MC-09 Phrase Lab

SERVICE NOTES
Issued by RJA

SPECIFICATIONS

MC-09: Phrase Lab

DSP Synthesizer

Number of Parts

1

Maximum Polyphony

LEAD, BASS: 1
RHYTHM: 3

Preset Tones

LEAD: 128
BASS: 128
RHYTHM: 10

Effects

Type
FILTER, ISOLATOR, PHASER, SLICER
Number of Types
30
LEAD Group
OVERDRIVE, DISTORTION, PHASER, SLICER + RING MODULATOR

Step Sequencer

Number of Steps

32 (Maximum)

Resolution

sixteenth note

Tempo

quarter note = 40 to 240

Preset Patterns

LEAD: 40
BASS: 60
RHYTHM: 100
EFFECT: 30

User Patterns

LEAD, BASS, RHYTHM, EFFECT: Total 20

External Memory (Memory card)

Pattern, Loop, All: 50 each

Signal Processing

AD Conversion: 24 bits
DA Conversion: 24 bits

Sample Rate

44.1 kHz

Nominal Input Level

INPUT: -10 dBu

Input Impedance

INPUT: 42 k ohm

Nominal Output Level

OUTPUT: -10 dBu

Output Impedance

OUTPUT: 600 ohm
PHONES: 100 ohm

Residual Noise Level

(LINE IN: OFF, input terminated with 150 , IHF-A, typ.)

- 88 dBu

Connectors

INPUT L/R Jacks: RCA phono type
OUTPUT L/R Jacks: RCA phono type

Headphones Jack: Stereo miniature phone type

MIDI IN/OUT Connectors
DC IN Jack
Ground Terminal
Memory Card Slot

Power Supply

AC Adaptor (DC 9V)

Current Draw

350 mA

Dimensions

318.6 (W) x 207.2 (D) x 69.5 (H) mm
12-9/16 (W) x 8-3/16 (D) x 2-3/4 (H) inches

Weight

1.2 kg / 2 lbs 11 oz (excluding AC Adaptor)

Accessories

Owner's Manual ENGLISH(#72123212)
JAPANESE(#72123201)
AC Adaptor
·ACI-120C(#00905767)
·ACI-230C(#01018312)
·PSB-1U(#01901578)
LEAD CTRL MAP Seal(#40458390)
Phrase CD (CD-EXTRA format)(#********)
Memory Card Protector(#01346312)

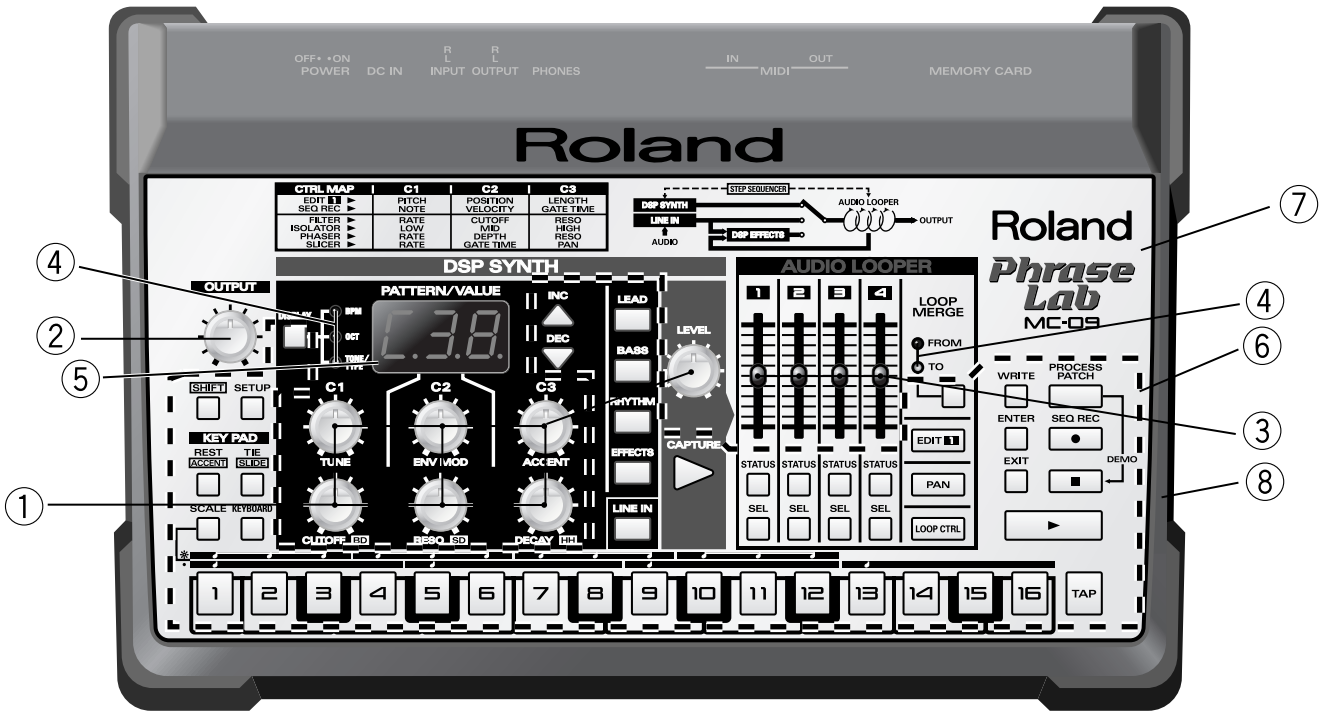
Options

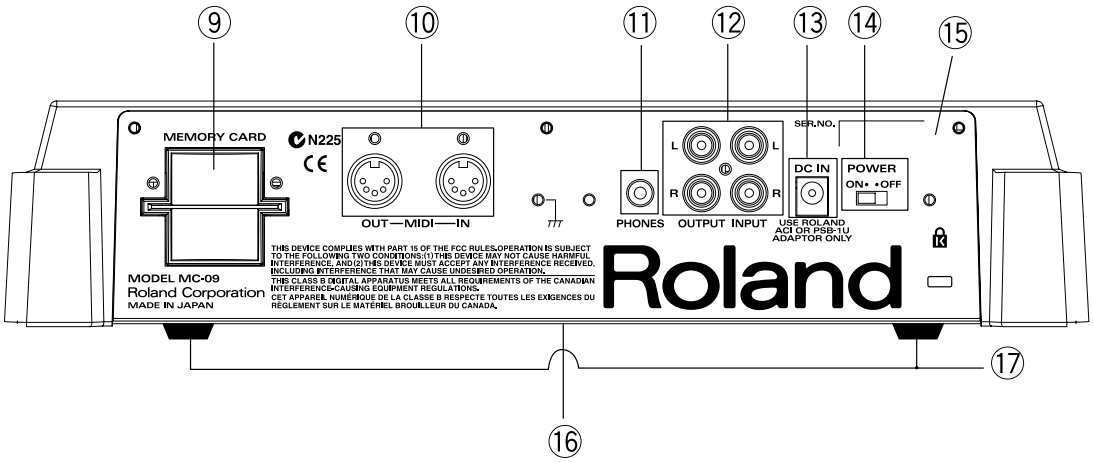
MIDI Implementation ENGLISH(#17041158)
JAPANESE(#17041157)

