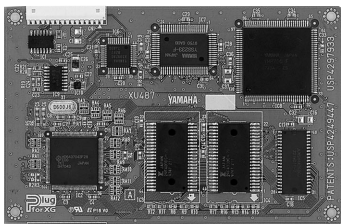


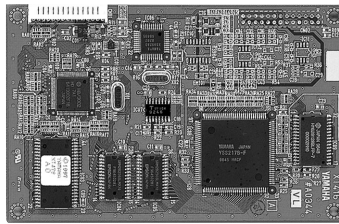
# TONE GENERATOR

# MU100

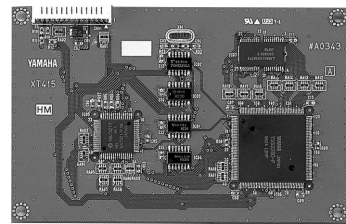
## SERVICE MANUAL



**DX**  
for XG PLG-100DX



**VL**  
for XG PLG-100VL



**VH**  
for XG PLG-100VH

### ■ CONTENTS

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### 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:** This 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 you 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.

### LITHIUM BATTERY HANDLING

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 by soldering, 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 ved fejlagtig håndtering. Udskiftning må kun ske med batteri af samme fabrikat og type. Levér det brugte batteri tilbage til leverandøren.

#### WARNING

Explosionsfara vid felaktigt batteribyte.

Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren.

Kassera använt batteri enligt fabrikantens instruktion.

#### VAROITUS

Paristo voi räjähtää, jos se on virheellisesti asennettu.

Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin.

Hävittä käytetty paristo valmistajan ohjeiden mukaisesti.

The following information complies with Dutch Official Gazette 1995. 45; ESSENTIALS OF ORDER ON THE COLLECTION OF BATTERIES.

- Please refer to the disassembly procedure for the removal of Back-up Battery.
- Leest u voor het verwijderen van de backup batterij deze beschrijving.

### 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.

# ■ SPECIFICATIONS

## Tone Generation Method

AWM2 (Advanced Wave Memory 2)

## Maximum Simultaneous Polyphony

64-note

## Sound Module Modes

XG, TG300B, C/M, and Performance

## Multi-timbral Capacity

32-Part (on 32 MIDI channels; with element reserve priority for later notes and dynamic Voice allocation)

## Internal Voice/Program Structure

### Normal Programs

Total Voices.....	1267
XG mode.....	1074
TG300B mode .....	614
C/M mode .....	128 (Parts 1 — 9), 64 (Parts 11 — 16)

### Drum Programs

Total Kits .....	46
XG mode.....	36
TG300B mode .....	10
C/M mode .....	1

### Performance Programs

Up to four Voices plus all effect settings can be memorized to a Performance.

Preset Programs .....	100
User Programs .....	100




## Effects

Six sections of multi-effects: Reverb (12 Types), Chorus (14 Types), Variation (70 Types), Insertion 1, 2 (43 Types), Multi EQ (4 Types), and Part EQ (1 Type)

## Display

Custom back-lit LCD

## Controls

POWER/VOL control, A/D INPUT level control; Mode select buttons: PLAY, UTIL (UTILITY), MODE, EDIT, EFFECT, EQ; other buttons: MUTE/SOLO, ENTER, EXIT, PART , SELECT , VALUE 

## Jacks and Terminals

Front panel: PHONES jack (Stereo Mini-pin), A/D INPUT (stereo 1/4" plug)

Rear panel: OUTPUT R,L (RCA-pin), INPUT R, L (RCA-pin); DC IN jack; TO HOST terminal; HOST SELECT switch; MIDI IN-A/B, MIDI OUT and MIDI THRU terminals

## Computer/MIDI Interface

Direct connection to host computer port (RS-232C, RS-422); MIDI terminals allow connection to MIDI sequencer or MIDI controller

## Data Transfer (Baud) Rate

MIDI —	31,250 bps (bits per second)
Mac —	31,250 bps
PC-1 —	31,250 bps
PC-2 —	38,400 bps

## Power Supply

Yamaha PA-5B AC Adaptor (included)

## Dimensions (W X D X H)

220 X 210 X 44 mm (8-11/16" X 8-1/4" X 1-3/4")

## Weight

1.3 kg (2 lbs., 14 oz.)

## Included Accessories

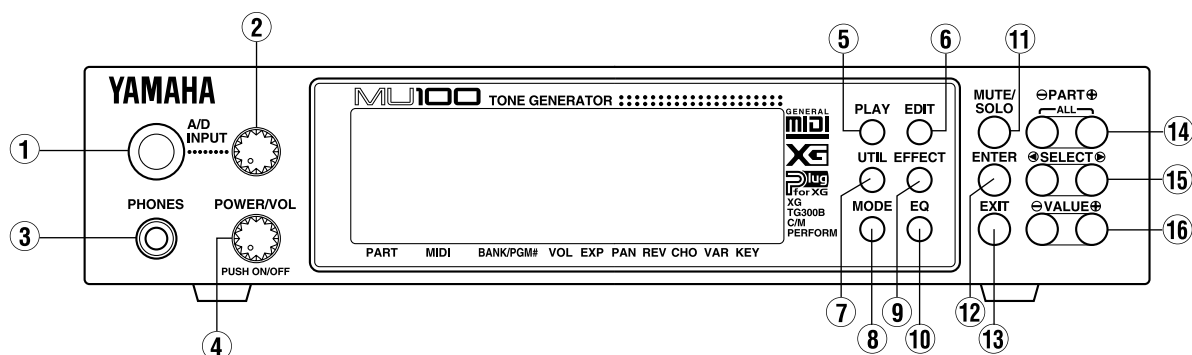
Owner's Manual, Yamaha PA-5B AC Adaptor, XGtools Setup Guide, CD-ROM "XGtools"

## Output Level

Refer to the TEST PROGRAM section of this manual on page,19 and 20.

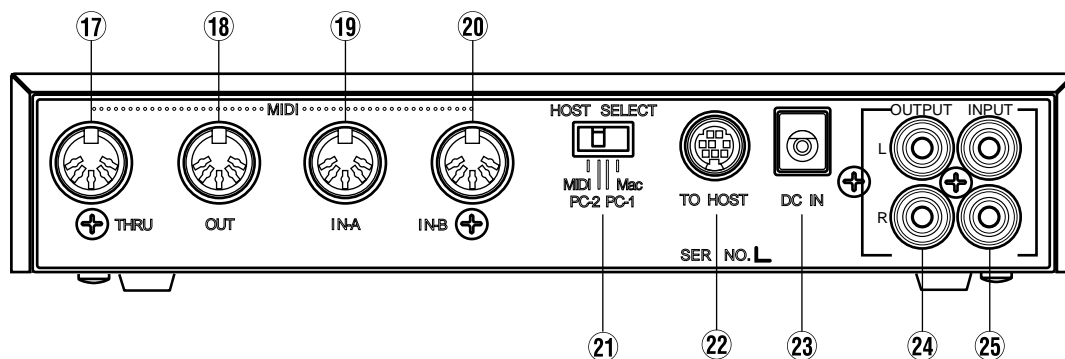
## ■ PANEL LAYOUT

### ● Front Panel



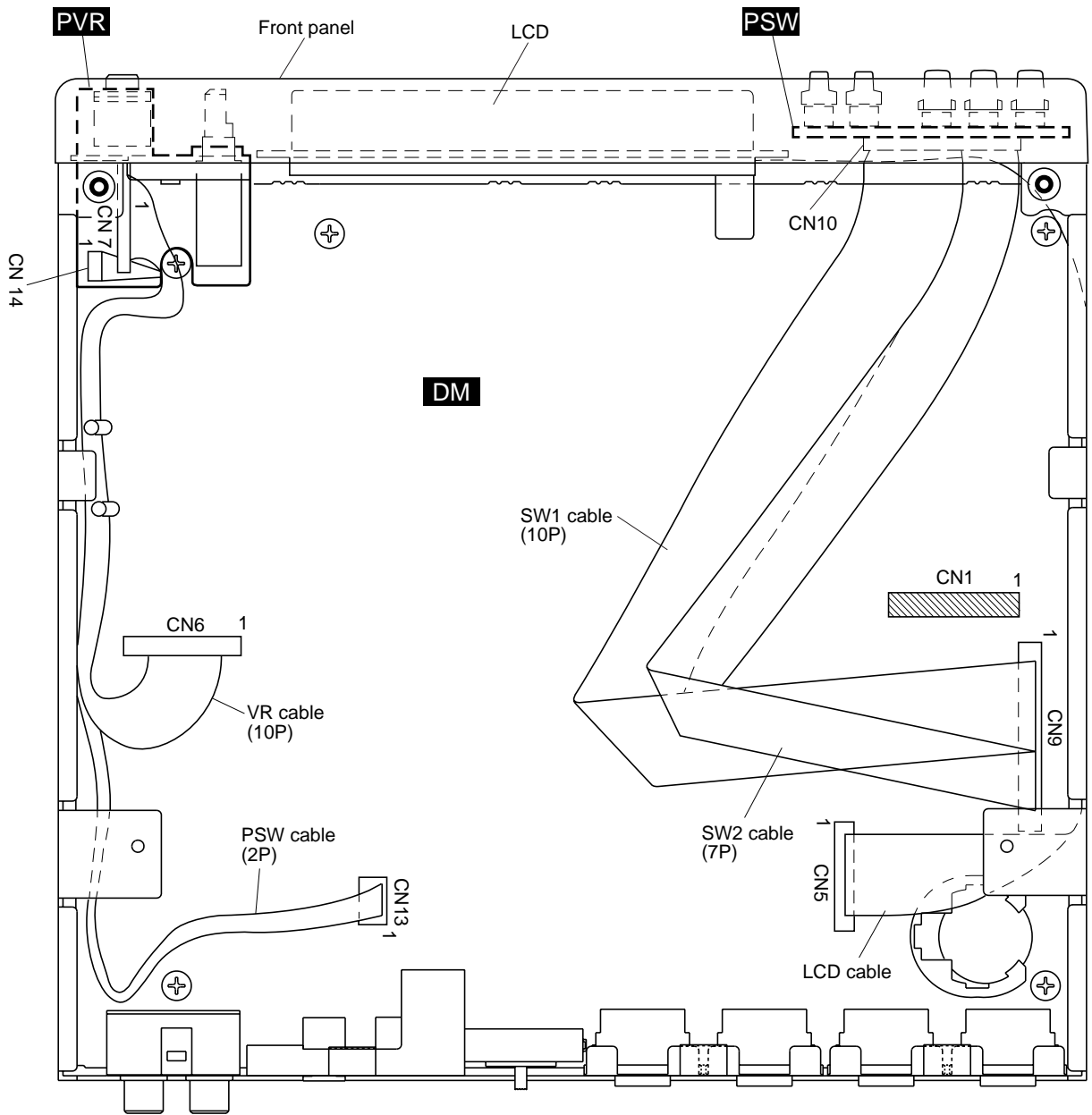
- |                           |   |
|---------------------------|---|
| ① A/D INPUT               | ⑨ EFFECT button                                       |
| ② A/D INPUT level control | ⑩ EQ button   |
| ③ PHONES jack             | ⑪ MUTE / SOLO button                                  |
| ④ POWER/VOL control       | ⑫ ENTER button  |
| ⑤ PLAY button             | ⑬ EXIT button   |
| ⑥ EDIT button             | ⑭ PART $\ominus/\oplus$ buttons                       |
| ⑦ UTIL (UTILITY) button   | ⑮ SELECT $\blacktriangle/\blacktriangleright$ buttons |
| ⑧ MODE button             | ⑯ VALUE $\ominus/\oplus$ buttons                      |

### ● Rear Panel

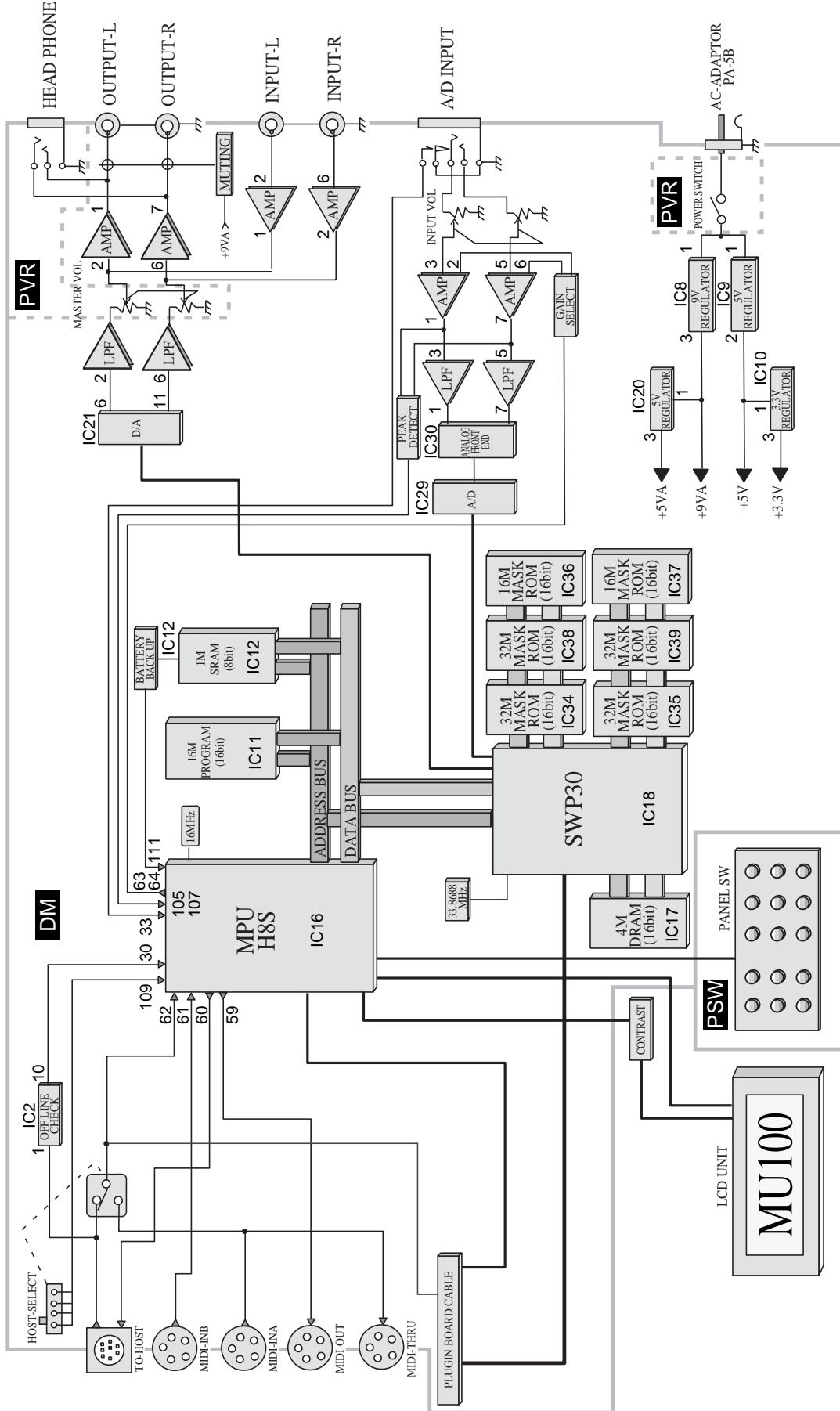


- |                      |                                 |
|----------------------|---------------------------------|
| ⑰ MIDI THRU terminal | ⑳ TO HOST terminal              |
| ⑱ MIDI OUT terminal  | ㉑ DC IN jack                    |
| ㉒ MIDI IN-A terminal | ㉒ OUTPUT L,R jacks (Left,Right) |
| ㉓ MIDI IN-B terminal | ㉓ INPUT L,R jacks (Left,Right)  |
| ㉔ HOST SELECT switch |                                 |

# ■ CIRCUIT BOARD LAYOUT



# ■ BLOCK DIAGRAM



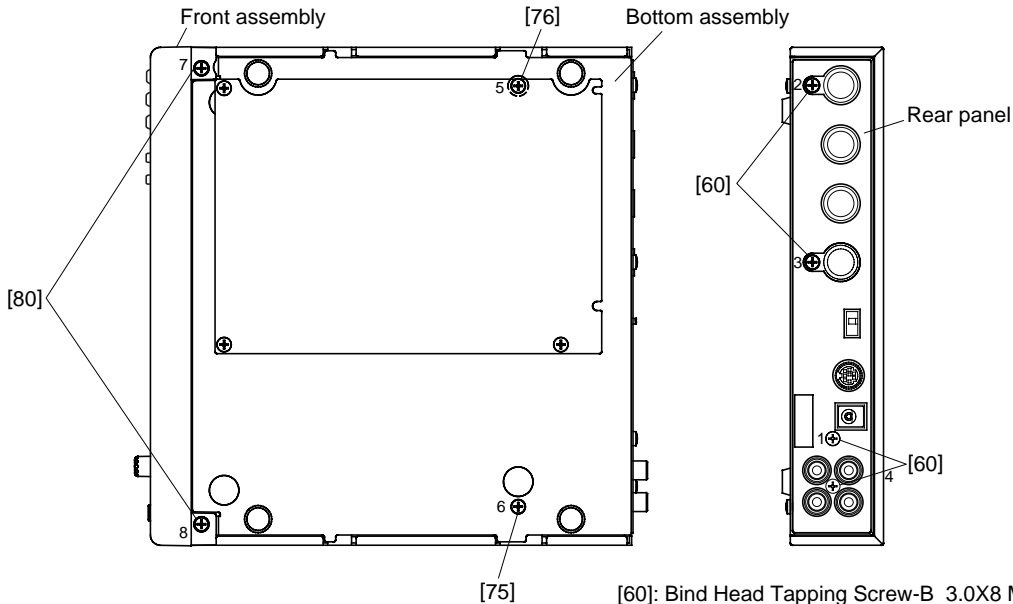
28CA1-8811650

## ■ DISASSEMBLY PROCEDURE

### 1. Bottom Assembly

- 1-1 Remove the four (4) screws marked [60], the screw marked [75], the screw marked [76] and the two (2) screws marked [80]. The bottom assembly can then be removed. (Fig. 1)

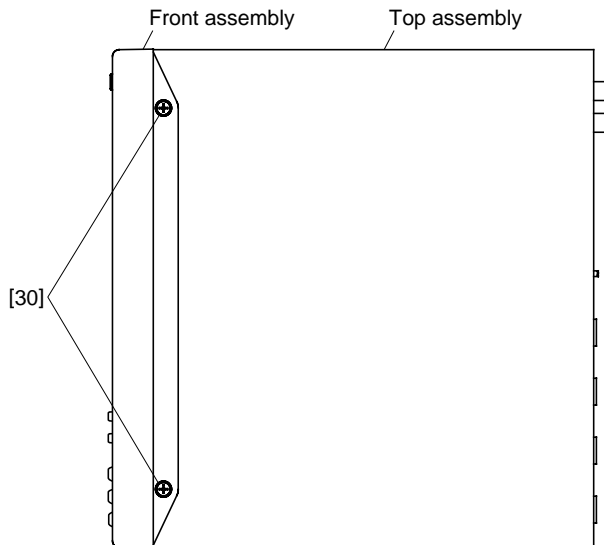
\* When you reattach the bottom assembly, you should tighten the screws in the order described in figure 1.



