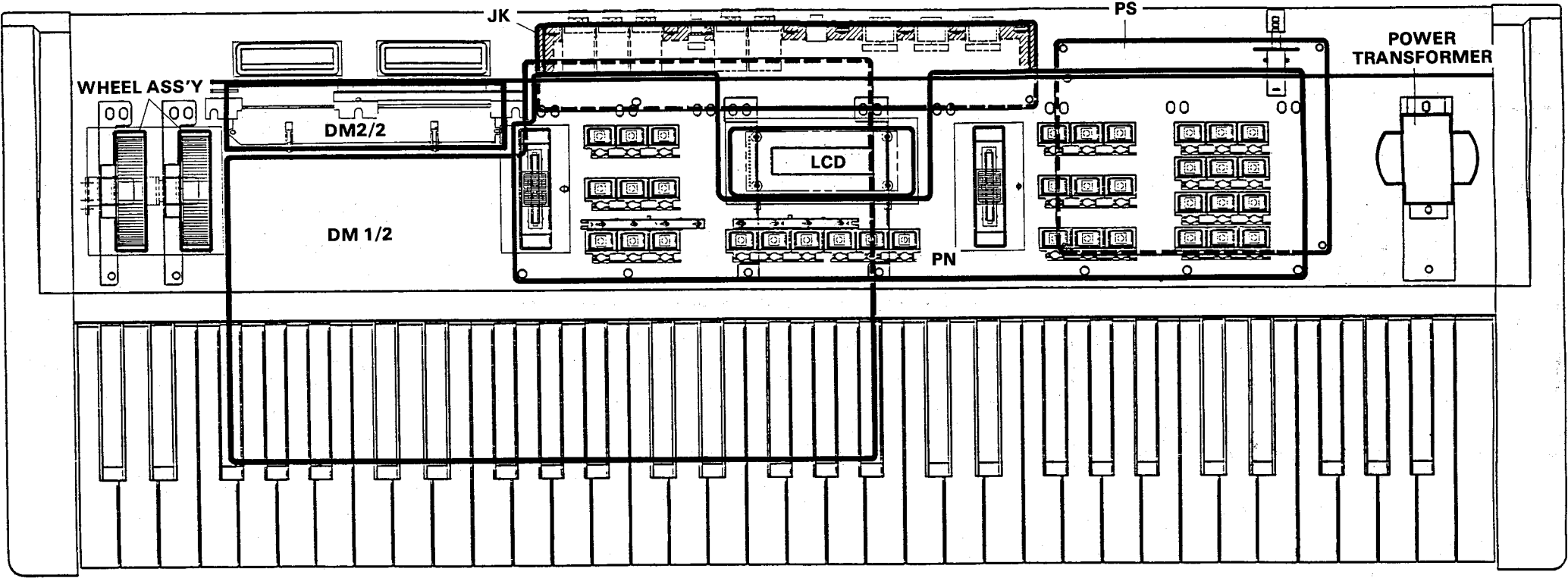
●Front Panel (フロントパネル)



●Rear Panel (リアパネル)



■CIRCUIT BOARD LAYOUT & WIRING (ユニットレイアウト&結線図)

