U-220

RS-PCM SOUND MODULE

SERVICE NOTES

First Edition

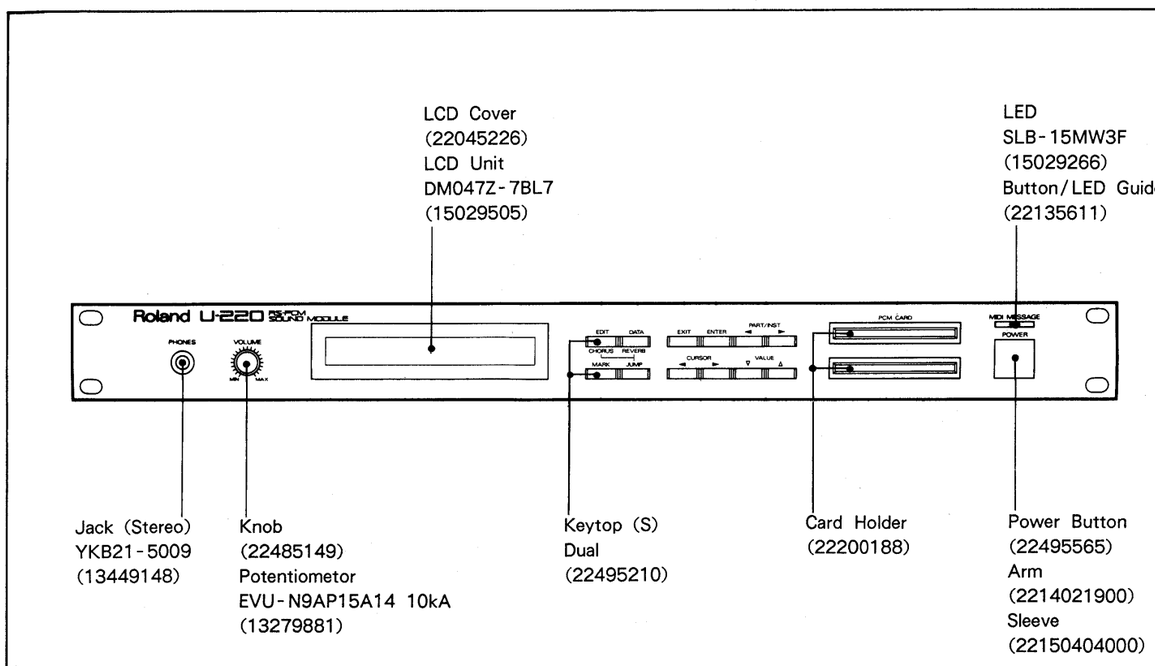
SPECIFICATIONS/仕様

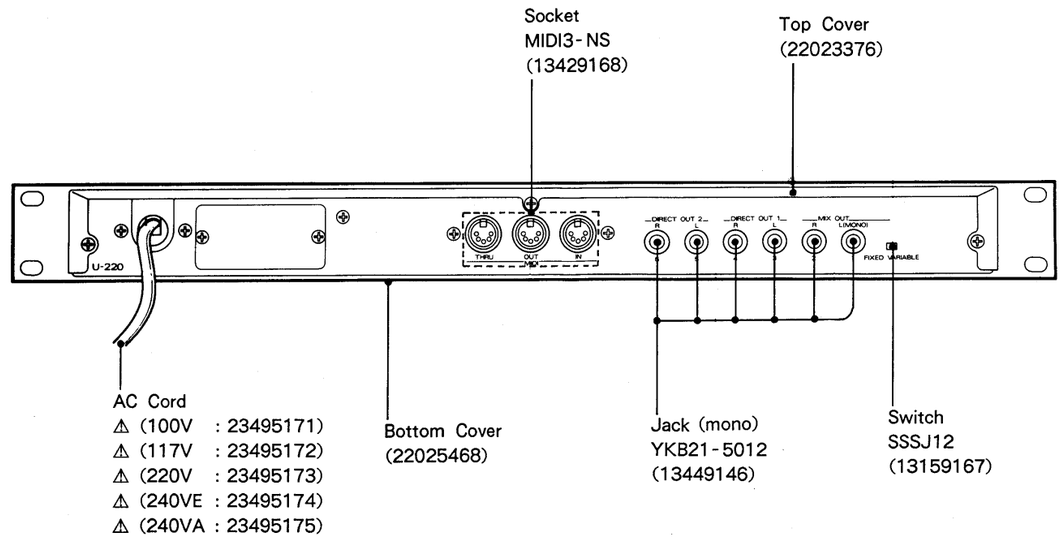
SOUND GENERATOR ····· RS-PCM Sound Generation
Maximum Simultaneous Notes : 30 Notes
MEMORY CAPACITY ····· Internal ROM : 3 Mbyte (128 Tones)
PCM Card : 512 Kbyte x 2 Slots
DISPLAY ····· 2 Line 24 Character (with backlight)
MIDI ····· IN, OUT, THRU
OUTPUT
PHONES ····· Level +10dbm
Impeadance 100Ω
MIX, DIRECT OUT ····· Level +6dbm
Impeadance 1.7KΩ
POWER CONSUMPTION ····· 20W
DIMENSIONS ····· 482 (W) x 358 (D) x 45 (H) mm
19" (W) x 14-1/8" (D) x 1-3/4" (H) inch
WEIGHT ····· 4.4Kg / 9 lb 11 oz
ACCESSORIES ····· Connection Cable (2.5m) (23430675S0) x 1
MIDI Cable (1m) (23485228) x 1
Owner's Manual Set x 1
English (26035365)
Japanese (26035364)
OPTTIONS ····· Sond Library SN-U110 series
Stereo Headphones RH-100
Connection Cord PJ-1M
MIDI/SYNC Cable MSC-07/15/25/50/100

Specifications are subject to change without notice.

TABLE OF CONTENTS / 目 次

		Page
SPECIFICATION	仕様	1
EXPLODED VIEW	分解図	2
PARTS LIST	パーツリスト	3
BLOCK DIAGRAM	ブロック図	5
MAIN BOARD	メイン基板	6, 7
PHONES BOARD	フォーン基板	7, 8
SWITCH BOARD	スイッチ基板	7, 8
CARD BOARD	カード基板	7, 8
POWER SUPPLY BOARD	電源基板	8
TEST MODE	テストモード	9-16
IDENTIFYIN VERSION NUMBER	バージョン・ナンバーの確認	(9)
1.LCD Contrast Test & MIDI LED Test	1.LCD Contrast Test & MIDI LED Test	(10)
2.Interna RAM Test	2.Internal RAM Test	(10)
3.PCM Card Test	3.PCM Card Test	(11)
4.INT PCM ROM Test	4.INT PCM ROM Test	(11)
5.Switch Test	5.Switch Test	(12)
6.MIDI Test	6.MIDI Test	(12)
7.DAC MSB Adjust	7.DAC MSB Adjust	(13)
8.Sound Test (1)	8.Sound Test (1)	(13)
9.Sound Test (2)	9.Sound Test (2)	(14)
10.Effect Test	10.Effect Test	(15)
11.Memory Initialization	11.Memory Initialization	(16)
12.Factory Data Load	12.Factory Data Load	(16)
Bulk Dump	バルク・ダンプ	16
(Note : Please read before servicing.)	(注：修理前に必ず読んで下さい。)	
IC DATA	ICデータ	17
CHANGE INFORMATION	変更案内	18





EXPLODED VIEW（分解図）

PARTS

①	Knob	22485149
②	LCD Cover	22045226
③	Power Button	22495565
④	Front Panel	22215684
⑤	Button	22495210
⑥	LCD Unit	15029505
⑦	Switch Board	7957412000
⑧	Card Holder	22200188
⑨	Button/LED Guide	22135611
⑩	LED	15029266
⑪	Front Holder	22205423
⑫	Phones Board	7957409000
⑬	Clasp	12199556
⑭	Holder	22200188
⑮	Card Board	7957411000
⑯	Main Board	7957413000
⑰	Power Transformer	
	⚠ 100/117V	22455534N0
	⚠ 220/240V	22455536D0
⑱	Base	2235031300
⑲	Bottom Cover	22025468
⑳	AC Cord	
	⚠ 100V	23495171
	⚠ 117V	23495172
	⚠ 220V	23495173
	⚠ 240VE	23495174
	⚠ 240VA	23495175
㉑	Extension Rod	22140219
㉒	Joint	22150404
㉓	Power Supply Board	7957417000
㉔	Power Holder	22205424
㉕	Angle Bracket	22123568
㉖	Top Cover	22023376

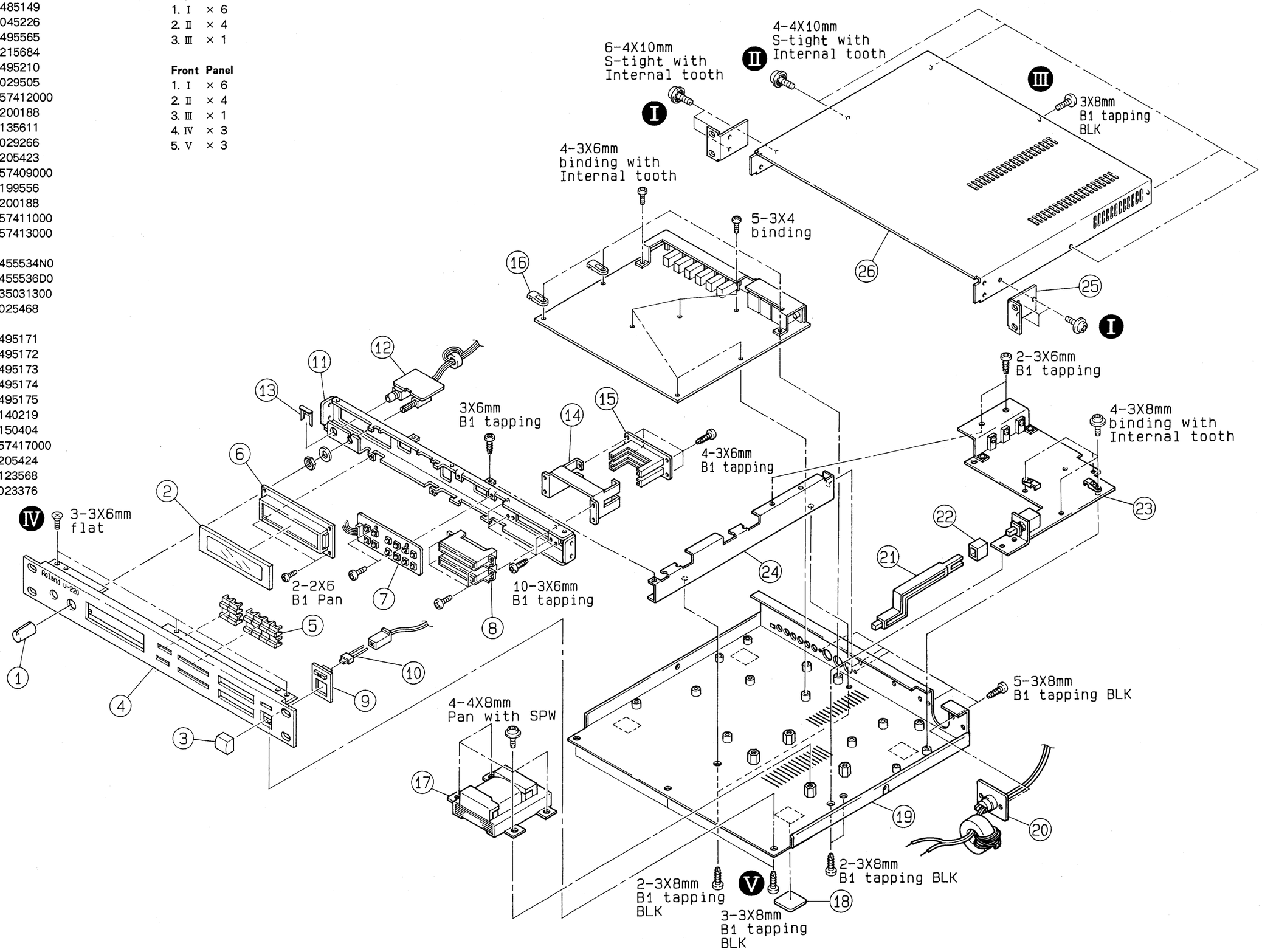
Panel removal screws.

Top Cover

1. Ⅰ × 6
2. Ⅱ × 4
3. Ⅲ × 1

Front Panel

1. Ⅰ × 6
2. Ⅱ × 4
3. Ⅲ × 1
4. Ⅳ × 3
5. Ⅴ × 3



PARTS LIST

SAFETY PRECAUTIONS:

The parts marked ⚠ have safety-related characteristics. Use only listed parts for replacement.

安全上の注意：

⚠が付いている部品は、安全上特別な企画でつくられたものです。
交換の際は、指定された部品番号以外の部品は使わないようにして下さい。

CONSIDERATIONS ON PARTS ORDERING

When ordering any parts listed in the parts list, please specify the following items in the order sheet.

	QTY	PART NUMBER	DESCRIPTION	MODEL NUMBER
Ex.	10	22575241	Sharp key	C-20/50
	15	2247017300	Knob (orange)	DAC-15D

Failure to completely fill the above items with correct number and description will result in delayed or even undelivered replacement.

パーツ発注に関するお願い

オーダーシートには、必ず下記の４項目は正確に記入して下さい。（例外は除く）

	必要数	パーツナンバー	品名	使用機種
例)	10	22575241	Sharp key	C-20/50
	15	2247017300	Knob (orange)	DAC-15D

もし記入漏れ、誤記等が有る場合、必要部品が発送できなかったり、大幅な遅れの原因になります。
御協力をお願いします。

≪ Cautionary points in returning a PCB when repair is impossible. ≫

When returning a PCB that cannot be repaired, first pack the PCB carefully and then clearly enter all necessary information in the sheet (see below) and always include it with the PCB.

