

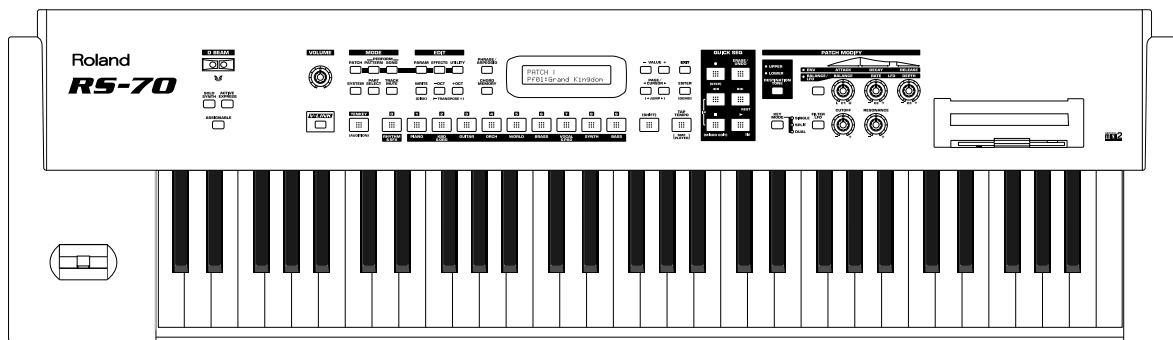
# RS-70

# SERVICE NOTES

*Issued by RJA*

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## SPECIFICATIONS

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RS-70: Synthesizer Keyboard (conforms to General MIDI 2 System)

### Keyboard

61 keys (with velocity)

### [Sound Generator]

#### Maximum Polyphony

64 voices

#### Parts

16

\* Each part (Patch) can be assigned two tones; can be split or layered.

#### Wave Memory

64 megabytes (16-bit linear equivalent)

#### Preset Memory

Original Tones: 1,024

Patches: 768 (RS-70 original: 512, General MIDI 2: 256)

Rhythm Sets: 30 (RS-70 Original: 21, General MIDI 2: 9)

#### User Memory

Patches: 128

\* Each Patch can be assigned two Tones.

Rhythm Sets: 16

\* Each Pattern provides one Performance.

#### Effects

Multi-Effects: 47 types

Reverb: 8 types

Chorus: 8 types

### [Quick Sequencer]

#### System

Instrument-based Pattern sequencer with realtime Pattern switching function

#### Recording Methods

Realtime loop recording, Step recording

#### Tracks

16 tracks/Pattern

#### Resolution

96 TPQN

#### Note Storage

Approx. 100,000 notes

#### Tempo

5-300 BPM (with tap tempo function)

#### Patterns

User Patterns: max. 256

\* The 128 Preset Patterns (including 110 Rhythm Patterns) are provided as part of the User Patterns, that can be rewritten and deleted.

#### Pattern Length

1-998 measures

#### User Songs

max. 99

### [Others]

#### Multi-Chord Memory

Preset Chord Sets: 16

\* 12 chord forms are assigned to each set.

User Chord Sets: 8

\* 12 chord forms can be assigned to each set.

#### Phrase/Arpeggio

Templates: over 342

User Templates: 8

Styles: over 473

User Styles: 8

#### Controllers

D Beam Controller: 1

Pitch Bend/Modulation Lever: 1

Control Knobs: 5

#### External Storage Device

3.5 inch floppy disk: 1.44 MB (2HD), 720 KB (2DD)

(SMF music files for General MIDI or General MIDI 2 can be played.)

#### Display

20 characters, 2 lines (Backlit LCD)

#### Connectors

Output Jacks (L/MONO, R)

Headphones Jack

MIDI Connectors (IN, OUT)

USB Connector (supports USB-MIDI conversion)

Hold Pedal Jack

Control Pedal Jack

#### Power Supply

DC 9 V (AC Adaptor)

#### Current draw

1,500 mA

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## Dimensions

1,033 (W) x 294 (D) x 103 (H) mm

40-11/16 (W) x 11-5/8 (D) x 4-1/16 (H) inches

## Weight

5.8 kg/12 lbs., 13 oz. (excluding AC adaptor)

## Accessories

Owner's Manual English(#72237556)

Japanese(#72237390)

AC Adaptor (PSB-1U)(#03017356)

AC CORD SET 100V (#01903334)

120V (#02562456)

230V (#01903356)

240V (#01903367)

CD-ROM (Editor program for PC/Mac, USB-MIDI driver):(#03341467)

## Options

Pedal Switch: DP-2, DP-8

Foot Switch: BOSS FS-5U

Expression Pedal: EV-5

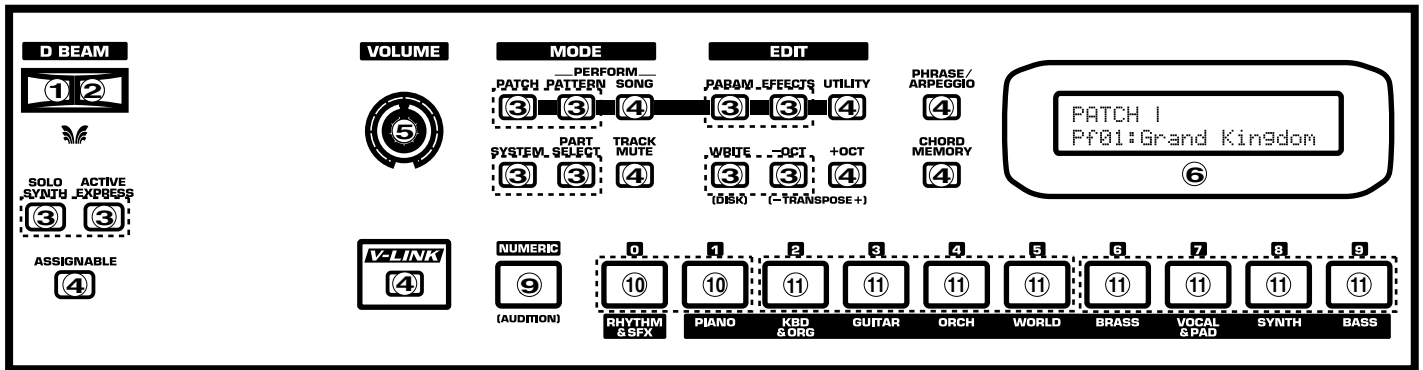
MIDI IMPLEMENTATION English(#17041319)

Japanese(#17041318)

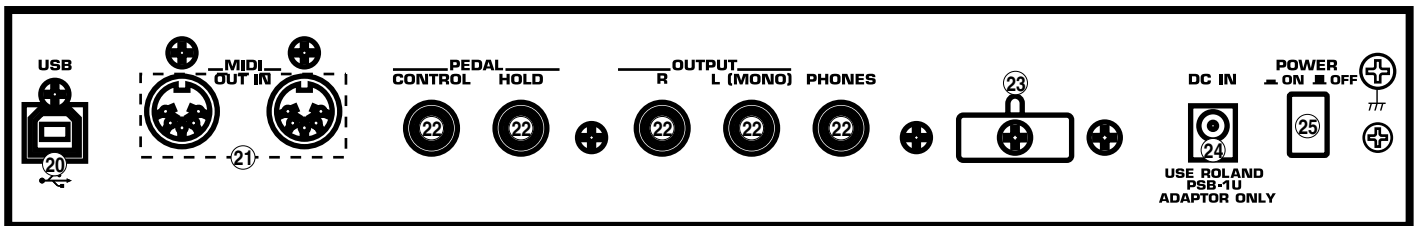
\* *In the interest of product improvement, the specifications and/or appearance of this unit are subject to change without prior notice.*

# LOCATION OF CONTROLS

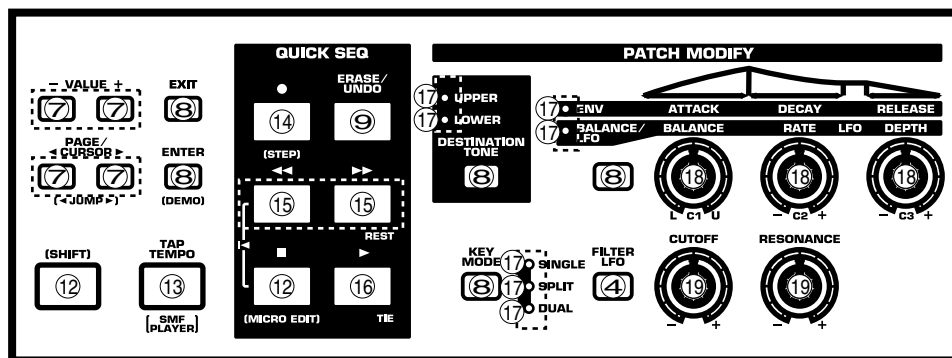
## [Top(Side L)]



## [Rear]



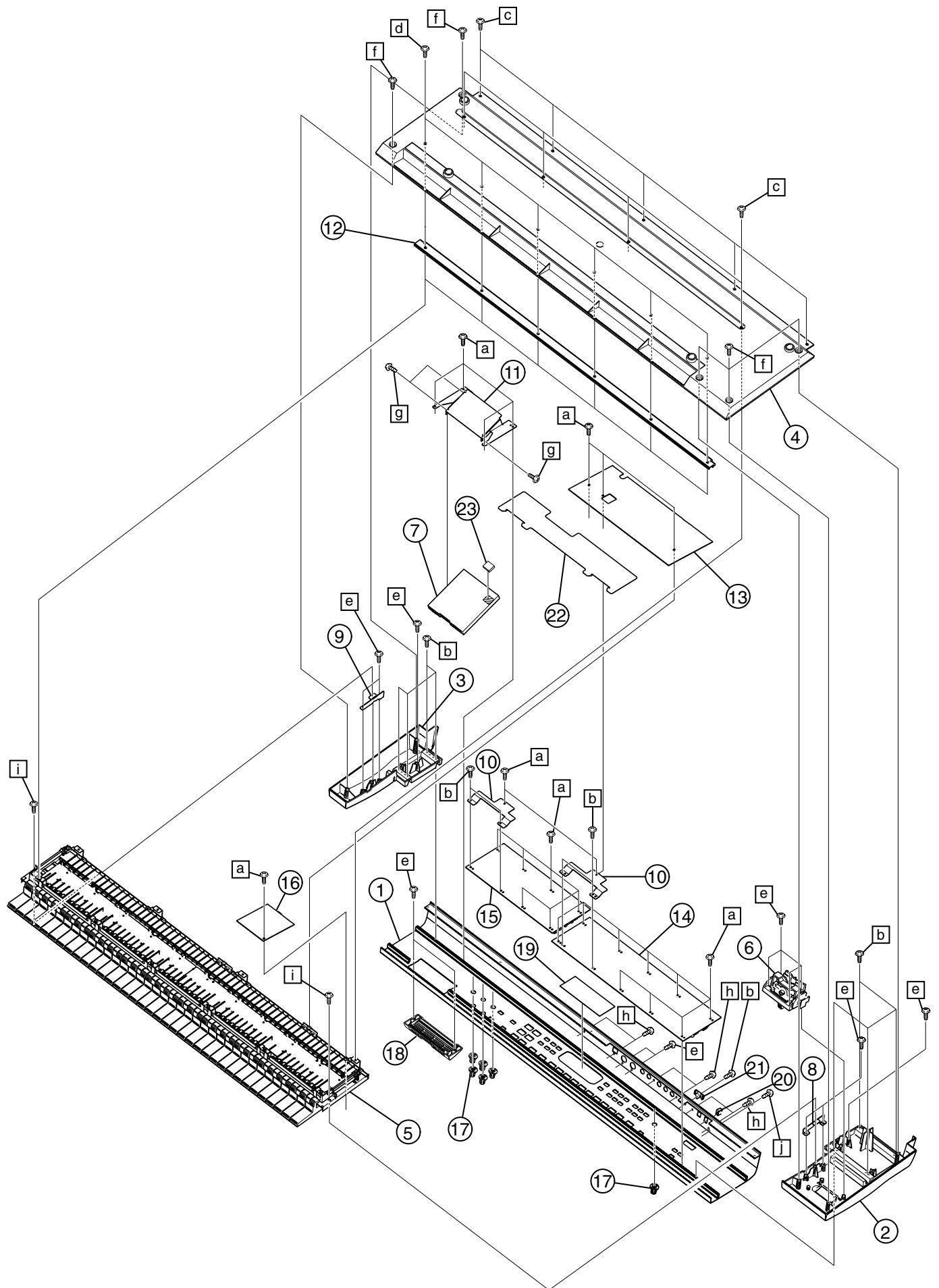
## [Top (Side R)]



## LOCATION OF CONTROLS PARTS LIST

No	PART CODE	Part name	Description	QTY
1	02230578	LED SPACER	LDS-50R	1
1	03126134	LED	TLN233	1
1-2	01343089	ESCUTCHEON	D-BEAM CONTROLLER ESCT BLK	1
2	01900612	DIODE	TPS611	1
2	12169368	LED SPACER	LDS-40B	1
3-4,9-11	01239856	LED (ORANGE)	SEL5921A TP15	29 +2
3-4,7-16	02891789	TACT SWITCH	SKRGADD010 H=5.0	29 +18
3,7	03120889	D S-KEYTOP	SX2H-B GRS	5 +2
4,8	03120890	D S-KEYTOP	SX1H-B GRS	8 +6
5	02455234	12M/M ROTARY POTENTIOMETER	EVJY15F02B14	1
5,18-19	02452912	J R-KNOB	SF-A BLK/LCG	6
6	02453145	LCD	RCM2072M-A	1
6	02453345	LCD HOLDER		1
6	02908834	LEAF REFLECTOR		1
6	03231856	DISPLAY COVER		1
6	03235334	LED (BLUE)	SELU5E20C-TP15	5
9,13,16	01783923	N S-KEYTOP	MD1H	1 +3
10	01783934	N S-KEYTOP	MD2H	1
11	01783956	N S-KEYTOP	MD4H	2
12	01783967	N S-KEYTOP	MX1H	2
13	01239867	LED (RED/GREEN)CLR	SML72423C TP15	1
14	00560756	LED (RED)	SEL5221S TP15	1
14	03235001	N S-KEYTOP	MD1H RED	1
15	01783978	N S-KEYTOP	MX2H	1
16	00676423	LED (GREEN)	SEL5421E TP-15	1
17	01343090	LED SPACER		3
17	01907901	LED	LNJ482YKXXE	7
18	02891889	9M/M ROTARY POTENTIOMETER	EVUFKFK3B14 10KB CC	3
19	01787545	9M/M ROTARY POTENTIOMETER	EVUF2KFK3B14 10KB	2
20	02781101	USB CONNECTOR	YKF45-0020	1
21	13429676	MIDI CONNECTOR	YKF51-5048 (TWIN)	1
22	00569278	6.5MM JACK	LGR4609-7100	5
23	22365714	CORD HOOK	236-714	1
24	13449711	AC ADAPTOR JACK	HEC-0470-01-630	1
25	01676512	PUSH SWITCH	SDKLA1-B	1
25	12499175	G S-BUTTON	S1H BLK 249-175	1

# EXPLODED VIEW



# EXPLODED VIEW PARTS LIST

## [Parts]

NO	PARTCODE	Part name	Description	Q'TY
1	03231867	TOP PANEL		1
2	02453290	SIDE PANEL L		1
3	02453301	SIDE PANEL R		1
4	03235656	BOTTOM CASE		1
5	72341001	KEYBOARD ASSY	SK-9A61-A	1
6	03234723	BENDER	PB-H0204	1
7	03231689	FDD	JU-226A033FC (1/2 INCH HEIGHT)	1
8	02453323	SIDE HOLDER L		1
9	02453334	SIDE HOLDER R		1
10	02455956	PANEL HOLDER		2
11	03231845	FDD HOLDER		1
12	03236689	CHANNEL		1
13	72237412	MAIN BOARD ASSY		1
14	72237501	PWB PANEL L ASSY		1
15	72237512	PWB PANEL R ASSY		1
16	72237523	PWB PS ASSY		1
17	02452912	J R-KNOB	SF-A BLK/LCG	6
18	02568790	FDD ESCT		1
19	03231856	DISPLAY COVER		1
20	12499175	G S-BUTTON	S1H BLK 249-175	1
21	22365714	CORD HOOK	236-714	1
22	03236667	INSULATING SHEET		1
23	03237589	FDD CUSHION		1

## [Screw]

NO	PARTCODE	Part name	Description	Q'TY
a	40011056	SCREW 3X6	BINDING TAPTITE B ZC	25
b	40011101	SCREW 3X8	BINDING TAPTITE B BZC	13
c	40011123	SCREW 4X8	BINDING TAPTITE B BZC	9
d	40012356	SCREW 4X20	BINDING TAPTITE B BZC	6
e	40011312	SCREW 3X8	BINDING TAPTITE P BZC	14
f	40012501	SCREW M4X12	BINDING TAPTITE P FE BZC	5
g	40453601	SCREW M2.5X4	PAN MACHNE W/SW ZC	3
h	40011490	SCREW M3X6	PAN MACHINE W/SW BZC	6
i	40239734	SCREW 3X6	VWH B-TIGHT ZC	2
j	40454856	SCREW M4X10	BINDING NI	1

# PARTS LIST

**SAFETY PRECAUTIONS:**

The parts marked  $\Delta$  have safety-related characteristics. Use only listed parts for replacement.

**CONSIDERATION ON PARTS ORDRING**

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.