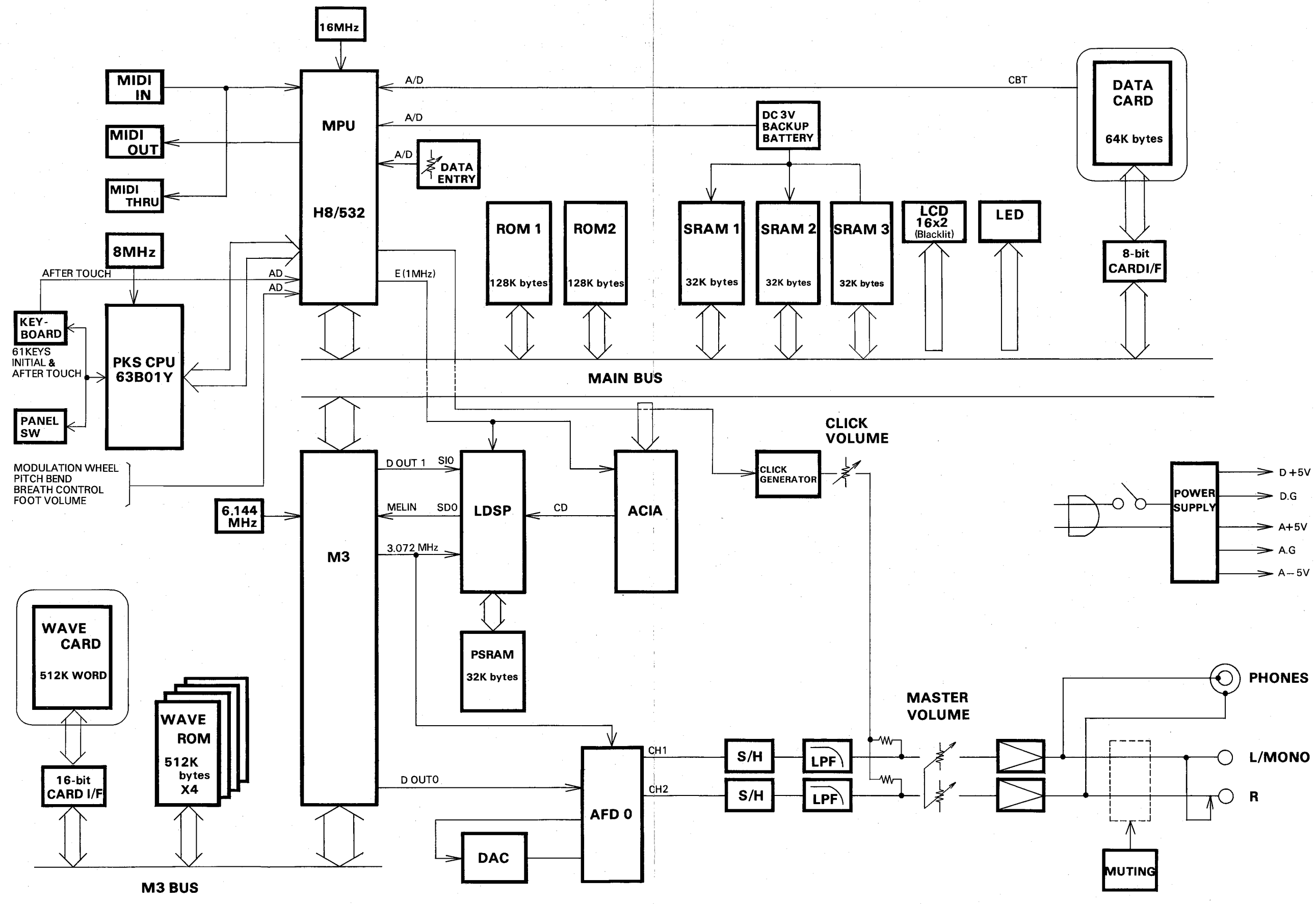


● Wire Harness

Marked	Pins	Destination
A	12	KS-CN3 ↔ DM-CN6
B	11	KS-CN2 ↔ DM-CN5
C	8	PS-CN3 ↔ DM-CN3
D	10	PN-CN4 ↔ DM-CN8
E	6	JK-CN3 ↔ DM-CN4
F	9	JK-CN2 ↔ DM-CN10
G	9	PN-CN2 ↔ DM-CN2
H	15	LCD ↔ DM-CN1
I	8	PN-CN1 ↔ DM-CN7
J	13	JK-CN1 ↔ DM-CN11
K	7	PN-CN3 ↔ DM-CN12
L	5	Wheel Assembly ↔ DM-CN9
M	4	KS-CN1 ↔ DM-CN15
N	4	PS-CN1 ↔ Power Transformer
O	4	PS-CN2 ↔ Power Transformer

* Circuit boards are located on the under side of the control panel.
(各シートは、コントロールパネルの裏側に取り付けられています。)

■BLOCK DIAGRAM (ブロックダイアグラム)



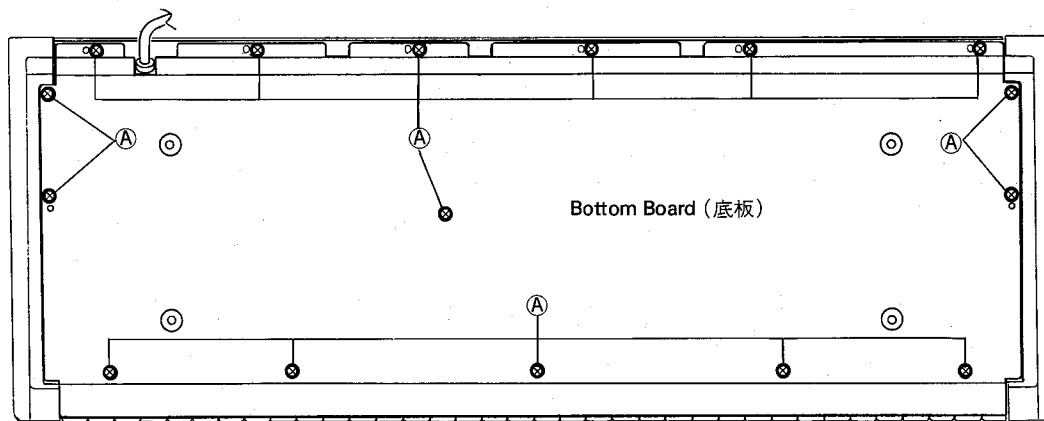
■DISASSEMBLY PROCEDURE (分解手順)

1 Bottom Board

- 1-1 Remove the sixteen (16) screws ① (bonding tapping screw 4×10), the Bottom board can be removed. (Fig. 1)

1 底板の外し方

- 1-1 ネジ① 16本 (ボンディングタッピングネジ4×10)を外し、底板を外します。(図1参照)



(Fig.1)