≪修理不可能で基板を返却する場合の注意点≫

修理不可能で基板を返却する場合、必要事項（詳細は下記参照）を明記して、必ず対象の返却基板に添えて返却して下さい。又、その際基板は、丁寧に梱包して返却するようにして下さい。

Necessary Information
必要事項

1.Company Name サービス名 | 2.Model 機種名 | 3.Serial Number 製造番号 | 4.Symptom 症状

CASING ケース

22215684	Front Panel	
22023376	Top Cover	202-376
22025468	Bottom Cover (Bottom Chassis)	
22045226	LCD Cover	
22205423	Front Holder	
22123568	Rack Mount Angle (Angle Bracket)	212-568
2235031300	Base (Rubber Foot)	235-313

HOLDER ホルダー

22205424	Power Holder	
22815731	Card Chassis	
22205220	Switch Holder	220-220
22205215	Output Holder	220-215
22200188	Card Holder (Card Slot)	220-188

PCB ASS'Y 基板完成品

E 7957413000	Main Board (pcb 22925830) with output holder and leaf terminal	
7957417000	Power Supply Board (pcb 22925833 1/5) with switch holder and heat sink	

NOTE : Power Supply Board can be used for any voltages of 100V, 177V, 220V and 240V.
注 : 電源ボードは、各電圧共通に使用できます。

7957409000	Phones Board (pcb 22925833 3/5)	
7957412000	Switch Board (pcb 22925833 4/5)	
7957411000	Card Board (pcb 22925833 5/5)	

BUTTON, KNOB ボタン、つまみ

22485149	Rack Round Knob	248-149	VOLUME
22495210	Rack Keytop (S) dual	248-210	
22495565	Rack Power Botton	249-565	

SWITCH スイッチ

13169684	SOA-123HS 100G (Push SW)	SW1-12 on Switch Board
13159167	SSSJ12	SW1 on Main Board
⚠13129124	SDDGA3078A (Push SW)	SW101 on Power Supply Board

JACK, SOCKET ジャック、ソケット

13449148	YKB21-5009 (Stereo)	PHONES	JK301 on Phones Board
13449146	YKB21-5012 (Mono)	OUTPUT1-6	JK2-7 on Main Board
13429551	DICF-32CS-E (IC socket 32P)		For using IC8 on Main Board
13429168	MIDI3-NS	MIDI IN/OUT/THRU	JK1 on Main Board

POWER TRANSFORMER 電源トランス

⚠22455534N0		100/117V
⚠22455536D0		220/240V

LCD UNIT LCDユニット

15029505	DM047Z-7BL7 (with LED, PCB and wiring)	2 line 24 character

NOTE : Replacement should be made on a unit bassis.
No replacements available for individual parts.
Replacement only by a unit.
注 : 交換は、ユニット単位でおこなって下さい。
補修品は、ユニット単位。

IC 集積回路

15179286	P8098	CPU	IC6 on Main Board
15449219	HN27C101G-20	U-220 EP ROM (Programed)	IC8 on Main Board
15179992H0	HM27C101G-20	EP ROM (blank)	
15179892F0 or 15179892	MB834000A-20P-G-226 HN62304BPE22	Wave ROM-A	IC19 on Main Board
15179893F0 or 15179893	MB834000A-20P-G-227 HN62304BPE23	Wave ROM-B	IC20 on Main Board
15179894F0 or 15179894	MB834000A-20P-G-228 HN62304BPE24	Wave ROM-C	IC21 on Main Board
15179895F0 or 15179895	MB834000A-20P-G-229 HN62304BPE25	Wave ROM-D	IC22 on Main Board
15179947 or 15179947H0	MB834000A-20P-G-3A1 HN62304BP E	Wave ROM-E	IC23 on Main Board
15179948 or 15179948H0	MB834000A-20P-G-3A2 HN62304BP F	Wave ROM-F	IC24 on Main Board
15179432	M5M4464AP-10	D RAM	IC26, 27 on Main Board
15279508	HM62256LFP-12T (Flat)	256k SRAM	IC10 on Main Board
15229894	MB87419 R06-0005 (Flat)	PCM Custom IC	IC17 on Main Board
15229895	MB87420 R06-0006 (Flat)	PCM Custom IC	IC18 on Main Board
15239126	TC23SC140AF-007 (Flat)	Effect Custom IC	IC25 on Main Board
15239130	MB623157 μPF-G-BND (Flat)	I/O Gate Array	IC12 on Main Board
15259706T0	TC74HCU04F-T2 (Flat)	Hex Inverter	IC5, 16 on Main Board
15269601	74F04SJL (Flat)	Hex Inverter	IC7 on Main Board
15269201	SN74LS04NSTAP-L (Flat)	Hex Inverter	IC2 on Main Board
15259701T0	TC74HC00F-T2 (Flat)	Quad 2-Input NAND Gate	IC11 on Main Board
15269609	74F02SJL (Flat)	Quad 2-Input NOR Gate	IC13 on Main Board
15269610	74F32SJL (Flat)	Quad 2-Input OR Gate	IC14, 15 on Main Board
15259863T0	TC74HC4051AF-T2 (Flat)	8-channel Analog Multiplexer	IC30 on Main Board
15209122	PCM56P	D/A Converter	IC28 on Main Board
15289120	NJM4565M-TE3 (Flat)	OP AMP (Dual in line)	Main Board
15289107	M5218FP (Flat)	OP AMP (Dual in line)	IC32 on Main Board
15289105	μPC4570G (Flat)	OP AMP (Dual in line)	IC29 on Main Board
15289116	NJM2082M-TE3 (Flat)	J-FET OP AMP (Dual in line)	Main Board
15289111	TL062CPS-TAP-L (Flat)	J-FET OP AMP (Dual in line)	IC4 on Main Board
15219183	M51953AL	Reset IC	IC3 on Main Board
15229706S0	PC910	Photo Coupler (Opt-isolator)	IC1 on Main Board
15199172	TA79L005P-TPE6	−5V Voltage Regulator	IC31 on Main Board
⚠ 15199137	AN7805F	+5V Voltage Regulator	IC101 on Power Supply Board
⚠ 15199184	AN78M15F	+15V Voltage Regulator	IC102 on Power Supply Board
⚠ 15199185	AN79M15F	−15V Voltage Regulator	IC103 on Power Supply Board

INDUCTOR インダクタ

12449294	BL03RN2-R62T2	Main Board, Phones Board
13529186	ELKTR150GA	FL21 on Main Board
13529187	ELKTR391CA	Main Board

CRYSTAL 発振子

15299106	CA301 12.000MHz	Crystal	X1 on Main Board
15299117	CA301 32.768MHz	Crystal	X2 on Main Board

POTENTIOMETOR ボリューム

13279881	EVU-N9AP15A14 10kA	VOLUME	VR301 on Phones Board
13299217	RVF6P51-5-104N 100k	Trimmer	VR1 on Main Board

TRANSISTOR トランジスター

15329502	DTC-124EK T-96 (Chip)	Q2, 4 on Main Board
15329503	DTA-124EK T-96 (Chip)	Q1, 3 on Main Board
15309101	2SA-1037KR T-96 (Chip)	Q5 on Main Board
15319101	2SC-2412KR T-96 (Chip)	Q6, 9 on Main Board
15329505	DTC-314TK T-96 (Chip)	Q12-17 on Main Board
15119135	2SA-1115-TP-E	Q7, 8 on Main Board
15129152	2SC-2878A	Q10, 11 on Main Board

DIODE, DIODE ARRAY ダイオード、ダイオード・アレイ

- DIODE -

15339103	MA-153 (Chip)		D6, 7, 8 on Main Board
15339104	RLS-71 TE-11 (Chip)		D1, 2, 3 on Main Board
15339105	DAN202K T-96 (Chip)		D5 on Main Board
15019674	0.5AZ5.1Y-TPB2	Zener	D4 on Main Board
⚠15019293A0	S4VB10 4003 L10 100V/4A	Bridge	D101 on Power Supply Board
⚠15019245SN	S1VB10 100V/1A	Bridge	D102 on Power Supply Board
15019208	1SR35-200A		D103, 104, 105 on Power Supply Board
15019126	1SS-133T-77		D1-12 on Switch Board
15029266	SLB-15MW3F (green, package white)	LED (MIDI Massage)	

- DIODE ARRAY -

15019142	DAN801	DA1 on Main Board
15019154	DAP801	DA2 on Main Board

CAPACITOR コンデンサー

⚠ 13529104	DE7150F472MVA1	Ceramic (Line Bypass)	C101 on Power Supply Board
13639157M0	ECEAICU472 4700μF/16V		C105 on Power Supply Board
13639195S0	35MV2200HA4 2200μF/25V		C106, 107 on Power Supply Board
13639171S0	25MV220HA4 220μF/25V		C114, 115, 116 on Power Supply Board

RESISTOR, RESISTOR ARRAY 抵抗、抵抗アレイ

- RESISTOR -

13829864	ERD2FCJ8R2P	Fuse Resistor	R35 on Main Board
13749170T0	SR50NJ 470K	470K 1/2W	R102 on Power Supply Board

- RESISTOR ARRAY -

15239108	MNRDM4J×681E (Chip)	RA7, 8, 9 on Main Board
15399917	MNR34J5A103E (Chip)	RA12, 13, 14, 15 on Main Board
15399904	MNR34J5A333E (Chip)	Main Board

CONNECTOR, WIRING ASS'Y コネクター、ワイヤリング・アッセイ

- Wire trap -

13439475	52004-0310 (3P)	CN2 on Main Board
13439409	52004-0810 (8P)	CN7 on Main Board
13439407	52004-1010 (10P)	CN5 on Main Board
13439406	52004-1110 (11P)	CN1 on Main Board
13439414	52004-1210 (12P)	CN4 on Main Board
13439436	52004-1410 (14P)	CN3 on Main Board

- Cable Holder -

13439465	SD-51016-0800 (8P)	CN1 on Switch Board
13439467	SD-51016-1000 (10P)	CN5 on Card Board
13439469	SD-51016-1200 (12P)	CN3 on Card Board
13439471	SD-51016-1400 (14P)	CN4 on Card Board
13439468	SD-51016-1100 (11P)	CN10 on Power Supply Board

- Pin Header -

13439533	53014-0910 (9P)		CN8 on Main Board
13439613	RF-H16 2TD-0190JST (16P)		CN6 on Main Board
13429240	7508096A (34P)	IC Card	CN1, 2 on Card Board
13439495	5285-05A (5P)		CN101 on Power Supply Board

- WIRING ASSY -

23485504	Wiring SET	
	NOTE : Wiring SET includes the following.	
	注：ワイヤリング・セットは、下記を含みます。	
	Wiring MC1 (10P)	Between CN5 on Main Board and CN5 on Card Board
	Wiring MC2 (12P)	Between CN4 on Main Board and CN3 on Card Board
	Wiring MC3 (14P)	Between CN3 on Main Board and CN4 on Card Board
23485505	Wiring MM (2P)	Between CN2 on Main Board and MIDI Message LED
23485508	Wiring SM (8P)	Between CN1 on Switch Board and CN7 on Main Board
23485509	Wiring PM (11P)	Between CN10 on Power Supply Board and CN1 on Main Board
23485510	Wiring VM (9P)	Between CN11 on Phones Board and CN8 on Main Board

AC CORD ASS'Y ACコード完成品

⚠23495171	100V
⚠23495172	117V
⚠23495173	220V
⚠23495174	240VE (England)
⚠23495175	240VA (Australia)

SCREW ネジ

4×8mm S.Tight Fe.BC with Internal tooth Washer × 10
4×8mm Pan Fe.Cm with Spring Washer × 4
3×8mm B1 tapping Fe.BC × 15
3×6mm B1 tapping Fe.Cm × 21
3×8mm binding Fe.BC with Internal tooth Washer × 7
3×6mm binding Fe.BC with Internal tooth Washer × 4
3×4mm binding Fe.Cm × 5
3×6mm flat Fe.Cm × 3
2×6mm Pan Fe.Cm × 2

