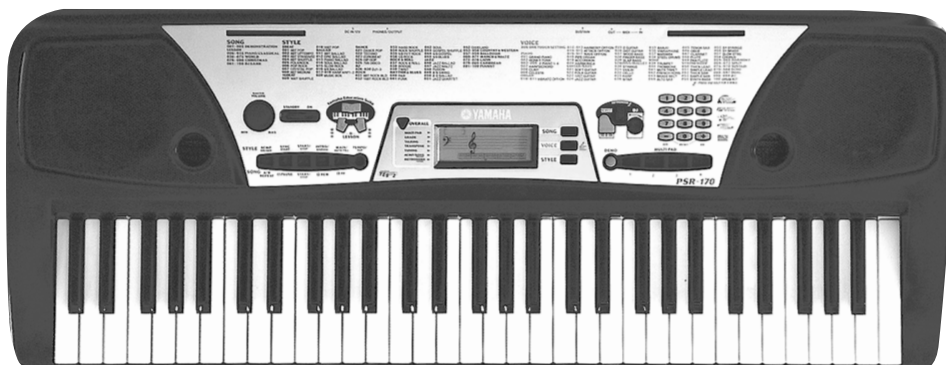


# PORTATONE *PSR-170* SERVICE MANUAL



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This document is printed on chlorine free (ECF) paper with soy ink.

## 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 your body may have accumulated by grounding yourself to the ground bus in the unit (heavy gauge black wires connect to this bus).

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

## WARNING : CHEMICAL CONTENT NOTICE !


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

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

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

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

## ■ WARNING

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

## ■ SPECIFICATIONS

### Keyboard

61 standard-size keys (C1 - C6)

### Display

Large multi-function LCD display (backlit)

### Setup

STANDBY/ON

MASTER VOLUME : MINI-MAX

### Panel controls

Overall, SONG, VOICE, STYLE, DEMO, POTABLE  
GRAND, DJ, METRONOME, Dict., L, R, TEMPO/TAP numeric  
keypad (0 - 9, +, -)

### Voices

100 panel voices (max. polyphony : 16)

### Effects

Dual (Included in Voice),  
Harmony/Echo (Included in Voice),  
Split (Included in Voice),  
Sustain

### Auto Accompaniment

100 styles

Fingering : Multi Fingering

Sections : Intro, Main A, B, Ending, Fill

### Overall controls

Multi Pad, Grade, Talking, Transpose, Tuning, Accompani-ment  
Volume, Song Volume, Metronome Volume

### Style controls

Acmp On/Off, Sync-Start, Start, Stop, Intro/Ending, Main A,  
B (Auto Fill)

### Song controls

Start, Stop, Pause, A-B Repeat, Fast Forward, Rewind, Mel-  
ody Voice Change

### One Touch Setting

1/style, 1/song

### Multi Pads

4 pads x 10 banks

### Yamaha Education Suite

Dictionary, Lesson 1-4

### Preset songs

100 songs

### Amplifier

2.0W + 2.0W

### MIDI

IN/OUT

### Auxiliary jacks

PHONES/OUTPUT, DC IN 12V, MIDI IN/OUT, SUSTAIN

### Speakers

10cm x 2

### Power consumption

VL/CSA 6-8W, CE7.5W (when using PA-3B power adaptor)

### Power supply

Adaptor : Yamaha PA-3B AC power adaptor

Batteries : Six "D" size, R20P(LR20) or equivalent batteries

### Dimensions

931 x 348.8 x 127.9 mm (36-2/3" x 13-3/4" x 5-1/16")

### Weight

4.4kg (9 lbs., 11 oz.)

### Supplied accessories

Music Stand, Owner's Manual, Song Book

### Optional accessories

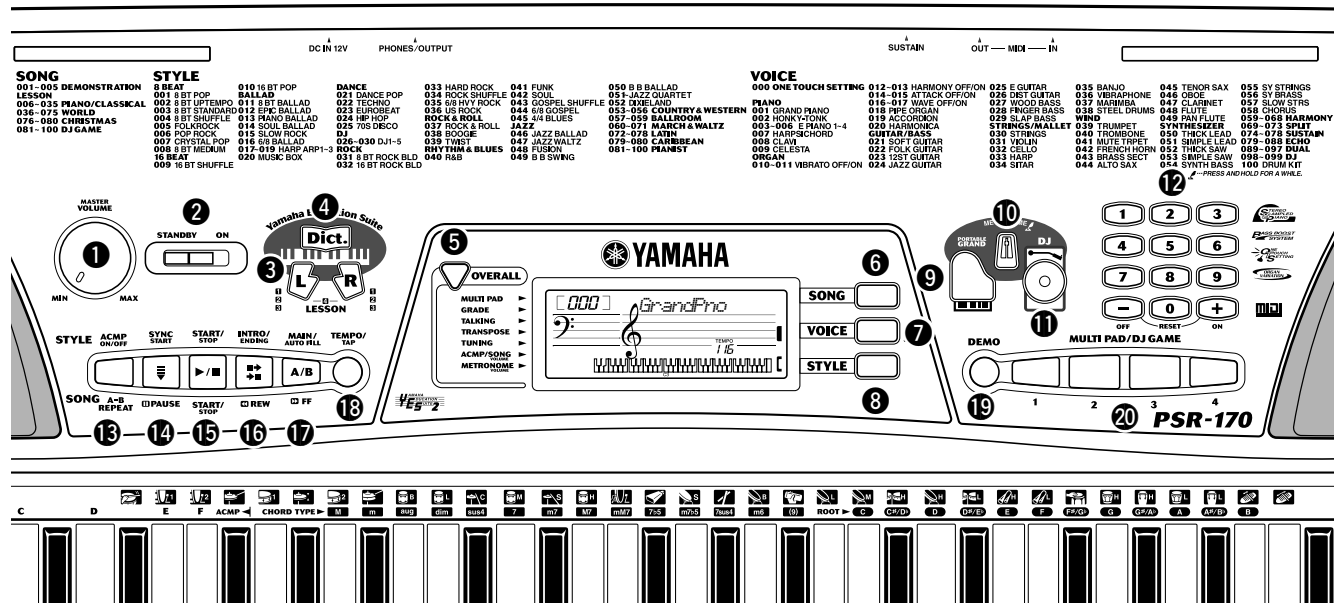
Headphones : HPE-150

AC power adaptor : PA-3B

Keyboard stand : L-2L, L-2C

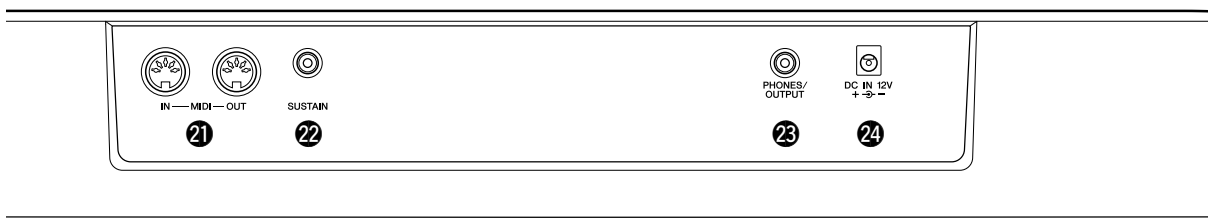
# ■ PANEL LAYOUT

## ● Top Panel



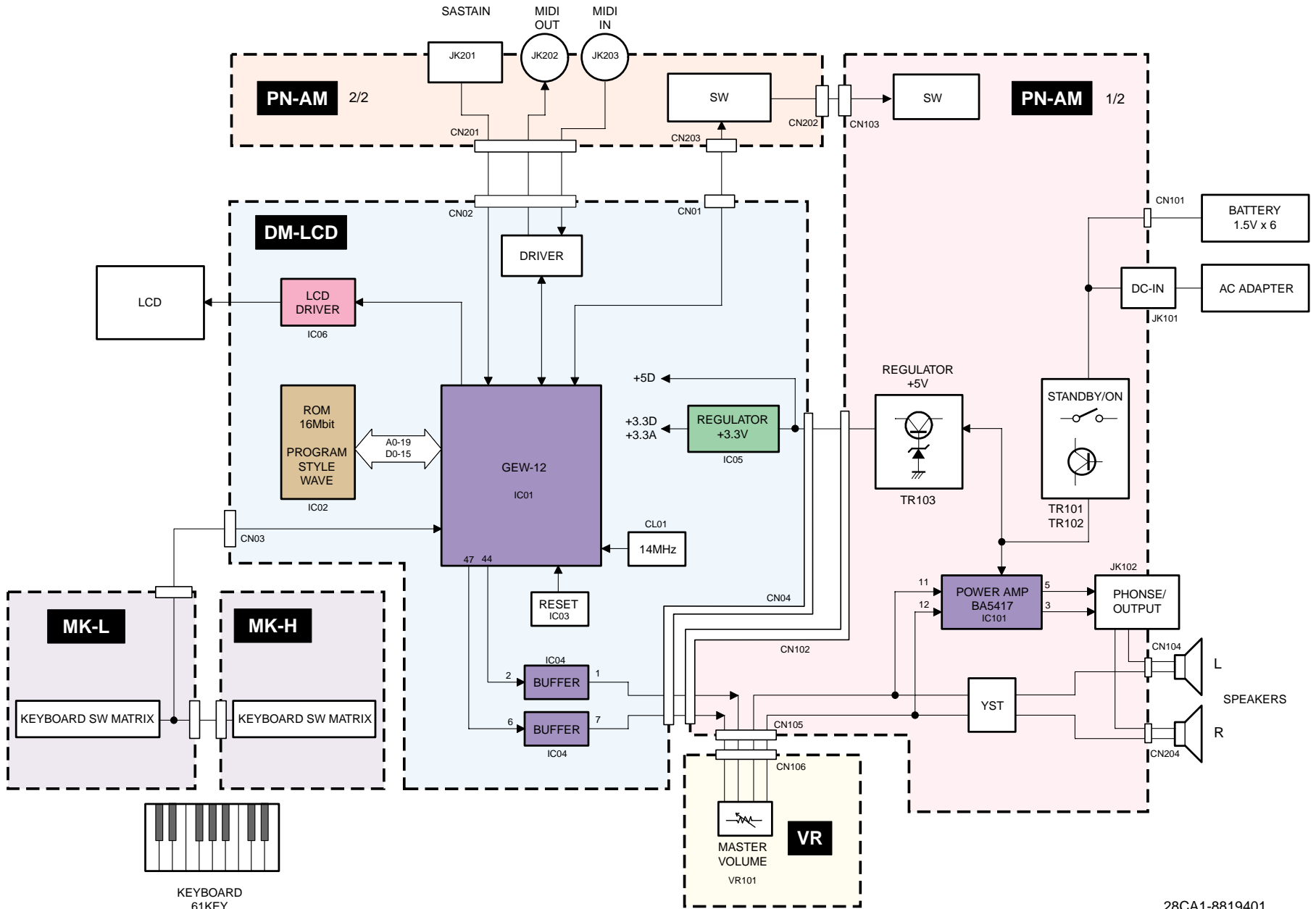
- |   |  |
|---|--|
| ① [MASTER VOLUME] dial                      | ⑫ Numeric keypad, [+ / ON] and [- / OFF] buttons |
| ② Power switch ([STANDBY / ON])             | ⑬ [ACCOMPANIMENT ON / OFF] ([A-B REPEAT]) button |
| ③ LESSON [L] (Left) and [R] (Right) buttons | ⑭ [SYNC START] ([ PAUSE]) button                 |
| ④ [Dict.] (DICTIONARY) button               | ⑮ [START / STOP] button                          |
| ⑤ [OVERALL] button                          | ⑯ [INTRO / ENDING] ([ REW]) button               |
| ⑥ [SONG] button                             | ⑰ [MAIN / AUTO FILL] ([ FF]) button              |
| ⑦ [VOICE] button                            | ⑱ [DEMO] button                                  |
| ⑧ [STYLE] button                            | ⑳ [MULTI PAD / DJ GAME] buttons                  |
| ⑨ [PORTABLE GRAND] button                   |  |
| ⑩ [METRONOME] button                        |  |
| ⑪ [DJ] button                               |  |