[60]: Bind Head Tapping Screw-B 3.0X8 MFZN2BL (EP600190)  
 [75]: Bind Head Screw 3.0X6 MFZN2BL (EG330360)  
 [76]: Bind Head Screw 3.0X6 MFNI33 (EG330370)  
 [80]: Flat Head Tapping Screw-C 3.0X8 MFZN2BL (VR060800)

### 2. DM Circuit Board

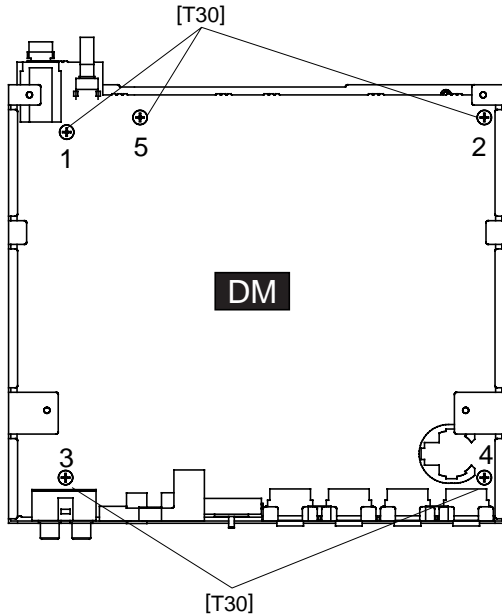
- 2-1 Remove the bottom assembly. (See Procedure 1.)  
 2-2 Remove the two (2) screws marked [30]. The top assembly can then be removed from the front assembly. (Fig. 2)



(Fig.2) [30]: Flat Head Tapping Screw-C 3.0X8 MFZN2BL (VR060800)

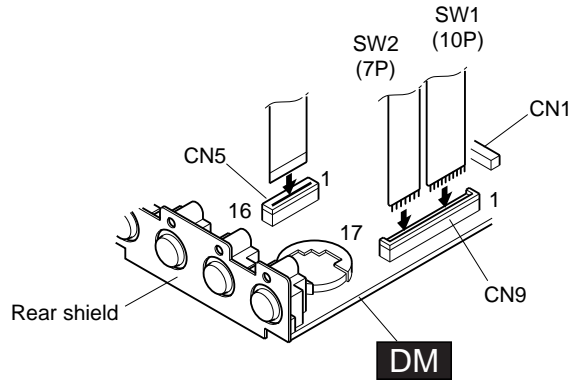
- 2-3 Remove the five (5) screws marked [T30]. The DM circuit board can then be removed. (Fig. 3)
- Pull off the A/D INPUT knob from the DM circuit board.
- Melt and remove the solder of the four (4) points marked [A]. The rear shield can then be removed from the DM circuit board. (Fig. 4-1,4-2)

\* When you reattach the DM circuit board, you should tighten the screws in the order described in figure 3. The cables plugged into the connector CN9 should be inserted as shown in figure 4-1.

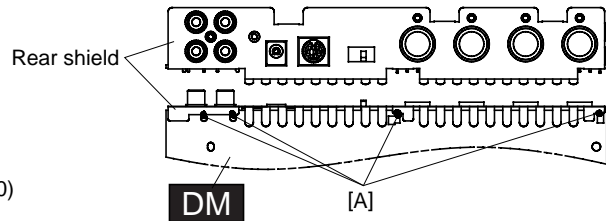


[T30]: Bind Head Tapping Screw-B 3.0X6 MFZN2BL (EP600230)

(Fig.3)



(Fig.4-1)

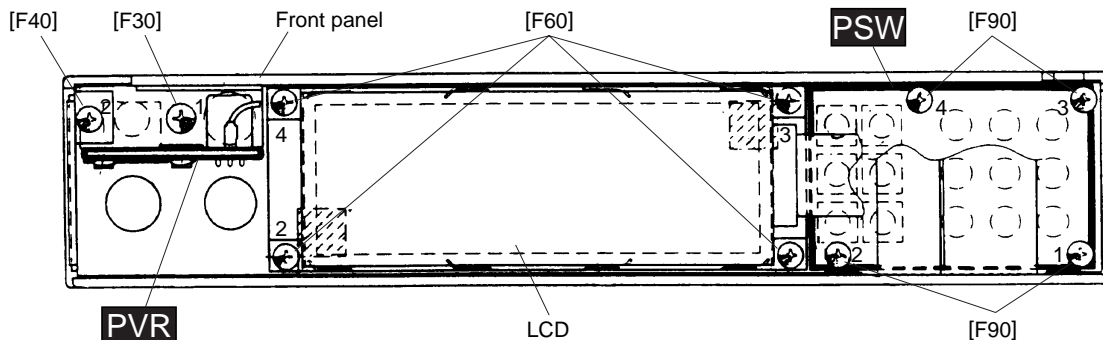


(Fig.4-2)

### 3. PSW & PVR circuit boards and LCD

- 3-1 Remove the bottom assembly. (See Procedure 1.)
- 3-2 Remove the top assembly. (See Procedure 2.)
- 3-3 Remove the four (4) screws marked [F90]. The PSW circuit board can then be removed. (Fig. 5)
- Pull off the OP buttons and the mode buttons from the PSW Circuit board.

- 3-4 Remove the screw marked [F30] and the screw marked [F40]. The PVR circuit board can then be removed. (Fig. 5)
- 3-5 Remove the four (4) screws marked [F60]. The LCD can then be removed. (Fig. 5)
- \* When you reattach the circuit boards, you should tighten the screws in the order described in figure 5.



(Fig.5)

- [F30]: Bind Head Tapping Screw-B 3.0X10 MFZN2Y (EP600220)
- [F40]: Bind Head Tapping Screw-B 2.6X10 MFZN2Y (VD791000)
- [F60]: Bind Head Tapping Screw-B 2.6X10 MFZN2Y (VD791000)
- [F90]: Bind Head Tapping Screw-B 2.6X6 MFZN2Y (VC069600)



## ● Installing a Plug-in Board into the MU100

### Warning

Installation and removal of a plug-in board into/from the MU100 initializes some of the setup and multi-part settings of the main unit. Be sure to save any of your important settings onto a personal computer or MIDI Data Filer MDF3 before installing or removing a plug-in board.

### CAUTION!

Be careful not to injure your hands or fingers while installing or removing the plug-in board.

Be careful not to injure yourself when handling the jagged surfaces or sharp areas of the plug-in board.

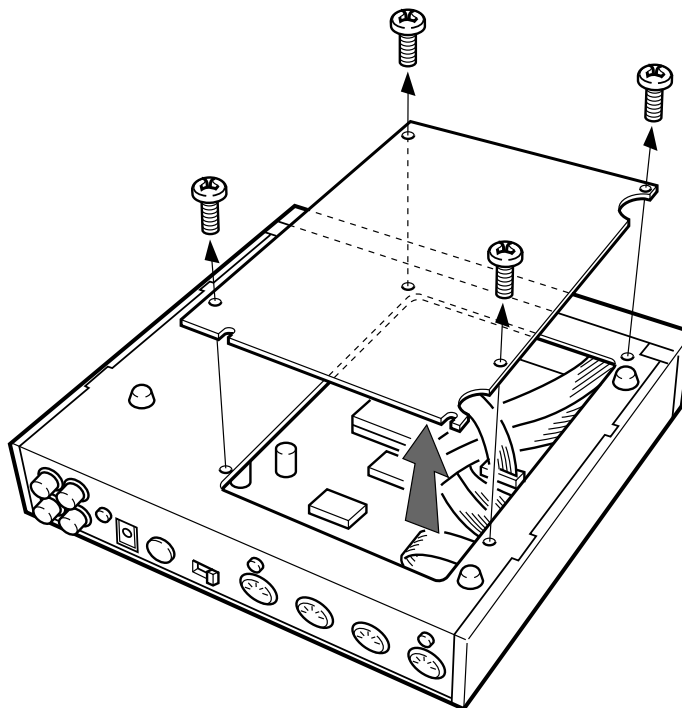
## Instructions

1. Turn off the power of any devices that may be connected to the MU100 and remove the MU100's AC adaptor from its power source.

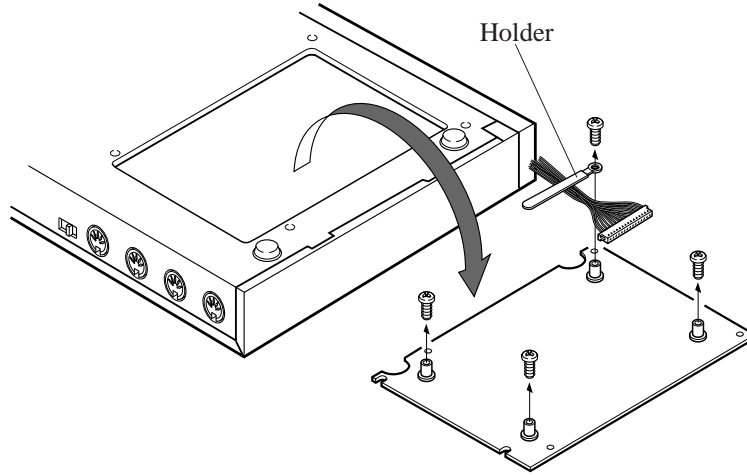
### CAUTION!

Accidents can occur if the plug-in board is installed or removed while the AC adaptor is connected to a power source. Be sure to unplug the AC adaptor of the MU100 before installing or removing the plug-in board.

2. Turn the MU100 upside down.  
Remove the DB cover by removing the four (4) silver screws that secure it to the MU100.



3. Remove the four (4), black, XG Plug-in Board installation screws that are secured to the inside of the DB cover. Unlatch and remove the holder that secures the connector. Extend the connector. Keep the holder for use when the XG Plug-in Board is removed.

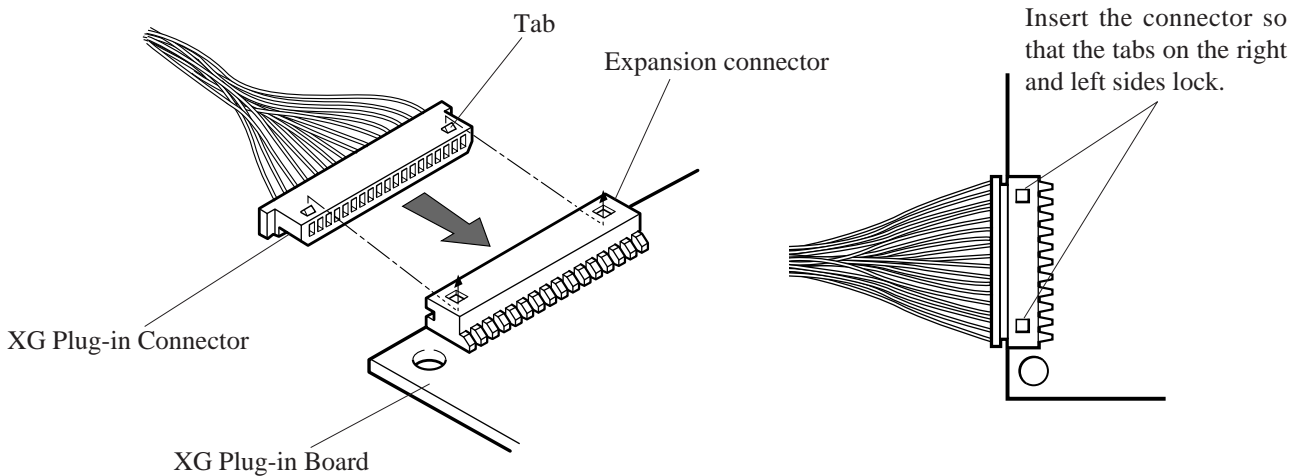


4. Remove the XG Plug-in Board from the anti-static bag.

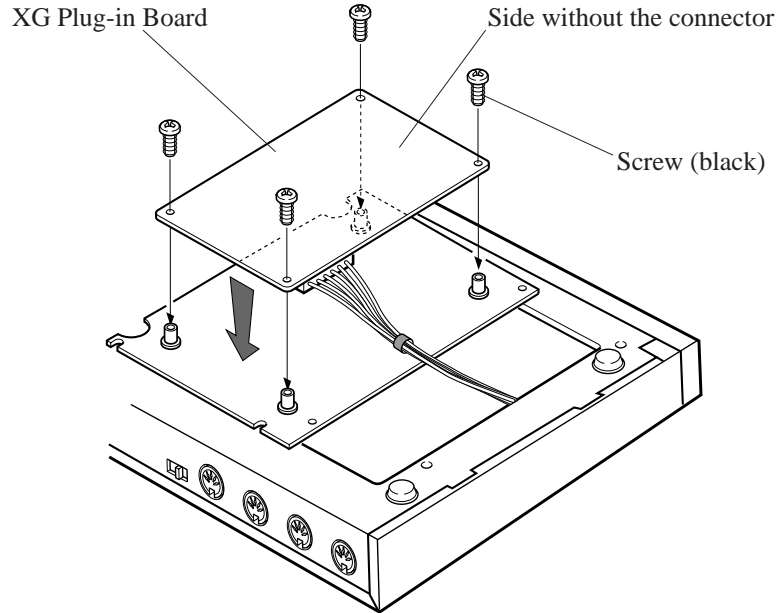
**CAUTION!**

Before handling the XG Plug-in Board, be sure to touch a grounded, metal surface in order to remove any static electricity from your clothes or body. Do not touch any of the patterned surfaces of the board or its connector.

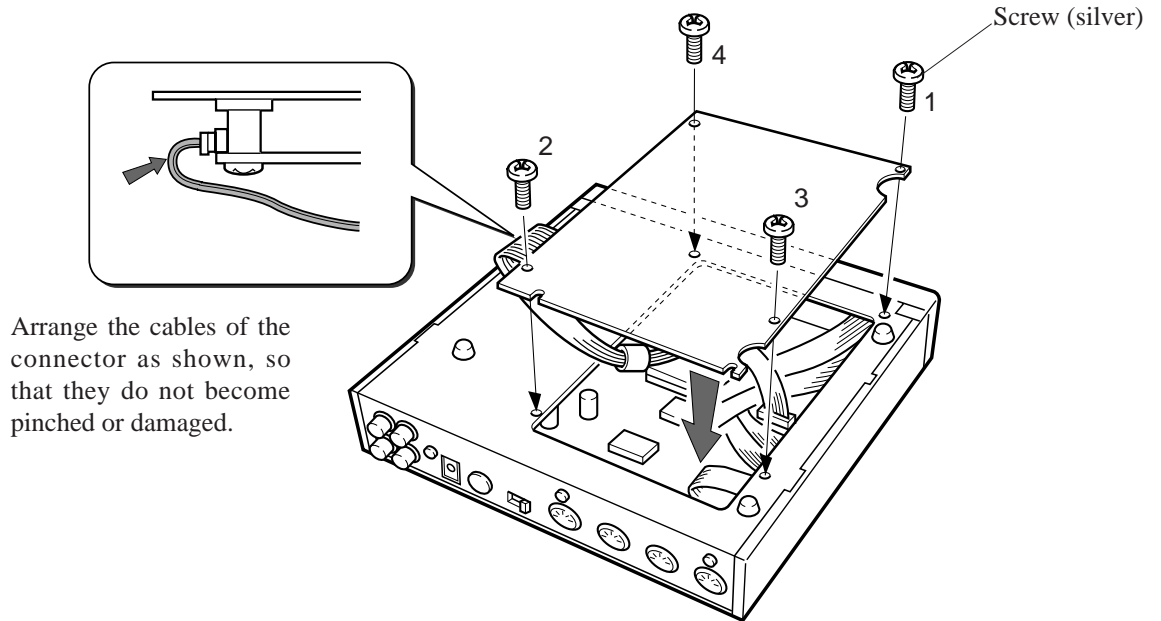
5. Insert the expansion connector of the MU100 into the connector of the XG Plug-in Board. Make sure to insert the connector so that it faces the proper direction and the right and left tabs of the expansion connector lock into place (as shown in the illustration).