* *0 dBu = 0.775 V rms*

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

LOCATION OF CONTROLS

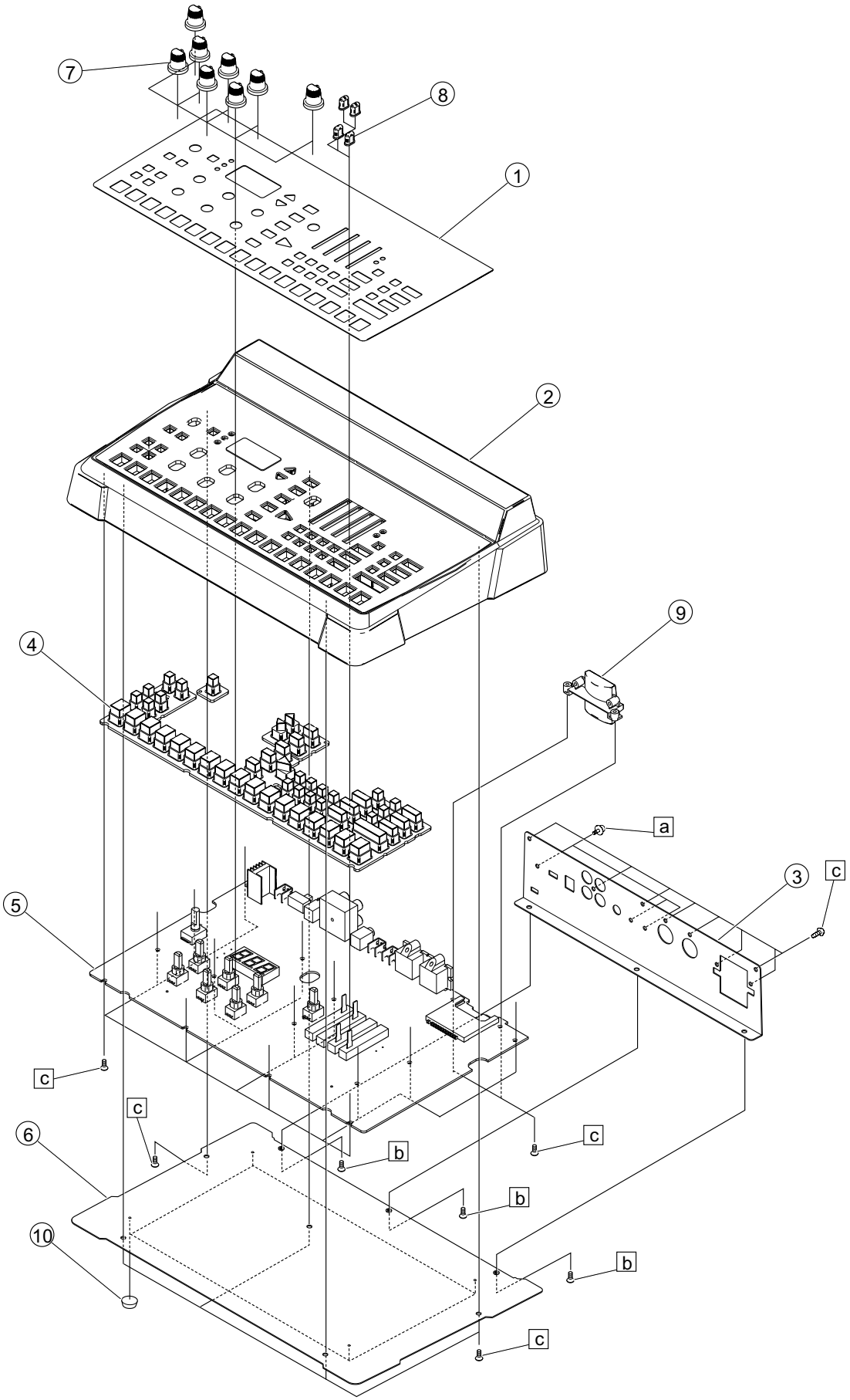




LOCATION OF CONTROLS PARTS LIST

No	PART CODE	Part name	Description	Q'TY
1	02905734	X R-KNOB	MF GLD	7
	02455223	EVUF2KFK4B14	9M/M ROTARY POTENTIOMETER	7
2	02905734	X R-KNOB	MF GLD	1
	02905412	RK12L12C0A0E	12M/M ROTARY POTENTIOMETER	1
3	01346112	KNOB	MOLD KNOB BLK	4
	02239523	EWAN1AC15B14	30M/M SLIDE POTENTIOMETER	4
4	02126912	PTR LED SLR-342VR-TG7	LED	5
5	01342534	SL-9351S	LED 7 SEGMENT	1
6	02905790	RUBBER SW		1
7	02905789	PANEL SHEET		1
8	02905745	TOP CASE		1
9	01343101	D C-ESCT	D C-ESCT BX1H BLK	1
	02121578	CN015R-3013-0	CARD CONNECTR	1
10	13429676	YKF51-5048 (TWIN)	MIDI CONNECTOR	1
11	02456390	STEREO YKB21-5290	3.5MM JACK	1
12	13449645	YKC21-3049 (4P) RED/WHITE	JACK (PIN)	1
13	13449720	HEC2305-01-250	DC JACK	1
14	02671312	SLG-22-465	SLIDE SWITCH	1
15	02905767	REAR PANEL		1
16	02905756	BOTTOM COVER		1
17	12359137	RUBBER FOOT	SJ-5012 BLK	4

EXPLODED VIEW



EXPLODED VIEW PARTS LIST

[PART]

No.	PART CODE	PART NAME	DESCRIPTION
1	02905789	PANEL SHEET	
2	02905745	TOP CASE	
3	02905767	REAR PANEL	
4	02905790	RUBBER SW	
4	02905790	RUBBER SW	
4	02905790	RUBBER SW	
5	72016578	MAIN BOARD ASSY	
6	02905756	BOTTOM COVER	
7	02905734	X R-KNOB	MF GLD
8	01346112	KNOB	MOLD KNOB BLK
9	01343101	D C-ESCT	D C-ESCT BX1H BLK
10	12359137	RUBBER FOOT	SJ-5012 BLK
10	12359137	RUBBER FOOT	SJ-5012 BLK
10	12359137	RUBBER FOOT	SJ-5012 BLK
10	12359137	RUBBER FOOT	SJ-5012 BLK

[SCREW]

No.	PART CODE	PART NAME	DESCRIPTION
A	40011490	SCREW M3X6	PAN MACHINE W/SW BZC
B	40011090	SCREW 3X6	BINDING TAPTITE B BZC
C	40011301	SCREW M3X6	BINDING P-TITE FE BZC

PARTS LIST

SAFETY PRECAUTIONS:
The parts marked ⚠ 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)

CASING

#	02905745	TOP CASE			1
#	02905767	REAR PANEL			1
#	02905756	BOTTOM COVER			1
	01343101	D C-ESCT	D C-ESCT BX1H BLK		1

KNOB, BUTTON

	01346112	KNOB	MOLD KNOB BLK		4
#	02905734	X R-KNOB	MF GLD		8
#	02905790	RUBBER SW			1

SWITCH

	02671312	SLG-22-465	SLIDE SWITCH	SW1 on Main Board	1

JACK, EXT TERMINAL

	13429676	YKF51-5048 (TWIN)	MIDI CONNECTOR	JK1 on Main Board	1
	13449645	YKC21-3049 (4P) RED/WHITE	JACK (PIN)	JK2 on Main Board	1
	02121578	CN015R-3013-0	CARD CONNECTR	CN1 on Main Board	1
	02456390	STEREO YKB21-5290	3.5MM JACK	JK5 on Main Board	1
	13449720	HEC2305-01-250	DC JACK	JK6 on Main Board	1

DISPLAY UNIT

	01342534	SL-9351S	LED 7 SEGMENT	LED57 on Main Board	1
	NOTE: Replacement SL-9351S should be made on a unit base.				

PCB ASSY

#	72016578	MAIN BOARD ASSY			1
	NOTE: 'MAIN BOARD ASSY' includes the following parts.				
	02014090	HEATSINK	K217 H25		1
	12199584	GROUNDING TERMINAL	M1698	TER3,TER2,TER1 on Main Board	3
	40011501	SCREW M3X8	PAN MACHINE W/SW+PW BZC		1

