

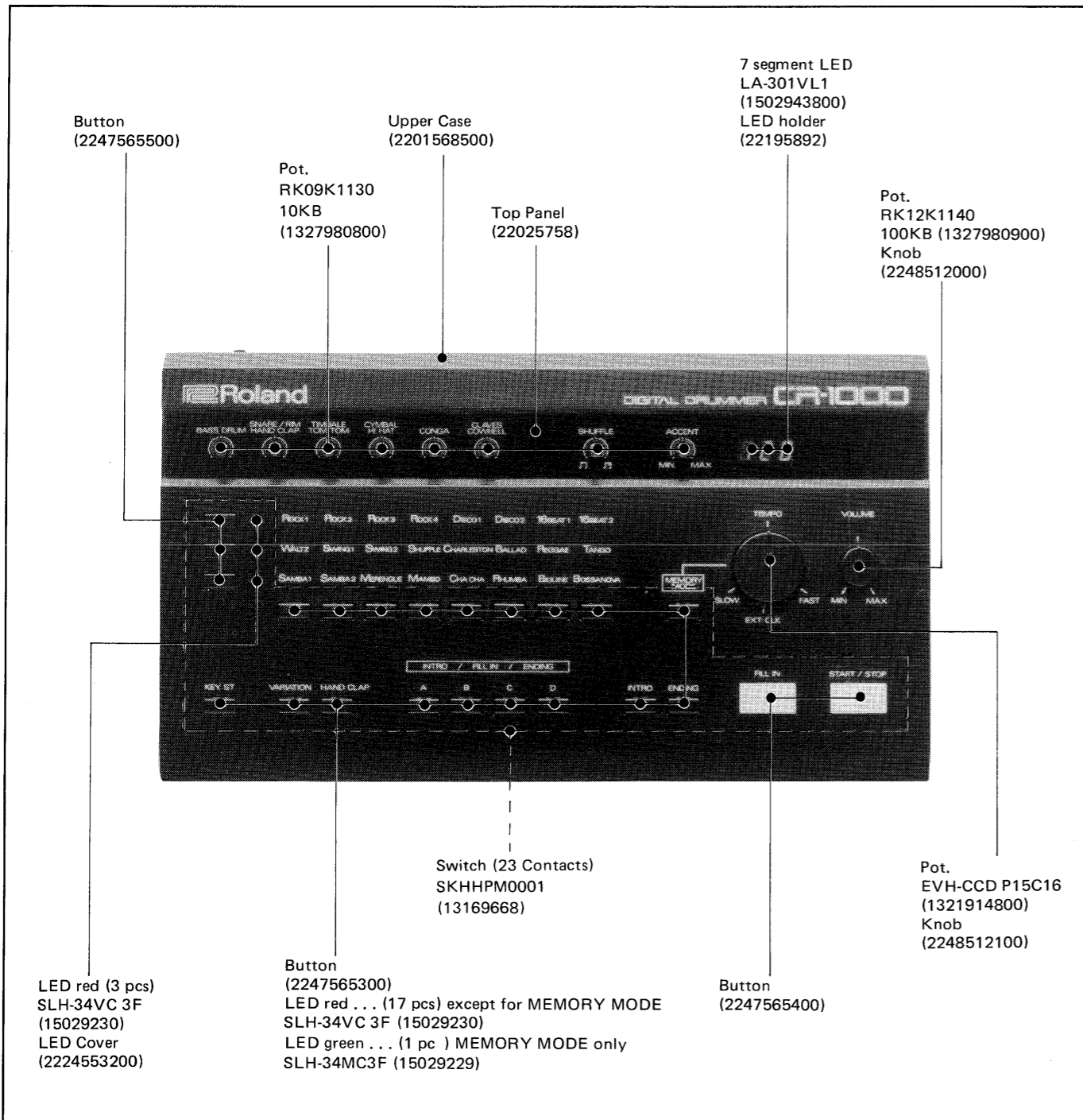
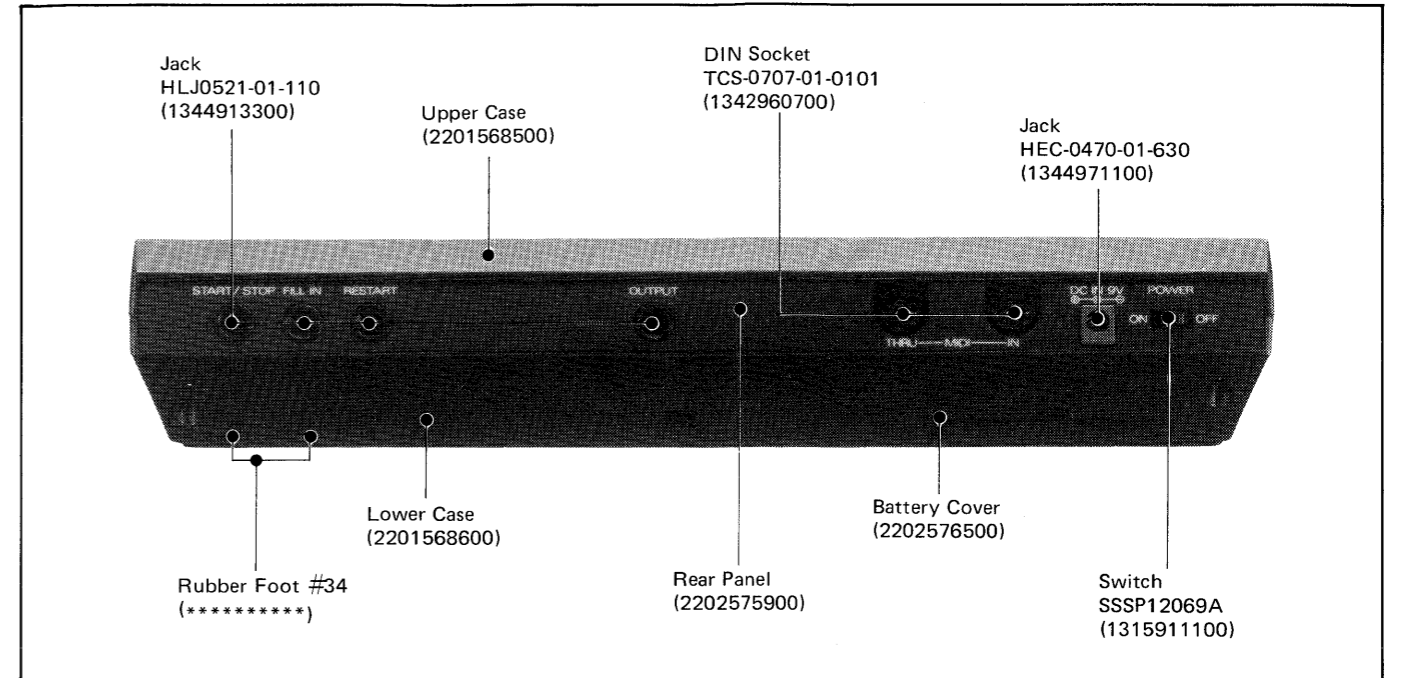
CR-1000