6. Attach the XG Plug-in Board to the DB cover using the four (4), black screws that were removed in Step 3. Install the XG Plug-in Board so that the side with the IC chips is facing the DB cover. Position the XG Plug-in Board from above, onto the DB cover, making sure to align the holes of the board with the holes on the lid. If the holes are not properly aligned, you may damage the plug-in board.



7. Secure the DB cover back onto the MU100 by using the same four (4) silver screws that were removed in Step 2. Secure the screws in the order shown in the illustration.



## LSI PIN DESCRIPTION

### ● HD6432655A00F (XT443A00) CPU

PIN NO.	NAME	I/O	FUNCTION	PIN NO.	NAME	I/O	FUNCTION
1	CS1	O	Chip Select for System RAM (CS1)	65	Vss	-	GND
2	CS0	O	Chip Select for System RAM (CS0)	66	P60	O	NC
3	Vss	-		67	Vss	-	GND
4	Vss	-	GND	68	Vss	-	GND
5	Vcc	-	Power Supply	69	P61	O	NC
6	A0	O	Address Bus	70	P62	O	PB Select (SW1)
7	A1	O		71	P63	O	PB Select (SW2)
8	A2	O		72	P27	O	NC
9	A3	O		73	P26	O	1 MHz Clock for Serial Interface
10	Vss	-	GND	74	P25	O	LCD Contrast (LCDC-C)
11	A4	O	Address Bus	75	P24	O	LCD Contrast (LCDC-B)
12	A5	O		76	P23	O	LCD Contrast (LCDC-A)
13	A6	O		77	P22	O	LCD Control (LCD-E)
14	A7	O		78	P21	O	LCD Control (LCD-R/W)
15	A8	O	Address Bus	79	P20	O	LCD Control (LCD-RS)
16	A9	O		80	WDT0VF	O	NC
17	A10	O		81	RES	I	Reset Signal
18	A11	O		82	NMI	I	not used
19	Vss	-	GND	83	STBV	I	not used
20	A12	O	Address Bus	84	Vcc	-	Power Supply
21	A13	O		85	XTAL		Quartz Cristal 16 MHz
22	A14	O		86	EXTAL		Quartz Cristal 16 MHz
23	A15	O		87	Vss	-	GND
24	A16	O	Address Bus	88	φ		NC
25	A17	O		89	Vcc	-	Power Supply
26	A18	O		90	AS	O	NC
27	A19	O		91	RD	O	Read Signal
28	Vss	-	GND	92	HWR	O	Write Signal
29	A20	O	Address Bus	93	LWR	O	NC
30	PA5	I	Off Line Detection	94	PF2	O	PB Select (SW4)
31	PA6	O	Signal for Rotary encoder(REB)	95	PF1	O	SW Data Read Control (SWD)
32	PA7	O	Signal for Rotary encoder(REA)	96	PF0	O	LED,SW Strobe Data Latch (SWS)
33	P67	I	Plug Detection of A/D Input	97	TXD2	O	Serial Output for PB (TXD2)
34	P66	O	NC	98	RXD2	I	Serial Input for PB (RXD2)
35	Vss	-	GND	99	Vss	-	GND
36	Vss	-	GND	100	Vss	-	GND
37	P65	O	Reset Signal for SWP30	101	SCK2	O	Serial Sync Clock for PB (MIDCLK)
38	P64	O	Reset Signal for PB	102	P53	O	Reset Signal for Rotary Encoder
39	Vcc	-	Power Supply	103	AVcc	I	Power Supply for A/D
40	D0	I/O	Two Way Data Bus	104	Vref	I	Reference Voltage for A/D
41	D1	I/O		105	AN0	I	Analog Level Input R
42	D2	I/O		106	AN1	I	not used
43	D3	I/O		107	AN2	I	Analog Level Output L
44	Vss	-	GND	108	AN3	I	not used
45	D4	I/O	Two Way Data Bus	109	AN4	I	Detection of Host SW Position
46	D5	I/O		110	AN5	I	not used
47	D6	I/O		111	AN6	I	Battery Voltage Check
48	D7	I/O		112	AN7	I	ModelCheck (MU100:GND)
49	D8	I/O	Two Way Data Bus	113	AVss	-	GND
50	D9	I/O		114	Vss	-	GND
51	D10	I/O		115	P17	I/O	LCD Data(DB7),SW Data,LED6
52	D11	I/O		116	P16	I/O	LCD Data(DB6),SW Strobe Data
53	Vss	-	GND	117	P15	I/O	LCD Data(DB5),SW Strobe Data
54	D12	I/O	Two Way Data Bus	118	P14	I/O	LCD Data(DB4),SW Data,LED5
55	D13	I/O		119	P13	I/O	LCD Data(DB3),SW Data,LED4
56	D14	I/O		120	P12	I/O	LCD Data(DB2),SW Data,LED3
57	D15	I/O		121	P11	I/O	LCD Data(DB1),SW Data,LED2
58	Vcc	-	Power Supply	122	P10	I/O	LCD Data(DB0),SW Data,LED1
59	TXD0	O	Serial MIDI OUT (TXD0)	123	MD0	I	GND
60	TXD1	O	Serial Host OUT (TXD1)	124	MD1	I	GND
61	RXD0	I	Serial MIDI IN B (RXD0)	125	MD2	I	+5 D
62	RXD1	I	Serial MIDI IN A (RXD1) or Host IN	126	PG0	O	PB Select (SW3)
63	P34	O	A/D Gain Control Signal(ADG1)	127	CS3	O	NC
64	P35	O	A/D Gain Control Signal(ADG2)	128	CS2	O	Chip Select for SWP30 (CS2)

● TC203C760HF-001 (XR738A00) ● TC203C760HF-002 (XS725A00)  
**SWP30** (AWM Tone Generator coped with MEG) Standard Wave Processor

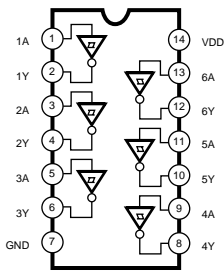
PIN NO.	NAME	I/O	FUNCTION	PIN NO.	NAME	I/O	FUNCTION
1	VSS	I	(Ground)	121	VSS	I	(Ground)
2	CA0	I	Address bus internal register	122	HMD0	I/O	Wave memory data bus (Upper data memory)
3	CA1	I					
4	CA2	I					
5	CA3	I					
6	CA4	I					
7	CA5	I					
8	CA6	I					
9	CA7	I					
10	CA8	I					
11	CA9	I					
12	CA10	I					
13	CA11	I					
14	VSS	I	(Ground)	134	HMD12	I/O	
15	CD0	I/O	Data bus of internal register	135	HMD13	I/O	
16	CD1	I/O					
17	CD2	I/O					
18	CD3	I/O					
19	CD4	I/O					
20	CD5	I/O					
21	CD6	I/O					
22	CD7	I/O					
23	CD8	I/O					
24	CD9	I/O					
25	CD10	I/O					
26	CD11	I/O					
27	CD12	I/O					
28	CD13	I/O					
29	CD14	I/O					
30	VDD	I	(Power supply)	136	HMD14	I/O	
31	VSS	I	(Ground)	137	HMD15	I/O	
32	CD15	I/O	Chip select Write strobe Read strobe	138	VSS	I	(Ground)
33	/CS	I					
34	/WR	I					
35	/RD	I					
36	VDDS	I		(Power supply)	139	HMA0	O
37	SYSH0	O		NSYS/LNSYS upper 16 bits	140	HMA1	O
38	SYSH1	O					
39	SYSH2	O					
40	SYSH3	O					
41	SYSH4	O					
42	SYSH5	O					
43	SYSH6	O					
44	SYSH7	O					
45	KON0	O	Key on data		141	HMA2	O
46	KON01	O					
47	KON02	O					
48	KON03	O	(Ground)	142	HMA3	O	
49	VSS	I	(Ground)	143	HMA4	O	
50	SYSL0	I/O	NSYS input/LNSYS output lower 8 bits	144	HMA5	O	
51	SYSL1	I/O					
52	SYSL2	I/O					
53	SYSL3	I/O					
54	SYSL4	I/O					
55	SYSL5	I/O					
56	SYSL6	I/O					
57	SYSL7	I/O					
58	KON10	I	Key on data	145	HMA6	O	
59	KON11	I					
60	VDDS	I		(Power supply)	146	HMA7	O
61	VSS	I	(Ground)	147	HMA8	O	
62	KON12	I	DAC output DAC output DAC0/DAC1 word clock	148	HMA9	O	
63	KON13	I					
64	DAC0	O					
65	DAC1	O					
66	WCLK	O					
67	MEL0	O	MEL wave data output	149	HMA10	O	
68	MEL01	O					
69	MEL02	O					
70	MEL03	O					
71	MEL04	O					
72	MEL05	O					
73	MEL06	O					
74	MEL07	O					
75	VDDS	I	(Power supply)	150	VSS	I	(Ground)
76	ADLR	O	ADC word clock	151	VDD	I	(Power supply)
77	MEL10	I					
78	MEL11	I					
79	MEL12	I	MEL wave data input	152	HMA11	O	Wave memory address bus (Upper 16 bits)
80	MEL13	I					
81	MEL14	I					
82	MEL15	I					
83	MEL16	I					
84	MEL17	I					
85	VSS	I	(Ground)	153	HMA12	O	
86	/RCAS	O	DRAM column address strobe	154	HMA13	O	
87	RA8	O					
88	RA7	O					
89	RA6	O	DRAM address bus	155	HMA14	O	
90	VDD	I		(Power supply)	156	HMA15	O
91	VSS	I		(Ground)	157	HMA16	O
92	RA5	O	DRAM row address strobe DARM write enable	158	HMA17	O	
93	RA4	O					
94	RA3	O					
95	RA2	O					
96	RA1	O					
97	RA0	O					
98	/RRAS	O					
99	/RWE	O					
100	VSS	I	(Ground)	159	HMA18	O	
101	RD7	I/O	DRAM data bus	160	HMA19	O	
102	RD6	I/O					
103	RD5	I/O					
104	RD4	I/O					
105	RD3	I/O					
106	RD2	I/O					
107	RD1	I/O					
108	RD0	I/O					
109	VSS	I		(Ground)	161	HMA20	O
110	RD17	I/O		Sync. signal for master clock Sync. signal for HCLK/QCLK 1/12 master clock (64 Fs) 1/6 master clock (128 Fs) 1/3 master clock (256 Fs) 1/2 master clock (384 Fs)	162	HMA21	O
111	RD16	I/O					
112	RD15	I/O					
113	RD14	I/O					
114	RD13	I/O					
115	RD12	I/O					
116	RD11	I/O					
117	RD10	I/O					
118	RD9	I/O					
119	RD8	I/O					
120	VDDS	I	(Power supply)		163	HMA22	O
				164	HMA23	O	
				165	HMA24	O	
				166	VSS	I	(Ground)
				167	/MRAS	O	RAS when DRAM(s) is connected to wave memory
				168	/MCAS	O	CAS when DRAM(s) is connected to wave memory
				169	/MOE	O	Wave memory output enable
				170	/MWE	O	Wave memory write enable
				171	VSS	I	(Ground)
				172	LMD0	I/O	Wave memory data bus (Lower data memory)
				173	LMD1	I/O	
				174	LMD2	I/O	
				175	LMD3	I/O	
				176	LMD4	I/O	
				177	LMD5	I/O	
				178	LMD6	I/O	
				179	LMD7	I/O	
				180	VDDS	I	(Power supply)
				181	VSS	I	(Ground)
				182	LMD8	I/O	
				183	LMD9	I/O	
				184	LMD10	I/O	
				185	LMD11	I/O	
				186	LMD12	I/O	
				187	LMD13	I/O	
				188	LMD14	I/O	
				189	LMD15	I/O	
				190	VSS	I	(Ground)
				191	LMA0	O	Wave memory address bus (Lower data memory)
				192	LMA1	O	
				193	LMA2	O	
				194	LMA3	O	
				195	LMA4	O	
				196	LMA5	O	
				197	LMA6	O	
				198	LMA7	O	
				199	LMA8	O	
				200	LMA9	O	
				201	LMA10	O	
				202	LMA11	O	
				203	VSS	I	(Ground)
				204	LMA12	O	
				205	LMA13	O	
				206	LMA14	O	
				207	LMA15	O	
				208	LMA16	O	
				209	LMA17	O	
				210	VDD	I	(Power supply)
				211	VSS	I	(Ground)
				212	LMA18	O	
				213	LMA19	O	
				214	LMA20	O	
				215	LMA21	O	
				216	LMA22	O	
				217	LMA23	O	
				218	LMA24	O	
				219	VSS	I	(Ground)
				220	SYO	O	Sync. signal for master clock
				221	SYOD	O	Sync. signal for HCLK/QCLK
				222	QCLK	O	1/12 master clock (64 Fs)
				223	HCLK	O	1/6 master clock (128 Fs)
				224	CK256	O	1/3 master clock (256 Fs)
				225	SYSCLK	O	1/2 master clock (384 Fs)
				226	VDDS	I	(Power supply)
				227	SYI	I	Sync. clock
				228	MCLKI	I	Master clock input
				229	MCLKO	O	Master clock output
				230	VDD	I	(Power supply)
				231	XIN	I	Crystal osc. input
				232	XOUT	O	Crystal osc. output
				233	VSS	I	(Ground)
				234	/IC	I	Initial clear
				235	CHIP2	I	2 chips mode enable
				236	SLAVE	I	Master/Slave select when 2 chips mode
				237	/TESTO	I	Test pin
				238	/ACI	I	
				239	DCTEST	I	
				240	VDDS	I	(Power supply)

● **μPD63200GS-E1** (XP867A00) DAC (Digital to Analog Converter)

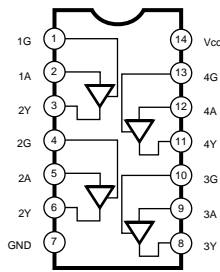
PIN NO.	NAME	I/O	FUNCTION	PIN NO.	NAME	I/O	FUNCTION
1	4/8F	I	4/8 Fs selection	9	R. REF		Channel R voltage reference
2	D. GND		Digital ground	10	L. REF		Channel L voltage reference
3	16 BIT	I	16 bit/18 bit selection	11	L. OUT	O	Channel L output
4	D. VDD		Digital power supply	12	A. GND		Analog ground
5	A. GND		Analog ground	13	WDCK	I	Word clock
6	R. OUT	O	Channel R output	14	RSI	I	Channel R series input
7	A. VDD		Analog power supply	15	SI/LSI	I	Series input/Channel L series input
8	A. VDD			16	CLK	I	Clock

■ IC BLOCK DIAGRAM

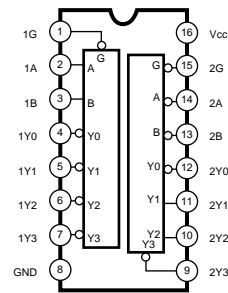
● **SN74HC14AF-TP1** (XD657A00)  
Hex Inverter



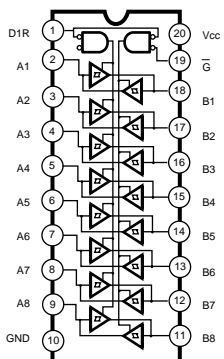
● **TC74HC126AF** (XS776A00)  
Bus Buffer



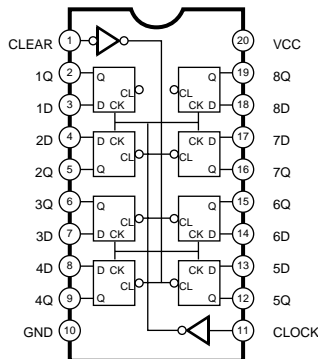
● **TC74LVC139F9EL** (XS048A00)  
Dual 2 to 4 Demultiplexer



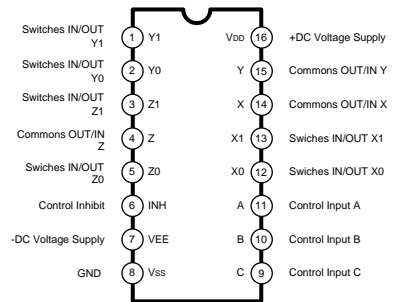
● **TC74HC245F-T1** (XD603A00)  
Octal 3-State Bus Transceiver



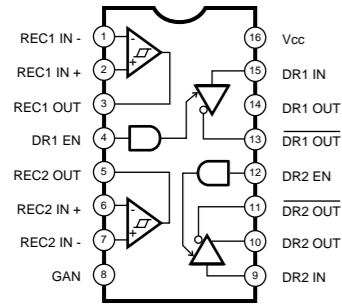
● **SN74HC273NSR** (XH223A00)  
Octal D-Type Flip Flop



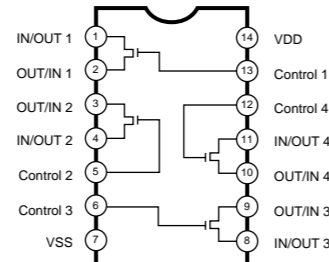
● **TC74HC4051AF-TP** (XR056A00)  
Triple 2-channel Multiplexer /Demultiplexer



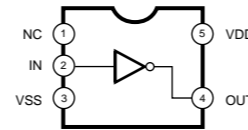
- **MC34051MEL** (XP881A00)  
**M5M34051FP** (XV103A00)  
Dual EIA-422/423 Line Transceiver