## ● Rear Panel



- |                                   |                          |
|-----------------------------------|--------------------------|
| ⑲ [MIDI IN], [MIDI OUT] terminals | ㉓ [PHONES / OUTPUT] jack |
| ⑳ [SUSTAIN] jack                  | ㉔ [DC IN 12V] jack       |

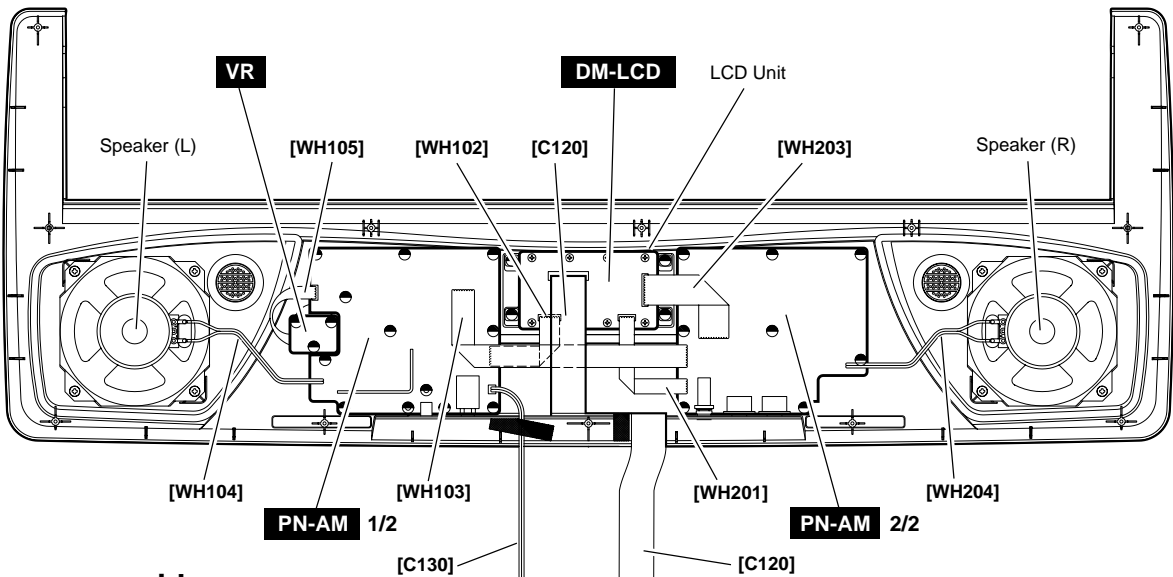
# ■ BLOCK DIAGRAM



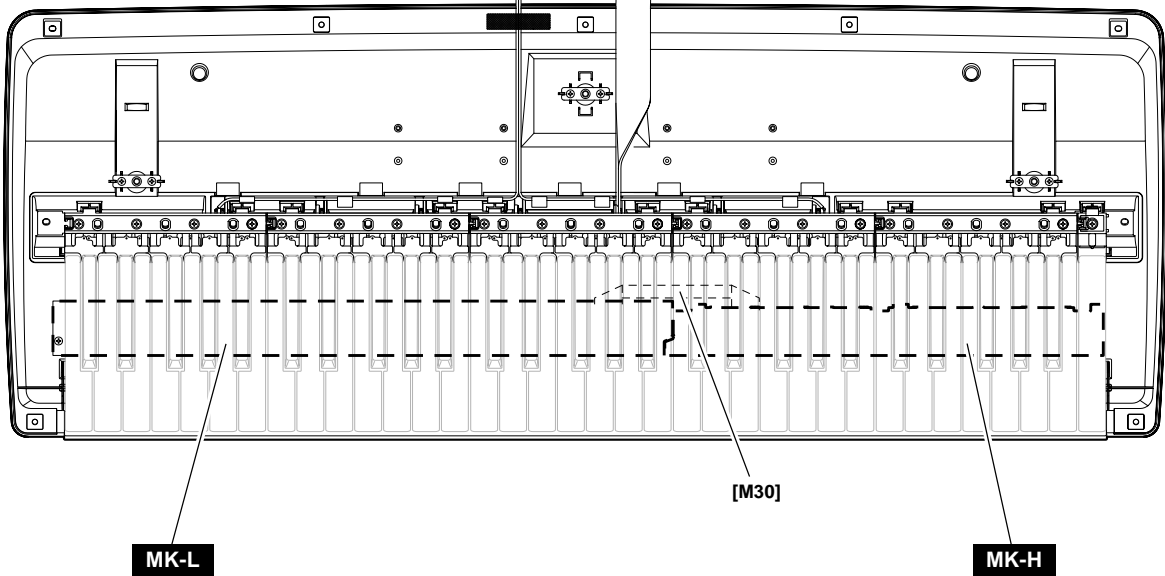
28CA1-8819401

CIRCUIT BOARD LAYOUT & WIRING

Upper case side



Lower case side



Location	Part No.	Connector Assembly	Destination				Remarks
C120	--	MK	MK-L		DM-LCD-CN03	*1	17P (V718700)
C130	--	BATTERY	PN-AM 1/2-CN101	*1	Contact Spring		2P (V718670)
M30	--	MK	MK-L		MK-H		11P (V719030)
WH102	--	AM	PN-AM 1/2-CN102	*1	DM-LCD-CN04	*1	8P (V719700)
WH103	--	PN2	PN-AM 1/2-CN103	*1	PN-AM 2/2-CN202	*1	9P (V719710)
WH104	--	SP	PN-AM 1/2-CN104	*1	Speaker L		2P (V719660)
WH105	--	VR	VR-CN106	*1	PN-AM 1/2-CN105	*1	5P (V719680)
WH201	--	MIDI	PN-AM 2/2-CN201	*1	DM-LCD-CN02	*1	6P (V719690)
WH203	--	PN1	PN-AM 2/2-CN203	*1	DM-LCD-CN01	*1	12P (V719720)
WH204	--	SP	PN-AM 2/2-CN204	*1	Speaker R		2P (V719660)

\* The parts with “--” in “Part No.” are not available as spare parts.

\* 1: Edge mark is adjusted to Pin 1 mark (△ mark).

Caution : Be sure to attach the removed filament tape just as it was before removal.

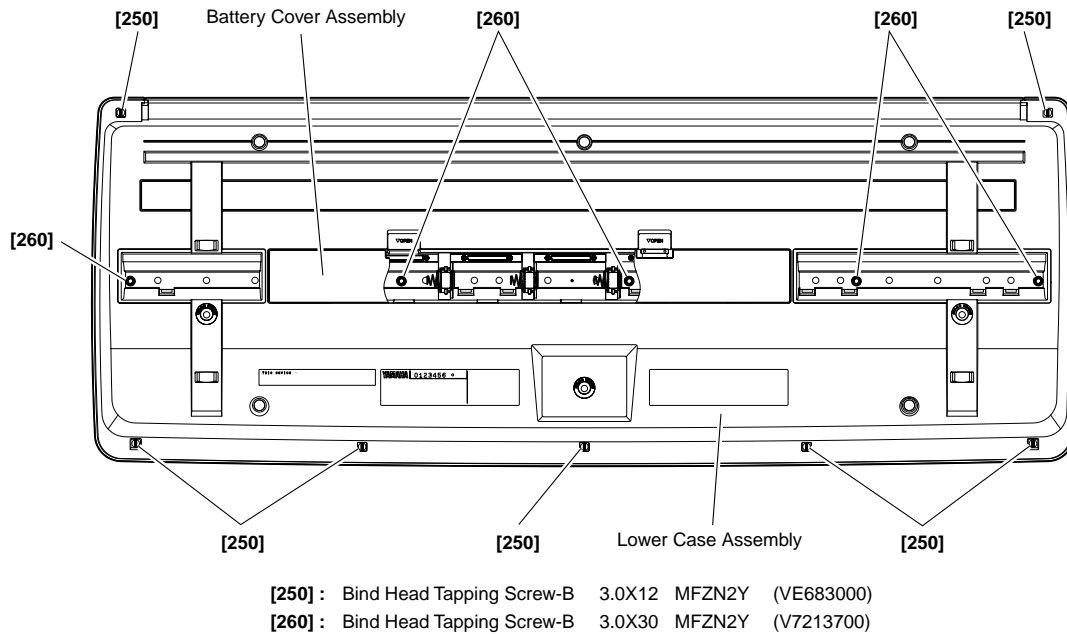
## ■ DISASSEMBLY PROCEDURE

### 1. Lower Case Assembly

(Time required : About 3 min.)

1-1. Remove the battery cover assembly. (Fig. 1)

1-2. Remove the seven (7) screws marked [250] and the five (5) screws marked [260]. The lower case assembly can then be removed. (Fig. 1)



(Fig. 1)

### 2. Spring Terminal

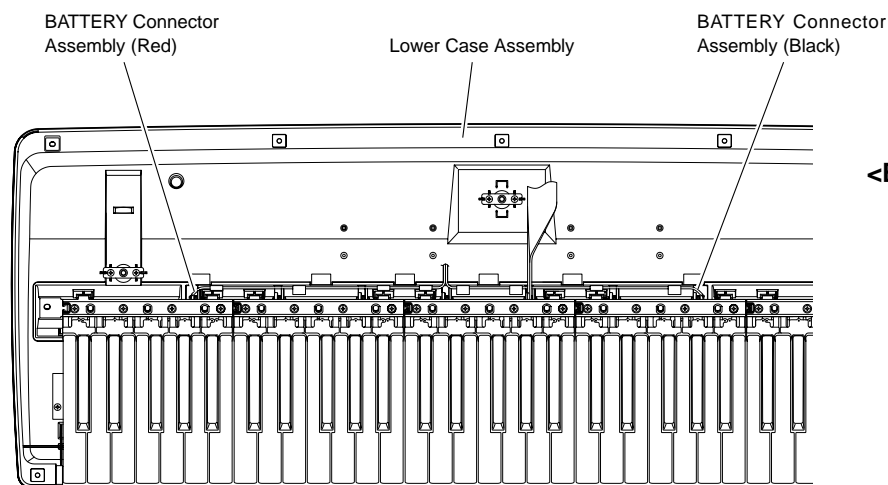
(Time required : About 10 min.)