SERVICE NOTES

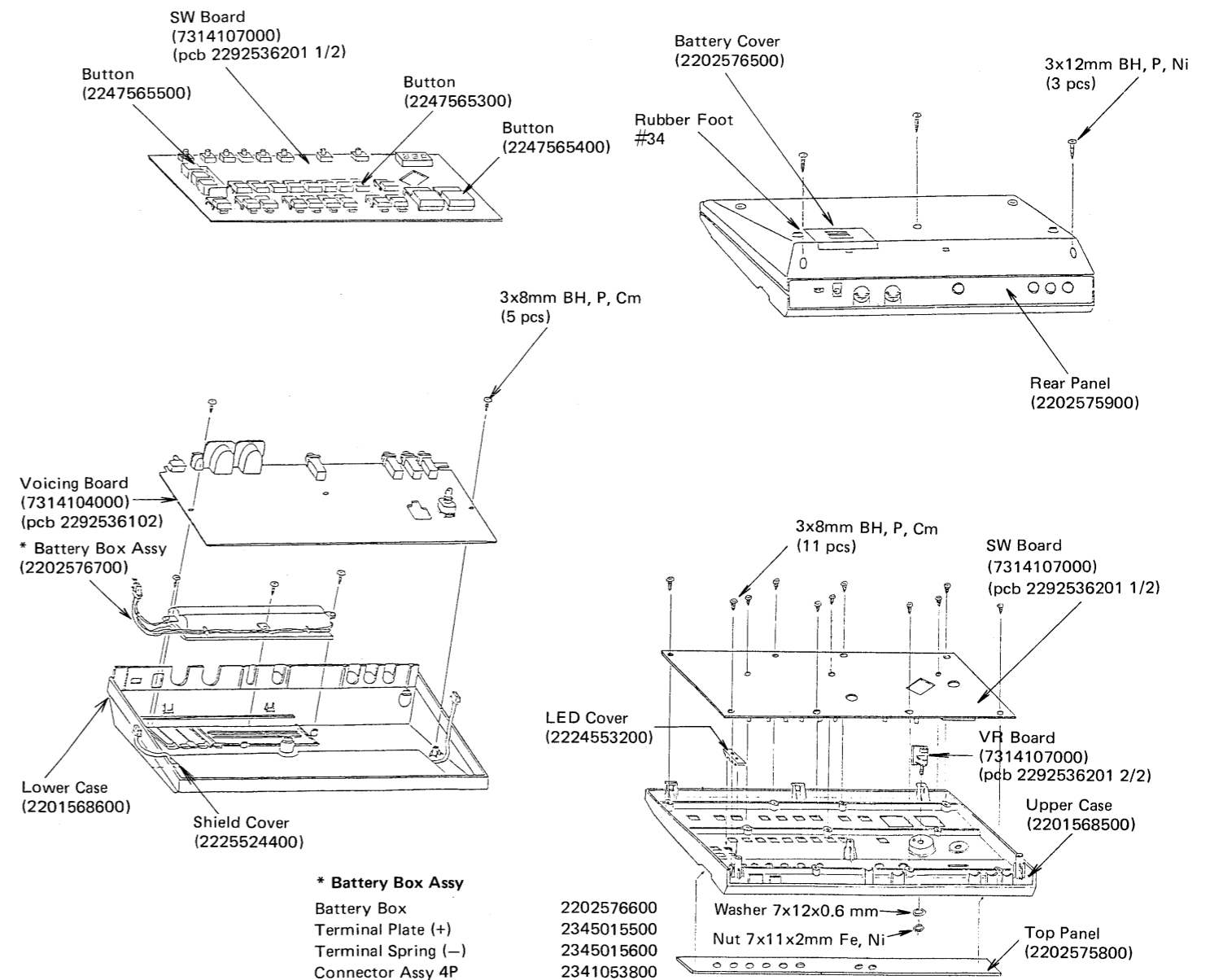
First Edition

SPECIFICATIONS

- Output** : Max. Level 3.5Vpp 100KΩ
Noise Level -74.5dBm (IHFA)
- Tempo** : ♩ = 40 to 240
- Power Requirements** : 9V DC (7.5V - 9.7V)
or AC Adaptor BOSS PSA-100, 120 or 240
- Current draw** : 100mA DC at 9V
- Battery life** : 6 hours using SUM3
- Dimensions** : 304 (W) x 176 (D) x 60 (H) mm
11-15/16 x 6-15/16 x 2-3/8 in.
- Weight** : 950 g/2 lb. 2 oz. including batteries
- Accessories** : Connection Cord LP-25
- Options** : AC Adaptor BOSS PSA-100, 120, 220 or 240
Pedal Switch DP-2



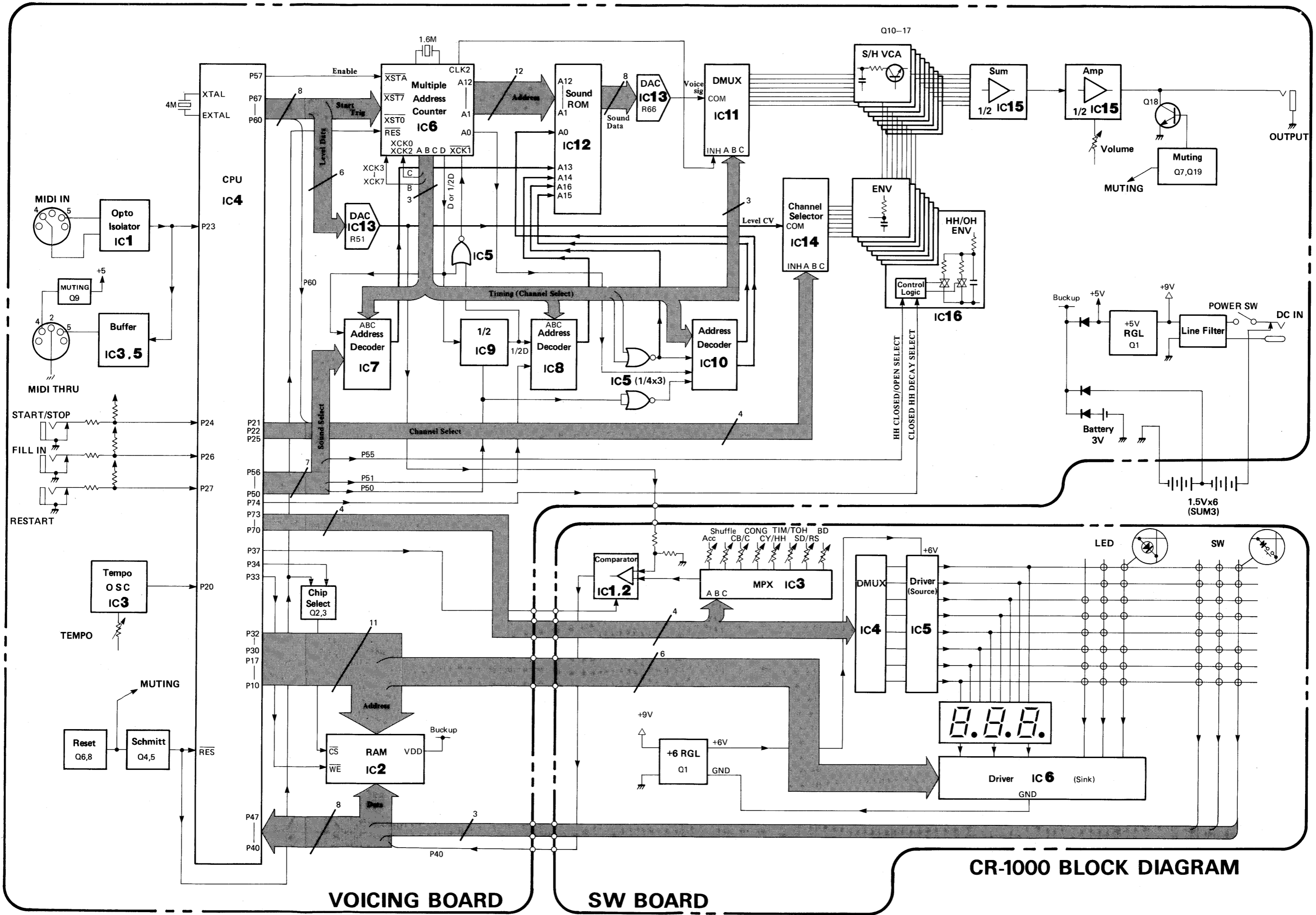
EXPLODED VIEW 分解図



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38

BLOCK DIAGRAM

A
B
C
D
E
F
G
H
I
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M
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CR-1000 BLOCK DIAGRAM

CIRCUIT DESCRIPTIONS

GENERAL DESCRIPTION

The sound reproduction system in the CR-1000 works on a multiplexing. With this system plural sound data stored in a single sound ROM can be addressed in sequence from a multiplex address counter containing 8 13-bit counters . . . capable of generating 8 different addresses concurrently. Then the multiplexed sounds, fetched from the sound ROM and converted to corresponding analog voltages, are sampled into the S/H capacitor of individual channels.

The multiplex address counter has found application on some predecessors and its function and applications are explained on the service notes of TR707/727, DDR-30 and TR-505. Readers not familiar with MBH63H114 are recommended to read the circuit description on these service notes, especially TR505's because TR505 and CR-1000 are very similar to each other in circuit configuration. The tables 1, 2 and 3 are duplication of those on TR-505 Service Notes. Only one sound differs from that of TR-505 which contains "HI COWBELL" instead of "CLAVES".