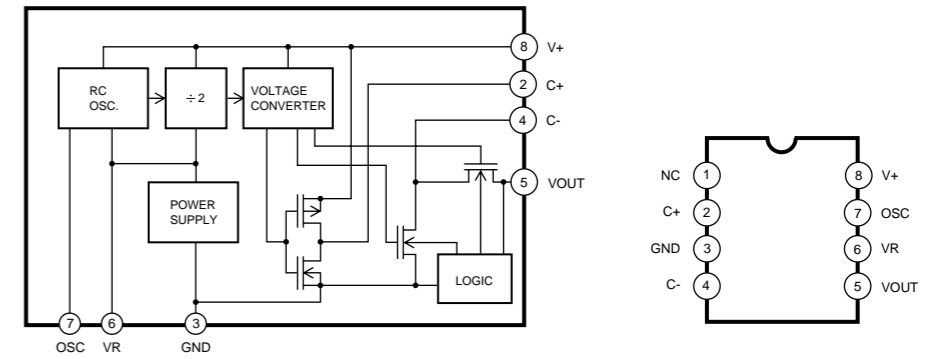
- **TC74HC4066AF-T1** (XG385A00)  
Quad Bilateral Analog Switch



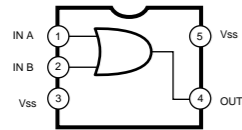
- **SC7SU04FEL** (XI348A00)  
Inverter



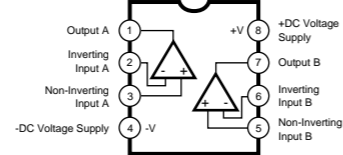
- **NJU7660M-T1** (XP596A00)  
DC/DC Voltage Converter



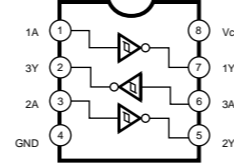
- **TC7S32F** (XM588A00)  
OR



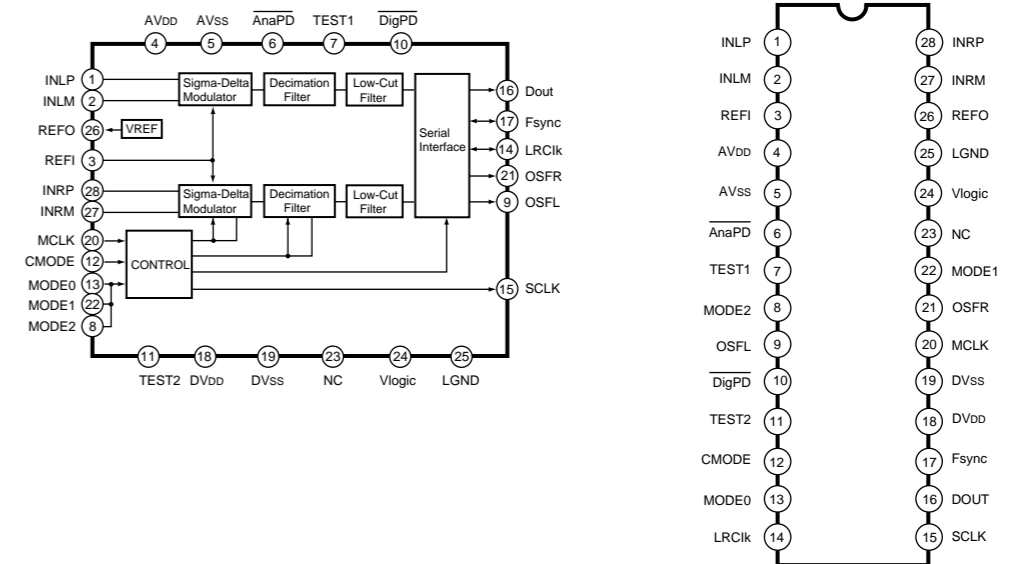
- **μPC4570G2** (XF291A00)  
● **NJM4556AMT1** (XQ138A00)  
Dual Operational Amplifier



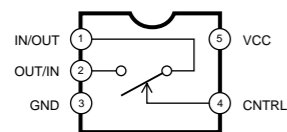
- **TC7W14FU** (XN883A00)  
Triple Inverter



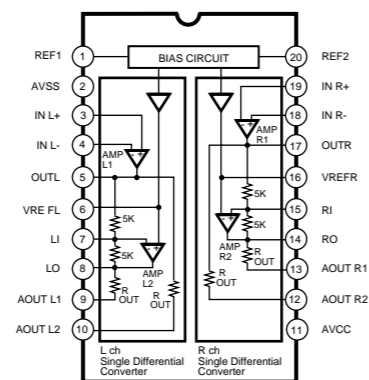
- **TLC320AD58CDWT** (XS892A00)



- **TC7S66F** (XR682A00)  
Bilateral Switch

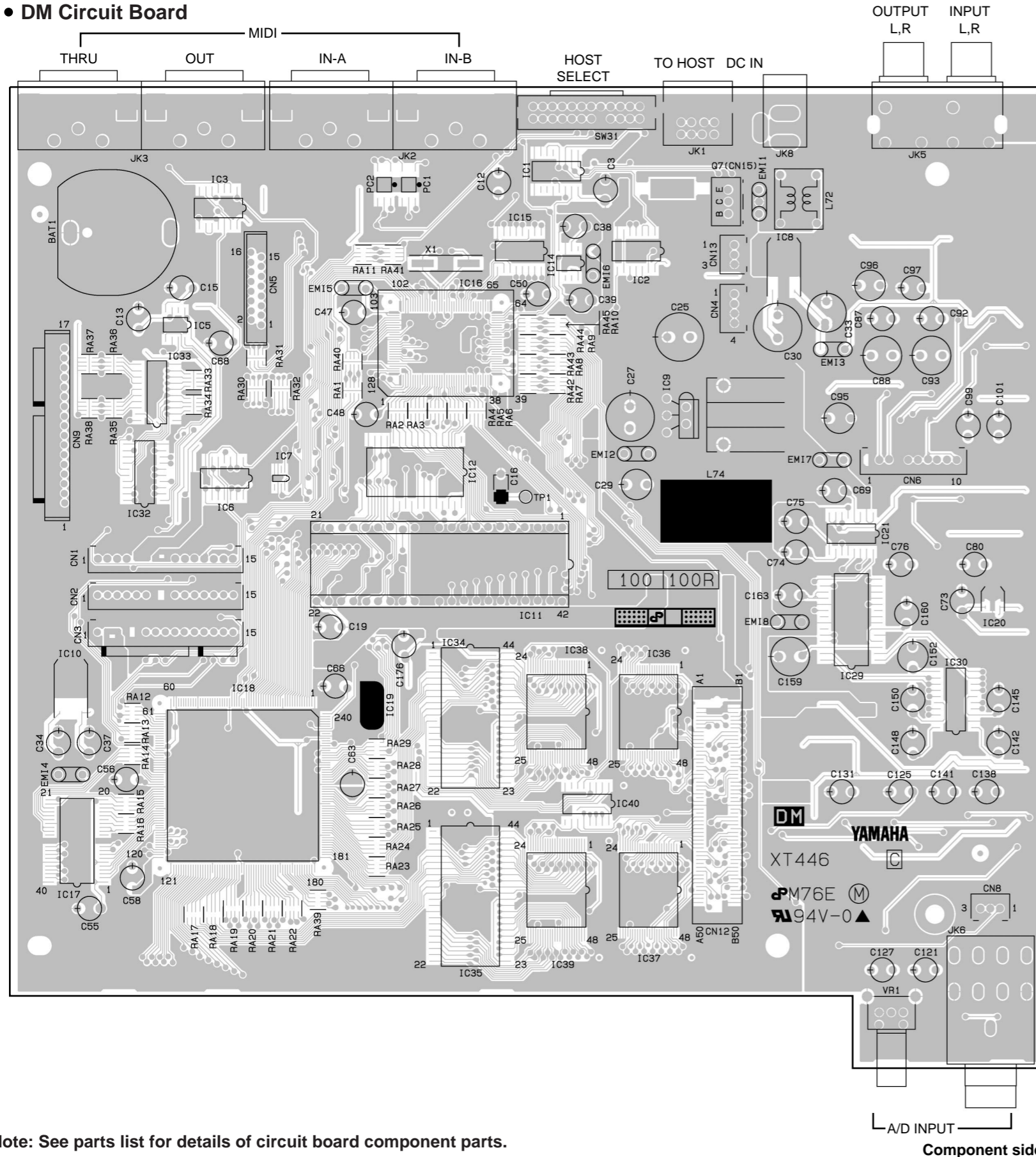


- **TL32088CNST** (XS893A00)  
AD FRONT END

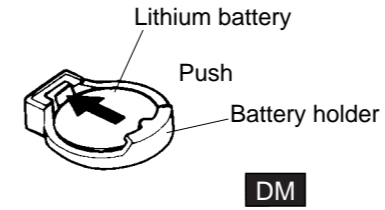


# CIRCUIT BOARDS

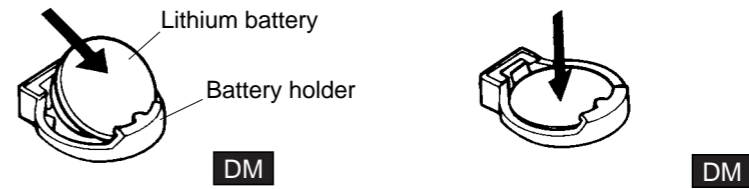
## DM Circuit Board



### When removing



### When installing

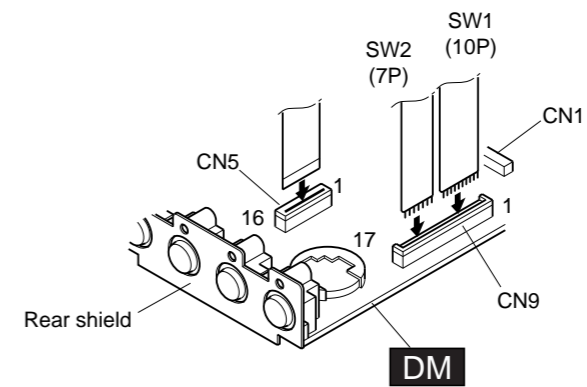


**Battery VN103500**  
VN103600(Battery holder for VN103500)

- Notice for back-up battery removal  
Push the battery as shown in figure, then the battery will pop up.
- Druk de batterij naar beneden zoals aangeven in de tekening de batterij springt dan naar voren.

\* The lithium battery is not a part of the DM circuit board .

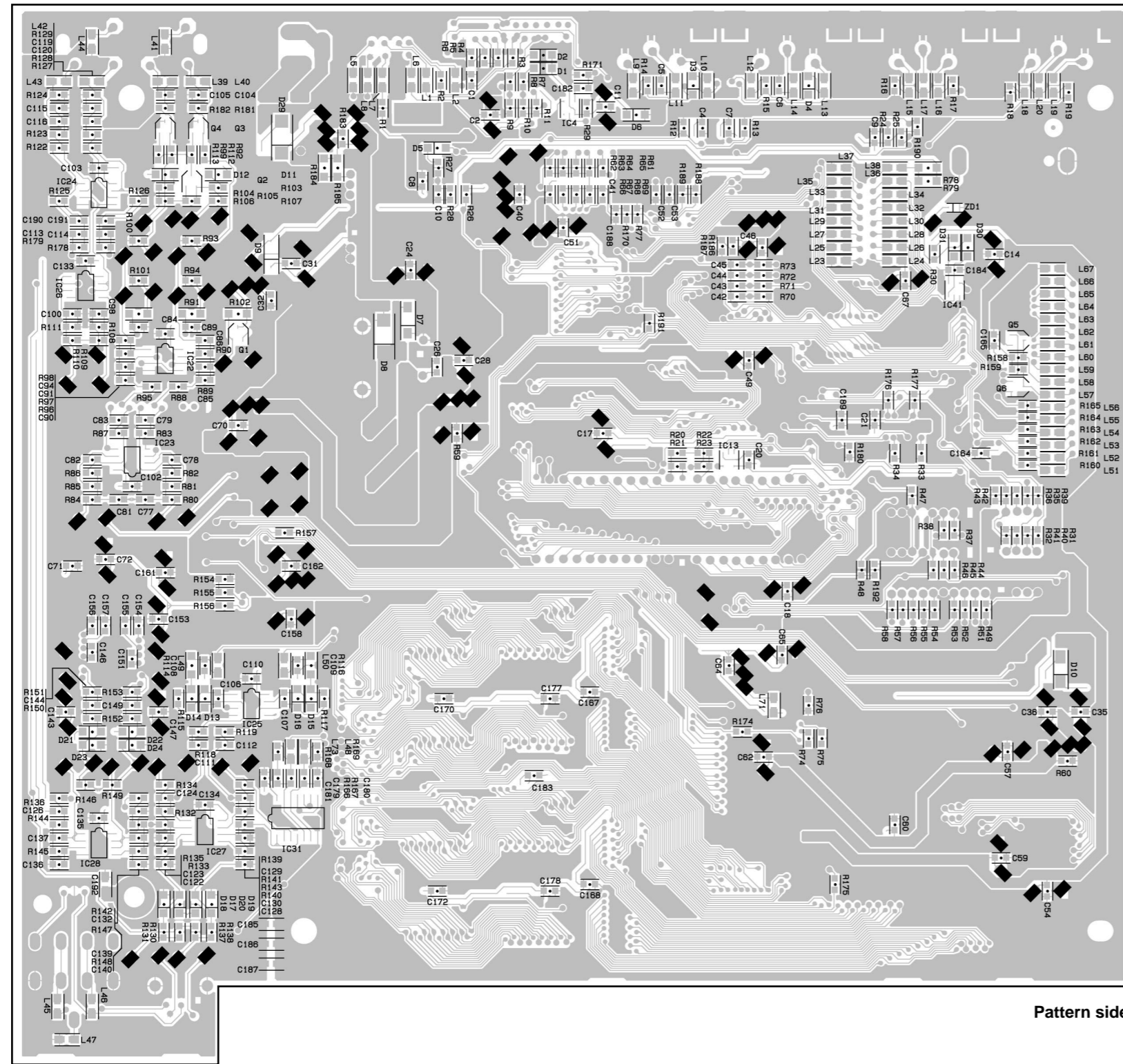
### • CN9 Installing



Note: See parts list for details of circuit board component parts.

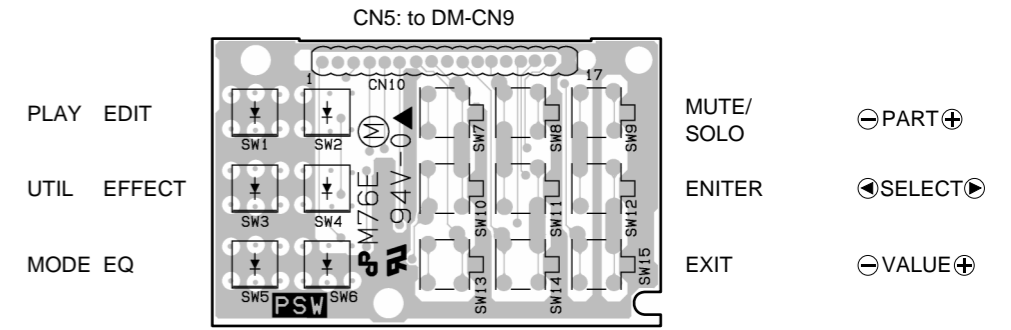


• DM Circuit Board

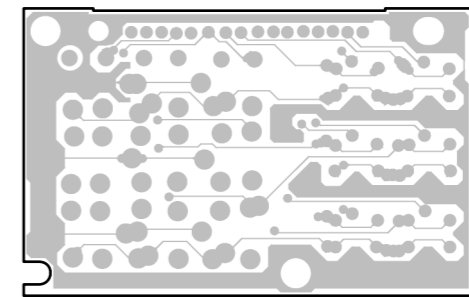


Pattern side

• PSW Circuit Board

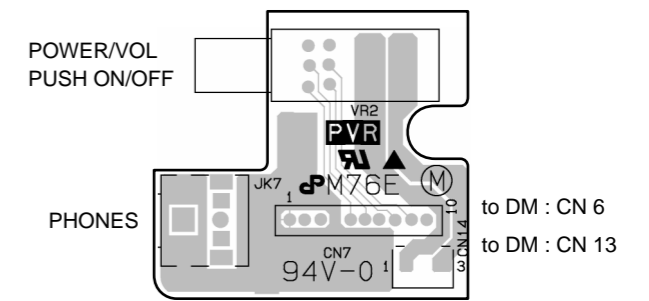


Component side

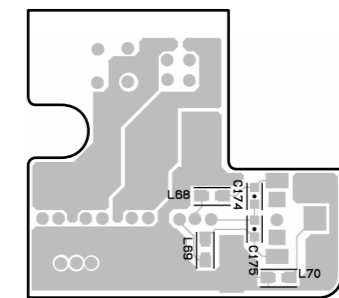


Pattern side

• PVR Circuit Board



Component side



Pattern side

Note: See parts list for details of circuit board component parts.

## ■ TEST PROGRAM

### PREPARATIONS

The following measuring instruments and jigs are necessary during the test.

Measuring instruments :

Audio signal generator, oscilloscope, amplifier/speaker system, etc.

Jigs : MIDI cables, etc.