IC

	01786667	HD6413006F20	IC (CPU)	IC2 on Main Board	1
	02231767	RA0A-101 (TC223C080AF-101)	IC (DSP)	IC1 on Main Board	1
	02671378	LC324260BJ-60-TLM	IC (DRAM)	IC3 on Main Board	1
	02450401	GM71C18163CJ-6	IC (DRAM)	IC4 on Main Board	1
	02232367	HN58X2432FPI	IC (EEPROM)	IC6 on Main Board	1
	********	MBM29F800BA-70PFTN-SFK	IC (FLASH MEMORY)		1
	02451434	AK4552VT	IC (AD/DA)	IC13 on Main Board	1
#	02905445	TC7SET08FU(TE85L)	IC (CMOS)	IC12 on Main Board	1
	15249104	TC7S04F(TE85L)	IC (CMOS)	IC5 on Main Board	1
	02675689	HD74LV245ATELL	IC (CMOS)	IC33 on Main Board	1
#	02905423	HD74LV4051ATELL	IC (CMOS)	IC23,IC30 on Main Board	2
	01675034	TC74VHC138FT(EL)	IC CMOS	IC22 on Main Board	1
	01679090	TC74VHC08FT(EL)	IC (CMOS)	IC10 on Main Board	1
	01897967	TC74VHC74FT(EL)	IC (CMOS)	IC27 on Main Board	1
	01899156	TC74VHC32FT(EL)	IC (CMOS)	IC32 on Main Board	1
	15189261	M5218AFP-600E	IC (BIPOLAR OP AMP)	IC17,IC16,IC15,IC11 on Main Board	4
	01458445	UPC29M33T-T1	IC (REGULATOR)	IC21 on Main Board	1
	02014645	BA17805T	IC (REGULATOR)	IC19 on Main Board	1
	15289123	M51953AFP-600C	IC (RESET)	IC9 on Main Board	1
	02900545	PC410LKNIP	IC (PHOTO COUPLER)	IC7 on Main Board	1

TRANSISTOR

	01784790	2SA1602A-T11-1F	TRANSISTOR	Q4,Q2 on Main Board	2

TRANSISTOR

	15319102	2SC2882-Y(TE12L.C)	TRANSISTOR	Q11 on Main Board	1
	15319116	2SC4154-T11-F	TRANSISTOR	Q34,Q6,Q5 on Main Board	3
	02670989	DTB113ZK-146T	TRANSISTOR	Q17,Q16,Q18,Q19,Q20,Q21,Q22,Q15 on Main Board	8
#	02905856	UNR5211-(TX)	TRANSISTOR	Q29,Q30,Q32,Q35,Q33,Q1,Q28,Q27,Q26,Q25,Q24,Q23,Q31 on Main Board	13
	15329536	RN1442-A(TE85L)	TRANSISTOR	Q8,Q7 on Main Board	2

DIODE

	15339412	U1BC44(TE12L)	DIODE	D1 on Main Board	1
	02014778	U1GC44(TE12L)	RECTIFIER DIODE	D2 on Main Board	1
	15339130	MA142WK-(TX)	ARRAY DIODE	DA33,DA22,DA23,DA25,DA30,DA20,DA32,DA24,DA34,DA36,DA37,DA38,DA31,DA18,DA17,DA16,DA15,DA13,DA12,DA11,DA3,DA2,DA1,DA19,DA27 on Main Board	25
	01897178	MA142WA-(TX)	ARRAY DIODE	DA46,DA51,DA29,DA47,DA48 on Main Board	5
	01897189	MA147-(TX)	ARRAY DIODE	DA54,DA6,DA5,DA7,DA41,DA8,DA40,DA53 on Main Board	8
	02671245	SML-310LTT86	LED	LED20,LED33,LED16,LED17,LED19,LED21,LED22,LED23,LED26,LED27,LED28,LED29, LED30,LED15,LED32,LED39,LED36,LED37,LED40,LED42,LED43,LED45,LED46,LED47,LED58,LED59,LED60,LED1,LED18,LED31,LED8,LED41,LED14,LED3,LED4,LED5,LED6,LED7,LED2,LED9,LED10,LED13,LED11,LED12 on Main Board	44
	02126912	SLR-342VR-TG7	LED	LED34,LED48,LED24,LED38,LED44 on Main Board	5

RESISTOR

	15399565	RPC18T 470 J	CARBON RESISTOR	R55,R72,R56,R71 on Main Board	4
	01011856	RPC05T 0R0 J	MTL.FILM RESIST0R	R149,R125,R150,R147,R179,R148,R43 on Main Board	7
	00567378	RPC05T 473 J	MTL.FILM RESISTOR	R27,R28,R40,R48,R49,R50,R64,R65 on Main Board	8
	00567501	RPC05T 474 J	MTL.FILM RESISTOR	R53,R157,R34,R41,R156,R63 on Main Board	6
	00567412	RPC05T 104 J	MTL.FILM RESISTOR	R58,R175,R165,R75,R122 on Main Board	5
	00567289	RPC05T 103 J	MTL.FILM RESISTOR	R10,R176,R8,R152,R68,R174,R69,R77,R80,R173,R170,R153,R2 on Main Board	13
	00567434	RPC05T 154 J	MTL.FILM RESISTOR	R25 on Main Board	1
	00567234	RPC05T 392 J	MTL.FILM RESISTOR	R51,R66 on Main Board	2
	00567089	RPC05T 331 J	MTL.FILM RESISTOR	R163,R162,R78,R31,R6,R4 on Main Board	6
	00566967	RPC05T 470 J	MTL.FILM RESISTOR	R13 on Main Board	1
	00567034	RPC05T 121 J	MTL.FILM RESISTOR	R12 on Main Board	1
	00567067	RPC05T 221 J	MTL.FILM RESISTOR	R109,R7,R1 on Main Board	3
	00567112	RPC05T 471 J	MTL.FILM RESISTOR	R46,R30,R38,R59,R32 on Main Board	5
	00567190	RPC05T 222 J	MTL.FILM RESISTOR	R11,R29 on Main Board	2
	00567245	RPC05T 472 J	MTL.FILM RESISTOR	R26,R5 on Main Board	2
	00567023	RPC05T 101 J	MTL.FILM RESISTOR	R137,R182,R181,R167,R166,R164,R159,R144,R143,R142,R141,R140,R138,R9,R121,R119,R118,R117,R116,R115,R114,R113,R112,R111,R110,R39,R33,R3,R139 on Main Board	29
	00567278	RPC05T 822 J	MTL.FILM RESISTOR	R67,R52 on Main Board	2
	00567301	RPC05T 153 J	MTL.FILM RESISTOR	R79 on Main Board	1
	00567323	RPC05T 223 J	MTL.FILM RESISTOR	R61,R45 on Main Board	2
	00903956	MCR100 JZH J 4R7	MTL.FILM RESISTOR	R120 on Main Board	1
	15399965	RCE9A103JAG7A (10KOHM X8)	RESISTOR ARRAY	RA18,RA9,RA10 on Main Board	3
	01906678	MNR14 EOAB J 103	RESISTOR-ARRY	RA6,RA25,RA17,RA24 on Main Board	4
	01906945	MNR14 E0AB J 101	RESISTOR-ARRY	RA16,RA15,RA13,RA14 on Main Board	4
	02239645	MNR14 E0AB J 102	RESISTOR-ARRAY	RA11,RA12 on Main Board	2

POTENTIOMETER

	02455223	EVUF2KFK4B14	9M/M ROTARY POTENTIOMETER	VR6,VR13,VR11,VR5,VR4,VR3,VR12 on Main Board	7
#	02905412	RK12L12C0A0E	12M/M ROTARY POTENTIOMETER	VR2 on Main Board	1
	02239523	EWAN1AC15B14	30M/M SLIDE POTENTIOMETER	VR8,VR7,VR10,VR9 on Main Board	4

CAPACITOR

	01674334	ECUV1H101JCV	CERAMIC CAPACITOR	C48,C16,C33,C44,C45,C47,C49,C50,C58,C59,C60,C61,C63,C191,C192,C46,C62 on Main Board	17
	02129534	ECJ1VB1H102K	CERAMIC CAPACITOR	C17,C31 on Main Board	2
	01674190	ECUV1H150JCV	CERAMIC CAPACITOR	C28,C29 on Main Board	2
	01674389	ECUV1H221JCV	CERAMIC CAPACITOR	C96,C111,C104,C91,C77,C70 on Main Board	6
	01674612	ECJ1VB1H103K	CERAMIC CAPACITOR	C185,C65,C54,C53,C66,C67,C51,C157,C52 on Main Board	9

