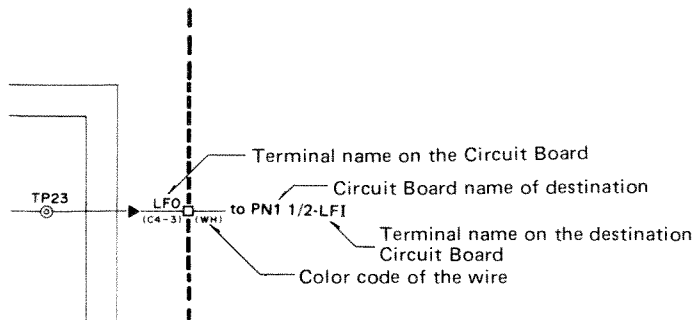


## CONTENTS

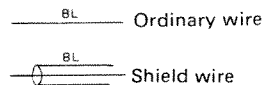
	CODING GUIDE . . . . .	2
	DISASSEMBLY PROCEDURE . . . . .	3
	SPECIFICATIONS . . . . .	4
	PANEL LAYOUT . . . . .	5
<b>SK</b>	Circuit Diagram . . . . .	6
<b>SK</b>	Circuit Board & Wiring . . . . .	7
<b>PA</b>	Circuit Diagram . . . . .	8
<b>PA</b>	Circuit Board & Wiring . . . . .	9
<b>PB</b>	Circuit Diagram . . . . .	10
<b>PB</b>	Circuit Board & Wiring . . . . .	11
<b>VCO</b>	Circuit Diagram . . . . .	12
<b>VCO</b>	Circuit Board & Wiring . . . . .	13
<b>MOD</b>	Circuit Diagram . . . . .	14
<b>MOD</b>	Circuit Board & Wiring . . . . .	15
<b>FA</b>	Circuit Diagram . . . . .	16
<b>FA</b>	Circuit Board & Wiring . . . . .	17
<b>IF</b>	Circuit Diagram . . . . .	18
<b>IF</b>	Circuit Board & Wiring . . . . .	19
<b>PGM</b>	Circuit Diagram . . . . .	20
<b>PGM</b>	Circuit Board & Wiring . . . . .	21
<b>DM</b>	Circuit Diagram . . . . .	22
<b>DM</b>	Circuit Board & Wiring . . . . .	23
<b>PL</b>	Circuit Diagram . . . . .	24
<b>PL</b>	Circuit Board & Wiring . . . . .	25
<b>BL, BR, KS</b>	Circuit Diagram . . . . .	26
<b>BL, BR</b>	Circuit Board & Wiring . . . . .	27
<b>JK, SW</b>	Circuit Diagram . . . . .	28
<b>JK1, JK2</b>	Circuit Board & Wiring . . . . .	29
<b>DC</b>	Circuit Diagram . . . . .	30
<b>DC</b>	Circuit Board & Wiring . . . . .	31
	PANEL SETTING . . . . .	32
	TUNING . . . . .	33
	Electrical Checks & Adjustments . . . . .	34
	PARTS LIST . . . . .	53

# CODING GUIDE

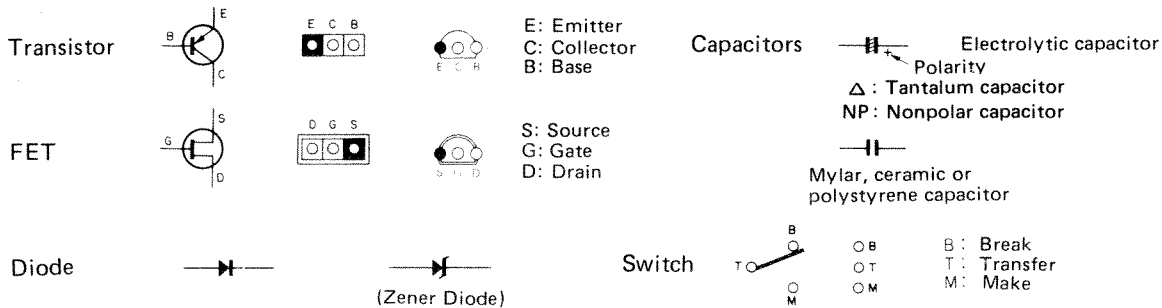
## 1 Wiring Notation



Note: Types of wire



## 2 Symbol Description



## 3 Abbreviations of Wire Color Codes

BLACK (クロ).....BL	BROWN (チャ).....BR	RED (アカ).....RE
ORANGE (ダイ).....OR	YELLOW (キイ).....YE	GREEN (ミド).....GR
BLUE (アオ).....BE	VIOLET (ムラ).....VI	GRAY (ハイ).....GY
WHITE (シロ).....WH	GRASS GREEN (クサ).....GG	SKY BLUE (ソラ).....SB
PINK (モモ).....PK	TRANSPARENT (トウメイ).....TR	

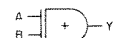
## 4 Relation of Color Coding and Notes

C	C≠	D	D≠	E	F	F≠	G	G≠	A	A≠	B
BR	RE	OR	YE	GR	BE	VI	GY	WH	GG	SB	PK
(チャ)	(アカ)	(ダイ)	(キイ)	(ミド)	(アオ)	(ムラ)	(ハイ)	(シロ)	(クサ)	(ソラ)	(モモ)

## 5 Logic Symbols

	MIL	YAMAHA
NOT		
NOR		
NAND		

Exclusive OR  
(排他的論理和)



Truth Table

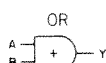
A	B	Y
L	L	L
H	L	H
L	H	H
H	H	L

NOT  
(Inverter)



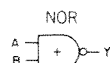
Truth Table

A	Y
L	H
H	L



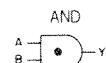
Truth Table

A	B	Y
L	L	L
H	L	H
L	H	H
H	H	H



Truth Table

A	B	Y
L	L	H
H	L	L
L	H	L
H	H	L



Truth Table

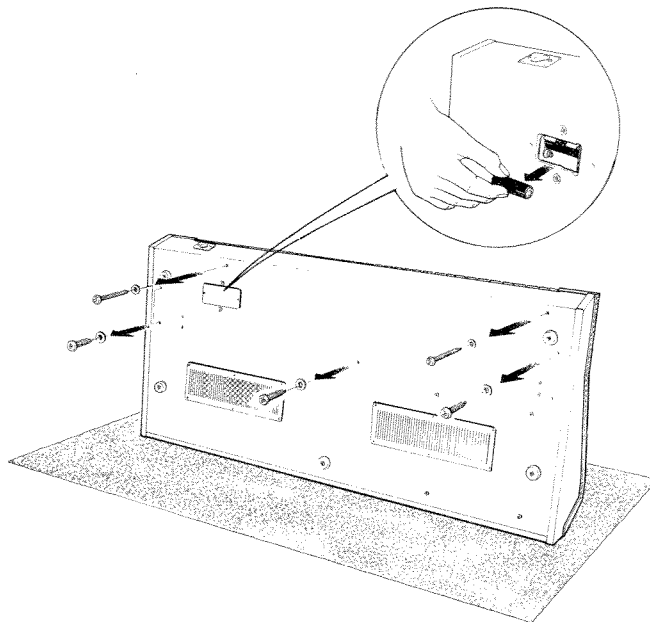
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L	L	L
H	L	L
L	H	L
H	H	H



Truth Table

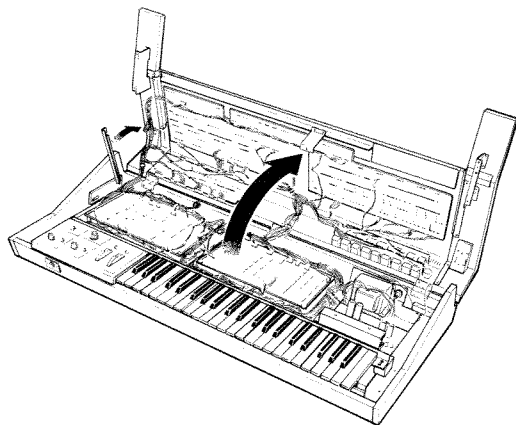
A	B	Y
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H	L	H
L	H	H
H	H	L

## DISASSEMBLY PROCEDURE

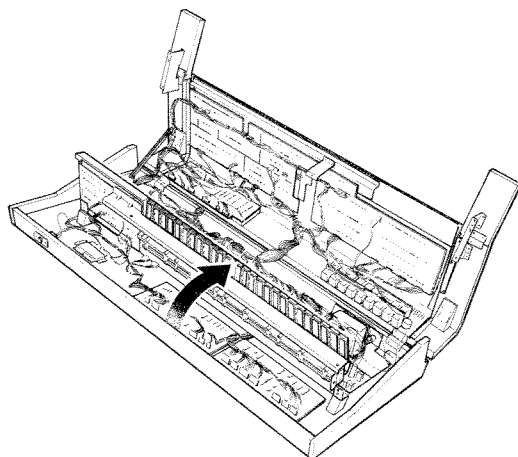


### Opening panel and keyboard

- Put the body on a seat of cloth so that the rear panel should not be damaged. Remove screws of the bottom plate.










- Uplift the arm, turn it and fix it with the stopper on the left side.






- You can rotate the keyboard, holding the clapper.