No.	Test	Remarks
A	TEST ENTRY	
B	PROCEEDING THROUGH THE TEST AND SELECTION WHEN AN ERROR IS DETECTED	
1	SRAM	SRAM Read/Write
2	BATTERY	A/D check on CPU
3	LCD ALL DOTS ON	
4	SWITCH & LED	SWITCH ON/OFF & LED ON/OFF
5	DIAL	Not using
6	MIDI 1	Connect MIDI IN A to MIDI OUT
7	MIDI 2	Connect MIDI IN A to MIDI OUT
8	HOST SELECT	Slide HOST SELECT
9	TO HOST TX/RX	Factory use
10	WAVE ROM	WAVE ROM READ
11	1 kHz OUTPUT(L)	Using measuring instruments
12	1 kHz OUTPUT(R)	Using measuring instruments
13	1 kHz INDIV.OUT1	Not using
14	1 kHz INDIV.OUT2	Not using
15	INPUT HIGH	Using measuring instruments
16	INPUT LOW	Using measuring instruments
17	MEG & DRAM	Using measuring instruments
18	64 SOUNDS OUTPUT	By listening
19	FACTORY SETTINGS	
20	EXIT	
21	PB1 NAME	Circuit Board test of CN 1
22	PB1 RAM	Circuit Board test of CN 1
23	PB1 MIDI IN	Circuit Board test of CN 1
24	PB1 MEL	Circuit Board test of CN 1
25	PB2 NAME	Not using
26	PB2 RAM	Not using
27	PB2 MIDI IN	Not using
28	PB2 MEL	Not using

The test "Not using" is written in the column of remarks and is not performed on the MU100.

When performing the tests numbered 21 to 24, connect the Plug-in Board to the connector CN1 of the MU100 before starting the test.

### A. HOW TO ENTER THE TEST PROGRAM

While pressing the [PLAY] and the [MUTE/SOLO] buttons, turn the MU100 POWER switch on.

When the test program is initiated, the version of the program ROM will appear on the LCD.

MU100 TEST MODE  
Ver#. ## #-###-##

(#.#=#Version number of the MU100 program ROM)

After displaying the version message shown above, the following display will appear.

01 RAM

The factory settings should be performed before any test when a circuit board or the backup battery is replaced. The factory settings are performed by turning the MU100 POWER switch on while pressing the [UTIL] and the [ENTER] buttons.

### B. PROCEEDING THROUGH THE TEST

When entering the test program, the following display will appear.

01 RAM

Use the [SELECT ●] and [SELECT ●] buttons to move through the various tests of the test program.

After having selected the test, press the [ENTER] button to start the test in succession from that number.

Pressing without selecting the test will start the test from "1. SRAM test".

### TEST SELECTION WHEN AN ERROR IS DETECTED

In each test, if an NG (No Good) error is detected, press the [EXIT] button. The MU100 will then wait for the entry of a test number.

#### 1. SRAM TEST

01 RAM

The Write/Read check for SRAM (IC 9 and IC 10) will be performed automatically on the following address.

IC9, IC10= h'200000 ~ h'20FFFF (16-bit Data Bus)

DISPLAY OF TEST RESULTS

OK 01 RAM ok

NG 01 RAM err

TEST END

After displaying the test result on the LCD, the test will be completed and proceed to the next test. If an error is detected during the test, refer to section B, "PROCEEDING TROUGH THE TEST". All SRAM data is preserved.

#### 2. BATTERY TEST

02 BATTERY

This test checks that the voltage of the battery is greater than 2.9 V and less than 3.4 V.

DISPLAY OF TEST RESULTS

OK 02 BATTERY ok

NG 02 BATTERY err

TEST END

After displaying the test result on the LCD, the test will be completed and proceed to the next test. If an error is detected during the test, refer to section B, "PROCEEDING TROUGH THE TEST".

#### 3. LCD-ALL DOTS "ON" TEST

Check that all dots of the LCD change to black. After checking the back light, press the [SELECT] button to control the LCD contrast in eight (8) steps.

TEST END

Press the [ENTER] button. The MU100 will then proceed to enter the following test.

If the [EXIT] button is pressed, the MU100 will wait for the entry of the test number.

#### 4. SWITCH & LED TEST

04 SWITCH & LED  
[PLAY]

Press the panel switches consecutively from the [PLAY] button to the [VALUE+] button, according to the order indicated on the LCD. At this time, check that the LED of the testing switch is lighted up.

04 SWITCH & LED  
[ENTER]

(e.g. when checking the [ENTER] switch)

The switch & LED test proceeds in the order as below.

[PLAY] → [UTIL] → [MODE] → [EDIT] → [EFFECT] → [EQ] → [MUTE/SOLO] → [ENTER] → [EXIT] → [PART-] → [SELECT ●] → [VALUE-] → [PART+] → [SELECT ●] → [VALUE+]

If the switch is OK, a beep will sound and the test will proceed to the next switch. If the wrong switch is pressed, the program does not proceed and no sound will heard.

DISPLAY OF TEST RESULTS

OK 04 SW & LED ok

NG no appearing

TEST END

When the button [VALUE+] is pressed, if the test is OK, the test will be completed and proceed to the next test.

If an error is detected during the test, turn the POWER off.

#### 5. DIAL TEST

This test is not performed on the MU100. After pressing the [EXIT] button, press the [SELECT ●] or [SELECT ●] button to select the next test.

#### 6. MIDI 1 TEST

After connecting the [MIDI IN A] to the [MIDI OUT] and the [MIDI THRU] to the [MIDI IN B] via MIDI cables, execute the test. The [HOST SELECT] switch must be set at the [MIDI] during the test.

06 MIDI 1

DISPLAY OF TEST RESULTS

OK 06 MIDI 1 ok

NG 06 MIDI 1 err

TEST END

If the test is OK, "OK" will be displayed on the LCD and the test will be completed and proceed to the next test. If an error is detected during the test, refer to section B, "PROCEEDING TROUGH THE TEST".

#### 7. MIDI 2 TEST

After connecting the [MIDI IN A] to the [MIDI OUT] and the [MIDI THRU] to the [MIDI IN B] via MIDI cables, execute the test. The [HOST SELECT] switch must be set at the [MIDI] during the test.

07 MIDI 2

DISPLAY OF TEST RESULTS

OK 07 MIDI 2 ok

NG 07 MIDI 2 err



**12. 1 kHz SOUND OUTPUT (R) TEST**

12 OUTPUT R 1 kHz

Check that the current signal is output from the OUTPUT (R) and the PHONES (R) jacks.

Insert the appropriate phone plug into the OUTPUT (L, R), the PHONES and the INDIV.OUTPUT (1,2) jacks and check the output. If necessary, verify the frequency, output waveform, output level, and THD of the OUTPUT (L,R) and the PHONES outputs using a frequency counter, oscilloscope, AC voltmeter(with 12.47 kHz filter) and distortion meter. If a plug is inserted to the A/D INPUT, it must be pulled out. The VOLUME control must be set at maximum for this check.

**ITEMS TO BE CHECKED**



- OUTPUT (L): less than -80 dBm
- OUTPUT (R): 1 kHz +/-3 Hz, sin wave, +2.0 dBm +/-2 dB (10 k ohm load), distortion 0.25 % or less
- PHONES (L): less than -65 dBm
- PHONES (R): 1 kHz +/-3 Hz sin wave, -4.5 dBm +/-2 dB (33 ohm load), distortion 0.5 % or less
- INDIV.OUTPUT1: less than -80 dBm
- INDIV.OUTPUT2: less than -80 dBm

**TEST END**

Press the [ENTER] button. The MU100 will then automatically proceed to the next test. If the [EXIT] button is pressed, the MU100 will wait for the entry of the test number.

**13. INDIV.1 1kHz SOUND OUTPUT TEST**

**14. INDIV.2 1kHz SOUND OUTPUT TEST**

This test is not performed on the MU100. After pressing the [EXIT] button, press the [SELECT ] or [SELECT ] button to select the next test.

**15. INPUT HIGH TEST**

15 INPUT HIGH

Apply a signal to [A/D INPUT], and check that the signal obtained at the [OUTPUT] is controlled in gain with the A/D INPUT.

Check that the level meters on the LCD light up when the provided signal is applied to [INPUT].

Insert the appropriate phone plug into the OUTPUT (L, R) and the PHONES jacks and check the output. If necessary, verify the frequency, output waveform, output level, and THD of the OUTPUT (L,R) and the PHONES outputs using a frequency counter, oscilloscope, AC voltmeter (with 12.47 kHz filter) and distortion meter. The VOLUME control must be set at maximum for this check.

**ITEMS TO BE CHECKED**

Listed below are the specifications and conditions of the

OUTPUT(L,R) outputs during this test.

When a sine wave signal of -36.0 dBm, 1 kHz is applied to A/D INPUT (L), and A/D INPUT is set at maximum, and A/D INPUT (R) is connected to the ground:

- OUTPUT (L): +5 dBm +/-2 dB (10 ohm load), distortion 0.5 % or less
- OUTPUT (R): less than -48 dBm

When a sine wave signal of -36.0 dBm, 1 kHz is applied to A/D INPUT (R), and A/D INPUT is set at maximum, and A/D INPUT (L) is connected to the ground:

- OUTPUT (L): less than -48 dBm
- OUTPUT (R): +5 dBm +/-2 dB (10 ohm load), distortion 0.5% or less

When a sine wave signal of -36.0 dBm, 1 kHz is applied to A/D INPUT (L), and A/D INPUT is set at minimum, and A/D INPUT (R) is connected to the ground:

- OUTPUT (L): less than -66 dBm

When a sine wave signal of -36.0 dBm, 1 kHz is applied to A/D INPUT (R), and A/D INPUT is set at minimum, and A/D INPUT (L) is connected to the ground:

- OUTPUT (R): less than -66 dBm

Check that the level meters on the LCD will light up, when the sine wave of -29.0 dBm +/-2 dB, 1 kHz is applied to the A/D INPUT (L).

**TEST END**

Press the [ENTER] button. The MU100 will then automatically proceed to the next test.

If the [EXIT] button is pressed, the MU100 will wait for the entry of the test number.

**16. INPUT LOW TEST**

16 INPUT LOW

Apply a signal to [A/D INPUT], and check that the signal obtained at the [OUTPUT] is controlled in gain with the A/D INPUT.

Check that the level meters on the LCD light up when the provided signal is applied to [INPUT].

Insert the appropriate phone plug into the OUTPUT (L, R) and the PHONES jacks and check the output. If necessary, verify the frequency, output waveform, output level, and THD of the OUTPUT (L,R) and the PHONES outputs using a frequency counter, oscilloscope, AC voltmeter(with 12.47 kHz filter) and distortion meter. The VOLUME control must be set at maximum for this check.

**ITEMS TO BE CHECKED**

Listed below are the specifications and conditions of the OUTPUT(L,R) outputs during this test.

When a sine wave signal of -11.5 dBm, 1 kHz is applied to A/D INPUT (L), and A/D INPUT is set at maximum, and A/D INPUT (R) is connected to the ground:

OUTPUT (L): +5 dBm +/-2 dB (10 ohm load), distortion 0.5 % or less

OUTPUT (R): less than -60 dBm

When a sine wave signal of -11.5 dBm, 1 kHz is applied to A/D INPUT (R), and A/D INPUT is set at maximum, and A/D INPUT (L) is connected to the ground:

OUTPUT (L): less than -60 dBm

OUTPUT (R): +5.0 dBm +/-2 dB (10 k ohm load), distortion 0.5 % or less

When a sine wave signal of -11.5 dBm, 1 kHz is applied to A/D INPUT (L), and A/D INPUT is set at minimum, and A/D INPUT (R) is connected to the ground:

OUTPUT (L): less than -65 dBm

When a sine wave signal of -11.5 dBm, 1 kHz is applied to A/D INPUT (R), and A/D INPUT is set at minimum, and A/D INPUT (L) is connected to the ground:

OUTPUT(R): less than -65 dBm

Check that the level meters on the LCD will light up, when the sine wave of -6.0 dBm +/-2 dB, 1 kHz is applied to the A/D INPUT (R).

**TEST END**

Press the [ENTER] button. The MU100 will then automatically proceed to the next test.

If the [EXIT] button is pressed, the MU100 will wait for the entry of the test number.

**17. MEG&DRAM**

17 MEG&DRAM

Check that the correct signal is output from OUTPUT (L) jack. Insert the appropriate phone plug into the OUTPUT (L) jack and check the output.

If necessary, verify the frequency, output waveform, output level, and THD of the OUTPUT (L,R) and the PHONES outputs using a frequency counter, oscilloscope, AC voltmeter(with 12.47 kHz filter) and distortion meter. The VOLUME control must be set at maximum for this check.

**ITEMS TO BE CHECKED**

OUTPUT(L): 1 kHz +/-3.0 Hz, sine wave, +2 dBm +/-2 dB (10 k ohm load), distortion 0.25 % or less

**TEST END**

Press the [ENTER] button. The MU100 will then automatically proceed to the next test.

If the [EXIT] button is pressed, the MU100 will wait for the entry of the test number.

**18. 64 SOUND OUTPUT TEST**

18 64ch OUT

Check that the correct sine wave signals from channel 1 to channel 32 are output from the OUTPUT (L) and channel 33 through channel 64 are output from the OUTPUT (R).

If necessary, verify the output waveform using an oscilloscope (L channel: 1 kHz, R channel: 2 kHz).

The VOLUME control must be set at maximum for this check. While sounding, the LCD will display the following message.

18 64ch OUT  
Lch=xx Rch=xx

(Where xx: currently sounded channel)

**TEST END**

Press the [ENTER] button. The MU100 will then automatically proceed to the next test.

If the [EXIT] button is pressed, the MU100 will wait for the entry of the test number.

**19. FACTORY SETTINGS**

19 FACTORY SET

This test is used to initialize the data to the factory settings. If the [ENTER] button is pressed, the factory preset data will be restored. The MU100 will then exit the test program mode and enter to play mode.

If the [EXIT] button is pressed, they will not be restored.

**20. EXIT**

20 EXIT

When the [ENTER] button is pressed, the MU100 will exit the test program mode and enter to the play mode.

To remain in the test program, press the [EXIT] button. The MU100 will then wait for the entry of the test number.

Check that the noise levels are as follows, after the MU100 has quit the test program.

OUTPUT (L): -88 dBm as follows  
 OUTPUT (R): -88 dBm as follows  
 PHONES (L): -88 dBm as follows  
 PHONES (R): -88 dBm as follows

**21. PB1 NAME TEST**

21 PB1 NAME

After transmitting the request of the circuit board name and version, the MU100 receives the data through the MU-PB wires and the CN1 connector, and displays it on the LCD. Check the circuit board name and version on the LCD.

DISPLAY OF TEST RESULTS

OK 

21 PB1 NAME PLG100-VL VX.XX
--------------------------------

(X.XX: version number)

NG 

21 PB1 NAME err
--------------------

(When not receiving the data from Plug-in Board)

TEST END

Press the [ENTER] button. The MU100 will then automatically proceed to the next test.

If the [EXIT] button is pressed, the MU100 will wait for the entry of the test number.

**22. PB1 RAM TEST**

22 PB1 RAM
------------

Check that the circuit board RAM, which is connected to connector CN1, functions correctly.

DISPLAY OF TEST RESULTS

OK 

22 PB1 RAM ok
------------------

NG 

22 PB1 RAM err
-------------------

TEST END

If the test is OK, "OK" will be displayed on the LCD and the test will be completed and proceed to the next test. If an error is detected during the test, refer to section B, "PROCEEDING THROUGH THE TEST".

**23. PB1 MIDI IN TEST**

23 PB1 MIDI IN
----------------

Check that the MIDI IN, which is connected to the connector CN1, functions correctly.

After connecting the MIDI IN A jack to the MIDI OUT jack via a MIDI cable, execute the test. At this time the HOST SELECT switch should be set at MIDI.

DISPLAY OF TEST RESULTS

OK 

23 PB1 MIDI IN ok
----------------------

NG 

23 PB1 MIDI IN err
-----------------------

TEST END

If the test is OK, "OK" will be displayed on the LCD and the test will be completed and proceed to the next test. If an error is detected during the test, refer to section B, "PROCEEDING THROUGH THE TEST".

**24. PB1 MEL**

24 PB1 MEL
------------

Check that the CN1-MEL IN/OUT functions correctly and the correct signal is output from the OUTPUT (L,R).

A signal is input from the AD input, goes through the DM circuit board and output from the CN1-MEL OUT. The signal travels from the CN1-MEL OUT to the circuit board connected to the CN1 connector, and the tone generator of the circuit board translates the signal into a 1 kHz sine wave. This sine wave travels through the MEL OUT and CN1-MEL IN, then is output as sound. If the effect circuit board is connected to the CN1 connector, the signal is not translated and the same signal as it received is returned to the DM circuit board through the MEL OUT and CN1-MEL IN, then is output as sound.

Insert the appropriate phone plug into the OUTPUT(L,R) and check the output.

The VOLUME control must be set at maximum for this test.

ITEMS TO BE CHECKED

- OUTPUT(L): 1 kHz +/-3 Hz, 4.0 dBm +/-2 dBm (VH)  
1 kHz +/-3 Hz, 3.2 dBm +/-2 dBm (VL)
- OUTPUT(R): 1 kHz +/-3 Hz, 4.0 dBm +/-2 dBm (VH)  
1 kHz +/-3 Hz, 3.2 dBm +/-2 dBm (VL)

TEST END

Press the [ENTER] button. The MU100 will then automatically proceed to the next test.



If the [EXIT] button is pressed, the MU100 will wait for the entry of the test number.

**25. PB2 NAME TEST**

**26. PB2 RAM TEST**

**27. PB2 MIDI IN TEST**

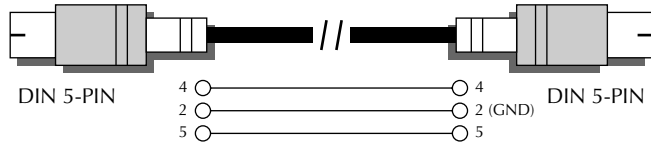
**28. PB2 MEL TEST**

This test is not performed on the MU100. After pressing the [EXIT] button, press the [SELECT ] or [SELECT ] button to select the next test.