2-1. Remove the lower case assembly. (See procedure 1)

2-2. Remove the BATTERY connector assembly (red/black) soldered to the spring terminal (+)/(-). (Fig. 2)

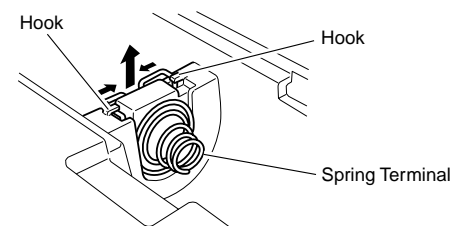
2-3. Remove the spring terminal by releasing hooks (2 locations for each). (Fig. 3)

#### <Top View>



(Fig. 2)

#### <Bottom View>



(Fig. 3)

### 3. PN-AM 1/2 Circuit Board

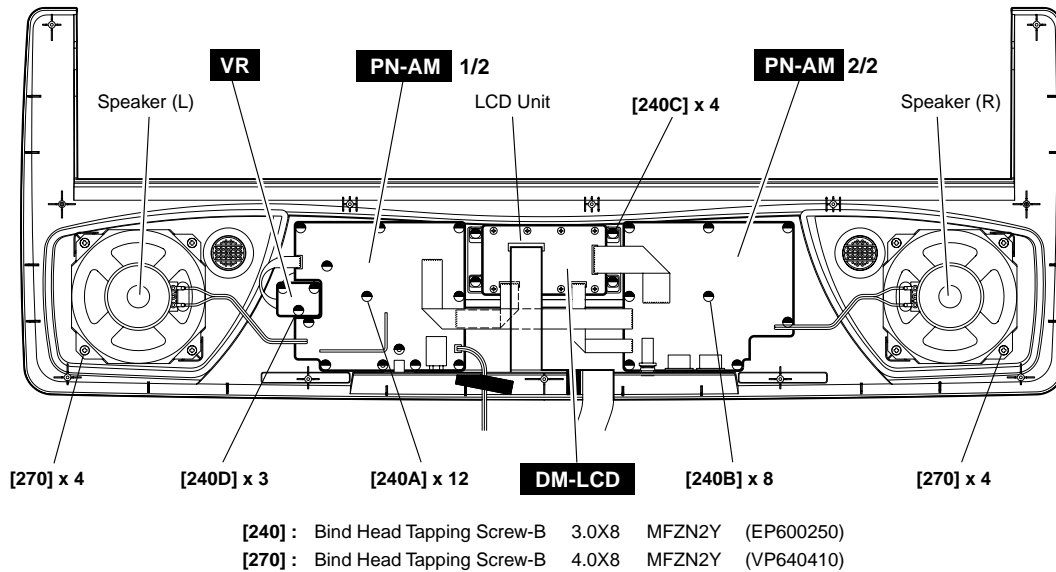
(Time required : About 8 min.)

- 3-1. Remove the lower case assembly. (See procedure 1)
- 3-2. Remove the twelve (12) screws marked [240A]. The PN-AM 1/2 circuit board can then be removed. (Fig. 4)

### 4. PN-AM 2/2 Circuit Board

(Time required : About 8 min.)

- 4-1. Remove the lower case assembly. (See procedure 1)
- 4-2. Remove the eight (8) screws marked [240B]. The PN-AM 2/2 circuit board can then be removed. (Fig. 4)



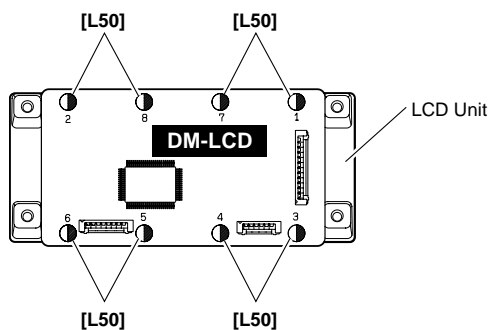
(Fig. 4)

### 5. LCD Unit and DM-LCD Circuit Board

(Time required : About 10 min.)

- 5-1. Remove the lower case assembly. (See procedure 1)
- 5-2. Remove the four (4) screws marked [240C]. The LCD unit can then be removed. (Fig. 4)
- 5-3. Remove the eight (8) screws marked [L50]. The DM-LCD circuit board can then be removed from the LCD unit. (Fig. 5)

\* When you install the DM-LCD circuit board, tighten the screws from No.1 to No. 8 in order as shown in Figure 5.



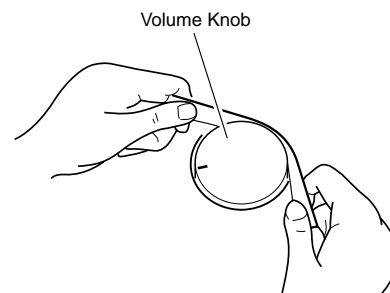
[L50] : Bind Head Tapping Screw-P 3.0X8 MFZN2Y (EP600280)

(Fig. 5)

### 6. VR Circuit Board

(Time required : About 8 min.)

- 6-1. Remove the lower case assembly. (See procedure 1)
- 6-2. Remove the volume knob from the control panel side. (Fig. 6)
- 6-3. Remove the three (3) screws marked [240D]. The VR circuit board can then be removed. (Fig. 4)



(Fig. 6)

### 7. Speaker (Time required : About 8 min.)

- 7-1. Remove the lower case assembly. (See procedure 1)
- 7-2. Remove the right and left speakers by removing four (4) screws marked [270] from each speaker. (Fig. 4)



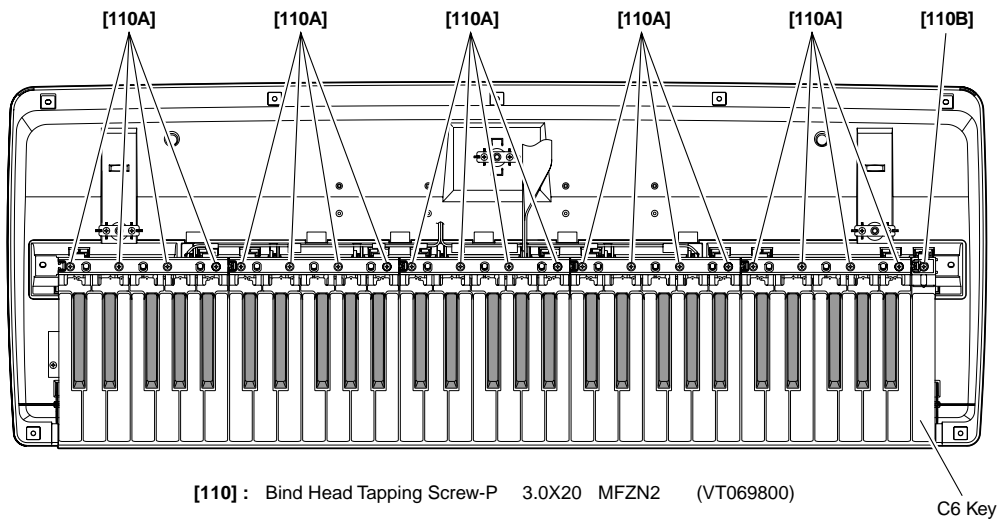
## 8. White key and Black key

(Time required : About 10 min. each)

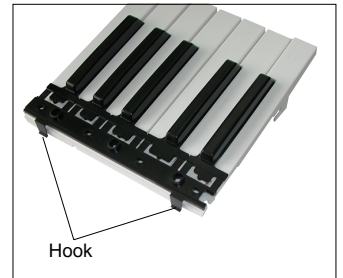
- 8-1. Remove the lower case assembly. (See procedure 1)  
 8-2. Remove the four (4) screws marked [110A] fixing the black and white keys for one octave. The black and white keys of each octave can then be removed. (Fig.7) At this time, lift the back of black key with

pushing the hooks of it and slide the black key towards you. (Photo 1)

- 8-3. When removing the C6 key, remove a screw marked [110B] and then lift the back of C6 key with pushing the hook of it and slide it towards you. (Fig.7)



(Fig. 7)



(Photo 1)

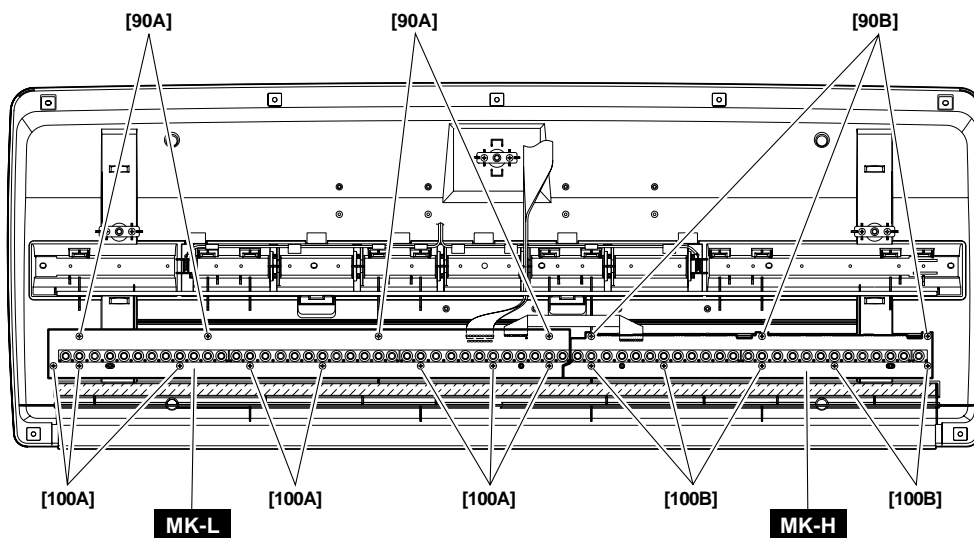
## 9. MK-L and MK-H Circuit Board

(Time required : About 15 min. each)

- 9-1. Remove the lower case assembly. (See procedure 1)  
 9-2. Remove the black and white keys (C1-B3). (See procedure 8.)  
 Remove the four (4) screws marked [90A] and the

eight (8) screws marked [100A]. The MK-L circuit board can then be removed. (Fig. 8)

- 9-3. Remove the black and white keys (C4-C6). (See procedure 8.) Remove the three (3) screws marked [90B] and the five (5) screws marked [100B]. The MK-H circuit board can then be removed. (Fig. 8)



[90] : Bind Head Tapping Screw-B 3.0X8 MFZN2Y(EP600250)  
 [100] : Bind Head Tapping Screw-P SP 3.0X12 MFZNBL(VZ313100)

(Fig. 8)

## ■ LSI PIN DESCRIPTION

● YMW728-F (XU355A00) GEW12 (AWM Tone Generator)

DM-LCD : IC001

PIN NO.	NAME	I/O	FUNCTION	PIN NO.	NAME	I/O	FUNCTION
1	PL0	I/O	Port L	51	DAC_Vdd		Power supply
2	PL1	I/O		52	SYI	I	Synch. signal
3	PL2	I/O		53	ICN	I	Initial Clear
4	PL3	I/O		54	Vss		Ground
5	PL4	I/O		55	MA19	O	Memory address bus
6	PL5	I/O	Power supply	56	MA18	O	
7	PL6	I/O		57	MA8	O	
8	Vdd		Port A	58	Vdd		Power supply
9	PA0	I/O		59	MA17	O	Memory address bus
10	PA1	I/O		60	MA9	O	
11	PA2	I/O		61	MA7	O	
12	PA3	I/O		62	MA10	O	
13	PA4	I/O	Port B	63	MA6	O	
14	PA5	I/O		64	MA11	O	Ground
15	PB0	I/O		65	Vss		
16	PB1	I/O		66	MA5	O	
17	PB2	I/O	Port C	67	MA12	O	Memory address bus
18	PB3	I/O		68	MA4	O	
19	PB4	I/O		69	MA13	O	
20	PB5	I/O		70	MA3	O	
21	Vss			71	MA14	O	
22	PC0	I/O	Port D	72	Vdd		Power supply
23	PC1	I/O		73	MA2	O	Memory address bus
24	PC2	I/O		74	MA15	O	
25	PC3	I/O		75	MA1	O	
26	PC4	I/O		76	MA16	O	
27	PC5	I/O	Port E	77	MA0	O	Memory data Input / output
28	PD0	I/O		78	MA20	O	
29	PD1	I/O		79	Vss		
30	PD2	I/O		80	ROMLOEN	O	
31	PD3	I/O		81	MD15	I/O	Ground
32	PD4	I/O	Power supply	82	MD0	I/O	
33	PD5	I/O		83	MD7	I/O	
34	Vdd			84	MD8	I/O	
35	PE0	I/O		85	MD14	I/O	
36	PE1	I/O	Port E	86	MD1	I/O	Power supply
37	PE2	I/O		87	MD6	I/O	
38	PE3	I/O		88	MD9	I/O	
39	PE4	I/O		89	Vdd		
40	PE5	I/O		90	MD13	I/O	
41	TESTE	I	Test Mode E	91	MD2	I/O	Memory data Input / output
42	TESTD	I	Test Mode D	92	MD5	I/O	
43	Vss		Ground	93	MD10	I/O	
44	DACLMM	O	1bit DAC Output L (-)	94	MD12	I/O	
45	DACLPP	O	1bit DAC Output L (+)	95	MD3	I/O	
46	DACRPP	O	1bit DAC Output R (+)	96	MD4	I/O	Ground
47	DACRMM	O	1bit DAC Output R (-)	97	MD11	I/O	
48	DAC_Vss		Ground	98	Vss		
49	X_O	O	Crystal quarts Output	99	MIDI I	I	MIDI Input
50	X_I	I	Crystal quarts Input	100	MIDI O	O	MIDI Output