2 DM1/2 and DM2/2 Circuit Boards

- 2-1 Remove the Bottom board. (see procedure 1.)
 2-2 After the nine (9) screws ② (bind tapping screw 4×10) have been removed, the DM1/2 circuit board can be removed. (Fig. 2)
 2-3 To remove the DM2/2 circuit board, remove the three (3) screws ③ (bind tapping screw 4×10). (Fig. 2)

2 DM1/2、DM2/2シートのはずし方

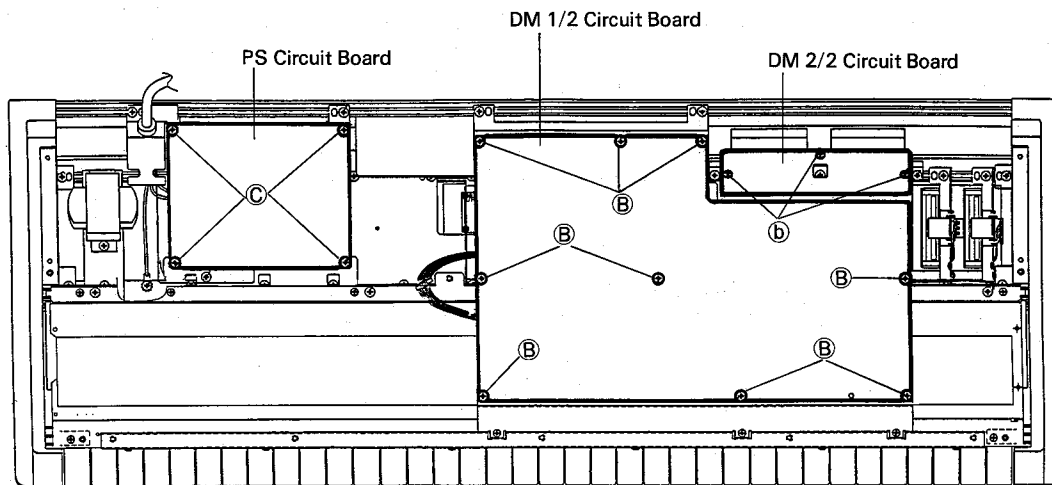
- 2-1 底板を外します。(1項参照)
 2-2 ネジ② 9本 (バインドタッピングネジ4×10)を外し、DM1/2シートを外します。(図2参照)
 2-3 ネジ③ 3本 (バインドタッピングネジ4×10)を外し、DM2/2シートを外します。(図2参照)

3 PS Circuit Board

- 3-1 Remove the Bottom board. (see procedure 1.)
 3-2 Remove the four (4) screws ④ (bind tapping screw 4×10), the PS circuit board can be removed. (Fig. 2)

3 PSシートの外し方

- 3-1 底板を外します。(1項参照)
 3-2 ネジ④ 4本 (バインドタッピングネジ4×10)を外し、PSシートを外します。(図2参照)



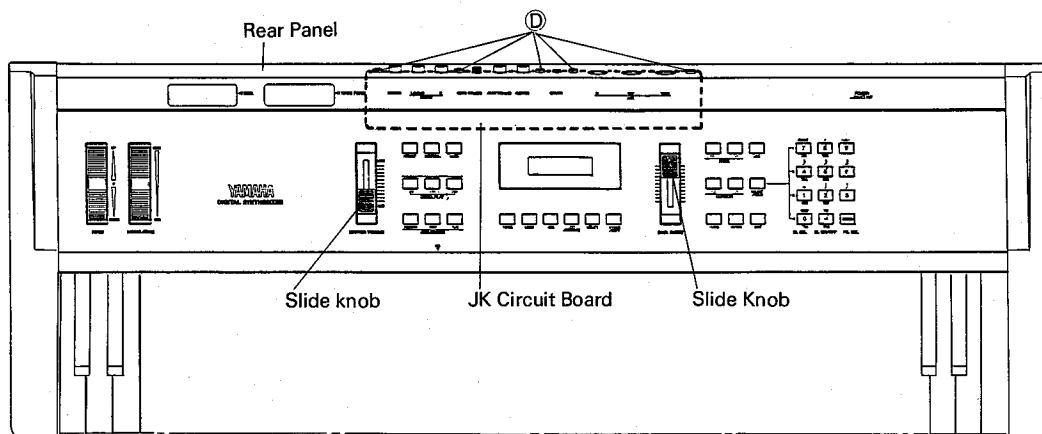
(Fig.2)

4 JK Circuit Board.

- 4-1 Remove the Bottom board. (see procedure 1.)
- 4-2 Remove the DM1/2 and DM2/2 circuit boards. (see procedure 2.)
- 4-3 After the five (5) screws ⑤ (bind tapping screw 4×10) have been removed, the JK circuit board can be removed. (Fig. 3)

4 JKシートの外し方

- 4-1 底板を外します。(1項参照)
- 4-2 DM1/2とDM2/2シートを外します。(2項参照)
- 4-3 ネジ⑤5本 (ボンディングタッピングネジ4×10)を外し、JKシートを外します。(図3参照)



(Fig.3)