## ■ MIDI/COMPUTER CONNECTING CABLE

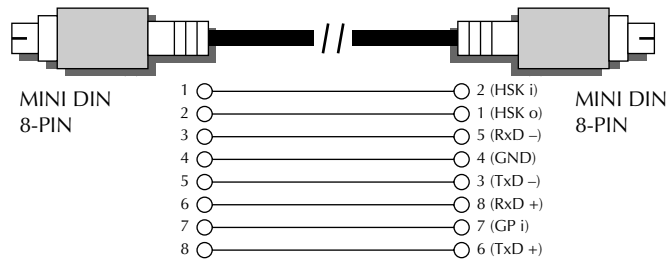
### MIDI

Standard MIDI cable. Maximum length 15 meters.



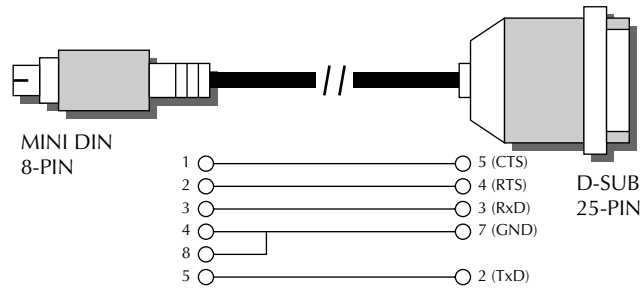
### Mac

Apple Macintosh Peripheral cable (M0197). Maximum length 2 meters.



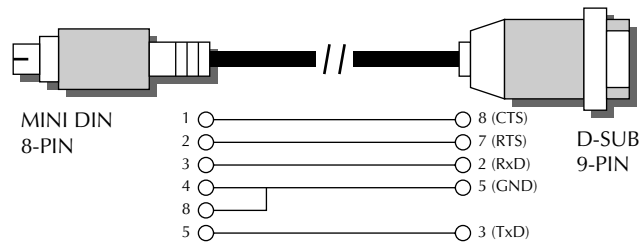
### PC-1

8-pin MINI DIN to D-SUB 25-pin cable. If your PC-1 type computer has a 9-pin serial port, use the PC-2 type cable. Maximum length 1.8 meters.



### PC-2

8-pin MINI DIN to D-SUB 9-pin cable. Maximum length 1.8 meters.



## ■ ERROR MESSAGES

### **Battery Low!**

The battery voltage (for internal memory backup) may be too low. Replace the battery with a new one.

---

### **Check Sum ERROR!**

The checksum of the received System Exclusive message is incorrect. Check the checksum of the message and try transmitting again.

---

### **HOST is Offline!**

This message appears when the host computer is not turned on, the connecting cable is not properly connected, or the sequencing software is not active.

---

### **Illegal Data!**

A data error resulted during reception of MIDI messages. Try transmitting the data again, or turn the MU100 off and back on again.

---

### **MIDI Buffer Full!**

Too much MIDI data is being received by the MU100 at one time. Reduce the amount of data being sent to the MU100.

---

### **No Parameter**

The selected parameter for use with the Show Exclusive function does not exist as a valid parameter.

---

### **No Recall Perform!**

When performing a Recall in the Performance Edit mode, this message appears if performance data cannot be recalled because the data has not been saved in the MU100.

---

### **Not Available**

This message appears in order to indicate that drum voices cannot be selected when the Sound Module mode is set to PFM (Performance).

---

### **PB Com ERROR!**

This message appears when data cannot be properly transmitted between the MU100 and a plug-in board. Unplug the power cord and make sure that the connector of the plug-in board is properly connected.

Too much MIDI data is being received by the plug-in board at one time. Reduce the amount of data being sent to the plug-in board.

---

### **Rcv CH is OFF!**

The selected parameter for use with the Show Exclusive function cannot be converted to a MIDI message value since the Receive Channel for the Part is off. Set the Receive Channel to an appropriate value.

---

### **Select drumS1 → 4 When You Edit**

This message appears when editing a drum voice if the Part mode is set to Drum. It appears as a reminder that the Part Mode must be set to drumS1-4 before the drum voice can be edited.

---

### **SysEx Adrs ERROR!**

The data of the received System Exclusive message is incorrect. Check the address of the message and try transmitting again.

---

### **SysEx Data ERROR!**

The data of the received System Exclusive message is incorrect. Check the data of the message (as to whether it requires an MSB or LSB header) and try transmitting again.

---

### **SysEx Size ERROR!**

The data of the received System Exclusive message is incorrect. Check the size of the message and try transmitting again.

---

### **This Parameter Isn't Excl Data**

The selected parameter has no System Exclusive value and cannot be displayed with the Show Exclusive function.



## INITIALIZE

The Initialize functions allow you to restore the factory settings of the MU100.

### NOTE

Since the Initialize functions replace existing data, you should save any and all important settings to a MIDI data storage device before using these functions.

### Operation

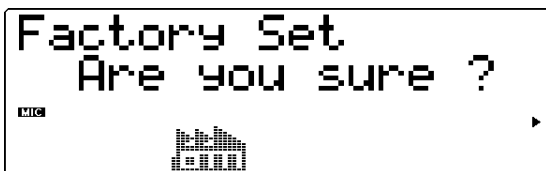
1. Press the **UTIL** button and select “INITIAL,” then press the **ENTER** button.



2. From the Initialize menu, select the type of data to be initialized: Factory Settings (FactSet), selected Sound Module mode (XGInit, GM Init, C/MInit, PFMInit) or Drum (DrumInit) Then, press the **ENTER** button to call up the selected data dump.



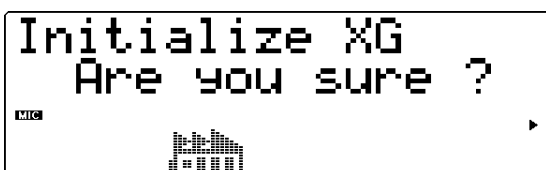
#### Factory Settings (FactSet)



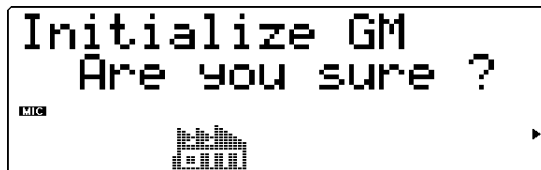
This restores the original factory settings of the MU100.

#### Selected Sound Module Mode:

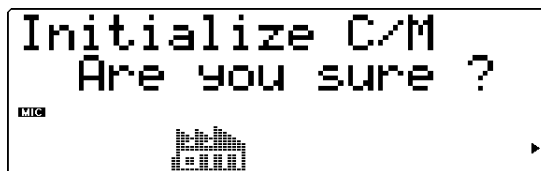
##### XG (XGInit)



##### General MIDI (GM Init)



##### Computer Music (C/MInit)



##### Performance (PFMInit)



One of the four parameters above will be available, depending on the currently selected Sound Module mode: **XG**, **TG300B**, **C/M** or **PFM**. Initializing this parameter restores the original settings for the selected mode.

### NOTES

- For the **PFMInit** setting, only the currently selected Performance will be initialized.
- For **XGInit** and **GM Init**, the initialized settings are the same as when the MU100 is reset upon receiving an **XG System On** or **GM System On** message.

#### Drum (DrumInit)

Range: DrumS1 — DrumS4



This restores the original drum settings for the selected Drum Setup S1 — S4. (Use the **VALUE**  $\ominus/\oplus$  buttons or data dial to select the desired Drum Setup.)

### NOTE

This parameter is not available when the MU100 is set to Performance mode.

3. From the “Are you sure?” prompt, press the **ENTER** button to execute the operation, or press the **EXIT** button to cancel it and return to the previous display.

An “Executing...” message appears in the display during the operation. When the operation is completed, the MU100 returns to the Initialize menu.

YAMAHA [ Tone Generator ] Date :27-JUL-1998  
 Model MU100 MIDI Implementation Chart Version : 1.1

Function...	Transmitted	Recognized	Remarks
Basic Channel	Default Changed	x x	1 - 16 1 - 16
Mode	Default Messages Altered	x x *****	3 3, 4 (m=1) *2 x
Note Number	:True voice	x *****	0 - 127 0 - 127
Velocity	Note ON Note OFF	x x	o 9nH,v=1-127 x
After Touch	Key's Ch's	x x	o *1 o *1
Pitch Bend		x	o 0-24 semi *1
Control Change	0,32 1,5,7,10,11 6,38 64-67 71-74 84 91,93,94 96-97 98-99 100-101	x x x x x x x x x x	o *1 o *1 o *1 o *1 o *1 o *1 o *1 o *1 o *1 o *1
Prog Change	: True #	x *****	o 0 - 127
System Exclusive		o *3	o *3
Common	: Song Pos. : Song Sel. : Tune	x x x	x x x
System	: Clock Real Time: Commands	x x	x x
Aux Messages	: All Sound Off : Reset All Cntrls : Local ON/OFF : All Notes OFF : Active Sense : Reset	x x x x x x	o(120,126,127) o(121) x o(123-125) o x
Notes:	*1 receive if switch is on. *2 m is always treated as "1" regardless of its value. *3 transmit/receive if exclusive switch is on.		

Mode 1 : OMNI ON , POLY      Mode 2 : OMNI ON , MONO      o : Yes  
 Mode 3 : OMNI OFF, POLY      Mode 4 : OMNI OFF, MONO      x : No



# STONE GENERATOR

# MU100

# PARTS LIST

## ■ CONTENTS

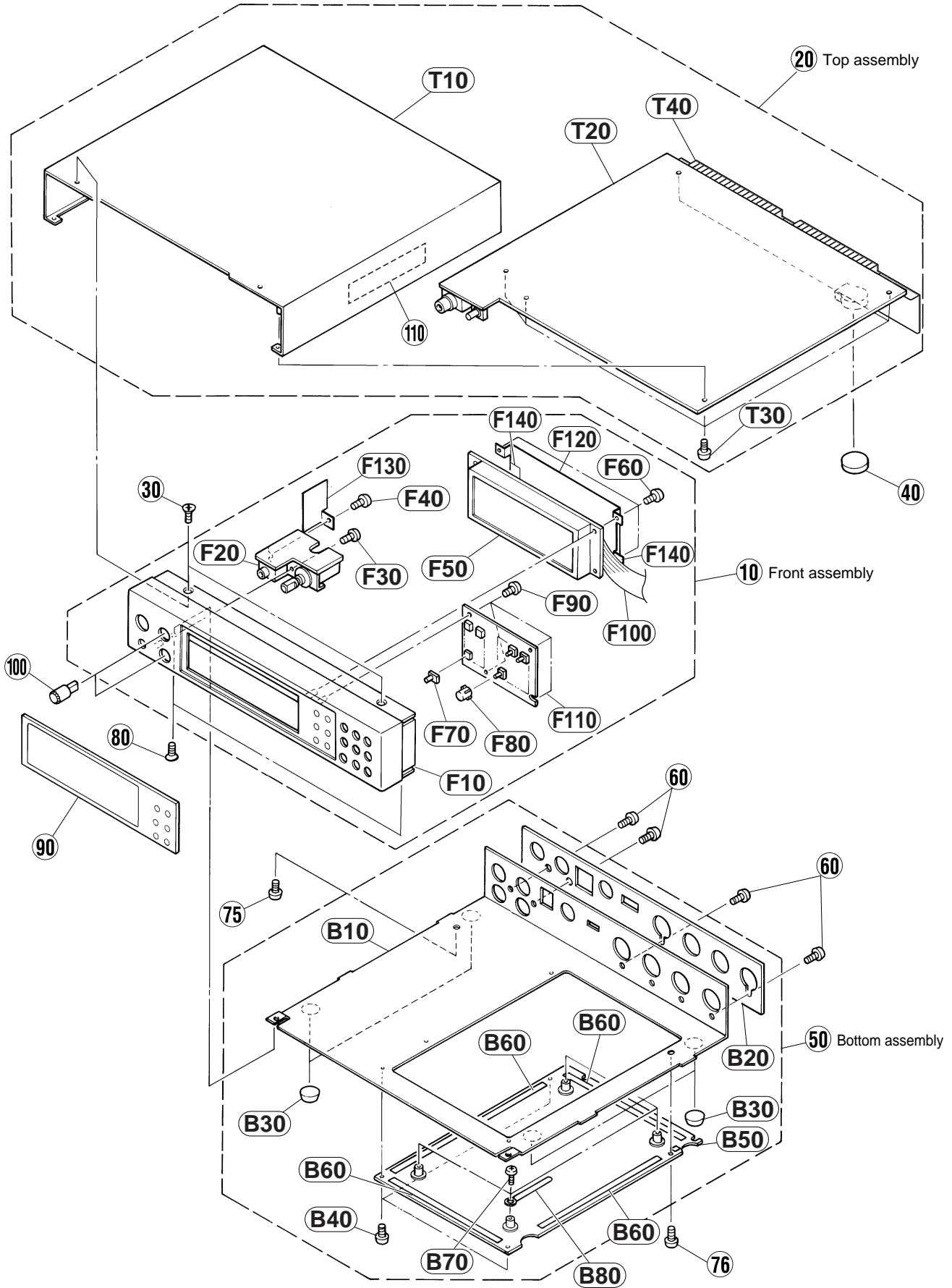
OVERALL ASSEMBLY .....	2
ELECTRICAL PARTS .....	4 ~ 11

## Notes : DESTINATION ABBREVIATIONS

A : Australian model	M : South African model
B : British model	O : Chinese model
C : Canadian model	Q : South-east Asia model
D : German model	T : Taiwan model
E : European model	U : U.S.A. model
F : French model	V : General export model (110V)
H : North European model	W : General export model (220V)
I : Indonesian model	X : General export model
J : Japanese model	Y : Export model

- The numbers in "QTY" show quantities for each unit.
- The parts with "--" in "PART NO." are not available as spare parts.
- The mark "}" in the remarks column indicates that these parts are interchangeable.

# OVERALL ASSEMBLY



REF NO.	PART NO.	DESCRIPTION		REMARKS	QTY	RANK
10	--	OVERALL ASSEMBLY		MU100 J,U,E,W		
20	--	Front Assembly		(VZ03500)		
30	VR060800	Flat Head Tapping Screw-C	3.0X8 MFZN2BL		2	01
40	VN103500	Lithium Battery	CR2032			03
50	--	Bottom Assembly		(VZ03510)		
60	EP600190	Bind Head Tapping Screw-B	3.0X8 MFZN2BL		4	01
75	EG330360	Bind Head Screw	3.0X6 MFZN2BL			01
76	EG330370	Bind Head Screw	3.0X6 MFNI33			01
80	VR060800	Flat Head Tapping Screw-C	3.0X8 MFZN2BL		2	01
90	VZ035200	Protect Board				08
100	VM825600	Input Knob	B	A/D INPUT, POWER/VOL	2	03
110	--	Adhesive Tape	12X50	(VA12610)		03
120	--	Lavel	FCC	(V328720)		
F10	VS598100	Front Assembly		(VZ03500)		09
F20	VZ018300	Front Panel				17
F30	EP600220	Circuit Board	PVR	(XT446C0)		01
F40	EP600220	Bind Head Tapping Screw-B	3.0X10 MFZN2Y			01
F40	VD791000	Bind Head Tapping Screw-B	2.6X10 MFZN2Y			19
F50	VS609700	LCD	DM113Z-5BL3		4	01
F60	VD791000	Bind Head Tapping Screw-B	2.6X10 MFZN2Y		6	03
F70	VM825700	Mode Button		PLAY,EDIT,UTIL,EFFECT, MODE,EQ		
* F80	VZ330900	OP Button		MUTE/SOLO,PART+/-,ENTER, SELECT</>,EXIT,VALUE+/-	9	
F90	VC069600	Bind Head Tapping Screw-B	2.6X6 MFZN2Y		4	01
F100	VT020800	LCD Cable	BNCD-P=1-L-16-250			03
F110	VZ018400	Circuit Board	PSW	(XT446C0)		17
F120	VT033700	LCD Shield				04
F130	VT034500	VR Shield Sheet				03
F140	--	Adhesive Tape	570F 30M W=10	(CB55090)		08
T10	--	Top Assembly		(VZ03550)		
T20	VZ035600	Top Cover				10
T20	VZ018500	Circuit Board	DM	(XT466CO)		64
T30	EP600230	Bind Head Tapping Screw-B	3.0X6 MFZN2BL		5	01
* T40	V3197600	Rear Shield				
B10	--	Bottom Assembly		(VZ03510)		
B10	VZ035700	Bottom Cover				11
B20	VV506200	Rear Panel Sheet				05
B30	CB037120	Foot			4	03
B40	EG330370	Bind Head Screw	3.0X6 MFNI33		3	01
B50	VZ317600	DB Cover				09
B60	--	Adhesive Tape	570F 30M W=10	(CB55090)		08
B70	EP600230	Bind Head Tapping Screw-B	3.0X6 MFZN2BL		4	01
B80	CB502030	Cord Binder	S-75B			01
		ACCESSORY				
	VS276100	AC Adapter	PA-5B	J		11
	VS353200	AC Adapter	PA-5B	U		11
	VS353300	AC Adapter	PA-5B	E		12
* XT644B00		Magneto Optical Disk		J		
* XV598A00		Magneto Optical Disk		U,E,W		

