YAMAHA

COMBO ENSEMBLE

CE20

SERVICE MANUAL

006496

'82,3 2K Printed in Japan

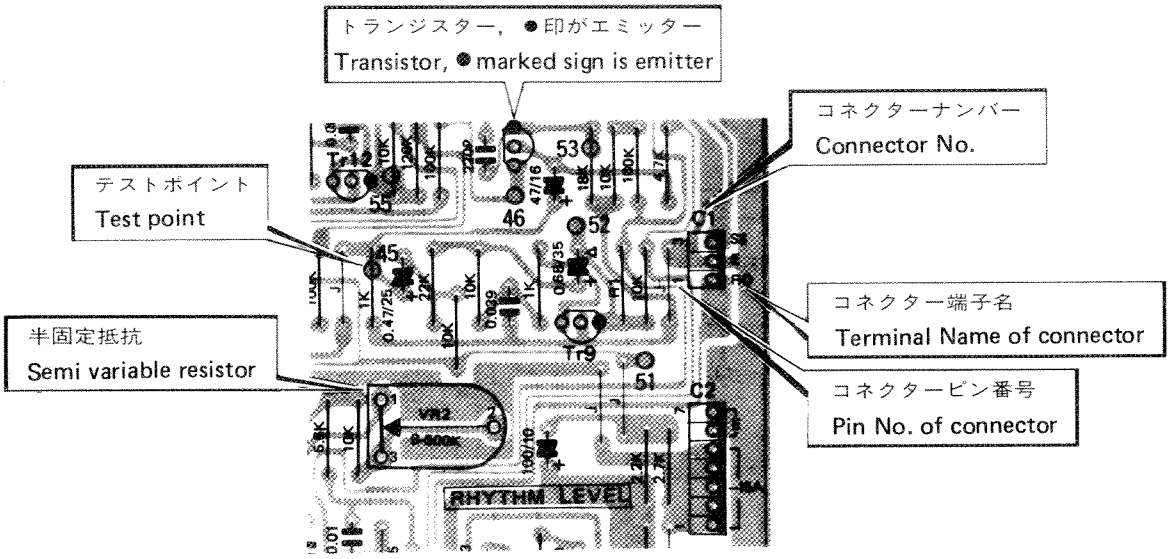
CONTENTS(目次)

CODING GUIDE 1
DISASSEMBLY PROCEDURE 2
SPECIFICATIONS 3
PANEL LAYOUT 4
LSI DATA TABLES 6
TUNING 14
DM & DMS CIRCUIT BOARDS 15
SA CIRCUIT BOARD 18
CPA CIRCUIT BOARD 20
CPB CIRCUIT BOARD 22
JK, PSW, PL, SCW, SCS & TS CIRCUIT BOARDS 24
FU CIRCUIT BOARD 26
PARTS LIST

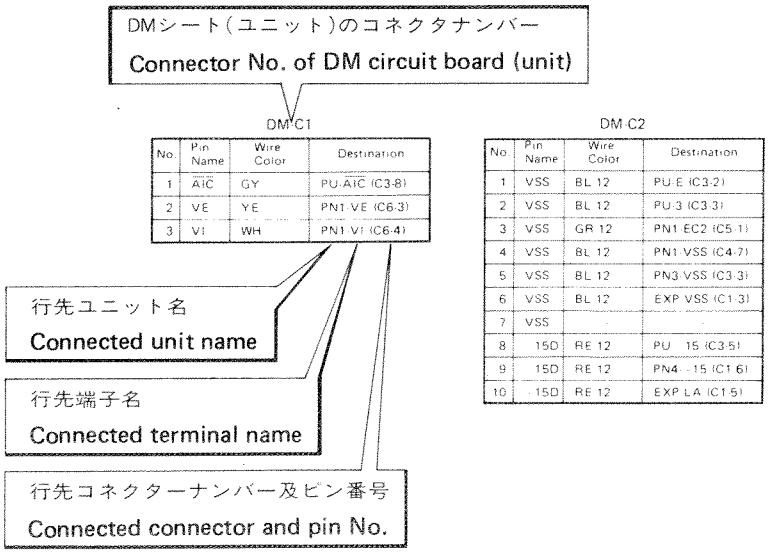
CODING GUIDE(活用の手引)

基板図の見方 CIRCUIT BOARD

＊断りのない場合は部品側からの表記です。
All circuit board layouts are from component side unless otherwise specified.



コネクターの接続はコネクター表にて表示しております。
Show the Connection Table about the connection.



DM-C1

No.	Pin Name	Wire Color	Destination
1	AIC	GY	PU-AIC (C3-8)
2	VE	YE	PN1-VE (C6-3)
3	VI	WH	PN1-VI (C6-4)

DM-C2

No.	Pin Name	Wire Color	Destination
1	VSS	BL 12	PU-E (C3-2)
2	VSS	BL 12	PU-3 (C3-3)
3	VSS	GR 12	PN1-EC2 (C5-1)
4	VSS	BL 12	PN1-VSS (C4-7)
5	VSS	BL 12	PN3-VSS (C3-3)
6	VSS	BL 12	EXP VSS (C1-3)
7	VSS		
8	15D	RE 12	PU 15 (C3-5)
9	15D	RE 12	PN4 -15 (C1-6)
10	15D	RE 12	EXP LA (C1-5)

DISASSEMBLY PROCEDURE(分解手順)

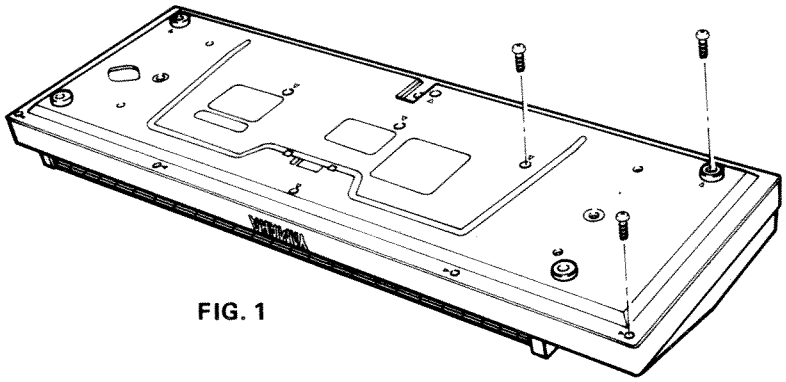


FIG. 1

- Loosen the screws installd at the 11 places, marked "▽", on the bottom plate and remove the lower case as shown in Fig. 1.

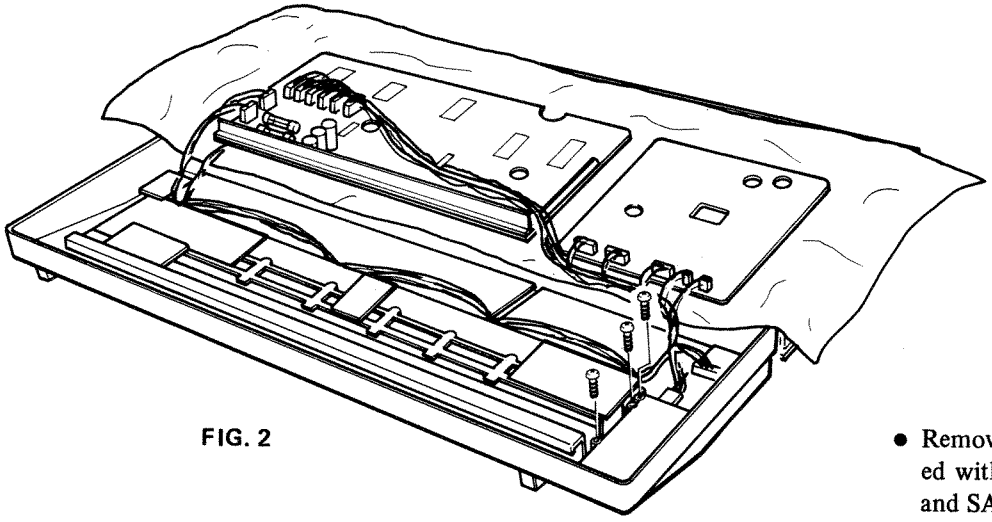


FIG. 2

- Remove eleven screws (each installed with a fiber washer) holding DM and SA boards in place.
  After the screws are removed the DM and SA boards can be removed as shown in Fig. 2.