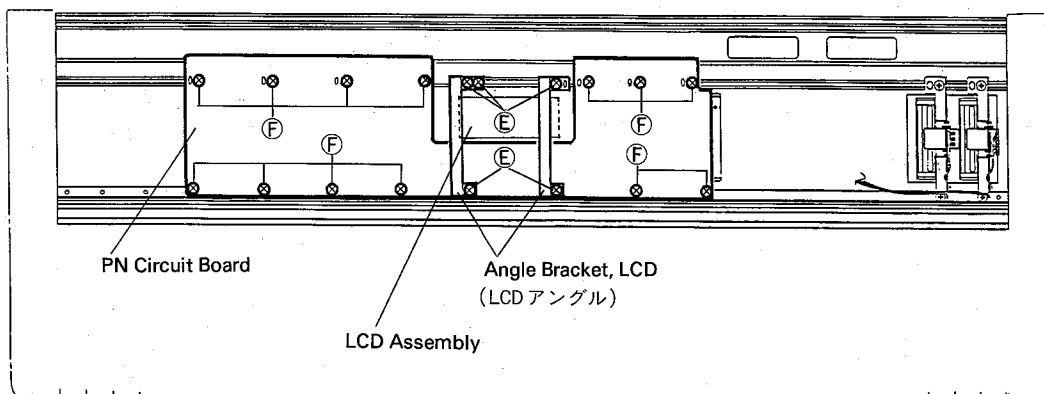
5 LCD Assembly and PN Circuit Board

- 5-1 Pull out the two (2) knobs on the Control panel. (Fig. 3)
- 5-2 Remove the Bottom board. (see procedure 1.)
- 5-3 Remove the DM1/2 and DM2/2 circuit boards. (see procedure 2.)
- 5-4 Remove the PS circuit board. (see procedure 3.)
- 5-5 Remove the JK circuit board. (see procedure 4.)
- 5-6 To remove the LCD-angle bracket, remove the five (5) screws ⑤ (bind tapping screw 4×10), then remove the LCD Assembly. (Fig. 4)
- 5-7 The PN circuit board can be removed by removing the thirteen (13) screws ⑥ (bind tapping screw 4×10). (Fig. 4)

5 LCD Ass'yとPNシートの外し方

- 5-1 コントロールパネル上のスライッドツマミ2ヶを外します。(図3参照)
- 5-2 底板を外します。(1項参照)
- 5-3 DM1/2とDM2/2シートを外します。(2項参照)
- 5-4 PSシートを外します。(3項参照)
- 5-5 JKシートを外します。(4項参照)
- 5-6 ネジ⑤5本 (バインドタッピングネジ4×10)を外し、LCDアングルを外してから、LCD Ass'yを外します。(図4参照)
- 5-7 ネジ⑥13本 (バインドタッピングネジ4×10)を外し、PNシートを外します。(図4参照)

● Bottom View (下側より)



(Fig.4)

6 Power Transformer

- 6-1 Remove the Bottom board. (see procedure 1.)
 6-2 Remove the two (2) screws ⑥ (bonding tapping screw 4×10), the Power transformer can be removed. (Fig. 5)

7 Wheel Assembly

- 7-1 Remove the Bottom board. (see procedure 1.)
 7-2 Remove the four (4) screws ④ (bind tapping screw 4×10), the Wheel assembly can be removed. (Fig. 5)

8 Keyboard Assembly

- 8-1 Remove the Bottom board. (see procedure 1.)
 8-2 Remove the DM1/2 and DM2/2 circuit boards. (see procedure 2.)
 8-3 Remove the PS circuit board. (see procedure 3.)
 8-4 To remove the Rail, remove the six (6) screws ① (bonding tapping screw 3×8) and four (4) screws ② (bonding tapping screw 4×10). (Fig. 5)
 8-5 To remove the Front rail, remove the nine (9) screws ⑧ (bonding tapping screw 3×8). (Fig. 5)
 8-6 After the two (2) screws ① (bonding tapping screw 4×10) have been removed, the Keyboard assembly can be removed. (Fig. 5)

6 電源トランスの外し方

- 6-1 底板を外します。(1項参照)
 6-2 ネジ⑥2本(ボンディングタッピングネジ4×10)を外し、電源トランスを外します。(図5参照)