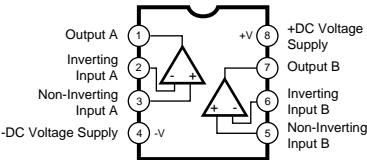
● S6A0069X10-Q0RJ (XV226A00) LCD DRIVER

DM-LCD : IC006

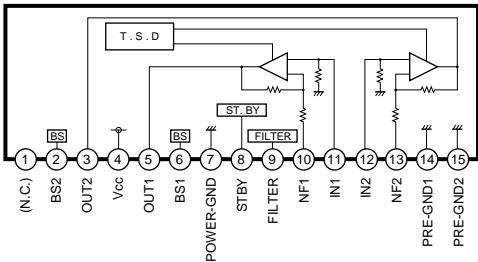
PIN NO.	NAME	I/O	FUNCTION	PIN NO.	NAME	I/O	FUNCTION
1	S22	O	Segment signal output for LCD driving	41	DB2	I/O	Data interface
2	S21	O		42	DB3	I/O	
3	S20	O		43	DB4	I/O	
4	S19	O		44	DB5	I/O	
5	S18	O		45	DB6	I/O	
6	S17	O		46	DB7	I/O	
7	S16	O		47	C1	O	Common signal output for LCD driving
8	S15	O		48	C2	O	
9	S14	O		49	C3	O	
10	S13	O		50	C4	O	
11	S12	O		51	C5	O	
12	S11	O		52	C6	O	
13	S10	O		53	C7	O	
14	S9	O		54	C8	O	
15	S8	O		55	C9	O	
16	S7	O		56	C10	O	
17	S6	O		57	C11	O	
18	S5	O		58	C12	O	
19	S4	O		59	C13	O	
20	S3	O		60	C14	O	
21	S2	O		61	C15	O	
22	S1	O		62	C16	O	
23	Vss		Ground	63	S40	O	Segment signal output for LCD driving
24	OSC1	I	Oscillator	64	S39	O	
25	OSC2	O	Oscillator	65	S38	O	
26	V1		Power supply	66	S37	O	
27	V2			67	S36	O	
28	V3			68	S35	O	
29	V4			69	S34	O	
30	V5			70	S33	O	
31	CLK1	O	Data latch clock	71	S32	O	
32	CLK2	O	Data shift clock	72	S31	O	
33	Vdd		Power supply (+5 V)	73	S30	O	
34	M	O	Altamated signal for LCD driver outout	74	S29	O	
35	D	O	Display data interface	75	S28	O	
36	RS	I		76	S27	O	
37	R/W	I	Read/write	77	S26	O	
38	E	I	Enable	78	S25	O	
39	DB0	I/O	Data interface	79	S24	O	
40	DB1	I/O	Data interface	80	S23	O	