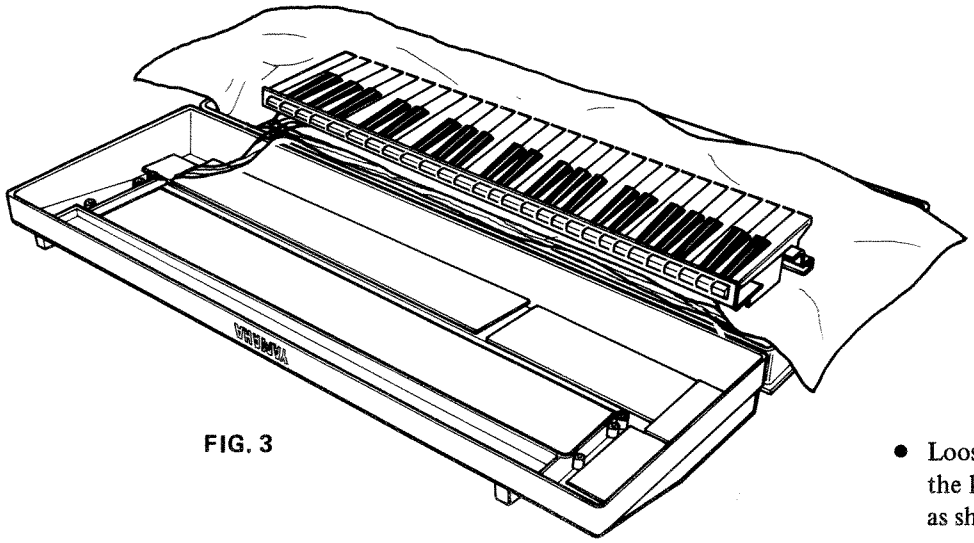


FIG. 3

- Loosen the eight screws that fasten the keyboard and it can be removed as shown in Fig. 3.

SPECIFICATIONS(総合仕様)

Keyboard . . . . . 49 keys, C2 ~ C6

Simultaneous Output Notes . . . . . Polyphonic : 8 Notes (first notes played)
Monophonic : 1 Note (high-note priority)

Voice Selector

Monophonic . . . . . PICCOLO, FLUTE, OBOE, CLARINET, SAXOPHONE, TRUMPET 1, TRUMPET 2, TROMBONE, VIOLIN, CELLO, CONTRA BASS 1, CONTRA BASS 2, ELECTRIC BASS 1, ELECTRIC BASS 2

Polyphonic . . . . . BRASS, HORN, ORGAN, ELECTRIC PIANO, HARPSICHORD, STRINGS

Touch Controls . . . . . PRESET switch
SENSITIVITY: TONE INITIAL lever
TONE AFTER lever
VIBRATO AFTER lever
VIBRATO : DEPTH lever
SPEED lever 4 ~ 10Hz
DELAY lever

Controls . . . . . SYMPHONIC switch
BRILLIANCE lever
PITCH control 436 ~ 447Hz (A3)
SLIDE CONTROL : switch, wheel (functions with monophonic voices)
TOTAL VOLUME control

Jacks . . . . . LINE OUT : 600 Ω, unbalanced
HEADPHONE : 8 Ω, MONO (stereo headphones can be used)
EXP. PEDAL : For Expression Pedal EP-1
SUSTAIN PEDAL: For Sustain Pedal FC-5

Others

Power Source . . . . . U.S. & Canadian Models : 100V, 120V selectable, 60Hz
General Model : 100, 120, 220 or 240V selectable, 50/60Hz

Power Consumption . . . . . 30W : U.S. & Canadian Models
35W : General Model

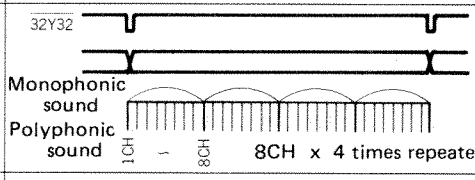
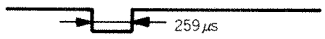
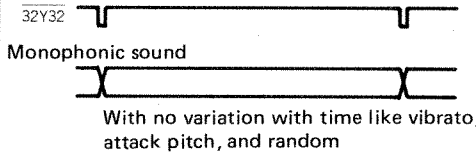
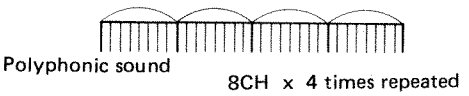
Dimension (W x H x D) . . . . . 33-1/8" x 3-3/8" x 11-5/8" (841 x 86 x 294 mm)

Weight . . . . . 19 lbs. 12 oz. (9 kg)

Standard Accessories . . . . . Expression Pedal EP-1, Sustain Pedal FC-5, Music Stand

***Specifications are subject to change without notice.**

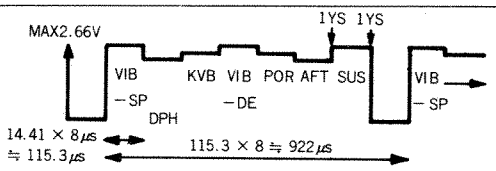
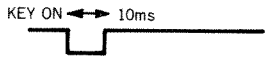
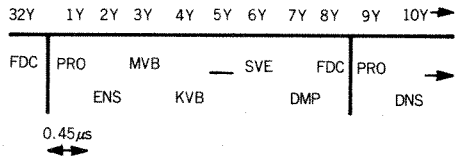
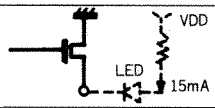
KAS (YM20080)

PIN NO.	NAME	I/O	FUNCTION	WAVEFORM
31	$\overline{B3}$	O	Key code output	
32	$\overline{B2}$	O		
33	$\overline{B1}$	O		
34	$\overline{N4}$	O		
35	$\overline{N3}$	O		
36	D1	I	Data lines for voice register	
37	D2	I		
38	D3	I		
39	D4	I		
40	D5	I		
41	D6	I		
42	D7	I		
43	D8	I		
44	$\overline{E}$	I	Voice register write enable Operates when voice is changed	
45	$\overline{F17}$	O	Frequency data output $2^{17}-1=131071$	
46	$\overline{F16}$	O	Corresponds to pitch	
47	$\overline{F15}$	O	0 ~ 131071	
48	$\overline{F14}$	O		
49	$\overline{F13}$	O		
50	$\overline{F12}$	O		
51	$\overline{F11}$	O	A_4(880Hz) 13292	
52	$\overline{F10}$	O	A_3(440Hz) 6646	
53	$\overline{F9}$	O	A_2(220Hz) 3323	
54	$\overline{F8}$	O		
55	$\overline{F7}$	O		
56	$\overline{F6}$	O		
57	$\overline{F5}$	O		
58	$\overline{F4}$	O	0.0662Hz/bit	
59	$\overline{F3}$	O		
60	$\overline{F2}$	O		
61	$\overline{F1}$	O		
62	VDD	—	Supply power +5V	
63	$\phi 1$	I	System clock 2.22MHz	
64	$\phi 2$	I		

VROM (YM20090)

PIN NO.	NAME	I/O	FUNCTION	WAVEFORM
1	VSS	—	Supply power 0V	
2	$\overline{32Y32}$	I	System sync signal	$\frac{1}{222M}$ = 0.45μs, 0.45 × 32 = 14.41μs, $\overline{32Y}$
3	$\overline{SCE}$	I	KAS sync signal	0.45 × 21 = 13.96μs, 14.41 × 8 × 15 7/8 = 1830μs, 1Y, 1Y
4	$\overline{KAS}$	O	Voice register write enable	259μs, 14.41×18, 1268μs, 14.41×88, 1268μs, 14.41×88
5	$\overline{OP1}$	O		
6	$\overline{OP2}$	O		
7	A8	O	Address line used when external ROM is used (Unused normally)	3.7ms, A8, A7, A1, 14.4μs
8	A7	O		
9	A6	O		
10	A5	O	Holds contents of address counter at all times	
11	A4	O		
12	A3	O		
13	A2	O		
14	A1	O		
15	$\overline{H0}$	O	Voice select LED drive	DC
16	$\overline{H1}$	O		//
17	VSS	—	Ground of plastic package	
18	$\overline{H2}$	O	Voice select LED drive	DC, H
19	$\overline{H3}$	O		//
20	$\overline{H4}$	O		//
21	L0	O	Voice select LED drive	VO-D, 150, LED, 15mA, L, //
22	L1	O		//
23	L2	O		//
24	L3	O		//
25	D1	O	Voice register data lines	Outputs data of selected voice on continuously
26	D2	O		
27	D3	O		
28	D4	O		
29	D5	O		
30	D6	O		
31	D7	O		
32	D8	O		

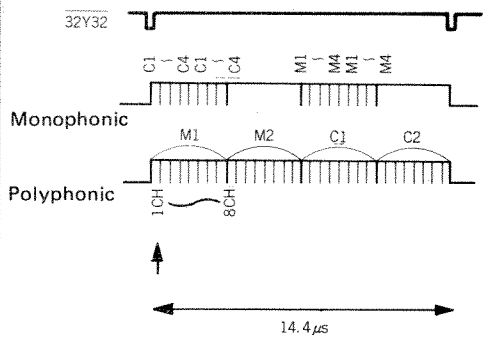
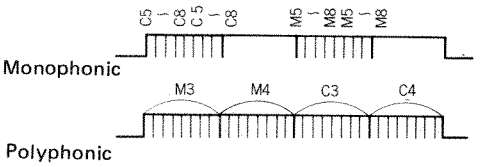
VROM (YM20090)