回路解説

概論

CR-1000ではマルチ音源、マルチアドレスシステムが採用されています。ここで言うマルチシステムとは1個のサウンドROMに格納されている音源データを複数のアドレスを同時に発生するマルチプルアドレスカウンタで順次読み出して行きアナログ電圧に変換後DMUXで各チャンネルに振り分けて行く方法です。同様の方法がTR707/727, DDR-30, TR505にも採用されており、基本的動作は、これらのサービスノートで詳しく説明されています。特にTR505とCR-1000の構成は基本的に同じですので、TR505サービスノートを参照する事をお勧めします。

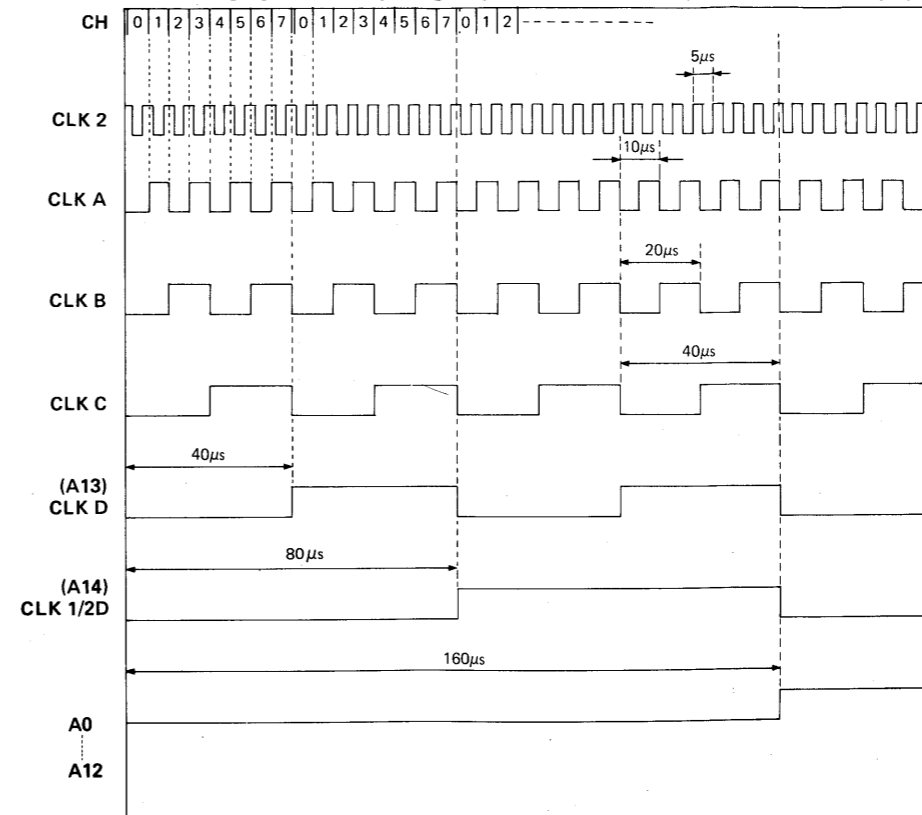
表1, 2, 3はTR505のサービスノートの表とほぼ同じですが、CR-1000での音源CLAVES (CLV) の部分だけTR505ではHICOWBELL (HCB) となり違っていますので注意して下さい。

(TABLE 1)

CH NO.	IC6 MB63H114 MULTIPLE ADDRESS COUNTER						IC12 SOUND ROM			
	INPUT		COUNTER STEP	OUTPUT		VOICE	CAPACITY (Bytes)			
	START	PIN NO.		CLOCK	PIN NO.				GATE ON PERIOD	PIN NO.
0	XST0=L	38	XCK0=C	56	40μsec	GAT0=330msec	32	OPEN HI-HAT, CLOSED HI-HAT (OH) (CH)	8K	
1	XST1=L	39	XCK1=D, XCK1=1/2D	57	80μs, 160μs	GAT1=660ms, GAT1=1320ms	31	RIDE CYMBAL, CRASH CYMBAL (RC) (CC)	16K, 32K	
2	XST2=L	40	XCK2=C	59	40μsec	GAT2=330msec	30	LOW TOM, MID TOM, HI TOM, TIMBAL (LT) (MT) (HT) (TIMB)	8K	
3	XST3=L	41	XCK3=B	60	20μsec	GAT3=164msec	29	BASS DRUM (BD)	4K	
4	XST4=L	44	XCK4=B	61	20μsec	GAT4=164msec	28	LOW CONGA, HI CONGA (LCG) (HCG)	4K	
5	XST5=L	45	XCK5=B	62	20μsec	GAT5=164msec	27	SNARE DRUM (SD)	4K	
6	XST6=L	46	XCK6=B	63	20μsec	GAT6=164msec	25	LOW COWBELL, CLAVES (LCB) (CLV)	4K	
7	XST7=L	47	XCK7=B	64	20μsec	GAT7=164msec	24	HAND CLAP, RIM SHOT (HCP) (RIM)	4K	

The drum voices in the same channel can not be selected at the same time. ()内はグラフィックディスプレイ上の省略記号です。

TIMMING CHART (CRASH CYMBAL) タイミングチャート (Fig. 1)



SOUND ROM MAP (TABLE 3)

	A16	A15	A14	A13	A12	A11	A10	A9	A8	A7	A6	A5	A4	A3	A2	A1	A0
TIMB(8K)	0	0	0	0													A0
LT(8K)	0	0	0	1													A0
HT(8K)	0	0	1	0													A0
MT(8K)	0	0	1	1													A0
BD(4K)	0	1	0	0													0(2n)
LCG(4K)	0	1	0	0													1(2n+1)
SD(4K)	0	1	0	1													0(2n)
HCG(4K)	0	1	0	1													1(2n+1)
HCP(4K)	0	1	1	0													0(2n)
LCB(4K)	0	1	1	0													1(2n+1)
RIM(4K)	0	1	1	1													0(2n)
CLV(4K)	0	1	1	1													1(2n+1)
CC(32K)	1	0	0	0													A0
	1	0	0	1													A0
	1	0	1	0													A0
	1	0	1	1													A0
RC(16K)	1	1	0	0													A0
OH(8K)	1	1	1	0													A0
CH(8K)	1	1	1	1													A0

(2n)=EVEN
(2n+1)=ODD

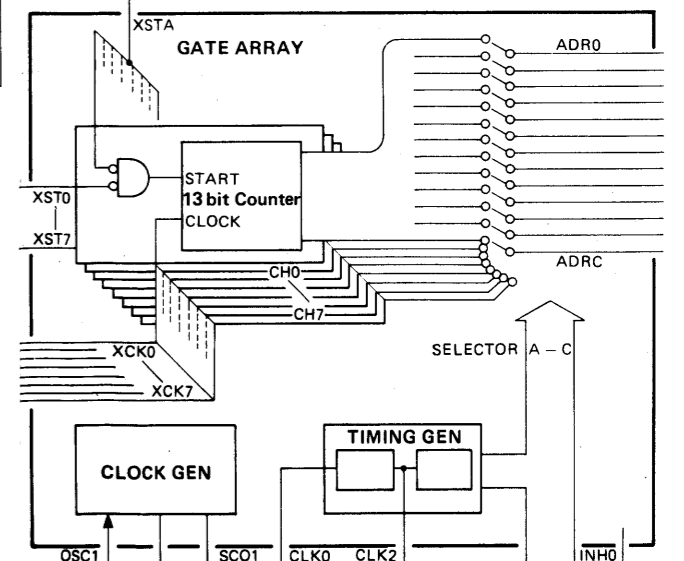
SOUND ROM SELECTOR (TABLE 2)

		A0	A1	A2	A3	A4	A5	A6	CH	Bytes
OPEN HI-HAT (OH)	AD0	AD1 - AD12	0	1	1	1	1	0	8K	
CLOSED HI-HAT (CH)	AD0	AD1 - AD12	1	1	1	1	1	0	8K	
CRASH CYMBAL (CC)	AD0	AD1 - AD12	D	1/2D	0	1	1	1	32K	
RIDE CYMBAL (RC)	AD0	AD1 - AD12	D	0	1	1	1	0	16K	
TIMBAL (TIMB)	AD0	AD1 - AD12	0	0	0	0	0	0	8K	
LOW TOM (LT)	AD0	AD1 - AD12	1	0	0	0	0	2	8K	
HI TOM (HT)	AD0	AD1 - AD12	0	1	0	0	0	0	8K	
MID TOM (MT)	AD0	AD1 - AD12	1	1	0	0	0	0	8K	
BASS DRUM (BD)	0	AD1 - AD12	0	0	1	0	3	4K		
LOW CONGA (LCG)	1	AD1 - AD12	0	0	1	0	4	4K		
HI CONGA (HCG)	1	AD1 - AD12	1	0	1	0	0	4K		
SNARE DRUM (SD)	0	AD1 - AD12	1	0	1	0	5	4K		
LOW COWBELL (LCB)	1	AD1 - AD12	0	1	1	0	6	4K		
CLAVES (CLV)	1	AD1 - AD12	1	1	1	0	0	4K		
HAND CLAP (HCP)	0	AD1 - AD12	0	1	1	0	7	4K		
RIM SHOT (RIM)	0	AD1 - AD12	1	1	1	0	0	4K		

(CPU) SOUND SELECT SIGNAL

CPU PORT	PIN NO.	"Hi"	"Low"
P50	17	RC	CC
P51	18	HT, MT	LT, TB
P52	19	HCG	LCG
P53	20	LT, MT	HT, TB
P54	21	CLV	LCB
P55	22	CH	OH
P56	23	RIM	HCP

GATE ARRAY 63H114 Multiple Address Counter



TESTING

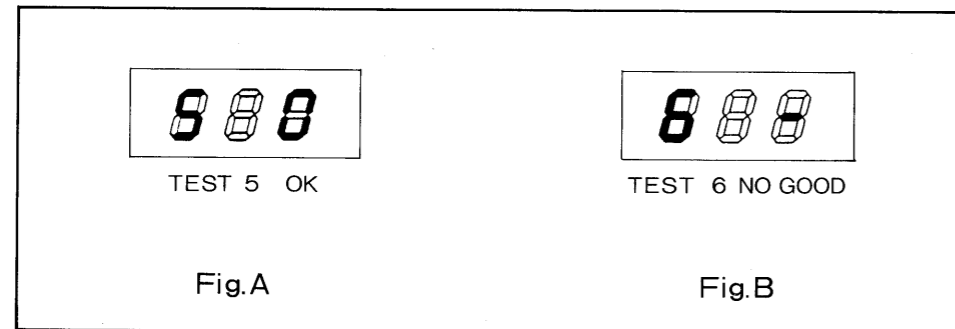
The built-in test program executes the following tests while in the TEST mode.