\*:New Parts

RANK:Japan only

**ELECTRICAL PARTS**

REF. NO.	PART NO.	DESCRIPTION		REMARKS	QTY	RANK
		ELECTRICAL PARTS		MU100		
	VZ018500	Circuit Board	DM	(XT466C0)		64
	VZ018400	Circuit Board	PSW	(XT446C0)		17
	VZ018300	Circuit Board	PVR	(XT446C0)		17
	VZ018500	Circuit Board	DM	(XT466C0)		64
	VZ018400	Circuit Board	PSW	(XT446C0)		17
	VZ018300	Circuit Board	PVR	(XT446C0)		17
BAT1	VN103600	Battery Holder	CR2032			03
C1	UB052100	Monolithic Ceramic Cap.	SL 100P 50V J			01
C2	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C3	UI537100	Electrolytic Cap.	10.00 16.0V			01
C4	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
-6	UB044100	Monolithic Ceramic Cap.	F 0.010 50V Z			01
C7	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
-9	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C10	UB013220	Monolithic Ceramic Cap.	B 2200P 50V K			01
C13	UI537100	Electrolytic Cap.	10.00 16.0V			01
C14	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C15	UI566470	Electrolytic Cap.	4.70 50.0V			01
C16	FP736470	Tantalum Cap.	4.70 16V M			01
C17	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C18	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C19	UI537100	Electrolytic Cap.	10.00 16.0V			01
C20	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C21	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C24	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C25	UJ848470	Electrolytic Cap.	470.00 25.0V			01
C26	UB044100	Monolithic Ceramic Cap.	F 0.010 50V Z			01
C27	UJ848470	Electrolytic Cap.	470.00 25.0V			01
C28	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C29	UJ838100	Electrolytic Cap.	100.00 16.0V			01
C30	UJ848100	Electrolytic Cap.	100.00 25.0V			01
C31	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C32	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C33	UJ838220	Electrolytic Cap.	220.00 16.0V			01
C34	UI537470	Electrolytic Cap.	47.00 16.0V			01
C35	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C36	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C37	UI537470	Electrolytic Cap.	47.00 16.0V			01
C38	UI537220	Electrolytic Cap.	22.00 16.0V			01
C39	UI537220	Electrolytic Cap.	22.00 16.0V			01
C40	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
-46	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C47	UI537100	Electrolytic Cap.	10.00 16.0V			01
C48	UI537100	Electrolytic Cap.	10.00 16.0V			01
C49	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C50	UI537100	Electrolytic Cap.	10.00 16.0V			01
C51	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C52	UB051330	Monolithic Ceramic Cap.	SL 33P 50V J			01
C53	UB051330	Monolithic Ceramic Cap.	SL 33P 50V J			01
C54	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C55	UI537100	Electrolytic Cap.	10.00 16.0V			01
C56	UI537100	Electrolytic Cap.	10.00 16.0V			01
C57	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C58	UI537100	Electrolytic Cap.	10.00 16.0V			01
C59	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C60	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C62	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C63	UI537100	Electrolytic Cap.	10.00 16.0V			01
C64	UB044100	Monolithic Ceramic Cap.	F 0.010 50V Z			01
C65	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C66	UI537100	Electrolytic Cap.	10.00 16.0V			01
C67	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C68	UI537100	Electrolytic Cap.	10.00 16.0V			01
C69	UI537470	Electrolytic Cap.	47.00 16.0V			01
C70	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
-72	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C73	UI537470	Electrolytic Cap.	47.00 16.0V			01
-75	UI537470	Electrolytic Cap.	47.00 16.0V			01

\*:New Parts

RANK:Japan only

REF NO.	PART NO.	DESCRIPTION		REMARKS	QTY	RANK
C76	UI566470	Electrolytic Cap.	4.70 50.0V			01
C77	UB013680	Monolithic Ceramic Cap.	B 6800P 50V K			01
C78	UB052270	Monolithic Ceramic Cap.	SL 270P 50V J			01
C79	UB013680	Monolithic Ceramic Cap.	B 6800P 50V K			01
C80	UI566470	Electrolytic Cap.	4.70 50.0V			01
C81	UB013680	Monolithic Ceramic Cap.	B 6800P 50V K			01
C82	UB052270	Monolithic Ceramic Cap.	SL 270P 50V J			01
C83	UB013680	Monolithic Ceramic Cap.	B 6800P 50V K			01
C84	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
-86	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C87	UI537220	Electrolytic Cap.	22.00 16.0V			01
C88	UJ838220	Electrolytic Cap.	220.00 16.0V			01
C89	UB013100	Monolithic Ceramic Cap.	B 1000P 50V K			01
C90	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C91	UB052100	Monolithic Ceramic Cap.	SL 100P 50V J			01
C92	UI537220	Electrolytic Cap.	22.00 16.0V			01
C93	UJ838220	Electrolytic Cap.	220.00 16.0V			01
C94	UB013100	Monolithic Ceramic Cap.	B 1000P 50V K			01
C95	UJ838100	Electrolytic Cap.	100.00 16.0V			01
C96	UJ838100	Electrolytic Cap.	100.00 16.0V			01
C97	UI537100	Electrolytic Cap.	10.00 16.0V			01
C98	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C99	UI537220	Electrolytic Cap.	22.00 16.0V			01
C100	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C101	UI537100	Electrolytic Cap.	10.00 16.0V			01
C102	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C103	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C104	UB013220	Monolithic Ceramic Cap.	B 2200P 50V K			01
C105	UB013220	Monolithic Ceramic Cap.	B 2200P 50V K			01
C106	UB051470	Monolithic Ceramic Cap.	SL 47P 50V J			01
C107	UB051470	Monolithic Ceramic Cap.	SL 47P 50V J			01
C108	VQ686200	Monolithic Ceramic Cap.	F 1.0 16V Z			01
C109	VQ686200	Monolithic Ceramic Cap.	F 1.0 16V Z			01
C110	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C111	VQ686200	Monolithic Ceramic Cap.	F 1.0 16V Z			01
C112	VQ686200	Monolithic Ceramic Cap.	F 1.0 16V Z			01
C113	UB052100	Monolithic Ceramic Cap.	SL 100P 50V J			01
-115	UB052100	Monolithic Ceramic Cap.	SL 100P 50V J			01
C116	VQ686200	Monolithic Ceramic Cap.	F 1.0 16V Z			01
C119	UB052100	Monolithic Ceramic Cap.	SL 100P 50V J			01
C120	VQ686200	Monolithic Ceramic Cap.	F 1.0 16V Z			01
C121	UI565220	Electrolytic Cap.	0.22 50.0V			01
C122	UB012470	Monolithic Ceramic Cap.	B 470P 50V K			01
C123	UB052100	Monolithic Ceramic Cap.	SL 100P 50V J			01
C124	UB051470	Monolithic Ceramic Cap.	SL 47P 50V J			01
C125	UJ866100	Electrolytic Cap.	1.00 50.0V			01
C126	UB013120	Monolithic Ceramic Cap.	B 1200P 50V K			01
C127	UI565220	Electrolytic Cap.	0.22 50.0V			01
C128	UB012470	Monolithic Ceramic Cap.	B 470P 50V K			01
C129	UB051470	Monolithic Ceramic Cap.	SL 47P 50V J			01
C130	UB052100	Monolithic Ceramic Cap.	SL 100P 50V J			01
C131	UJ866100	Electrolytic Cap.	1.00 50.0V			01
C132	UB013120	Monolithic Ceramic Cap.	B 1200P 50V K			01
C133	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
-135	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C136	UB052180	Monolithic Ceramic Cap.	SL 180P 50V J			01
C137	UB013330	Monolithic Ceramic Cap.	B 3300P 50V K			01
C138	UI537220	Electrolytic Cap.	22.00 16.0V			01
C139	UB013330	Monolithic Ceramic Cap.	B 3300P 50V K			01
C140	UB052180	Monolithic Ceramic Cap.	SL 180P 50V J			01
C141	UI537220	Electrolytic Cap.	22.00 16.0V			01
C142	UI537470	Electrolytic Cap.	47.00 16.0V			01
C143	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C144	UB012220	Monolithic Ceramic Cap.	B 220P 50V K			01
C145	UI537470	Electrolytic Cap.	47.00 16.0V			01
C146	UB012220	Monolithic Ceramic Cap.	B 220P 50V K			01
C147	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C148	UI537470	Electrolytic Cap.	47.00 16.0V			01
C149	UB012220	Monolithic Ceramic Cap.	B 220P 50V K			01
C150	UI537470	Electrolytic Cap.	47.00 16.0V			01

\*:New Parts

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REF. NO.	PART NO.	DESCRIPTION		REMARKS	QTY	RANK
C151	UB012220	Monolithic Ceramic Cap.	B 220P 50V K			01
C152	UJ838100	Electrolytic Cap.	100.00 16.0V			01
C153	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C154	UB013470	Monolithic Ceramic Cap.	B 4700P 50V K			01
-157	UB013470	Monolithic Ceramic Cap.	B 4700P 50V K			01
C158	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C159	UJ838220	Electrolytic Cap.	220.00 16.0V			01
C160	UI537470	Electrolytic Cap.	47.00 16.0V			01
C161	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C162	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C163	UI537470	Electrolytic Cap.	47.00 16.0V			01
C164	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C165	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C167	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C168	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C170	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C172	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C174	UB044100	Monolithic Ceramic Cap.	F 0.010 50V Z			01
C175	UB044100	Monolithic Ceramic Cap.	F 0.010 50V Z			01
C176	UI537100	Electrolytic Cap.	10.00 16.0V			01
C177	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
-184	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C185	VQ686200	Monolithic Ceramic Cap.	F 1.0 16V Z			01
-187	VQ686200	Monolithic Ceramic Cap.	F 1.0 16V Z			01
C189	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
-191	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C192	VQ686200	Monolithic Ceramic Cap.	F 1.0 16V Z			01
CN1	— —	Connector Assembly	XPS 15P-120	(VZ03760)		
CN5	VS666700	Connector	SLW 16P TE			02
CN6	VB390600	Connector Base Post	PH-10P TE			01
CN9	VF667700	Wire Trap	52147 17P TE			01
CN10	VI879500	Cable Holder	51048 17P TE			01
CN13	VB389900	Connector Base Post	PH- 3P TE			01
D3	VB493900	Diode	MA221			01
-5	VB493900	Diode	MA221			01
D7	VS201100	Diode	D1F60			01
D8	VZ016600	Diode	D3FP3			03
D9	VS201100	Diode	D1F60			01
D10	VS201100	Diode	D1F60			01
D11	VB493900	Diode	MA221			01
-24	VB493900	Diode	MA221			01
D29	VZ016600	Diode	D3FP3			03
D30	VB493900	Diode	MA221			01
D31	VB493900	Diode	MA221			01
EMI1	VR193800	LC Filter	STF-104ZB-TBM			01
-MI8	VR193800	LC Filter	STF-104ZB-TBM			01
IC1	XP881A00	IC	MC34051MEL	LINE TRANCEIVER } Interchangeable		05
IC1	XV103A00	IC	M5M34051FP	LINE TRANCEIVER }		05
IC2	XD657A00	IC	TC74HC14AF-TP1	INVERTER		02
IC3	XD657A00	IC	TC74HC14AF-TP1	INVERTER		02
IC4	XI348A00	IC (chip)	SC7SU04FEL	INVERTER		01
IC5	XI686A00	IC	M62021FP	SYSTEM RESET		04
IC6	XS776A00	IC	TC74HC126AF	BUS BUFFER		02
IC7	XN883A00	IC	TC7W14FU	INVERTER		02
IC8	XT441A00	IC	UPC2909T-E1	REGULATOR +9V		03
IC9	XT442A00	IC	SI-8050S	REGULATOR +5V		05
IC10	XS516A00	IC	UPC2933T-E1	REGULATOR +3.3V		03
IC11	XT714200	IC	KM23C16000C-XXXXXX	EPROM 16M		
IC11	VK863100	IC Socket	DICF-42CS-E			03
IC12	XS681A00	IC	M5M51008BFP-70LLT	SRAM 1M		11
IC13	XM588A00	IC	TC7S32F	OR		01
IC14	XP596A00	IC	NJU7660M-T1	DC/DC Converter		05
IC15	XR056A00	IC	TC74HC4051AF-TP	MULTIPLEXER		02
IC16	XT443A00	IC	HD6432655A00F	CPU		11
IC17	XU462A00	IC	MSM514260C-60TS-K	DRAM 4M		16
IC18	XR738A00	IC	TC203C760HF-001	SWP30 } Interchangeable		20
IC18	XS725A00	IC	TC203C760HF-002	SWP30 }		19
IC19	VV345500	Quartz Crystal Unit	DOC-49S5			05
IC20	XJ598A00	IC	NJM78L05UA	REGULATOR +5V		02
IC21	XP867A00	IC	UPD63200GS-E1	D/A Converter		07

\*:New Parts

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REF NO.	PART NO.	DESCRIPTION		REMARKS	QTY	RANK
IC22	XQ138A00	IC	NJM4556AMT1	OP AMP		03
IC23	XF291A00	IC	UPC4570G2	OP AMP		03
-28	XF291A00	IC	UPC4570G2	OP AMP		03
IC29	XS892A00	IC	TLC320AD58CDWT-EL	A/D Converter		09
IC30	XS893A00	IC	TL32088CNST-EL	AD FRONT END		03
IC31	XG385A00	IC	TC74HC4066AF-T1	ANALOG SWITCH		02
IC32	XH223A00	IC	SN74HC273NSR	D-FF		01
IC33	XD603A00	IC	TC74HC245F-T1	TRANSCEIVER		04
IC34	XS518A00	IC	KM23C32000AG-4J	WAVE ROM1 32M	} Interchangeable	13
* IC34	XS518B00	IC	KM23C32000CG-438A	WAVE ROM1 32M		
IC35	XS743A00	IC	KM23C32000AG-439A	WAVE ROM2 32M	} Interchangeable	13
IC35	XS743B00	IC	KM23C32000CG-439A	WAVE ROM2 32M		
IC36	XT445A00	IC	23C16000WGY828	ROM1 16M		10
IC37	XT461A00	IC	23C16000WGY829	ROM2 16M		10
IC38	XT462A00	IC	MX23C3210TC-10	ROM3 32M		13
IC39	XT463A00	IC	MX23C3210TC-10	ROM4 32M		13
IC40	XS048A00	IC	HD74LVC139FPEL	DECODER		03
IC41	XR682A00	IC	TC7S66F	ANALOG SWITCH		01
JK1	VM761000	DIN Connector	MD-S810 8P	TO HOST		03
JK2	VJ885500	DIN Connector	YKF51-5054 3P	MIDI(IN-A,IN-B)		04
JK3	VJ885500	DIN Connector	YKF51-5054 3P	MIDI(THRU,OUT)		04
JK5	VM725900	Pin Jack	YKC21-3282 4P	OUTPUT(L/R),INPUT(L/R)		02
JK6	VS708300	Phone Jack	HLJ5305 STEREO	AD/INPUT		03
JK7	VM552100	Phone Jack	HSJ0912-01-01 ST	PHONES		02
JK8	VJ207400	DC-IN Jack	16V DC 3A HEC2305	DC IN		01
L1	VL139800	Solid Inductance (chip)	BLM31A700SPT 70ohm			01
L2	VL139800	Solid Inductance (chip)	BLM31A700SPT 70ohm			01
L5	VL139800	Solid Inductance (chip)	BLM31A700SPT 70ohm			01
L6	VL139800	Solid Inductance (chip)	BLM31A700SPT 70ohm			01
L8	VL139800	Solid Inductance (chip)	BLM31A700SPT 70ohm			01
L9	VQ464300	Chip Inductance (chip)	NWL2520-560J	} Interchangeable		01
L9	VR243700	Chip Inductance (chip)	56U LEM2520 T 560J			
L10	VQ464300	Chip Inductance (chip)	NWL2520-560J	} Interchangeable		01
L10	VR243700	Chip Inductance (chip)	56U LEM2520 T 560J			
L11	VL139800	Solid Inductance (chip)	BLM31A700SPT 70ohm			01
L12	VQ464300	Chip Inductance (chip)	NWL2520-560J	} Interchangeable		01
L12	VR243700	Chip Inductance (chip)	56U LEM2520 T 560J			
L13	VQ464300	Chip Inductance (chip)	NWL2520-560J	} Interchangeable		01
L13	VR243700	Chip Inductance (chip)	56U LEM2520 T 560J			
L14	VL139800	Solid Inductance (chip)	BLM31A700SPT 70ohm			01
L15	VQ464300	Chip Inductance (chip)	NWL2520-560J	} Interchangeable		01
L15	VR243700	Chip Inductance (chip)	56U LEM2520 T 560J			
L16	VQ464300	Chip Inductance (chip)	NWL2520-560J	} Interchangeable		01
L16	VR243700	Chip Inductance (chip)	56U LEM2520 T 560J			
L17	VL139800	Solid Inductance (chip)	BLM31A700SPT 70ohm			01
L18	VQ464300	Chip Inductance (chip)	NWL2520-560J	} Interchangeable		01
L18	VR243700	Chip Inductance (chip)	56U LEM2520 T 560J			
L19	VQ464300	Chip Inductance (chip)	NWL2520-560J	} Interchangeable		01
L19	VR243700	Chip Inductance (chip)	56U LEM2520 T 560J			
L20	VL139800	Solid Inductance (chip)	BLM31A700SPT 70ohm			01
L23	VL139800	Solid Inductance (chip)	BLM31A700SPT 70ohm			01
-38	VL139800	Solid Inductance (chip)	BLM31A700SPT 70ohm			01
L39	VQ464300	Chip Inductance (chip)	NWL2520-560J	} Interchangeable		01
L39	VR243700	Chip Inductance (chip)	56U LEM2520 T 560J			
L40	VQ464300	Chip Inductance (chip)	NWL2520-560J	} Interchangeable		01
L40	VR243700	Chip Inductance (chip)	56U LEM2520 T 560J			
L41	VL139600	Solid Inductance (chip)	BLM21B050SPT 5ohm			01
L42	VQ464300	Chip Inductance (chip)	NWL2520-560J	} Interchangeable		01
L42	VR243700	Chip Inductance (chip)	56U LEM2520 T 560J			
L43	VQ464300	Chip Inductance (chip)	NWL2520-560J	} Interchangeable		01
L43	VR243700	Chip Inductance (chip)	56U LEM2520 T 560J			
L44	VL139600	Solid Inductance (chip)	BLM21B050SPT 5ohm			01
L45	VQ464300	Chip Inductance (chip)	NWL2520-560J	} Interchangeable		01
L45	VR243700	Chip Inductance (chip)	56U LEM2520 T 560J			
L46	VQ464300	Chip Inductance (chip)	NWL2520-560J	} Interchangeable		01
L46	VR243700	Chip Inductance (chip)	56U LEM2520 T 560J			
L47	VL139800	Solid Inductance (chip)	BLM31A700SPT 70ohm			01
L48	VQ464300	Chip Inductance (chip)	NWL2520-560J	} Interchangeable		01
L48	VR243700	Chip Inductance (chip)	56U LEM2520 T 560J			
L49	VQ464300	Chip Inductance (chip)	NWL2520-560J	} Interchangeable		01