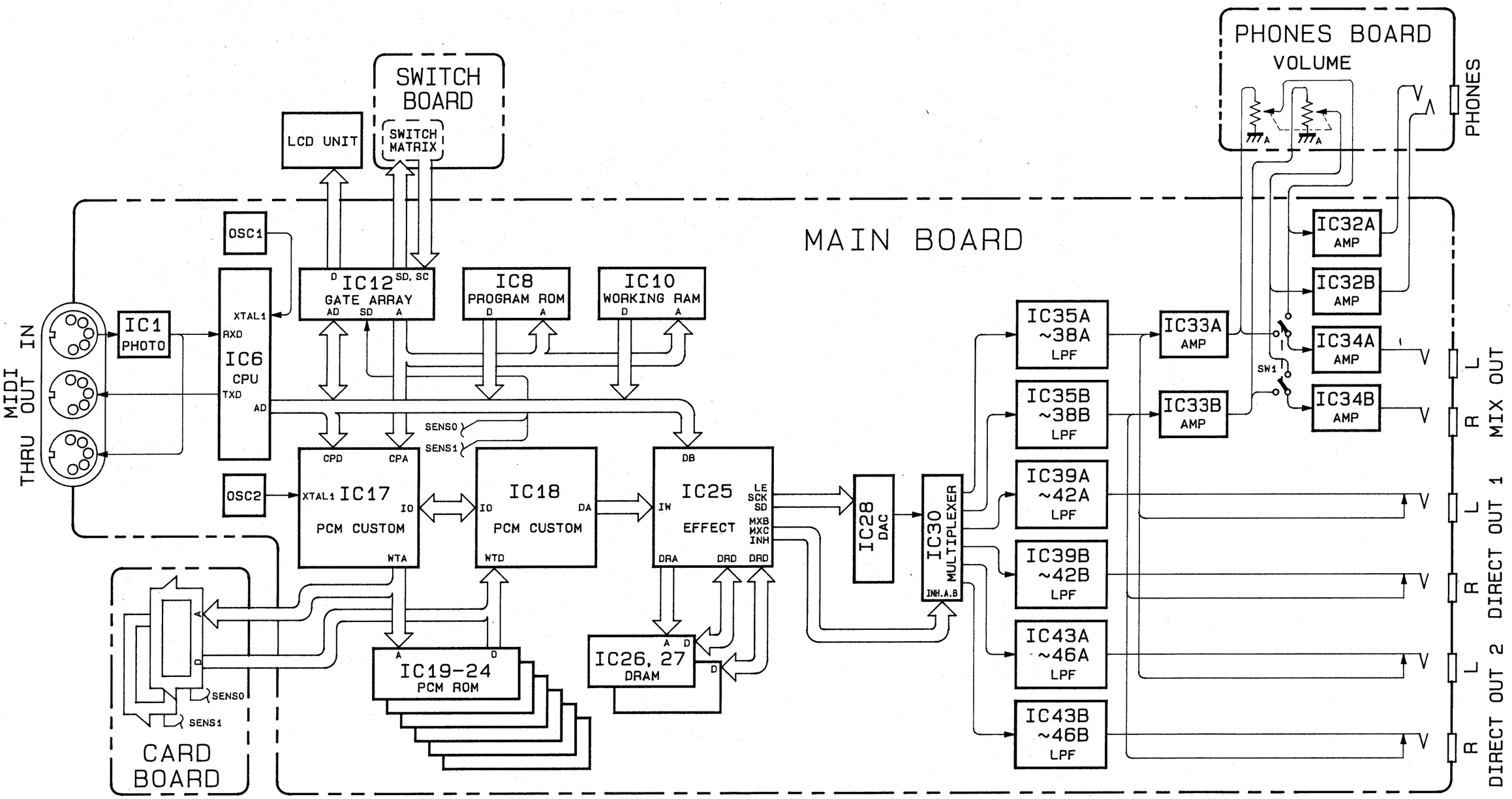
MISCELLANEOUS その他

12569249	Lithium Battery DC 3V	CR2032	
12199570	Battery Holder (Battery Retainer)	BBH-1	BA1 on Main Board
22135611	Rack Button/LED Guide	213-611	
2214021900	Arm	214-219	Power Switch
2215040400	Sleeve	215-404	Power Switch
22465518	Heat Sink		Power Supply Board
23455320	Leaf Terminal		Output Holder
12199556	Phones Jack Clasp		Phones

ACCESSORIES 付属品

26035364	Owner's Manual Set	Japanese
26035365	Owner's Manual Set	English
23430675S0	LP Cord LP-25 2.5m	PJ-1M
23485228	MIDI Cable 1m	348-228

BLOCK DIAGRAM



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 40

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

E

MAIN BOARD

ASSY 7957413000
(pcb 22925830)

ADVARSEL!

Lithiumbatteri. Eksplosionsfare.
Udskiftning må kun foretages af en sagkyndig,
og som beskrevet i servicemanual.

Lithium batteri må kun udskiftes med samme type og fabrikat.

VAROITUS!

Lithiumpariston. Räjähdysvaara.
Pariston saa vaihtaa ainoastaan
alan ammottimies.

Kun vaihat lithium pariston KAYTA saman valmistajan samaa tyyppiä.

ADVARSEL!

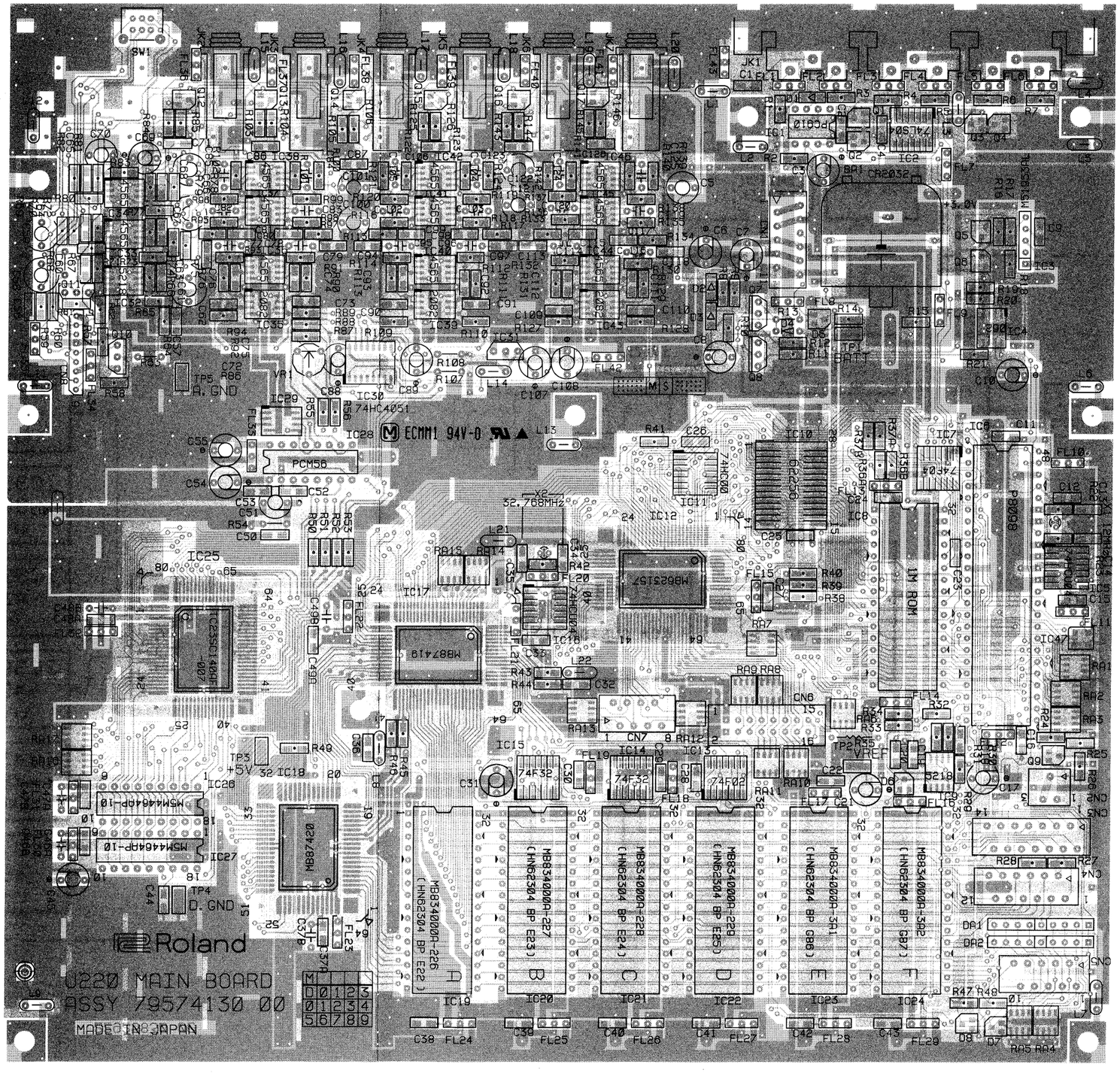
Lithiumbatteri. Fare for eksplotion.
Måbare skiftes av kvalifisert tekniker som
beskrevet i servicemanualen.

Lithium batteri må kun utskiftes med samme type og fabrikat.

VARNING!

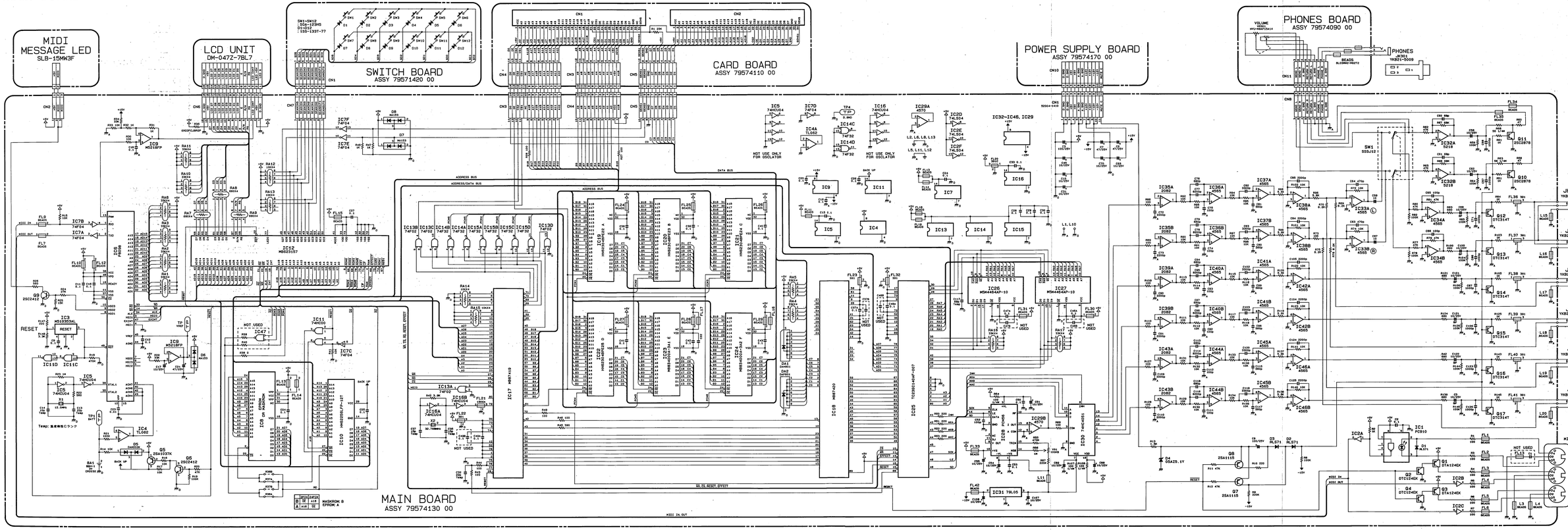
Lithiumbatteri. Explosionsrisk.
Får endast bytas av behörig servicetekniker.
Se instruktioner i servicemanualen.

Lithium batteri for endast ersättes med samme typ och fabrikat.

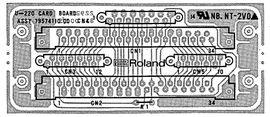


View from component side.

MAIN BOARD

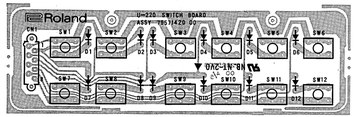

MIDI MESSAGE LED
SLB-15MW3F
LCD UNIT
DM-0472-7BL7
SWITCH BOARD
ASSY 79571420 00
CARD BOARD
ASSY 79574110 00
POWER SUPPLY BOARD
ASSY 79574170 00
PHONES BOARD
ASSY 79574090 00
PHONES
MAIN BOARD
ASSY 79574130 00
MIX OUT
DIRECT OUT 1
DIRECT OUT 2
MIDI
IN
OUT
THRU

CARD BOARD
ASSY 7957411000
(pcb 22925833 5/5)



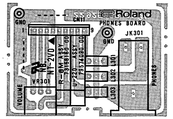
View from component side.

SWITCH BOARD
ASSY 7957412000
(pcb 22925833 4/5)



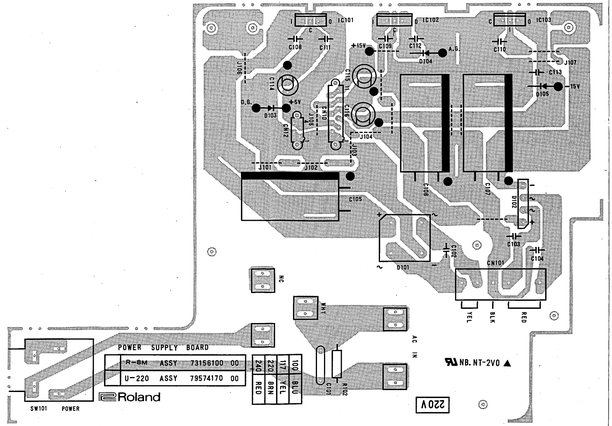
View from component side.

PHONES BOARD
ASSY 7957409000
(pcb 22925833 3/5)



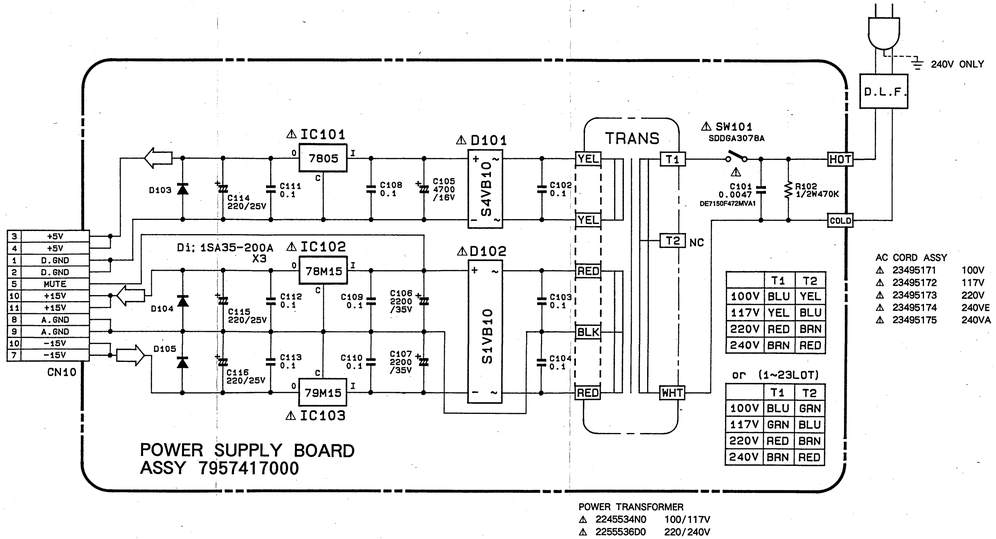
View from component side.