■ IC BLOCK DIAGRAM

- μPC4570G2 (XF291A00)  
Dual Operational Amplifier  
DM-LCD : IC004



- BA5417 (XV771A00)  
Power Amplifier  
PN-AM 1/2 : IC101



CIRCUIT BOARDS INDEX

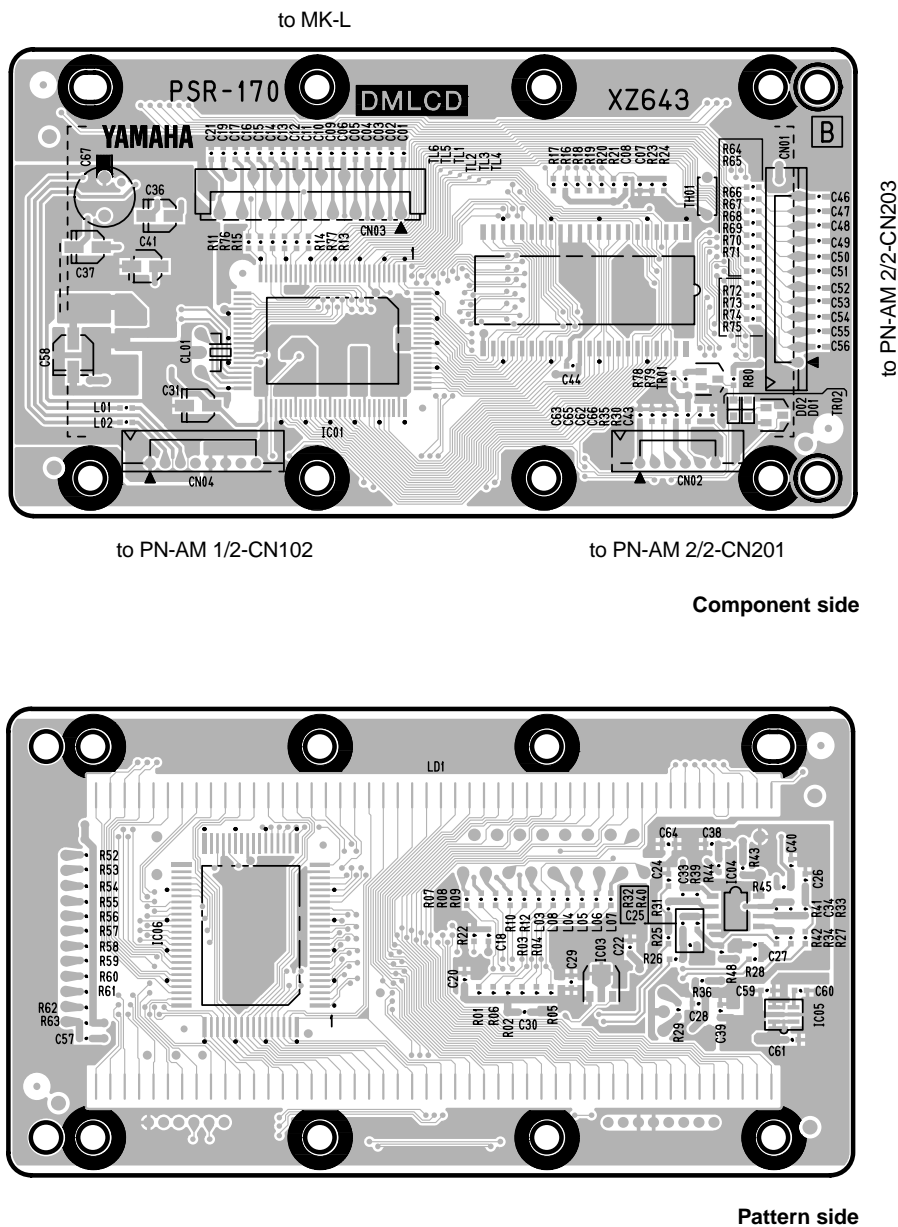
DM-LCD (XZ643B0) ..... 12

PN-AM 1/2 (XZ644B0) ..... 13

PN-AM 2/2 (XZ644B0) ..... 14

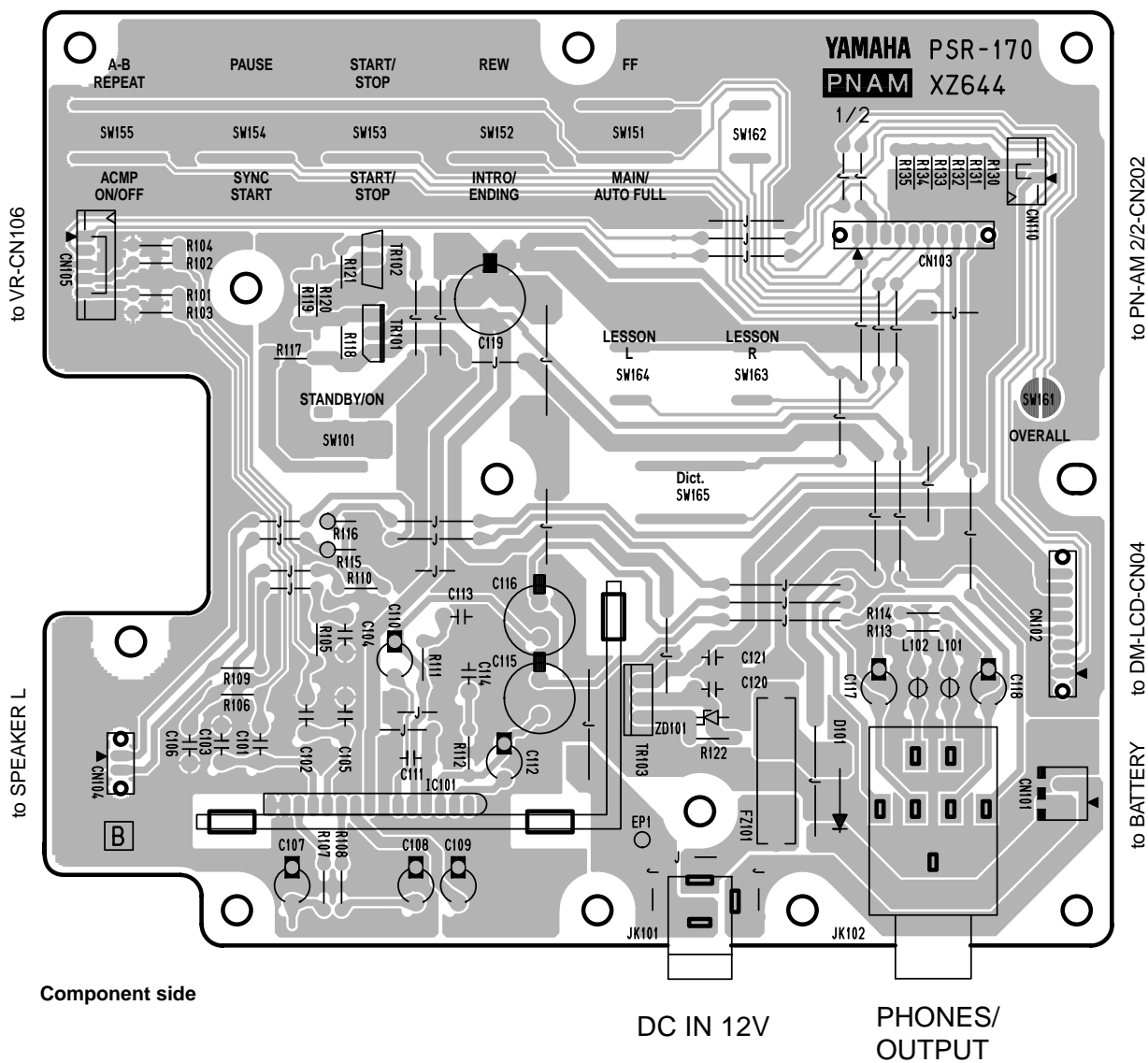
VR (XZ644B0) ..... 14

DM-LCD Circuit Board

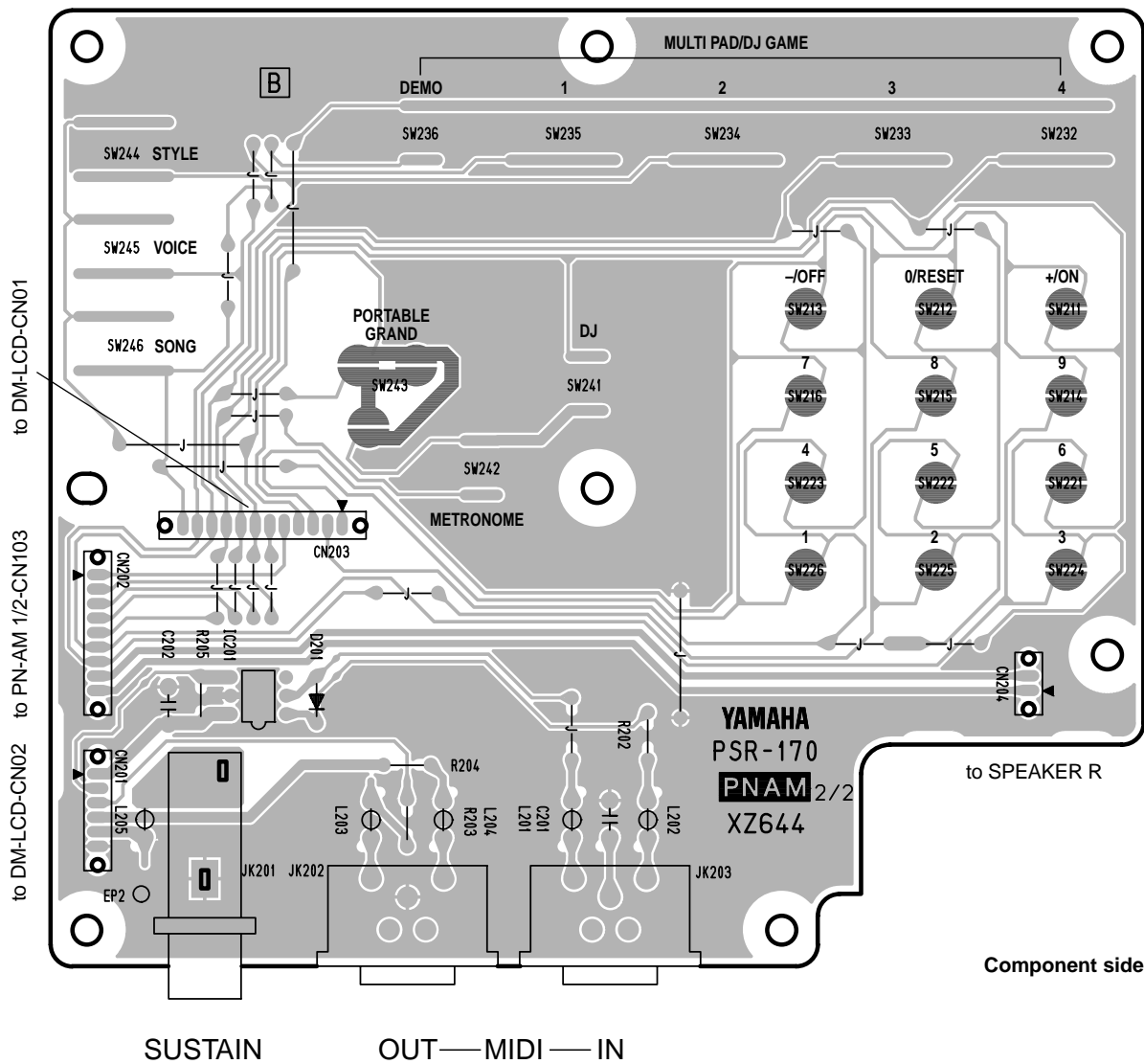


Note : See parts list for details of circuit board component parts.

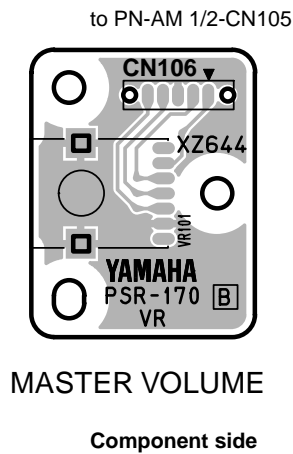
## ● PN-AM 1/2 Circuit Board



● PN-AM 2/2 Circuit Board



● VR Circuit Board



## ■ TEST PROGRAM

### 1. PREPARATION

- 1) PA-3B or PA-3(AC adaptor) is used.
- 2) The volume is usually moved to the use position when no volume change is required.
- 3) Measuring instruments : frequency counter, level meter (with JIS-C filter)  
**Note** : Connect a stereo plug to the [PHONES/OUTPUT] jack at 33 ohms.
- 4) Jigs : foot switch, MIDI cable

### 2. HOW TO ENTER THE TEST PROGRAM

While pressing the C2#, F2 and G2# keys, turn the [STANDBY/ON] switch on.

### 3. PROCEEDING THROUGH THE TEST PROGRAM

- 1) When the test program is started, "TEST" appears on the LCD.
  - 2) Select the test program item to be executed by pressing the [-/NO] or [+/YES] button.
  - 3) Press the [START/STOP] button to execute testing.
- When the test result is OK, press the [START/STOP] button to return to the test item name on display. Proceed to the next test by pressing the [-/NO] or [+/YES] button.  
 When the test result is OK, a cursor ( ) is added under the first character of the test item name on display.
  - When the test result is NG, press the lowest (leftmost) white key on the keyboard to return to the test item name on display and then turn off the [STANDBY/ON] switch to end the test program.

### 4. TEST PROGRAM LIST

TEST No.	LCD (initial)	Test Functions and Judgment Criteria
1	[001] Version	Displays ROM version. ROM (Program) versions are displayed alternately on the LCD.
2	[002] Rom Chk1	Checks the ROM. The test results appear on the LCD.
3	[003] Ram Chk1	Checks the RAM. (GEW12) The test results appear on the LCD.
11	[011] TG1 Chk	Outputs the sine wave by changing the channels in sequence from C2 to D#3. After auto-scaling is finished, individual keys can be played. (If playing two or more keys simultaneously, the first pressed key has priority to make a sound.)
13	[013] Pit Chk	Connect the frequency counter to the [PHONES] jack. Sets PAN to Center and produces a signal at 440 +/- 1.76 Hz Check that the correct signal is produced.
14	[014] Output R	Connect the level meter (with a JIS-C filter) to the [PHONES] jack. (33 ohm load) Set the [MASTER VOLUME] at maximum and check the output level (1 kHz). <b>PHONES L</b> : less than -60.0 dBm <b>PHONES R</b> : -24.5 dBm +/- 2 dB
15	[015] Output L	Connect the level meter (with a JIS-C filter) to the [PHONES] jack. (33 ohm load) Set the [MASTER VOLUME] at maximum and check the output level (1 kHz). <b>PHONES L</b> : -24.5 dBm +/- 2 dB <b>PHONES R</b> : less than -60.0 dBm
19	[019] Noise	Connect the level meter (with a JIS-C filter) to the [PHONES] jack. (33 ohm load) Set the [MASTER VOLUME] at maximum. Check D/A converter noise. <b>PHONES L/R</b> : Less than -75.0 dBm
20	[020] SW Chk	Check the switches on the panel. Press the switches on the LCD as instructed. A pre-assigned note is output when the switch is pressed (See table 1.). As the check result appears on the LCD when all the switches are pressed as instructed,. Check that OK is displayed. (To stop this check before reaching its end, press the lowest (leftmost) white key on the keyboard to return to the test item name on display.

TEST No.	LCD (initial)	Test Functions and Judgment Criteria
28	[028] LCD On	Check that all LCD dots are on.
29	[029] LCD Off	Check that all LCD dots are off.
31	[031] PD1 Chk	Connect the foot switch (FC-4 or FC-5) to the [SUSTAIN] jack. Check that the C3 note is output when the [START/STOP] button is pressed while stepping the pedal and the C4 note is output when releasing the pedal.
37	[037] MIDI Chk	After connecting the [MIDI IN] jack and [MIDI OUT] jack with a MIDI cable, execute the test. Check that the C4 note is output and that the test results appear on the LCD.
41	[041] Rom Chk2	Checks the ROM. The test results appear on the LCD.
42	[042] Ram Chk2	Checks the RAM. (GEW12) The test results appear on the LCD.
48	[048] TestExit	Exit from the test program after executing this test.

\* NOTE : The above tests Nos. 41-42, require approximately 20 minutes to conduct.

## ● TABLE 1

Order of SW check	Switch name	Pitch (note number)	Lcd display	Order of SW check	Switch name	Pitch (note number)	Lcd display
1	Dictionary	60 (C3)	Dict.	18	Tenkey 8	77 (F4)	Tenkey 8
2	Lesson L	61 (C#3)	Lesson L	19	Tenkey 9	78 (F#4)	Tenkey 9
3	Lesson R	62 (D3)	Lesson R	20	Tenkey –	79 (G4)	Tenkey –
4	Overall	63 (D#3)	Overall	21	Tenkey 0	80 (G#4)	Tenkey 0
5	Song	64 (E3)	Song	22	Tenkey +	81 (A4)	Tenkey +
6	Voice	65 (F3)	Voice	23	Acmp ON/OFF	82 (A#4)	Accomp
7	Style	66 (F#3)	Style	24	Synchro start	83 (B4)	Sync Str
8	Grand piano	67 (G3)	GrandPia	25	Start/Stop	84 (C5)	Str/Stp
9	Metronome ON/OFF	68 (G#3)	Metro	26	Intro/Ending	85 (C#5)	Int/End
10	DJ	69 (A3)	DJ	27	Main A/B	86 (D5)	Main AB
11	Tenkey 1	70 (A#3)	Tenkey 1	28	Tempo	87 (D#5)	Tempo
12	Tenkey 2	71 (B3)	Tenkey 2	29	Demo	88 (E5)	Demo
13	Tenkey 3	72 (C4)	Tenkey 3	30	Pat 1	89 (F5)	Pad 1
14	Tenkey 4	73 (C#4)	Tenkey 4	31	Pat 2	90 (F#5)	Pad 2
15	Tenkey 5	74 (D4)	Tenkey 5	32	Pat 3	91 (G5)	Pad 3
16	Tenkey 6	75 (D#4)	Tenkey 6	33	Pat 4	92 (G#5)	Pad 4
17	Tenkey 7	76 (E4)	Tenkey 7				



# MIDI IMPLEMENTATION CHART

YAMAHA [ PSR-170 ]

Model PSR-170 MIDI Implementation Chart

Date:26-JAN-2001

Version : 1.0

Function...	Transmitted	Recognized	Remarks
Basic Default Channel Changed	1 - 7,10 x	1 - 7,10 x	
Mode Default Messages Altered	3 x *****	3 x x	
Note Number : True voice	0 - 127 *****	0 - 127 0 - 127	
Velocity Note ON Note OFF	o 9nH,v=1-127 *1 x 9nH,v=0	o 9nH,v=1-127 x 9nH,v=0 or 8nH	
After Key's Touch Ch's	x x	x x	
Pitch Bend	x	x	
Control Change	0,32 o *2 7 o 10 o 6,38 x 64 o 71-74 x 84 o 91,93,94 x 96-97 x 98,99 x 100-101 x	0,32 o *2 7 o 10 o 6,38 x 64 o 71-74 x 84 o 91,93,94 x 96-97 x 98,99 x 100-101 x	Bank Select LSB,MSB Volume Pan Data Entry Sustain  Portamento Cntrl  RPN Inc,Dec NRPN LSB,MSB RPN LSB,MSB
Prog Change : True #	o 0 - 127 *3 *****	o 0 - 127 *3 *3	
System Exclusive	o *4	o *4	
: Song Pos. Common : Song Sel. : Tune	x x x	x x x	
System :Clock Real Time:Commands	x x	x x	
Aux :All Sound OFF :Reset All Cntrls :Local ON/OFF :All Notes OFF Mes- :Active Sense sages:Reset	x x x x o x	x x x x o x	