TEST PROGRAM

While holding down BEGUINE (Rhythm Key 7) and MEMORY MODE, switch the power on. The unit is now in the test mode.

To select tests 1 through 9, press START/STOP to increment the test number or press FILL IN to decrement.

Upon completion of test 2, 5, 6 or 7, the LED display will indicate the result as exemplified in Fig. A or Fig. B, respectively.



CAUTION

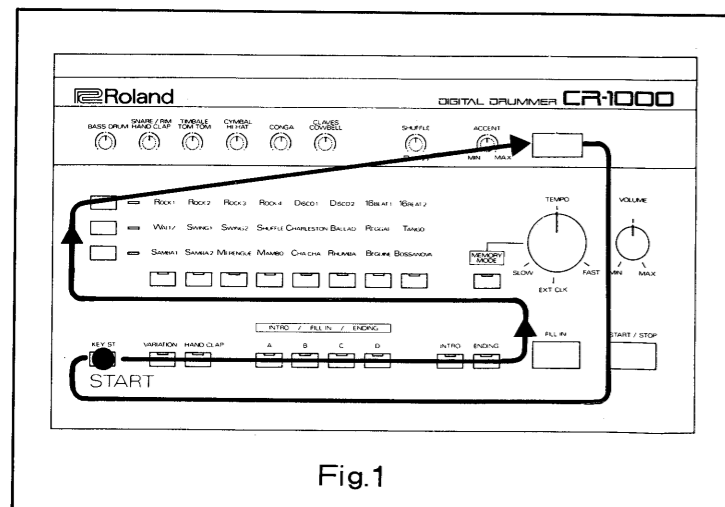
Both Factory and User's data in the backed up RAM IC2 will be erased somewhere during the TEST mode. Only the factory data can be revised by initializing the memory as instructed later. (Refer to "EXITING TEST MODE")

TEST 1. LEDS LIGHTING

While holding down BEGUINE (Rhythm Key 7) and MEMORY MODE, switch the power on. The unit is now in the test mode and executes TEST 1 automatically.

LEDs will light one by one in the order as shown in Fig. 1 and repeat the sequence.

(Each segment of the three 7-segment LEDs will light one by one in order at the same time.)



テスト

CR-1000には回路機能チェック用のプログラムが内蔵されています。

このプログラムを走らせるにはテストモードに入る必要が有ります。

テストモード

リズムセレクトキー (BEGUINE) と MEMORY MODE のボタンを同時に押しながら電源をオンにするとテストモードにはいれます。

テストは1から9まで有り、テストナンバーは START/STOP ボタンを押す事により前進、FILL IN で後退します。テスト2、5、6、7については下図のような良否判定表示が出ます。

注意

テスト実行中にRAM (IC2) 内のファクトリデータとユーザが書き込んだデータは消されます。後述のメモリーニシヤライズをする事によりファクトリデータだけは復旧出来ます。(「通常モードへ」参照)

TEST 1. LED点灯

(1) リズムセレクトキー (BEGUINE) と MEMORY MOD ボタンを同時に押しながら電源をオンにするとテストモードに入ります。

(2) テストモードに入ると同時に下図の順にLEDが1ずつ点灯します。

7セグメントLEDは3桁同時に1セグメントずつ点灯します。

そして次のテストへ進まないかぎり下図のように点灯を繰り返すことを確認します。

TEST 2. SWITCHES

- 1) Press START/STOP.
- 2) Press panel button, except for START/STOP and FILL IN, one of 21 buttons at a time in any order.
- 3) Check the mated LED for lighting followed by a click of RIM SHOT. After the 21st button has been checked, all the LEDs will light again, this time, simultaneously.

TEST 3. POTENTIOMETERS

- 1) Press START/STOP: The leftmost digit will display "3" (TEST 3).
- 2) Press KEY ST. The rightmost digit display will show "1", signaling that BASS DRUM control is being selected.
- 3) Rotate BASS DRUM ccw, and then cw and check BANK LEDs for on or off according to the setting. (The audio output level will also vary.)
- 4) Repeat steps 2) and 3) for remaining knobs 2 to 8 shown in Fig. 2.

TEST 2. スイッチ読み込み

- (1) START/STOP ボタンを押します。
- (2) フロントパネル上の21個のボタン (START/STOP, FILL INを除く) のどれか1つを押します。
- (3) ボタンを押すごとに、それぞれのボタンに対応したLEDが点灯し同時にリムショット音が鳴ることを確認します。
21個のボタン全てを押し終るとLEDが全て同時に点灯します。

テスト 3. ボリューム動作

- (1) START/STOP ボタンを押すと7セグメントLEDの左の桁にテストナンバー "3" が表示されます。
- (2) KEY ST ボタンを押すとBASS DRUM ボリュームが選択されそのボリュームナンバー "1" がディスプレイの右の桁に表示されます。
- (3) 選択されたBASS DRUMボリュームを回し、3つのバンク用LEDが、それに伴って点灯する事を確認します。(音源の連打音の大きさも変化します。)
- (4) 残りの7つのボリュームについても同様にステップ(2)と(3)を繰り返し確認します。

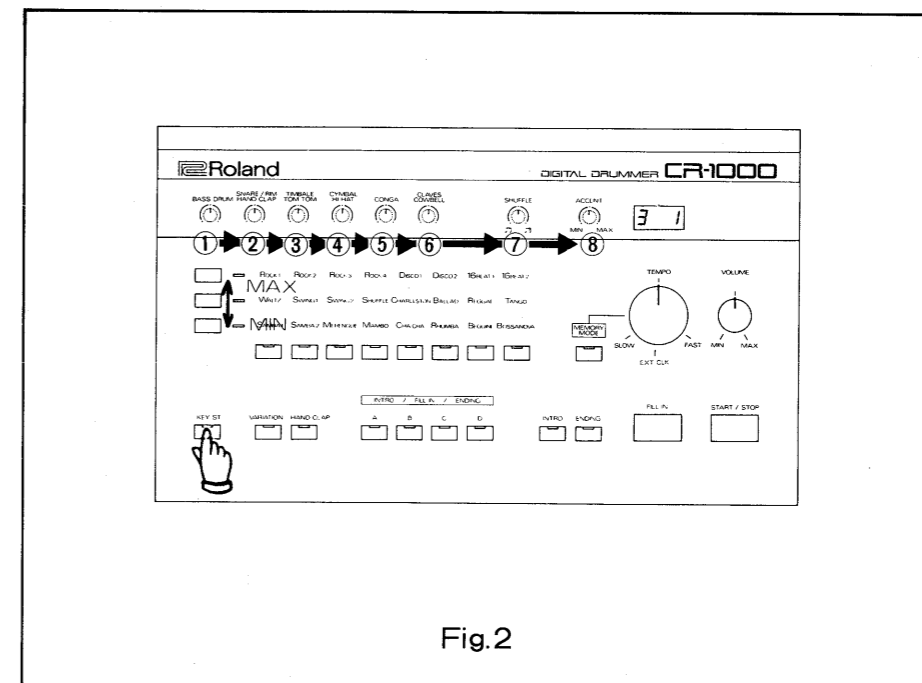


Fig.2

TEST 4. TEMPO DISPLAY

- 1) Press START/STOP. The 7 segment LEDs show the tempo speed to the TEMPO knob setting. (Max. = more than 240, Min. = less than 40).
- 2) Set TEMPO knob to EXT CLK position. The 7 segment LEDs should show "Ec".

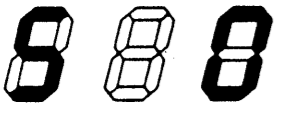
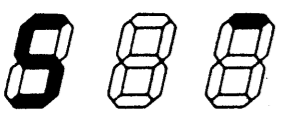
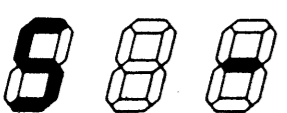
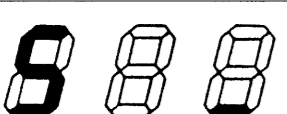
テスト 4. テンポ表示

- (1) START/STOP ボタンを押します。テンポつまみで設定されたテンポを表示します。(最大240以上 - 最小40以下)
- (2) EXT CLKの位置にすると "Ec" を表示します。

TEST 5. RAM IC2 WRITING AND READING

CAUTION: TEST 5 erases the customer's data in RAM IC2.