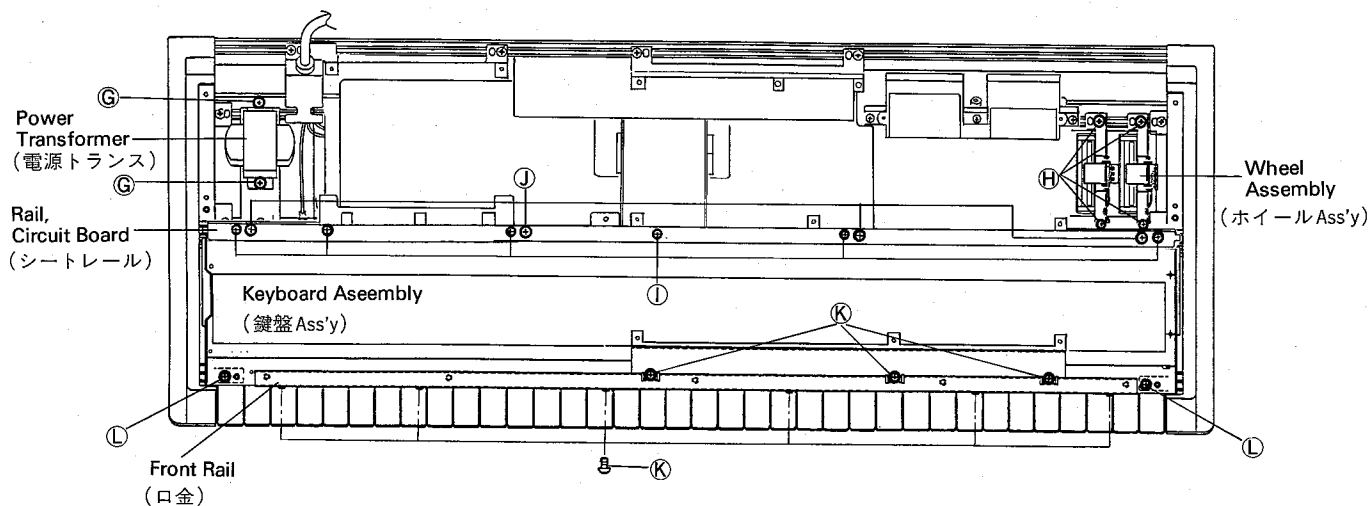
7 ホイールAss'yの外し方

- 7-1 底板を外します。(1項参照)
 7-2 ネジ④4本(バインドタッピングネジ4×10)を外し、ホイールAss'yを外します。(図5参照)

8 鍵盤Ass'yの外し方

- 8-1 底板を外します。(1項参照)
 8-2 DM1/2とDM2/2シートを外します。(2項参照)
 8-3 PSシートを外します。(3項参照)
 8-4 ネジ①6本(ボンディングタッピングネジ3×8)とネジ②4本(ボンディングタッピングネジ4×10)を外し、シートレールを外します。(図5参照)
 8-5 ネジ⑧9本(ボンディングタッピングネジ3×8)を外し、口金を外します。(図5参照)
 8-6 ネジ①2本(ボンディングタッピングネジ4×10)を外し、鍵盤Ass'yを外します。(図5参照)

● Bottom View (下側より)



(Fig.5)

LSI PIN DESCRIPTION (LSI 端子機能表)

● HD6475328CP-10 <H8/532> (XH017D00) CPU (Central Processing Unit)

PIN NO.	NAME	I/O	FUNCTION	PIN NO.	NAME	I/O	FUNCTION
1	XTAL	I	Clock	43	P50/A8	O	Address bus
2	Vss	I	Ground	44	P51/A9	O	
3	P10/ ϕ	O	System clock	45	P52/A10	O	
4	P11/E	O	Enable	46	P53/A11	O	
5	P12/BACK	O	Bus acknowledge	47	P54/A12	O	
6	P13/BREQ	I	Bus request	48	P55/A13	O	
7	P14/WAIT	I	Wait	49	P56/A14	O	
8	P15/IRQ0	I	Interrupt request 0	50	P57/A15	O	
9	P16/IRQ1	I	Interrupt request 1	51	P60/A16	O	
10	P17/TMO	O	8-bit timer output	52	P61/A17	O	
11	P20/AS	O	Address strobe	53	P62/A18	O	Power supply
12	P21/R/W	O	Read/Write	54	P63/A19	O	
13	P22/DS	O	Data strobe	55	Vcc	I	
14	P23/RD	O	Read control	56	P70/TMC1	I	
15	P24/WR	O	Write control	57	P71/FT11	I	
16	Vcc	I	Power supply	58	P72/FT12	I	
17	MD0	I	Mode control	59	P73/FT13/TMR1	I	
18	MD1	I		60	P74/FT081/FTCI1	O/I	
19	MD2	I		61	P75/FT082/FTCI2	O/I	Free running timer output compare B/ Free running timer counter clock
20	STBY	I	Standby	62	P76/FT083/FTCI3	O/I	
21	RES	I	Reset	63	P77/FTOA1	O	
22	NMI	I	Non-maskable interrupt	64	Vss	I	Ground
23	NC	I		65	AVss	I	
24	Vss	I	Ground	66	P80/AN0	I	
25	P30/D0	I/O	Data bus	67	P81/AN1	I	Port 8
26	P31/D1	I/O		68	P82/AN2	I	
27	P32/D2	I/O		69	P83/AN3	I	
28	P33/D3	I/O		70	P84/AN4	I	
29	P34/D4	I/O		71	P85/AN5	I	
30	P35/D5	I/O		72	P86/AN6	I	
31	P36/D6	I/O		73	P87/AN7	I	
32	P37/D7	I/O		74	AVcc	I	Analog power supply
33	P40/A0	O		75	P90/FTOA2	O	
34	P41/A1	O		76	P91/FTOA3	O	
35	P42/A2	O	Address bus	77	P92/PW1	O	Pulse width
36	P43/A3	O		78	P93/PW2	O	
37	P44/A4	O		79	P94/PW3	O	
38	P45/A5	O		80	P95/TXD	O	Transmit data
39	P46/A6	O		81	P96/RXD	I	Receive data
40	P47/A7	O	Ground	82	P97/SCK	I/O	Serial clock
41	Vss	I		83	Vss	I	Ground
42	Vss	I		84	EXTAL	I	Clock

