

16bit DIGITAL SYNTHESIZER (MODULE)

# **K4/K4r**

## **SERVICE MANUAL**

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**KAWAI**

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Kawai Musical Instrument  
Manufacturing Co., Ltd.

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## 1. P.W.B. INFORMATION

K4

P.W.B. Name	Code No.	Description
MI-051      (1) : Japan 110V Markets 220/240V Markets (2) : U.S.A., Canada (3) : Australia, U.K., West Germany Europe	236283  236284 236285	MI-051 : MPU, CARD BUFFER, RESET, RAM, CODE ROM, ADDRESS DECODER, DCO, DCA, KEY SCAN, VELOCITY SENSOR, WAVE ROM, DCF, EFFECT, PAN POT, LINE GATE, MIDI, AUDIO, D/A, POWER SUPPLY
MI-052-055 (1) : All Markets	236286	MI-052 : PRESSURE SENSOR MI-053 : VOLUME MI-054 : DATA ENTRY (VALUE) MI-055 : PANEL SWITCHES

K4r

P.W.B. Name	Code No.	Description
MI-056-059 (1) : Japan 110V Markets 220/240V Markets (2) : U.S.A., Canada (3) : Australia, U.K., West Germany Europe	236290  236291 236292	MI-056 : MPU, CARD BUFFER, RESET, RAM, CODE ROM, ADDRESS DECODER, DCO, DCA, WAVE ROM, DCF, PAN POT, MIDI, AUDIO, D/A, POWER SUPPLY  MI-057 : PANEL SWITCHES MI-058 : VOLUME MI-059 : DATA ENTRY (VALUE)