NOTE: The parts marked # are new. (initial parts)

MAIN BOARD ASSY=MB, PWB PANEL L ASSY=PAL, PWB PANEL R ASSY=PAR, PWB PS ASSY=PS

**CASING**

#	03235656	BOTTOM CASE		1
#	03231856	DISPLAY COVER		1
	02568790	FDD ESCT		1
	02453290	SIDE PANEL L		1
	02453301	SIDE PANEL R		1
#	03231867	TOP PANEL		1

**CHASSIS**

#	03231845	FDD HOLDER		1
	02455956	PANEL HOLDER		2
	02453323	SIDE HOLDER L		1
	02453334	SIDE HOLDER R		1
#	03236689	CHANNEL		1

**KNOB, BUTTON**

	12499175	G S-BUTTON	S1H BLK 249-175	1
	02452912	J R-KNOB	SF-A BLK/LCG	6

**SWITCH**

	02891789	TACT SWITCH	SKRGADD010 H=5.0	SW29,SW33,SW32,SW31,SW30,SW28,SW27,SW26,SW34,SW24,SW23,SW22,SW21,SW20,SW25,SW42,SW38,SW39,SW50,SW41,SW35,SW44,SW45,SW46,SW47,SW48,SW49,SW37,SW40 on PAL, SW19,SW18,SW17,SW16,SW15,SW14,SW13,SW12,SW11,SW10,SW9,SW8,SW7,SW6,SW5,SW2,SW3,SW4 on PAR	29 +18
	01676512	PUSH SWITCH	SDKLA1-B	SW1 on PS	1

**JACK, EXT TERMINAL**

	13429676	MIDI CONNECTOR	YKF51-5048 (TWIN)	JK1 on MB	1
	02781101	USB CONNECTOR	YKF45-0020	JK7 on MB	1
	00569278	6.5MM JACK	LGR4609-7100	JK3,JK2,JK4,JK5,JK6 on MB	5
	13449711	AC ADAPTOR JACK	HEC-0470-01-630	JK1 on PS	1

**DISPLAY UNIT**

	02453145	RCM2072M-A	LCD	IC9 on PAL	1
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NOTE: Replacement RCM2072M-A should be made on a unit base.

**DISK DRIVE UNIT**

#	03231689	JU-226A033FC (1/2 INCH HEIGHT)	FDD		1
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NOTE: Replacement JU-226A033FC (1/2 INCH HEIGHT) should be made on a unit base.

**KEYBOARD ASSY**

#	72341001	SK-9A61-A	KEYBOARD ASSY		1
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NOTE: See 'KEYBOARD PARTS LIST' for details.

**PCB ASSY**

#	72237412	MAIN BOARD ASSY			1
	NOTE: 'MAIN BOARD ASSY' includes the following parts.				
#	03236101	WIRING	8X170-P2.5-XHP-SCN-R	CN8 on MB	1
	02014090	HEATSINK	K217 H25	HS1 on MB	1
	12199584	GROUNDING TERMINAL	M1698	TER1,TER2,TER3 on MB ,TER2,TER1 on PS	3



PCB ASSY				
	40011501	SCREW M3X8	PAN MACHINE W/SW+PW BZC	1
#	72237501	PWB PANEL L ASSY		1
		NOTE: 'PWB PANEL L ASSY' includes the following parts.		
	02560123	RIBBON CABLE	JWFV 10X175-P2.0	1
	01343089	ESCUTCHEON	D-BEAM CONTROLLER ESC T BLK	1
	02453345	LCD HOLDER		1
	01783923	N S-KEYTOP	MD1H	1
	01783934	N S-KEYTOP	MD2H	1
	01783956	N S-KEYTOP	MD4H	2
	03120889	D S-KEYTOP	SX2H-B GRS	5
	03120890	D S-KEYTOP	SX1H-B GRS	8
	02908834	LEAF REFLECTOR		1
	02230578	LED SPACER	LDS-50R	1
	12169368	LED SPACER	LDS-40B	1
#	72237512	PWB PANEL R ASSY		1
		NOTE: 'PWB PANEL R ASSY' includes the following parts.		
	01783923	N S-KEYTOP	MD1H	3
	01783967	N S-KEYTOP	MX1H	2
	01783978	N S-KEYTOP	MX2H	1
	03120889	D S-KEYTOP	SX2H-B GRS	2
	03120890	D S-KEYTOP	SX1H-B GRS	6
#	03235001	N S-KEYTOP MD1H RED		1
	01343090	LED SPACER		3
#	72237523	PWB PS ASSY		1
		NOTE: 'PWB PS ASSY' includes the following parts.		
	22465224	HEATSINK	246-224 HS1 on PS	1
	12199584	GROUNDING TERMINAL	M1698 TER1,TER2,TER3 on MB ,TER2,TER1 on PS	2
	40011501	SCREW M3X8	PAN MACHINE W/SW+PW BZC	1
IC				
	02902867	M37641M8-137FP VER1.00	IC (8BIT CPU)	IC40 on MB
#	03231645	HD6437016E30F	IC (32BIT CPU)	IC7 on MB
	02568456	FDC FDC37C78	IC (FDC CPU PERIPH)	IC39 on MB
	02677490	RA0C-003XP7TC203C180AF003	IC (CUSTOM)	IC24 on MB
	00129278	SSC1080F0B	IC	IC33 on MB
	01342978	TC160G22AF-1253	IC (CUSTOM)	IC18 on MB
	02784856	M11L416256SA-35T	IC (DRAM)	IC30 on MB
	03017856	M11L16161SA-45T	IC(DRAM)	IC10 on MB
	01900678	BR93LC46FV-WE2	IC (EEPROM)	IC16 on MB
#	03231656	MX23L12810TC-12 M1P0102WAV	IC (MASK ROM)	IC21 on MB
#	03231667	MX23L12810TC-12 M1P01 WAVE	IC (MASK ROM)	IC20 on MB
	02678878	LH28F320BFE-PBTL80	IC (FLASH MEMORY)	IC2 on MB
	01451578	AK4324-VF-E2	IC (DAC)	IC28 on MB
	01458401	TC74LVX4245FS(EL)	IC (TTL)	IC12,IC14 on MB
	01121845	TC7W04FU TE12L	IC (CMOS)	IC41 on MB
#	03127589	TC7S08FU	IC (CMOS)	IC36 on MB
	01348912	TC7SH08FU(TE85L)	IC (CMOS)	IC11,IC32 on MB
	01348945	TC7SH32FU(TE85L)	IC (CMOS)	IC9 on MB
	01455301	TC7WH04FU(TE12L)	IC (CMOS)	IC4 on MB
	02234245	TC7WHU04FU(TE12L)	IC (CMOS)	IC25 on MB
	02675689	HD74LV245ATELL	IC (CMOS)	IC1,IC8,IC15,IC5 on MB
	03016167	TC74VHCT08AFT(EL)	IC (CMOS)	IC3 on MB
	15189261	M5218AFP-600E	IC (BIPOLAR OP AMP)	IC29,IC27,IC19 on MB
	15289109	M5216FP-600D	IC (BIPOLAR OP AMP)	IC31 on MB
	15199190	NJM7805FA	IC(V.RGL)	IC38 on MB, IC3 on PS
	15199286	AN78L05M-(E1)	IC (REGULATOR)	IC26 on MB
	01458445	UPC29M33T-T1	IC (REGULATOR)	IC34 on MB
	02234778	NJM2360AM-TE3	IC (REGULATOR)	IC35 on MB
#	03236112	FS781BZBT	IC	IC401 on MB
	15199937	M51953BFP-600C	IC (RESET)	IC37 on MB
	02900545	PC410LKNIP	IC (PHOTO COUPLER)	IC6 on MB
	01677756	HD74HC138P	IC (CMOS)	IC5,IC4 on PAL
	01677823	HD74HC574P	IC CMOS	IC6 on PAL
	15189186	UPC4570C	IC (BIPOLAR OP AMP)	IC7,IC8 on PAL
#	01677812	HD74HC4053P	IC (CMOS)	IC2 on PAR
	15189249	BA10324A	IC (OP AMP)	IC1 on PAR
TRANSISTOR				
	15309101	2SA1037AKT146R	TRANSISTOR	Q13,Q7,Q6 on MB
	15319101	2SC2412KR T146	TRANSISTOR	Q15,Q14 on MB
	15319115	2SC4213-A(TE85L)	TRANSISTOR	Q11,Q10,Q9,Q12 on MB
#	03233989	2SC4210-Y(TE85R)	TRANSISTOR	Q17 on MB
	02671023	2SC3052-T12-1E	TRANSISTOR	Q5,Q18 on MB
	02905501	SSM3J02T	TRANSISTOR	Q19 on MB
	15329507	DTA114EKT146	DIGITAL TRANSISTOR	Q1 on MB

TRANSISTOR					
	15329511	DTC114TKT146	DIGITAL TRANSISTOR	Q3,Q2 on MB	2
	15329516	DTC114EKT146	TRANSISTOR	Q16 on MB	1
	03126145	2SA933ASTPR	TRANSISTOR	Q18 on PAL	1
#	03234545	2SD1858 TV2 Q	TRANSISTOR	Q19 on PAL	1
	15119163	RN2227(TPE4)	TRANSISTOR	Q8,Q6,Q7,Q5 on PAL, Q3,Q1,Q2,Q4 on PAR	4 +4
	15129164	DTC114ESTP	DIGITAL TRANSISTOR	Q16,Q9,Q10,Q11,Q12,Q13,Q14,Q15 on PAL	8
DIODE					
	02780401	MA720-(TX)	SCHOTTKY DIODE	D2 on MB	1
	00673789	SB20-03P-TD	SCHOTTKY DIODE	D5 on MB	1
	01897189	MA147-(TX)	ARRAY DIODE	DA6,DA1,DA8,DA7 on MB	4
	15339130	MA142WK-(TX)	ARRAY DIODE	DA3,D3,DA4,DA5,DA401,DA402,DA403,D 1 on MB	8
	01565678	RD5.1M-T2B	ZENER DIODE	D4 on MB	1
	01900612	TPS611	DIODE	Q17 on PAL	1
	15019126	1SS133 T-77	SWITCHING DIODE	D50,D49,D401,D58,D57,D56,D55,D54,D51, D34,D21,D22,D23,D24,D25,D26,D27,D28,D 29,D30,D31,D53,D33,D48,D35,D36,D38,D39 ,D40,D41,D42,D43,D45,D46,D47,D32 on PAL, D19,D14,D5,D3,D15,D4,D16,D18,D13,D12, D17,D11,D10,D9,D8,D7,D6,D20 on PAR	36 +18
	03126134	TLN233	LED	LED44 on PAL	1
	01239856	SEL5921A TP15	LED (ORANGE)	LED29,LED13,LED14,LED15,LED16,LED17 ,LED18,LED19,LED20,LED21,LED22,LED2 3,LED12,LED27,LED24,LED30,LED31,LED 32,LED33,LED34,LED36,LED37,LED38,LE D39,LED40,LED41,LED42,LED25,LED26 on PAL, LED401,LED6 on PAR	29 +2
#	03235334	SELU5E20C-TP15	IC (LED)	LED49,LED53,LED51,LED47,LED45 on PAL	5
	00560756	SEL5221S TP15	LED (RED)	LED1 on PAR	1
	00676423	SEL5421E TP-15	LED (GREEN)	LED5 on PAR	1
	01907901	LNJ482YKXXE	LED	LED2,LED3,LED4,LED7,LED8,LED9,LED1 0 on PAR	7
	01239867	SML72423C TP15	LED (RED/GREEN)CLR	LED11 on PAR	1
	15039136	DSA26C	DIODE	D1 on PS	1
RESISTOR					
	15399952	MCR50JZH470 1/2W	CHIP RESISTOR	R122,R123,R128,R129 on MB	4
	15399711	MCR25 JZH J 221 1/4W	MTL.FILM RESISTOR	R47 on MB	1
#	03236123	RPC05T 2R2 J	MTL.FILM RESISTOR	R149,R152,R153,R150,R148 on MB	5
	01011856	RPC05T 0R0 J	MTL.FILM RESISTOR	R29,L401,R178,L80,L68,R65,R64,L60,L57,R5 7,R403,R31,R163,R19,L18,R17,L15,L13,L12, L11,L10,L9,L8,L7,R3,L1,L55,R80 on MB	28
	00567278	RPC05T 822 J	MTL.FILM RESISTOR	R108,R112,R98,R94,R154 on MB	5
	00567301	RPC05T 153 J	MTL.FILM RESISTOR	R126,R93,R104,R107,R120,R117 on MB	6
	00567378	RPC05T 473 J	MTL.FILM RESISTOR	R139,R133,R141,R156,R45 on MB	5
	00567290	RPC05T 123 J	MTL.FILM RESISTOR	R81,R97,R110 on MB	3
	00567289	RPC05T 103 J	MTL.FILM RESISTOR	R100,R85,R86,R95,R408,R96,R405,R404,R16 8,R109,R111,R113,R116,R134,R74,R180,R17 5,R170,R99,R5,R72,R16,R32,R69 on MB	24
	00567267	RPC05T 682 J	MTL.FILM RESISTOR	R121,R127 on MB	2
	00567412	RPC05T 104 J	MTL.FILM RESISTOR	R48,R105,R118,R124,R131,R159,R171,R161 on MB	8
	00567245	RPC05T 472 J	MTL.FILM RESISTOR	R135,R30,R28,R22,R87,R70,R13,R413,R66 on MB	9
	00567212	RPC05T 332 J	MTL.FILM RESISTOR	R119,R58,R37,R106,R415 on MB	5
	00567156	RPC05T 102 J	MTL.FILM RESISTOR	R132,R137,R140,R147,R151,R125,R166,R67, R172,R174,R157,R73,R68,R53,R46,R11,R71 on MB	17
	00567023	RPC05T 101 J	MTL.FILM RESISTOR	R54,R177,R8,R20,R26,R27,R40,R51,R414,R1 65,R416,R56,R410,R6,R167,R146,R101,R76,R 59 on MB	19
	00566923	RPC05T 270 J	MTL.FILM RESISTOR	R164,R162 on MB	2
	00566967	RPC05T 470 J	MTL.FILM RESISTOR	R75,R41 on MB	2
	00567034	RPC05T 121 J	MTL.FILM RESISTOR	R7 on MB	1
	00567067	RPC05T 221 J	MTL.FILM RESISTOR	R36,R4,R2 on MB	3
	00566912	RPC05T 220 J	MTL.FILM RESISTOR	R411,R412 on MB	2
	00567089	RPC05T 331 J	MTL.FILM RESISTOR	R103,R179,R176,R115 on MB	4
	00567112	RPC05T 471 J	MTL.FILM RESISTOR	R49,R90,R79,R78,R77,R50 on MB	6
	00567134	RPC05T 681 J	MTL.FILM RESISTOR	R102,R114 on MB	2
	00567178	RPC05T 152 J	MTL.FILM RESISTOR	R169 on MB	1
	00566867	RPC05T 100 J	MTL.FILM RESISTOR	R25,R409,R407,R145,R92,R88,R35,R34,R14, R24,R144 on MB	11
	00567556	RPC05T 105 J	MTL.FILM RESISTOR	R160 on MB	1
	15409113	EXBV8V103JV	RESISTOR ARRAY	RA24,RA401,RA28,RA27,RA25,RA22,RA19 ,RA26 on MB	8
	01457145	EXBE10C103J	RESISTOR ARRAY	RA12,RA17,RA14,RA13,RA35,RA21,RA30, RA33,RA8,RA10 on MB	10
	01013923	EXBV8V100JV	RESISTOR ARRAY	RA31,RA3,RA16,RA23,RA29,RA15 on MB	6