# SPECIFICATIONS



**KEYBOARD** . . . . . 44 keys, f to c4 (3-2/3 octaves)  
**CONTROLS**





VCO 1, VCO 2 . . . . . PITCH: -500 to + 700 cents  
 FEET: 64', 32', 16', 8', 4', 2'  
 WAVE: , ,   
 MODULATION FUNCTION:  
, , , S/H, EG+, EG-  
 MODULATION DEPTH  
 PW: 50% to 90%  
 PWM FUNCTION  
, EG+, EG-  
 PWM DEPTH

MIXER. . . . . VCO 1  
 VCO 2  
 NOISE

VCF . . . . . CUT OFF FREQ.  
 RESONANCE: Q= 0.5 to 10  
 HP / BP / LP  
 HP: 12dB/oct.  
 BP: ±6dB/oct.  
 LP: -12dB/oct.  
 MODULATION FUNCTION:  
, , , S/H  
 MODULATION DEPTH  
 EG DEPTH  
 KCV: ON / OFF

VCA . . . . .  1  
 2  
 MODULATION FUNCTION:  
, ,   
 MODULATION DEPTH  
 INITIAL LEVEL

LFO . . . . . SPEED: 0.1 to 100Hz  
 SPEED DEPTH  
 EG-VCO:  /   
 TRIGGER: REPEAT / OFF  
 EG-VCO . . . . . NORMAL / TIME x 5  
 ATTACK TIME: 0.001 to 1 sec.  
 (at "NORMAL" setting)  
 DECAY TIME: 0.01 to 10 sec.  
 (ditto)


RING MODULATOR. ON / OFF  
 SPEED: 0.5 to 500 Hz  
 SPEED DEPTH  
 EG-VCO:  /   
 EG-VCF . . . . .  /   
 NORMAL / TIME x 5  
 ATTACK TIME: 0.001 to 1 sec.  
 (at "NORMAL" setting)  
 DECAY TIME: 0.01 to 10 sec.  
 (ditto)  
 SUSTAIN LEVEL  
 RELEASE TIME: 0.01 to 10 sec.  
 (ditto)

EG-VCA . . . . . NORMAL / TIME x 5  
 ATTACK TIME: 0.001 to 1 sec.  
 (at "NORMAL" setting)  
 DECAY TIME: 0.01 to 10 sec.  
 (ditto)  
 SUSTAIN LEVEL  
 RELEASE TIME: 0.01 to 10 sec.  
 (ditto)

OUTPUT. . . . . POA: ON / OFF  
 VOLUME  
 PHONES

UNISON . . . . . ON / OFF  
 PORTAMENTO. . . . . PORTAMENTO / GLISSANDO  
 TIME  
 BRILLIANCE  
 SUSTAIN . . . . . SUSTAIN I / SUSTAIN II  
 TIME  
 PITCH BEND . . . . . OCTAVE (±1200 cents)  
 FIFTH (±700 cents)  
 THIRD (±400 cents)  
 WHEEL  
 MODULATION. . . . . VCO / VCO + VCF / VCF  
 WHEEL  
 PROGRAMMER . . . . . PROGRAM SELECT Buttons  
 M1 (1, 2, 3, 4, 5, 6, 7, 8, 9, 10)  
 M2 (11, 12, 13, 14, 15, 16, 17, 18, 19, 20)  
 PANEL  
 WRITE  
 STORE  
 LOAD

## JACKS

OUTPUT. . . . . BALANCED OUTPUT  
 (-16dBm/600Ω)  
 HIGH (-13dBm)  
 LOW (-32dBm)  
 During output of saw-tooth wave  
 () at basic setting.  
 FOOT SW. . . . . SUSTAIN  
 PORTAMENTO  
 FOOT CONT. . . . . VOLUME  
 FILTER  
 VCF IN. . . . . -10 to 10V  
 VCA IN . . . . . -10 to 10V  
 CONTROL VOLT I / II:  
 IN ( 0.0835 to 4V)  
 OUT ( 0.0835 to 4V)  
 TRIGGER I / II . . . . . IN (OFF: 15 to 3V, ON: 0 to -10V)  
 OUT (OFF: 3V, ON: -7V)  
 PROGRAM . . . . . TO TAPE  
 FROM TAPE  
 PHONES. . . . . 24.5 millivolts rms nominal  
 ( 8Ω or higher impedance)

## OTHERS

POWER SOURCE. . . . . U.S. and CANADIAN models:  
 120V, 60Hz  
 GENERAL model  
 220V or 240V selectable, 50/60Hz  
 POWER CONSUMPTION: 40 Watts  
 DIMENSIONS. . . . . 988 x 177 x 470.5mm  
 ( W x H x D ) (38-7/8 x 7 x 18-1/2")  
 WEIGHT. . . . . 21 kg (46.3 lbs.)  
 FINISH. . . . . Semi-gloss black panels, rosewood-  
 grain cabinet  
 ACCESSORIES:  
 Power cord  
 Alkaline batteries (Size: AA) x 2  
 OPTIONAL ACCESSORIES:  
 FC-3 Foot Controller  
 FC-4 Foot Switch Pedal

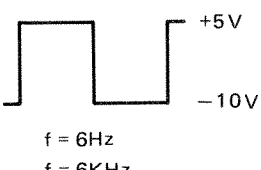
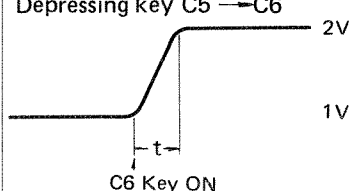
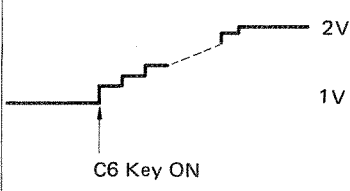
Specifications subject to change without notice.

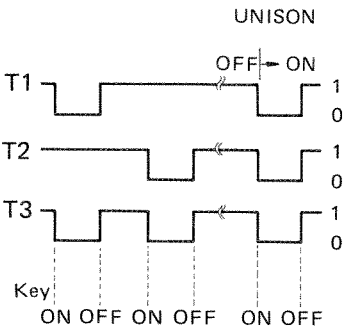
## Tuning

No.	Adjustment item		Measurement point		Adjustment value	Adjusting VR		Setting & Conditions
1	Power supply Voltage 1) +15V 2) -15V 3) +5V -10V		SK  MOD	CT1 - E CT2 - E CT1 - E CT2 - E	+15 ± 0.01V -15 ± 0.01V +5 ± 0.1V -10 ± 0.5V	DC	VR1 VR2 VR3	
2	Key voltage 1) PITCH WHEEL voltage		PL	TP1 (C5-1) TP2 (C5-2) VR (C2-6)	-2 ± 0.002V +1 ± 0.002V +2 ± 0.002V	PL	VR1 VR2 VR3	* For the No. 2 operation use the terminal EK (C1-1) of the SK board as their ground point.
	2) Key voltage output (SK board)		SK	K1 (C1-5) K2 (C1-4)	+166.8 ± 0.2mV	SK	VR3 VR4	SUSTAIN I/II . . . . . "II" UNISON . . . . . "ON" Depressing Key F2
	3) Offset voltage adjustment		PA	O11 (C2-5) O12 (C2-1) O21 (C5-5) O22 (C5-6)	0 ± 0.1mV	PA	VR1 VR2 VR3 VR4	Carry out measurement with short plugs inserted into the CONTROL VOLT IN 1 and 2 at the rear panel.
	4) PITCH adjustment			O11  O21	2 ± 0.001V  2 ± 0.001V	VCO1 block VCO2 block	PITCH  PITCH	Carry out adjustment with short plugs disconnected. Depressing Key C6
	5) Key voltage output (PA board)			O11 O12 O21 O22	166.8 ± 0.1mV	PA	VR1 VR2 VR3 VR4	Depressing Key F2
	6) CONTROL VOLT -OUT 1 and 2-		REAR PANEL	CONTROL VOLT OUT 1 and 2	F2: 166.8 ± 0.2mV C3: 250 ± 0.5mV C4: 500 ± 1mV C5: 1 ± 0.002V C6: 2 ± 0.002V			Depressing Key F2 " C3 " C4 " C5 " C6
3	Tuning	1) VCO1-C6 key	REAR PANEL	OUTPUT "HIGH"	(C6 + 12) ± 2 φ	REAR PANEL	HIGH of the tuning VR VCO1I or II	Depressing key C6 UNISON . . . . . "OFF" VCA block ~1 . . . . . "10"
		2) VCO1-F2 key			(F2 + 12) ± 2 φ		LOW of the tuning VR VCO1I or II	Depressing key F2
		3) VCO2-C6 key			(C6 + 12) ± 2 φ		HIGH of the tuning VR VCO2I or II	Depressing key C6 VCA block ~1 . . . . . "0" ~2 . . . . . "10"
		4) VCO2-F2 key			(F2 + 12) ± 2 φ		LOW of the tuning VR VCO2I or II	Depressing key F2

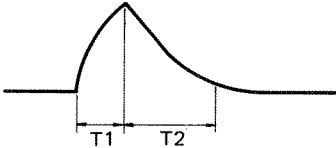
# Electrical Checks & Adjustments

## SK Circuit Board

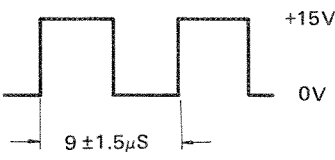
Name of Circuit	TEST POINT	Setting conditions	Adjustment (measurement) value	Adjusting VR	Remarks																									
+5V, −10V Regulator	+5V (C3-3)  −10V (C2-2)		+4.9 ± 0.5V  −9 ± 1V																											
Clock OSC. -PORTAMENT ● f[Hz] adj.	TP1	● EFFECT block  PORTAMENT ..... L ..... S	 f = 6Hz f = 6KHz	VR1 VR2																										
Compalater -PORTAMENT	TP2 TP3 TP4	When the setting of PORTAMENT is made within each specified voltage: STATE 1... 4.6 to 3.3V 2... 3.3 to 0.6V 3... 0.6 to −5.7V 4... −5.7 to −9V	<table border="1"><thead><tr><th></th><th colspan="4">STATE</th></tr><tr><th></th><th>1</th><th>2</th><th>3</th><th>4</th></tr></thead><tbody><tr><td>TP2</td><td>0</td><td>1</td><td>1</td><td>1</td></tr><tr><td>TP3</td><td>1</td><td>1</td><td>0</td><td>0</td></tr><tr><td>TP4</td><td>1</td><td>1</td><td>1</td><td>0</td></tr></tbody></table> 1 : Vss (+5V) 0 : VDD (−10V)  When the PORTA/ GLISS is set at the GLISS under the state 4, the TP3 should be "1" (Vss).		STATE					1	2	3	4	TP2	0	1	1	1	TP3	1	1	0	0	TP4	1	1	1	0		
	STATE																													
	1	2	3	4																										
TP2	0	1	1	1																										
TP3	1	1	0	0																										
TP4	1	1	1	0																										
Key Assigner, Key Volt Buffer, Key Volt S/H Circuits 1) Key Volt adjustment  2) PORTA- MENT effect  3) GLISSANDO effect	K1 (C1-5)  K2 (C1-4)	● EFFECT block SUSTAIN I/II...II UNISON .....ON PITCH WHEEL ..... Center 0	C6 Key ON ..... 2 ± 0.001V < Reference > F2 Key ON ..... 166.8mV C3 " ..... 250mV C4 " ..... 500mV C5 " ..... 1000mV	VR3 (K1) VR4 (K2)																										
			Depressing key C5 → C6  C6 Key ON  t = 0.2 ± 0.2mS → 2.5 ± 0.5S																											
		PORTAMENT..... L PORTA/GLISS ..... GLISS	 C6 Key ON																											

Name of Circuit	TEST POINT	Setting conditions	Adjustment (measurement) value	Adjusting VR	Remarks
Trigger Buffer ● UNISON effect	T1 T2 T3	UNISON ..... OFF → ON	 <p>UNISON</p> <p>OFF → ON</p> <p>T1 1 0</p> <p>T2 1 0</p> <p>T3 1 0</p> <p>Key</p> <p>ON OFF ON OFF ON OFF</p> <p>* In this timing diagram, when one key is depressed ON with the UNISON set at the OFF position, either T1 or T2 should become "0". Moreover, when the key is depressed with the UNISON set at the ON position, T1 and T2 should become "0" simultaneously.</p>		