Press START/STOP. The CPU writes the test data into RAM IC2, reads back the data, verifies it and displays the results as shown in the table below.

DISPLAY	RESULT	SUSPECTIVE CIRCUIT
	OK	_____
	DEFECTIVE	Data bus (IC2 pin9, 10, 11, 13, 14, 15, 16, 17) Control signal (IC2 pin21, WR;pin18, CS)
	DEFECTIVE	The lower 8 bits of address bus. (CPU port 1: pin 43 through pin 50)
	DEFECTIVE	The higher 3 bits of address bus. (CPU port 30-32: pin 56 through pin 58)

テスト 5. RAM(IC2)書き込み、読み出し

注 このテストを実行するとRAM(IC2)に書き込まれているデータは全て書き替わります。

START/STOP ボタンを押します。CPUはRAM(IC2)にデータを書き込み、ベリファイし、RAMのリード、ライトが正しく行われているかチェックし下表のように良否判定表示をします。

TEST 6. MIDI IN

- 1) Press START/STOP.
- 2) Apply a squarewave (5Vpp, 2KHz-20KHz) to MIDI IN jack as shown in Fig. 3. The CPU reads the square-wave and displays the result.

テスト 6. MIDI IN動作

- (1) START/STOP ボタンを押します。
- (2) 下図のように矩形波 (2KHz~20KHz程度、5Vpp) をMIDI INに加えるとCPUはこの矩形波を読み込みMIDI IN回路の良否判定表示をします。
(注 このテストはハードウェアのテストで、MIDI信号そのもののテストでは有りません。)

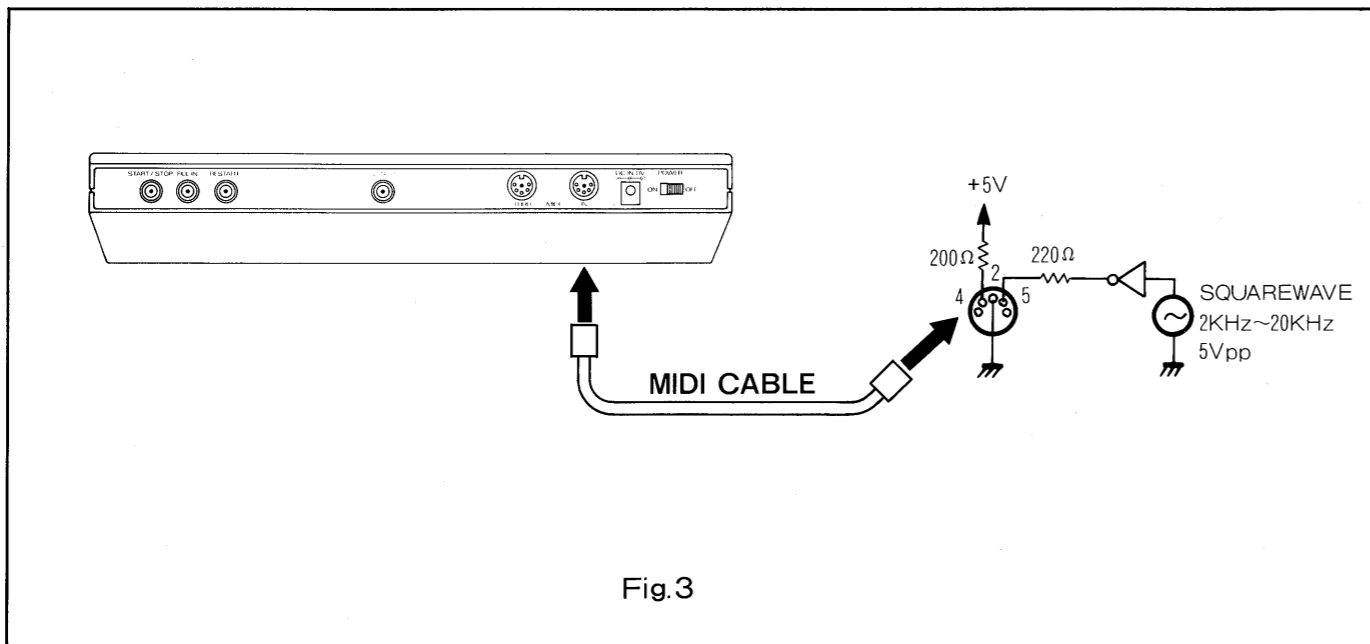


Fig.3

TEST 7. START/STOP, FILL IN, RESTART JACK

- 1) Press START/STOP. Each digit of the 7-segment LEDs corresponds to START/STOP, FILL IN and RESTART jacks, respectively, as shown in Fig. 4.
- 2) Connect open-circuit plug into START/STOP jack; CPU port 24 will be pulled up "H", causing corresponding digit LED to display "0".
- 3) Pull out the plug from the jack.
- 4) In the same way, check FILL IN and RESTART jacks.

テスト 7. ジャック動作

- (1) START/STOP ボタンを押します。
START/STOP, FILL IN, RESTART の各ジャックが下図の様に7セグメントLEDに、それぞれ対応します。
- (2) START/STOP ジャックにオープンプラグを接続 ("H" レベルにプルアップ)すると良否判定表示が出ます。
- (3) ジャックを抜きます。
- (4) 同様にFILL IN, RESTARTジャックも確認します。

TEST 8. DAC OUTPUT

- 1) Press START/STOP.
- 2) Connect the oscilloscope to the cathode of D9 on the voicing board and verify the waveform below.
- 3) Disconnect the scope.

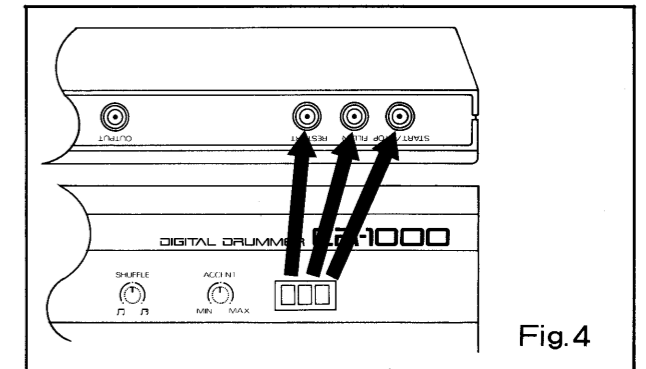
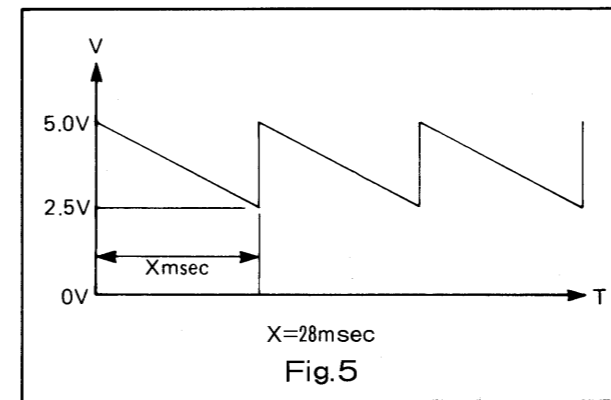


Fig.4

テスト 8. レベルデータD/A変換動作

- (1) START/STOP ボタンを押します。
- (2) オシロスコープをボイス基板のD9のカソード側に接続し、左図の信号を確認します。
- (3) オシロスコープを外します。

TEST 9. SOUND CHECK

- 1) Press START/STOP button.
- 2) Select a particular sound by pressing Bank and Rhythm buttons as shown in Fig. 6 and verify the sound through monitoring.
Repeat for the remaining sounds.