RESISTOR					
	02239645	MNR14 E0AB J 102	RESISTOR-ARRAY	RA38 on MB	1
	02456878	EXB2HV220JV	RESISTOR-ARRAY	RA5,RA36,RA2,RA1,RA11,RA6,RA7,RA9,R A4,RA18,RA34,RA20,RA32 on MB	13
	13749757T0	SR25TRE 220 J	CARBON RESISTOR	R16,R15,R18,R19,R20,R14,R17 on PAL	7
	13749767T0	SR25TRE 560J	CARBON RESISTOR	R26,R28,R27,R25,R24,R23,R22,R21 on PAL, R10,R13,R12,R9,R11 on PAR	13
	13749773T0	SR25TRE 101 J	CARBON RESISTOR	R41,R45 on PAL,R5,R1,R7 on PAR	5
	13749779T0	SR25TRE 181 J	CARBON RESISTOR	R49 on PAL	1
	13749783T0	SR25TRE 271 J	CARBON RESISTOR	R65,R57,R55,R63,R61 on PAL	5
	13749799T0	SR25TR 122J	CARBON RESISTOR	R44 on PAL	1
	13749823T0	SR25TRE 123 J	CARBON RESISTOR	R46 on PAL	1
	13749845T0	SR25TRE 104 J 1/4W	CARBON RESISTOR	R50 on PAL	1
	13749857T0	SR25TRE 334 J	CARBON RESISTOR	R53 on PAL	1
	13749861T0	SR25TRE 474 J	CARBON RESISTOR	R43 on PAL,R2, R6,R8 on PAR	4
	13749190	SR50TR 100 J	CARBON RESISTOR	R32,R33 on PAL	2
	13749797T0	SR25TRE 102 J	CARBON RESISTOR	R38,R42,R47 on PAL, R60 on PAR	4
	13749813T0	SR25TRE 472 J	CARBON RESISTOR	R35 on PAL	1
	13749817T0	SR25TRE 682 J	CARBON RESISTOR	R34,R51 on PAL	2
	13749821T0	SR25TRE 103 J	CARBON RESISTOR	R48 on PAL	1
	13749831T0	SR25TR 273 J	CARBON RESISTOR	R39 on PAL	1
	13749837T0	SR25TRE 473 J	CARBON RESISTOR	R37,R40 on PAL	2
	13749859T0	SR25TRE 394 J	CARBON RESISTOR	R36 on PAL	1
	13749795T0	SR25TRE 821 J	CARBON RESISTOR	R59 on PAR	1
POTENTIOMETER					
	02455234	EVJY15F02B14	12M/M ROTARY POTENTIOMETER	VR6 on PAL	1
	01787545	EVUF2KFK3B14 10KB	9M/M ROTARY POTENTIOMETER	VR5,VR1 on PAR	2
	02891889	EVUFEKFK3B14 10KB CC	9M/M ROTARY POTENTIOMETER	VR4,VR3,VR2 on PAR	3
CAPACITOR					
	01674189	ECUV1H120JCV	CERAMIC CAPACITOR	C143 on MB	1
	01674190	ECUV1H150JCV	CERAMIC CAPACITOR	C222,C213,C214,C215,C216,C217,C218,C21 9,C212,C221,C225,C224,C91,C226,C90,C228 ,C229,C230,C231,C305,C306,C220,C95,C227 ,C211,C92,C94,C99,C100,C102,C103,C104,C 198,C192,C193,C194,C195,C196,C197,C209, C93,C210,C191 on MB	43
	01674334	ECUV1H101JCV	CERAMIC CAPACITOR	C297,C298,C302,C303,C301,C296,C295,C29 3,C292,C402,C105,C294,C416,C290,C425,C2 89,C160,C152,C426,C427,C151,C36,C3,C291 ,C428 on MB	25
	01674356	ECUV1H151JCV	CERAMIC CAPACITOR	C235 on MB	1
	01674712	ECJ1VF1A105Z	CERAMIC CAPACITOR	C22,C60,C166,C167,C168,C237,C20,C6,C21 on MB	9
	01675189	GRM39CH180J50PT	CERAMIC CAPACITOR	C408,C407,C299,C300 on MB	4
	02129534	ECJ1VB1H102K	CERAMIC CAPACITOR	C81,C80,C79,C68,C78,C67,C75,C69,C72,C71 ,C70,C82,C174,C76,C403,C423,C101,C404,C 83,C223,C170,C89,C88,C87,C86 on MB	25
	01674489	ECJ1VB1H152K	CERAMIC CAPACITOR	C409 on MB	1
	00567978	GRM39F104Z25PT	CERAMIC CAPACITOR	C273,C118,C253,C275,C417,C415,C414,C30 7,C201,C280,C281,C418,C283,C284,C287,C2 36,C413,C278,C254,C406,C411,C412,C274,C 277,C249,C250,C251,C252,C207,C304,C51,C 85, C44,C45,C46,C47,C48,C39,C50,C38,C52,C53 ,C55,C56,C57,C58,C120,C65,C200,C49,C14, C1,C4,C5,C7,C8,C9,C11,C42,C13,C74,C16,C 17,C18,C19,C25,C26,C27,C28,C37,C12,C173 ,C96,C140,C61,C142,C153,C161,C162,C137, C164,C138,C175,C177,C179 ,C181,C183,C185,C186,C188,C190,C163,C11 9,C113,C141,C111,C135,C117,C115,C121,C1 22,C123,C124,C125,C126,C127,C108,C116 on MB	108
	00567945	GRM39B103K50PT	CERAMIC CAPACITOR	C109,C106,C77,C98,C110,C203,C15 on MB	7
	01674423	ECUV1H471JCV	CERAMIC CAPACITOR	C29 on MB	1
	01674167	ECUV1H100DCV	CERAMIC CAPACITOR	C171,C154,C146,C144,C165 on MB	5
	01674445	ECUV1H681JCV	CERAMIC CAPACITOR	C285 on MB	1
	02456778	ECJ1VB1C104K	CERAMIC CAPACITOR	C286 on MB	1
	02236712	AMZV0050J221 0200	POLYEST. CAPACITOR	C145,C155 on MB	2
	01343245	AMZV0050J271 0200	POLYEST. CAPACITOR	C150,C159 on MB	2
	00239401	AMZV0050J821 0200	POLYEST. CAPACITOR	C156,C147 on MB	2
	02345101	RV2-16V100M-R	CHEMICAL CAPACITOR	C270,C2,C405,C272,C202,C184,C182,C114, C97,C43,C24,C199,C10,C23 on MB	14
	00560212	ECA1CM4471B	CHEMICAL CAPACITOR	C232,C205 on MB	2
	00560245	16SC10M+T (OS)	CAPACITOR(CHEMICAL)	C233 on MB	1
	01454889	RA2-16V470MT2 470UF/16V	CHEMICAL CAPACITOR	C158,C149 on MB	2
	01900834	RA2-16V101M-T2	CHEMICAL CAPACITOR	C172,C180,C176,C139,C169,C157,C148,C13 6,C73,C178,C234,C134,C208,C204,C206 on MB	15
	01902590	RA2-6V101MC-T2	CHEMICAL CAPACITOR	C84,C107,C64,C54 on MB	4

CAPACITOR					
	02784812	RE3-16V102M-T2	CHEMICAL CAPACITOR	C187,C276 on MB	2
	02891667	RE3-6V102M-T2	CHEMICAL CAPACITOR	C189,C279 on MB, C15 on PS	2 +1
	02898101	RA2-50V2R2MC-T2	CHEMICAL CAPACITOR	C288 on MB	1
#	03125023	RPER11H103K2M1A01A	CERAMIC CAPACITOR	C41 on PAL,C18, C3,C22 on PAR	1 +3
	03018523	RPE2C1H100J2M1D01A	MLT.LAY.CERA CAPACITOR	C37,C38,C39 on PAL	3
	13529132	RPE132-901F104Z50	MLT.LAY.CERAMIC CAPACITOR	C42,C45,C43,C40,C34,C32,C29,C27,C25,C24 ,C44 on PAL, C23,C17,C9,C8,C7,C6,C5,C4,C2 on PAR, C14,C13,C11,C10 on PS	11 +9 +4
	01894601	RC2-16V101MB-T2	CERAMIC CAPACITOR	C31,C36,C33 on PAL, C19 on PAR	3 +1
	02781423	RC3-6V101M-T2	CHEMICAL CAPACITOR	C28 on PAL, C21,C1,C16 on PAR	1 +3
	02891756	RC2-6V331M-T2	CHEMICAL CAPACITOR	C26 on PAL	1
	02891767	RC2-16V100M-T2	CHEMICAL CAPACITOR	C30 on PAL	1
	13649270	ECA1CM222B 2200UF/16V	CAPACITOR	C12 on PS	1
INDUCTOR, COIL, FILTER					
	01676023	SBCP-87331H	CHOKO COIL	L64 on MB	1
	01565578	N1608Z601T01	FERRITE-BEAD	L53,L19 on MB	2
	01787056	N1608Z102T01	FERRITE-BEAD	L50,L77,L20,L79,L76,L75,L74,L73,L72,L71,L 33,L21,L22,L23,L24,L25,L26,L27,L28,L29,L3 0,L70,L32,L51,L35,L37,L38,L40,L41,L43,L44 ,L45,L46,L47,L48,L49,L31,L78 on MB	38
	00903167	N2012Z601T02 (CHIP)	FERRITE-BEAD	L65,L36,L58,L56,L54,L52,L59,L39,L6,L34,L1 7,L16,L14,L5,L3,L2,L42,L4 on MB	18
	01340834	EXCML20A390	FERRITE-BEAD	L62 on MB	1
	01909645	EXCML16A270U	FERRITE-BEAD	L66,L67 on MB	2
	12449268	BL02RN2-R62T2	FERRITE-BEAD	L69 on MB	1
	00237212	SH-202	CHOKO COIL	FL2 on PS	1
CRYSTAL, RESONATOR					
	00891801	MA-406 24.000MHZ TE24	CRYSTAL	X4,X3 on MB	2
	01126267	MA-406 7.056MHZ	CRYSTAL	X1 on MB	1
	02561323	MA-406 33.8688MHZ TE24	CRYSTAL	X2 on MB	1
CONNECTOR					
	01908656	18FE-BT-VK-N	CONNECTOR	CN3 on MB	1
	01908667	22FE-BT-VK-N	CONNECTOR	CN2 on MB	1
	02014445	20FE-BT-VK-N	CONNECTOR	CN5 on MB	1
	02010867	16FE-ST-VK-N	CONNECTOR	CN7,CN9 on MB	2
#	03231623	52806-2610	CONNECTOR	CN10 on MB	1
	13369605	52147-1010(10P)	WIRE TRAP	CN6 on MB	1
	13369664	S4B-PH-K-S(4P)	CONNECTOR	CN4 on MB	1
	02010878	18FE-ST-VK-N FOR WIRING	CONNECTOR	CN4 on PAL, CN3,CN1 on PAR	3
	02016956	22FE-ST-VK-N	CONNECTOR	CN5 on PAL	1
	02018712	20FE-ST-VK-N FOR WIRING	CONNECTOR	CN7 on PAL	1
	13429299	51048-1000(10P)	CABLE HOLDER	CN6 on PAL	1
	13369556	B8B-XH-A JST	CONNECTOR	CN2 on PS	1
WIRING, CABLE					
	02342034	WIRING	4X300-P2.0-PHR-PHR-F		1
#	03236712	BAN CARD	BNCD-S-P=1.25-K-16-130(NO GS)		2
#	03236056	BAN CARD	BNCD-S-P=1.25-K-18-280(NO GS)		1
#	03236067	BAN CARD	BNCD-P=1.25-K-18-120		1
#	03236078	BAN CARD	BNCD-P=1.25-K-20-140		1
#	03236089	BAN CARD	BNCD-P=1.25-K-22-380		1
#	03236090	BAN CARD	BNCD-P=1.00-K-26-450		1
SCREW					
	40454856	SCREW M4X10	BINDING NI		1
	40011123	SCREW 4X8	BINDING TAPTITE B BZC		9
	40011101	SCREW 3X8	BINDING TAPTITE B BZC		13
	40011056	SCREW 3X6	BINDING TAPTITE B ZC		25
	40239734	SCREW 3X6	VWH B-TIGHT ZC		2
	40012501	SCREW M4X12	BINDING TAPTITE P FE BZC		5
	40011312	SCREW 3X8	BINDING TAPTITE P BZC		14
	40011490	SCREW M3X6	PAN MACHINE W/SW BZC		6
	40453601	SCREW M2.5X4	PAN MACHNE W/SW ZC		3
	40012356	SCREW 4X20	BINDING TAPTITE B BZC		6
PACKING					
	02561512	PAD SIDE R			1

PACKING				
	02561523	PAD LOWER CENTER		1
	02561501	PAD SIDE L		1
	02561534	PAD UPPER CENTER		1
#	03236678	PACKING CASE		1
MISCELLANEOUS				
	40122812	ACETATE TAPE	NITTO NO.5 BLK W15MM 30M	10
	40122901	DOUBLE-FACED TAPE	#501F W10MM 20M 20P (CM)	84
	22365714	CORD HOOK	236-714	1
#	03234723	BENDER	PB-H0204	1
#	03236667	INSULATING SHEET		1
#	03237589	FDD CUSHION		1
ACCESSORIES (STANDARD)				
△	03017356	AC ADAPTOR WITHOUT AC CORD	PSB-1U(R) UNIVERSAL	1
△	01903334	AC CORD SET	100V 1.0M FOR PSB-1U	1
△	02562456	AC CORD SET	120V 1.0M (NON POLAR)	1
△	01903356	AC CORD SET	230V 1.0M FOR PSB	1
△	01903367	AC CORD SET	240V 1.0M FOR PSB	1
△	00905234	ECP01-5A (PLUG FOR BRC-230T)	EURO CONVERTER PLUG	1
#	72237390	OWNER'S MANUAL	JAPANESE	1
#	72237556	OWNER'S MANUAL	ENGLISH	1
#	03341467	CD-ROM	EDITOR & DRIVER V1.50	1
	40232334	WARRANTY CARD	MOCHIKOMI JAPAN ONLY	1

## CHECKING THE VERSION NUMBER

While holding down the [SYSTEM] button, turn on the power. The following screen will appear. (Continue holding down the [SYSTEM] button until the following screen appears.) The CPU and ROM version numbers will be displayed. Please turn off the power, if the version of CPU and ROM is checked.

```
RS-70 VERSION [US]
CPU:1.00 ROM:1.00
```

## USERS DATA SAVE AND LOAD

### Preparing a disk for use by the RS-70 (FORMAT)

Be aware that if you format a disk, all of the data in the disk will be lost.

1. Insert a disk into the floppy disk drive.
2. Press [WRITE] button while holding down [SHIFT] button.
3. Use PAGE/CURSOR [<|/>] button to select "3:FORMAT."

```
DISK MENU:      [ENT]
3 : FORMAT
```

4. Press [ENTER] button.
5. Assign a volume label.
6. Press [ENTER] button.

If you decide to cancel, press [EXIT] button.

When the disk has been formatted, the display will indicate "COMPLETED." This ends the procedure.

### User Backup

Here's how an image of all data in the user area can be saved to disk as one file.

### Procedure

1. Insert a disk into the floppy disk drive.
2. Press [WRITE] button while holding down [SHIFT] button.
3. Use PAGE/CURSOR [<|/>] button to select "2:SAVE."

```
DISK MENU:      [ENT]
2 : SAVE
```

4. Press [ENTER] button.
5. Use VALUE [-]/[+] button to select "Type:ALL."

```
SAVE           >
TYPE:          ALL
```

6. Press PAGE/CURSOR [>] button to go to the next page.
7. Assign a file name.  
Use VALUE [-]/[+] to modify the characters.  
Use PAGE/CURSOR [<|/>] to move the cursor.  
The file will be saved with an extension of ".RSU".

8. Press [ENTER] button.

```
SAVE           [ENT]
Name:  TEST    .RSU
```

When the user memory has been saved, the display will indicate "COMPLETED." This ends the procedure.

### User Restore

Here's how data that you saved using "Type:ALL" can be loaded into user memory.

1. Insert a disk into the floppy disk drive.
2. Press [WRITE] button while holding down [SHIFT] button.
3. Use PAGE/CURSOR [<|/>] button to select "1:LOAD."

```
DISK MENU      [ENT]
1 : LOAD
```

4. Press [ENTER] button.
5. Use VALUE [-]/[+] button to select "Type:ALL."

```
LOAD           >
TYPE:          ALL
```

6. Press PAGE/CURSOR [>] button to go to the next page.
7. Use VALUE [-]/[+] button to select the file (.RSU file) that you wish to load into the user area.

```
LOAD           [ENT]
001:  RS-70    .RSU
```

The file name will depend on the file you are loading.

8. Press [ENTER] button.  
If you decide to cancel, press [EXIT] button.  
When the data has been loaded, the display will indicate "COMPLETED."  
This ends the procedure.

## TEST MODE

### Required items

- Headphones
- Monitor speakers (MA-12 etc.) (two speakers)
- Audio cables (two)
- MIDI cable (one)
- Expression pedal (EV-5 etc.)
- Hold pedal (DP-2 etc.)
- 2HD and 2DD floppy disks (one of each type; DOS-formatted on the RS-70 or on a PC)
- USB cable
- A computer with the RS-70 USB driver already installed
- Noise meter

## Test items

The RS-70 has the following tests.

For details on each test item, refer to the corresponding section.

0 :Test Mode Top Page  
 1 :SHOCK Test  
 2 :MEMORY Test  
 3 :MIDI Test  
 4 :SOUND Test  
 5 :LCD Test  
 6 :A/D Test 1 (Bender, Modulation)  
 7 :A/D Test 2 (Control Knob)  
 8 :A/D Test 3 (Hold Pedal, Expression Pedal)  
 9 :D BEAM ADJUSTMENT  
 10:D BEAM Test  
 11:USB Test  
 12:DISK Test  
 13:SWITCH&LED Test  
 14:KEYBOARD Test  
 15:NOISE Test  
 16:DESTINATION Set  
 17:Factory Reset

## Please note before you begin the tests

- Even if you enter Test mode, the user data will not be lost until you execute "17.Factory Reset." Save the user data to disk beforehand only if you will be executing "17.Factory Reset." (See "Saving and loading data")
- Some of the test items output a tone for confirmation. Please connect headphones and monitor speakers before you begin.

## Entering Test mode

While holding down the [DESTINATION TONE] button + [ENV or BALANCE/LFO] button + [TAP TEMPO] button (three buttons), turn on the power of the RS-70. The top page of Test mode will appear. (Continue holding down the buttons until the top page appears.)

## Exiting Test mode

In "0 Test Mode Top Page," press [SHIFT] button + [EXIT] button.

## Moving to the next test item

Press [SHIFT] button + [PAGE/CURSOR < ] button to move to the preceding test, or [SHIFT] button + [PAGE/CURSOR > ] button to move to the next test.

## Details of Test mode

### 0. Test Mode Top page

```
RS-70 PD Test  [US]
CPU:1.00  ROM:1.00
```

- Check the ROM version. If the version is not appropriate, update the firmware. (Refer to "Updating the system.")
- Check the export destination ([US] or [EUR]). If the destination is not appropriate, use "16 DESTINATION Set" to change it.
- Verify that the LCD backlight is lit consistently. If it is not lit correctly, check the following locations.  
 MAIN BOARD L52,CN5  
 RS-70 PWB PANEL L ASSY

R55,R57,R61,R63,R65,LED45,LED47,LED49,LED51,LED53,CN7  
 BNCD-P=1.25-K-20-140

- Press the [ENTER] button to start Test mode.

### 1. SHOCK Test

```
SHOCK Test:
Mute: --
```

- Demo playback will begin. Verify that the VOLUME is not scratchy, etc.
- Verify that the audio output is muted while you hold down the [TAP TEMPO] button. (The display changes from "Mute: --" to "Mute: OK")
- Press the [ENTER] button to proceed to the next test.

### 2. MEMORY Test

(MEMORY Test 1)

```
MEMORY Test 1:
CPU:OK  ROM:OK
```

- This test checks the CPU and the flash ROM (program memory).
- If there are no problems, the display will indicate OK and you will automatically proceed to MEMORY Test 2.
- If NG, check the following locations.  
 CPU NG :MAIN BOARD IC7,IC401,X1  
 ROM NG :MAIN BOARD IC2  
 Press [SHIFT] button + [ENTER] button to proceed to the next test.  
 (MEMORY Test 2)

```
MEMORY Test 2:
DRAM:OK  EEPROM:OK
```

- This test checks the DRAM and EEPROM.
- If there are no problems, the display will indicate OK and you will automatically proceed to MEMORY Test 3.
- If NG, check the following locations.  
 DRAM NG :MAIN BOARD IC10  
 EEPROM NG :MAIN BOARD IC16,R24,R25  
 Press [SHIFT] button + [ENTER] button to proceed to Memory Test 3.  
 (MEMORY Test 3)

```
MEMORY Test 3:
WAVE:OK  DSP:OK
```

- This test checks the WAVE ROM and DSP.
- If there are no problems, the display will indicate OK and you will automatically proceed to the next test.
- If NG, check the following locations.  
 WAVE NG :MAIN BOARD IC20,IC21  
 DSP NG :MAIN BOARD IC24,IC30  
 Press [SHIFT] button + [ENTER] enter to proceed to the next test.

### 3. MIDI Test

```
MIDI Test:
Connect: --
```

- Use a MIDI cable to connect MIDI IN and MIDI OUT. If the connection is correct, the display will indicate OK and you will automatically proceed to the next test.