PIN NO.	NAME	I/O	FUNCTION	WAVEFORM
33	$\overline{E}$	I	Internal ROM enable	"0" ... Internal ROM "1" ... External ROM
34	V5	O	Voice select decoder output	
35	V4	O		
36	V3	O		
37	V2	O		
38	V1	O		
39	AGND	O	Analog ground	DC
40	Fi	I	Initial touch voltage for presetting	0V ~ 2.66V
41	F6	I	After touch voltage for presetting	
42	F3	I	After vibrato voltage for presetting	
43	A	O	Analog voltage data output (time division)	
44	Pi	I	Initial touch voltage ini	0V ~ 2.66V
45	P7	I	Sustain volume voltage SUS	
46	P6	I	After touch voltage AFT	
47	P5	I	Slide speed voltage POR	
48	P4	I	Delay time voltage DEL	
49	P3	I	After vibrato voltage KUB	
50	P2	I	Vibrato depth voltage DPH	
51	P1	I	Vibrato speed voltage SP	
52	$\overline{iS}$	I	Initial touch sensing signal	
53	$\overline{F}$	O	Function data output PRO: portamento SVE:SUS VR ENABLE ENS: MONO POLY DMP:SUS MVB: DEL VIB FDC: FORCING DECAY KVB: KEY VIB	
54	$\overline{POR}$	O	Slide LED drive	
55	$\overline{FAC}$	O	Preset LED drive	
56	$\overline{BBD}$	O	Synphonic selector LED drive	
57	$\overline{iC}$	I	Initial clear	
58	$\overline{N1}$	I	Function & voice select scan	
59	$\overline{N3}$	I		
60	$\overline{N5}$	I		
61	$\overline{N7}$	I		
62	VDD	—	Supply power +5V	
63	$\phi 1$	I	System clock	
64	$\phi 2$	I		

PA (YM20100)

PIN NO.	NAME	I/O	FUNCTION	WAVEFORM
1	VSS	—	Supply power 0V	
2	$\overline{F1}$	I	Frequency data from KAS 17 bits	
3	$\overline{F2}$	I		
4	$\overline{F3}$	I		
5	$\overline{F4}$	I		
6	$\overline{F5}$	I		
7	$\overline{F6}$	I		
8	$\overline{F7}$	I		
9	$\overline{F8}$	I		
10	$\overline{F9}$	I		
11	$\overline{F10}$	I		
12	$\overline{F11}$	I		
13	$\overline{F12}$	I		
14	$\overline{F13}$	I		
15	$\overline{F14}$	I		
16	$\overline{F15}$	I		
17	VSS		Connected to stage if plastic package is used	
18	$\overline{F16}$	I		
19	$\overline{F17}$	I		
20	D1	I	Voice register data lines	
21	D2	I		
22	D3	I		
23	D4	I		
24	D5	I		
25	$\overline{E1}$	I	Voice register write enable for operator 1	
26	$\overline{E2}$	I	Voice register write enable for operator 2	
27	V5	I	Monophonic/Polyphonic mode select "0"…MONO "1"…POLY	
28	$\overline{32Y32}$	I	System sync signal	
29	$\overline{KD1}$	I	Key OFF signal	
30	—			
31	$\overline{T1}$	I	For test	
31	$\overline{T2}$	I	For test	

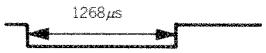
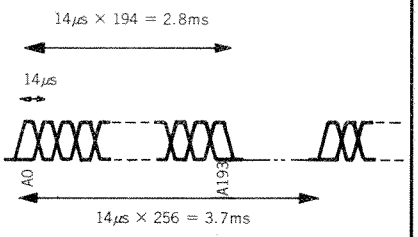
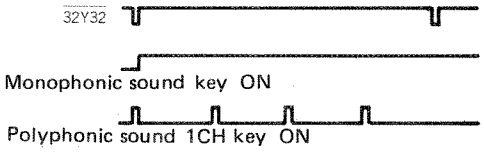
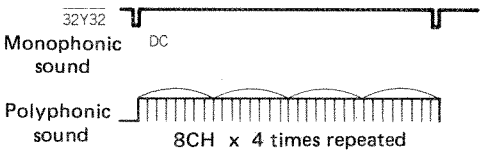
PA (YM20100)

PIN NO.	NAME	I/O	FUNCTION	WAVEFORM
33	$\overline{W12B}$	O	Phase data for operator 2 12 bits	
34	$\overline{W11B}$	O		
35	$\overline{W10B}$	O		
36	$\overline{W9B}$	O		
37	$\overline{W8B}$	O		
38	$\overline{W7B}$	O		
39	$\overline{W6B}$	O		
40	$\overline{W5B}$	O		
41	$\overline{W4B}$	O		
42	$\overline{W3B}$	O		
43	$\overline{W2B}$	O		
44	$\overline{W1B}$	O		
45	$\overline{W12A}$	O	Phase data for operator 1 12 bits	
46	$\overline{W11A}$	O		
47	$\overline{W10A}$	O		
48	$\overline{W9A}$	O		
49	$\overline{W8A}$	O		
50	$\overline{W7A}$	O		
51	$\overline{W6A}$	O		
52	$\overline{W5A}$	O		
53	$\overline{W4A}$	O		
54	$\overline{W3A}$	O		
55	$\overline{W2A}$	O		
56	$\overline{W1A}$	O		
57	$\overline{TW5}$	O	Test output	
58	$\overline{TW4}$	O		
59	$\overline{TW3}$	O		
60	$\overline{TW2}$	O		
61	$\overline{TW1}$	O		
62	VDD	—	Supply power +5V	
63	$\phi 1$	I	System clock	
64	$\phi 2$	I		

OP (YM20110)

PIN NO.	NAME	I/O	FUNCTION	WAVEFORM
1	VSS	—	Supply power 0V	
2	B1	O	Output to DAC Mantissa 10 bits	Repetition period 0.45 × 32 = 14.4μs
3	B2	O		
4	B3	O		
5	B4	O		
6	B5	O		14.4μs
8	B6	O		
8	B7	O		32Y32
9	B8	O		
10	B9	O		
11	B10	O		Bm
12	$\overline{B11}$	O	Sign bit	
13	S1	O	Output to DAC Exponent 3 bits	
14	S2	O		Sn
15	S3	O		
16	Y	O	Sampling signal	16T30Y32 6.8μs
17	VSS	—	Connected to stage if plastic package is used	
18	$\overline{SO}$	O	Serial output of final waveform data 16-bit data repeated twice	L5B M5B 7.2μs
19	$\overline{Si}$	I	Serial input of waveform data coming from other OP	Same as above
20	$\overline{W1}$	I	Phase data from PA 12 bits	
21	$\overline{W2}$	I	$2^{12} - 1 = 4095$	
22	$\overline{W3}$	I	Variation of data from 0 to 4095 corresponds to 2π of phase	
23	$\overline{W4}$	I		
24	$\overline{W5}$	I		
25	$\overline{W6}$	I		
26	$\overline{W7}$	I		
27	$\overline{W8}$	I		
28	$\overline{W9}$	I		
29	$\overline{W10}$	I		
30	$\overline{W11}$	I		
31	$\overline{W12}$	I		
32	$\overline{32Y32}$	I	System sync signal	14.4μs 0.45μs

OP (YM20110)

PIN NO.	NAME	I/O	FUNCTION	WAVEFORM
33	I / II	I	Selects OP1 or OP2 "0" ... OP1, "1" ... OP2	
34	V5	I	Monophonic/Polyphonic mode select "0"···MONO "1"···POLY	
35	$\overline{\text{ENABLE}}$	I	Voice register write enable Generated when voice is changed	
36 37 38 39 40 41 42 43	D1 D2 D3 D4 D5 D6 D7 D8	I I I I I I I I	Voice register data lines 8 bits	
44	$\overline{\text{KD1}}$	I	Key OFF signal	
45 46 47 48 49	$\overline{\text{N3}}$ $\overline{\text{N4}}$ $\overline{\text{B1}}$ $\overline{\text{B2}}$ $\overline{\text{B3}}$	I I I I I	Key code note Key code block	
50	$\overline{\text{IC}}$	I	Initial clear	
51	—			
52 53 54 55 56	$\overline{\text{TS5}}$ $\overline{\text{TS4}}$ $\overline{\text{TS3}}$ $\overline{\text{TS2}}$ $\overline{\text{TS1}}$	I I I I I	Test terminals	
57	$\overline{\text{SD}}$	I	EG serial data 32 bits Initial touch level (8) After touch level (8) Portamento rate (7) Portamento ON (1) Damp/sustain (1) Other Bit counts are given in parentheses.	
58 59 60 61	TO4 TO3 TO2 TO1	O O O O	Test terminals	
62	VDD		Supply power +5V	
63 64	ϕ1 ϕ2	I I	System clock 2.22MHz	