POWER SUPPLY BOARD
ASSY 7957417000
(pcb 22925833 1/5)



View from component side.

POWER SUPPLY BOARD



	T1	T2
100V	BLU	YEL
117V	YEL	BLU
220V	RED	BRN
240V	BRN	RED

or (1~23LOT)

	T1	T2
100V	BLU	GRN
117V	GRN	BLU
220V	RED	BRN
240V	BRN	RED

AC CORD ASSY
△ 23495171 100V
△ 23495172 117V
△ 23495173 220V
△ 23495174 240VE
△ 23495175 240VA

POWER TRANSFORMER
△ 2245534N0 100/117V
△ 2255536D0 220/240V

TEST MODE テスト・モード

IDENTIFYIN VERSION NUMBER バージョン・ナンバーの確認

ROM (IC8 on MAIN BOARD)
To enter TEST MODE, (1) first press [JUMP] and [VALUE▲] at the same time to activate ROM PLAY MODE and (2) then press [ENTER] while pressing [MARK] and [JUMP].

ROM (IC8 メインボード)
[JUMP]と[VALUE▲]ボタンを同時に押して、ロム・プレイ・モードにし、[MARK]、[JUMP]ボタンを押しながら、[ENTER]を押して、テスト・モードに入ります。

The display will show the current ROM version number and the version date.

ディスプレイは、ロムバージョンと日付を表示します。

```
==< U-220 TEST MODE >===
U220 V*.** YY/MM/DD ****
```

Version Number バージョンナンバー

Version Date (year, month, day) 日付（年、月、日）

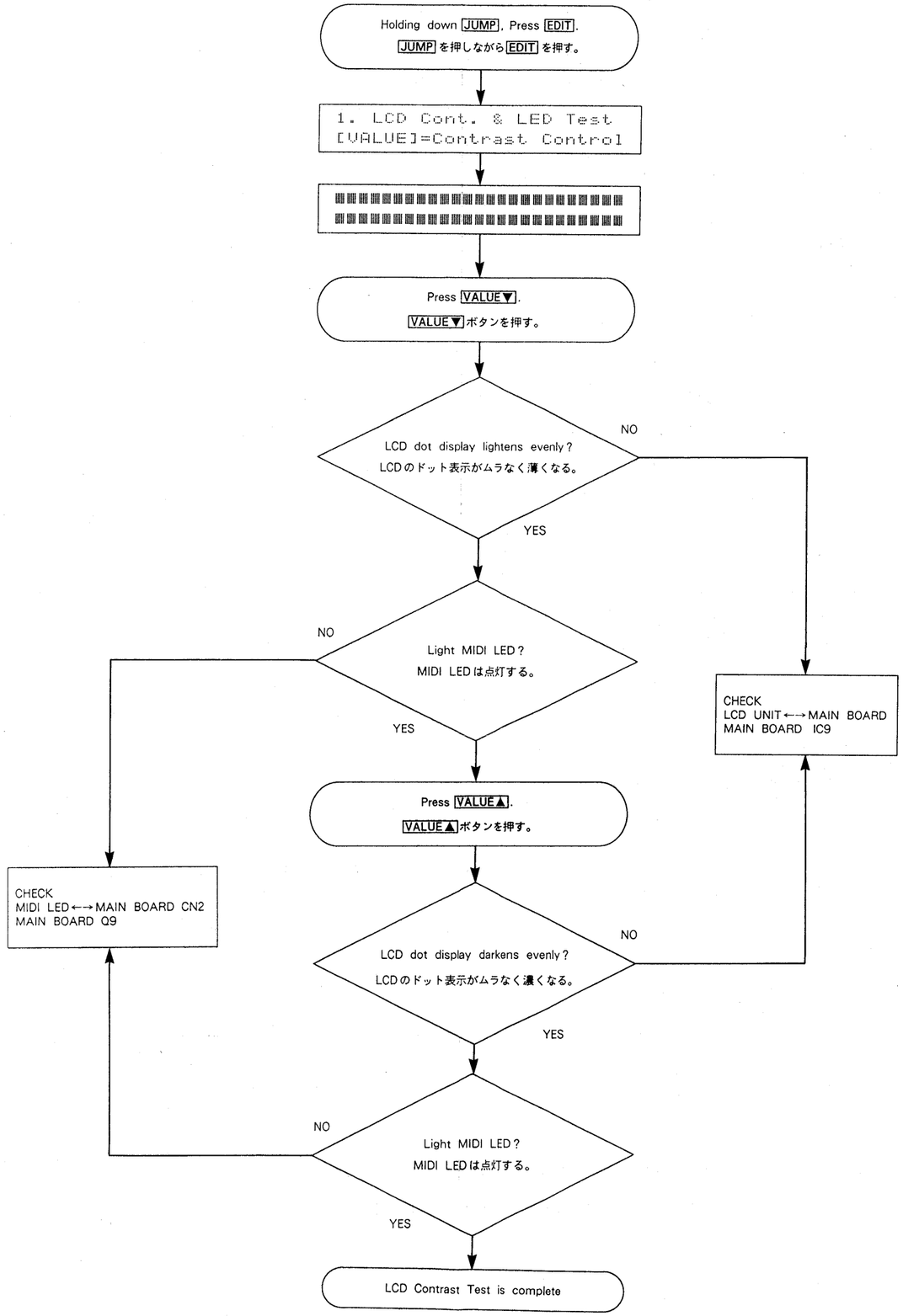
To exit TEST MODE, press [EXIT] while pressing [MARK] and [JUMP].

[MARK][JUMP]を押しながら、[EXIT]を押すと、テスト・モードから出ます。

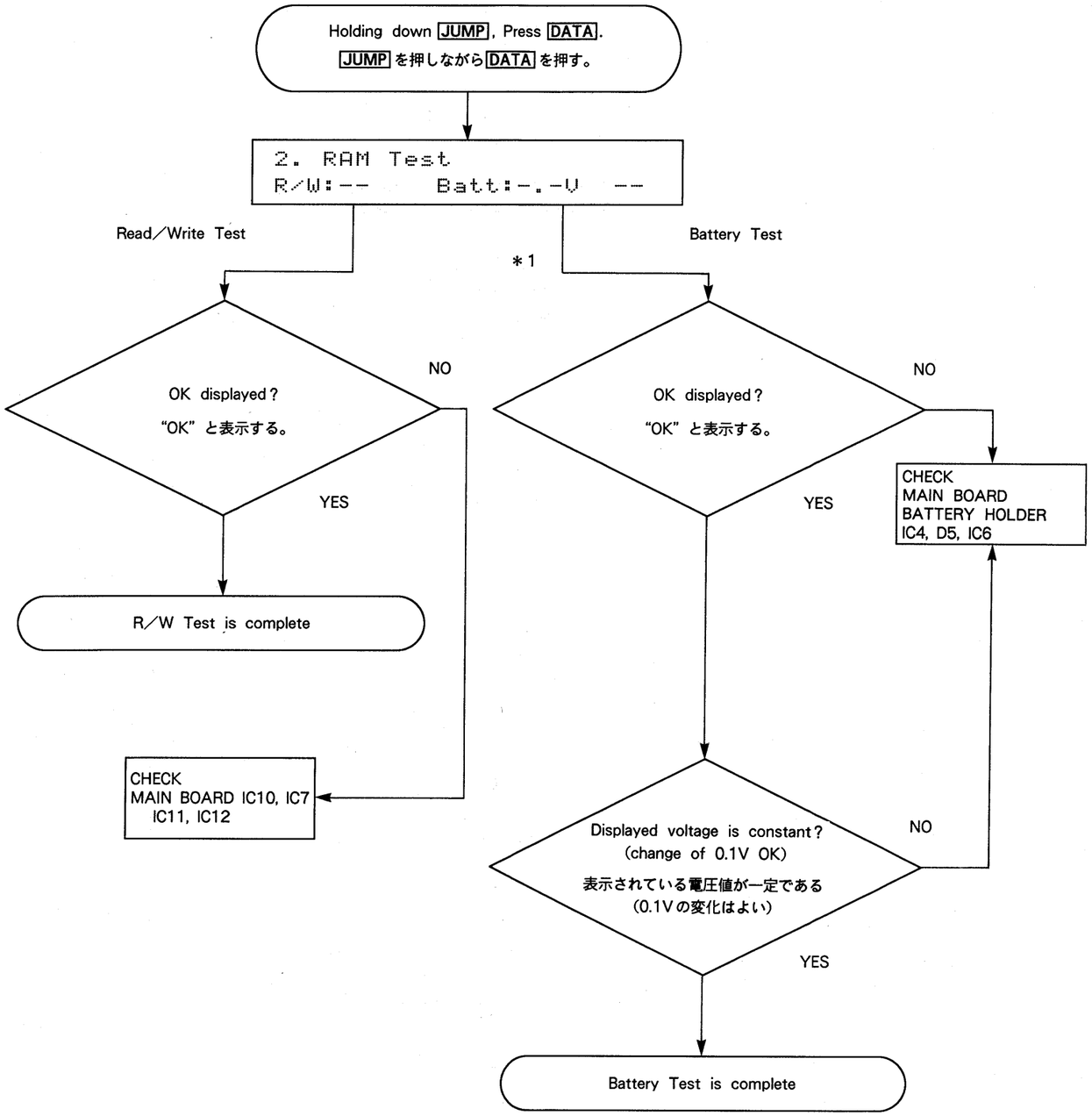
Switch operation スイッチ操作

To enter Test Mode テスト・モードに入る	Press [JUMP] and [VALUE▲] at the same time to activate ROM PLAY MODE, then press [ENTER] while pressing [MARK] and [JUMP]. [JUMP]を押しながら、[VALUE▲]を押してロムプレイモードにする。 その後、[MARK]と[JUMP]を押しながら[ENTER]を押す。		
To exit Test Mode テスト・モードから出る	Press [EXIT] while pressing [MARK] and [JUMP]. [MARK]と[JUMP]を押しながら[EXIT]を押す。		
Move to next test 次のテストに移る	[JUMP] + [CURSOR▶]		
Move to previous test 前のテストに移る	[JUMP] + [◀CURSOR]		
Directly selects test ダイレクトに選択する	1	LCD & LED Test	[JUMP] + [EDIT]
	2	SRAM Test	[JUMP] + [DATA]
	3	PCM CARD Test	[JUMP] + [EXIT]
	4	PCM-ROM Test	[JUMP] + [ENTER]
	5	Switch Test	[JUMP] + [◀PART]
	6	MIDI Test	[JUMP] + [PART▶]
	7	DAC MSB Adjust	[MARK] + [EDIT]
	8	Sound Test (1)	[MARK] + [DATA]
	9	Sound Test (2)	[MARK] + [EXIT]
	10	Effect Test	[MARK] + [ENTER]
	11	Memory Initialize	[MARK] + [◀PART]
	12	Factory Data Load	[MARK] + [PART▶]