Mode 1 : OMNI ON , POLY  
Mode 3 : OMNI OFF, POLY

Mode 2 : OMNI ON ,MONO  
Mode 4 : OMNI OFF,MONO

o : Yes  
x : No

# PORTATONE

# *PSR-170*

## PARTS LIST

### ■ CONTENTS



OVERALL ASSEMBLY .....	2
KEYBOARD ASSEMBLY .....	4
ELECTRICAL PARTS .....	5 – 8

### Notes : DESTINATION ABBREVIATIONS

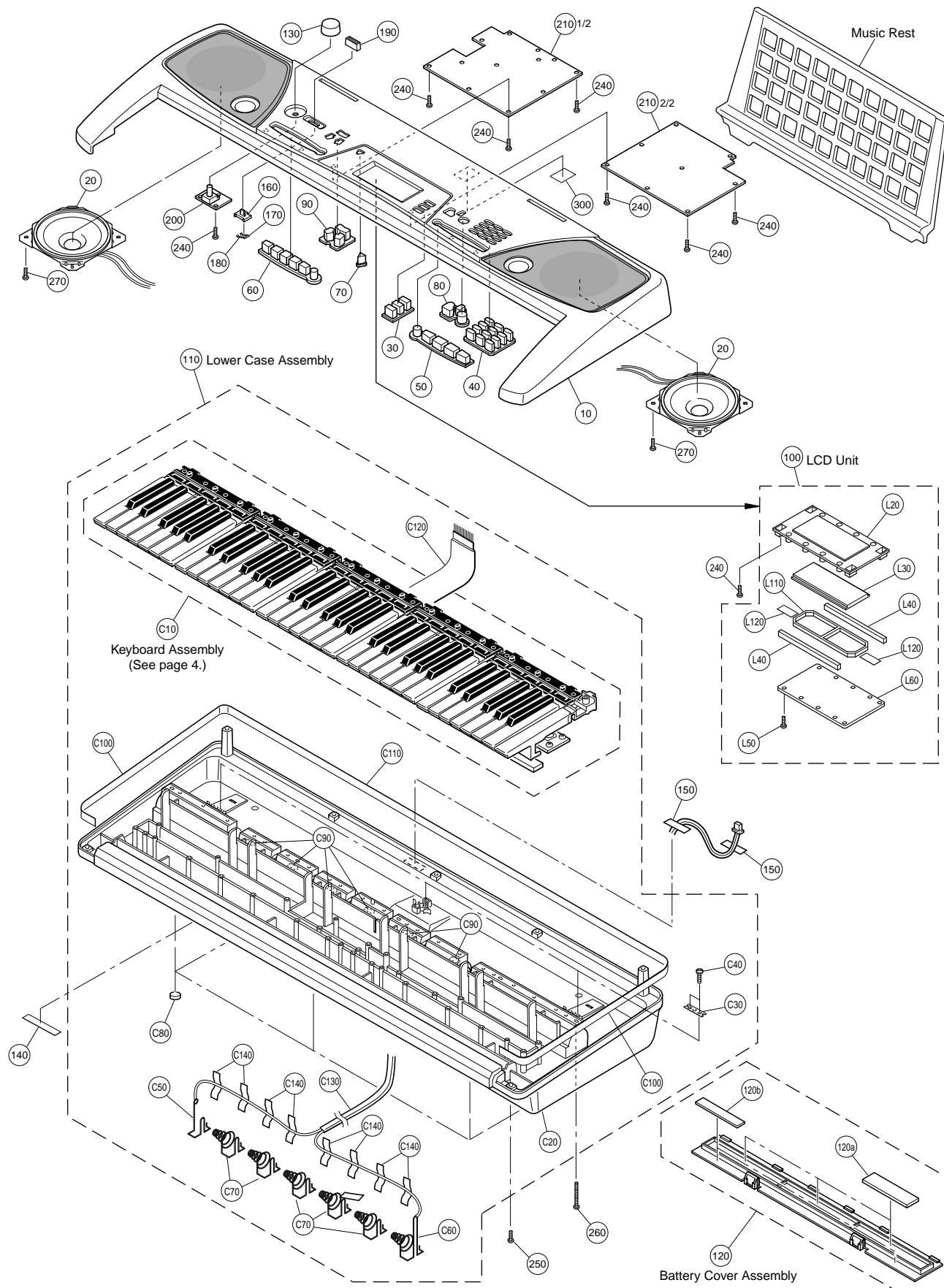
A : Australian model	M : South African model
B : British model	O : Chinese model
C : Canadian model	Q : South-east Asia model
D : German model	T : Taiwan model
E : European model	U : U.S.A. model
F : French model	V : General export model (110V)
H : North European model	W : General export model (220)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

### ■ WARNING

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

- The numbers "QTY" show quantities for each unit.
- The parts with "--" in "PART NO." are not available as spare parts.
- This mark " } " in the REMARKS column means these parts are interchangeable.
- The second letter of the shaded (  ) part number is O, not zero.
- The second letter of the shaded (  ) part number is I, not one.

# OVERALL ASSEMBLY

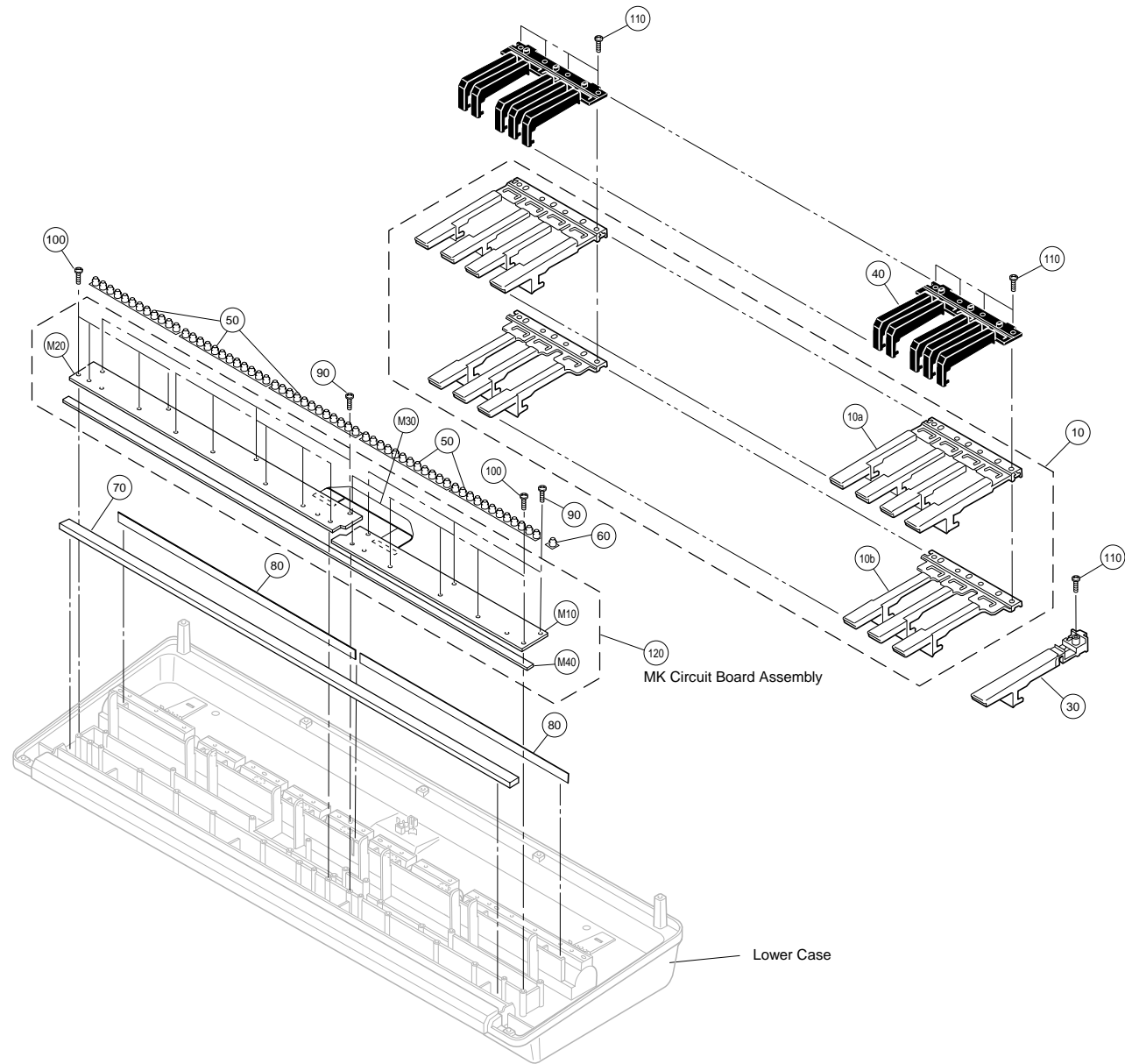


REF NO.	PART NO.	DESCRIPTION		REMARKS	QTY	RANK
	--	OVERALL ASSEMBLY		PSR-170 (V702380)		
* 10	V7024000	Upper Case			2	
* 20	XZ871A00	Speaker	12.0cm 4 ohm 3W			
* 30	V7031700	Panel Switch	3 DOME BLACK	SONG,VOICE,STYLE		
* 40	V7202300	Panel Switch	12 DOME WHITE	0-9,OFF/-,ON/+		
* 50	V7032100	Panel Switch	5 DOME YELLOW/BLACK	DEMO,MULTI PAD 1-4		
* 60	V7032200	Panel Switch	6 DOME BLACK	ACMP ON/OFF,SYNC START, START/STOP,INTRO/ENDING, MAIN/AUTO FILL,TEMPO/TAP OVERALL		
* 70	V7032300	Panel Switch	1 DOME BLACK	METRONOME,PORTABLE GRAND, DJ		
* 80	V7032400	Panel Switch	3 DOME BLACK/YELLOW	Dict.,LESSON L,LESSON R		
* 90	V7032500	Panel Switch	3 DOME WHITE/YELLOW	(V709880)		
100	--	LCD Unit	M	(V702430)		
110	--	Lower Case Assembly				
* 120	V7042300	Battery Cover Assembly	BLACK			
120a	--	Battery Cushion	WHITE	(V710060)	3	
120b	--	Nonwoven Fabric Cloth	10X70X0.5	(V781030)	2	
130	VU432400	Knob	BLACK	MASTER VOLUME		01
140	--	Label	FE	(V709870)		
150	VA126100	Adhesive Tape	12X50		2	03
160	VF073800	Slider	LC			01
170	BB005650	Brush	YCUT-MEH			02
180	VA010200	Grease	G-902, 1kg			40
190	VV490600	Knob	BLACK	STANDBY/ON		03
* 200	V7083700	Circuit Board	VR			
* 210	V7083600	Circuit Board	PN-AM			
240	EP600250	Bind Head Tapping Screw-B	3.0X8 MFZN2Y		27	01
250	VE683000	Bind Head Tapping Screw-B	3.0X12 MFZN2Y		7	01
* 260	V7213700	Bind Head Tapping Screw-B	3.0X30 MFZN2Y		5	
270	EP640410	Bind Head Tapping Screw-B	4.0X8 MFZN2Y		8	01
300	--	Adhesive Tape	12X90	(V591240)		
	--	LCD Unit	M	(V709880)		
L20	V5339000	LCD Panel	TYPE-A			01
* L30	V6968000	LCD	TTR5297DPRDCN-C3			
L40	V3755900	Rubber Connector	SS-105L		2	01
L40	V5415400	Rubber Connector	SS-105L		2	
L50	EP600280	Bind Head Tapping Screw-P	3.0X8 MFZN2Y		8	01
* L60	V6925200	Circuit Board	DM-LCD			
* L110	V7172200	LCD Holder	A			
L120	VA119300	Adhesive Tape	12x25		2	01
	--	Lower Case Assembly		(V702430)		
C10	--	Keyboard Assembly	16N C61 P1M	(V709960)		
* C20	V6997500	Lower Case				
C30	VI104400	Holder	CH		3	
C40	EP600250	Bind Head Tapping Screw-B	3.0X8 MFZN2Y		6	01
C50	V7060500	Spring Terminal	(+)			
* C60	V7060700	Spring Terminal	(-)			
* C70	V7060200	Spring Terminal			5	
C80	CB043750	Foot	T1.6 BLACK		5	01
C90	--	Dust Proof Cloth		(V720600)	6	
C100	--	Cushion	360X15X1.0 PE	(V642100)	2	
C110	--	Cushion	885X15X1.0 PE	(V642110)		
C120	--	Connector Assembly	17P	(V718700)		
C130	--	Connector Assembly	XH 2P	(V718670)		
C140	VA119300	Adhesive Tape	12X25		8	01
		ACCESSORIES				
	V2115000	Music Rest				06
	VY944300	AC Adapter	PA-32 CH	O		10
* V7199200	Chinese Guide Sheet			O		