TUNING

ITEM	CONTROL SETTING	TEST POINT	ADUSTMENTS /READINGS	WHERE TO ADJUST	REMARKS
[D M] SHEET MASTER CLOCK	[PITCH]·····CENTER	Tr.2···Emiter Tr.4···Emiter	2.22±0.01MHz SINE WAVE MAX	L1 L2	Turn the DM board upside down.
[S A] SHEET BBD	Connect IC1–10 to E.	IC1-5 IC2-8 IC3-8 IC4-8	6.4±0.2Hz 66± 2KHz 66± 2KHz 66± 2KHz	VR1 VR2 VR3 VR4	Turn the SA board upside down.
	Set at [FLUTE]	Tr.2···Emiter Tr.4···Emiter Tr.6···Emiter	Adjust for minimum distortion.	VR5 VR6 VR7	
[T S] SHEET	Turn VR2 fully counterclockwise.	[DM] C9-7	0 ±20mV	VR1	
	Depress key deeply until it stops.		3V	VR2	

YAMAHA

COMBO ENSEMBLE

CE20

PARTS LIST

CONTENTS

A. Electronic Components (電気部品) 1
B. Top Case Assembly & Keyboard Assembly (上ケースAss'y及び鍵盤) 4
C. Bottom Case Assembly (下ケースAss'y) 7
D. Stand (スタンド) 9
E. Expression Pedal Assembly (EXP ペダル) 11
F. Foot Switch (フットペダル) 13

006496

Printed in Japan

A. Electronic Components(電気部品)

Ref. No.	Part No.	Description		部品名	Remarks	Common Model	Markets
	NA 10 44 40	Circuit Board, MK		M K シート			
	NA 10 68 40	– do. – , DM		D M シート			J
	NA 10 68 50	– do. – , – do. –		〃			U,C
	NA 10 68 60	– do. – , – do. –		〃			G
	NA 10 68 70	– do. – , SA		S A シート			
	NA 10 68 80	– do. – , CPA		C P A シート			
	NA 10 68 90	– do. – , CPB		C P B シート			
	NA 10 69 00	– do. – , JK		J K シート			J,U,G
	NA 10 80 80	– do. – , – do. –		〃			C
	NA 10 72 70	– do. – , TS		T S シート			
	NA 10 80 40	– do. – , FU		F U シート			J
	NA 10 80 50	– do. – , – do. –		〃			U
	NA 10 80 60	– do. – , – do. –		〃			C
	NA 10 80 70	– do. – , – do. –		〃			G
	NA 10 86 00	– do. – , DMS		D M S シート			
	iG 00 13 90	IC	NJM4558DV	I C	Dual OP Amp.		
	iG 00 14 40	– do. –	TC4071BP	〃	OR		
	iG 00 16 90	– do. –	TC4016BP	〃	Quand Bilateral Switch		
	iG 00 17 20	– do. –	TC4069UBP	〃	HEX Inverter		
	iG 00 17 70	– do. –	TC4051BP	〃	MULTIPLEXER		
	iG 02 56 00	– do. –	TA7505M	〃	OP Amp.		
	iG 02 70 10	– do. –	HD74LS04P	〃	HEX Inverter		
	iG 03 29 00	– do. –	iG03290	〃	BBD Driver		
※	iG 03 33 50	– do. –	μPC7805H	〃	Regulator		
	iG 03 34 00	– do. –	μPC311C	〃	Converter		
	iG 03 35 00	– do. –	μPC610D	〃	10 bit DAC		
	iG 04 42 00	– do. –	HD74LS138P	〃	3 to 8 Demultiplexer	GS1	
※	iG 05 27 00	– do. –	TC4528BP	〃			
※	iG 05 46 00	– do. –	HD14053BP	〃	Multiplexer		
※	iG 05 47 00	– do. –	μPC78M15H	〃	Regulator		
	iG 05 92 00	– do. –	HD74LS10P	〃	Nand		
※	iT 20 08 00	– do. –	YM20080	〃	KAS		
※	iT 20 09 00	– do. –	YM20090	〃	VROM		
※	iT 20 10 00	– do. –	YM20100	〃	PA		
※	iT 20 11 00	– do. –	YM20110	〃	OP		
	iT 35 10 00	– do. –	YM35100	〃	BBD		
	iT 60 80 00	– do. –	YM60800	〃	SEC		
	iA 05 09 10	Transistor	2SA509(Y)	トランジスタ			
	iA 09 50 00	– do. –	2SA950(Y)	〃			
	iA 10 15 20	– do. –	2SA1015(Y)	〃			
	iA 10 15 70	– do. –	2SA1015(O,Y)	〃			
	iA 11 64 00	– do. –	2SA1164(Y)	〃			
	iC 04 59 00	– do. –	2SC458(C,D)				
	iC 07 52 20	– do. –	2SC752(Y)	〃			
	iC 21 20 00	– do. –	2SC2120(Y)	〃			
	iC 23 20 40	– do. –	2SC2320L(F)	〃			
	iE 00 00 10	FET	2SK30A(Y)	F E T			
	iE 10 12 00	– do. –	2SK105(F)	〃			
	iF 00 00 40	Diode	1S1555	ダイオード			

※ **New Parts**(新規部品) (J: Japanese, U: U.S., C: Canadian, G: General)