## 4. SOUND Test

- Connect monitor speakers to OUTPUT L/R, and connect headphones.  
(L-ch Test)

```
SOUND Test :
Left >>>>>
```

- Verify that a sine wave is output from Output-L and the left side of the headphones.
- Press the [ENTER] button to proceed to the R-ch test.  
(R-ch Test)

```
SOUND Test :
<<<<< Right
```

- Verify that a triangle wave is output from Output-R and the right side of the headphones.
- Press the [ENTER] button to proceed to the L/R-ch test.  
(L/R-ch Test)

```
SOUND Test :
Left >>>>><<<<< Right
```

- Verify that a sine wave is output from Output-L and the left side of the headphones, and a triangle wave from Output-R and the right side of the headphones.
- Press the [ENTER] button to proceed to the next test.

## 5. LCD Test

- Verify that all pixels of the LCD are lit.
- Press the [ENTER] to proceed to the "all LCD unlit" test.
- Verify that all pixels of the LCD are unlit.
- Press the [ENTER] button to proceed to the LCD Contrast Test.  
(LCD Contrast Test)

```
LCD Test :
LCD Contrast: 5
```

- Verify that pressing (and holding down) the [VALUE+] button / [VALUE-] button will adjust the contrast.
- The contrast value is displayed in the LCD.
- Press the [ENTER] button to proceed to the next test.

## 6. A/D Test1 (Bender, Modulation)

- This checks the operation of the bender and modulation.
- Make sure that the bender is upright (i.e., released) when you enter this test.  
(This is because the A/D value is read as the central voltage when you enter this test.)

```
A/D Test 1:
BEND: 0 MOD: 0
```

- Move the Bender fully left; a click will sound if the value of -128 is reached.
- Move the Bender fully right; a click will sound if the value of 127 is reached.
- When both left and right tests are completed, the display will indicate OK.
- Move the Modulation all the way away from yourself; if the value of 127 is reached, a click will sound.
- Return the modulation lever toward yourself; if a value of 0 is reached, a click will sound, the display will indicate OK, and you will proceed to the next test.

(The OK result will not appear unless you perform the tests in the order of Bender left, Bender right, and Modulation.)

## 7. A/D Test2 (Control Knob)

```
A/D A--- D--- R---
Tst2: C--- R---
```

A: ATTACK or BALANCE  
D: DECAY or RATE  
R: RELEASE or DEPTH  
C: CUTOFF  
R: RESONANCE

- Perform this test in the order of A, D, R (RELEASE), C, R (RESONANCE).
- Turn the knob fully left; a click will sound if 0 is reached.
- Turn the knob fully right; a click will sound if 127 is reached.
- Set the knob to the center; if 63/64 is reached, a click will sound and the OK indication will appear.
- If all knobs are OK, you will automatically proceed to the next test.

## 8. A/D Test3 (Hold Pedal, Expression Pedal)

```
A/D Test 3:
HOLD: 0 CTL: 0
```

- Connect a Hold pedal to the rear panel HOLD jack, and connect an Expression pedal to the rear panel CONTROL jack.
- Press the Hold pedal; a click will sound when the display indicates 127.
- Release the Hold pedal; a click will sound and the display will indicate OK.
- Advance the Expression pedal; a click will sound when the display indicates 127.
- Return the Expression pedal; when the display indicates 0, a click will sound and OK will appear.
- If both HOLD and CTL are OK, you will automatically proceed to the next test.

## 9. D BEAM ADJUSTMENT

```
D BEAM ADJUSTMENT:
LOW: 0 HIGH: ---
```

- This test makes D BEAM settings.
- Before you begin this test, make sure that there are no objects closer than 50 cm above the RS-70. (If there is any such object, the setting cannot be made correctly.)
- Do not perform the test in direct sunlight.
- Hold your hand 5 cm above the D BEAM and press the [ENTER] button. If the setting was accomplished correctly, the display will indicate OK.
- Hold your hand 45 cm above the D BEAM and press the [ENTER] button. If the setting was accomplished correctly, the display will indicate OK and you will automatically proceed to the next test.

## 10. D BBEAM Test

```
D-BEAM Test :
0
```

- This tests the operation of the D BEAM.
- Move your hand upward and downward in a range 5~40 cm above the D



BEAM, and verify that the value increases and decreases.

- Hold your hand 5 cm above the D BEAM and verify that 127 is displayed.
- Hold your hand 45 cm above the D BEAM and verify that 0 is displayed.
- Hold your hand 30 cm above the D BEAM and verify that a value greater than 1 is displayed.
- Press the [ENTER] button to proceed to the next test.

## 11. USB Test (USB-MIDI)

```
USB Test :
Connect :--
```

- This checks the USB connection.
- Connect a computer on which you have already installed the USB driver for the RS-70. When the PC is detected, the display will indicate OK and you will automatically proceed to the next test.

## 12. DISK Test

```
DISK Test:      [ENT]
R/W:--- Protect:---
```

- This checks the floppy disk drive.
- Floppy disk Read/Write tests will be performed.
- Insert a 2HD floppy disk and press the [ENTER] button. If the drive operates correctly, the display will indicate OK.
- Remove the 2HD floppy disk.

```
DISK Test:      [ENT]
R/W: OK Protect:---
```

- This checks the floppy disk protect mechanism, and performs a Read test.
- Insert a write-protected 2DD floppy disk.
- Press the [ENTER] button. If the drive operates correctly, you will automatically proceed to the next test.

## 13. SWITCH & LED Test

```
SWITCH & LED Test:52
```

- This checks the switches (buttons) and LEDs.
- When you enter this test, all LEDs will light.
- When you press a switch that has an LED, its LED will go dark.
- The upper right of the screen indicates the number of switches that have not yet been pressed.
- The lower line of the LCD indicates the name of the switch you pressed.
- If one switch corresponds to two or more LEDs, press the switch (buttons) the corresponding number of times.  
<UPPER>, <LOWER>LED = [DESTINATION TONE] switch (buttons)  
<ENV>, <BALANCE/LFO>LED = [ENV or BALANCE/LFO] switch (button)  
<SINGLE>, <SPLIT>, <DUAL>LED = [KEY MODE] switch (button)
- Verify that pressing the TAP TEMPO switch (button) causes the LED to change "red" -> "green" -> "unlit."
- When all switches (buttons) have been pressed, you will automatically proceed to the next test.

\* If you press two or more switches (buttons) simultaneously, the lower line of the LCD will indicate "WARNING !!". In this case, use the [SHIFT] button + [PAGE/CURSOR <] button / [PAGE/CURSOR >] button to re-select the SWITCH & LED Test item, and perform the test again.

## 14. KEYBOARD Test

```
KEYBOARD Test :
PIANO
```

- Play all keys and verify that sound is produced.  
Also verify that the volume changes in response to your playing strength.
- Press the [ENTER] button to change the sound from PIANO to ORGAN.

```
KEYBOARD Test :
ORGAN
```

- Play all keys and verify that sound is produced.  
Also verify that the volume changes in response to your playing strength.
- Press the [ENTER] button to proceed to the next test.

## 15. NOISE Test

```
NOISE Test :
```

- Use a noise meter to measure the residual noise.
- Set the input filter of your noise meter to 'DIN-AUDIO'.
- Verify that the result is below "-83.0 dBm."
- Press the [ENTER] button to proceed to the next test.

## 16. DESTINATION Set

```
DESTINATION set:
[-]US [+]EUR
```

- Specify the export destination setting.
- For 100V, 117V, and 117VUS voltage models, set the export destination to US. Press the [VALUE -] button, and you will proceed to the next test.
- For 230V, 230VE, and 240V voltage models, set the export destination to EUR. Press the [VALUE +] button, and you will proceed to the next test.

## 17. Factory Reset

```
Factory Reset:   EUR
[ENTER] / [EXIT]
```

- Verify that the export destination is displayed in the upper right of the screen.
- If you press the [ENTER] button, Factory Reset will be executed. (Do not turn off the power while the screen indicates "KEEP POWER ON!" The operation will be completed in less than five minutes.)
- If you press the [EXIT] button, you will return to 16.DESTINATION Set.
- If you press the [SHIFT] button + [EXIT] button, you will return to 0.Test Mode Top Page.

```
COMPLETED
Test Mode End
```

- When this screen appears, the procedure has been completed. Turn off the power.

## RESTORING THE FACTORY SETTINGS

If there is important data you've created that's stored in the RS-70's internal memory, you must note that all such data will be discarded when a Factory Reset is performed. If you want to keep the existing data, save it on a disk (Saving the entire user memory).

Be sure not to turn off the power while Factory Reset is being performed.

If the power is turned off or interrupted while data is being written to memory, the internal data may become corrupted, and you may not be able to turn the power back on.

### Procedure

1. Press [PATCH] button so it is lit and you are in Patch mode.
2. Press [UTILITY] button so it is lit.
3. Use PAGE/CURSOR [<]/[>] button to select "5:FACTORY RESET."

```
UTIL MENU:  [ENT]
5 :FACTORY RESET
```

4. Press [ENTER] button.

```
FACTORY RESET [ENT]
Are You Sure?
```

5. Press [ENTER] button again to execute the Factory Reset.  
The Factory Reset operation will require several minutes.

#### NOTE

Do not turn off the power while the screen indicates "KEEP POWER ON !"  
The operation will be completed in less than five minutes.

```
KEEP POWER ON !
```

6. When the display indicates "COMPLETED", the factory reset operation has been completed.

## SYSTEM SOFTWARE UPDATE PROCEDURE

### Overview

- The RS-70 uses 32 Mbit flash memory to store its control program.
- The flash memory updater (control program) is stored in the updater block of the flash memory.
- Normally, the data for the update is provided in the form of binary data or SMF data divided into two or more parts.

If using binary data to perform the update, the program version can be updated by loading the binary data from the floppy disk drive of the RS-70.

If using SMF data to perform the update, the program version can be updated by connecting a sequencer (e.g., MC-80) capable of playing back SMF data to the RS-70, and loading the data into the RS-70.

#### NOTE

After you update the system, you will need to perform the Factory Reset procedure.

Since this will reset the user data, you will need to back up the user data beforehand.

Details are given in "Saving and loading data."

## Updating via the floppy disk drive (Turnaround time of updating about 2 minutes and 30 second)

### Required items

- Binary data update disks (2HD x 3 disks): P/No.17041310

These disks contain the following files.

#### NOTE

The file name will be the same even if the version changes.

```
RS-70 Binary Update Disk #1(1/3)
RS70A.BIN
RS-70 Binary Update Disk #2(2/3)
RS70B.BIN
RS-70 Binary Update Disk #3(3/3)
RS70C.BIN
```

### Procedure

1. While holding down the [KEY MODE] button and the [ENV or BALANCE/LFO] button, turn on the power. (Continue holding down the [KEY MODE] button and the [ENV or BALANCE/LFO] button until the following screen appears.)

```
Select Menu:
1:MIDI 2:FDD 3:SUM
```

2. Press the [2](KBD&ORG) button.

```
Insert Disk-A and
Press [ENTER].
```

3. Insert RS-70 Binary Update Disk #1 in the floppy disk drive and press the [ENTER] button.  
When RS-70 Binary Update Disk #1 has been processed, the following screen will appear.

```
Insert Disk-B and
Press [ENTER].
```

4. Insert RS-70 Binary Update Disk #2 into the floppy disk drive and press the [ENTER] button.  
When RS-70 Binary Update Disk #2 has been processed, the following screen will appear.

```
Insert Disk-C and
Press [ENTER].
```

5. Insert RS-70 Binary Update Disk #3 into the floppy disk drive and press the [ENTER] button.  
When RS-70 Binary Update Disk #3 has been processed, the following screen will appear, and the [1](PIANO) button and [2](KBD&ORG) button LEDs will blink.

```
INT:160B (160B 160B)
EXT:**** (****) xxxx
```

6. Verify that "\*\*\*\*" matches the checksum of the updated version.  
Turn off the power of the RS-70, turn the power on again, and perform the Factory Reset operation. (See "Factory reset.")

## Updating via SMF data (Turnaround time of updating about 25 minutes)

### Required items

- A sequencer that is able to play back SMF data (a sequencer with Chain Play capability is ideal; e.g., the MC-80)
- MIDI cable
- SMF data update disks (2HD x 3 disks): P/No.17041309

These disks have the following names.

RS-70 SMF Update Disk #1(1/3)

RS-70 SMF Update Disk #2(2/3)

RS-70 SMF Update Disk #3(3/3)

The three disks contain SMF files named p000XX.mid (XX is a consecutive number starting with "01"; the number of files will depend on the version). Play back these files in numerical order.

### Procedure

1. Connect a MIDI cable from the MIDI OUT of your external sequencer to the MIDI IN of the RS-70. If your sequencer has Chain Play capability, make settings to chain-play the SMF files.
2. While holding down the [KEY MODE] button and [ENV or BALANCE/LFO] button, turn on the power. (Continue holding down the [KEY MODE] button and [ENV or BALANCE/LFO] button until the following screen appears.)

```
Select Menu:
 1:MIDI 2:FDD 3:SUM
```

3. Press the [1](PIANO) button. The screen will indicate "Waiting," and the RS-70 will wait to receive MIDI data.

```
Waiting...
[          ]
```

4. Verify that the RS-70 is waiting to receive MIDI data, and then play back all ".mid" files on the RS-70 SMF Update Disks in numerical order. While MIDI data is being received, the [NUMERIC] button LED will blink, and the "Waiting" indication will change to "Receiving." When the data of one file has been transferred, the indication will change to "Waiting"; play back the next file. The update process will be easier if you use a sequencer that has a Chain Play function, such as the MC-80.
5. When the update is completed, following screen will appear, and the [1](PIANO) and [2](KBD&ORG) LEDs will blink.

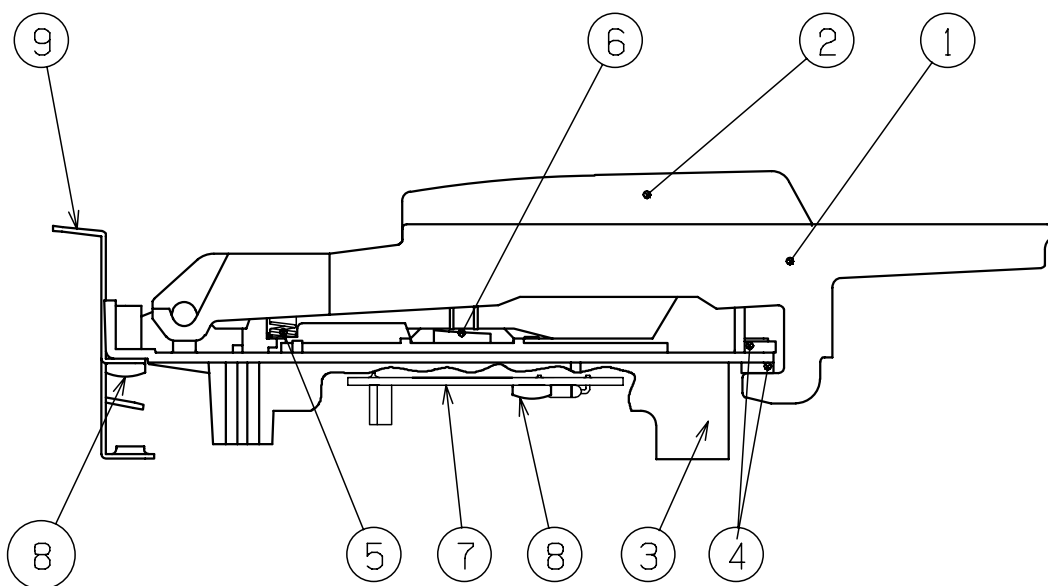
```
INT:160B (160B 160B)
EXT:**** (****) xxxxx
```

6. Verify that "\*\*\*\*" matches the checksum of the updated version.
7. Turn off the power of the RS-70, turn the power on again, and perform the Factory Reset operation. (See "Factory reset.")