\*:New Parts

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REF.NO.	PART NO.	DESCRIPTION		REMARKS	QTY	RANK
L49	VR243700	Chip Inductance (chip)	56U LEM2520 T 560J	Interchangeable		01
L50	VQ464300	Chip Inductance (chip)	NWL2520-560J			
L50	VR243700	Chip Inductance (chip)	56U LEM2520 T 560J	} Interchangeable		01
L51	VL139800	Solid Inductance (chip)	BLM31A700SPT 70ohm			
-67	VL139800	Solid Inductance (chip)	BLM31A700SPT 70ohm			01
L68	VQ464300	Chip Inductance (chip)	NWL2520-560J	} Interchangeable		01
L68	VR243700	Chip Inductance (chip)	56U LEM2520 T 560J			
L69	VQ464300	Chip Inductance (chip)	NWL2520-560J	} Interchangeable		01
L69	VR243700	Chip Inductance (chip)	56U LEM2520 T 560J			
L70	VL139600	Solid Inductance (chip)	BLM21B050SPT 5ohm			01
L71	VL139800	Solid Inductance (chip)	BLM31A700SPT 70ohm			01
L72	VG238200	LC Filter	PLT2003C EMI			04
L73	VQ464300	Chip Inductance	NWL2520-560J	} Interchangeable		01
L73	VR243700	Chip Inductance	56U LEM2520 T 560J			
L74	VZ017900	Coil	HP-022J 180u			05
PC1	VN686000	Photo Coupler	PC410T			04
PC2	VN686000	Photo Coupler	PC410T			04
Q1	VD303700	Transistor	2SC3326 A,B TE85R			01
Q2	VJ927200	Transistor	2SA1162 O,Y			01
Q3	VD303700	Transistor	2SC3326 A,B TE85R			01
Q4	VD303700	Transistor	2SC3326 A,B TE85R			01
Q5	VD456900	Transistor	2SCDTC143XK			01
Q6	VD456900	Transistor	2SCDTC143XK			01
Q7	VZ092600	Transistor	2SA1567 O			03
R2	RD254560	Carbon Resistor (chip)	56.0 0.1 J			01
R3	RD254560	Carbon Resistor (chip)	56.0 0.1 J			01
R4	RD257100	Carbon Resistor (chip)	10.0K 0.1 J			01
-6	RD257100	Carbon Resistor (chip)	10.0K 0.1 J			01
R9	RD257100	Carbon Resistor (chip)	10.0K 0.1 J			01
R10	RD257100	Carbon Resistor (chip)	10.0K 0.1 J			01
R11	RD257100	Carbon Resistor (chip)	10.0K 0.1 J			01
R12	RD256100	Carbon Resistor (chip)	1.0K 0.1 J			01
R13	RD256100	Carbon Resistor (chip)	1.0K 0.1 J			01
R14	RD255220	Carbon Resistor (chip)	220.0 0.1 J			01
-19	RD255220	Carbon Resistor (chip)	220.0 0.1 J			01
R20	RD250000	Carbon Resistor (chip)	0.0 0.0 J			01
R23	RD250000	Carbon Resistor (chip)	0.0 0.0 J			01
R24	RD257100	Carbon Resistor (chip)	10.0K 0.1 J			01
-26	RD257100	Carbon Resistor (chip)	10.0K 0.1 J			01
R27	RD255680	Carbon Resistor (chip)	680.0 0.1 J			01
R28	RD258680	Carbon Resistor (chip)	680.0K 0.1 J			01
R29	RD250000	Carbon Resistor (chip)	0.0 0.0 J			01
R30	RD257100	Carbon Resistor (chip)	10.0K 0.1 J			01
-34	RD257100	Carbon Resistor (chip)	10.0K 0.1 J			01
R35	RD255100	Carbon Resistor (chip)	100.0 0.1 J			01
-37	RD255100	Carbon Resistor (chip)	100.0 0.1 J			01
R38	RD254470	Carbon Resistor (chip)	47.0 0.1 J			01
R39	RD255100	Carbon Resistor (chip)	100.0 0.1 J			01
R42	RD257100	Carbon Resistor (chip)	10.0K 0.1 J			01
R43	RD255100	Carbon Resistor (chip)	100.0 0.1 J			01
R46	RD254470	Carbon Resistor (chip)	47.0 0.1 J			01
-48	RD254470	Carbon Resistor (chip)	47.0 0.1 J			01
R59	RD257100	Carbon Resistor (chip)	10.0K 0.1 J			01
R60	RD257100	Carbon Resistor (chip)	10.0K 0.1 J			01
R61	RD255680	Carbon Resistor (chip)	680.0 0.1 J			01
R62	RD256240	Carbon Resistor (chip)	2.4K 0.1 J			01
R63	RD256330	Carbon Resistor (chip)	3.3K 0.1 J			01
R64	RD256360	Carbon Resistor (chip)	3.6K 0.1 J			01
R65	RD256300	Carbon Resistor (chip)	3.0K 0.1 J			01
R66	RD256160	Carbon Resistor (chip)	1.6K 0.1 J			01
R67	RD256100	Carbon Resistor (chip)	1.0K 0.1 J			01
R68	RD255470	Carbon Resistor (chip)	470.0 0.1 J			01
R69	RD256200	Carbon Resistor (chip)	2.0K 0.1 J			01
R70	RD256470	Carbon Resistor (chip)	4.7K 0.1 J			01
-73	RD256470	Carbon Resistor (chip)	4.7K 0.1 J			01
R74	RD255100	Carbon Resistor (chip)	100.0 0.1 J			01
R75	RD255100	Carbon Resistor (chip)	100.0 0.1 J			01
R76	RD257470	Carbon Resistor (chip)	47.0K 0.1 J			01
R77	RD257100	Carbon Resistor (chip)	10.0K 0.1 J			01
R78	RD154680	Carbon Resistor (chip)	68.0 1/4 J			01

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REF NO.	PART NO.	DESCRIPTION		REMARKS	QTY	RANK
R79	RD154680	Carbon Resistor (chip)	68.0 1/4 J			01
R80	RD256680	Carbon Resistor (chip)	6.8K 0.1 J			01
R81	RD256680	Carbon Resistor (chip)	6.8K 0.1 J			01
R82	RD257120	Carbon Resistor (chip)	12.0K 0.1 J			01
R83	RD256100	Carbon Resistor (chip)	1.0K 0.1 J			01
R84	RD256680	Carbon Resistor (chip)	6.8K 0.1 J			01
R85	RD256680	Carbon Resistor (chip)	6.8K 0.1 J			01
R86	RD257120	Carbon Resistor (chip)	12.0K 0.1 J			01
R87	RD256100	Carbon Resistor (chip)	1.0K 0.1 J			01
R88	RD257100	Carbon Resistor (chip)	10.0K 0.1 J			01
R89	RD256820	Carbon Resistor (chip)	8.2K 0.1 J			01
R90	RD257240	Carbon Resistor (chip)	24.0K 0.1 J			01
R91	RD154470	Carbon Resistor (chip)	47.0 1/4 J			01
R92	RD256100	Carbon Resistor (chip)	1.0K 0.1 J			01
R93	RD257100	Carbon Resistor (chip)	10.0K 0.1 J			01
-95	RD257100	Carbon Resistor (chip)	10.0K 0.1 J			01
R96	RD256820	Carbon Resistor (chip)	8.2K 0.1 J			01
R97	RD257240	Carbon Resistor (chip)	24.0K 0.1 J			01
R98	RD154470	Carbon Resistor (chip)	47.0 1/4 J			01
R99	RD256100	Carbon Resistor (chip)	1.0K 0.1 J			01
R100	RD257100	Carbon Resistor (chip)	10.0K 0.1 J			01
R101	RD257100	Carbon Resistor (chip)	10.0K 0.1 J			01
R102	RD155470	Carbon Resistor (chip)	470.0 1/4 J			01
R103	RD254100	Carbon Resistor (chip)	10.0 0.1 J			01
R104	RD255150	Carbon Resistor (chip)	150.0 0.1 J			01
R105	RD25747	Carbon Resistor (chip)	47.0K 0.1 J			01
R106	RD258100	Carbon Resistor (chip)	100.0K 0.1 J			01
R107	RD254680	Carbon Resistor (chip)	68.0 0.1 J			01
R108	RD257100	Carbon Resistor (chip)	10.0K 0.1 J			01
R109	RD256150	Carbon Resistor (chip)	1.5K 0.1 J			01
R110	RD256470	Carbon Resistor (chip)	4.7K 0.1 J			01
R111	RD257220	Carbon Resistor (chip)	22.0K 0.1 J			01
R112	RD256100	Carbon Resistor (chip)	1.0K 0.1 J			01
R113	RD256100	Carbon Resistor (chip)	1.0K 0.1 J			01
R114	RD154470	Carbon Resistor (chip)	47.0 1/4 J			01
R115	RD257360	Carbon Resistor (chip)	36.0K 0.1 J			01
R116	RD154470	Carbon Resistor (chip)	47.0 1/4 J			01
R117	RD257360	Carbon Resistor (chip)	36.0K 0.1 J			01
R118	RD257150	Carbon Resistor (chip)	15.0K 0.1 J			01
R119	RD257150	Carbon Resistor (chip)	15.0K 0.1 J			01
R122	RD257120	Carbon Resistor (chip)	12.0K 0.1 J			01
R123	RD257100	Carbon Resistor (chip)	10.0K 0.1 J			01
R124	RD257100	Carbon Resistor (chip)	10.0K 0.1 J			01
R125	RD256820	Carbon Resistor (chip)	8.2K 0.1 J			01
R126	RD256820	Carbon Resistor (chip)	8.2K 0.1 J			01
R127	RD257120	Carbon Resistor (chip)	12.0K 0.1 J			01
R128	RD257100	Carbon Resistor (chip)	10.0K 0.1 J			01
R129	RD257100	Carbon Resistor (chip)	10.0K 0.1 J			01
R130	RD258100	Carbon Resistor (chip)	100.0K 0.1 J			01
R131	RD256100	Carbon Resistor (chip)	1.0K 0.1 J			01
R132	RD258100	Carbon Resistor (chip)	100.0K 0.1 J			01
R134	RD258100	Carbon Resistor (chip)	100.0K 0.1 J			01
R135	RD256330	Carbon Resistor (chip)	3.3K 0.1 J			01
R136	RD257100	Carbon Resistor (chip)	10.0K 0.1 J			01
R137	RD258100	Carbon Resistor (chip)	100.0K 0.1 J			01
R138	RD256100	Carbon Resistor (chip)	1.0K 0.1 J			01
R139	RD258100	Carbon Resistor (chip)	100.0K 0.1 J			01
R141	RD258100	Carbon Resistor (chip)	100.0K 0.1 J			01
R142	RD257100	Carbon Resistor (chip)	10.0K 0.1 J			01
R143	RD256330	Carbon Resistor (chip)	3.3K 0.1 J			01
R144	RD257100	Carbon Resistor (chip)	10.0K 0.1 J			01
-148	RD257100	Carbon Resistor (chip)	10.0K 0.1 J			01
R150	RD256470	Carbon Resistor (chip)	4.7K 0.1 J			01
-153	RD256470	Carbon Resistor (chip)	4.7K 0.1 J			01
R155	RD254560	Carbon Resistor (chip)	56.0 0.1 J			01
R156	RD254560	Carbon Resistor (chip)	56.0 0.1 J			01
R157	RD255100	Carbon Resistor (chip)	100.0 0.1 J			01
R158	RD256470	Carbon Resistor (chip)	4.7K 0.1 J			01
R159	RD256470	Carbon Resistor (chip)	4.7K 0.1 J			01
R160	RD255470	Carbon Resistor (chip)	470.0 0.1 J			01

\*:New Parts

RANK:Japan only

REF.NO.	PART NO.	DESCRIPTION		REMARKS	QTY	RANK
-165	RD255470	Carbon Resistor (chip)	470.0 0.1 J			01
R166	RD257100	Carbon Resistor (chip)	10.0K 0.1 J			01
-169	RD257100	Carbon Resistor (chip)	10.0K 0.1 J			01
R170	RD256100	Carbon Resistor (chip)	1.0K 0.1 J			01
R171	RD256470	Carbon Resistor (chip)	4.7K 0.1 J			01
R174	RD254680	Carbon Resistor (chip)	68.0 0.1 J			01
R175	RD254680	Carbon Resistor (chip)	68.0 0.1 J			01
R176	RD257100	Carbon Resistor (chip)	10.0K 0.1 J			01
R177	RD257100	Carbon Resistor (chip)	10.0K 0.1 J			01
R178	RD257240	Carbon Resistor (chip)	24.0K 0.1 J			01
R179	RD257240	Carbon Resistor (chip)	24.0K 0.1 J			01
R180	RD257100	Carbon Resistor (chip)	10.0K 0.1 J			01
R181	RD256100	Carbon Resistor (chip)	1.0K 0.1 J			01
R182	RD256100	Carbon Resistor (chip)	1.0K 0.1 J			01
R183	RD257470	Carbon Resistor (chip)	47.0K 0.1 J			01
R184	RD156100	Carbon Resistor (chip)	1.0K 1/4 J			01
R185	RD156100	Carbon Resistor (chip)	1.0K 1/4 J			01
R187	RD256470	Carbon Resistor (chip)	4.7K 0.1 J			01
R188	RD257100	Carbon Resistor (chip)	10.0K 0.1 J			01
R189	RD257100	Carbon Resistor (chip)	10.0K 0.1 J			01
R191	RD257100	Carbon Resistor (chip)	10.0K 0.1 J			01
RA1	RE045180	Resistor Array	180X4			01
RA2	RE044680	Resistor Array	68X4			01
-9	RE044680	Resistor Array	68X4			01
RA10	RE044680	Resistor Array	68X4			01
RA11	RE044680	Resistor Array	68X4			01
RA12	RE045100	Resistor Array	100X4			01
RA13	RE045100	Resistor Array	100X4			01
RA14	RE044680	Resistor Array	68X4			01
-29	RE044680	Resistor Array	68X4			01
RA30	RE045100	Resistor Array	100X4			01
-34	RE045100	Resistor Array	100X4			01
RA35	RE046470	Resistor Array	4.7KX4			01
RA36	RE046470	Resistor Array	4.7KX4			01
RA37	RE047100	Resistor Array	10KX4			01
RA38	RE047100	Resistor Array	10KX4			01
RA39	RE044680	Resistor Array	68X4			01
RA40	RE047220	Resistor Array	22KX4			01
-45	RE047220	Resistor Array	22KX4			01
SW1	VK701100	Push Switch	SKHQFN GR	PLAY		02
SW2	VK701100	Push Switch	SKHQFN GR	EDIT		02
SW3	VK701100	Push Switch	SKHQFN GR	UTIL		02
SW4	VK701100	Push Switch	SKHQFN GR	EFFECT		02
SW5	VK701100	Push Switch	SKHQFN GR	MODE		02
SW6	VK701100	Push Switch	SKHQFN GR	EQ		02
SW7	VN121700	Push Switch	SKHHPP	MUTE/SOLO		01
SW8	VN121700	Push Switch	SKHHPP	PART -		01
SW9	VN121700	Push Switch	SKHHPP	PART +		01
SW10	VN121700	Push Switch	SKHHPP	ENTER		01
SW11	VN121700	Push Switch	SKHHPP	SELECT <		01
SW12	VN121700	Push Switch	SKHHPP	SELECT >		01
SW13	VN121700	Push Switch	SKHHPP	EXIT		01
SW14	VN121700	Push Switch	SKHHPP	VALUE -		01
SW15	VN121700	Push Switch	SKHHPP	VALUE +		01
SW31	VQ665200	Slide Switch	SSSF144-S06N-0	HOST SELECT		03
VR1	VS666800	Rotary Variable Resistor	RK09K12A0A6CA	AD/INPUT		03
VR2	VV016200	Rotary Variable Resistor	RK0971212004A	A10KX2 POWER/VOL		05
X1	VP864900	Quartz Crystal Unit	16M SMD-49			04
ZD1	VU171500	Zener Diode	UDZ 3.6BTE-17 3.6V			01
	BA808520	Heat Sink	T220M 25L			03
	VS598500	Angle Bracket	VR			03
	VV488200	Holder, Jack	JK			03
	--	Connector Assembly	SW1 10P	(VZ01810)		
	--	Connector Assembly	SW2 7P	(VZ01820)		
	--	Connector Assembly	VR 10P	(VZ01890)		
	--	Power Switch Assembly	PSW	(VZ04850)		
	EG330360	Bind Head Screw	3.0X6 MFZN2BL			01
	VN103500	Lithium Battery	CR2032			03

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