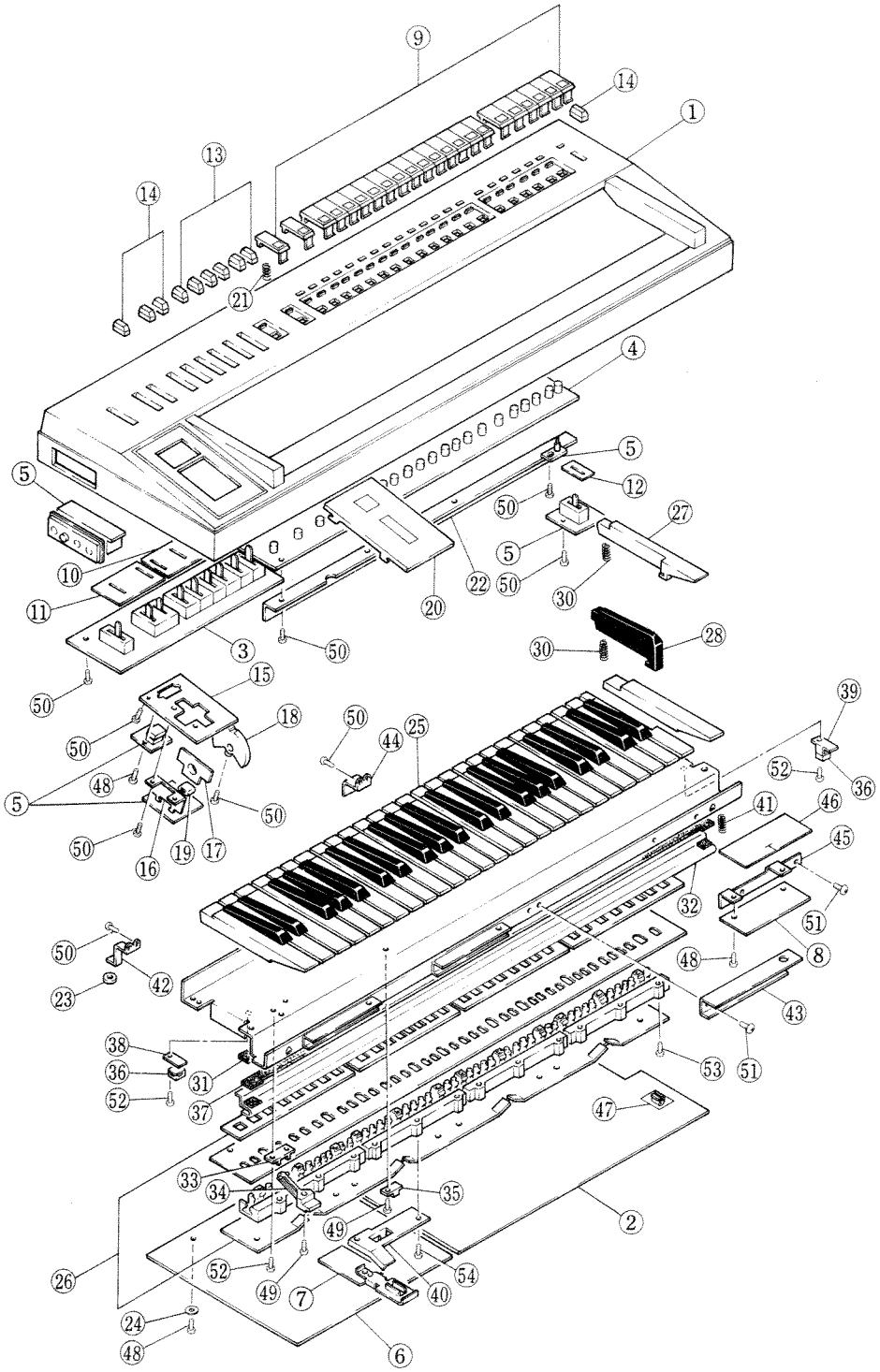
	Ref. No.	Part No.	Description	部品名		Remarks	Common Model	Markets	
		iH 00 04 70	Diode	1D4B1	ダイオード				
		iF 00 08 80	Zener Diode	WZ050	ツェナーダイオード				
※		iF 00 33 40	— do. —	RD8.2EB2	〃				
※		iF 00 33 50	— do. —	RD39EB1	〃				
		iF 00 12 80	LED	SLB-26UR	LED				
※		HQ 45 00 10	Slide Variable Resistor	B10KΩ/SW	スライドボリューム	VIBRATO AFTER, DELAY			
※		HQ 45 00 20	— do. —	B10KΩ/CC, CT	〃	BRILLIANCE			
※		HQ 45 00 30	— do. —	B10KΩ	〃	TONE IN/AF, DEPTH, SPEED			
※		HQ 45 00 40	— do. —	A10KΩ	〃	TOTAL VOLUME			
※		HR 10 02 30	Variable Resistor	B10KΩ/90°	ボリューム	SLIDE CONTROL			
		HT 19 00 50	Semi Variable Resistor	B10KΩ	半固定抵抗				
※		HT 77 00 60	— do. —	B10KΩ	〃				
※		HT 77 01 10	— do. —	B500KΩ	〃				
		HL 31 24 70	Metal Oxide Film Resistor	0.47Ω 1P	酸化金属皮膜抵抗				
		HL 32 51 20	— do. —	120Ω 2P	〃				
		HL 41 44 70	— do. —	47Ω 1P	〃				
		HZ 00 17 30	Metal Film Resistor	1KΩ	金属被膜抵抗				
		HZ 00 17 40	— do. —	1KΩ	〃				
		HV 55 51 00	Flame Proof Carbon Resistor	100Ω	不燃性カーボン抵抗				
		HV 55 52 20	— do. —	220Ω	〃				
		HW 49 43 30	Fuse Resistor	33Ω	ヒューズ抵抗				
		FL 63 71 00	Nonpolar Capacitor	10μF/16V	ノンポーラコンデンサ				
		FL 64 64 70	— do. —	4.7μF/25V	〃				
		FL 66 61 00	— do. —	1μF/50V	〃				
		FN 83 64 70	Tantalum Capacitor	4.7μF/16V	タンタルコンデンサ				
		FN 84 61 00	— do. —	1μF/25V	〃				
		FD 15 15 60	Polystyrene Capacitor	56P	スチロールコンデンサ				
		FD 65 21 20	— do. —	125P	〃				
		FD 65 22 70	— do. —	270P	〃				
		FZ 00 10 20	MM Capacitor	0.047μF/125V	メタライズドマイラーコンデンサ			J,G	
		FZ 00 21 50	— do. —	0.047μF/125V	〃			U,C	
		UW 82 82 20	Electrolytic Capacitor	220μF/10V	ケミカルコンデンサ				
		UW 63 71 00	— do. —	10μF/16V	〃				
		UW 63 72 20	— do. —	22μF/16V	〃				
		UW 63 74 70	— do. —	47μF/16V	〃				
		UW 83 81 00	— do. —	100μF/16V	〃				
		UW 85 72 20	— do. —	22μF/35V	〃				
		UW 56 54 70	— do. —	0.47μF/50V	〃				
		UW 86 64 70	— do. —	4.7μF/5V	〃				
		UW 54 92 20	— do. —	2200μF/25V	〃				

※ New Parts (新規部品) (J: Japanese, U: U.S., C: Canadian, G: General)

Ref. No.	Part No.	Description		部品名	Remarks	Common Model	Markets
	UW 85 92 20	Electrolytic Capacitor	2200μF/35V	ケミカルコンデンサ			
	UW 82 84 70	— do. —	470μF/10V	〃			
	GE 30 01 20	Choke Coil	100μH	高周波コイル			
	GE 30 01 60	— do. —	60μH	チョークコイル			
	GE 30 03 50	— do. —	68μH	〃			
	GE 90 05 30	— do. —		〃		GS1	
	GE 90 04 90	SN Coil	SN8S309	SNコイル			
※	GE 90 05 40	Master Coil	85μH	マスターコイル			
	KA 40 08 50	Slide Switch		スライドスイッチ	POWER		
※	KA 90 27 30	Push Switch	LED 付	プッシュスイッチ	SLIDE CONTROL		
※	KA 90 27 20	Switch	KEF10904	タクトスイッチ			
	LB 20 02 50	Voltage Selector		電圧切替器			G
※	GA 03 80 00	Power Transformer		電源トランス			
※	GA 03 81 00	— do. —		〃			U,C
※	GA 03 83 00	— do. —		〃			G
	iK 00 02 60	Photo Coupler	P873-G35-201B	フォトカプラー			
※	iK 00 03 40	— do. —	P1501	〃	HTV		
※	KC 00 13 00	Relay	RZ-12	リレー			
	KB 00 03 10	Fuse	0.5A/250V	ヒューズ			J
	KB 00 03 20	— do. —	0.75A/250V	〃			J
	KB 00 03 30	— do. —	1.0A/250V	〃			J
	KB 00 03 50	— do. —	2.0A/250V	〃			J
	KB 00 10 60	— do. —	1.0A/250V	〃			U,C
	KB 00 12 20	— do. —	0.75A/250V	〃			U,C
	KB 00 17 70	— do. —	T1A	〃			G
	KB 00 26 10	— do. —	T800mA	〃			G
	KB 00 11 50	Fuse, UL Type	0.5A/250V	ヒューズ(UL型)			U,C
	KB 00 12 40	— do. —	2A/250V	〃			U,C
	KB 00 06 40	Fuse (Miniature Type)	T250mA/250V	ヒューズ(ミニチュア型)			G
	KB 00 07 50	— do. —	T2A/250V	〃			G
	LB 20 15 30	Fuse Holder Pin		ヒューズホルダーピン			
※	MG 00 08 10	AC Cord With Plug		電源コード			J
※	MG 00 01 00	— do. —		〃			U
※	MG 00 07 70	— do. —		〃			G
※	MG 00 02 70	— do. —		〃			C
※	iT 43 90 20	PC Sensor		PCセンサー			

※ New Parts (新規部品)　(J: Japanese, U: U.S., C: Canadian, G: General)

B. Top Case Assembly & Keyboard Assembly (上ケースAss'y及び鍵盤)



	Ref. No.	Part No.	Description		部品名	Remarks	Common Model	Markets
※	1	CB 03 96 20	Top Case		上ケース			J,C,G
※		CB 04 18 10	– do. –		〃			U
※	2	NA 10 68 40	Circuit Board, DM		DM シート			J
		NA 10 68 50	– do. – , – do. –		〃			U,C
		NA 10 68 60	– do. – , – do. –		〃			G

※ **New Parts** (新規部品) (J: Japanese, U: U.S., C: Canadian, G: General)