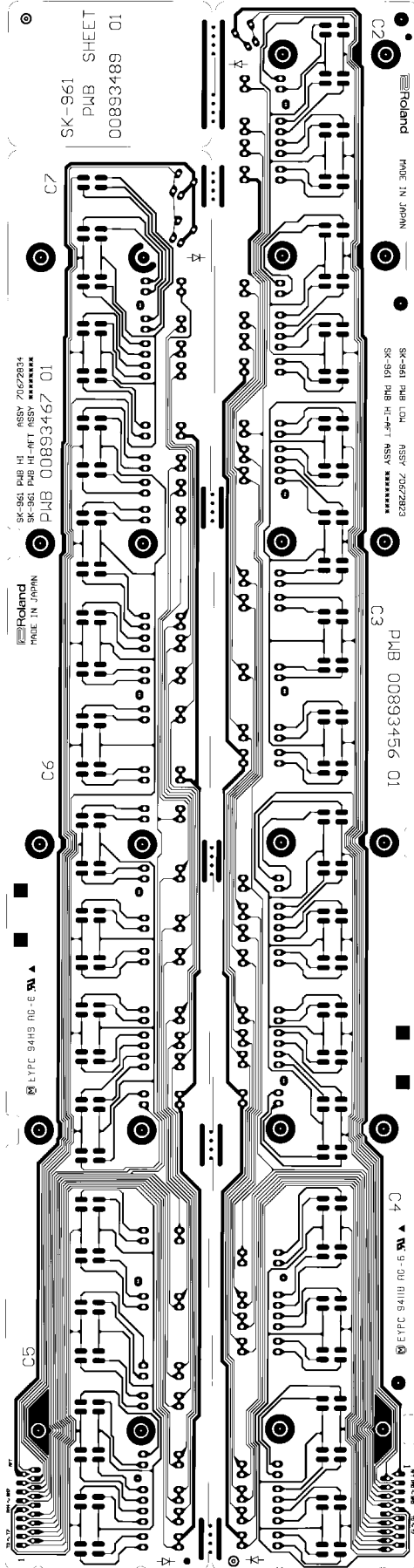
**KEYBOARD PARTS LIST**

RS-70 SK-9A61-A PARTS LIST

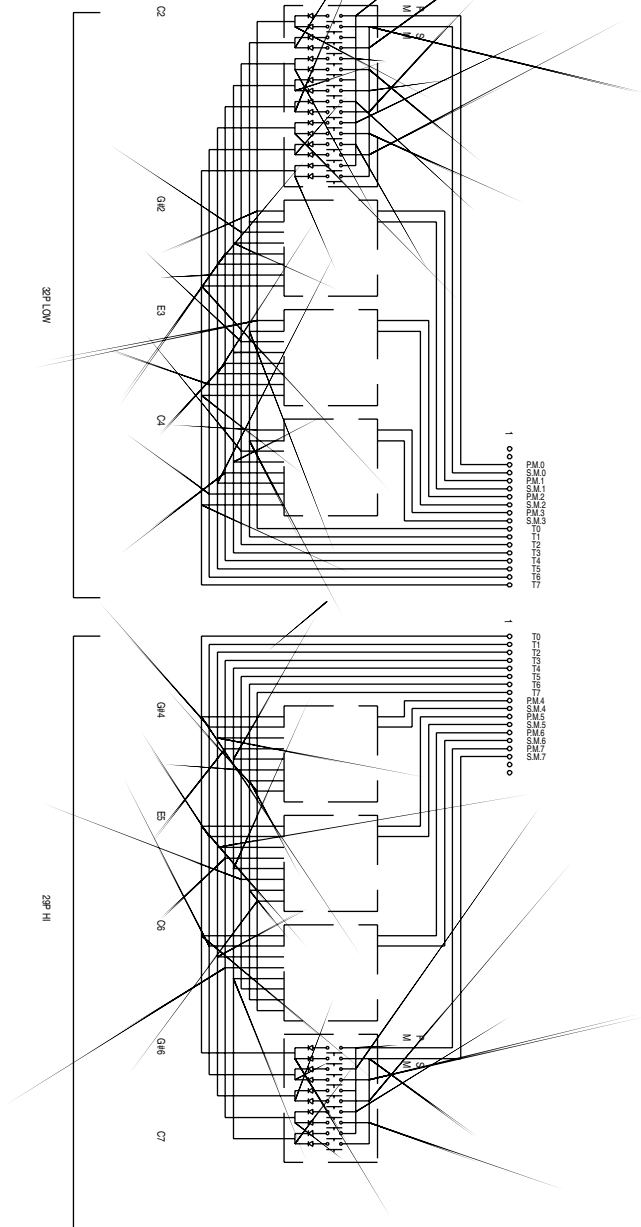
No.	PARTS No.	PARTS NAME	Qty.	
1	00893723	SK-9 NATURAL KEY CF	10	
	00893734	SK-9 NATURAL KEY EB	10	
	00893756	SK-9 NATURAL KEY D	5	
	00893767	SK-9 NATURAL KEY G	5	
	00893745	SK-9 NATURAL KEY A	5	
	00893778	SK-9 NATURAL KEY C' F'	1	
2	00893790	SK-9 SHARP KEY	25	
	72341012	SK-9A61-A SUB ASSY	1	
	3	03120667	SK-9A CHASSIS 61P	1
	4	00129812	SK-8 CUSHION 61P-C	2
5	03236967	SK-9A SPRING	61	
6	00893823	SK-9 RUBBER SWITCH 12P	4	
	00893834	SK-9 RUBBER SWITCH 13P	1	
7	70672823	SK-961 PWB LOW ASSY	1	
	70672834	SK-961 PWB HI ASSY	1	
8	40011312	SCREW 3x8 BINDING TAPTITE P BZC	25	
9	03236645	RS-70 KBD HOLDER	4	
	03236656	RS-70 PWB HOLDER	2	



## KEYBOARD CIRCUIT BOARD



## KEYBOARD CIRCUIT DIAGRAM



# KEYBOARD DISASSEMBLY

## <ATTACHING RUBBER SWITCH and CIRCUITBOARD>

Use screws which TAPTIGHT P 3X8MM ZC(#40011312) to fixed SIRCUIT BOARD in SK-9.

1) Turn over the keyboard as shown in Fig. 1 . Place the RUBBER SWITCH 12P on 4 chassis, from the left (lowest note) upward, with respect to slots in the chassis. Make sure that each switch is aligned with corresponding air groove in the chassis(Fig.2). Similarly, Place the RUBBER SWITCH 13P on the right section (high note) chassis.

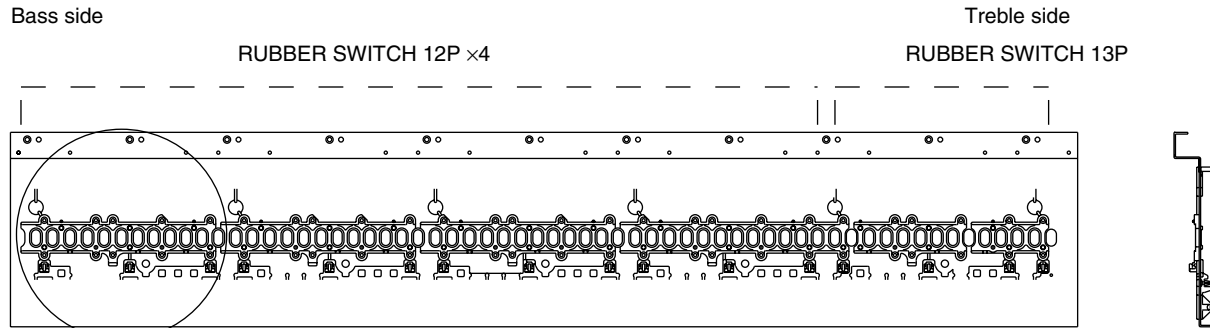


Fig.1

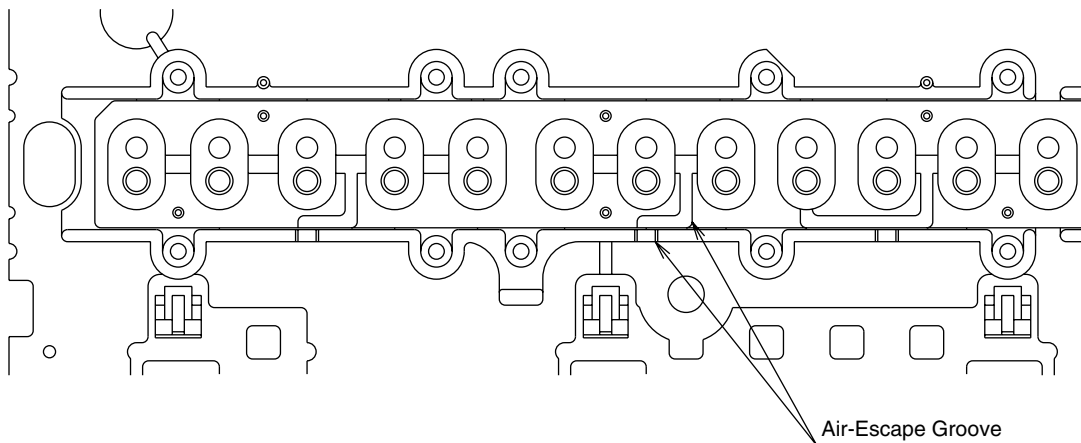


Fig.2

2) Align notch of the LOW PCB with projection from the chassis and then insert the PCB into the chassis hook until the chassis's positioning reference pin (located closest to the connector, (Fig.4) fits into the positioning reference hole of the PCB(Fig.3). Then, engage all pins with holes. Repeat above steps for the HI PCB.

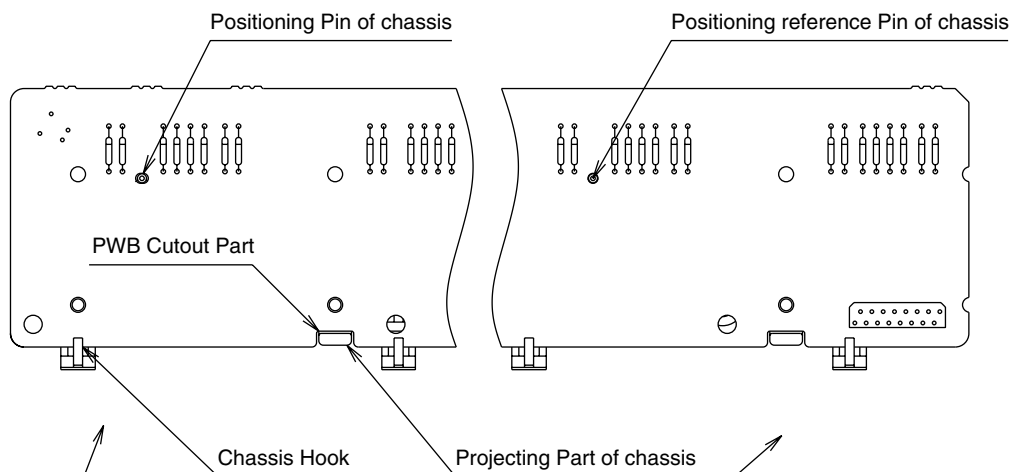


Fig.3

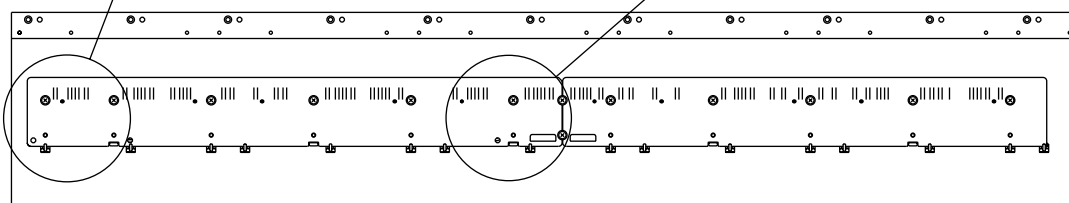
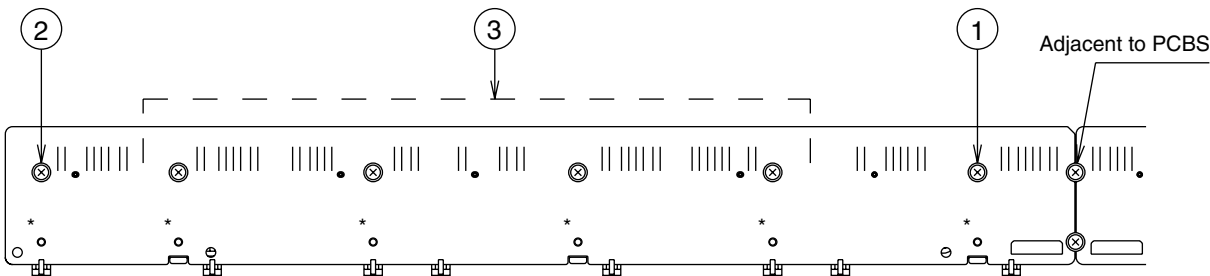


Fig.4

3) Secure the LOW and HI PCBs with screws, while holding the PCB at the center, and starting at the center screw (1) and then (2) and (3). See Fig.5. Screw at the locations illustrated.



⊗:Secure with screw : No screw is required unless the chassis hook becomes useless.

Fig.5

**NOTE**

When using a power screwdriver, set the tightening torque to 8kgf.cm to firmly secure the PCB without damaging it. Overtightening will break foil conductors.

## <Removing the keyboard>

Holding the tip of the key, insert a pair of long nose pliers into the U groove (shaded in Fig.6) and then push the key in the direction of arrow.

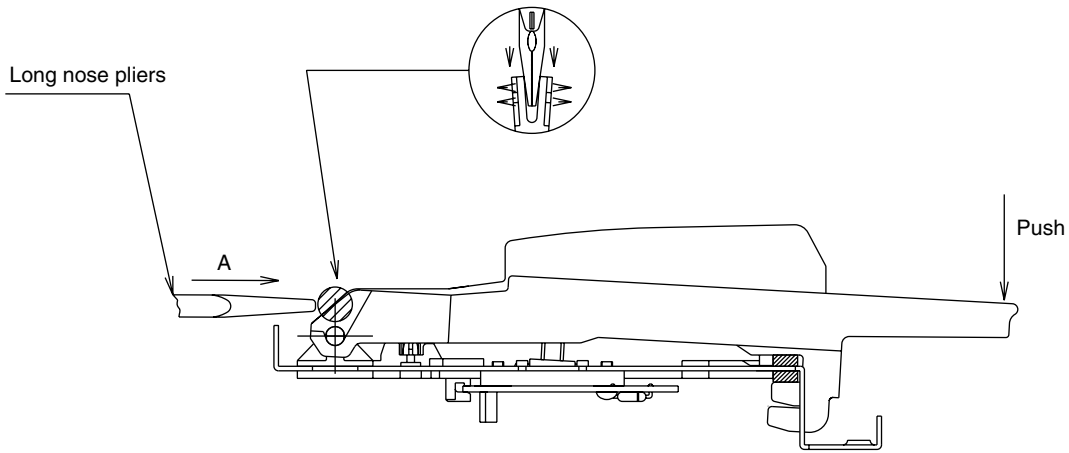


Fig.6

## <Installing the keyboard>

Fit the spring on the chassis, place the key as illustrated in Fig.7 and then push the dotted circle line section in the direction of arrow.

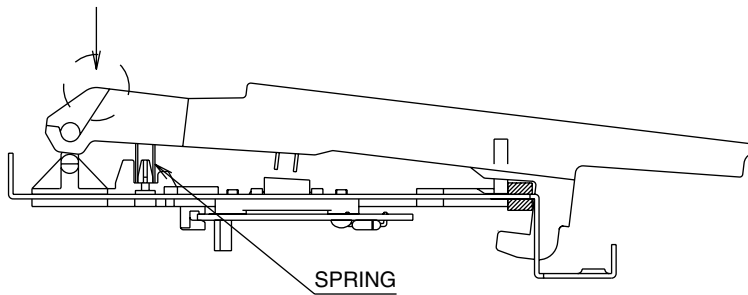
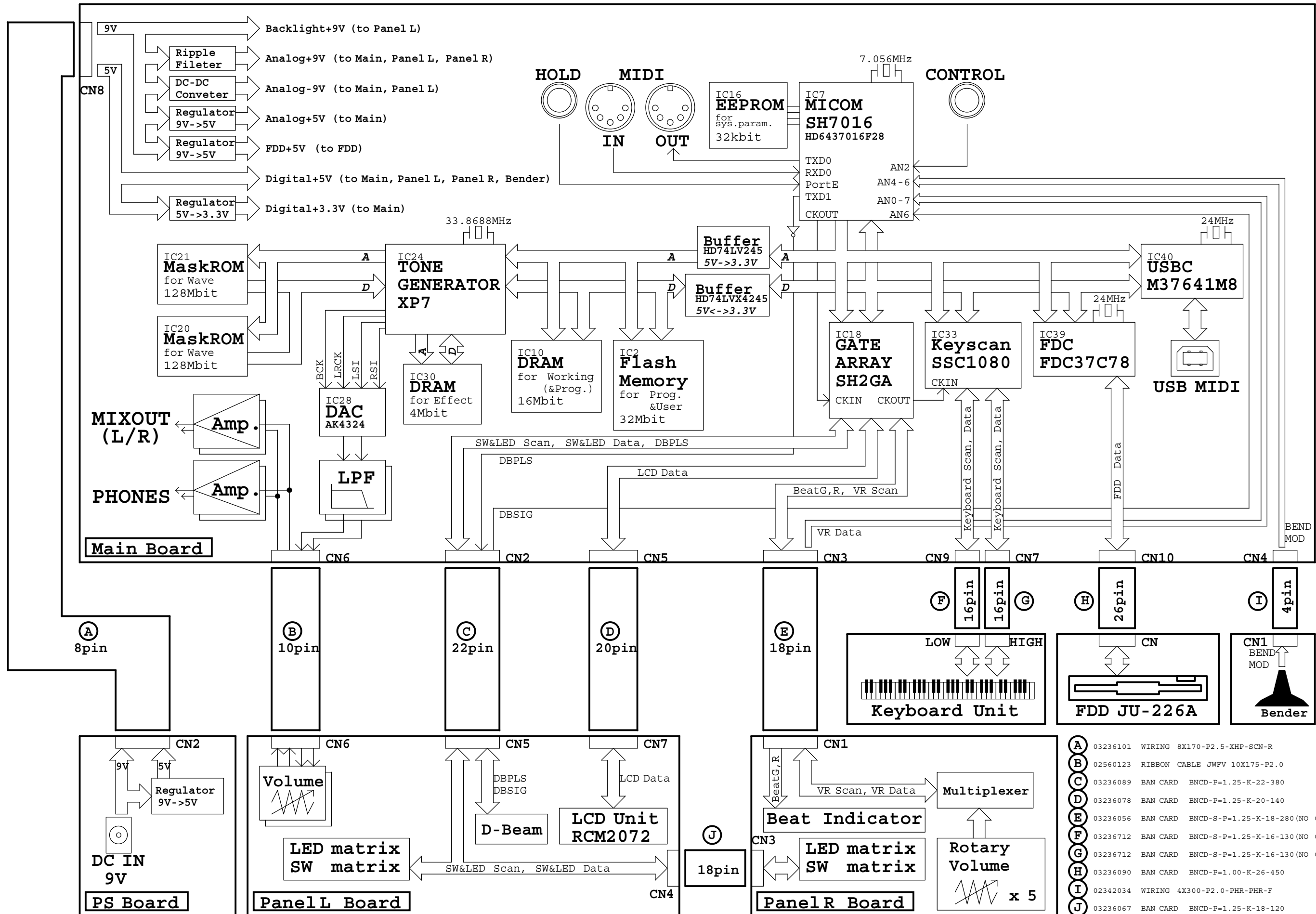