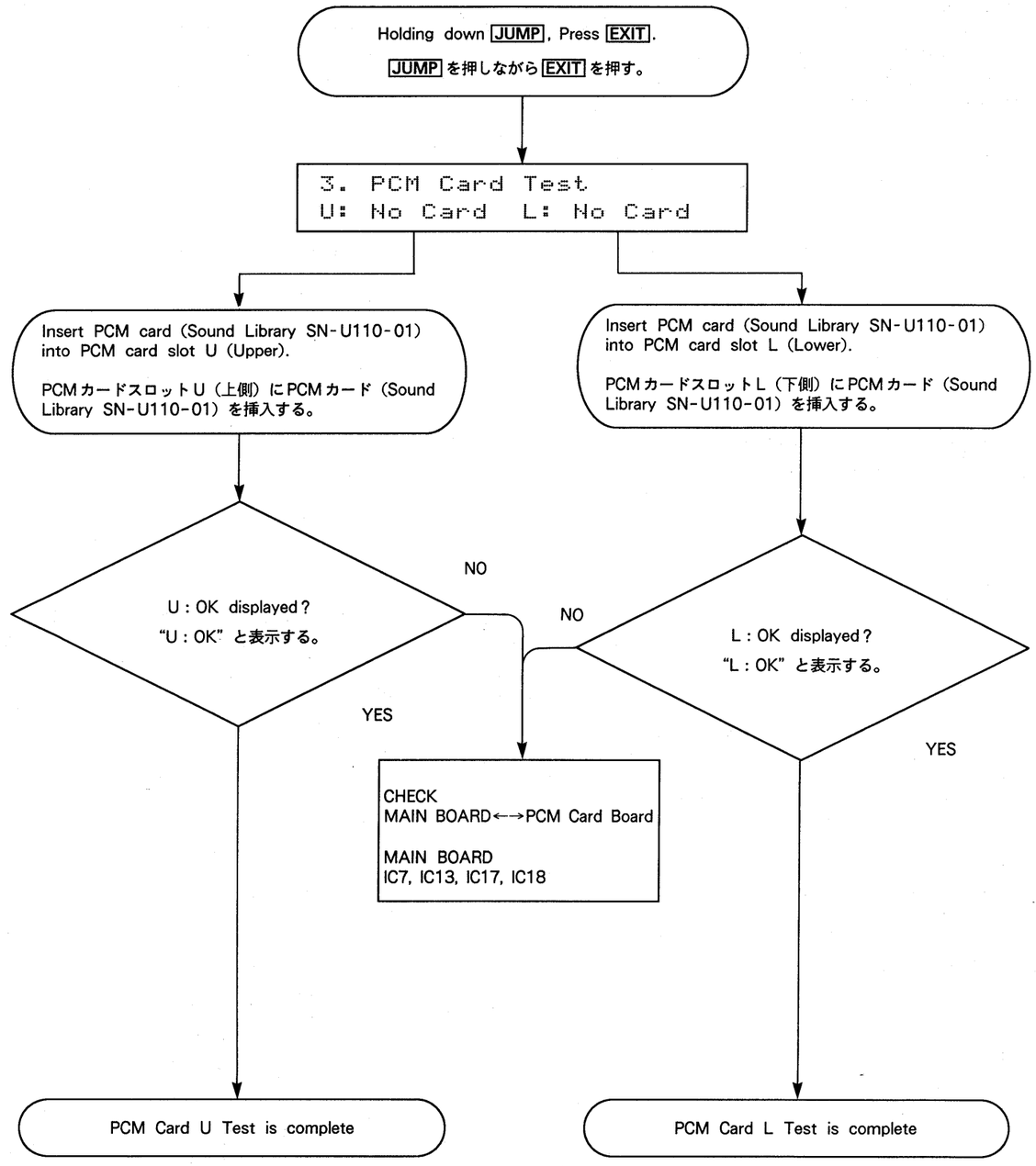
1. LCD Contrast Test & MIDI LED Test



2. Internal RAM Test



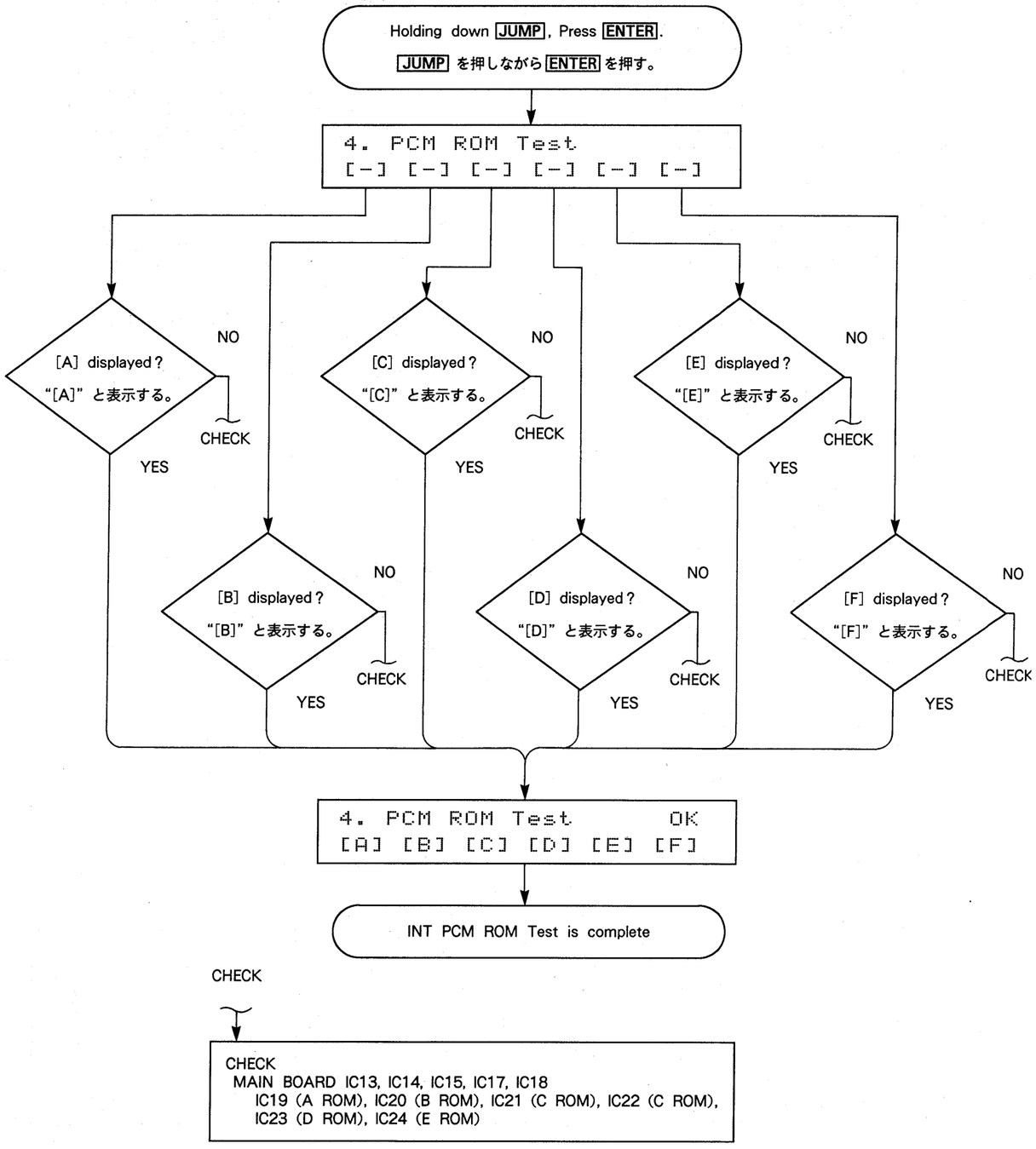
3. PCM Card Test



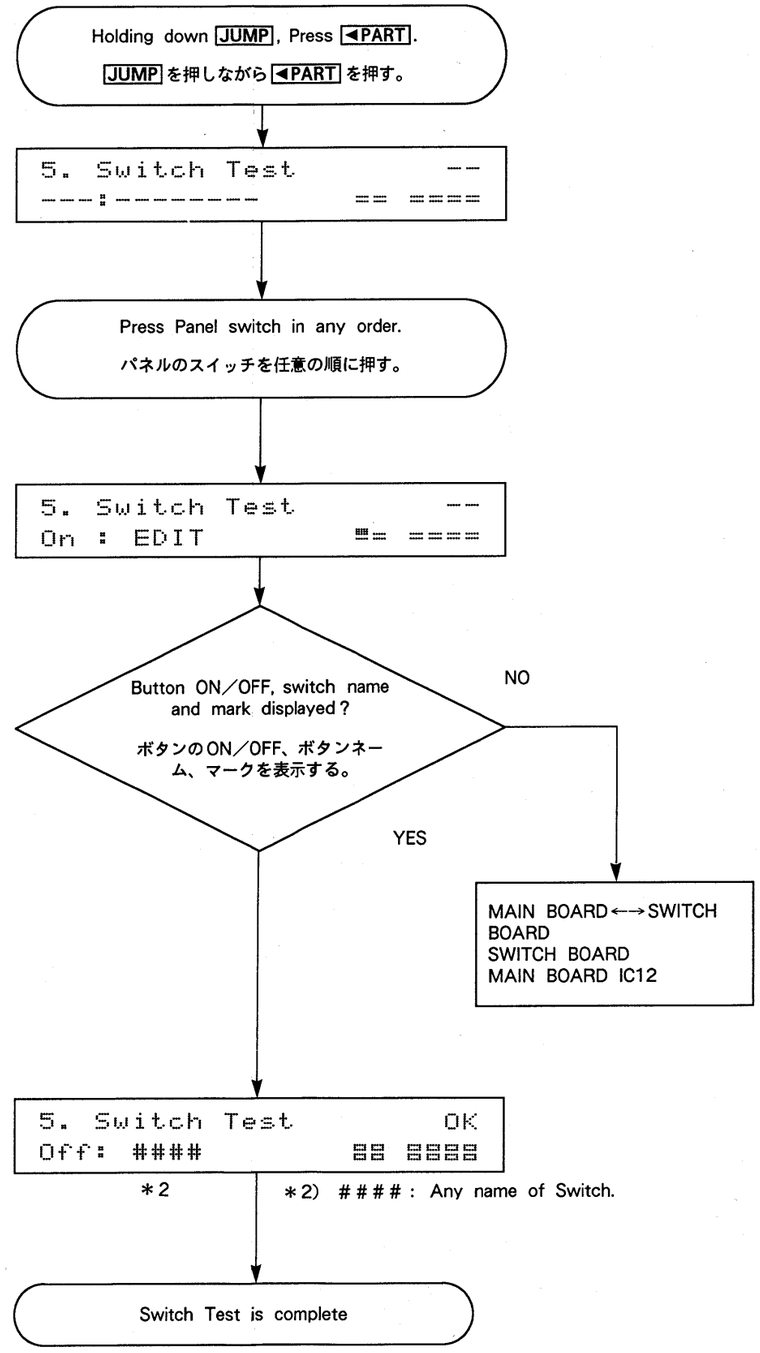
*1) Battery voltage display in range 2.8V – 3.5V is OK.