\*: New Parts

RANK: Japan only

KEYBOARD ASSEMBLY



REF NO.	PART NO.	DESCRIPTION		REMARKS	QTY	RANK
	--	KEYBOARD ASSEMBLY	16N C61 P1M	PSR-170 (V709960)	5	
10	V34107A0	White Keys	16N CEGBDFA		5	
10a	--	White Keys	16N CEGB	(V341260)	5	
10b	--	White Keys	16N DFA	(V341270)	5	
* 30	V4760300	White Key	16N C			
40	VZ271700	Black Keys	16N		5	06
50	VZ271800	Rubber Contact	16N-1M OCT 1M		5	05
60	VZ271900	Rubber Contact	16N-1M C' 1M			04
70	VZ303000	Felt L	16N			02
* 80	V7100100	Rubber Support	16N L832			
90	EP600250	Bind Head Tapping Screw-B	3.0X8 MFZN2Y		7	01
100	VZ313100	Bind Head Tapping Screw-P	SP 3.0X12 MFZNBL		13	01
110	VT069800	Bind Head Tapping Screw-P	3.0X20 MFZN2		21	01
120	--	MK Circuit Board Assembly	16N1M C61 P1	(V718920)		
	--	MK Circuit Board Assembly	16N1M C61 P1	(V718920)		
M10	VZ272400	Circuit Board	MK-H 16N-1M			09
* M20	V7189900	Circuit Board	MK-L 16N-1M C61 P1			
M30	--	Connector Assembly	MK 16N-1M-C61	(V719030)		
M40	VZ302900	Felt U	16N			02

※: New Parts

RANK: Japan only

# ELECTRICAL PARTS

REF NO.	PART NO.	DESCRIPTION		REMARKS	QTY	RANK
		ELECTRICAL PARTS		PSR-170		
*	V6925200	Circuit Board	DM-LCD	(XZ643B0)		
	VZ272400	Circuit Board	MK-H 16N-1M	(XT701A0)		09
*	V7189900	Circuit Board	MK-L 16N-1M C61 P1	(XZ850C0)		
*	V7083600	Circuit Board	PN-AM	(XZ644C0)		
*	V7083700	Circuit Board	VR	(XZ644B0)		
*	V6925200	Circuit Board	DM-LCD	(XZ643B0)		
C0001	US062470	Ceramic Capacitor-SL(chip)	470P 50V J			01
-0006	US062470	Ceramic Capacitor-SL(chip)	470P 50V J			01
C0007	US135100	Ceramic Capacitor-F (chip)	0.1000 16V Z			01
C0008	US135100	Ceramic Capacitor-F (chip)	0.1000 16V Z			01
C0009	US062470	Ceramic Capacitor-SL(chip)	470P 50V J			01
-0017	US062470	Ceramic Capacitor-SL(chip)	470P 50V J			01
C0018	US135100	Ceramic Capacitor-F (chip)	0.1000 16V Z			01
C0019	US062470	Ceramic Capacitor-SL(chip)	470P 50V J			01
C0020	US135100	Ceramic Capacitor-F (chip)	0.1000 16V Z			01
C0021	US062470	Ceramic Capacitor-SL(chip)	470P 50V J			01
C0022	US135100	Ceramic Capacitor-F (chip)	0.1000 16V Z			01
C0024	US063150	Ceramic Capacitor-B (chip)	1500P 50V K			01
-0027	US063150	Ceramic Capacitor-B (chip)	1500P 50V K			01
C0028	US135100	Ceramic Capacitor-F (chip)	0.1000 16V Z			01
-0030	US135100	Ceramic Capacitor-F (chip)	0.1000 16V Z			01
C0031	UF017220	Electrolytic Cap. (chip)	22 6.3V			01
C0033	US063100	Ceramic Capacitor-B (chip)	1000P 50V K			01
C0034	US063100	Ceramic Capacitor-B (chip)	1000P 50V K			01
C0036	UF046470	Electrolytic Cap. (chip)	4.7 25V			01
C0037	UF046470	Electrolytic Cap. (chip)	4.7 25V			01
C0038	US064100	Ceramic Capacitor-B (chip)	0.0100 50V K			01
C0039	US135100	Ceramic Capacitor-F (chip)	0.1000 16V Z			01
C0040	US064100	Ceramic Capacitor-B (chip)	0.0100 50V K			01
C0041	UF017220	Electrolytic Cap. (chip)	22 6.3V			01
C0043	US135100	Ceramic Capacitor-F (chip)	0.1000 16V Z			01
C0044	US135100	Ceramic Capacitor-F (chip)	0.1000 16V Z			01
C0046	US062100	Ceramic Capacitor-SL(chip)	100P 50V J			01
-0057	US062100	Ceramic Capacitor-SL(chip)	100P 50V J			01
C0058	UF017470	Electrolytic Cap. (chip)	47 6.3V			01
C0059	US135100	Ceramic Capacitor-F (chip)	0.1000 16V Z			01
-0061	US135100	Ceramic Capacitor-F (chip)	0.1000 16V Z			01
C0062	US062100	Ceramic Capacitor-SL(chip)	100P 50V J			01
C0063	US135100	Ceramic Capacitor-F (chip)	0.1000 16V Z			01
C0064	US135100	Ceramic Capacitor-F (chip)	0.1000 16V Z			01
C0065	US062100	Ceramic Capacitor-SL(chip)	100P 50V J			01
C0066	US135100	Ceramic Capacitor-F (chip)	0.1000 16V Z			01
C0067	UR838470	Electrolytic Cap.	470.00 16.0V			01
CL001	V2905100	Ceramic Resonator	14M CST14.00MXW140			02
CL001	V3522500	Ceramic Resonator	14M EFOEX1405E38			01
CN001	VK025600	Wire Trap	52147 12P TE			01
CN002	VF728300	Wire Trap	52147 6P TE			01
CN003	VG924500	Wire Trap	52328 17P TE			02
CN004	VK025200	Wire Trap	52147 8P TE			01
D0001	VT332900	Diode	1SS355 TE-17			01
D0002	VT332900	Diode	1SS355 TE-17			01
IC001	XU355A00	IC	YMW728-F	GEW12		10
* IC002	XZ870100	IC	MX23L1610MC-10	MASK ROM 16M PROGRAM		
* IC003	XZ625A00	IC	M62722ML	SYSTEM RESET		
IC004	XF291A00	IC	UPC4570G2	OP AMP		03
* IC005	XZ624A00	IC	MM1385ENRE	REGULATOR +3.3V		
IC006	XV226A00	IC	S6A0069X10-Q0RJ	LCD DRIVER		05
L0001	VY657200	Chip Inductance	600 BK1608HM601			01
L0001	V3063400	Chip Inductance	BLM11B601S 1608			01
L0002	VY657200	Chip Inductance	600 BK1608HM601			01
L0002	V3063400	Chip Inductance	BLM11B601S 1608			01
L0003	RD355100	Carbon Resistor (chip)	100 63M J			01
-0008	RD355100	Carbon Resistor (chip)	100 63M J			01
R0001	RD357470	Carbon Resistor (chip)	47K 63M J			01
-0006	RD357470	Carbon Resistor (chip)	47K 63M J			01
R0007	VY657200	Chip Inductance	600 BK1608HM601			01
-0015	VY657200	Chip Inductance	600 BK1608HM601			01
R0007	V3063400	Chip Inductance	BLM11B601S 1608			01

\*: New Parts

RANK: Japan only

REF NO.	PART NO.	DESCRIPTION		REMARKS	QTY	RANK
-0015	V3063400	Chip Inductance	BLM11B601S 1608	J		01
R0016	RD356220	Carbon Resistor (chip)	2.2K 63M J			01
R0017	RD357910	Carbon Resistor (chip)	91K 63M J			01
R0018	RD356220	Carbon Resistor (chip)	2.2K 63M J			01
-0021	RD356220	Carbon Resistor (chip)	2.2K 63M J			01
R0022	RD357470	Carbon Resistor (chip)	47K 63M J			01
R0023	RD354680	Carbon Resistor (chip)	68 63M J			01
R0024	RD355220	Carbon Resistor (chip)	220 63M J			01
R0025	RD357150	Carbon Resistor (chip)	15K 63M J			01
-0028	RD357150	Carbon Resistor (chip)	15K 63M J			01
R0029	RD359100	Carbon Resistor (chip)	1.0M 63M J			01
R0030	RD357100	Carbon Resistor (chip)	10K 63M J			01
R0031	RD357220	Carbon Resistor (chip)	22K 63M J			01
R0032	RD357100	Carbon Resistor (chip)	10K 63M J			01
R0033	RD357220	Carbon Resistor (chip)	22K 63M J			01
R0034	RD357100	Carbon Resistor (chip)	10K 63M J			01
R0035	RD357470	Carbon Resistor (chip)	47K 63M J			01
R0036	RD354470	Carbon Resistor (chip)	47 63M J			01
R0039	RD357220	Carbon Resistor (chip)	22K 63M J			01
R0040	RD357100	Carbon Resistor (chip)	10K 63M J			01
R0041	RD357220	Carbon Resistor (chip)	22K 63M J			01
R0042	RD357100	Carbon Resistor (chip)	10K 63M J			01
R0043	RD355680	Carbon Resistor (chip)	680 63M J			01
R0044	RD355150	Carbon Resistor (chip)	150 63M J			01
R0045	RD355150	Carbon Resistor (chip)	150 63M J			01
R0048	RD356220	Carbon Resistor (chip)	2.2K 63M J			01
R0052	RD357470	Carbon Resistor (chip)	47K 63M J			01
-0063	RD357470	Carbon Resistor (chip)	47K 63M J			01
R0064	RD354470	Carbon Resistor (chip)	47 63M J			01
-0075	RD354470	Carbon Resistor (chip)	47 63M J			01
R0076	VY657200	Chip Inductance	600 BK1608HM601	}		01
R0076	V3063400	Chip Inductance	BLM11B601S 1608			01
R0077	VY657200	Chip Inductance	600 BK1608HM601			01
R0077	V3063400	Chip Inductance	BLM11B601S 1608			01
R0078	RD357100	Carbon Resistor (chip)	10K 63M J			01
R0079	RD357220	Carbon Resistor (chip)	22K 63M J			01
R0080	RD357220	Carbon Resistor (chip)	22K 63M J			01
TH001	VR346900	Thermistor	ERTD2FGJ801S 800			03
TR001	VV556400	Transistor	2SC2412K Q,R,S			01
TR002	VV556400	Transistor	2SC2412K Q,R,S			01
	VZ272400	Circuit Board	MK-H 16N-1M		(XT701A0)	09
	VB941200	Diode	1SS133,1SS176			01
	VK025500	Wire Trap	52147 11P TE			01
*	V7189900	Circuit Board	MK-L 16N-1M C61 P1		(XZ850A0)	
	VB941200	Diode	1SS133,1SS176	}		01
	VV437800	Diode	1N4148(DO-34)			01
	VK025500	Wire Trap	52147 11P TE			01
	VG924500	Wire Trap	52328 17P TE			02
*	V7083600	Circuit Board	PN-AM		(XZ644C0)	
*	V7083700	Circuit Board	VR		(XZ644C0)	
	EP600190	Bind Head Tapping Screw-B	3.0X8 MFXN2BL			2 01
	--	Jumper Wire	0.55		(VA07890)	
C0101	VE327200	Monolithic Mylar Capacitor	1.0 50V J	}		02
C0101	VU838100	Monolithic Mylar Capacitor	1.0000 50V J			
C0102	VE327200	Monolithic Mylar Capacitor	1.0 50V J			02
C0102	VU838100	Monolithic Mylar Capacitor	1.0000 50V J			
C0104	VE326600	Monolithic Mylar Capacitor	0.33 50V J			01
C0104	VR169000	Monolithic Mylar Capacitor	ECQ-V1H334JL3			01
C0106	VE326600	Monolithic Mylar Capacitor	0.33 50V J			01
C0106	VR169000	Monolithic Mylar Capacitor	ECQ-V1H334JL3			01
C0107	UR837470	Electrolytic Cap.	47.00 16.0V			01
-0109	UR837470	Electrolytic Cap.	47.00 16.0V			01
C0110	UR838100	Electrolytic Cap.	100.00 16.0V			01
C0111	VC694800	Semiconductive Cera. Cap.	0.1000 25V Z			01
C0112	UR838100	Electrolytic Cap.	100.00 16.0V			01
C0113	VE326200	Monolithic Mylar Capacitor	0.15 50V J	}		
C0113	VR168500	Monolithic Mylar Capacitor	ECQ-V1H154JL3			01