Fig.7

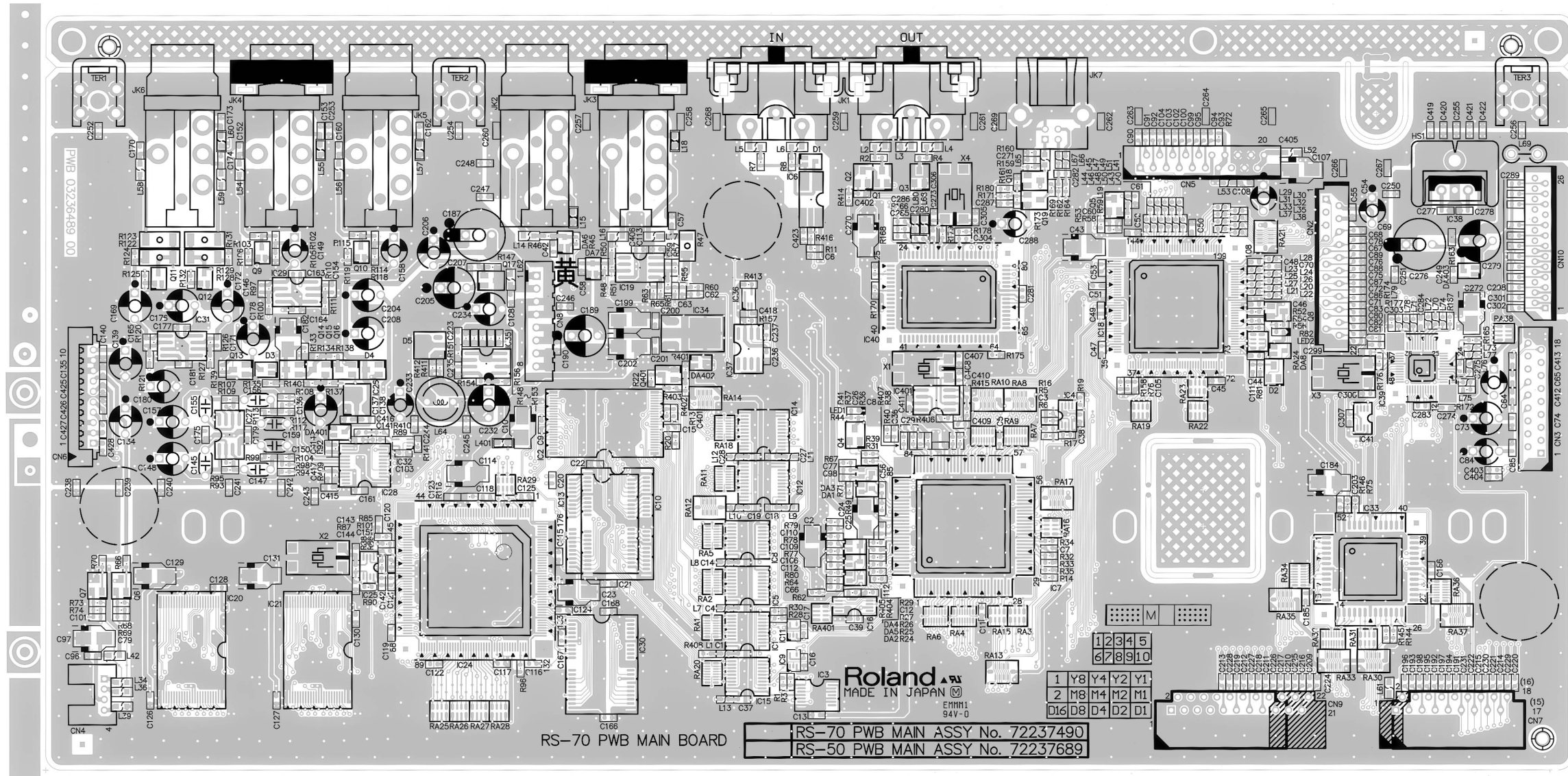




**BLOCK DIAGRAM**

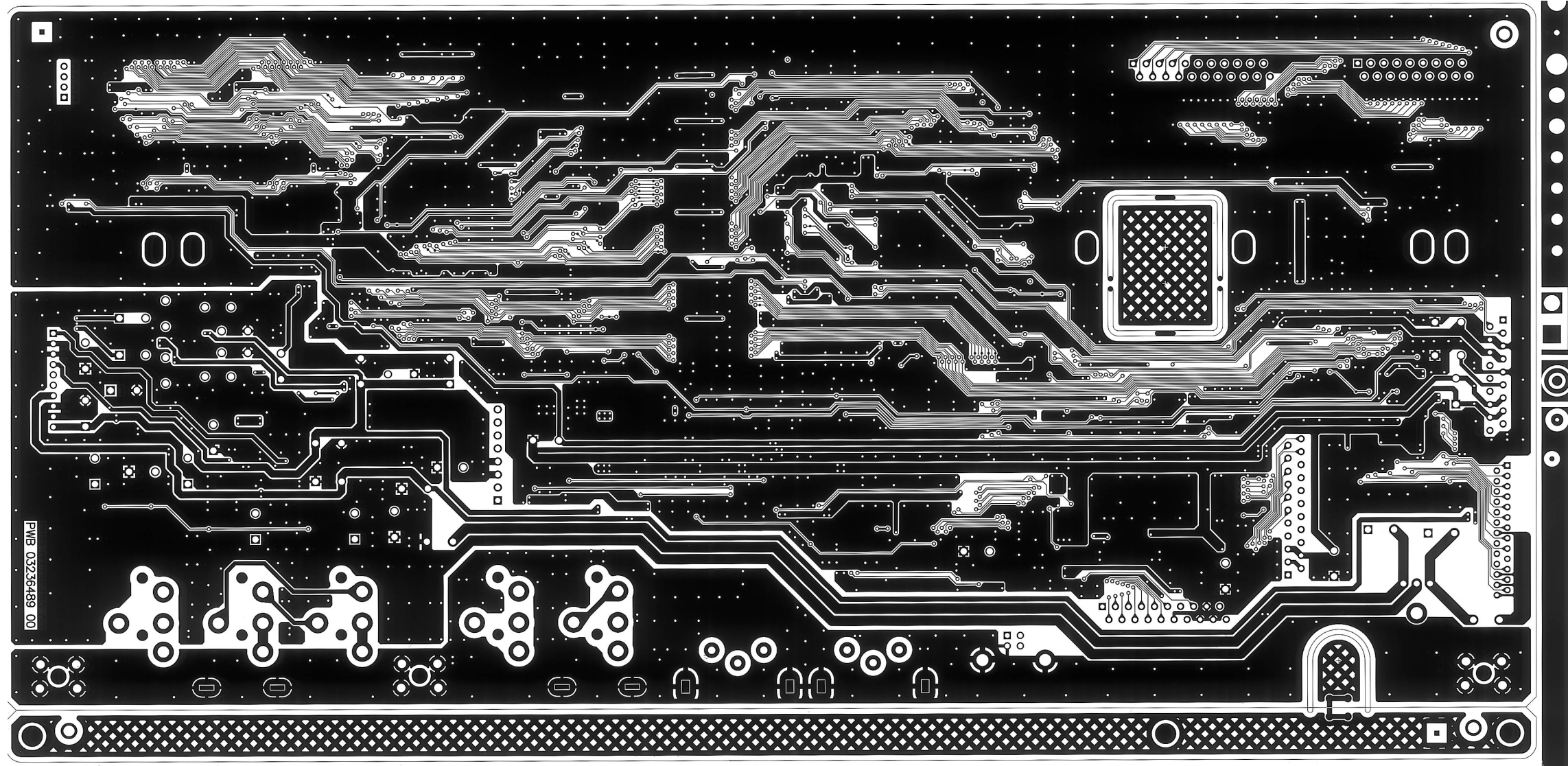


# CIRCUIT BOARD(Main Board)



View from components side

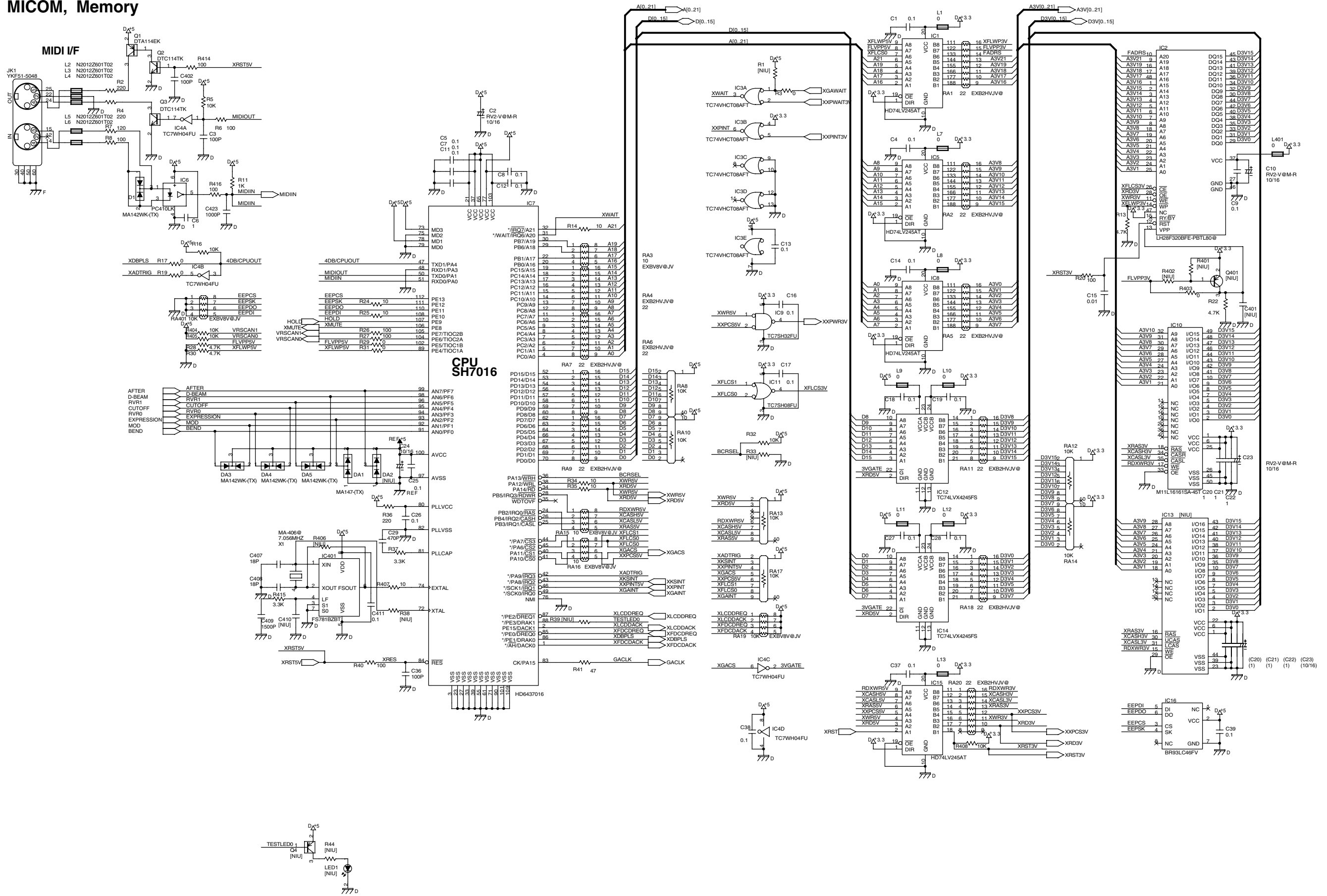
# CIRCUIT BOARD(Main Board)



View from foil side

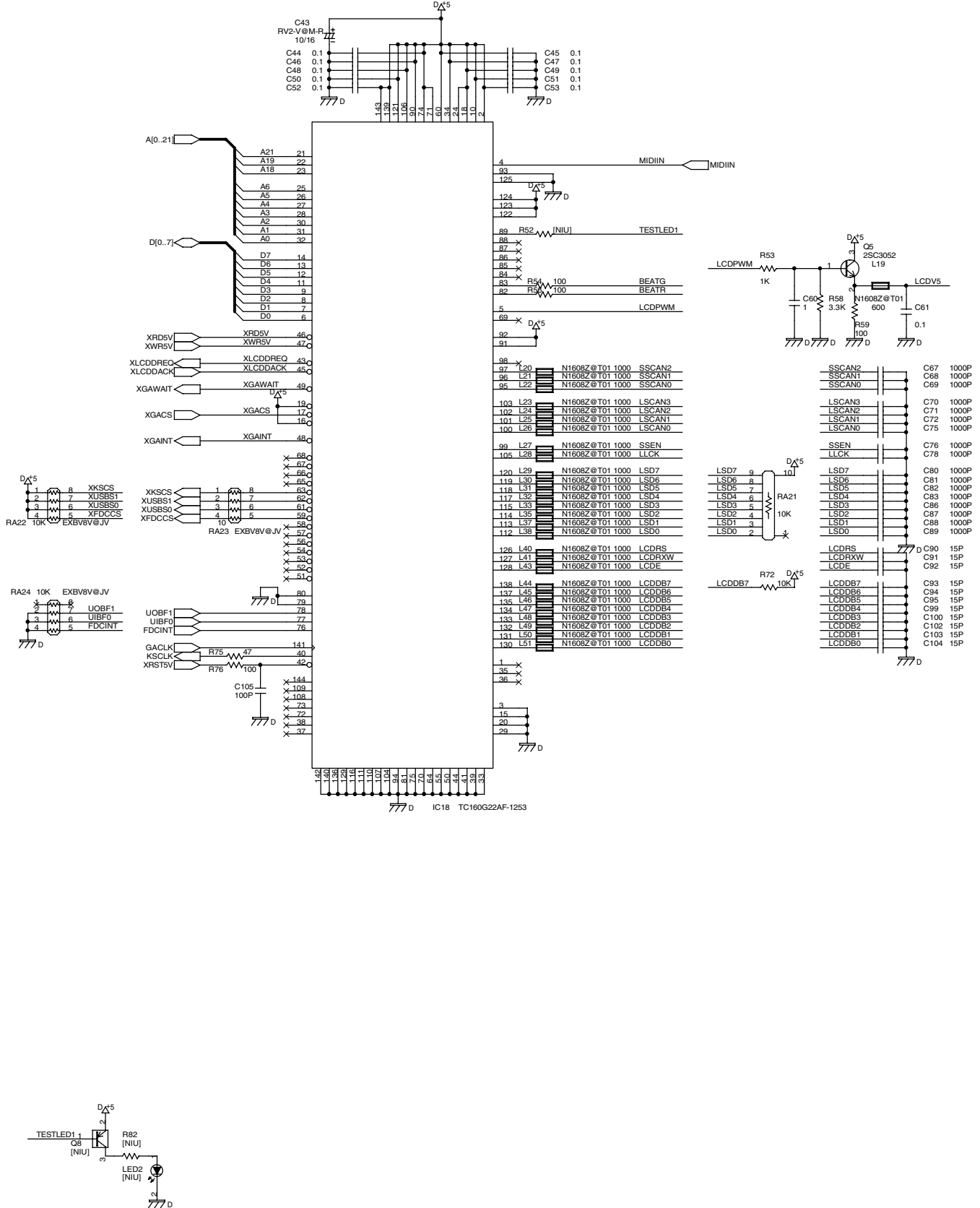
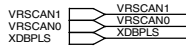
# CIRCUIT DIAGRAM(MAIN(MICOM, Memory))

## MICOM, Memory

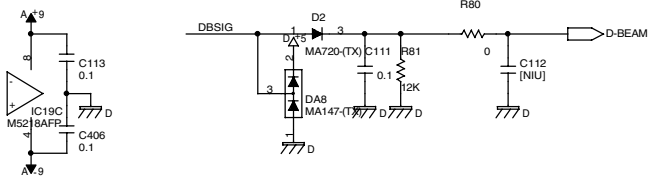
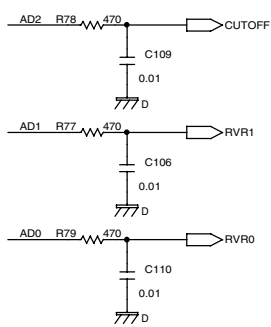
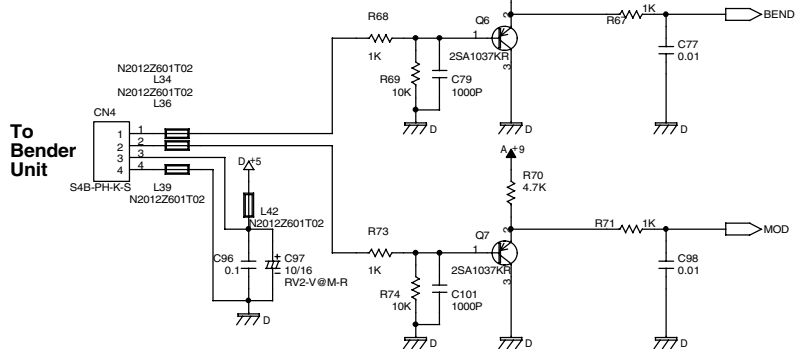
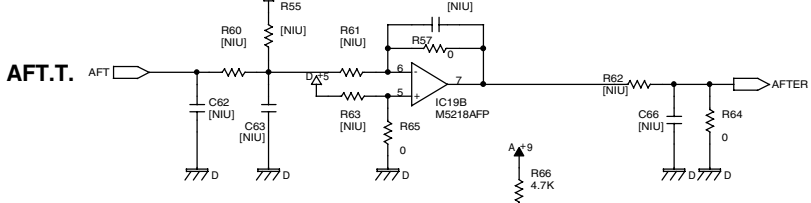
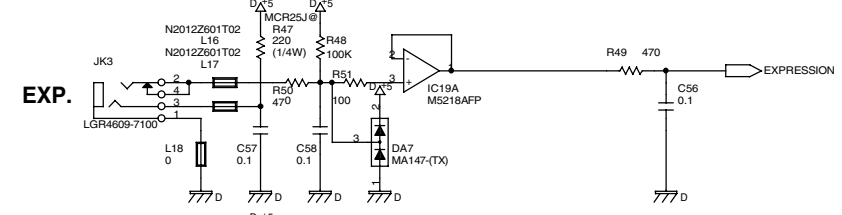
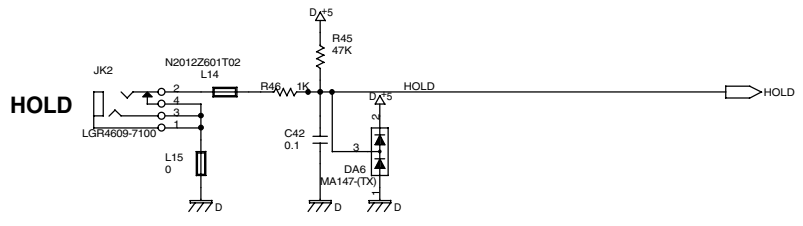
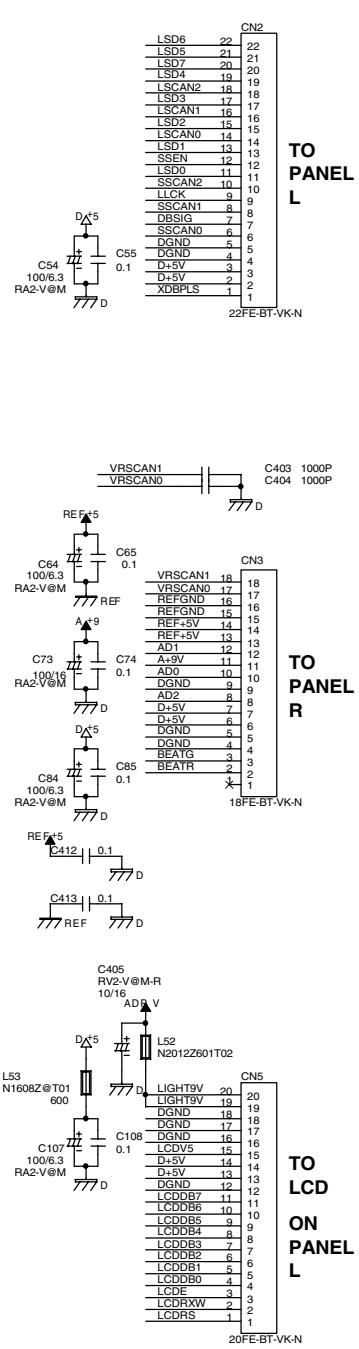