*1) バッテリーの電圧表示は、2.8V～3.5Vの間で "OK" となる。

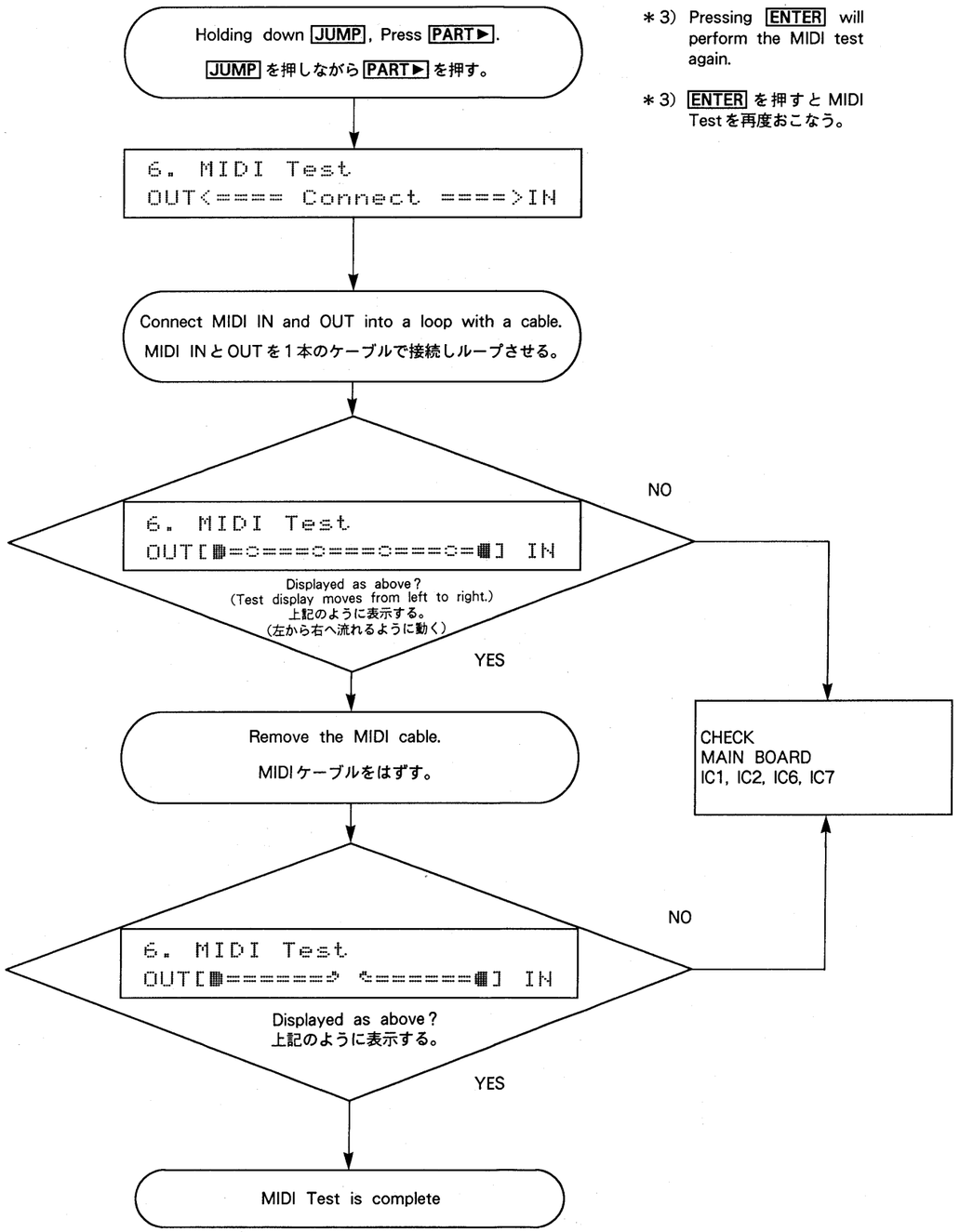
4. INT PCM ROM Test



5. SWITCH Test



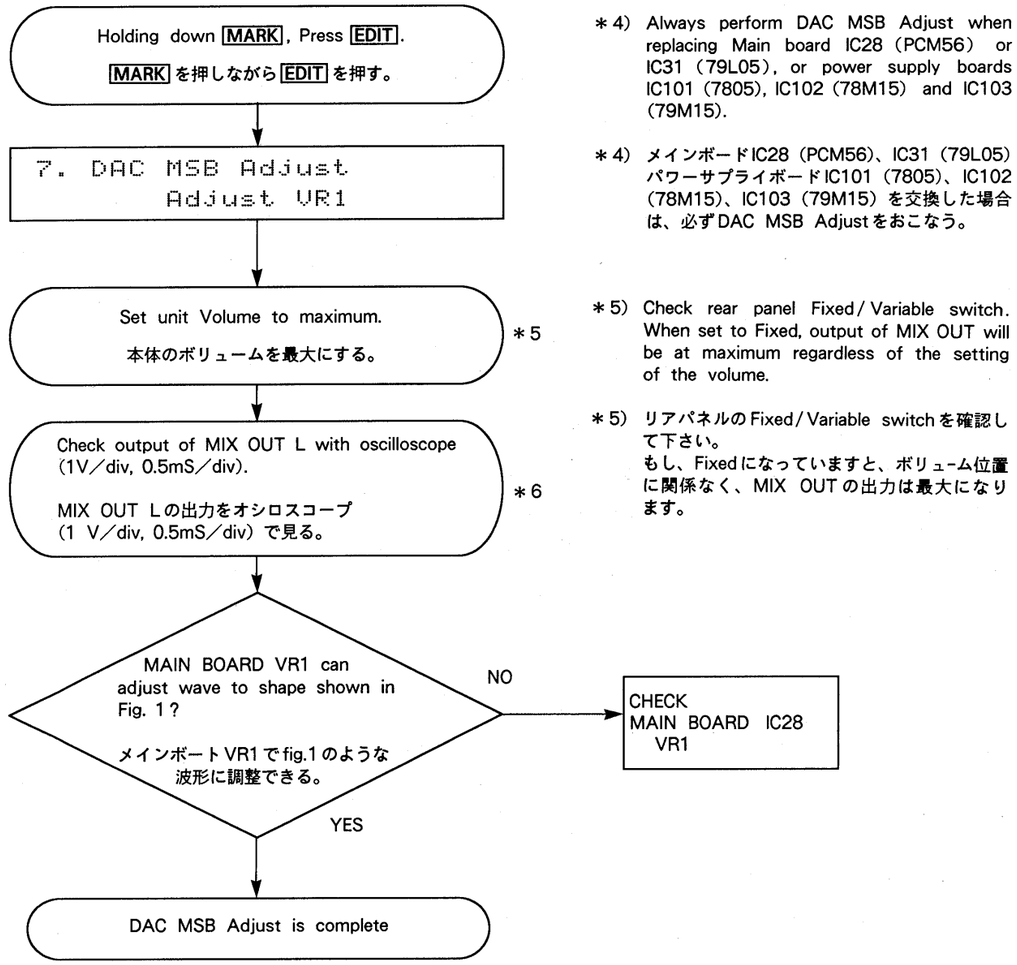
6. MIDI Test



＊3) Pressing [ENTER] will perform the MIDI test again.

＊3) [ENTER] を押すと MIDI Test を再度おこなう。

7. DAC MSB Adjust



＊4) Always perform DAC MSB Adjust when replacing Main board IC28 (PCM56) or IC31 (79L05), or power supply boards IC101 (7805), IC102 (78M15) and IC103 (79M15).

＊4) メインボード IC28 (PCM56)、IC31 (79L05) パワーサプライボード IC101 (7805)、IC102 (78M15)、IC103 (79M15) を交換した場合は、必ず DAC MSB Adjust をおこなう。

＊5) Check rear panel Fixed/Variable switch. When set to Fixed, output of MIX OUT will be at maximum regardless of the setting of the volume.

＊5) リアパネルの Fixed/Variable switch を確認して下さい。
もし、Fixed になっていますと、ボリューム位置に関係なく、MIX OUT の出力は最大になります。

＊6) The wave shape as displayed on the oscilloscope. (Probe 1 : 1 Range : 5mV/div 0.5mS/div)

＊6) オシロスコープで見る波形 (プローブ 1 : 1 レンジ 5mV/div 0.5mS/div)

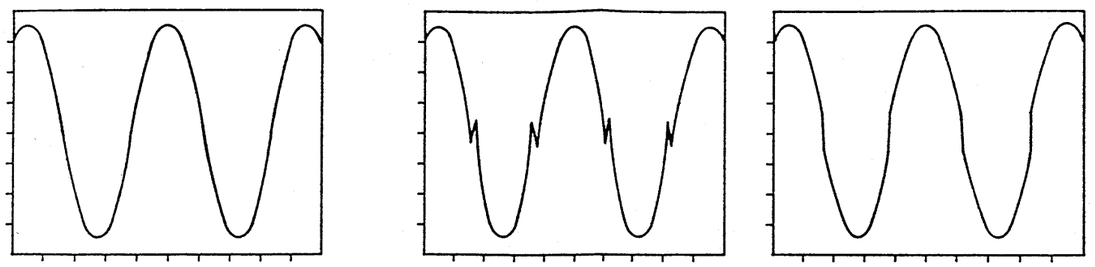
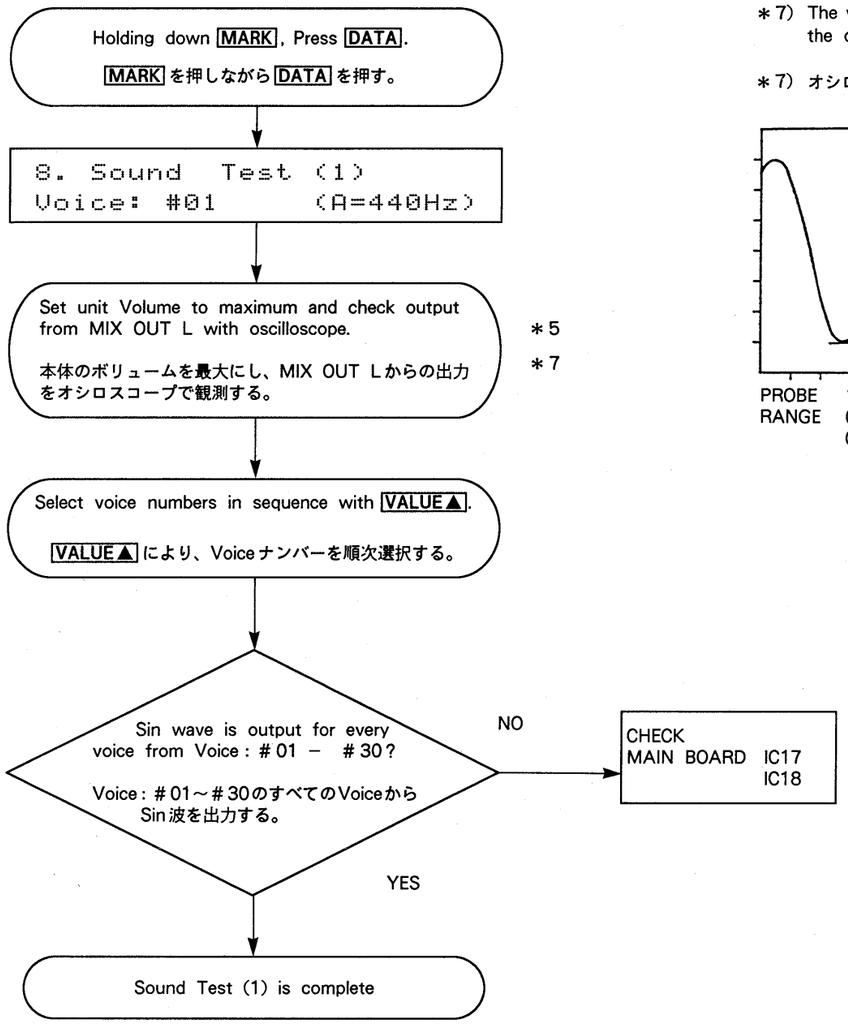


Fig.1

調整済　　調整必要

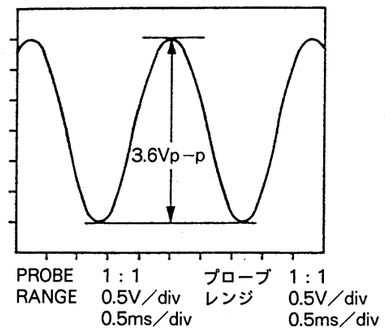
(Since the level is low for the performance of the oscilloscope, the wave shape may contain noise and be difficult to see.)
(レベルが小さいため、オシロスコープの性能で、ノイズを含んで波形が見づらくなることがある)

8. Sound Test (1)

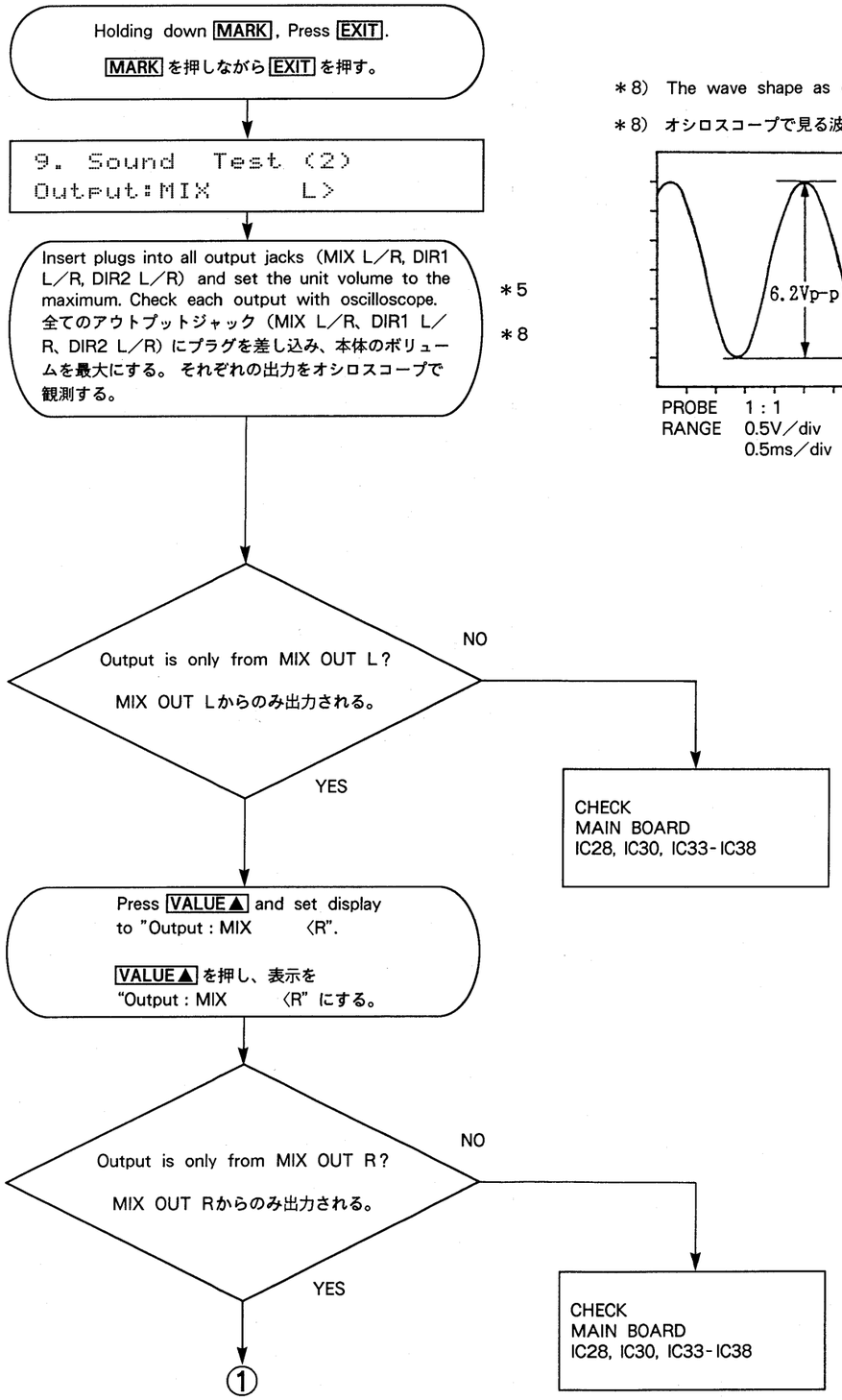


＊7) The wave shape as displayed on the oscilloscope.