CAPACITOR

	01674701	ECJ1VF1E104Z 0.1UF/16VK	CERAMIC CAPACITOR(CHIP)	C178,C138,C139,C141,C144,C145,C151,C190,C158,C41,C179,C180,C186,C132,C154,C10,C81,C107,C9,C11,C15,C18,C27,C102,C37,C39,C75,C82,C99,C32,C8,C106 on Main Board	32
	01674712	ECJ1VF1A105Z	CERAMIC CAPACITOR	C5,C4,C3,C2,C24,C22,C6,C167,C25,C12,C13,C20,C21,C26,C40,C131,C169,C170,C130 on Main Board	19
#	01346889	ECHU1H151JX5	POLYEST. CAPACITOR	C103,C86 on Main Board	2
	01784145	ECHU1H152JX5	POLYEST. CAPACITOR	C92,C108 on Main Board	2
	13639546M0	ECEA1CKA100B 10UF/16V	CHEMICAL CAPACITOR	C133,C88,C87,C89,C90,C173,C172,C171,C140,C109,C105,C100,C98,C97,C94,C142,C30,C80,C42,C74,C83,C93 on Main Board	22
	13639547M0	ECEA1CKA220B 22UF/16V	CHEMICAL CAPACITOR	C19,C38,C153 on Main Board	3
	13639550M0	ECEA1CKA101B 100UF/16V	CHEMICAL CAPACITOR	C155,C115,C112 on Main Board	3
	13639549M0	ECEA1CKA470B	CHEMICAL CAPACITOR	C23,C113,C150 on Main Board	3
	01902612	RA2-6V471MC-T2	CHEMICAL CAPACITOR	C146 on Main Board	1
	02014890	RA2-16V221MT2	CERAMIC CAPACITOR	C36,C116 on Main Board	2
	02239623	RA2-16V102M-T2	CHEMICAL CAPACITOR	C143 on Main Board	1

INDUCTOR, COIL, FILTER

	01565612	DSS310-93D223S50	EMI FILTER	FL1 on Main Board	1
	01565589	N1608ZA601T01	FERRITE-BEAD	L8,L2,L3,L5,L15,L9,L10,L11,L12,L13,L14,L16,L1,L4 on Main Board	14

CRYSTAL, RESONATOR

	00894023	MA-406 20.000MHZ TE24	CRYSTAL	X1 on Main Board	1
	01893334	SG8002JC-67.7376M-PHCL	OSCILLATOR	X2 on Main Board	1

SCREW

	40011090	SCREW 3X6	BINDING TAPTITE B BZC		3
	40011301	SCREW M3X6	BINDING P-TITE FE BZC		29
	40011490	SCREW M3X6	PAN MACHINE W/SW BZC		3

PACKING

#	02905690	LOWER PAD			1
#	02905701	UPPER PAD			1
#	02905689	PACKING CASE			1
#	02905834	OUTER PACKING CASE			1
#	40458989	RECYCLE MARK SEAL	FOR PACKING		1

MISCELLANEOUS

	40237123	NITTO DAMPLON K60	#3505 W50MM 50M		140
	12359137	RUBBER FOOT	SJ-5012 BLK		4
#	02905789	PANEL SHEET			1

ACCESSORIES (STANDARD)

⚠	00905756	AC ADAPTOR	ACI-100C		1
⚠	00905767	AC ADAPTOR	ACI-120C		1
⚠	01018312	AC ADAPTOR	ACI-230C		1
⚠	01901578	AC ADAPTOR WITHOUT AC CORD	PSB-1U UNIVERSAL		1
⚠	01903356	AC CORD SET	230V 1.0M FOR PSB		1
⚠	01903367	AC CORD SET	240V 1.0M FOR PSB		1
⚠	00905234	EURO CONVERTER PLUG	ECP01-5A (PLUG FOR BRC-230T)		1
#	72123201	OWNER'S MANUAL SET	JAPANESE		1
#	72123212	OWNER'S MANUAL SET	ENGLISH		1
#	********	PHRASE CD			1
#	40458390	LEAD CTRL MAP SEAL			1
	01346312	CARD PROTECTOR			1
	40232334	WARRANTY CARD	MOCHIKOMI JAPAN ONLY		1

CHECKING THE VERSION NUMBER

1. Turn off the main power.
2. While holding down [SHIFT] and STEP [4], turn on the main power.
3. The version number of the software will appear on the display and the test mode will be turned on .
4. The mode will end when the main power is turned off.

USERS DATA SAVE AND LOAD(MEMORY CARD)

Memory cards usable with the MC-09

The MC-09 can use commercially available SmartMedia memory cards. However, a memory card is not included. You can purchase a memory card at a nearby computer shop or digital camera dealer. When you purchase a memory card, make sure that it meets the following conditions.

· Power supply voltage: 3.3 V
· Capacity: 2 MB-128 MB

* *The MC-09 cannot use SmartMedia of types other than the above.*

* *If you use 2 MB Smart Media, it may not be possible to save all data.*

Cautions when using a memory card

* *The power of the MC-09 must be off when you insert or remove a memory card. Inserting or removing a memory card when the power is on will damage the memory card as well as the data in the MC-09.*

* *Make sure that the memory card is oriented correctly (The surface without gold contactsmust face upward), and push it all the way into the slot.*

* *Never turn on the power when a memory card is inserted part-way into the slot. Doing so will damage the data in internal memory.*

* *Never turn off the power while "BSY" appears in the display. Doing so will damage the data in the memory card and internal memory.*

Formatting a memory card

This operation prepares the memory card for use on the MC-09. You will need to format a newly purchased memory card before using it for the first time, or before a memory card used with another device can be used on the MC-09.

* *When you format a memory card, the entire contents of the card will be erased.*

1. Press the [SETUP] button.
2. Press the [INC] or [DEC] button until the display indicates "FMT".
3. Press the [ENTER] button. The display will show "SUR".
4. To format the card, press the [WRITE] button. While the card is being formatted, "BSY" will appear in the display. When formatting is finished, you're returned to where you were in step 2.

* *If you decide not to format the card, press the [SETUP] button or the [EXIT] button.*

5. Press the [SETUP] button.

Saving all settings of the MC-09 to a memory card

The following settings stored in the audio looper will be saved together on the memory card.

· All loops and user patterns
· Process patch
· System settings
· The settings of the currently selected pattern/effect pattern

For details on system settings, refer to "Parameter list"

1. Press the [SETUP] button.
2. Press the [INC] or [DEC] button until the display indicates " AL.L".
3. Press the [ENTER] button. The display will show the save-destination file number (A01- A50).
4. Use the [INC] and [DEC] buttons to select the desired save-destination file number.

* *Should you decide that you don't want to carry out the save, press the [SETUP] button or the [EXIT] button.*

5. Press the [WRITE] button to begin saving. While the settings are being saved, the display will show "BSY". Once the save is complete, you're returned to where you were in step 2.

* *If the save-destination file number already exists on the memory card, the display will indicate "SUR". If you want to save the new data by overwriting the old, press the [ENTER] button. If you want to save the data with a different file number, press the [EXIT] button and repeat the procedure from step 2.*

* *It may take up to three minutes for saving one loop.*

6. Press the [SETUP] button. When loops are saved to a memory card, they are saved in the MC-09's own original format.

Loading MC-09 settings

Here's how MC-09 settings saved on a memory card can be loaded back into the MC-09.

1. Press the [SETUP] button.
2. Press the [INC] or [DEC] button until the display indicates "AL.L".
3. Press the [ENTER] button. The display will show one of the file numbers (A01-A50) that have been saved in the memory card.
4. Use the [INC] and [DEC] buttons to select the file number that you want to load.

* *If you decide not to load a file, press the [SETUP] button or the [EXIT] button.*

5. Press the [WRITE] button. The display will indicate "SUR", asking you to confirm the operation.
6. Press the [ENTER] button to load MC-09 settings. While the settings are being loaded, the display will show "BSY". Once the data's been loaded, you're returned to where you were in step 2.