## PA Circuit Board

Name of Circuit	TEST POINT	Setting condition	Adjustment (measurement) value	Adjusting VR	Remarks
EG-VCO 1) Off set voltage  2) ATTACK TIME adjustment	E <sup>+</sup> (C6-1)	<ul style="list-style-type: none"> <li>EG-VCO Block</li> <li>TIME EXPAND</li> <li>.....NORMAL</li> <li>ATTACK TIME ....S</li> <li>DECAY TIME .....S</li> </ul>	0 ± 0.01V	VR6	
		Set the ATTACK TIME and DECAY TIME so that 8V may be obtained at terminals A (C8-4) and D (C8-3).	1. When any key on the key-board is depressed, the waveform that can be obtained at the terminal E <sup>+</sup> (C6-1) should be one indicated below.  T1 = 4mS (When the voltage of terminal A is 8V) = 125mS (When the voltage of terminal A is 3V) T2 = 40 ± 10mS (Terminal D 8V) = 1.25 ± 0.4S (Terminal D 3V)	VR5	4mS adjustment
		Set the ATTACK TIME, so that 3V may be obtained at the terminal A.	2. Adjust the VR7 in such away that, with any key is depressed, T1 will become still longer when the obtained value was longer than the standard length of 125mS, and conversely T1 will become still shorter when the obtained value was shorter than the foregoing standard length. Repeat the adjustments described in paragraphs 1 and 2 above, until T1 becomes within ±5% of the specified value.	VR7	125mS adjustment



Name of Circuit	TEST POINT	Setting condition	Adjustment (measurement) value	Adjusting VR	Remarks
PITCH Circuit 1) Clock  2) Offset adjustment	TP1				
	O11 (C2-5) O12 (C2-6) O21 (C5-5) O22 (C5-6)	<ul style="list-style-type: none"> <li>● Turn the PITCH (VR-8, 12) clockwise fully.</li> <li>● Connect K1 and K2 with the terminal EK.</li> </ul>	Not to exceed $0 \pm 100 \mu V$ .    A voltage of $3 \pm 0.009 V$ should be present at each terminal.   A Voltage of $1.4 \pm 0.1 V$ should be present at each terminal.	VR1  VR2  VR3  VR4	

## PB Circuit Board

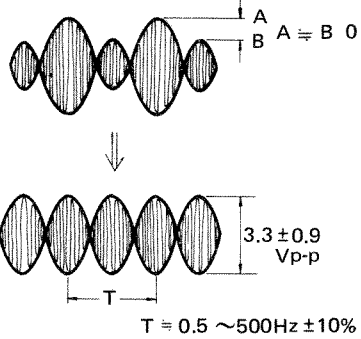
Name of Circuit	TEST POINT	Setting condition	Adjustment (measurement) value	Adjusting VR	Remarks
4V Regulator	+4V (C1-1)		$+4 \pm 0.01V$	VR6	
Ring Modulator OSC 1) Level adjustment	TP1	<ul style="list-style-type: none"> <li>● RING MODULATOR block SPEED DEPTH..... 10 EG-VCO ..... ^</li> </ul>	Adjust the VR3 in such a way that, with any key is depressed, the waveforms of E- (C1-7) and TP1 may have the same level.	VR3	
		SPEED DEPTH .... 0	No waveform should appear at TP1.		
2) Speed adjustment	TP2	RMO SPEED.... S .... F	0.5Hz 500Hz	VR5 VR4	
Ring Modulator 1) Balance adjustment	HO (C6-7)	<ul style="list-style-type: none"> <li>● VCA block ~1 ..... 10</li> <li>● RING MODULATOR block RMO ON/OFF..... ON RMO SPEED .....S ~ F</li> </ul>		VR2	
2) O level adjustment		After the adjustment above has been completed. <ul style="list-style-type: none"> <li>● VCA block ~ 1 ..... 0</li> </ul>	The adjustment should be made so that the waveform which appears at the terminal HO (C6-7) may become a minimum.	VR1	
Mixing Amp EXP Control Output Amp 1) Level adjustment	HO (C6-7)	<ul style="list-style-type: none"> <li>● OUTPUT block POA ..... OFF</li> <li>● RING MODULATOR block RMO ON/OFF ...OFF</li> <li>● VCA block Set the ~ 1 so that 0.4Vp-p may be obtained at the terminal I1.</li> </ul>	The adjustment should be made so that 1Vp-p may be obtained at the terminal HO (C6-7) when 0.4Vp-p is present at the terminal I1 (C5-6).	VR7	
2) FOOT CONTROLLER		Connect the terminal EI (C5-9) to E (earth).	Variation exceeding -36dB should be obtained.		

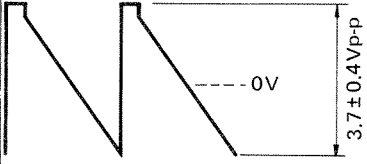
Table of Parameter Control Voltage

Circuit Board	Block	Function	Position	Voltage [V]	Remarks
PA	VCO1,2	FEET	64'	0	
			32'	0.67	
			16'	1.33	
			8'	2.00	
			4'	2.67	
			2'	3.33	
		WAVE	∧	0	
			∟	1.33	
			∟	2.67	
		MODULATION FUNCTION	∩	0	
			∟	0.57	
			∟	1.14	
			∟	1.71	
			S/H	2.29	
			E <sup>+</sup>	2.86	
			E <sup>-</sup>	3.43	
		MODULATION DEPTH	0 ~ 10	0 ~ 4	A type VR
		PW (PULSE WIDTH)	50 ~ 90%	0 ~ 4	B type VR
		P.W.M FUNCTION	∩	0	
			E <sup>+</sup>	1.33	
			E <sup>-</sup>	2.67	
		P.S. M DEPTH	0 ~ 10	0 ~ 4	B type VR
	LFO	SPEED	S ~ F	0 ~ 4	B type VR
		SPEED DEPTH	0 ~ 10	0 ~ 4	B type VR
		EG-VCO	∧ ∨	4 0	
	EG-VCO	TIME EXPAND	NORMAL TIME x 5	0 4	
		ATTACK TIME	S ~ L	4 ~ 0	C type VR
		DECAY TIME	S ~ L	4 ~ 0	
	RMO	ON-OFF	ON OF	4 0	
		SPEED	S ~ F	0 ~ 4	B type VR
		SPEED DEPTH	0 ~ 10	0 ~ 4	B type VR
		EG-VCO	∧ ∨	4 0	

Circuit Board	Block	Function	Position	Voltage [V]	Remarks
PB	MIXER	VCO1	0 ~ 10	0 ~ 4	A type VR
		VCO2	0 ~ 10	0 ~ 4	A type VR
		NOISE	0 ~ 10	0 ~ 4	A type VR
	VCF	CUT OFF FREQ.	L ~ H	0 ~ 4	B type VR
		RESONANCE	L ~ H	0 ~ 4	B type VR
		FILTER MODE	LP BP HP	0 1.33 2.67	
		MODULATION FUNCTION	~ ^ v □ S/H	0 0.8 1.6 2.4 3.2	
		MODULATION DEPTH	0 ~ 10	0 ~ 4	B type VR
		EG DEPTH	0 ~ 10	0 ~ 4	B type VR
		KCV	ON OFF	4 0	
	EG-VCF	POLE	^ v	0 4	
		TIME EXPAND	NORMAL TIME x 5	0 4	
		ATTACK TIME	S ~ L	4 ~ 0	C type VR
		DECAY TIME	S ~ L	4 ~ 0	C type VR
		SUSTAIN LEVEL	0 ~ 10	0 ~ 3.4	B type VR
		RELEASE TIME	S ~ L	4 ~ 0	C type VR
	VCA	~1	0 ~ 10	0 ~ 4	A type VR
		~2	0 ~ 10	0 ~ 4	A type
		MODULATION FUNCTION	~ ^ v □	0 1 2 3	



## VCO Circuit Board

Name of Circuit	TEST POINT	Setting condition	Adjustment (measurement) value	Adjusting VR	Remarks
VCO Circuit 1) Offset adjustment	TP	<ul style="list-style-type: none"> <li>● VCO1, 2 block FEET ..... 2'</li> </ul>	Not to exceed $0 \pm 100\mu V$ Adjustments should be made on all of the VCO1-I, VCO2- I , VCO1-II and VCO2-II.	VR3 VR6 VR9 VR12	
2) Tuning	O11 (C6-10) O12 (C3-10) O21 (C4-10) O22 (C1-10)	<ul style="list-style-type: none"> <li>● Connect each of the terminals V (C6-5) (C3-5), (C4-5) and (C1-5) to the terminal E.</li> <li>● EFFECT block UNISON ..... ON</li> <li>● VCO block FEET ..... 8' PITCH..... 0</li> </ul>	1. Depressing Key C6. (Ensure that a voltage of +2,000V is present at the terminal K.) (C6 + 12) $\pm 1 \phi$	VR11 VR5 VR8 VR2	C6
			2. Depressing Key F2. (Ensure that a voltage of +166.8mV is present at the terminal K.) (F2 + 12) $\pm 1 \phi$	VR1 VR4 VR7 VR10	
			3. Repeat 1. and 2.		
					
3) VCO modulation		<ul style="list-style-type: none"> <li>● Disconnect the terminal V from the terminal E.</li> <li>● VCO block MODULATION FUNCTION..... □ (S3) Set the MOD. DEPTH so that +2V may be obtained at the terminals V.</li> <li>● LFO block SPEED ..... S</li> </ul>	When the F2 key is depressed, the output frequency that appears at each of the terminals O should vary more than C3.		
4) Cent [ $\phi$ ] & Tolerance [ $\phi$ ]		<ul style="list-style-type: none"> <li>● Connect each of the terminals V to E.</li> <li>● VCO block MOD. DEPTH..... 0 FEET .....2', 4', 8', 16', 32', 64'</li> </ul>	Table 1. & 2.		

4) Cent [ ¢ ] & Tolerance [ ¢ ]

Table 1 Cent [ ¢ ] and Tolerance [ ¢ ] of each FEET.