● HD63B50P (IG147300)ACIA (Asynchronous Communication Interface Adapter)

Pin No.	Name	I/O	Function	Pin No.	Name	I/O	Function
1	Vss	I	Ground	13	R/W	I	Read/Write
2	Rx Data	I	Receive data	14	E	I	Enable
3	Rx CLK	I	Receive clock	15	D7	I/O	Data bus
4	Tx CLK	O	Transmit clock	16	D6	I/O	
5	RTS	I/O	Request to send	17	D5	I/O	
6	Tx Data	O	Transmit data	18	D4	I/O	
7	IRQ	I	Interrupt request	19	D3	I/O	
8	CS0	I	Chip select	20	D2	I/O	
9	CS2	I		21	D1	I/O	
10	CS1	I		22	D0	I/O	
11	RS	I	Resist select	23	DCD	I	Data carrier detect
12	Vcc	I	Power supply (+5V)	24	CTS	I	Clear to send

● HD637B01Y (XG950A00) CPU

PIN NO.	NAME	I/O	FUNCTION	PIN NO.	NAME	I/O	FUNCTION
1	V _{ss}	I	Ground	33	V _{cc}	O	DC Supply (+5V)
2	XTAL	I	Clock (8MHz)	34	P47	O	Port 4
3	EXTAL	I		35	P46	O	
4	MP0	I	Mode program	36	P45	O	
5	MP1	I		37	P44	O	
6	RES	I	Reset	38	P43	O	Port 1
7	STBY	I	Stand-by mode signal	39	P42	O	
8	NMI	I	Non-maskable interrupt	40	P41	O	
9	P20	I/O	Port 2	41	P40	O	
10	P21	I/O		42	V _{ss}	O	Ground
11	P22	I/O		43	P17	O	Port 3
12	P23	I/O		44	P16	O	
13	P24	I/O		45	P15	O	
14	P25	I/O		46	P14	O	
15	P26	I/O	Port 5	47	P13	O	Port 7
16	P27	I/O		48	P12	O	
17	P50	I		49	P11	O	
18	P51	I		50	P10	O	
19	P52	I		51	P37	I/O	Port 6
20	P53	I		52	P36	I/O	
21	P54	I		53	P35	I/O	
22	P55	I	Port 6	54	P34	I/O	
23	P56	I		55	P33	I/O	Port 7
24	P57	I		56	P32	I/O	
25	P60	I/O		57	P31	I/O	
26	P61	I/O		58	P30	I/O	
27	P62	I/O		59	P74	O	Port 7
28	P63	I/O		60	P73	O	
29	P64	I/O		61	P72	O	
30	P65	I/O		62	P71	O	
31	P66	I/O	Port 6	63	P70	O	Enable
32	P67	I/O		64	E	I	

● Mode Program

	MP0	MP1
Mode 1	H	L
Mode 2	L	H
Mode 3	H	H

● Port

	Mode 1, 2	Mode 3
Port 1	Address bus (A0 ~ A7)	O Port
Port 2	I/O Port	I/O Port
Port 3	Data bus (D0 ~ D7)	I/O Port
Port 4	Address bus (A8 ~ A15)	O Port
Port 5	I/O Port	I Port
Port 6	I/O Port	I/O Port
Port 7	RD, WR, R/W, LIR, BA	O Port

• YM7119 (XG995A00) M3 (AWM Tone Generator & Digital Filter)