# CIRCUIT DIAGRAM(MAIN(SH2GA, Panel I/F, Controller I/F))

## SH2GA, Panel I/F

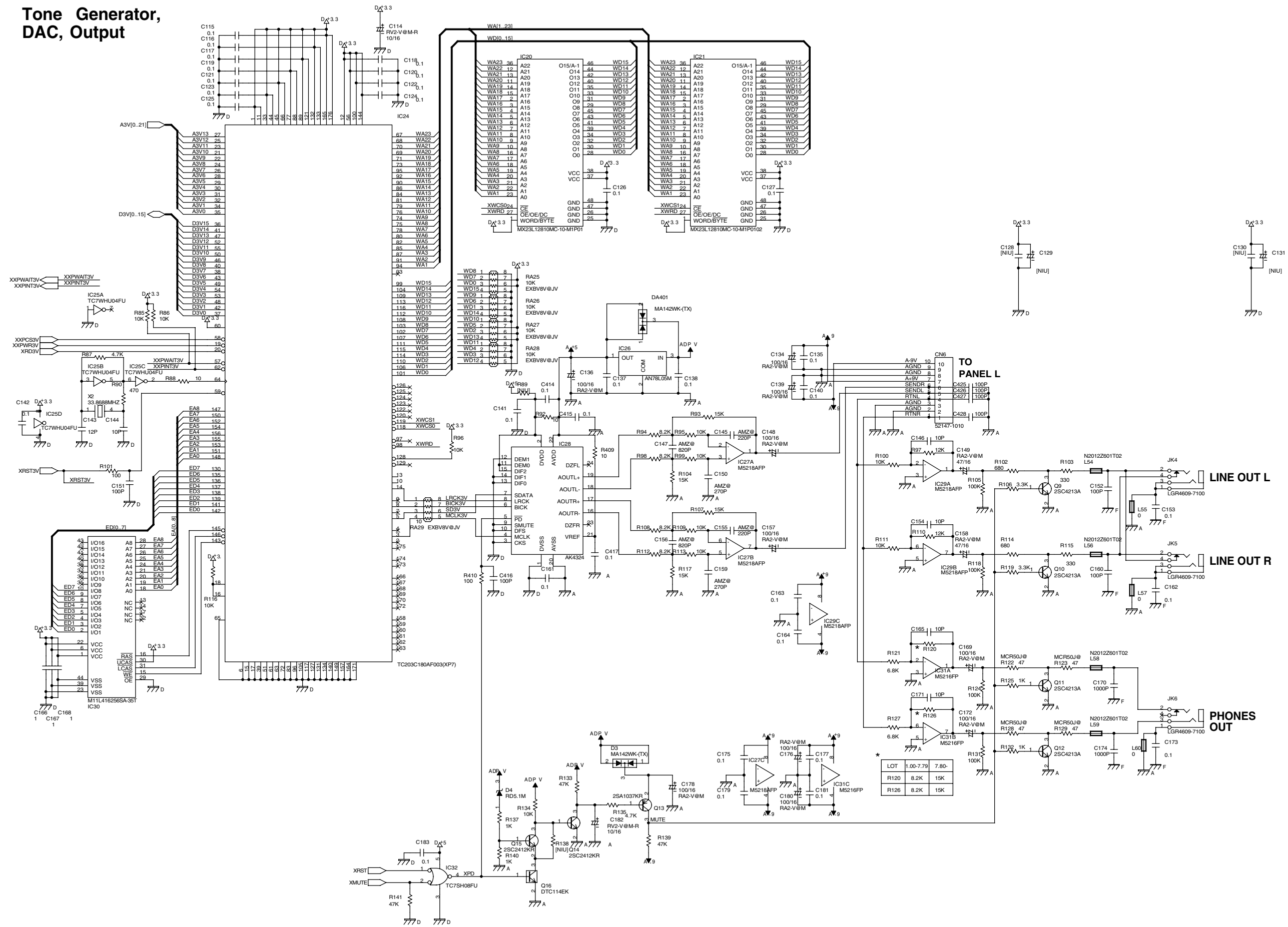


# Controller I/F



# CIRCUIT DIAGRAM(MAIN(Tone Generator, DAC, Output))

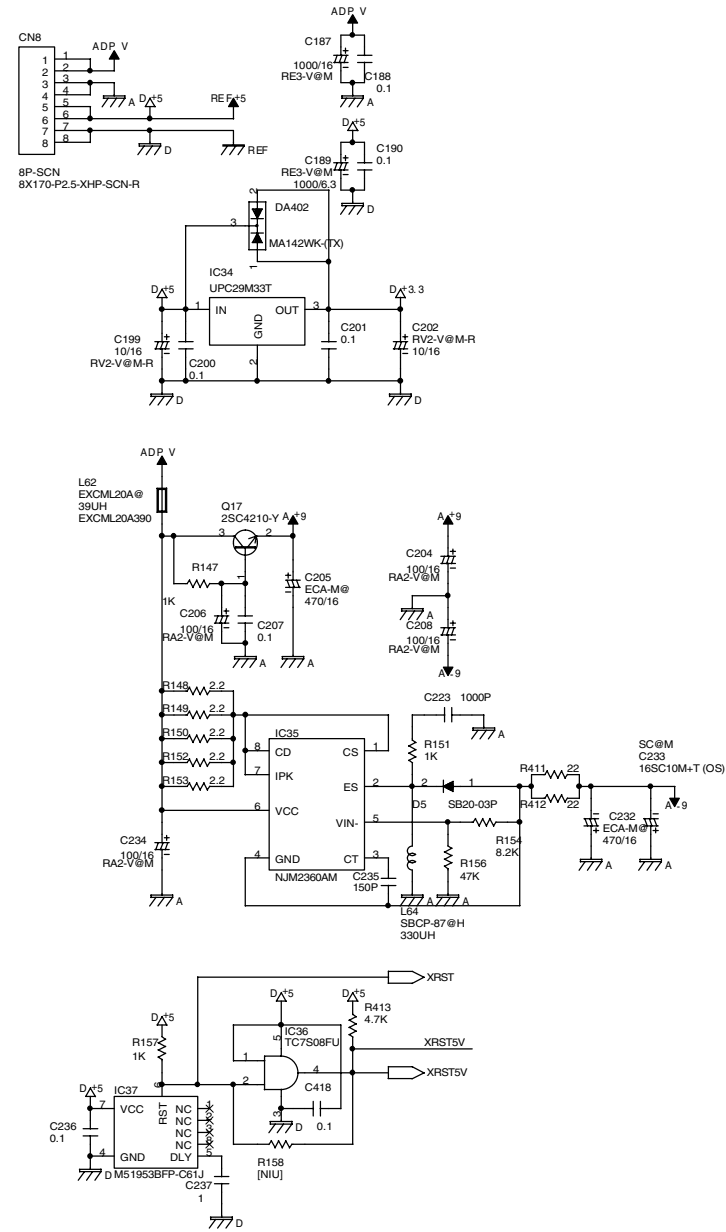
## Tone Generator, DAC, Output



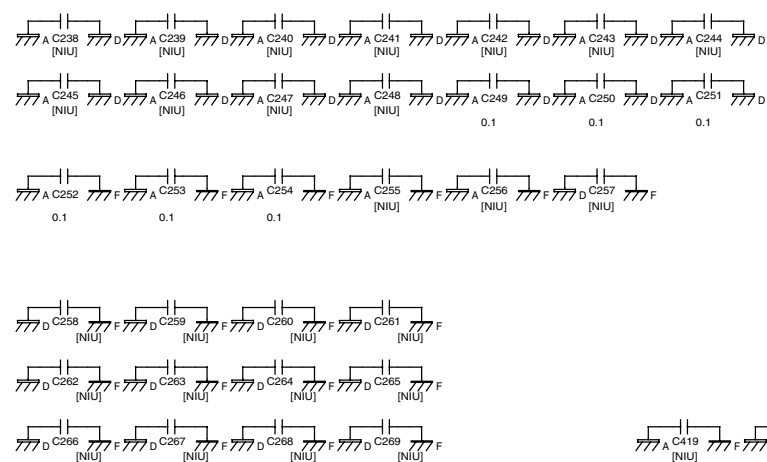
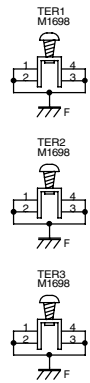
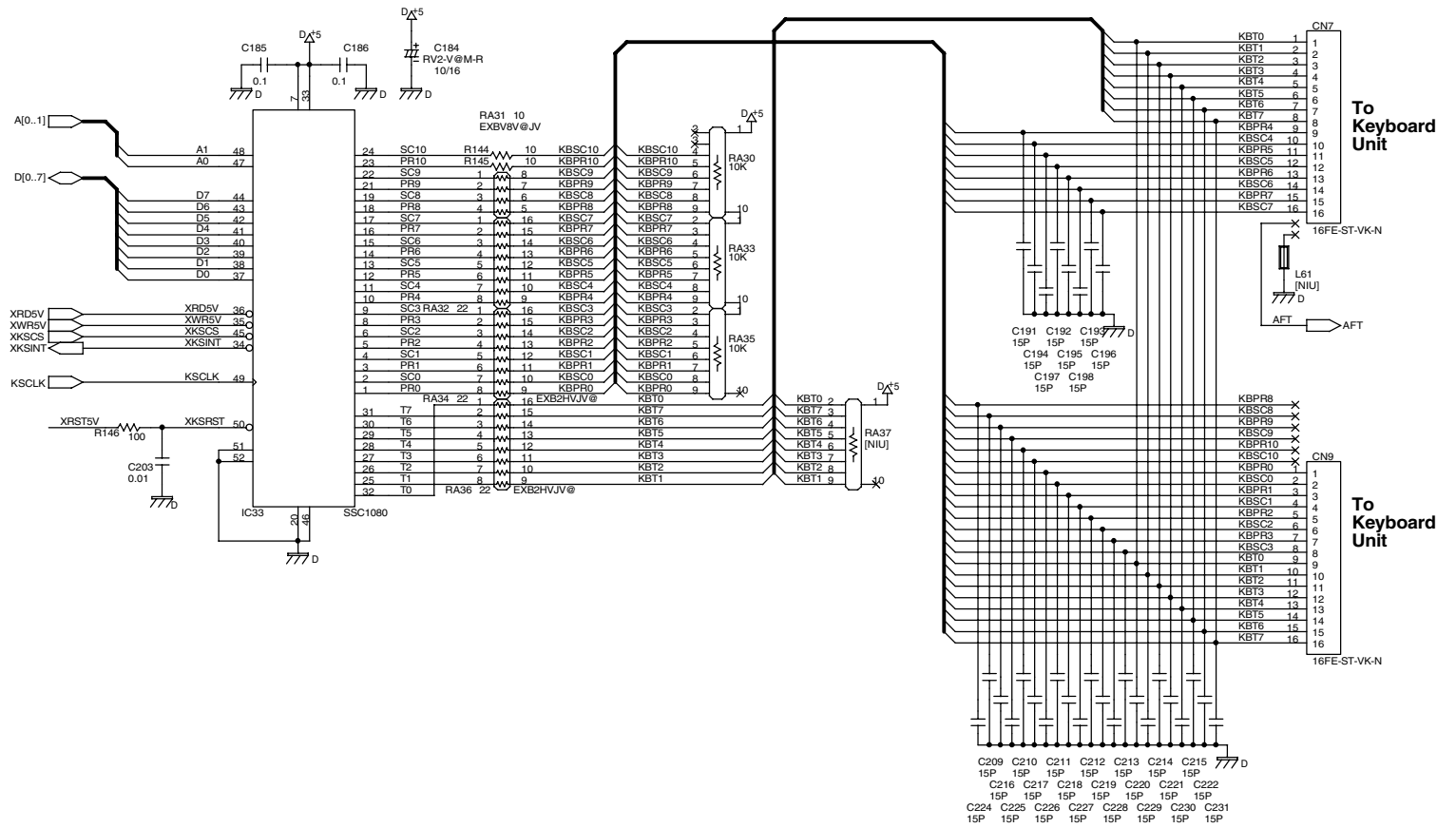