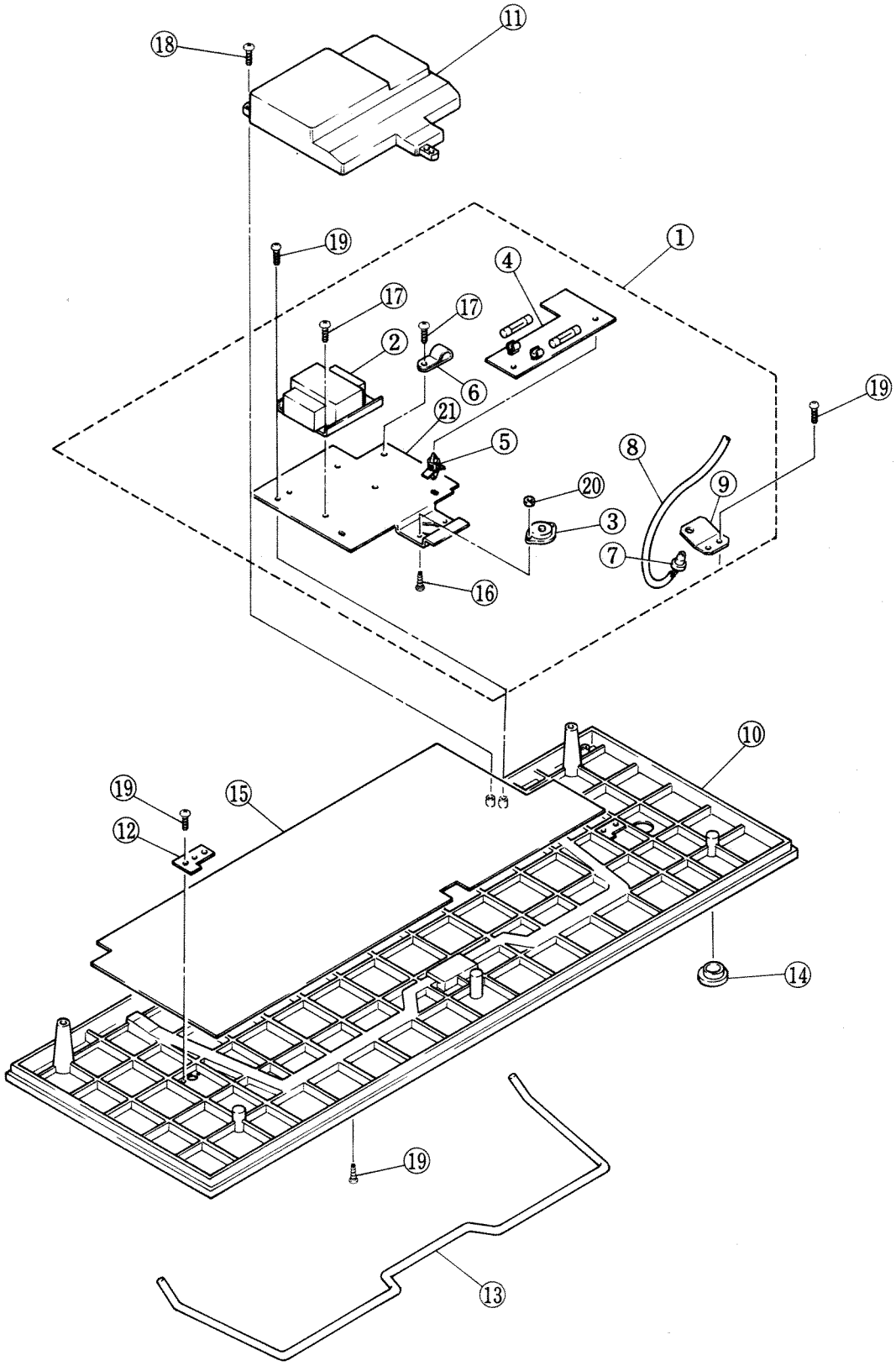
	Ref. No.	Part No.	Description		部品名	Remarks	Common Model	Markets	
※	3	NA 10 68 80	Circuit Board Assembly, CPA		CPAシートAss'y				
※	4	NA 10 68 90	— do. — , CPB		CPBシートAss'y				
※	5	NA 10 69 00	Circuit Board, JK		JKシート			J,U,G	
※		NA 10 80 80	— do. — , — do. —		〃			C	
※	6	NA 10 68 70	Circuit Board, SA		SAシート				
※	7	NA 10 72 70	— do. — , TS		TSシート				
※	8	NA 10 86 00	— do. — , DMS		DMSシート				
※	9	NK 00 67 90	Button	Preset	ボタン				
※		NK 00 68 00	— do. —	Symphonic	〃				
※		NK 00 68 10	— do. —	Piccolo	〃				
※		NK 00 68 20	— do. —	Flute	〃				
※		NK 00 68 30	— do. —	Oboe	〃				
※		NK 00 68 40	— do. —	Clarinet	〃				
※		NK 00 68 50	— do. —	Saxophone	〃				
※		NK 00 68 60	— do. —	Trumpet 1	〃				
※		NK 00 68 70	— do. —	— do. — 2	〃				
※		NK 00 68 80	— do. —	Trombone	〃				
※		NK 00 68 90	— do. —	Violin	〃				
※		NK 00 69 00	— do. —	Cello	〃				
※		NK 00 69 10	— do. —	Contra Bass 1	〃				
※		NK 00 69 20	— do. —	Contra Bass 2	〃				
※		NK 00 69 30	— do. —	Electric Bass 1	〃				
※		NK 00 69 40	— do. —	Electric Bass 2	〃				
※		NK 00 69 50	— do. —	Brass	〃				
※		NK 00 69 60	— do. —	Horn	〃				
※		NK 00 69 70	— do. —	Organ	〃				
※		NK 00 69 80	— do. —	Electric Piano	〃				
※		NK 00 69 90	— do. —	Harpsichord	〃				
※		NK 00 70 00	— do. —	Strings	〃				
※	10	CA 01 34 00	Dust-Proof-Cloth		防塵シート				
※	11	CA 01 34 10	— do. —		〃				
※	12	CA 01 34 20	— do. —		〃				
※	13	CB 03 95 70	Knob	White	ツマミ (白)				
※	14	CB 03 96 40	— do. —	Orange	〃 (橙)				
※	15	AA 05 21 00	Holder		取付板				
※	16	AA 05 21 10	Variable Holder		ボリューム取付金具				
※	17	AA 05 21 20	Wheel Holder		ホイール受け金具				
※	18	CB 03 95 30	Wheel		ホイール				
※	19	CB 03 95 50	Wheel Tube		ホイールチューブ				
※	20	AA 05 20 90	Controller Panel		コントローラ化粧板			J,U,G	
		AA 05 42 80	— do. —		〃			C	
※	21	AA 05 27 50	Coil-Spring		コイルバネ				
※	22	AA 05 22 60	Printed Circuit Board Angle		基板押え金具				
※	23	CB 03 98 90	Rubber Washer		ゴムワッシャー				
※	24	CA 01 31 60	Fiber Washer		ファイバーワッシャー				

※ New Parts (新規部品) (J: Japanese, U: U.S., C: Canadian, G: General)

	Ref. No.	Part No.	Description		部品名	Remarks	Common Model	Markets	
※	25	NB 10 37 10	Keyboard Assembly		鍵盤 Ass'y				
	26	NB 10 11 60	Switch Unit		スイッチユニット		PS-30		
	27	CB 03 22 10	White Key	C,F	白鍵				
		CB 03 22 20	– do. –	D	〃				
		CB 03 22 30	– do. –	B,E	〃				
		CB 03 22 40	– do. –	G	〃				
		CB 03 22 50	– do. –	A	〃				
		CB 03 22 60	– do. –	C'	〃				
	28	CB 03 22 70	Black Key		黒鍵				
	30	AA 04 37 20	Coil Spring		コイルスプリング				
	31	CC 02 17 50	Felt		フェルト		PS-20		
※	32	BA 01 50 20	Gearing Plate		連動板				
※	33	CB 03 95 90	Arm Holder		腕受け				
※	34	CB 03 96 00	Arm		腕				
※	35	CB 03 96 10	Actuator		アクチェータ				
※	36	CC 03 05 30	Stopper Felt		ストッパーフェルト				
※	37	CC 03 05 40	Gearing Felt		連動板フェルト				
※	38	AA 05 40 80	Stopper	Left	ストッパー(左)				
※	39	AA 05 40 90	– do. –	Right	〃 (右)				
※	40	AA 05 41 40	Sensor Holder		センサー取付板				
※	41	AA 05 27 40	Spring		引張りバネ				
※	42	AA 05 20 10	Printed Circuit Board Holder		基板取付金具				
※	43	AA 05 41 20	– do. –		〃				
※	44	AA 05 20 30	– do. –		〃				
※	45	AA 05 45 30	DMS Angle		DMS アングル				
※	46	CA 01 36 30	DMS Fiber		DMS ファイバー				
	47	CB 82 52 80	Cord Clamp	DKN-05	DKNクランプ				
	48	ED 33 00 60	Bind Head Screw	M3 x 6	バインド小ネジ	Black			
	49	E i 03 00 80	Bind Head Taping Screw	M3 x 8	バインドタッピングネジ2種	Yellow			
	50	E i 33 00 80	– do. –	– do. –	〃	Black			
	51	E i 04 01 00	– do. –	4 x 10	〃	Yellow			
	52	ED 03 00 60	Bind Head Screw	3 x 6	バインド小ネジ	– do. –			
	53	EZ 33 01 40	– do. –	M3 x 6	エバータイトバインドネジ	– do. –			
	54	ED 03 01 60	– do. –	M3 x 16	バインド小ネジ	– do. –			

※ New Parts (新規部品)