＊7) オシロスコープで見る波形

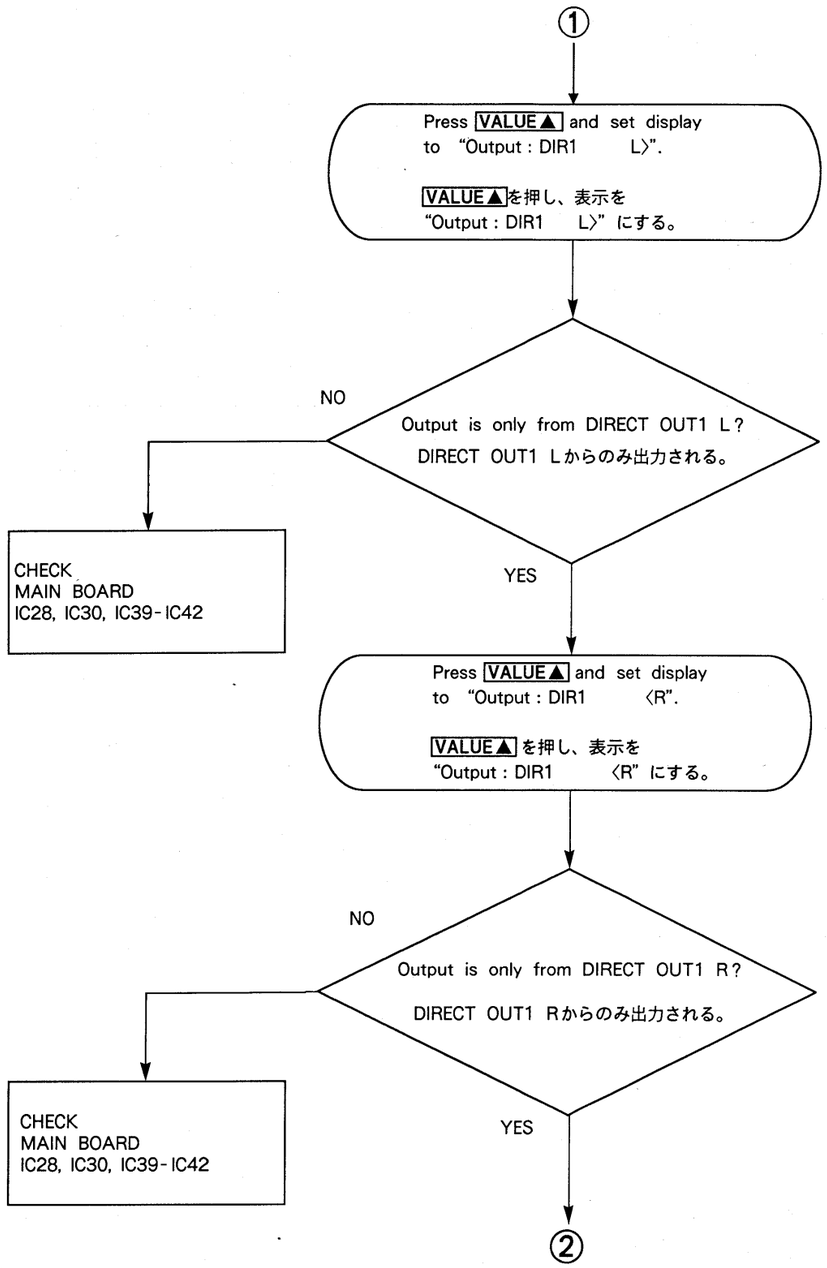


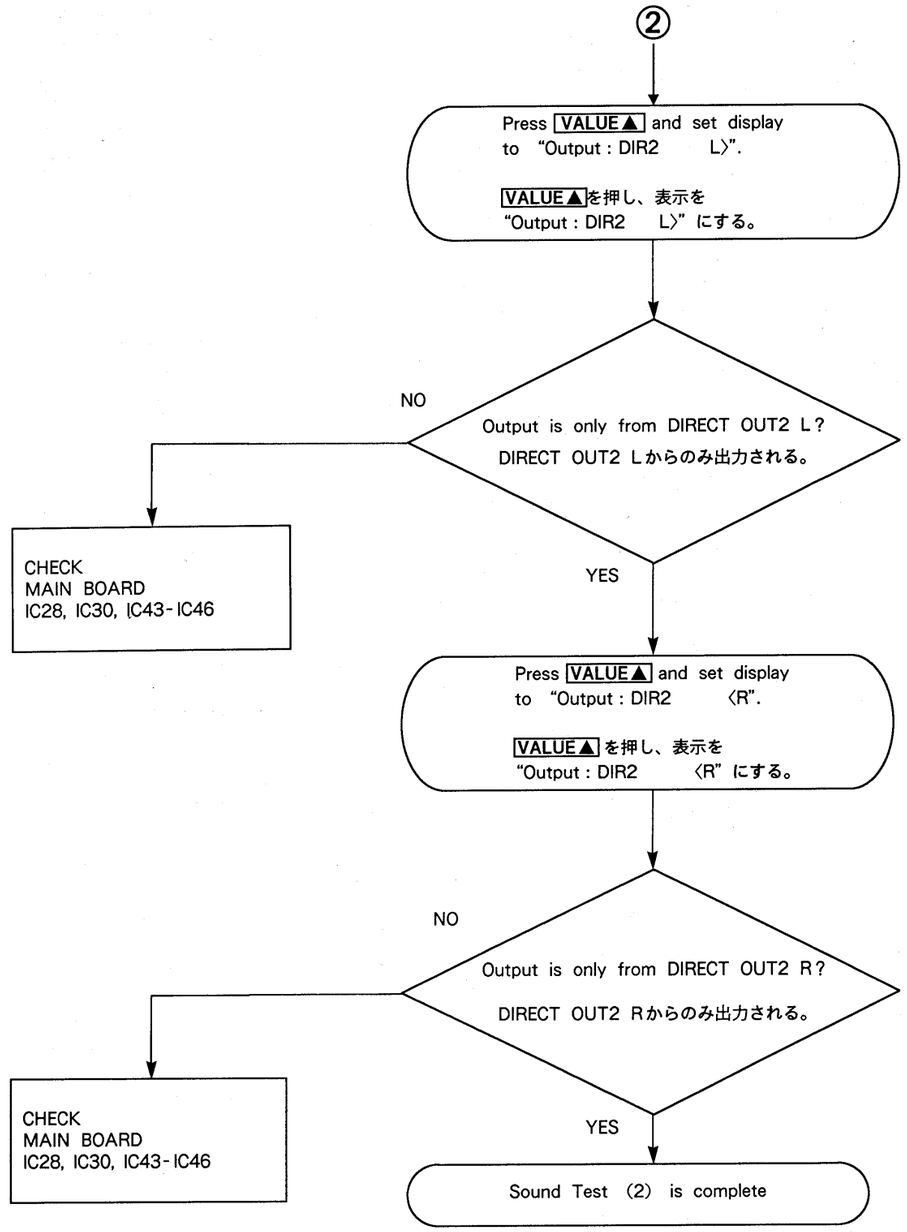
9. Sound Test (2)



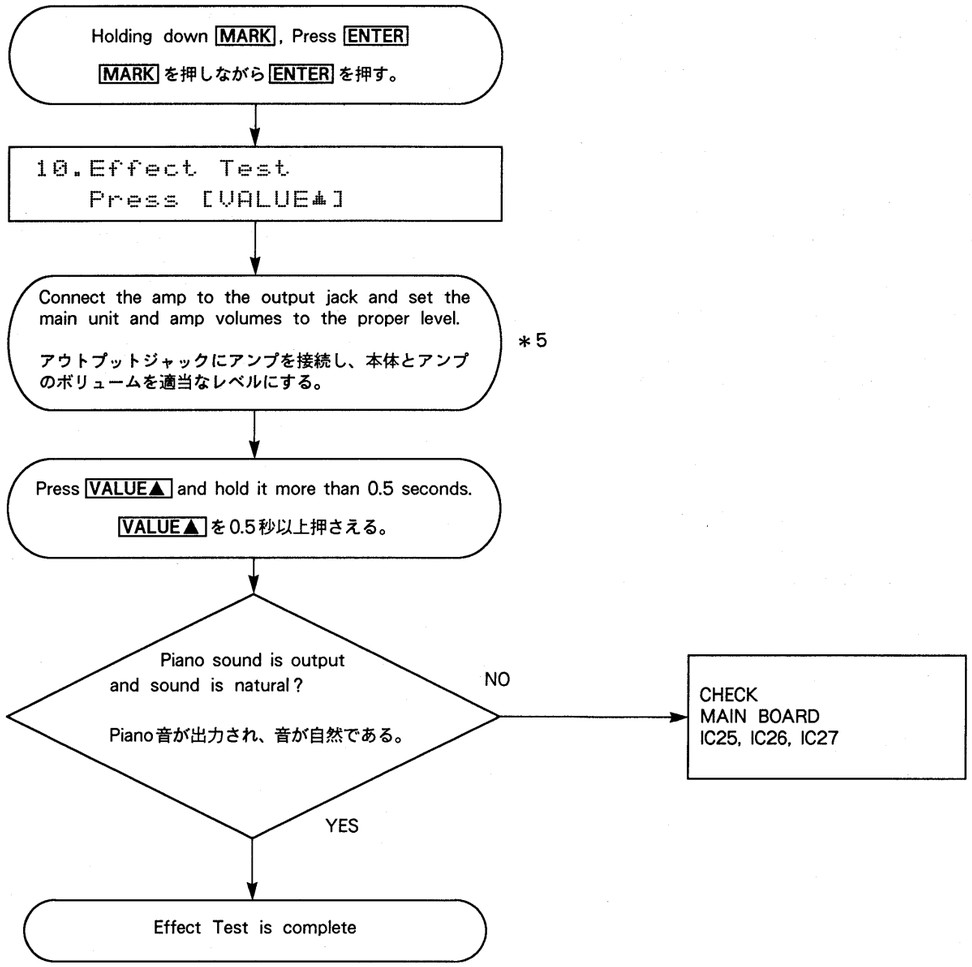
＊8) The wave shape as displayed on the osilloscope.

＊8) オシロスコープで見る波形

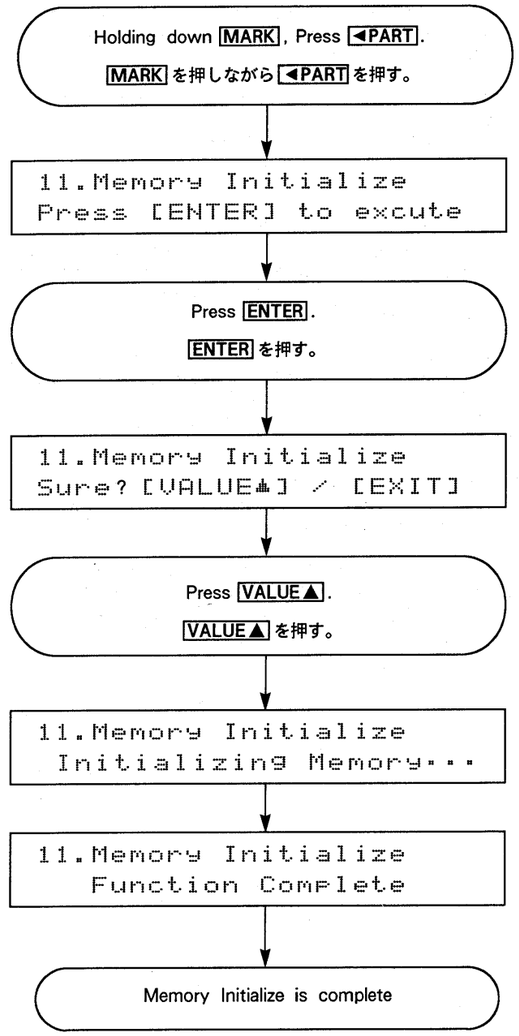

①
Press VALUE▲ and set display to "Output : DIR1 L〉".
VALUE▲を押し、表示を "Output : DIR1 L〉" にする。
Output is only from DIRECT OUT1 L?
DIRECT OUT1 Lからのみ出力される。
NO
YES
CHECK MAIN BOARD IC28, IC30, IC39-IC42
Press VALUE▲ and set display to "Output : DIR1 〈R".
VALUE▲を押し、表示を "Output : DIR1 〈R" にする。
Output is only from DIRECT OUT1 R?
DIRECT OUT1 Rからのみ出力される。
NO
YES
CHECK MAIN BOARD IC28, IC30, IC39-IC42
②


②
Press VALUE▲ and set display to "Output : DIR2 L〉".
VALUE▲を押し、表示を "Output : DIR2 L〉" にする。
Output is only from DIRECT OUT2 L?
DIRECT OUT2 Lからのみ出力される。
NO
YES
CHECK MAIN BOARD IC28, IC30, IC43-IC46
Press VALUE▲ and set display to "Output : DIR2 〈R".
VALUE▲を押し、表示を "Output : DIR2 〈R" にする。
Output is only from DIRECT OUT2 R?
DIRECT OUT2 Rからのみ出力される。
NO
YES
CHECK MAIN BOARD IC28, IC30, IC43-IC46
Sound Test (2) is complete

10. Effect Test



11. Memory Initialization



＊9) Set all Temporary to the initialization value.(Data stored in the main unit (internal) will not be initialized.)

＊9) テンポラリーの全ての内容を、イニシャライズ時の設定にします。(本体(Internal)に記憶されているデータは、イニシャライズされません。)

＊10) The contents of the working RAM may be destroyed when replacing the battery (BA1) or working RAM (main board IC10). In this case, perform a Factory Data Load at the same time as Memory Initialize with the procedure shown at left.

＊10) バッテリー(BA1)や、ワーキングRAM(メインボードIC10)の交換などで、ワーキングRAMの内容が破壊されることがあります。その場合は、左記の手順により、メモリーのイニシャライズと同時にファクトリーデータのロードを行います。

12. Factory Data Load

＊11) To perform this test, the "U220 factory preset card" is necessary. If necessary, please order from Local Roland service station.

＊11) このテストを行うには、「U-220 Factory Preset Card」が必要です。
必要な場合は、ローランドサービスまでオーダーして下さい。

＊12) The contents of the working RAM may be destroyed when replacing the battery (BA1) or working RAM (main board IC10). In this case, perform a Factory Data Load at the same time as Memory Initialize with the procedure shown at left.

＊12) バッテリー (BA1) や、ワーキングRAM (メインボードIC10) の交換などで、ワーキングRAMの内容が破壊されることがあります。その場合は、左記の手順により、メモリーのイニシャライズと同時にファクトリーデータのロードを行います。

＊13) OTP ROM Card (M-256N) is used for the memory card, don't use a RAM Card (M-256E, etc.). The contents of the RAM Card may be destroyed.

＊13) メモリーカードには、OTP ROM Card (M-256N) を使用してください。RAM Card (M-256Eなど) は使用しないでください。RAM Cardの内容が破壊されることがあります。

Bulk Dump

バルク・ダンプ

Before repairing the unit, always perform a bulk dump in order to preserve customer data.
Press [DATA] while the PLAY screen is active and then select [Bulk] with the cursor. Select [All] from the [Bulk] menu to display the following.