Key FEET	F2 166.8mV	F4 667.2mV	C6 2.000V
2'	$(F4 + 12) \begin{smallmatrix} +15 \\ -3 \end{smallmatrix}$	$(F6 + 12) \begin{smallmatrix} +8 \\ -3 \end{smallmatrix}$	$(C8 + 12) \pm 3$
4'	$(F3 + 12) \begin{smallmatrix} +10 \\ -3 \end{smallmatrix}$	$(F5 + 12) \begin{smallmatrix} +5 \\ -3 \end{smallmatrix}$	$(C7 + 12) \pm 3$
8'	$(F2 + 12) \pm 3$	$(F4 + 12) \pm 3$	$(C6 + 12) \pm 3$
16'	$(F1 + 12) \begin{smallmatrix} +3 \\ -15 \end{smallmatrix}$	$(F3 + 12) \begin{smallmatrix} +3 \\ -8 \end{smallmatrix}$	$(C5 + 12) \pm 3$
32'	$(F0 + 12) \begin{smallmatrix} +3 \\ -18 \end{smallmatrix}$	$(F2 + 12) \begin{smallmatrix} +3 \\ -14 \end{smallmatrix}$	$(C4 + 12) \begin{smallmatrix} +3 \\ -7 \end{smallmatrix}$
64'		$(F1 + 12) \begin{smallmatrix} +5 \\ -20 \end{smallmatrix}$	$(C3 + 12) \begin{smallmatrix} +3 \\ -10 \end{smallmatrix}$

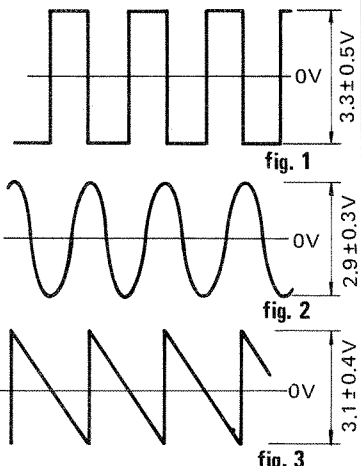
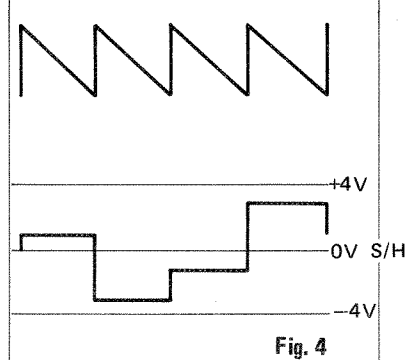
[ ¢ ]

Table 2 Output Tolerance [ ¢ ] of the terminals O11, O12, O21 and O 22.

Key FEET	F2 166.8mV	F4 667.2mV	C6 2.000V
2'	10	7	3
4'	10	7	3
8'	10	7	3
16'	12	10	3
32'	15	15	5
64'		20	7

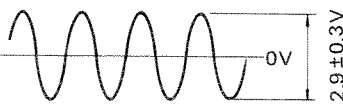

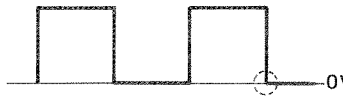
[ ¢ ]

# MOD Circuit Board


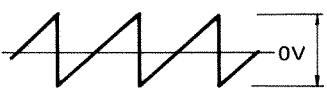
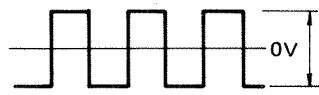
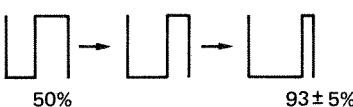

Name of Circuit	TEST POINT	Setting condition	Adjustment (measurement) value	Adjusting VR	Remarks
LFO Circuit 1) Level adjustment	TP1	● LFO block SPEED DEPTH ..... 10 EG-VCO ..... ^	Adjust the VR1 in such a way that, with any key is depressed, the waveforms of E <sup>-</sup> (C11-4) and TP1 may have the same level.	VR1	
		SPEED DEPTH ..... 0	No waveform should appear at TP1.		
2) LFO SPEED	□ (C1-1) ~ (C12-3, 4) ^ (C12-5,6) v (C12-7,8)	LFO SPEED ..... S	Each waveform ..... . 0.1Hz	VR3	
		LFO SPEED ..... F	Each waveform ..... $100 \pm 2\text{Hz}$ 	VR2	
3) Noise level	WN (C1-4)		+2 dBm	VR6	
4) S/H	S/H (C1-2,3)				



## MOD Circuit Board

Name of Circuit	TEST POINT	Setting condition	Adjustment (measurement) value	Adjusting VR	Remarks
VCO MODULATION Circuit 1) Level adjustment  2) Lower edge level adjustment	V1 (C9-6, 7)	● VCO1, 2 block MOD FUNCTION ..... ~	 <p>Fig. 6 The same waveform as Fig. 2</p>	VR8 VR12	
	V2 (C9-4, 5)	MOD DEPTH ..... 10 Turn the MODULATION WHEEL fully up to the "0" position at the front side.			
		MOD DEPTH ..... 0	The waveform should disappear.		
		Turn the MODULATION WHEEL fully toward the inside.	The new output should be the output in Fig. 6 ± 10%.		
		MOD FUNCTION ..... ^ MOD DEPTH ..... 10 Turn the MODULATION WHEEL fully up to the "0" position at the front side.	 <p>Fig. 7 Align the lower edge of the waveform with 0V.</p>	VR9 VR11	
		MOD FUNCTION.... V	Align the lower edge of the output waveform that appears at the terminal V1 with 0V. Ensure that the same waveform as one at the terminal V1 can be obtained at the terminal V2 too.	VR4	
		MOD FUNCTION.... L	 <p>Fig. 8 Align the lower edge of the waveform with 0V.</p>	VR5	
		MOD FUNCTION...S/H	Ensure that the S/H waveform can be obtained at the terminals V1 and V2.		
		MOD FUNCTION ..... EG <sup>+</sup> ..... EG <sup>-</sup>	With any key is depressed, the same waveform as the PA Circuit Board E <sup>+</sup> (C6-1), E <sup>-</sup> (C6-2,3) should appear at the terminals V1 and V2, respectively.		

# MOD Circuit Board

Name of Circuit	TEST POINT	Setting condition	Adjustment measurement) value	Adjusting VR	Remarks
WSC Circuit	S11 (C3-1) S12 (C3-3) S21 (C3-5) S22 (C3-7)  O11 (C10-5) O12 (C10-1) O21 (C4-2) O22 (C4-1)	● VCO1, 2 block PW ..... 50% PWM DEPTH.... 0  WAVE ..... ^ ^ ^ ^ PW .....50%→90%	When the C6 key is turned ON a sine wave of $3.7V \pm 0.8V$ should appear at each of the terminals S. Moreover, switch the WAVE (S3,6) progressively and turn ON the C6 key. Ensure that the waveform as indicated in Fig. 9,10,11 below appear at the terminals O, respectively.   Fig. 9   Fig. 10   Fig. 11  Ensure that the output waveform at each of terminals O change as indicated in diagrams below.   Fig. 12		
PWM FUNCTION Circuit 1) Level adjustment 2) Lower edge Voltage adjustment	TP2 TP3	● VCO1, 2 block PW ..... 50% PWM FUNCTION ..... ~ PWM DEPTH ..... 10  PWM FUNCTION ..... EG <sup>+</sup> ..... EG <sup>-</sup>	Carry out the level adjustment using VR10 and VR14 and the lower edge voltage adjustment using VR9 and VR13 in order that the waveform as indicated in Fig. 13 may be obtained.   Fig. 13  With any key is depressed, the same wavefors as one at the terminals E <sup>+</sup> (C7-3), E <sup>-</sup> (C4, 5) should appear.	VR10 VR9 VR14 VR13	Level 0V Level 0V

# FA Circuit Board

Name of Circuit	TEST POINT	Setting condition	Adjustment (measurement) value	Adjusting VR	Remarks
VCF Circuit 1) Level adjustment	TP1 TP3	<ul style="list-style-type: none"> <li>● VCO1, 2 block FEET '..... 4' WAVE ..... ^</li> <li>● EFFECT block UNISON ..... ON</li> <li>● MIXER block VCO1 ..... 10</li> </ul>	The adjustment should be made that, with the C4 Key turned ON, the signal level appearing at TP1 and TP3 may become 2/3 time the signal level of F11 (C7-1) and F12 (C7-2). <b>(Reference information)</b> The adjustment should be made so that TP1 and TP3 may become 2 Vp-p when a sine wave of 3Vp-p is applied to F11 and F12 externally.	VR1 VR10	
		VCO1, 2 ..... 0 NOISE ..... 10	The same as paragrapy above.	VR2 VR11	
		VCO1,2 ..... 0 NOISE ..... 10	The adjustment should be made so that the level of noise waveform appearing at TP1 and TP3 may become the same as the noise level at the terminal NI (C6-2)	VR3 VR12	
2) Peak point and peak level adjustment	FO1 (C4-8)	<ul style="list-style-type: none"> <li>● VCO1, 2 block FEET ..... 4' WAVE ..... ^</li> </ul>	The adjustment should be carried out so that the waveform as indicated in Fig. 1. may appear at FO1 (FO2) with the C4 key turned ON and the peak point may be obtained using the VR4 (VR13). Then, adjust the VR5 (VR14) so as to obtain 1Vp-p.	VR4 (VR13)	Peak Point
	FO2 (C4-3)	<ul style="list-style-type: none"> <li>● MIXER block VCO1 ..... 10 VCO2, NOISE ..... 0</li> <li>● VCF block Set the CUT OFF. FREQ. and RESONANCE in such a way that 5V may be obtained at the terminal CO (C5-2), RE (C5-1).</li> <li>MOD DEPTH..... 0 HP/BP/LP .....LP KCV .....ON</li> <li>● EFFECT block BRILLIANCE ..... Center "0" UNISON ...ON</li> </ul>			

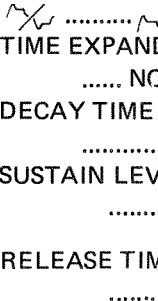
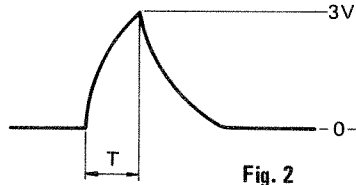