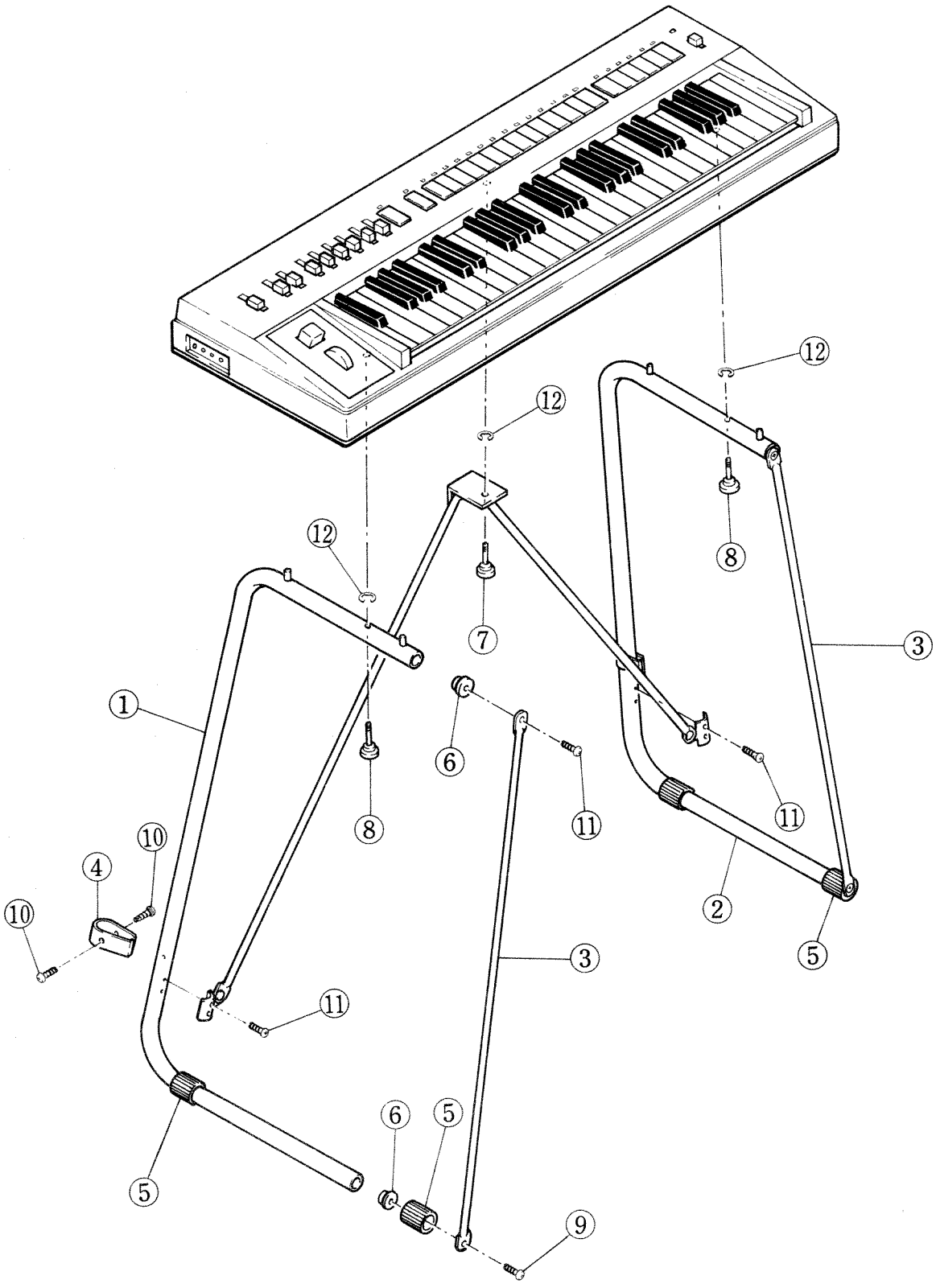
C. Bottom Case Assembly (下ケースAss'y)



	Ref. No.	Part No.	Description		部品名	Remarks	Common Model	Markets
※	1	NB 10 45 30	Power Supply Unit		電源ユニット			J
※		NB 10 45 40	— do. —		〃			U
※		NB 10 45 50	— do. —		〃			C
※		NB 10 45 60	— do. —		〃			G
※	2	GA 03 80 00	Power Transformer		電源トランス			J
※		GA 03 81 00	— do. —		〃			U,C
※		GA 03 83 00	— do. —		〃			G
	3	LB 20 02 50	Voltage Selector		電圧切替器			G
※	4	NA 10 80 40	Circuit Board, FU		FUシート			J
※		NA 10 80 50	— do. — , — do. —		〃			U
※		NA 10 80 60	— do. — , — do. —		〃			C
※		NA 10 80 70	— do. — , — do. —		〃			G
※	5	CB 03 97 00	Support	LCBS-3NS	サポート			
	6	CB 00 07 10	Cord Clamp		コード押え			U,C
		CB 06 55 20	— do. —		〃			J,G
	7	CB 03 28 40	Stopper, AC Cord		コードストッパー			J
		CB 07 27 50	— do. —		〃			G
		CB 81 12 30	— do. —		〃			U,C
	8	MG 00 08 10	AC Cord with Plug		電源コード			J
		MG 00 01 00	— do. —		〃			U
		MG 00 07 70	— do. —		〃			G
		MG 00 02 70	— do. —		〃			C
※	9	AA 05 20 60	Bracket		ブラケット			J,G
※		AA 05 20 70	— do. —		〃			U,C
※	10	CB 03 96 30	Bottom Case		下ケース			J
※		CB 03 99 80	— do. —		〃			G
※		CB 04 18 20	— do. —		〃			U
※	11	CB 04 18 50	Cover, Power Supply		電源カバー			U,G
※	12	AA 05 41 50	Leg Holder		脚取付金具			
	13	AA 04 89 80	Music Panel Wire		譜面ワイヤー		PS-20	
	14	CB 03 80 00	Leg		ゴム脚			
	15	CA 01 34 90	Circuit Board		絶縁シート			U
	16	ED 33 00 80	Bind Screw	M3 x 8	バインド小ネジ	Black		
	17	Ei 03 01 00	Bind Tapping Screw	3 x 10	バインドタッピングネジ2種	Yellow		
	18	Ei 33 01 20	— do. —	3 x 12	〃	Black		
	19	Ei 34 01 00	— do. —	M4 x 10	〃	— do. —		
	20	EV 10 33 00	Hexagonal Nut	M3	六角ナット	— do. —		
	21	AA 05 42 90	Power Supply Plate		電源シャーシ			

※ **New Parts**（新規部品）(J: Japanese, U: U.S., C: Canadian, G: General)

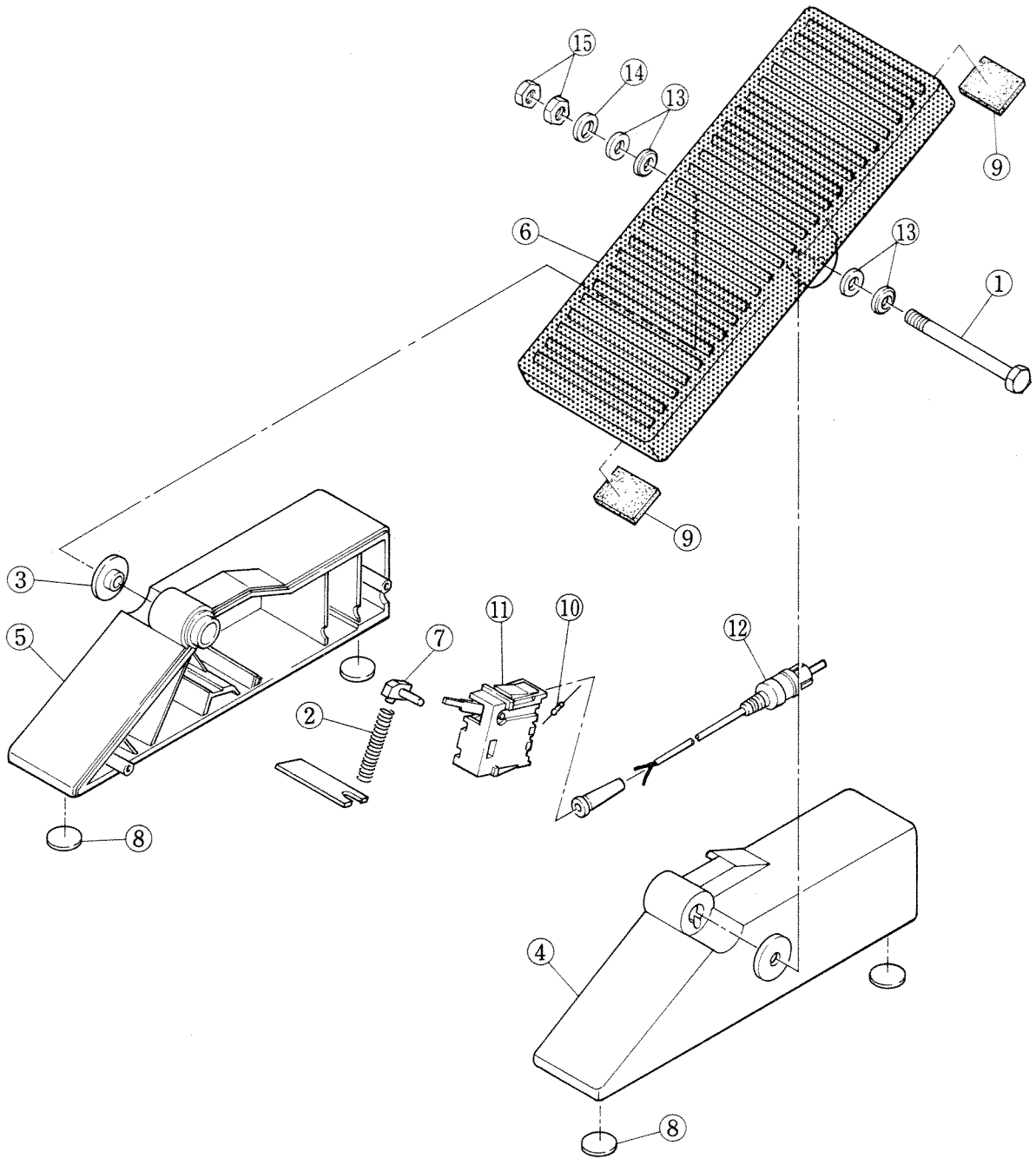
D. Stand(スタンド)