修理時にはユーザーデータの保存のためバルク・ダンプを行なってください。
プレイ画面の状態で[DATA]を押し、カーソルで[Bulk]を選択します。[Bulk]では[All]を選択して下図の様な表示にします。

```
Data/Bulk/All
Bulk Dump All
```

Connect MIDI OUT on the transmitting side to MIDI IN on the receiving side. If the receiving side is a sequencer, activate RECORDING; if the receiving side is another U-220, turn ON the exclusive receiving switch after verifying the device ID (17). Then press [ENTER] on the transmitting side to execute the bulk dump.
(U-220 Owner's Manual "Chapter 4 Function reference/ 2.Edit mode/ a.Setup settings/ MIDI" P.48.)

送信側MIDI OUTと受信側MIDI INをつなぎ、受信側がシーケンサーの場合、レコーディング状態にしてから、受信側が他のU-220の場合、デバイスID (17) を確認の上、エクスクルーシブ受信スイッチをONにしてから送信側U-220の[ENTER]を押してバルク・ダンプしてください。
(U-220取扱説明書「第4章 操作階層別機能一覧/ 2.エディット・モード/ a.セットアップの設定/MIDI」P.48。)

```
Data/Bulk/All
   Transmitting SysEx.
```

Data is now being transmitted.

データを転送しています。

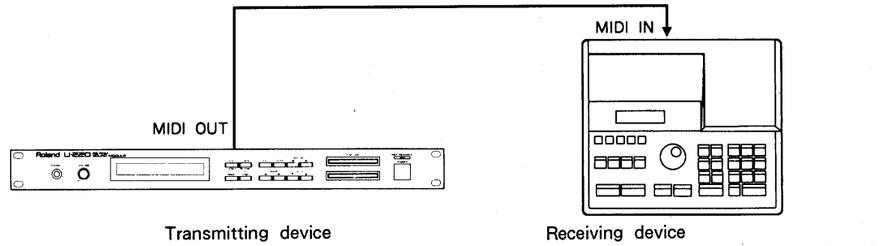
```
Data/Bulk/All
   Function Completed.
```

⬇

```
Data/Bulk/All
Bulk Dump All
```

Check if all the data has been transmitted.
After completion of repairs, check the unit device ID (17) and turn ON the exclusive receiving switch to transmit the stored customer data back to the unit.
Refer to Owner's Manuals for details of the bulk dump method.
(U-220 Owner's Manual "Chapter4 Function reference/ 3.Data Mode/ b.Bulk Dump" P.88.)

データが転送されたことを確認してください。
修理終了後、本体のデバイスID (17) を確認の上、エクスクルーシブ受信スイッチをONにして保存しておいたユーザーデータを本体へ転送してください。
なお、詳しいバルク・ダンプの方法についてはそれぞれの取扱説明書を参照してください。
(U-220取扱説明書「第4章 操作階層別機能一覧/ 3.データ・モード/ b.バルク・ダンプ (データの転送)」P.88。)

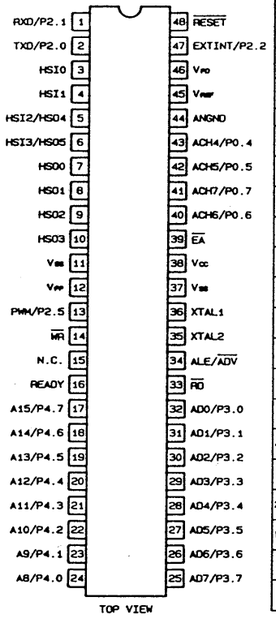


Transmitting device
U-220

Receiving device
(MIDI sequencer, another U-220 etc.)

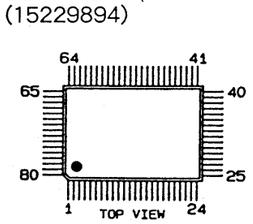
IC DATA

CPU
P8098
(15179286)

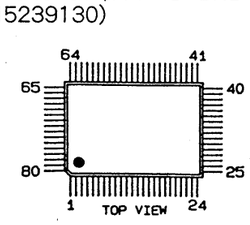


PIN NO.	PIN NAME	IO	DESCRIPTION
38	Vcc	–	Main supply voltage (5V). 主電源5V
11, 37	Vss	–	Digital circuit ground (0V). デジタル・グランド
46	VPD	–	RAM standby supply voltage (5V). RAMスタンバイ電源5V
45	VREF	–	Reference voltage for the AD converter (5V). A/Dコンバータの基準電圧
44	ANGND	–	Reference ground fpr the AD converter (5V). アナログ・グランド
12	Vpp	–	Programming voltage for the future EP ROM parts.
36	XTAL1	I	Input of the oscillator inverter and of the internal clock generator. クロック接続端子
35	XTAL2	O	Output of the oscillator inverter. クロック接続端子
48	RESET	I	Reset input to the chip. リセット入力端子
39	EA	I	Input for the memory select. メモリー選択入力
34	ALE/ADV	O	Address Latch Enable or Address Valid output. アドレス・ラッチ・イネーブル
33	RD	O	Read signal output to external memory. 外部メモリー呼び出し信号出力
14	WR	O	Write output to external memory. 外部メモリー書き込み信号出力
16	READY	I	Ready input to lengthen external memory cycles. スピードの遅いメモリーの使用を可能にする入力端子
3, 4, 5	HSI	I	Input to High Speed Input Unit. 状態変化入力
5 - 10	HSO	O	Output from High Speed Output Unit. 指定時間に出力変化を起こさせる出力端子
40 - 43	Port 0	I	4-bit high impedance input-only port. 4ビット・ハイ・インピーダンス入力専用ポート
13, 47	Port 2	IO	4-bit multi-functional port. 4ビット・マルチ・ファンクショナル・ポート
25 - 32	AD	IO	Address data bus. 下位8ビット・アドレス・データ端子
17 - 24	A	O	Address bus. 下位8ビット・アドレス端子
1	RXD	I	Sirial input. シリアル入力
2	TXD	O	Sirial output. シリアル出力

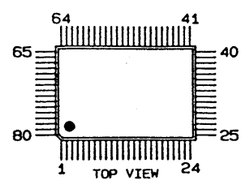
PCM Custom IC
MB87419
(15229894)



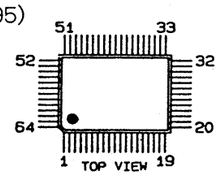
I/O Gate Array
MB623157 μ PF-G-BND
(15239130)



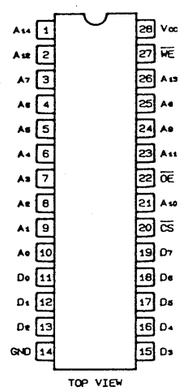
Effect Custom IC
TC23SC140AF-007
(15239126)



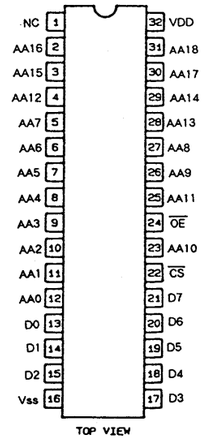
PCM Custom IC
MB87420
(15229895)



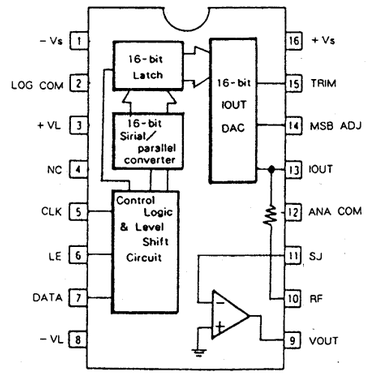
256K SRAM
HM62256LFP-12T
(15279508)



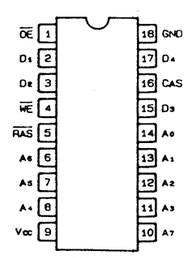
Wave ROM A-F
A : MB834000A-20P-G-226 (15179892F0)
B : MB834000A-20P-G-227 (15179893F0)
C : MB834000A-20P-G-228 (15179894F0)
D : MB834000A-20P-G-229 (15179895F0)
E : MB834000A-20P-G-3A1 (15179947)
F : MB834000A-20P-G-3A2 (15179948)



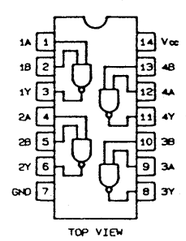
D/A Converter
PCM56P
(15209122)



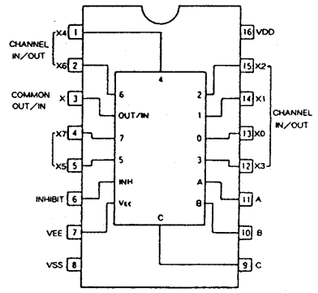
D RAM
M5M4464-10
(15179432)



Quad 2-Input NAND Gate
TC74HC00F-T2
(15259701T0)



8-channel Analog Multiplexer
TC74HC4051AF-T2
(15259863T0)

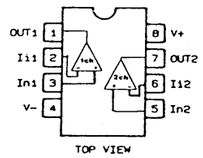


TRUTH TABLE

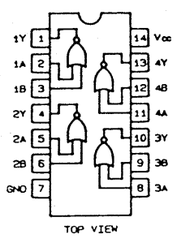
INHIBIT	A	B	C	ON SWITCH
L	L	L	L	X0
L	H	L	L	X1
L	L	H	L	X2
L	H	H	L	X3
L	L	L	H	X4
L	H	L	H	X5
L	L	H	H	X6
L	H	H	H	X7
H	X	X	X	NONE

X : Don't Care

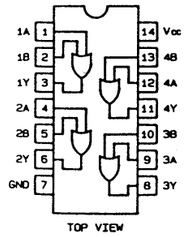
OP Amp
NJM4565M-TE3 (15289120)
M5218FP (15289107)
μPC4570G (15289105)
TL062CPS-TAP-L (15289111)
NJM2082D (15189220)



Quad 2-Input NOR Gate
74F02SJL
(15269609)



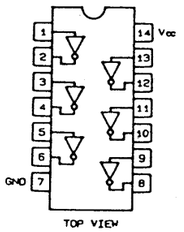
Quad 2-Input OR Gate
74F32SJL
(15269610)



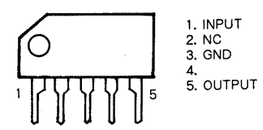
TRUTH TABLE

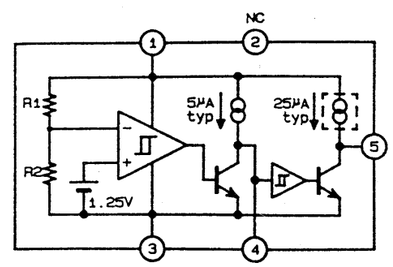
A	B	Y
H	H	H
L	H	H
H	L	H
L	L	L

Hex Inverter
TC74HCU04F-T2 (15259706T0)
74F04SJL (15269609)
SN74LS04NSTAP-L (15269201)



RESET IC
M51953AL
(15219183)





CHANGE INFORMATION

● MAIN Board

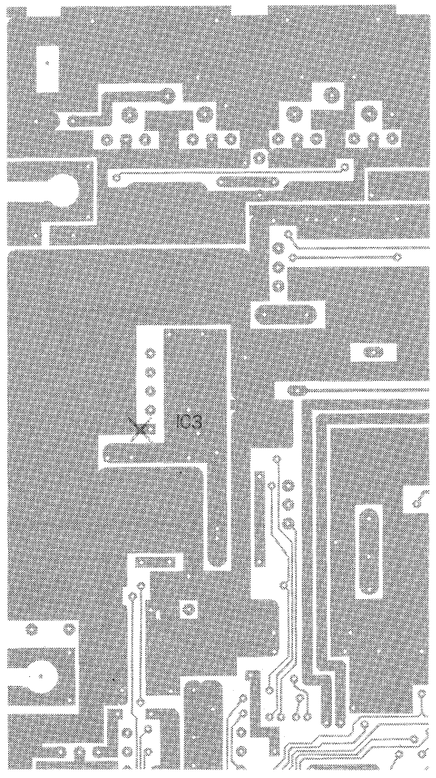
＊ Add Resistor
R147 (220 Ω)　R148 (3.3k Ω)

Eff. SN
ZA70100-UP

Reason
To improve power off noise.

Change description
See the figure below.

: cut trace
パターンカット



View from solder side.

変更案内

● メインボード

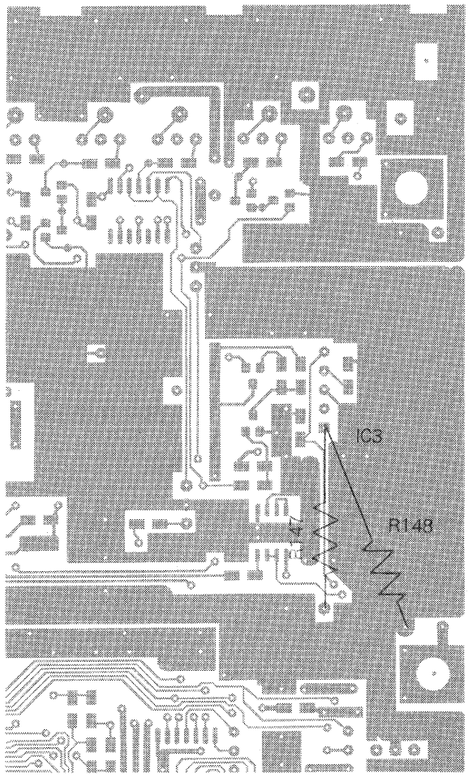
＊ 抵抗追加
R147 (220 Ω)　R148 (3.3k Ω)

実施製番
ZA70100～

変更理由
電源オフ時のノイズ改善

変更内容
下図参照

: Add resistor　抵抗追加
R147 (220 Ω)　R148 (3.3k Ω)



View from component side.