Fig. 1

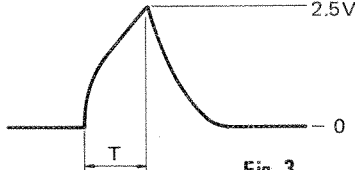
## FA Circuit Board

Name of Circuit	TEST POINT	Setting condition	Adjustment (measurement) value	Adjusting VR	Remarks
VCA Circuit 1) Level adjustment	TP5 TP7	<ul style="list-style-type: none"> <li>● VCO1, 2 block FEET ..... 4'</li> <li>● VCA block ~1 ..... 10</li> <li>● EFFECT block UNISON..... ON</li> </ul>	1. Adjust the VR19 and VR27 so that the level of sine wave appearing at TP5 and TP7 may become 1/2 of that of sine wave appearing at the terminals A11 (C8-6) and A12 (C8-5) when the C4 key is depressed.	VR19 VR27	
		<ul style="list-style-type: none"> <li>● VCA block ~1 ..... 10 ~2 ..... 10</li> </ul>	2. In the same way as with paragraph 1 above, adjust the VR20 and VR28 so that the level of the foregoing sine wave may become 1/2 of that of sine wave appearing at the terminals A21 (C9-1) and A22 (C8-8).	VR20 VR28	
		~1, ~2..... 0 <ul style="list-style-type: none"> <li>● MIXER block Set the VCO1 and VCO2 so that 3Vp-p may be obtained at the terminals A13 (C9-10,11) and A23 (C9-3,4)</li> </ul>	3. Ensure that 3Vp-p signal is obtained at TP5 (TP7).		
	AO1 (C9-8)  AO2 (C9-9)	<ul style="list-style-type: none"> <li>● VCA block MOD DEPTH.... 0 Set the INITIAL LEVEL so that 3V may be obtained at the terminal IL (C1-6).</li> </ul>	4. Adjust the VR22 (VR30) so that 1.5Vp-p may appear at the terminal AO1 (AO2) when 3Vp-p is applied TP5 (TP7).	VR22  VR30	
		<ul style="list-style-type: none"> <li>● MIXER block VCO1, 2 ..... 0</li> <li>● VCA block ~1, ~2 ..... 0 MOD. DEPTH.. 10</li> </ul>	5. Adjust the VR21 and VR29 so that the output at the terminals AO1 and AO2 may become a minimum.	VR21  VR29	

## FA Circuit Board

Name of Circuit	TEST POINT	Setting condition	Adjustment (measurement) value	Adjusting VR	Remarks
<b>EG-VCF</b> 1) Level adjustment  2) ATTACK TIME adjustment	TP2  TP4	● EG-VCF block  TIME EXPAND ..... NORMAL DECAY TIME ..... S SUSTAIN LEVEL ..... 0 RELEASE TIME ..... S  Set the ATTACK TIME so that 8V may be present at the terminal FA (C3-4).  ● VCF block EG-DEPTH ..... 10  ● EFFECT block UNISON ..... ON	1. Carry out the level adjustment using the VR9 (VR18) so that the waveform as indicated in Fig. 2 may appear at TP2 (TP4) with any key is depressed.  Furthermore, adjust the VR6 (VR15) so that the length of T may become 4mS.	VR9 (VR18)   VR6 (VR15)	Level   T [mS]
		● EG-VCF block Set the ATTACK TIME so that 3V may be present at the terminal FA.	 Fig. 2  $T = 4\text{mS} \pm 5\%$ (Terminal FA 8V) $= 125\text{mS} \pm 5\%$ (Terminal FA 3V)	VR8 (VR17)	
3) Zero level adjustment			2. Adjust the VR8 (VR17) in such a way that, with any key is depressed, T in Fig. 2 will become still longer when the obtained value was longer than the standard length of 125mS, and conversely T will become still shorter when the obtained value was shorter than the foregoing standard length. After the adjustment above has been completed, again carry out the adjustment as described in paragraph 1 above.  3. After the adjustment as described in paragraph 2 above has been completed, adjust the zero level of the output waveform of TP2 (TP4) using the VR7 (VR16). Make sure that the key is turned OFF during the adjustment above.	VR7 (VR16)	

## FA Circuit Board

Name of Circuit	TEST POINT	Setting condition	Adjustment (measurement) value	Adjusting VR	Remarks
EG-VCA Circuit 1) Level adjustment  2) ATTACK TIME adjustment          3) Zero level adjustment	TP6  TP8	<ul style="list-style-type: none"> <li>● VCA block MOD. DEPTH .... 0 INITIAL LEVEL..0</li> <li>● EG-VCA block DECAY TIME..... S SUSTAIN LEVEL .....0 RELEASE TIME ..... S</li> </ul> <p>Operate the ATTACK TIME so that 8V may be present at the terminal AA (C1-4).</p> <ul style="list-style-type: none"> <li>● EFFECT UNISON ..... ON</li> </ul>	<p>1. Carry out the level adjustment using the VR26 (VR34) so that the waveform as indicated in Fig. 3 may appear at TP6 (TP8) with any key is depressed.</p> <p>Furthermore, adjust the VR23 (VR31) so that the length of T may become 4mS.</p>  <p>Fig. 3</p> <p>T = 4mS ±5% (Terminal AA 8V) = 125mS ±5% (Terminal AA 3V)</p>	VR26 (VR34) VR23 (VR31)	Level  T
		Operate the ATTACK TIME so that 3V may be present at the terminal AA.	2. Adjust the VR25 (VR33) in such a way that, with any key is depressed, T in Fig. 3 will become still longer than the standard length of 125mS, and conversely T will become still shorter when the obtained value was shorter than the foregoing standard length. After the adjustment above has been completed, again carry out the adjustment as described in paragraph 1 above.	VR25 (VR33)	T
			3. After the adjustments as described in paragraphs 1 and 2 above have been completed, adjust the zero level of the output waveform of TP6 (TP8) using the VR24 (VR32). Make sure that the key is turned OFF during the adjustment above.	VR24 (VR32)	

## IF Circuit Board

Name of Circuit	TEST POINT	Setting condition	Adjustment (measurement) value	Adjusting VR	Remarks
VCF MODULATION	F (C7-2)	<ul style="list-style-type: none"> <li>● VCF block MOD. FUNCTION ..... ~ MOD. DEPTH ..... 10</li> <li>● EFFECT block MODULATION WHEEL ..... 0</li> </ul>	<p>Adjust the VR1 so that sine waves at the terminal ~ (C5-8) and the terminal F may have the same level.</p> <p>(Reference information) When the MOD. FUNCTION is switched progressively, ensure that those waveforms appearing at the input terminal and the terminal F have the same level.</p>	VR1	
VCA MODULATION	A (C7-3)	<p>VCA block MOD. FUNCTION ..... ~ MOD. DEPTH ..... 10</p>	<p>Adjust the VR2 so that sine waves at the terminal ~ (C5-8) and the terminal A may have the same level.</p> <p>(Reference information) When the MOD. FUNCTION is switched progressively, ensure that those waveforms appearing at the input terminal and the terminal A have the same level.</p>	VR2	

## PL Circuit Board

Name of Circuit	TEST POINT	Setting condition	Adjustment (measurement) value	Adjusting VR	Remarks
Key Volt Generator Circuit	TP1	● EFFECT block LIMITER ..... OCTAVE ..... FIFTH ..... THIRD	-2 ± 0.002V -0.997 ± 0.003V -0.520 ± 0.003V	VR1	
	TP2	The same above.	+1 ± 0.001V +0.665 ± 0.003V +0.413 ± 0.003V	VR2	
	VR (C2-6)	LIMITER ..... OCTAVE	Set TP3 at 0V. (This 0V should be obtained at the center detent position.) Adjust the VR3 so that 2 ± 0.001V may be present at the terminal VR.	VR3	
Modulation Buffer Circuit	MO (C2-7) MF (C2-8)	● EFFECT block MODULATION WHEEL ..... MAX MODE ..... VCO VCO + VCF VCF	MO 10.2 ± 1V 10.2 ± 1V 0.6 ± 0.1V MF 0.6 ± 0.1V 10.2 ± 1V 10.2 ± 1V		
Sustain Control Circuit	FRO (C2-2) ARO (C2-4)	● EFFECT block SUSTAIN ..... S ● VCF block RELEASE TIME ..... S ● VCA block RELEASE TIME... S	At both terminals FRO and ARO → +10 ± 1V SUSTAIN ..... When set at L, → 0 ± 1V		
		When the FSS (C2-1) is set at 0V:	At both terminals FRO and ARO → +10 ± 1V		