* *It may take up to three minutes for loading one loop.*

7. Press the [SETUP] button.

USERS DATA SAVE AND LOAD(BULK DUMP)

Saving the MC-09 settings to an external sequencer (Bulk Dump)

Data for the currently selected pattern, process patch or all saved settings, can be transmitted to an external MIDI device. This function is called bulk dump. You can create a backup of the MC-09's data by using bulk dump to record the data on an external MIDI sequencer. You can also use this function to replicate the current settings of one MC-09 (except for the Loop setting) on another MC-09.

Saving MC-09 data on an external MIDI sequencer

1. Use a MIDI cable to connect the MC-09's MIDI OUT tothe MIDI IN of your external MIDI sequencer.
2. Press the [SETUP] button.
3. Press the [INC] or [DEC] button until the display indicates "DMP"(Bulk Dump).
4. Press the [ENTER] button.
5. Use the [INC] and [DEC] buttons to select the data that you want to save.Ptn: Settings for the currently selected pattern Ptc: Process patchesALL: All patterns, process patches, and system settings
6. Press the [ENTER] button. The display will blink "SUR"(Sure), asking you to confirm the operation. If you decide to cancel, press the [EXIT] button.
7. Begin recording on your external MIDI sequencer.
8. Press the [ENTER] button to initiate the bulk dump. While the data is being transmitted, the indication in the display will blink. When transmission is completed, the display will show "END".
9. Stop recording on your external MIDI sequencer.
10. Press the [EXIT] button to complete the bulk dump.

Restoring MC-09 data from an external MIDI sequencer

The data that was saved by a bulk dump is referred to as bulk data. By loading this bulk data, you can reproduce the state in which the MC-09 was when it transmitted the bulk data.

1. Use a MIDI cable to connect the MC-09's MIDI IN to the MIDI OUT of the external MIDI sequencer.
2. Press the [SETUP] button.
3. Press the [INC] or [DEC] button until the display indicates "rcv"(Bulk Receive).
4. Press the [ENTER] button. The MC-09 will wait to receive bulk data. If you decide to cancel, press the [EXIT] button.
5. Play back your external MIDI sequencer to transmit the bulk data to the MC-09. While the MC-09 is receiving bulk data, the display will blink.When bulk data reception ends, the display will indicate "BSY". This display will continue for approximately 60 seconds.

* *Never turn off the power while "BSY"appears in the display. Doing so will damage the data in the memory card and internal memory.*

* *You must transmit all of the bulk data.*

6. Press the [EXIT] button to complete the operation, after the display indicates "rcv".

RESTORING THE FACTORY SETTINGS

Restoring the factory settings (Factory Reset)

By carrying out a Factory Reset, the following settings of the MC-09 are restored to their original factory-set condition.

· System settings

· All patterns you've saved (User Patterns)

* *Once you execute a Factory Reset, all the settings you've saved will be lost, being replaced by the settings your unit originally had when it left the factory. If internal memory contains important data that you want to keep, you must save it on a memory card, or to an external MIDI sequencer via bulk dump.*

1. Press the [SETUP] button.
2. Press the [INC] or [DEC] button until the display indicates "Fct".
3. Press the [ENTER] button. The display will show "Sur".
4. To execute the factory reset, press the [WRITE] button. While the factory settings are being restored, "BSY" will appear in the display. When the factory reset is finished, you're returned to where you were in step 2.

* *If you decide not to restore the factory settings, press the* [SETUP] *button or the* [EXIT] *button.*

* *Never turn off the power while "BSY"appears in the display. Doing so will damage the system.*

5. Press the [SETUP] button to return to the previous display.

SYSTEM SOFTWARE UPDATE PROCEDURE

General Outline

The MC-09 uses a Flash Memory for the system program.
The Flash Memory updater (control program) is stored within the Flash Memory.
Generally, data for updating is provided in divided SMF data. The program version is updated by connecting a playable sequencer (MC-80, etc.) to the MC-09 with a MIDI cable and then loading SMF data to the MC-09.
The Flash Memory consists of 2 areas and modes: FIX (with updating and test mode programs) and USER (with main program) areas, and ALL (for both FIX and USER areas) and USER (for USER area only) updating modes.
Updating is only available via MIDI.
Note:
If updating fails in ALL updating mode, the unit may become permanently unrebootable. In this case, the current Flash Memory must be replaced with the one already written in with program.
After updating, factory reset is necessary. Back up the user data in advance since it will be reset. Details are described in "Saving and loading data".

Device Used in Updating Mode

MC-09 and AC adapter
Sequencer that can playback SMF (MC-80, etc.)
MIDI cable x 1
SMF data disk for updating (2HD) x 1 (#17041155)
Files on SMF disk are as follows:
File names remain the same even after version updating.
Update Disk
UP_U_TKO.MID
UP_A_TKO.MID
_TKO00.MID
_TKO01.MID
_TKO02.MID
_TKO03.MID
_TKO04.MID
_TKO05.MID
_TKO06.MID
_TKO07.MID
_TKO08.MID
_TKO09.MID
_TKO10.MID
_TKO11.MID

Common Updating Procedure in ALL and USER Updating Modes

1. Connect the power code to the respective devices to be used and confirm that the power can be turned on.
2. Confirm the MC-09's version prior to updating if necessary.

3. Connect MIDI OUT of the sequencer and MIDI IN of the MC-09 with the MIDI cable.

Beyond these steps, proceed according to the updating mode.

Procedure for ALL Updating Mode

1. While holding down the [SEL] buttons of parts 1, 2 and 4 of AUDIO LOOPER, "ALL" appears on the display when the power is turned on.
2. Load the SMF data [UP_A_TKO.MID] from the sequencer.
3. "Ers" appears on the display and the Flash Memory is initialized.Approximately 10 seconds later, "UPd" appears on the display.(Do not load the data while "Ers" is displayed.)4. Load the SMF data for updating from the sequencer.Playback the 12 [_TKO00.MID] - [_TKO11.MID] files in numerical order.
4. While loading the data, the LED of the [START] button blinks and the number displayed is incremented.
5. When all files have been loaded, "End" appears on the display to indicate completion of updating. Approximately 10 minutes is required for loading all of the SMF files.
6. After completion of updating, turn on the main power again, enter the test mode, confirm the version and conduct a device check. Subsequently, conduct factory reset.

Procedure for USER Update Mode

1. While holding down the [SEL] buttons of parts 1, 3 and 4 of AUDIO LOOPER, "USR" appears on the display when the power is turned on.
2. Load the SMF data [UP_U_TKO.MID] from the sequencer.
3. "Ers" appears on the display and the Flash Memory is initialized.Approximately 10 seconds later, "UPd" appears on the display.(Do not load the data while "Ers" is displayed.)
4. Load the SMF data for updating from the sequencer. Playback the 11 [_TKO01.MID] - [_TKO11.MID] files in numerical order.
5. While loading the data, the LED of the [START] button blinks and the number displayed is incremented.
6. When all files have been loaded, "End" appears on the display to indicate completion of updating.
7. After completion of updating, turn on the main power again, enter the test mode, confirm the version and conduct a device check. Subsequently, conduct factory reset.

Actions to be Taken when the Unit became Unrebootable

Turning off the power accidentally while update may cause improper booting of the unit.

1. Replace the board if booting becomes impossible after ALL update.
2. Repeat the USER updating procedure again if the unit becomes unrebootable after USER update.

List of Error Messages Displayed upon Updating

Er0:Erase Error

Displayed when contents of the Flash Memory cannot be initialized. It is assumed that the power is not supplied to the VPP terminal of the Flash Memory.

Er1:Write Error

Displayed when an error occurs while trying to write the Flash Memory.

Er2:Message Error

Displayed when a problem exists in received MIDI message. (SumCheck, etc.)

Er3:FIFO Over Flow

Displayed when the MC-09 cannot process a large amount of MIDI messages received all at once.

Er4:Overrun Error

Displayed when a MIDI message is missed.

Er5: Framing Error

Displayed when a problem exists in the received MIDI message data such as transfer rate and jitter.