PIN NO.	NAME	I/O	FUNCTION	PIN NO.	NAME	I/O	FUNCTION
1	INDV0	O	Individual output 0 (8 channels)	65	WA8	O	Wave memory address bus
2	INDV1	O	Individual output 1 (8 channels)	66	WA9	O	
3	OPZ	I	MELIN input select (H: OPZ, L: PAN)	67	WA10	O	
4	DIOUT0	O	Stereo output (L & R)	68	WA11	O	
5	DIOUT1	O	Assignable output (ch.0 & ch.4)	69	WA12	O	
6	DIOUT2	O	Assignable output (ch.1 & ch.5)	70	WA13	O	
7	DIOUT3	O	Assignable output (ch.2 & ch.6)	71	WA14	O	
8	DIOUT4	O	Assignable output (ch.3 & ch.7)	72	NC		
9	MELIN	I	MEL formatted signal input	73	WA15	O	
10	LSB/MSB	I	Individual output mode select (H: MSB first, L: LSB first)	74	WA16	O	
11	TTPAD0	I/O	Test pin	75	WA17	O	CPU address bus
12	TTPAD1	I/O		76	WA18	O	
13	NC			77	WA19	O	
14	TTPAD2	I/O		78	WA20	O	
15	TTPAD3	I/O		79	WA21	O	
16	TTPAD4	I/O		80	WA22	O	
17	TTPAD5	I/O		81	WA23	O	
18	NC			82	A0	I	
19	TTPAD6	I/O		83	A1	I	
20	TTPAD7	I/O		84	A2	I	
21	NC		Individual input 0 (8 channels) Individual input 1 (8 channels)	85	A3	I	CPU data bus
22	TTPAD8	I/O		86	A4	I	
23	TTPAD9	I/O		87	A5	I	
24	NC			88	D0	I/O	
25	TTPAD10	I/O		89	NC		
26	TTPAD11	I/O		90	D1	I/O	
27	DIIN0	I		91	D2	I/O	
28	DIIN1	I		92	D3	I/O	
29	WD0	I/O		93	D4	I/O	
30	WD1	I/O		94	D5	I/O	
31	WD2	I/O	Wave memory data	95	D6	I/O	Sample and hold set timing 0~3
32	WD3	I/O		96	D7	I/O	
33	NC			97	S/HSC0	I	
34	WD4	I/O		98	S/HSC1	I	
35	WD5	I/O		99	S/HSC2	I	
36	WD6	I/O		100	S/HSC3	I	
37	WD7	I/O		101	S/HEN	O	
38	WD8	I/O		102	S/H0	O	Sample and hold 0~3
39	WD9	I/O		103	S/H1	O	
40	NC			104	S/H2	O	
41	NC		Ground Power supply	105	S/HRC A	I	
42	WD10	I/O		106	S/HRC B	I	
43	WD11	I/O		107	IC	I	
44	NC			108	Vss		
45	WD12	I/O		109	XTAL	O	
46	WD13	I/O		110	EXTAL	I	
47	WD14	I/O		111	NC		
48	Vss			112	FCLKOUT	O	Sync. signal on 2 chips mode
49	VDD			113	FCLKIN	I	
50	WD15	I/O		114	NC		
51	MSBW	O	Wave data MSB write signal	115	CLK3	O	
52	LSBW	O	Wave data LSB write signal	116	VDD		
53	OE	O	Output enable for wave data	117	SYWIN	I	
54	ODD/EVEN	I	Odd/Even select on 2 chips mode	118	CLKMEL	O	
55	SINGLE/DUAL	I	Wave memory single/dual mode select (H: dual-2 chips mode, L: single-1 chip mode)	119	NC		
56	WA0	O	Wave memory address bus	120	DACLE	O	
57	WA1	O		121	SYWOUT	O	
58	WA2	O		122	SYW64	O	
59	WA3	O		123	IRO	O	
60	WA4	O		124	CS	I	
61	WA5	O		125	R/W	I	
62	WA6	O		126	CHPIN	I	
63	WA7	O		127	CHPOUT	O	
64	NC			128	KSYNC	I	

• **YM3029 (XF237A00) AFD0 (Floating Point Converter)**

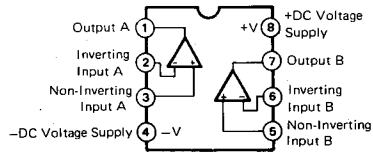
PIN NO.	NAME	I/O	FUNCTION	PIN NO.	NAME	I/O	FUNCTION
1	DVDD		Digital power supply (+5V)	15	SHA	I	Sample and hold input (Channel A)
2	LE	O	Latch enable	16	EXG		} Exponent ground
3	DAB	O	Channel A/B data output	17	EXG		
4	SYW	I	Sync pulse	18	EXI	I	Exponent input
5	CLK	I	Clock	19	EXO	O	Exponent output
6	$\phi 1$	O	Clock for DAC	20	AVSS		Analog power supply (-5V)
7	DGND		Digital ground	21	AVDD		Analog power supply (+5V)
8	ADV		Analog power supply (+5V)	22	SI1	I	Serial data input 1 (Channel A)
9	AVSS		Analog power supply (-5V)	23	VLA0	I	} Volume level select (Channel A)
10	SHB	I	Sample and hold input (Channel B)	24	VLA1	I	
11	CH4		} Hold capacitor connection	25	SI2	I	Serial data input 2 (Channel B)
12	CH3			26	VLB0	I	} Volume level select (Channel B)
13	CH2			27	VLB1	I	
14	CH1			28	4/2	I	Channel number select (4 or 2-channel)