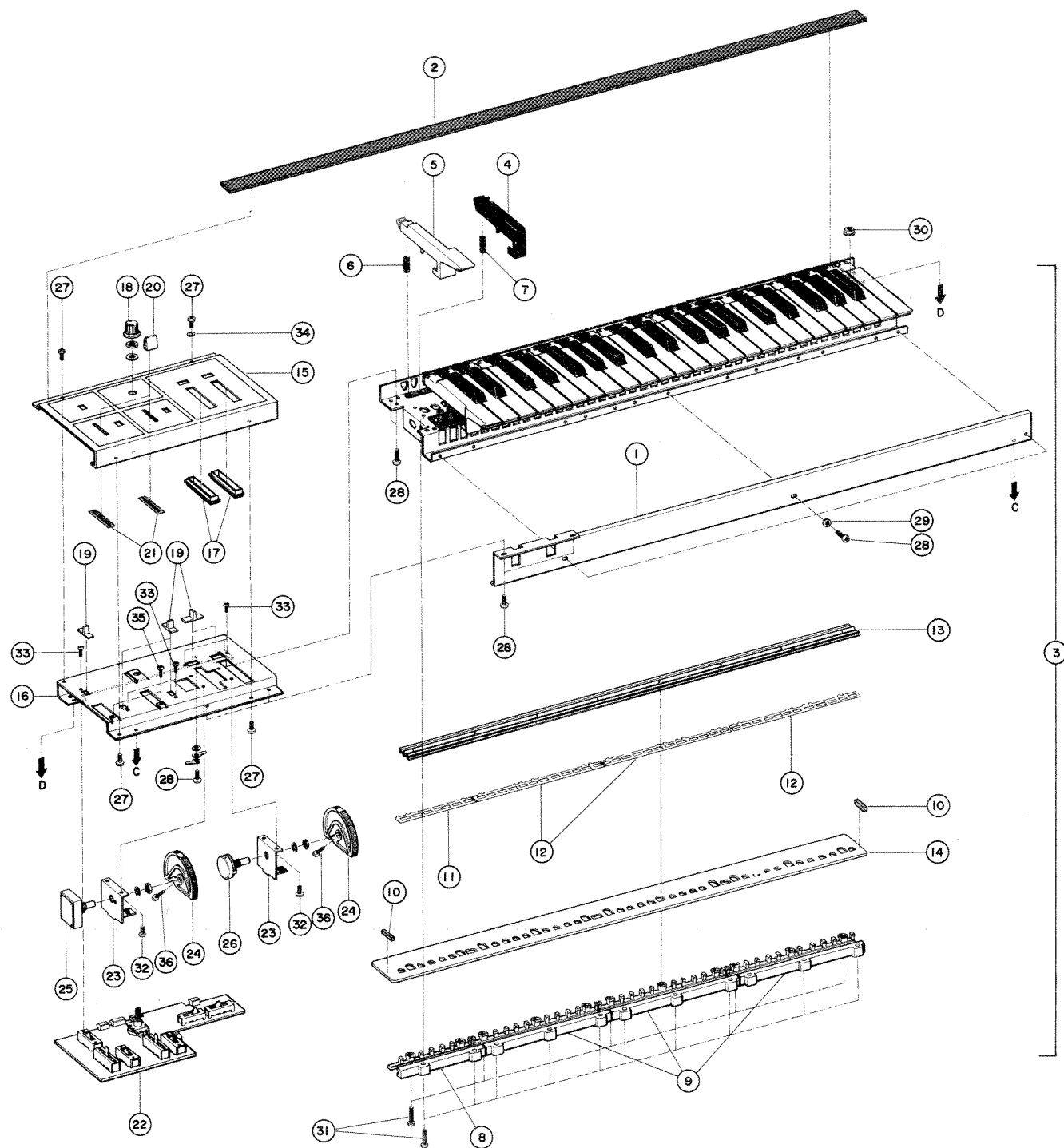


**PROGRAMMABLE MEMORY SYNTHESIZER**

**CS-40M**

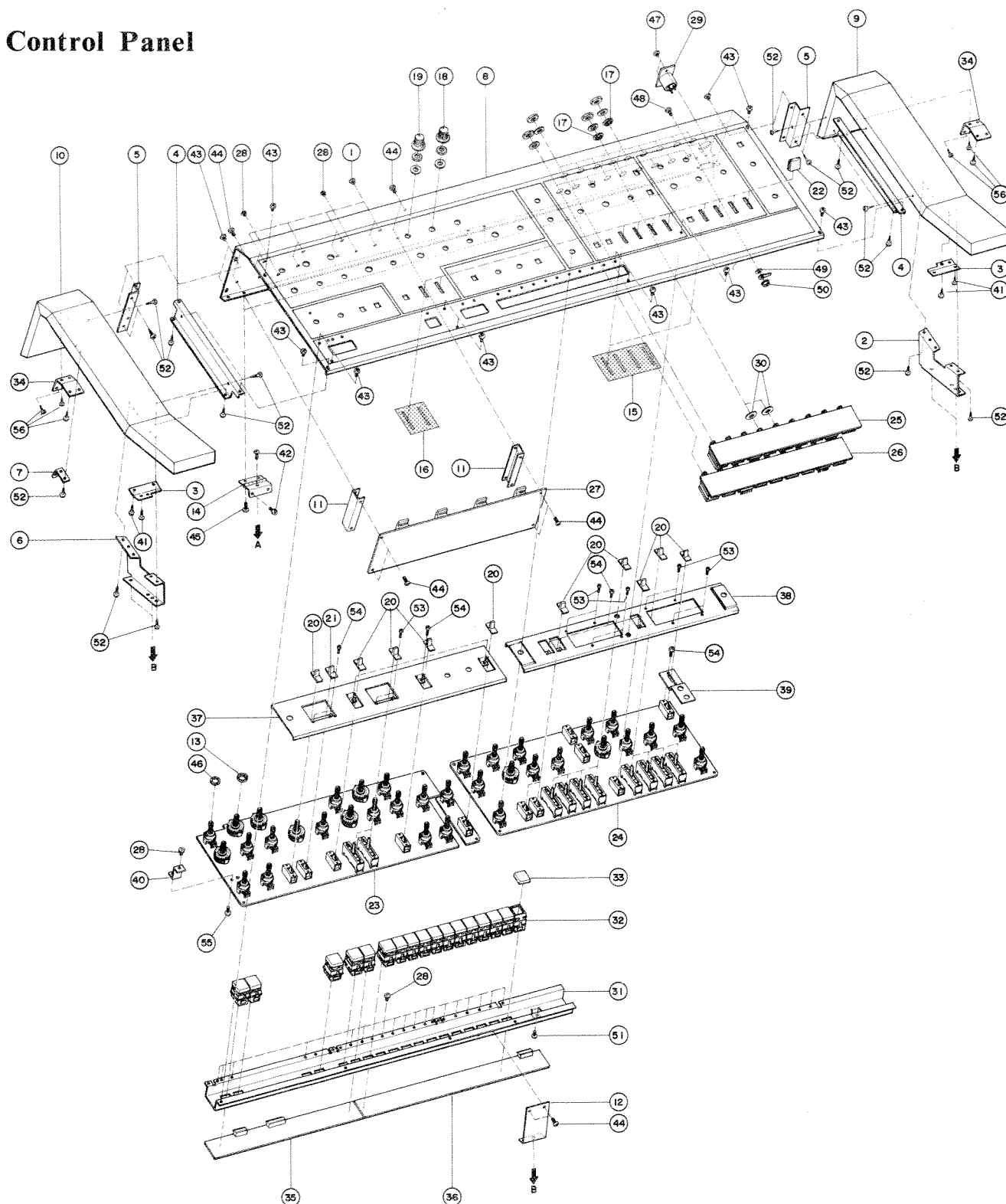
**PARTS LIST**

# Keyboard





# Control Panel



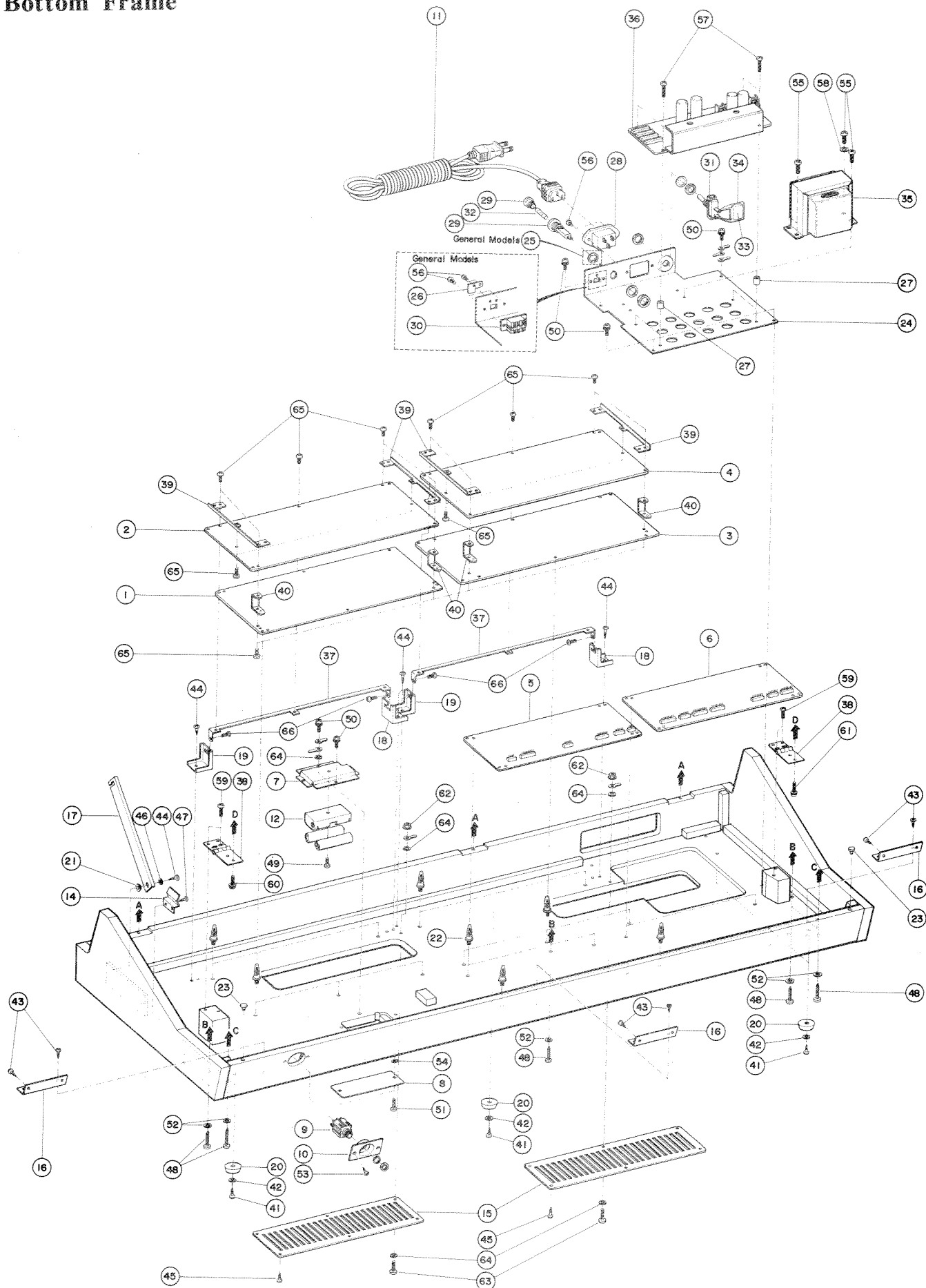
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※ 1	30 10 00 CB 81 40 60	Rubber Cap	ゴム キャップ				
※ 2	30 10 00 AA 81 11 80	Side Arm Bracket (R)	腕木固定金具(右)				
※ 3	30 10 00 AA 81 13 00	Support Angle	補強金具				
※ 4	30 10 00 AA 81 11 50	Panel Bracket (Large)	パネル取付金具(大)				

※ : New Part (新部品)