Er6:Compare Error

Displayed when a difference is found upon comparison of data written in the Flash Memory and data to be written to the Flash Memory.

TEST MODE

Devices to be Used

MIDI cable x 1
Oscillator
Noise meter
Oscilloscope
Audio cable
Smart Media Card

Method of Booting in the Test Mode

While holding down [SHIFT] and Step [4], turn on the main power.
Automatically proceeds to version display of item 1.

* *Selection of Test Items Proceed through the items in the test mode by holding down [SETUP] and [TAP]. Moreover, holding down [SETUP] and Step [Item Number] proceeds directly to the desired inspection item.*

Details on Each Test Item

1:Version Display

Displays the program version on the display.
Ex: "1.03" appears on the display when the version is 1.03.

* *Holding down [SETUP] and [TAP] proceeds to the next item.*

2:Device Test

Performs an operation check on each device (IC).
Insert the Smart Media Card (voltage: 3.3V, capacity: 2-128MB) into the memory card slot beforehand.
"DEV" appears on the display and checking in the following order automatically starts:
Step [4] will light if ESP RAM (IC1) is O.K.
Step [2] will light if WORK RAM (IC3) is O.K.
Step [3] will light if EEP RAM (IC6) is O.K.
Step [5] will light if Smart Card is O.K.
Step [1] will light if Flash ROM (IC8) is O.K.
Requires approximately one minute to complete.
"ok" appears on the display when all are confirmed to be O.K.
If an error occurs, the error number appears on the display and procession to the next item is disabled.

Error number and error content	
ER1	Checksum error in Flash ROM.
ER2	Access error in Work RAM.
ER3	Access error in EEP ROM.
ER4	Access error in ESP RAM.
ER5	Access error in Smart Media.

* *Holding down [SETUP] and [TAP] proceeds to the next item.*

3: MIDI Test

Confirm open and short statuses of MIDI IN and OUT.

Connect 1 MIDI cable to MIDI IN/OUT connector to form a loop beforehand.

"000" indicating short status is displayed.

Remove the MIDI cable connection.

* *If the MIDI cable is not connected beforehand, "---" indicating open status is displayed.In this case, connect 1 MIDI cable to MIDI IN/OUT connector to form a loop.When confirmed to be O.K., it will automatically proceed to the next item.*

4: SW/ LED Test

Checking the LED and SW operations.

Initially, all LEDs corresponding to all the switches will light. Confirm that all LEDs are lit. Pressing each SW turns off the corresponding LED.

If the SW has an LED, the LED will go out. For SWs without LEDs, the LEDs will correspond to the SWs as shown in the chart below.

SWs without LEDs	Corresponding to LEDs
[DISPLAY] button	[BPM]
[INC] button	[OCT]
[DEC] button	[TONE/TYPE]
[TAP] button	"8" of right part of 7-segment display
[SHIFT] button	"8" of left part of 7-segment display
[ENTER] button	[FROM]
[EXIT] button	[TO]
[STOP] button	Beat LED (located close to the Memory Card connector)

* *There is no reaction when 2 or more SWs are held down. Pressing all SWs and turning off all LEDs will automatically proceed to the next item.*

5: VR test

Confirm whether or not the volume functions properly.

Initially, "Vr" appears on the display.Rotating each volume control will display volume value "000"-"127" for whichever one is currently being operated.

All LEDs will blink when minimum "000" and maximum "127" values for each volume are properly obtained.

Completing all volume checks will automatically proceed to the next item.

* *Output volume is not included in this test.*

6: BYPASS Test

Checks for residual noise and whether or not the signal input from INPUT is properly output from OUTPUT. "BPS" appears on the display.

6-1: Confirmation of Residual Noise Rotate the OUTPUT volume control to its maximum position.

Check the residual noise of the output signal from the rear OUTPUT jack with the noise meter.

The residual noise level is as follows.

- 75 dBm or lower (JIS-A) 6-2:Confirming Output Signal Input oscillator signal to the rear INPUT jack.

Input signal: 100Hz/ 1kHz/ 10kHz: +6dBm sinewave

Rotate the OUTPUT volume control to its maximum position.

Measure the level of the output signal from the rear OUTPUT jack with the noise meter.

Confirm that the output signal level for each input signal is within the range of +4dBm - +8dBm.

For 1kHz sinewaves only, check for distortions in wave form with the oscilloscope.

* *Holding down [SETUP] and [TAP] proceeds to the next item.*

7: Initialize

Reset the user memory built into the main unit to factory shipment setting.

After "ini" appears for a few seconds on the display, "Sur" appears and blinks.

Press the [Enter] button to execute.

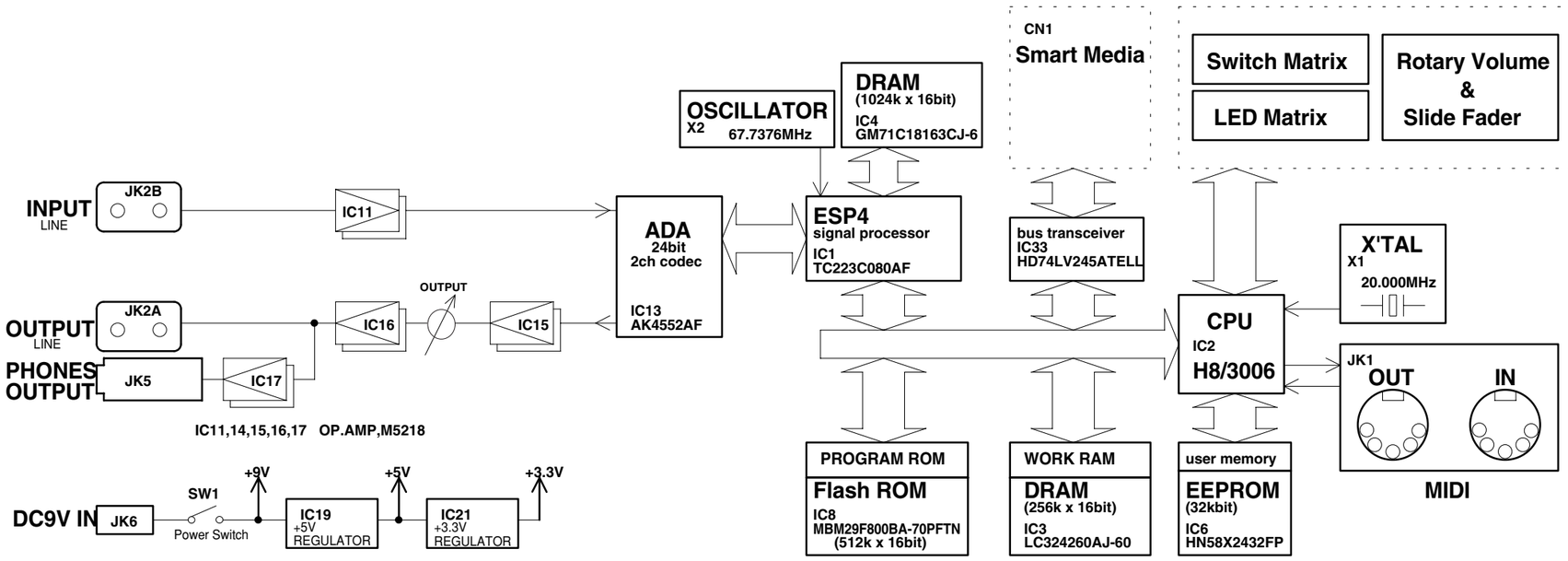
"BSY" appears on the display during execution.

Requires approximately one minute to complete.