# CIRCUIT DIAGRAM(MAIN(Power Supply, Keyboard I/F))

## Power Supply

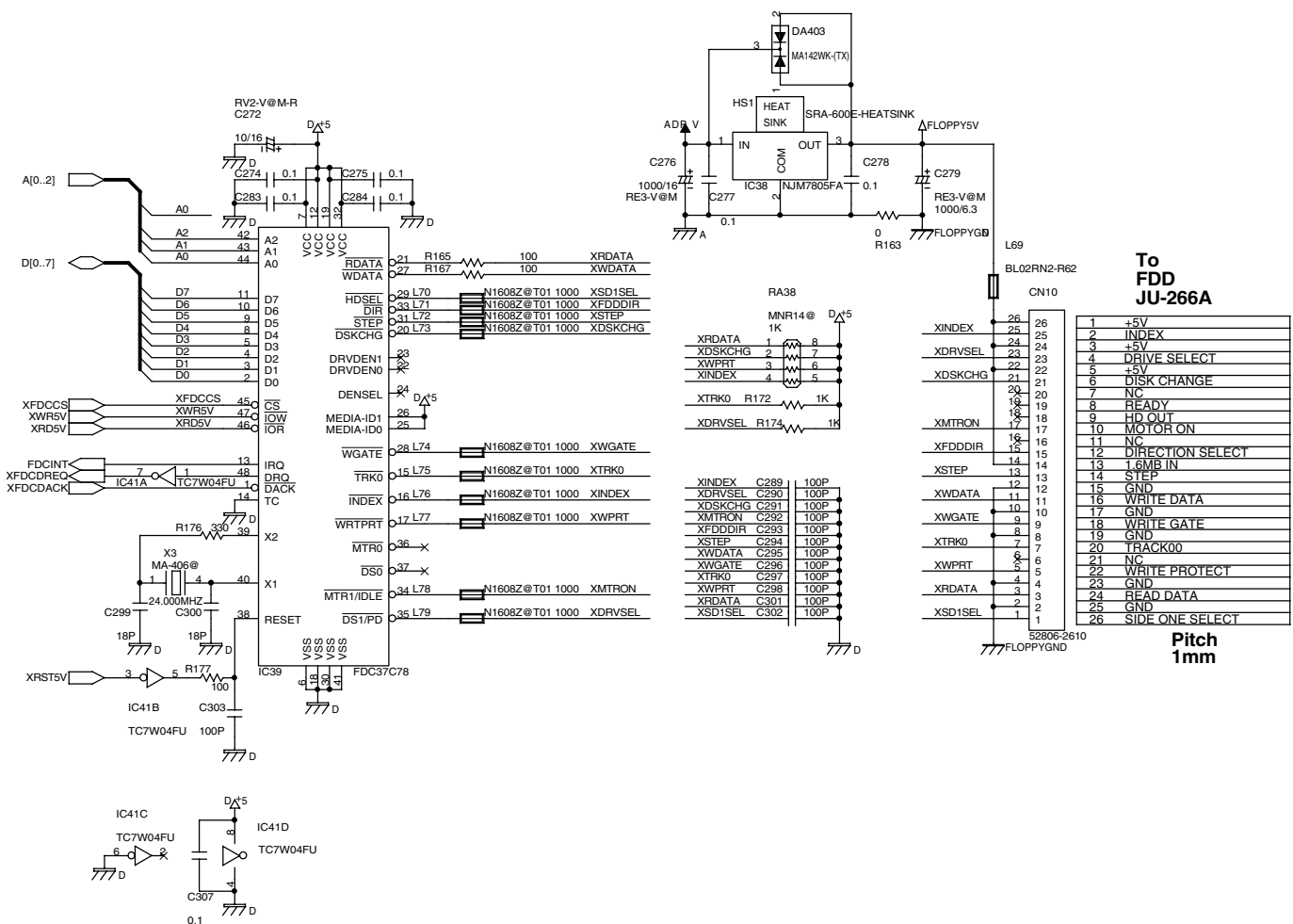


## Keyboard I/F

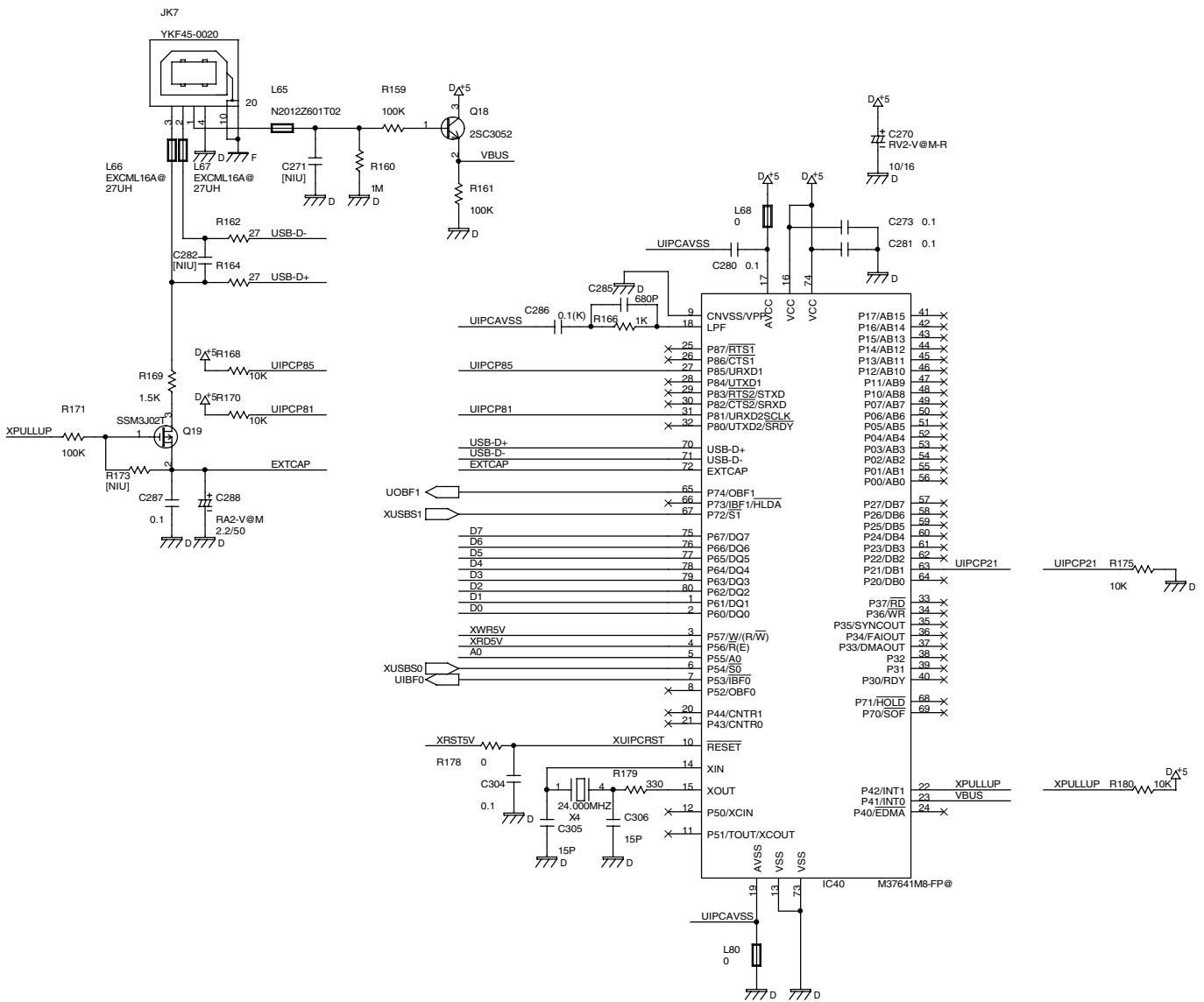


# CIRCUIT DIAGRAM(MAIN(FDD I/F, USB I/F))

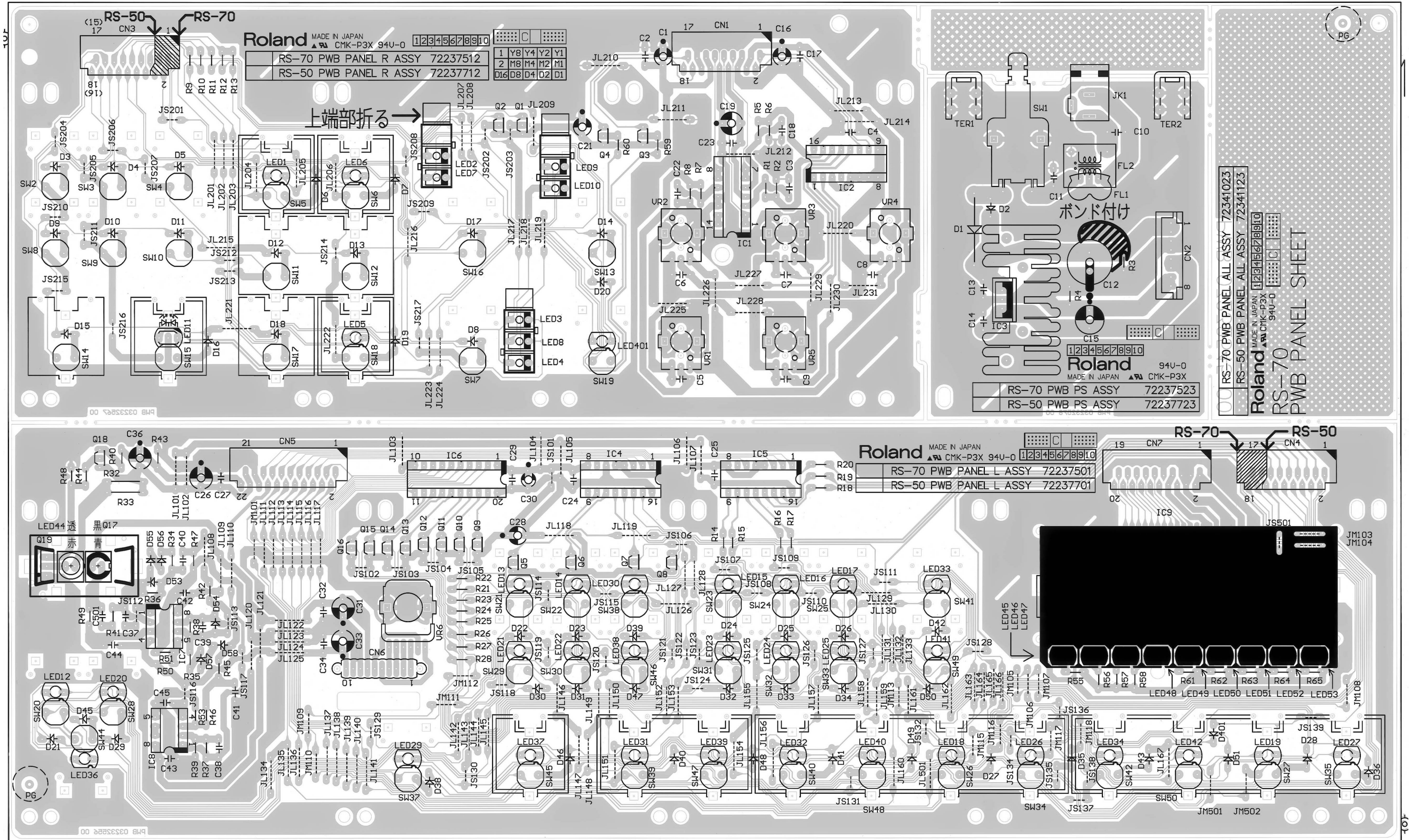
## FDD I/F



USB I/F



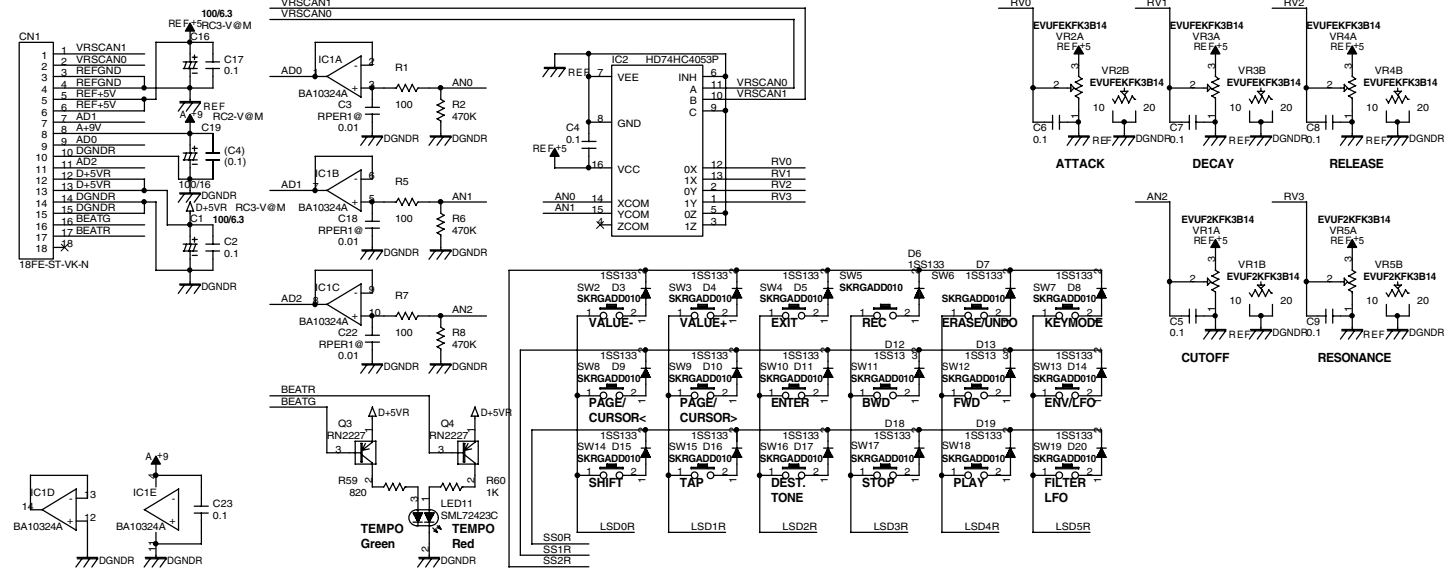
CIRCUIT BOARD(PWB PANEL R ASSY/PWB PANEL L ASSY/PWB PS ASSY)



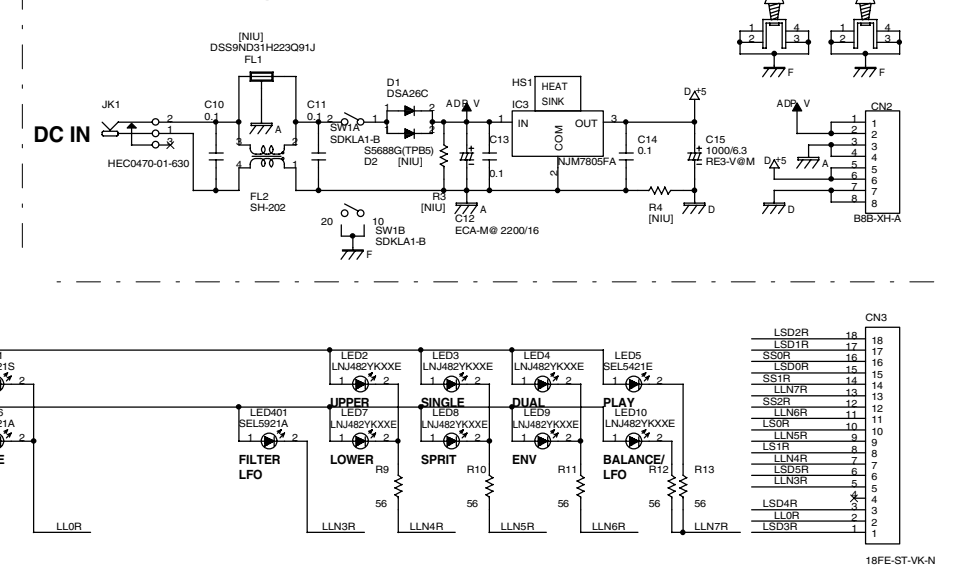
View from components side

CIRCUIT DIAGRAM(PWB PANEL R ASSY/PWB PANEL L ASSY/PWB PS ASSY)

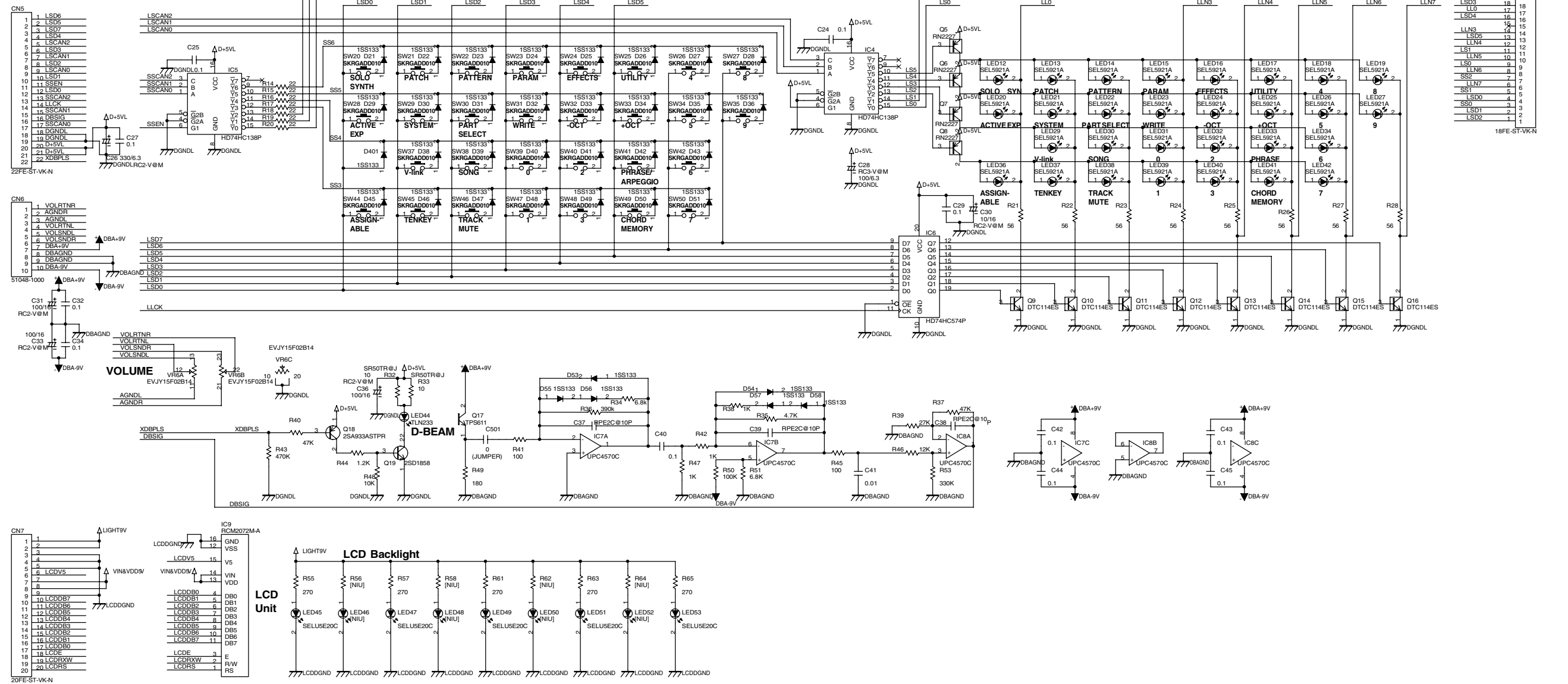
Panel R Board



Power Supply Board



Panel L Board



---

## ERROR MESSAGES

---

### Check Sum Error

Meaning: The checksum of a received System Exclusive message was incorrect.

Action: Set the correct checksum value.

### MIDI Buffer Full

Meaning: Due to an inordinate volume of MIDI messages received, the RS-70 has failed to process them properly.

Action: Reduce the amount of MIDI messages to be transmitted.

### MIDI Communication Error

Meaning: A problem has occurred with the MIDI cable connections.

Action: Check that MIDI cables are not broken or pulled out.

### Receive Data Error

Meaning: A MIDI message was received incorrectly.

Action: If the same error message is displayed repeatedly, the problem lies with the MIDI messages that are being transmitted to the RS-70.

### User Memory Damaged

Meaning: The data in user memory has been lost.

Action: Use the Factory Reset function to initialize the memory to the factory settings.

### USB Off Line

Meaning: It is possible that the power has been turned off for the computer connected to the RS-70's USB connector.

Action: Check the power of the connected computer.

Meaning: It is possible that a USB cable has been pulled out or has a short.

Action: Check that USB cable is not broken or pulled out.

### No File

Meaning: There is no file that the RS-70 can use. (Note: This will be displayed if there is no file with an extension of RSU or MID.)

Action: ---

### Disk Not Ready

Meaning: A disk is not inserted in the disk drive.

Action: Insert a disk.

### Unformatted Disk

Meaning: This disk cannot be used by the RS-70.

Action: Format the disk on the RS-70.

### Write Protected

Meaning: Since the write protect tab of the disk is in the Protect position, data cannot be written to the disk.

Action: Set the write protect tab to the Write position, and re-try the operation.

### Master Disk

Meaning: This disk is a master disk. Master disks cannot be used to save data or be formatted.

Action: ---

### Disk Read/Write Error

Meaning: A file is corrupted, the disk is scratched or damaged, or the disk drive is malfunctioning.

Action: Insert another disk formatted on the RS-70 (not containing important data). If this solves the problem, the problem is probably a scratched or damaged disk, or a corrupted file. Do not use the disk. If the same error message appears repeatedly, a malfunctioning disk drive is suspected.

### Too Many Files

Meaning: The maximum number of files that can be created has been exceeded.

Action: Delete unneeded files.

### File Format Error

Meaning: The RS-70 cannot handle this file.

Action: ---

### Disk Incorrect

Meaning: The operation you attempted to execute is not appropriate for this disk. (Note: This will be displayed if you insert a different disk during disk backup.)

Action: Do not select this disk as the object of the operation.

### Memory Full

Meaning: Internal memory is full, preventing processing of the data.

Action: Delete unneeded data, reducing the amount of data in the pattern.

### File Name Duplicate

Meaning: A file with the same name already exists on the disk.

Action: Use a different file name.

### Disk Full

Meaning: Insufficient free space available on the disk to save the data.

Action: Either insert a different disk (formatted on the RS-70) or delete unnecessary data and retry the operation.

### Irregular Name

Meaning: There is a space within the file name.

Action: Change the file name.

### Data Not Found

Meaning: Since data was not found at the specified location, the operation could not be executed. (This will be displayed if there is no applicable data for the Microscope.)

Action: Specify the correct location.

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**CANCELED**

Meaning: Processing is canceled. (This is not an error message.)

Action: ---