	Ref. No.	Part No.	Description	部品名	Remarks	Common Model	Markets	
※	1	AA 05 22 10	Leg	Left	脚 (左)			
※	2	AA 05 22 20	– do. –	Right	脚 (右)			
※	3	AA 05 22 30	Stay		ステー			
※	4	AA 05 22 50	Cord Clamp		コード止め			
	5	CB 03 72 50	Slip Fitting		スベリ座			
	6	CB 03 81 90	Cap		キャップII			
	7	EK 00 35 60	Knob Bolt	M5 x 30	ノブネジ			
	8	EK 00 35 70	– do. –	M5 x 25	〃			
	9	EH 24 01 60	Truss Tapping Screw	4 x 16	トラスタッピングネジ2種	Chromium		
	10	Ei 23 00 80	Bind Head Tapping Screw	3 x 8	バインドタッピングネジ1種	– do. –		
	11	EM 23 50 80	Oval Head Tapping Screw	3.5 x 8	丸皿タッピングネジ1種	– do. –		
	12	EV 50 00 40	E Ring		Eリング	Yellow		

※ New Parts (新規部品)

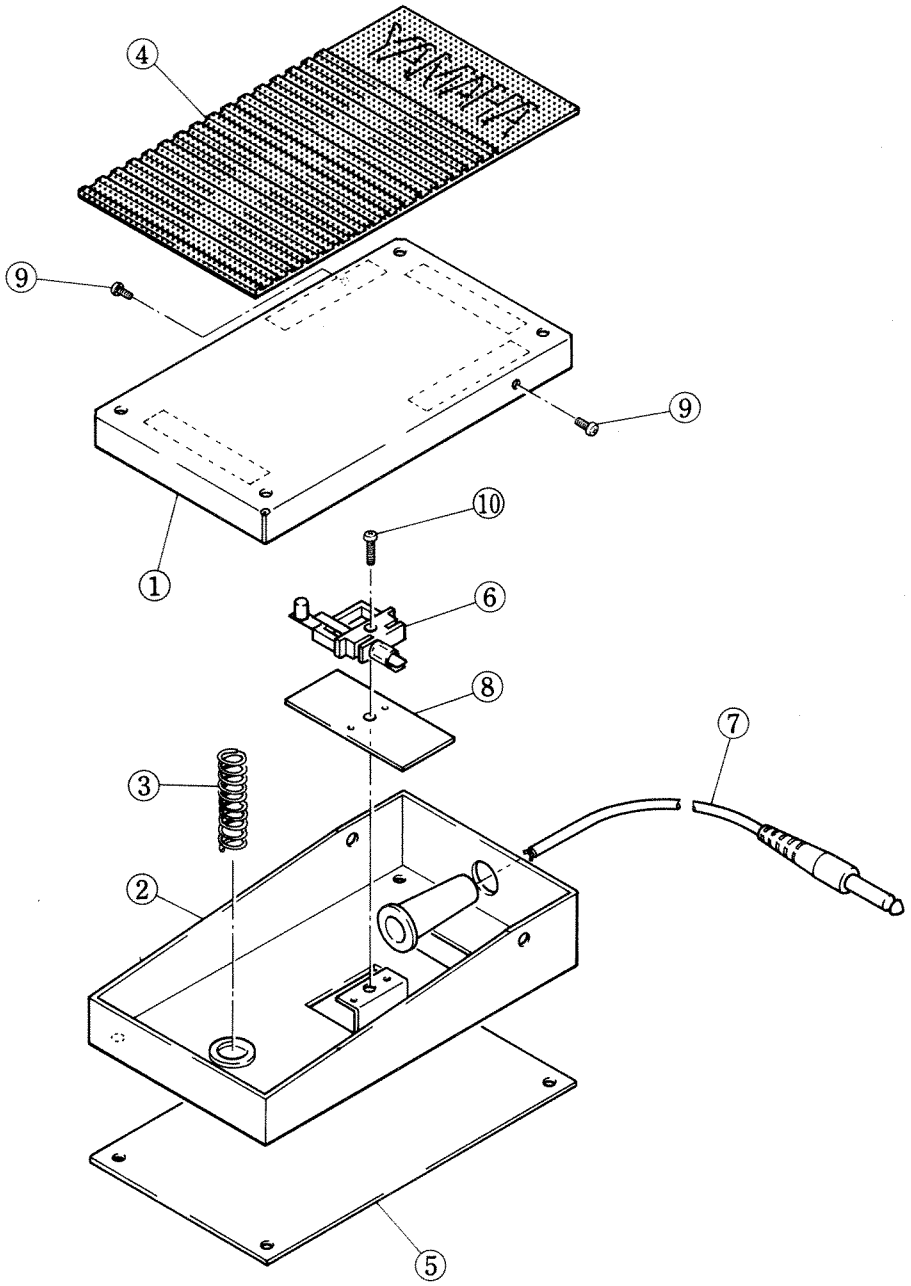
E. Expression Pedal Assembly (EXP ペダル)



Ref. No.	Part No.	Description		部品名	Remarks	Common Model	Markets	
1	AA 04 91 60	Shaft		シャフト	Black	PS-30		
2	AA 04 91 70	Coil Spring		コイルスプリング		PS-30		
3	CB 03 32 00	Bearing		軸受				
4	CB 03 68 30	Flame A		フレーム A				
5	CB 03 68 40	Flame B		フレーム B				
6	CB 03 68 50	Exp. Pedal Plate		踏板				
7	CB 03 68 60	Lever		ボリュームレバー				
8	CB 03 71 20	Slip Fitting		スベリ座				
9	CC 02 19 10	Felt		フェルト				
10	HJ 35 52 20	Carbon Resistor	220Ω 1/4PS	カーボン抵抗				
11	HP 60 02 00	Variable Resistor	TVR 10K	ボリューム				
12	Mi 07 24 20	Exp. Cord		EXP コード		PS-30		
13	EV 98 04 80	Oval Spring Washer	M6	皿バネ座金 1 種	Black			
14	EV 20 30 60	Flat Washer	M6	平座金小形丸	– do. –			
15	EV 10 30 60	Hexagonal Nut	M6	六角ナット 3 種	– do. –			

※ New Parts (新規部品)

F. Foot Switch (フットペダル)



Ref. No.	Part No.	Description	部品名	Remarks	Common Model	Markets	
		Foot Switch	FC-5	フットペダル		CP10	
1	AA 81 28 80	Upper Case, Foot Switch		ペダル上蓋			
2	AA 81 28 90	Bottom Case, Foot Switch		ペダル底蓋			
3	AA 81 29 00	Spring		ペダルバネ			
4	CB 81 51 40	Rubber Mat, Upper		上蓋マット			
5	CB 81 51 50	Rubber Mat, Bottom		底蓋マット			
6	NB 03 71 50	Switch Assembly	1B	スイッチアッセンブリー			
7	Mi 80 11 20	Cord With Y4" Phone Plug		プラグ付コード			
8	CA 80 04 50	Washer		ファイバーワッシャー			
9	EK 00 35 20	Pan Head Screw	M3 x 4 (6.5)	段付小ネジ	Black		
10	EA 03 01 20	— do. —	M3 x 12	ナベ小ネジ	Yellow		

※ New Parts (新規部品)