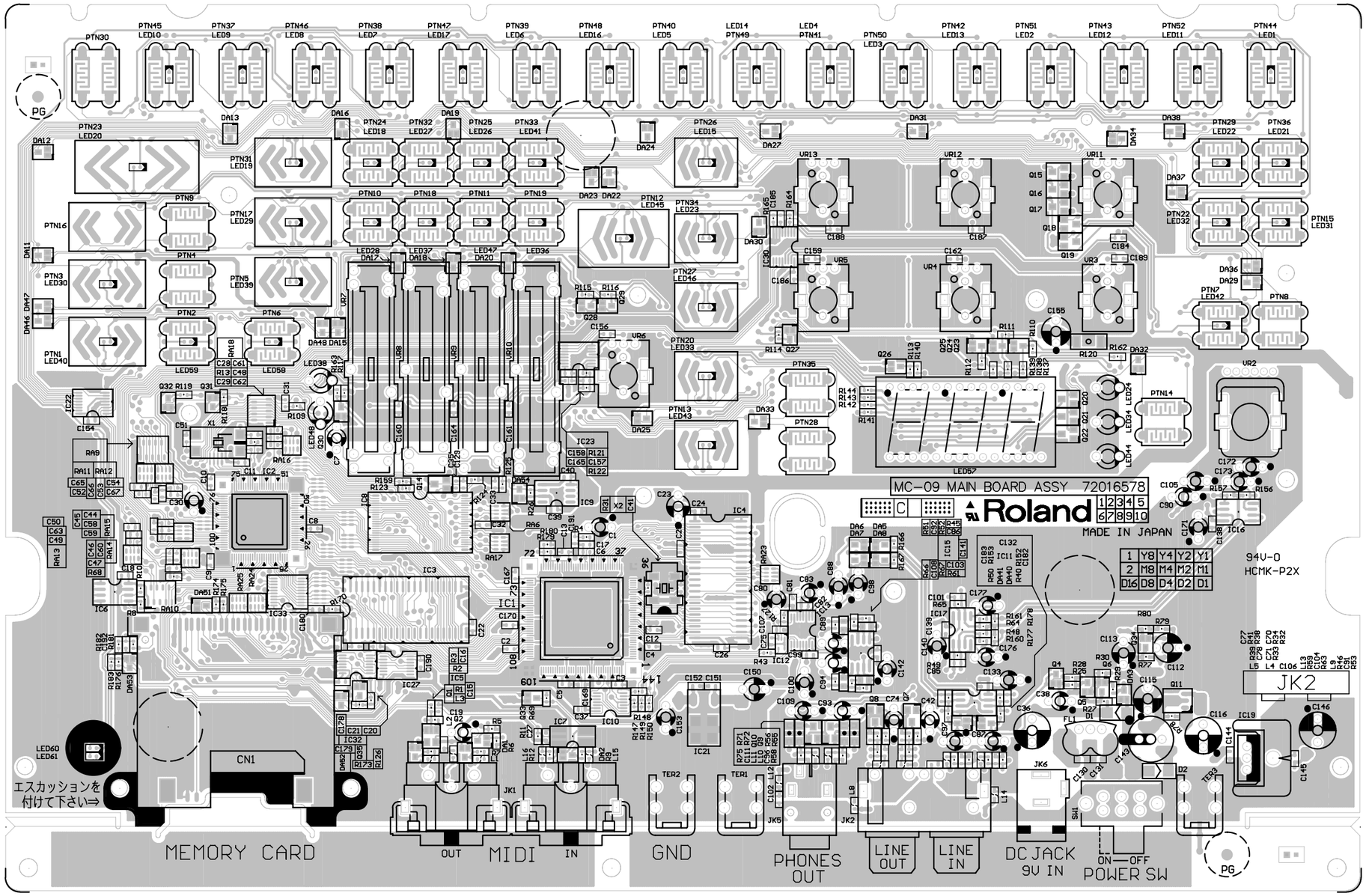
"ini" reappears on the display when initialization is completed.

* *"End" appears on the display when [SETUP] and [TAP] are held down and* switching to normal mode is done automatically.

BLOCK DIAGRAM

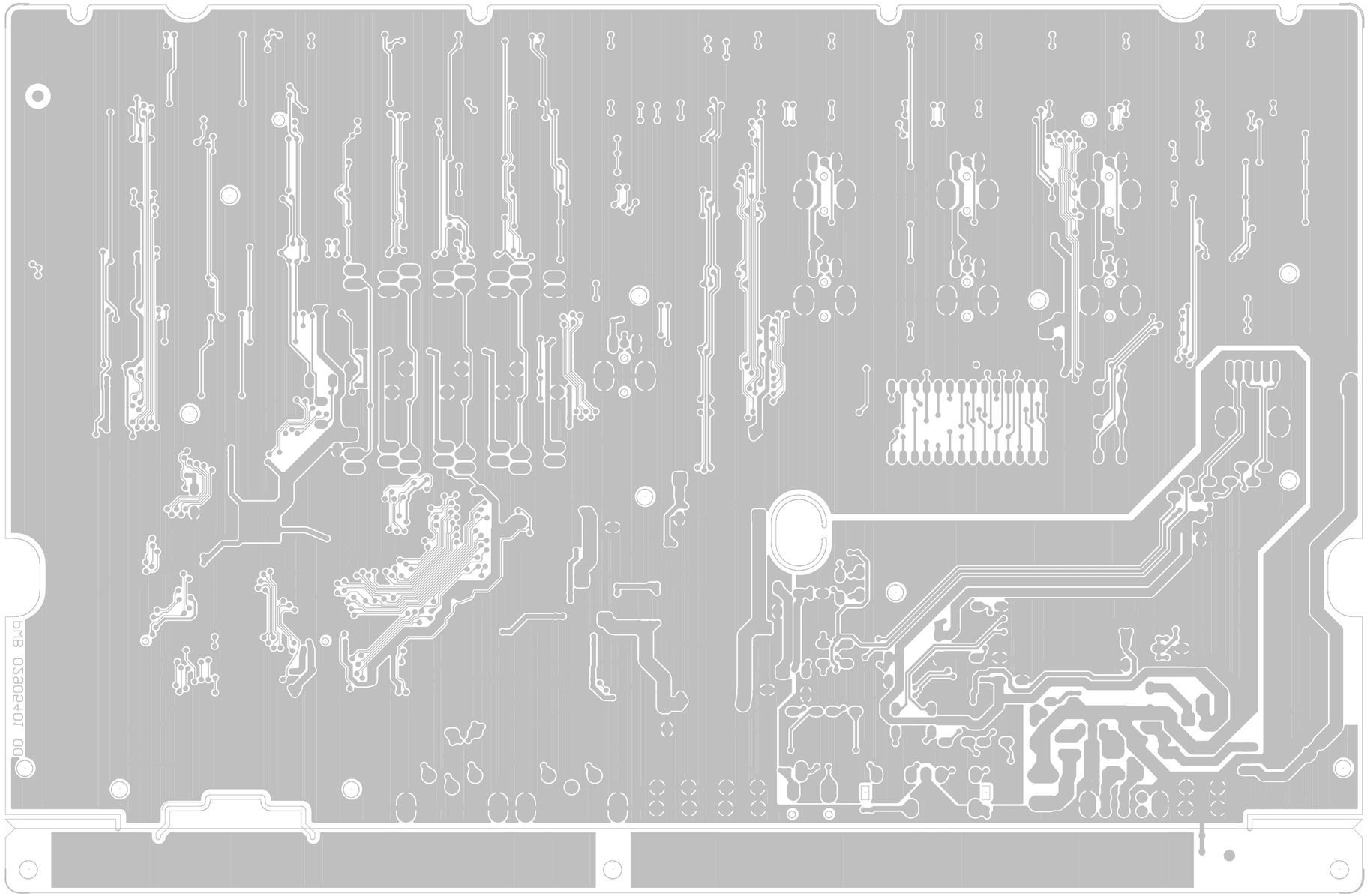


CIRCUIT BOARD(MAIN BOARD 1/2)