テスト 9. 音出し動作

- (1) START/STOP ボタンを押します。
- (2) 各音源は下図の様に対応しています。各音源に対応したバンクキーとリズムキーを押し、各音源が正しく発音されるか耳で確認します。

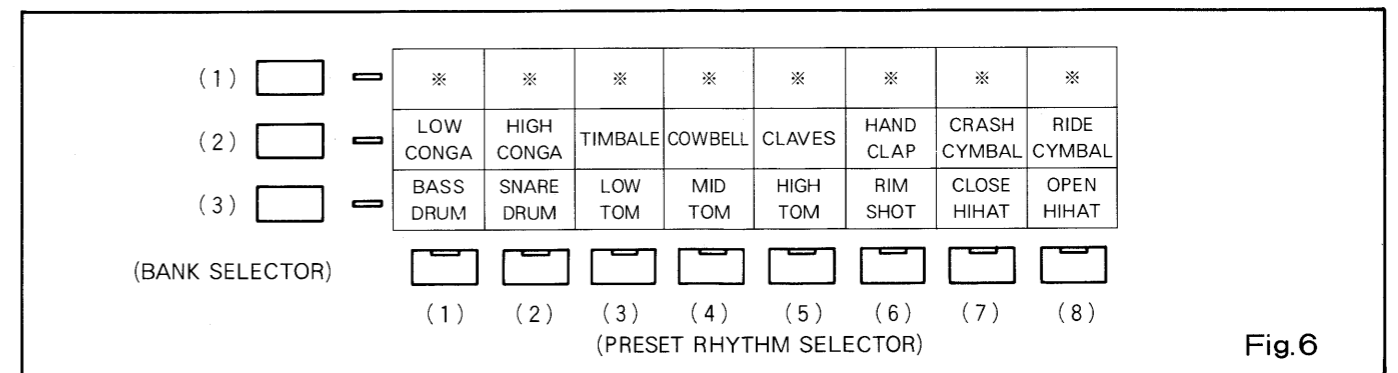


Fig.6

EXITING TEST MODE

- * Press START/STOP. The RAM (IC2) will be initialized and the unit returns to the normal mode.
- or
- * Turn off the power first. While holding down VARIATION and HAND CLAP, switch the power on again to initialize the RAM (IC2).

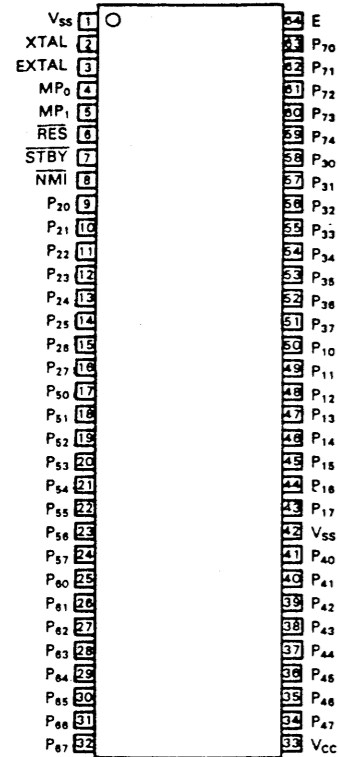
通常モードへ

- * テスト 9 の状態から START/STOP ボタンを押します。または、
- * 一旦電源を切った後、VARIATIONとHAND CLAP ボタンを同時に押しながら電源をONします。上記のどちらかを実行する事でRAM(IC2)が、インシャライズされ通常モードへ戻ります。

IC DATA

CPU HD6301Y0B33P
(HD6301Y0B57P)

Pin Configuration
(Top View)

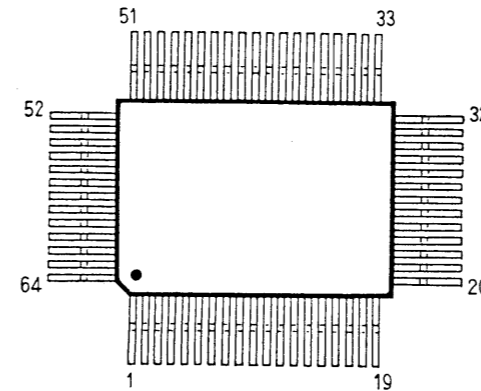


Port Assignment

PIN NO.	PORT NAME	DESCRIPTION
1	Vss	GND
2	XTAL	terminal, Xtal
3	EXTAL	terminal, Xtal or external system clock in
4	MP0	input, MCU mode setting pulled up +5V
5	MP1	input, MCU mode setting pulled up +5V
6	RES	input, MCU reset (active low)
7	STBY	unused, pulled up +5V (active low)
8	NMI	unused, pulled up +5V (active low)
9	P20	input, TEMPO CLOCK
10	P21	output, Channel Selector INH
11	P22	output, Channel Selector C
12	P23	input, MIDI IN
13	P24	input, START/STOP
14	P25	output, Channel Selector B
15	P26	input, FILL IN
16	P27	input, RESTART
17	P50	(RC/CC)
18	P51	(HT, MT/LT, TB)
19	P52	(HCG/LCC)
20	P53	output, Sound Selector (LT, MT/HT, TB)
21	P54	(CLV/LCB)
22	P55	(CH/OH)
23	P56	(RIM/HCP)
24	P57	output, Enable
25	P60	
26	P61	
27	P62	
28	P63	output, Start Trigger
29	P64	Level & D/A data
30	P65	
31	P66	
32	P67	
33	Vcc	input, +5 power supply
34	P47	
35	P46	
36	P45	input, SW Condition
37	P44	
38	P43	input/output, Ext RAM data bus
39	P42	
40	P41	
41	P40	input, A/D Input
42	Vss	GND
43	P17	
44	P16	
45	P15	LED data
46	P14	
47	P13	output, Ext RAM address bus
48	P12	
49	P11	LED data (for 7 seg.)
50	P10	
51	P37	output, A/D Enable
52	P36	unused
53	P35	unused
54	P34	output, Ext RAM CS
55	P33	output, Ext RAM WR
56	P32	
57	P31	output, Ext RAM address bus
58	P30	
59	P74	output, Closed HH Decay Selector
60	P73	
61	P72	output, VR, SW & LED Matrix Selector
62	P71	
63	P70	
64	E	unused, system clock

GATE ARRAY
RD63H114

Pin Configuration
(Top View)



PIN	name	PIN	name	PIN	name
1	INHO	23	CST 6	45	XST 5
2	ADRC	24	GATE 7	46	XST 6
3	A	25	GATE 6	47	XST 7
4	D	26	VDD	48	TST 1
5	B	27	GATE 5	49	TST 2
6	ADR 7	28	GATE 4	50	XSTA
7	C	29	GATE 3	51	MSEL
8	ADR 6	30	GATE 2	52	CLK 1
9	ADR 8	31	GATE 1	53	CLK 2
10	VSS	32	GATE 0	54	CLK 3
11	ADR 9	33	XRES	55	CLK 4
12	ADR 5	34	OSC i	56	XCK 0
13	ADR 8	35	SCO 0	57	XCK 1
14	ADR 4	36	SCO 1	58	VDD
15	ADR 3	37	CLK 0	59	XCK 2
16	ADRA	38	XST 0	60	XCK 3
17	ADR 2	39	XST 1	61	XCK 4
18	ADR 1	40	XST 2	62	XCK 5
19	ADRO	41	XST 3	63	XCK 6
20	CST 0	42	VSS	64	XCK 7
21	CST 2	43	XOUT		
22	CST 4	44	XST 4		

Multiple Address Counters

DESIGNATION	PIN	DESCRIPTION	I/O		
CST	0	pulled up (+5V) } continue start	counter 0	I	
	2		counter 2	I	
	4		counter 4	I	
	6		counter 6	I	
XST	A	XST0-XST7 enable, active low	counter 0	I	
	0		counter 1	I	
	1		counter 2	I	
	2		counter 3	I	
	3		counter 4	I	
	4		counter 5	I	
	5		counter 6	I	
	6		counter 7	I	
XCK	0	counter start, active low	counter 0	I	
	1		counter 1	I	
	2		counter 2	I	
	3		counter 3	I	
	4		counter 4	I	
	5		counter 5	I	
	6		counter 6	I	
	7		counter 7	I	
XOUT	0	address (ADRO-ADRC) out enable, active low; high=HI z	counter 0	I	
	1		counter 1	I	
	2		counter 2	I	
	3		counter 3	I	
	4		counter 4	I	
	5		counter 5	I	
	6		counter 6	I	
	7		counter 7	I	
ADR	0	ROM ADDRESS		O	
	1			O	
	2			O	
	3			O	
	4			O	
	5			O	
	6			O	
	7			O	
	8			O	
	9			O	
	A			O	
	B			O	
A	3	MUX, DMUX channel select	100kHz	O	
	5		system clock	50kHz	O
	7		for 8	25kHz	O
	4		counters	12.5kHz	O
INHO	1	DMUX inhibit		O	
				O	
OSCI	34	internal clock generator	master clock out 1.6MHz	I	
	35		system clock in 1.6MHz	I	
	36			O	
CLK	0	system clock 100kHz		I	
	1			O	
	2			O	
	3			O	
XRES	33	reset pulse, active low		I	
	51		counter 12/13 bit select	pulled down	I
TST1	48	IC test		I	
	49			pulled down	I
Vss	10	GND			
	42				
VDD	26	power supply +5V			
GAT	0	counter gate output	Hi=counter running	O	
	1			O	
	2			O	
	3			O	
	4			O	
	5			O	
	6			O	
7		O			