\*: New Parts

RANK: Japan only

REF NO.	PART NO.	DESCRIPTION		REMARKS	QTY	RANK
C0114	VE326200	Monolithic Mylar Capacitor	0.15 50V J			01
C0114	VR168500	Monolithic Mylar Capacitor	ECQ-V1H154JL3			
C0115	UR839100	Electrolytic Cap.	1000 16.0V			
C0116	UR839100	Electrolytic Cap.	1000 16.0V			
C0117	UR837470	Electrolytic Cap.	47.00 16.0V			
C0118	UR837470	Electrolytic Cap.	47.00 16.0V			
C0119	UR848470	Electrolytic Cap.	470.00 25.0V			
C0120	VC694800	Semiconductive Cera. Cap.	0.1000 25V Z			
C0121	VC694800	Semiconductive Cera. Cap.	0.1000 25V Z			
C0201	FG644100	Ceramic Capacitor-F	0.0100 50V Z			
C0202	VC694800	Semiconductive Cera. Cap.	0.1000 25V Z			01
CN101	LB918020	Base Post Connector	XH 2P TE			
CN102	VI878600	Cable Holder	51048 8P TE			
CN103	VI878700	Cable Holder	51048 9P TE			
CN104	VI878000	Cable Holder	51048 2P TE			
CN105	VK024900	Wire Trap	52147 5P TE			
CN106	VI878300	Cable Holder	51048 5P TE			
CN201	VI878400	Cable Holder	51048 6P TE			
CN202	VI878700	Cable Holder	51048 9P TE			
CN203	VI879000	Cable Holder	51048 12P TE			
CN204	VI878000	Cable Holder	51048 2P TE			01
D0101	VL723600	Diode	20E1-FC4			
D0101	VV731400	Diode	2A02M			
D0101	VY717100	Diode	LT2A02-E			
D0201	VB941200	Diode	1SS133,1SS176			
FZ101	V6979300	Fuse	3.00A J			
HS101	--	Heat Sink				
IC101	XV771A00	IC	BA5417			
IC201	VG181900	Photo Coupler	PC-900V			
JK101	LB302260	Connector	HEC0470-01-630			
JK102	LB101870	Phone Jack	YKB21-5006			
JK201	VC687500	Phone Jack	YKB21-5014 BLACK	DC IN 12V PHONES SUSTAIN MIDI OUT MIDI IN		01
JK202	VJ107200	DIN Connector	5P YKF51-5050			
JK203	VJ107200	DIN Connector	5P YKF51-5050			
L0101	VB835000	Coil	FL5R200QNT 20uH			
L0102	VB835000	Coil	FL5R200QNT 20uH			
L0201	VB835000	Coil	FL5R200QNT 20uH			
-0205	VB835000	Coil	FL5R200QNT 20uH			
R0101	HF757150	Carbon Resistor	15.0K 1/4 J			
R0102	HF757150	Carbon Resistor	15.0K 1/4 J			
R0103	HF756470	Carbon Resistor	4.7K 1/4 J			
R0104	HF756470	Carbon Resistor	4.7K 1/4 J			
R0105	HF756560	Carbon Resistor	5.6K 1/4 J			
R0106	HF756560	Carbon Resistor	5.6K 1/4 J			
R0107	HF755470	Carbon Resistor	470.0 1/4 J			
R0108	HF755470	Carbon Resistor	470.0 1/4 J			
R0109	HF756100	Carbon Resistor	1.0K 1/4 J			
R0110	HF756100	Carbon Resistor	1.0K 1/4 J			
R0111	HF753220	Carbon Resistor	2.2 1/4 J			
R0112	HF753220	Carbon Resistor	2.2 1/4 J			
R0113	HF755100	Carbon Resistor	100.0 1/4 J			
R0114	HF755100	Carbon Resistor	100.0 1/4 J			
R0115	VU317000	Metal Oxide Film Resistor	0.1 1W J			
R0116	VU317000	Metal Oxide Film Resistor	0.1 1W J			
R0117	HF758100	Carbon Resistor	100.0K 1/4 J			
R0118	HF757470	Carbon Resistor	47.0K 1/4 J			
R0119	HF756180	Carbon Resistor	1.8K 1/4 J			
R0120	HF756180	Carbon Resistor	1.8K 1/4 J			
R0121	HF757470	Carbon Resistor	47.0K 1/4 J			
R0122	HF756100	Carbon Resistor	1.0K 1/4 J			
R0202	HF755220	Carbon Resistor	220.0 1/4 J			
-0204	HF755220	Carbon Resistor	220.0 1/4 J			
R0205	HF756100	Carbon Resistor	1.0K 1/4 J			
TR101	VT459200	Transistor	2SB1326 Q,R			
TR102	IC174070	Transistor	2SC1740S R,S			
TR103	VS883400	Transistor	2SD2394 E,F			
VR101	VZ048400	Rotary Variable Resistor	A10.0K XV0141GPVN2			
WH102	--	Connector Assembly	AM 8P-100	MASTWER VOLUME		02
WH103	--	Connector Assembly	PN2 9P-270			
WH104	--	Connector Assembly	SP 2P-140			

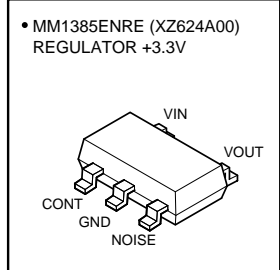
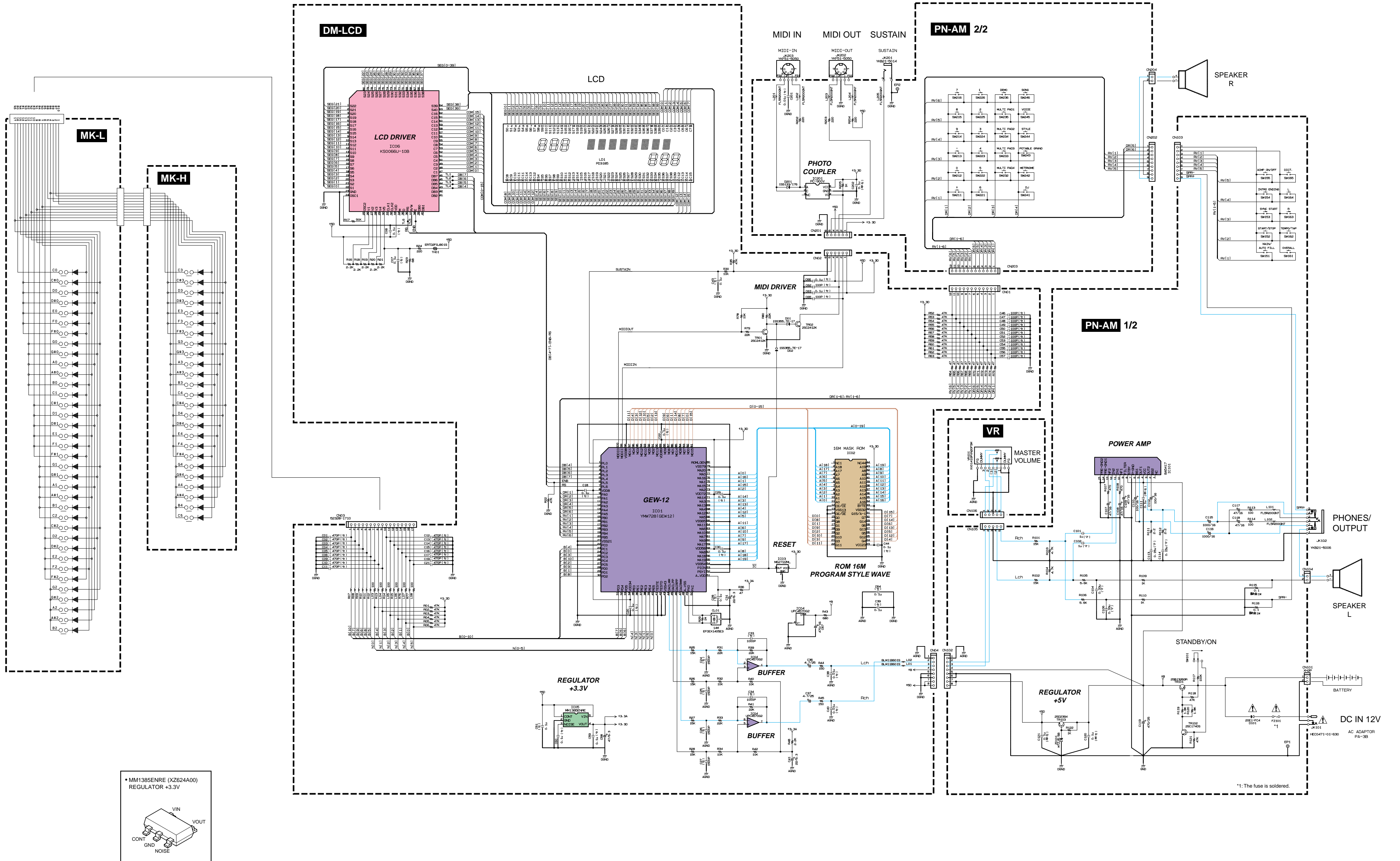
\*: New Parts

RANK: Japan only



RANK: Japan only

# PSR-170 OVERALL CIRCUIT DIAGRAM



(マ) : Mylar Capacitor  
(セ) : Ceramic Capacitor  
(半セ) : Semiconductive Ceramic Capacitor  
Ⓜ : Metal Oxide Film Resistor  
Note : See parts list for details of circuit board component parts.

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

DM-LCD, PN-AM, VR : 28CC1-8819402   
MK-L, MK-H : 28CC1-8819596