• **YM3413 (XE449A00) LDSP (Digital Signal Processor)**

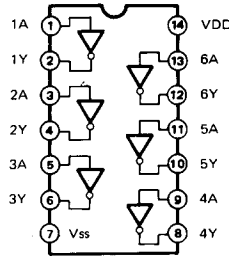
PIN NO.	NAME	I/O	FUNCTION	PIN NO.	NAME	I/O	FUNCTION
1	VDD		DC supply (+5V)	21	A5	O	} Address bus
2	D7	I/O	} Data bus	22	A6	O	
3	D6	I/O		23	A7	O	
4	D5	I/O		24	A8	O	
5	D4	I/O		25	A9	O	
6	D3	I/O		26	A10	O	
7	D2	I/O		27	A11	O	
8	D1	I/O		28	A12	O	
9	D0	I/O		29	A13	O	
10	SI0	I	Serial data input	30	A14	O	
11	SI1	I		31	A15	O	
12	SYW	I	Sync pulse	32	A16	O	} Serial data output
13	WE	O	Write enable	33	SO0	O	
14	OE	O	Output enable	34	XCLK	I	
15	A0	O	} Address bus	35	IC	I	
16	A1	O		36	CRS	I	
17	A2	O		37	CDI	I	
18	A3	O		38	CDo	O	
19	A4	O		39	SO1	O	
20	Vss		Ground	40	CLK	I	Clock

IC BLOCK DIAGRAM (IC ブロック図)

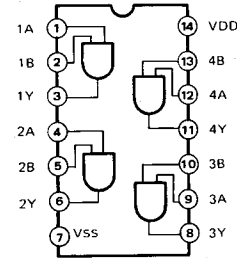
- **RC4558D-V** (IG001390)
 - **NJM4560ED** (IG040000)
 - **NJM4556** (IG042500)
 - **M5238P** (XA013001)
- Dual Operational Amplifier



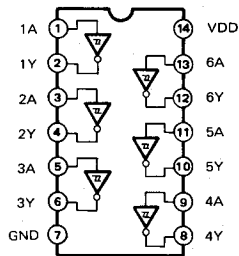
- **SN74HC04N** (IR000450)
- Hex Inverter



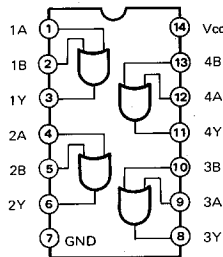
- **TC74AC08P** (XG656A00)
- Quad 2 Input AND



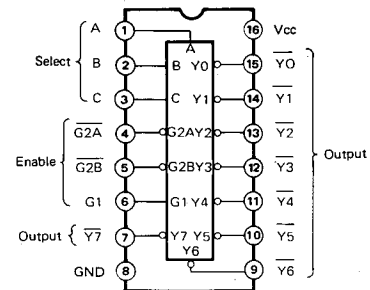
- **SN74HC14N** (IR001450)
- Hex Inverter



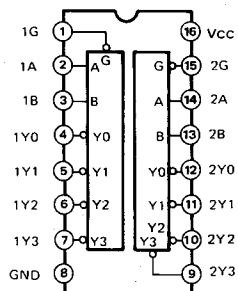
- **TC74AC32P** (XG658A00)
- Quad 2 Input OR



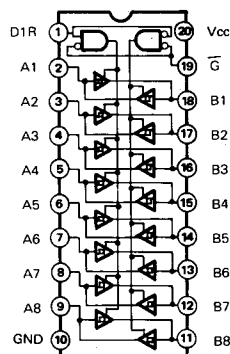
- **SN74HC138N** (IR013850)
 - **TC74AC138P** (XG659A00)
- 3 to 8 Demultiplexer



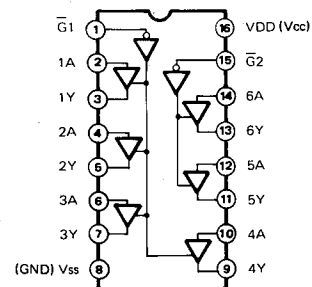
- **SN74HC139N** (IR013950)
- Dual 2 to 4 Demultiplexer



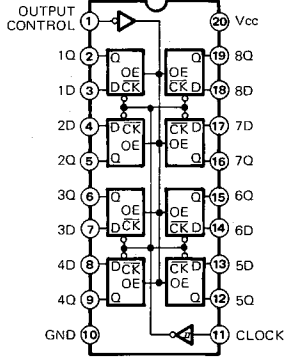
- **TC74HC245P** (IR024500)
 - **SN74ALS245A-1N** (XA198A00)
- Octal 3-State Bus Transceiver



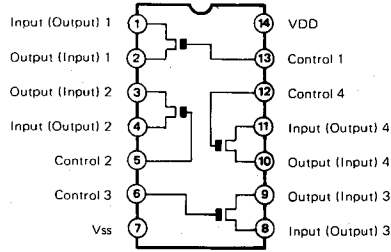
- **SN74HC367N** (IR036750)
- Hex 3-State Bus Buffer



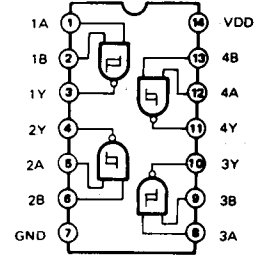
- **SN74HC374N** (IR037450)
Octal 3-State D-Type Flip-Flop



- **TC74HC4066** (IR406600)
Quad Bilateral Switch



- **TC4093BP** (IG043300)
Quad 2-Input NAND Schmitt Trigger



- **PCM56P** (XB637001)
Digital Analog Converter