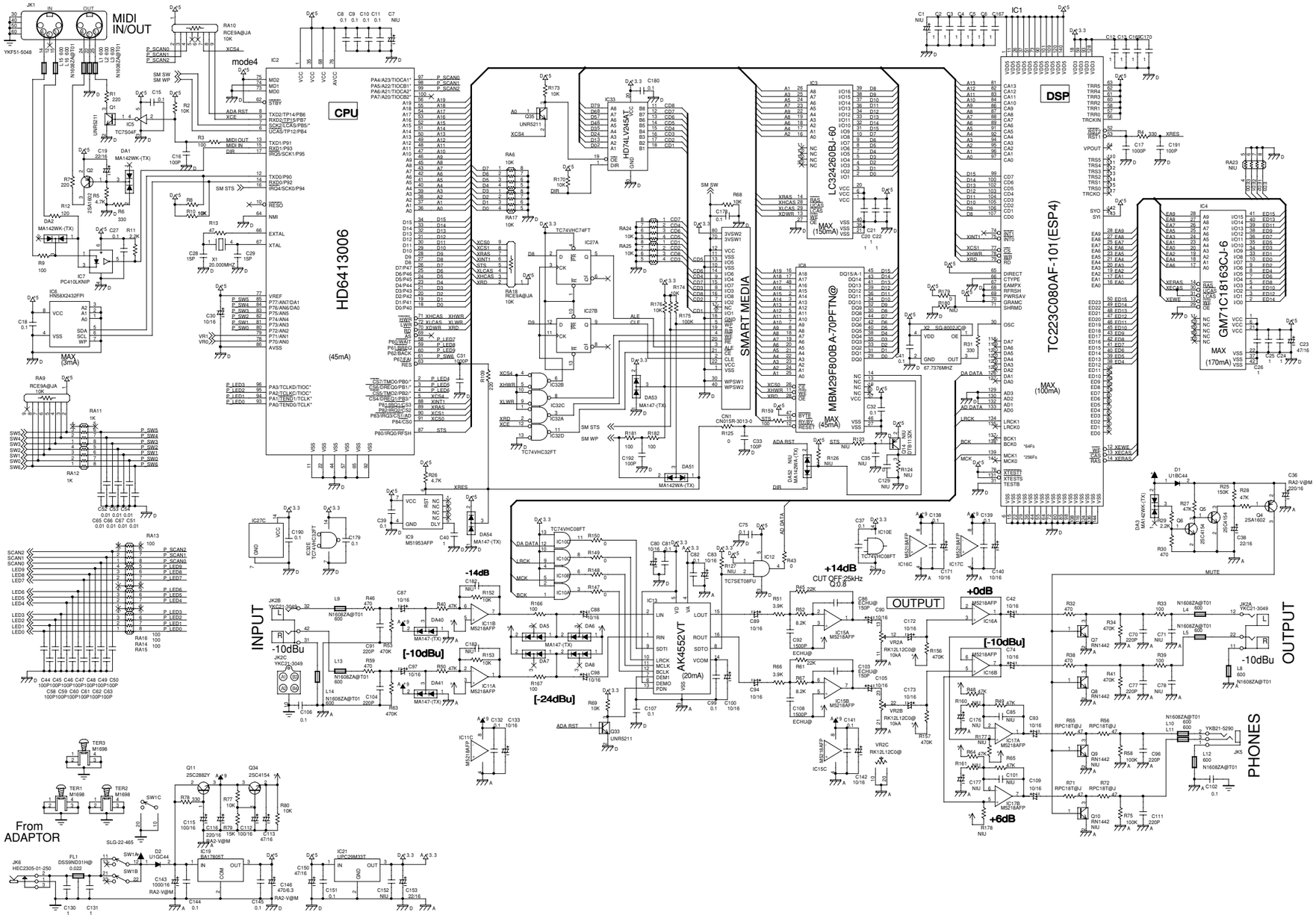
View from component side

CIRCUIT BOARD(MAIN BOARD 2/2)

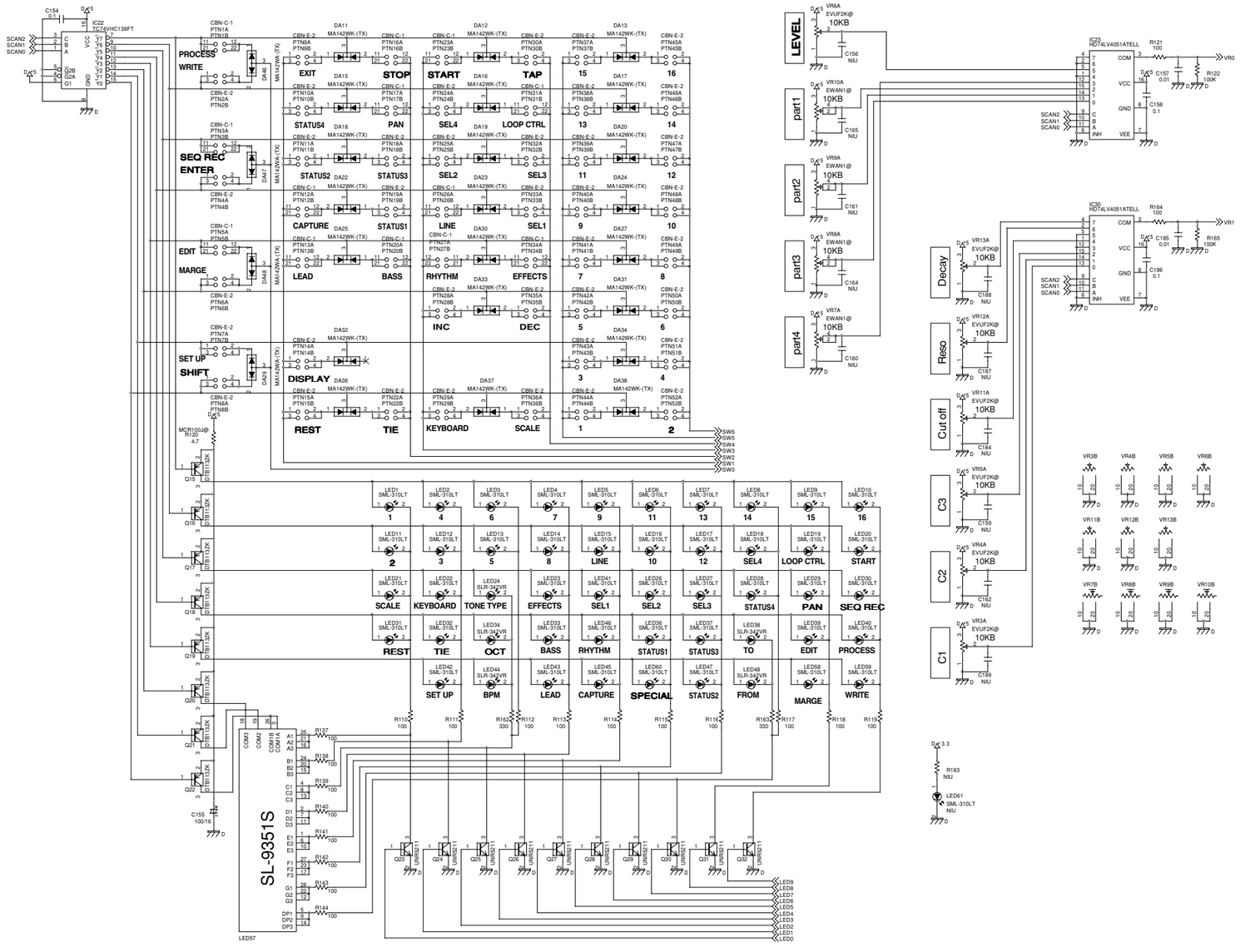


View from foil side

CIRCUIT DIAGRAM(MAIN BOARD 1/2)



CIRCUIT DIAGRAM(MAIN BOARD 2/2)



ERROR MESSAGES

Message	Cause
E01	A large number of MIDI messages were received all atonce, and processing could not be completed.
E02	There is a problem with the MIDI cable connection.
E03	The checksum value of a received exclusive message is incorrect.
E04	The format of a received exclusive message is incorrect.
E05	It is possible that the contents of internal memory have been damaged.
E12	The specified file does not exist on the memory card.
E13	The file has an incorrect data format, or has been dam-aged.
E14	There is insufficient space on the memory card.
E15	The memory card is write-protected.
E16	The memory card is not inserted.
E17	The memory card is not formatted.
	The MC-09 does not support this memory card.
	The memory card is damaged.