Ref. No.	Part No.	Description	(部 品 名)	Remarks	Common model		
※ 5	30 10 00 AA 81 11 60	Panel Bracket (Small)	パネル取付金具(小)				
※ 6	30 10 00 AA 81 15 30	Side Arm Bracket (L)	腕木固定金具(左)				
※ 7	30 10 00 AA 81 12 20	Prop Holder	引 掛 け 金 具				
※ 8	30 10 00 AA 81 13 70	Control Panel	コントロールパネル				
※ 9	30 12 56 00 00 00 30	Side Arm (R)	腕 木 集 成 (右)				
※ 10	30 12 56 00 00 00 20	" (L)	" (左)				
※ 11	30 10 00 AA 81 12 70	C. B Holder	シ ー ト 受 け 金 具				
※ 12	30 10 00 AA 81 12 50	Stay	ス テ イ				
13	30 10 00 AA 80 58 20	Spacer	ス ペ ー サ ー				
※ 14	30 10 00 AA 81 12 40	Hinge	蝶 番				
※ 15	40 10 00 CA 80 20 20	Dust Proof Cover	防 塵 ク ロ ス				
※ 16	40 10 00 CA 80 20 30	"	"				
17	30 56 00 CB 81 00 90	Isolation Nut	絶 縁 ナ ッ ト		EM-120		
18	30 56 00 CB 81 21 30	Knob, Rotary VR — Yellow —	つ ま み		EM-200		
19	30 56 00 CB 81 21 40	" , Rotary SW — Ivory —	"				
※ 20	30 10 00 CB 81 46 80	" , Slide SW — Yellow —	"				
※ 21	30 10 00 CB 81 46 90	" , " — Ivory —	"				
※ 22	30 10 00 CB 81 40 40	" , Slide VR	"				
※ 23	30 12 56 NA 80 48 20	PA Board # 84052	P A シ ー ト				
※ 24	30 12 56 NA 80 48 30	PB " # 84062	P B "				
※ 25	30 12 00 NA 80 49 30	JK1 " # 84161	J K 1 "				
※ 26	30 12 00 NA 80 50 20	JK2 " "	J K 2 "				
※ 27	30 12 56 NA 80 48 40	VCO " # 84072	V C O "				
28	40 10 00 iF 00 13 10	LED TLR102KB	L E D		CS-5		
29	40 10 00 LB 30 01 60	Cannon-type Connector XLR-3-32	キャノンソケット		PM-400		
30	40 10 00 EK 00 23 70	Washer	ファイバーワッシャー				
※ 31	30 10 00 AA 81 13 60	SW Holder	プリセットSW取付金具				
※ 32	40 10 00 KA 90 14 00	Push Switch SPA	照 光 式 ス イ ッ チ				
※ 33	40 10 00 CB 81 42 10	Button (Red)	つ ま み (赤)				
※ 40	10 00 CB 81 42 20	" (White)	" (白)				
※ 34	30 10 00 AA 81 27 40	Angle	補 強 ア ン グ ル				
※ 35	30 12 00 NA 80 49 10	BL Board # 84141	B L シ ー ト				
※ 36	30 12 00 NA 80 49 20	BR " # 84151	B R "				
※ 37	30 10 00 AA 81 13 40	Sub-Panel, PA Board	P A サ ブ パ ネ ル				
※ 38	30 10 00 AA 81 13 50	" , PB "	P B "				
※ 39	30 10 00 AA 81 15 00	Switch Holder	ス イ ッ チ 取 付 金 具				
※ 40	30 10 00 AA 81 11 90	LED Holder	L E D 金 具				
41	40 10 00 EP 03 11 30	Flat Head Wood Screw M3.1 x 13	皿 木 ネ ジ	ZMC2-y			
42	40 10 00 Ei 33 01 20	Bind Head Tapping Screw M3 x 12	バインドタッピングネジ	ZMC2-BI			
43	40 10 00 EC 33 00 50	Truss Head Screw M3 x 5	ト ラ ス 小 ネ ジ	"			
44	40 10 00 ED 33 00 80	Bind Head Screw M3 x 8	バインド小ネジ	"			
45	40 10 00 Ei 33 00 60	Bind Head Tapping Screw M3 x 6	バインドタッピングネジ	"			
46	40 10 00 EV 41 00 70	Toothed Lock Washer A7S	歯 付 座 金	ZMC2-y			
47	40 10 00 EM 13 00 60	Oval Head Tapping Screw M3 x 6	丸皿タッピングネジ	FNM3-3g			
48	40 10 00 ED 34 01 00	Bind Head Screw M4 x 10	バインド小ネジ	ZMC2-BI			
49	40 10 00 EV 31 44 00	Toothed Lock Washer A4S	歯 付 座 金	"			
50	40 10 00 EK 80 06 20	Flange Nut M4	フ ラ ン ジ ナ ッ ト	"			
51	40 10 00 EA 03 00 60	Pan Head Screw M3 x 6	ナ ベ 小 ネ ジ	ZMC2-y			
52	40 10 00 EQ 03 11 30	Round Head Wood Screw M3.1 x 13	丸 木 ネ ジ	"			
53	40 10 00 EA 02 00 40	Pan Head Screw M2 x 4	ナ ベ 小 ネ ジ	(PA) (PB) ZMC2-y			
54	40 10 00 EA 02 60 40	" M2.6 x 4	"	"			
55	40 10 00 ED 03 00 60	Bind Head Screw M3 x 6	バインド小ネジ	(PA) ZMC2-y			

※ : New Part (新部品)

# Bottom Frame



Ref. No.	Part No.		Description	(部 品 名)	Remarks	Common model		
※	30	12 56 00 00 00 10	Bottom Frame Ass'y	底 枠 集 成				
※	1	30 12 56 NA 80 48 90	DM Board # 84121	D M シ ー ト				
※	2	30 12 56 NA 80 48 60	FA " # 84093	F A "				
※	3	30 12 56 NA 80 48 80	PGM " # 84114	P G M "				
※	4	30 12 56 NA 80 48 50	MOD " # 84082	M O D "				
※	5	30 12 56 NA 80 48 00	SK " # 84031-1/2	S K "				
※	6	30 12 56 NA 80 48 70	IF " # 84031-2/2	I F "				
	7	30 10 00 AA 81 14 00	Battery Cover	バッテリーカバー				
	8	30 10 00 AA 81 12 60	Battery Bottom Cover	フ タ	J			
		30 10 00 AA 81 26 00	"	"	U, C, G			
	9	40 10 00 LB 40 01 00	Phone Jack LJ-070	フオーンジャック				
※	10	30 10 00 CB 81 42 30	Phone Panel	フオーンパネル				
	11	40 10 00 MG 00 05 60	A.C. Cord	電 源 コ ー ド	J			
		40 10 00 MG 00 05 80	"	"	U, C			
		40 10 00 MG 00 03 60	"	"	G	PM1000		
※	12	40 10 00 CB 81 42 40	Battery Case	電 池 ケ ー ス				
	14	30 54 00 AA 80 25 40	Holder, Stay	ス テ ー 押 え 金 具		PM-700		
	15	30 56 00 AA 81 00 50	Radiator Grille	放 熱 グ リ ル		EM100-2		
※	16	30 10 00 AA 81 12 10	Angle	ア ン グ ル				
※	17	30 10 00 AA 81 12 30	Stay	ス テ イ				
※	18	30 10 00 CB 81 40 70	Shaft Holder (R)	軸 受 (右)				
※	19	30 10 00 CB 81 40 80	" (L)	" (左)				
	20	30 54 00 CB 80 12 70	Leg	ゴ ム 脚		PM200B		
	21	30 10 00 CB 81 14 30	Bush	ブ ッ シ ュ				
	22	30 56 00 CB 08 70 00	Circuit Board Holder	シ ー ト ホ ル ダ ー		EM-200		
※	23	30 10 00 CB 81 47 00	Rubber Bush	ゴ ム ボ タ ン				
※	24	30 10 00 AA 81 13 80	Power Supply Unit Chassis	電 源 シ ャ ー シ	J, U, C			
※		30 10 00 AA 81 13 90	"	"	G			
	25	40 10 00 AA 03 15 80	Fuse Holder Washer	ヒューズホルダーワッシャー	G			
※	26	40 10 00 CB 81 42 50	Stopper, Slide SW	ス ト ッ パ ー	G			
	27	30 56 00 CB 01 09 80	Spacer	ス ペ ー サ ー				
	28	40 10 00 LB 30 05 60	A.C. Connector	A C コ ネ ク タ ー				
	29	40 10 00 LB 20 04 90	Fuse Holder SN-2052	ヒューズホルダー	J, U, C			
		40 10 00 LB 20 05 90	" FEB031, 1401	"	G			
	30	40 10 00 KA 40 04 10	Slide Switch	ス ラ イ ド S W	G			
	31	40 10 00 KA 30 04 30	Toggle Switch CTA11	ト グ ル S W	J, U, C	J-15 35B		
		40 10 00 KA 30 03 70	" 3902B	"	G	EM200		
	32	40 10 00 KB 00 03 30	Fuse 1.0A 250V	ヒ ュ ー ズ	J			
		40 10 00 KB 00 06 60	" 400MA 250V	"	G			
		40 10 00 KB 00 10 60	" 1.0A 250V	"	U, C			
	33	40 10 00 FZ 00 01 10	Spark Suppressor Capacitor 0.33+120Ω500V	ス パ ー ク キ ラ ー	J, U			
		40 10 00 FZ 00 09 50	" S1201	"	C			
	34	40 10 00 CB 07 21 90	Cover, Spark Suppressor Capacitor	コ ン デ ン サ カ バ ー	J, U	A-55		
		40 10 00 CB 07 98 90	Cover, "	"	C			
※	35	40 10 00 GA 81 38 00	Power Transformer	電 源 ト ラ ン ス	J			
※		40 10 00 GA 81 51 00	"	"	U, C			
※		40 10 00 GA 81 52 00	"	"	G			
※	36	30 12 00 NA 80 48 10	DC Board # 84041	D C シ ー ト	J			
※		30 12 00 NA 80 54 20	" "	D C "	U, C			
※		30 12 00 NA 80 54 30	" "	D C "	G			
※	37	30 10 00 AA 81 11 70	C. B. Frame	回 転 フ レ ー ム				
※	38	30 10 00 AA 81 12 00	Hinge	蝶 番				

※: New Part (新部品)

※: New Part (新部品)