PARTS LIST

CASING ケース

22015685	Upper Case	上ケース
22015686	Lower Case	下ケース
22025765	Battery Cover	電池カバー
22025767	Battery Box Assy (including the following 4 parts)	電池ボックス完成品 (下記4点を含む)
2202576600	Battery Box	電池ボックス
2345015500	Terminal Plate (+)	端子板
2345015600	Terminal Spring (-)	端子板
2341053800	Connector Assy 4P	リード付コネクタ完成品
22025758	Top Panel	トップパネル
22025759	Rear Panel	リアパネル

KNOB, BUTTON ツマミ, ボタン

22475654	Button (large)	モールドツマミ (大)
22475653	Button (small with a window)	モールドツマミ (小、窓付)
22475655	Button (small, 3P)	モールドツマミ (小、3連)
22485121	Knob rotary (large)	丸ツマミ (大)
22485120	Knob rotary (small)	丸ツマミ (小)

PCB ASSY 基板完成品

7314107000	SW Board (pcb 2292536201 1/2)	スイッチ基板
7314107000	VR Board (pcb 2292536201 2/2)	ボリューム基板

Replacement pcb for SW board or VR board is available in a set of these two boards with SW board being the representative.
 補修用基板はスイッチ基板 およびボリューム基板のセットとなっています。
 補修用基板の代表名はスイッチ基板となります。

7314104000	Voicing Board (pcb 2292536102)	音源基板
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COIL コイル

12449272	Line filter GM-50510152	ラインフィルタ
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JACK, SOCKET ジャック, ソケット

13429607	TCS-0707-01-0101	DIN	MIDI IN, MIDI THRU
13449711	HEC-0470-01-630	AC Adapter	DC IN 9V
13449133	HLJ-0521-01-110	monaural	START/STOP, FILL IN, RESTART

SWITCH スイッチ

13159111	SSSP12004A	POWER
13169668	SKHHPM0001	

POTENTIOMETER ボリューム

13219148	EVH-CCDP15C16	1MC	TEMPO
13279808	RK09K1130	10KB	BASS DRUM, SNARE/RIM, HAND CLAP TIMBALE, TOM TOM, CYMBAL, HI HAT CONGA, COWBELL, SHUFFLE, ACCENT
13279809	RK12K1140	100KB	VOLUME

CERAMIC RESONATOR 発振子

12389735	CSA 1.6MHz
12389729	CSA 4.0MHz

IC

15229825	MB63H114PF	gate array
15179248	HD6301Y0B33P	CPU
15179781	HN62311BPC-10	CMOS mask ROM (SOUND ROM)
15179317	TC5517APL	CMOS S-RAM
15159105D0	BU-4013B	CMOS
15159106D0	BU-4016B	CMOS
15159113D0	BU-4051B	CMOS
15159116D0	BU-4069UB	CMOS
15159134D0	BU-4028B	CMOS
15169516	TC74HC02P	H CMOS quad 2-input NOR gate
15169532	TC74HC51P	H CMOS dual 2 wide-2input AND/OR gate
15169533	TC74HC151P	H CMOS
15189136	M5218L	Op. amp hex inverter
15229712	PC-900	photo coupler
15189194	BA6993	comparater
15149110	M54562	transistor array
15149126	BA914A	transistor array

TRANSISTOR トランジスタ

15119106DR	2SA933R	PNP
15129136	2SC2878-A	NPN
15129140	2SC2603E	NPN
15129602	2SD667C	NPN
15129616	2SD1469M-R	NPN

DIODE ダイオード

15019125	1SS-133		
15019209T0	S-5500G	rectifier	整流器
15019406	MTZ6.8B	6.8V zener	ツェナー
15019409	MTZ5.6C	5.6V zener	ツェナー
15029229	SLH-34MC3F	LED green	緑
15029230	SLH-34VC3F	LED red	赤
15029438	LA-301VL1	7-seg. LED	

RESISTOR ARRAY 抵抗アレイ

13919118	RGSD16L104G	R-2R ladder network (A/D converter)
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CONNECTOR コネクタ

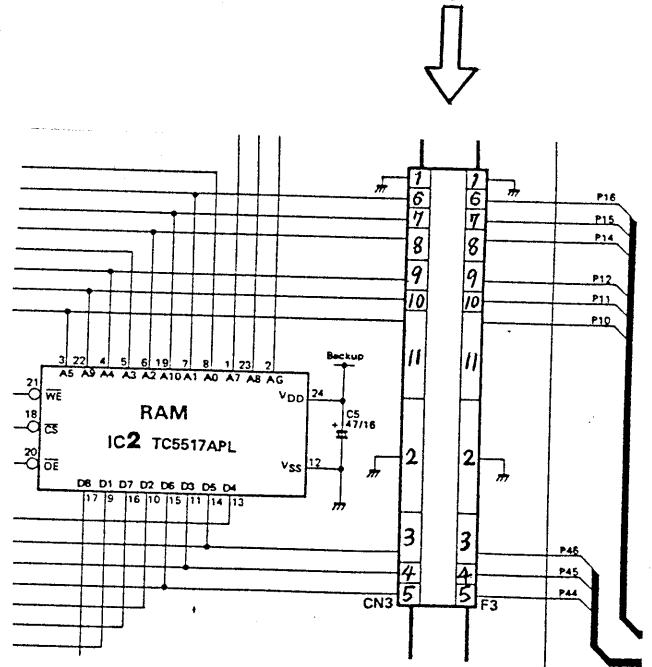
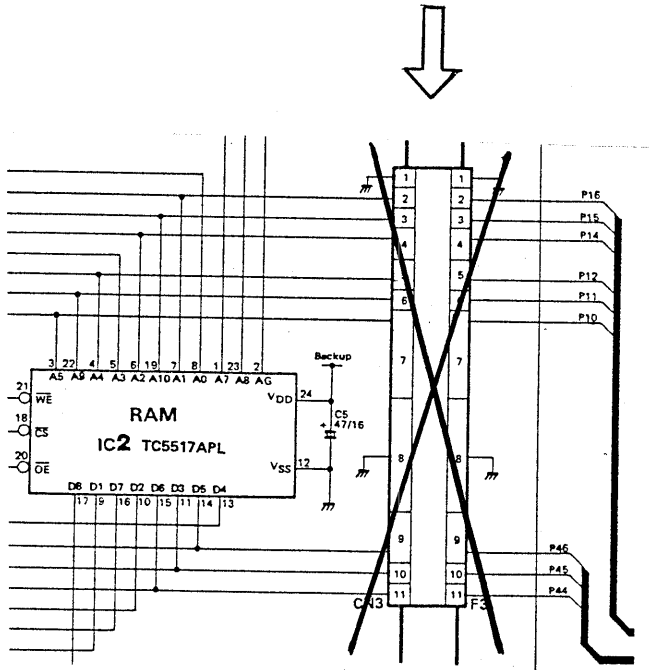
13439320	IL-S-4P-S2T2-EF	4P (Voicing pcb)
13439298	IL-S-10P-S2T2-EF	10P (Voicing pcb)
13439331	IL-S-11P-S2T2-EF	11P (Voicing pcb)
13439333	IL-S-2P-S2T2-EF	2P (Voicing pcb)
13439332	IL-S-5P-S2T2-EF	5P (VR pcb)

MISCELLANEOUS その他

22195892	LED Holder	(7-seg LED)
12569255	Lithium battery M2B-C200 3V	リチウム電池
12569105	Dry cell SUM-3S 1.5V	単三乾電池
22255244	Shield Cover (for Lower case)	シールドカバー
22245532	LED Cover	LEDカバー
*****	Rubber Foot #34	ゴム足

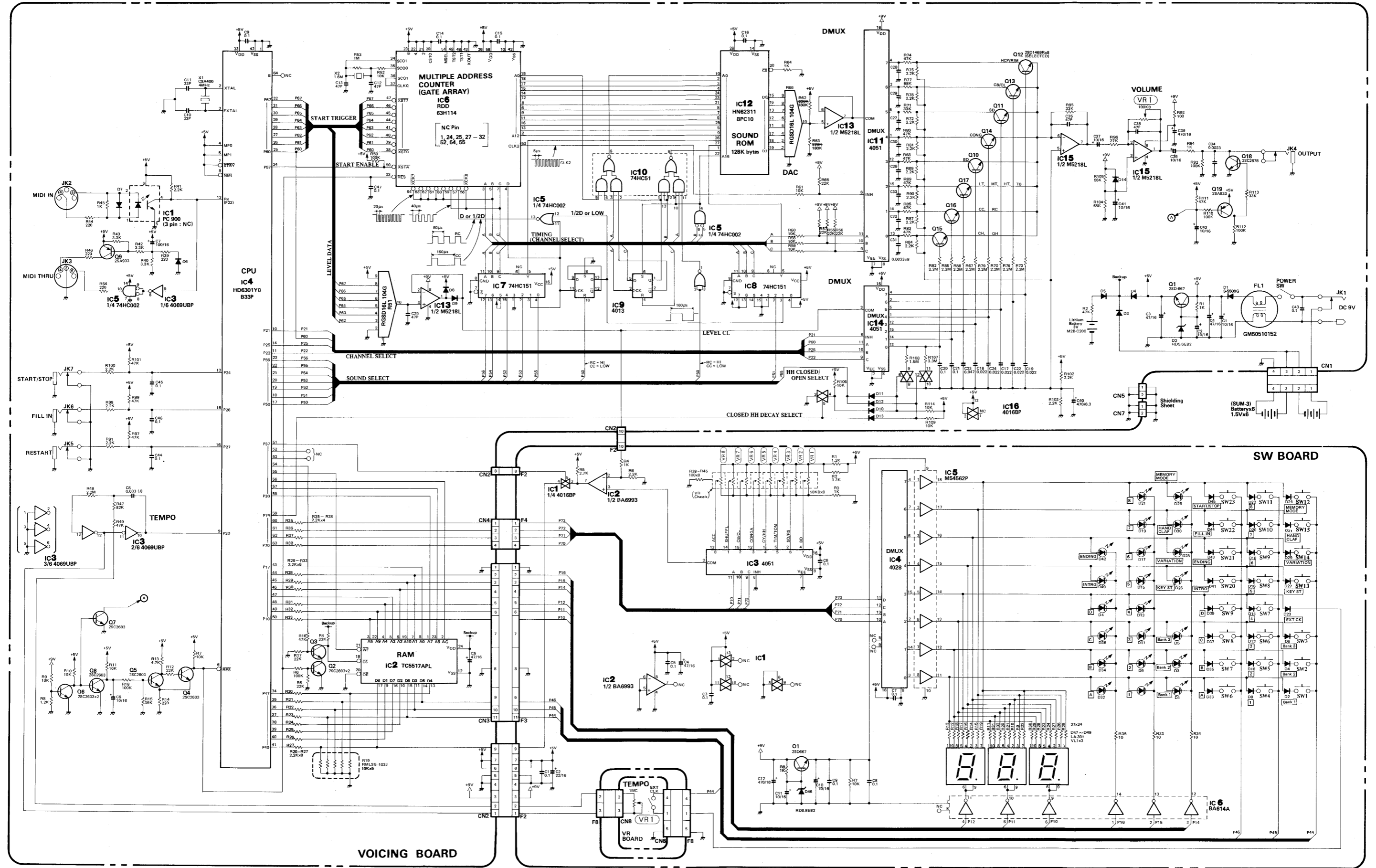
CR-1000

訂正 CORRECTION



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39

CIRCUIT DIAGRAM



A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

Rhythm machine

MODEL CR-1000 MIDI Implementation

1. RECOGNIZED RECEIVE DATA

1.1 In NORMAL and MIDI SYNC mode.

Status	Second	Third	Description
1001 nnnn	0kkk kkkk	0vvv vvvv	Note ON 0kkk kkkk = 0 - 127 #1 0 - 54 #2 0vvv vvvv = 1 - 127
1011 nnnn	0111 1100	0000 0000	OMNI OFF
1011 nnnn	0111 1101	0000 0000	OMNI ON
1100 nnnn	0ppp pppp		Program change 0ppp pppp = 0 - 51, 56 - 63 #3 #4
1111 1000			Timing Clock #5
1111 1010			Start #5
1111 1011			Continue #5
1111 1100			Stop #5

- Notes :
- #1 For 'KEY START' function. If the function is set, rhythm sequence will start when any 'NOTE ON' message is received.
 - #2 For 'NUANCE' function. If the power has been applied while INTRO/FILL IN/ENDING PATTERN SELECT KEY 'B' being held down, velocity of these notes will affects 'nuance' of rhythm.
 - #3 This message is ignored if the power has been applied while INTRO/FILL IN/ENDING PATTERN SELECT KEY 'A' being held down.
 - #4 Program numbers are assigned as follows.

Prog #	RHYTHM	Prog #	RHYTHM
0	ROCK 1	8	ROCK 1 (VARIATION)
1	ROCK 2	9	ROCK 2 (VARIATION)
2	ROCK 3	10	ROCK 3 (VARIATION)
3	ROCK 4	11	ROCK 4 (VARIATION)
4	DISCO 1	12	DISCO 1 (VARIATION)
5	DISCO 2	13	DISCO 2 (VARIATION)
6	16-BEAT 1	14	16-BEAT 1 (VARIATION)
7	16-BEAT 2	15	16-BEAT 2 (VARIATION)

Prog #	RHYTHM	Prog #	RHYTHM
16	WALTZ	24	WALTZ (VARIATION)
17	SWING 1	25	SWING 1 (VARIATION)
18	SWING 2	26	SWING 2 (VARIATION)
19	SHUFFLE	27	SHUFFLE (VARIATION)
20	CHARLESTON	28	CHARLESTON (VARIATION)
21	BALLAD	29	BALLAD (VARIATION)
22	REGGAE	30	REGGAE (VARIATION)
23	TANGO	31	TANGO (VARIATION)

Prog #	RHYTHM	Prog #	RHYTHM
32	SAMBA 1	40	SAMBA 1 (VARIATION)
33	SAMBA 2	41	SAMBA 2 (VARIATION)
34	MERENGUE	42	MERENGUE (VARIATION)
35	MAMBO	43	MAMBO (VARIATION)
36	CHA CHA	44	CHA CHA (VARIATION)
37	RHUMBA	45	RHUMBA (VARIATION)
38	BEGUINE	46	BEGUINE (VARIATION)
39	BOSSANOVA	47	BOSSANOVA (VARIATION)

Prog #	FILL IN
48	FILL IN - A ON
49	FILL IN - B ON
50	FILL IN - C ON
51	FILL IN - D ON

Prog #	INTRO/ENDING
56	INTRO/ENDING - A
57	INTRO/ENDING - B
58	INTRO/ENDING - C
59	INTRO/ENDING - D
60	INTRO ON
61	INTRO OFF
62	ENDING ON
63	ENDING OFF

Program numbers 52-55 and 64-127 are ignored.

#5 MIDI SYNC mode only.

1.2 In MIDI SOUND MODULE mode.

Status	Second	Third	Description
1001 nnnn	0kkk kkkk	0vvv vvvv	Note ON 0kkk kkkk = 35 - 76 0vvv vvvv = 1 - 127
1011 nnnn	0111 1100	0000 0000	OMNI OFF
1011 nnnn	0111 1101	0000 0000	OMNI ON

Notes :
#1 Note numbers are assigned to each voices as follows.

Note #	instrument
35	Bass Drum
37	Rim Shot
38	Snare Drum
39	Hand Clap
41	Low Tom
42	Closed Hi-Hat
45	Mid Tom
46	Open Hi-Hat
48	Hi Tom
49	Crash Cymbal
51	Ride Cymbal
62	Hi Conga
63	Low Conga
65	Timbale
68	Cowbell
76	Claves

An assignment is fixed, and other note # is ignored.

#2 The voices listed below on the same row cannot sound at the same time.

Low Tom / Mid Tom / Hi Tom / Timbale
Closed Hi-Hat / Open Hi-Hat
Crash Cymbal / Ride Cymbal
Rim Shot / Hand Clap
Low Conga / Hi Conga
Cowbell / Claves

Rhythm machine

MODEL CR-1000 MIDI Implementation Chart

DATE: JUN.30 '86
VERSION: 1.0

Function.....	Recognized		Remarks	
	mode I	mode II		
Basic Channel	Default Changed	1 1-16	10 1-16	OMNI ON OMNI OFF
Mode	Default Messages Altered	Mode 1 OMNI ON/OFF	Mode 1 OMNI ON/OFF	MONO/POLY ignored
Note Number	True voice	*1 0-127 (0-54)	** 35-76	** instrument #
Velocity	Note ON Note OFF	○ v=1-127 ×	○ v=1-127 ×	
After Touch	Key's Ch's	× ×	× ×	
Pitch Bender		×	×	
Control Change		×	×	
Prog Change	True #	*2 (0-51, 56-63)	×	Rhythm pattern etc.
System Exclusive		×	×	
System Common	Song Pos Song Sel Tune	× × ×	× × ×	
System Real Time	Clock Commands	○ (MIDI SYNC mode) ○ (MIDI SYNC mode)	× ×	
Aux Messages	Local ON/OFF All Notes OFF Active Sense Reset	× × × ×	× × × ×	
Notes	CR-1000 has no transmitter. mode I: NORMAL or MIDI SYNC mode. mode II: MIDI SOUND MODULE mode. *1 0-127 for 'KEY START' function, 0-54 for 'NUANCE' function. *2 Can be set to ○ or × by power-up setting.			

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

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

○ : Yes
× : No