Ref. No.	Part No.	Description	(部 品 名)	Remarks	Common model		
※	30 12 56 NA 80 48 00	SK, IF Board # 84031	S K , I F シ ー ト				
※	30 12 56 NA 80 48 20	PA " # 84052	P A "				
※	30 12 56 NA 80 48 30	PB " # 84062	P B "				
※	30 12 56 NA 80 48 40	VCO " # 84072	V C O "				
※	30 12 56 NA 80 48 50	MOD " # 84082	M O D "				
※	30 12 56 NA 80 48 60	FA " # 84093	F A "				
※	30 12 56 NA 80 48 80	PGM " # 84114	P G M "				
※	30 12 56 NA 80 48 90	DM " # 84121	D M "				
※	30 12 56 NA 80 49 00	PL " # 84132	P L "				
※	30 12 00 NA 80 49 10	BL " # 84141	B L "				
※	30 12 00 NA 80 49 20	BR " # 84151	B R "				
※	30 12 00 NA 80 49 30	JK1 " # 84161	J K 1 "				
※	30 12 00 NA 80 50 20	JK2 " "	J K 2 "				
※	30 10 00 NA 80 54 10	MK " # 84831	M K "				
※	30 12 00 NA 80 48 10	DC " # 84041	D C "	J			
※	30 12 00 NA 80 54 20	DC " "	D C "	U, C			
※	30 12 00 NA 80 54 30	DC " "	D C "	G			
※	40 10 00 FD 31 21 00	Polystyrene Capacitor (K) 100pF	スチロールコンデンサ				
	40 10 00 FF 04 31 20	" (J) 1,200pF	"				
	40 10 00 FM 09 71 00	Nonpolar Capacitor 16V 10μF	N P コ ン デ ン サ				
	40 10 00 FM 61 61 00	" 50V 1μF	"				
	40 10 00 FP 33 63 30	Tantalum Capacitor 16V 3.3μF	タンタルコンデンサ				
	40 10 00 FP 34 51 50	" 25V 0.15μF	"				
	40 10 00 FP 34 61 50	" 25V 1.5μF	"				
	40 10 00 FP 35 52 20	" 35V 0.22μF	"				
	40 10 00 FP 35 61 00	" 35V 1μF	"				
	40 10 00 FP 33 71 00	" 16V 10μF	"				
	40 10 00 FP 34 61 00	" 25V 1μF	"				
	40 10 00 FT 21 52 20	Polypropylene Capacitor 0.22μF	ポリプロピレンコンデンサ				
	40 10 00 GD 90 02 50	Out Put Transformer	出 カ ト ラ ン ス				
	40 10 00 Hi 20 99 90	Solid Resistor (K) 10MΩ	ソ リ ッ ド 抵 抗				
	40 10 00 HL 31 24 70	Metal Oxide Film Resistor 1W 0.47Ω	酸化金属被膜抵抗				
	40 10 00 HL 31 51 50	" 1W 150Ω	"				
	40 10 00 HL 31 54 70	" 1W 470Ω	"				
	40 10 00 HL 32 36 80	" 2W 6.8Ω	"				
	40 10 00 HQ 42 00 30	Slide Variable Resistor B-10KΩ	ス ラ イ ド V R				
	40 10 00 HQ 42 00 60	" C-10KΩ	"				
	40 10 00 HS 31 05 50	Variable Resistor 16φ A-10KΩ	可 変 抵 抗 器				
	40 10 00 HS 31 05 70	" 16φ B-10KΩ	"				
	40 10 00 HS 31 07 30	" B-10KΩ	"	Center-tap			
※	40 10 00 HT 19 00 10	Semi Variable Resistor B-500Ω	半 固 定 抵 抗	V10K8-4-2	CS-40M		
	40 10 00 HT 19 00 40	" B-5KΩ	"	"			

※ : New Part (新部品)

Ref. No.	Part No.		Description (部 品 名)			Remarks	Common model		
	40 10 00	HT 19 00 50	Semi Variable Resistor	B-10K $\Omega$	半 固 定 抵 抗	V10K8-4-2			
	40 10 00	HT 19 00 60	"	B-20K $\Omega$	"	"			
	40 10 00	HT 19 00 80	"	B-100K $\Omega$	"	"			
	40 10 00	HT 19 00 90	"	B-100K $\Omega$	"	"			
	40 10 00	HT 19 01 00	"	B-500K $\Omega$	"	"			
	40 10 00	HT 19 01 30	"	B-2K $\Omega$	"	"			
	40 10 00	HT 56 00 70	"	B-10K $\Omega$	"	3321H-1			
	40 10 00	HT 69 00 10	"	B-5K $\Omega$	"	RJ9W			
※	40 10 00	HT 69 00 20	"	B-500K $\Omega$	"	"			
	40 10 00	HU 57 53 00	Metal Film Resistor	1% 300 $\Omega$	金 属 被 膜 抵 抗				
	40 10 00	HU 57 53 30	"	" 330 $\Omega$	"				
	40 10 00	HU 57 61 00	"	" 1K $\Omega$	"				
	40 10 00	HU 57 63 30	"	" 3.3K $\Omega$	"				
	40 10 00	HU 57 65 10	"	" 5.1K $\Omega$	"				
	40 10 00	HU 57 68 20	"	" 8.2K $\Omega$	"				
	40 10 00	HU 57 71 00	"	" 10K $\Omega$	"				
	40 10 00	HU 57 71 50	"	" 15K $\Omega$	"				
	40 10 00	HU 57 71 80	"	" 18K $\Omega$	"				
	40 10 00	HU 57 72 00	"	" 20K $\Omega$	"				
	40 10 00	HU 57 72 20	"	" 22K $\Omega$	"				
	40 10 00	HU 57 73 00	"	" 30K $\Omega$	"				
	40 10 00	HU 57 73 90	"	" 39K $\Omega$	"				
	40 10 00	HU 57 74 70	"	" 47K $\Omega$	"				
	40 10 00	HU 57 81 20	"	" 120K $\Omega$	"				
	40 10 00	HU 57 81 50	"	" 150K $\Omega$	"				
	40 10 00	HU 59 51 00	"	0.1% 100 $\Omega$	"				
	40 10 00	HU 59 61 00	"	" 1K $\Omega$	"				
	40 10 00	HU 59 65 00	"	" 5K $\Omega$	"				
	40 10 00	HU 59 71 00	"	" 10K $\Omega$	"				
※	40 10 00	HU 59 71 30	"	" 13K $\Omega$	"				
※	40 10 00	HU 59 71 40	"	" 14K $\Omega$	"				
	40 10 00	HU 59 72 00	"	" 20K $\Omega$	"				
	40 10 00	HU 59 74 00	"	" 40K $\Omega$	"				
	40 10 00	HU 59 78 00	"	" 80K $\Omega$	"				
	40 10 00	HU 59 81 00	"	" 100K $\Omega$	"				
	40 10 00	HU 59 81 60	"	" 160K $\Omega$	"				
	40 10 00	HZ 00 11 40	Metal Film Resistor	0.1% 29.94K $\Omega$	金 属 被 膜 抵 抗				
	40 10 00	HZ 00 11 50	"	" 1.684K $\Omega$	"				
※	40 10 00	HZ 00 12 10	"	" 252.6	"				
※	40 10 00	HZ 00 12 20	"	" 334.8	"				
※	40 10 00	HZ 00 12 30	"	" 412.6	"				
※	40 10 00	HZ 00 12 40	"	" 476.8	"				
※	40 10 00	HZ 00 12 50	"	" 519.8	"				
※	40 10 00	HZ 00 12 60	"	" 1.005K $\Omega$	"				
※	40 10 00	HZ 00 12 70	"	" 2.414K $\Omega$	"				
※	40 10 00	HZ 00 12 80	"	" 8.243K $\Omega$	"				
	40 10 00	iA 04 90 10	Transistor	2SA490 (Y)	ト ラ ン ジ ス タ				
※	40 10 00	iA 09 50 00	"	2SA950 (Y)	"				
	40 10 00	iA 10 15 20	"	2SA1015 (Y)	"				
	40 10 00	iC 18 15 20	"	2SC1815 (Y)	"				

※ : New Part (新部品)

Ref. No.	Part No.	Description	(部 品 名)	Remarks	Common model		
※	40 10 00 iC 21 20 00	Transistor	2SC2120 (Y)	ト ラ ン ジ ス タ			
	40 10 00 iD 02 35 10	"	2SD235 (Y)	"			
	40 10 00 iE 00 00 10	FET	2SK30A (Y)	F E T			
	40 10 00 iE 10 12 00	"	2SK105 (F)	"			
	40 10 00 iF 00 13 10	LED	TLR102KB	L E D			
	40 10 00 iF 00 00 10	Diode	1N34A	ダ イ オ ー ド			
	40 10 00 iF 00 00 40	"	1S1555	"			
	40 10 00 iF 00 03 00	"	1S1715P	"			
	40 10 00 iH 00 02 80	"	1D2C1	"			
	40 10 00 iH 00 02 90	"	1D2Z1	"			
※	40 10 00 iF 00 16 60	Zenor Diode	RD3.6EB1	ツェナーダイオード			
※	40 10 00 iF 00 16 70	"	RD6.8EB2	"			
※	40 10 00 iF 00 16 80	"	RD9.1EB3	"			
※	40 10 00 iF 00 16 90	"	RD5.6EB3	"			
※	40 10 00 iF 00 17 00	"	RD15EB3	"			
	40 10 00 iF 00 19 00	"	02BZ3.3	"			
	40 10 00 iG 00 11 80	I C	TC4013BP	I C	D-F/F x 2		
	40 10 00 iG 00 12 10	"	μA310H	"	OP Amp		
	40 10 00 iG 00 12 40	"	TC4011BP	"	NAND		
	40 10 00 iG 00 12 60	"	TC4049BP	"	Inverter		
	40 10 00 iG 00 13 90	"	NJM4558DV	"	OP Amp		
	40 10 00 iG 00 14 10	"	BA617	"	VCO		
	40 10 00 iG 00 14 40	"	TC4071BP	"	OR		
	40 10 00 iG 00 15 00	"	iG00150	"	VCO II		
	40 10 00 iG 00 15 10	"	iG00151	"	VCA		
	40 10 00 iG 00 15 30	"	iG00153	"	VCO III		
	40 10 00 iG 00 15 60	"	iG00156	"	(+) VCF		
	40 10 00 iG 00 15 80	"	iG00158	"	WSC		
	40 10 00 iG 00 15 90	"	iG00159	"	EG-VCA		
	40 10 00 iG 00 16 00	"	BA634	"	Divider		
	40 10 00 iG 00 16 20	"	μA796HC	"	Ring MOD.		
	40 10 00 iG 00 16 90	"	TC4016BP	"	Analog SW		
	40 10 00 iG 00 17 20	"	TC4069UBP	"	Inverter		
	40 10 00 iG 00 17 40	"	TC4050BP	"	Buffer		
	40 10 00 iG 00 17 60	"	TC4081BP	"	AND		
	40 10 00 iG 00 17 90	"	TC4030BP	"	EX-OR		
	40 10 00 iG 02 55 00	"	TA7504S	"	OP Amp		
	40 10 00 iG 02 56 00	"	TA7505M	"	OP Amp		
	40 10 00 iG 02 57 00	"	TC4017BP	"	Counter		
	40 10 00 iG 03 11 00	"	M54516P	"	Tr Array		
	40 10 00 iG 03 25 00	"	TA7531M	"	OP Amp		
※	40 10 00 iG 03 55 00	"	TC4028BP	"	DECODER		
※	40 10 00 iG 03 56 00	"	TC4532BP	"	8bit Encoder		
※	40 10 00 iG 03 57 00	"	TC4075BP	"	3 Input OR		
※	40 10 00 iG 03 58 00	"	TC40175BP	"	D-F/F		
※	40 10 00 iG 03 59 10	"	M58981S-45	"	RAM		
※	40 10 00 iG 03 61 00	"	NJM2901	"	Comparator		
※	40 10 00 iG 03 62 00	"	μPC271C	"	Comparator		
※	40 10 00 iG 03 63 00	"	TC4072BP	"	4 input OR		

※: New Part (新部品)



## **CS-40M SERVICE MANUAL**

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