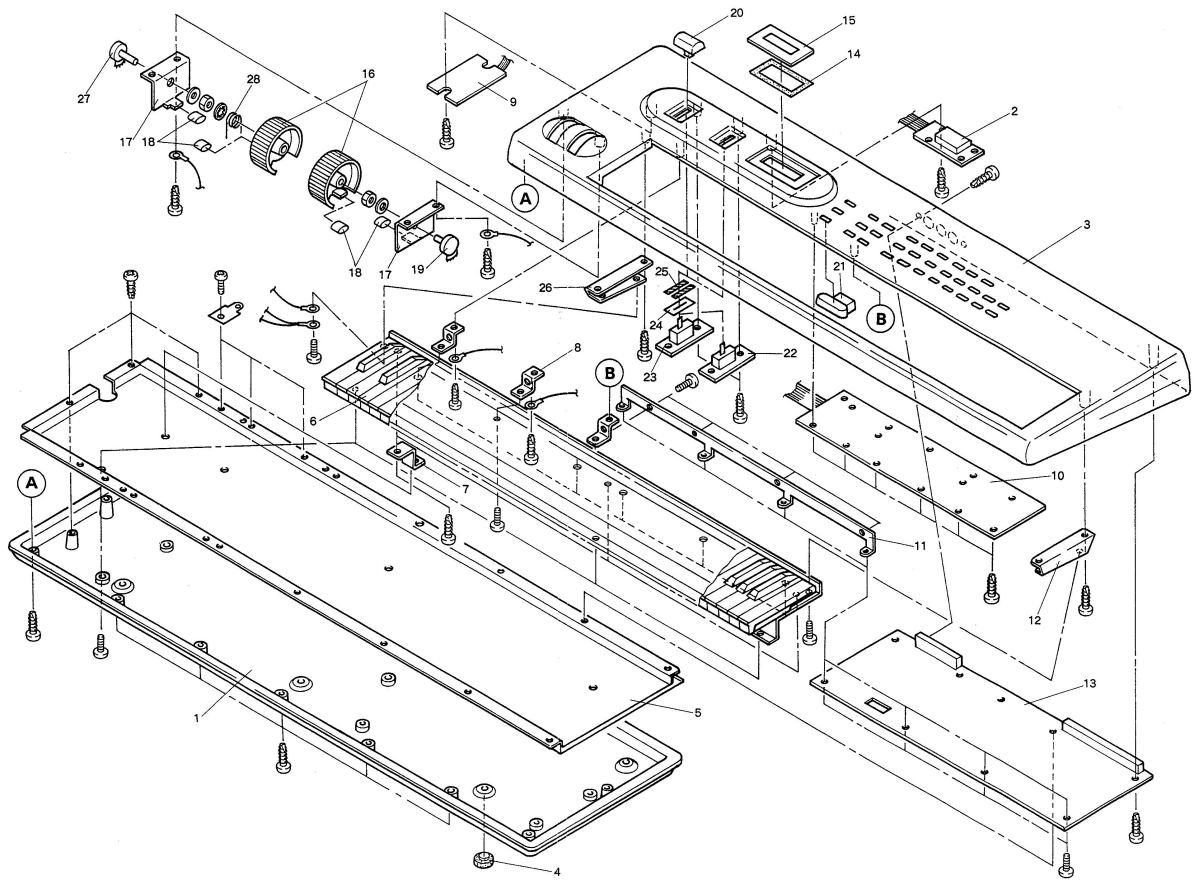
## 2. SEMICONDUCTORS LIST

	Code No.	Name	Description	K4 Pieces	K4r Pieces	
IC	706939	SN74LS138	3-To 4 Line Decoder	1		
	706990	TA75558P	Dual OP AMP		3	
	707019	NJM-4556D	Dual OP AMP	1	1	
	801926	TC74HC08	Quad 2-Input AND Gate	1	1	
	802832	MSM74HC04	Hex Inverter	1	3	
	802835	MSM74HC139	Dual 2-To 4 Line Decoder	1	1	
	802837	MSM74HC174	Hex D-Type Flip Flop	1	3	
	802838	MSM74HC244	Octal 3-State Bus Buffer	2	2	
	802842	MSM74HC373	Octal D-Type Latch with 3-State Output		1	
	802931	MSM74HC02	Quad 2-Input NOR Gate	1		
	802935	MSM74HC245	Octal 3-State Bus Transceiver	1	1	
	803005	MSM74HC00	Quad 2-Input NAND Gate	1	5	
	804981	74HC4538	Dual Monostable Multivibrator	1		
	804982	MB3771	Reset	1	1	
	804984	TA7508P	Quad OP AMP	1	1	
	804986	PD78310G-36	Micro Processing Unit	1	1	
	805043	TA75358P	Dual OP AMP	2		
	805065	HM62256LP-15SL	8 x 32Kbits SRAM	1	1	
	805129	TC74LS03	Quad 2- input NAND Gate with Open Collector Output	1	1	
	805727	TLP513	PHOTO Coupler	1	1	
	805758	K005FP : FP64P	Key Scanner	1		
	805759	K007FP : FP100P	EFFECTOR	1		
	805760	TC51832SP-12	8 x 32Kbits PSRAM	2		
	805823	K002FP : FP100P	Tone Generator	2	2	
	805979	K004FP : FP80P	Pan Pot	1	1	
	805980	K008FP : FP80P	Digital Filter	1	1	
	805981	PCM66P : FP20P	D/A Converter	1	4	
	805982	MC7809CT	Regulator	1	1	
	805983	PC78L05J	Regulator	1	1	
	919345	TC534000P MASKROM : P202	8 x 512Kbits MASK ROM	1	1	
	919350	TC534000P MASKROM : P203	8 x 512Kbits MASK ROM	1	1	
	919355	TC534000P MASKROM : P204	8 x 512Kbits MASK ROM	1	1	
	919360	27C512-20 EPROM : P206	8 x 64Kbits EPROM ROM	1		
	919685	27C512-20 EPROM : P207	8 x 64Kbits EPROM ROM		1	
	Transistor	802508	2SC3331T	SINPN : Epitaxial Planar Type	1	1
		805984	2SD1468SR		2	8
		805985	RN1202		1	
		806089	DTC114ES			1
	Fet	805986	2SK371GR		2	8
		800625	1SS133		33	32
	Diode	805987	HPG06D		2	2
		805988	MA700		5	3
		805989	HZS4A-LL		1	8
	Zenor Diode	806200	HZS3C3		1	
	Crystal	803422	AT-51B	12MHz	1	1

## 3. PARTS LIST For K4

K4					
No.	Code No.	Name	Pieces	Country	
	803349	AC Adapter PS-121 D	1	Japan	
	803350	AC Adapter PS-121 U	1	U.S.A., CSA, 110V Markets	
	803351	AC Adapter PS-121 N	1	200V Markets	
	803352	AC Adapter PS-121 S	1	Australia	
	804351	AC Adapter PS-121 G	1	U.K., 220/240V Markets	
	804504	AC Adapter PS-121 W	1	West Germany	
	803363	Power Jack	1	All Markets	
	805123	Fuse TSC 1A 250V	1	Japan	
	803622	Fuse MT4 1A 250V	1	U.S.A., Canada	
	803628	Fuse SET 1A	1	Europe	
	805000	Jack	3	All Markets	
	805736	MIDI Connector	1	All Markets	
	806046	Lithium Battery	1	All Markets	
	805439	Power Supply Switch	1	All Markets	
1	806017	Lower Case	1	All Markets	
2	806008	LCD : DMCI6205-NY-LY1	1	All Markets	
3	806016	Upper Case	1	All Markets	
4	806023	Rubber leg	5	All Markets	
5	919380	Lower Base	1	All Markets	
6	805040	Keyboard (61keys)	1	All Markets	
7	915435	Keyboard support metal	3	All Markets	
8	915430	Fixing metal for panel	6	All Markets	
9	236286	MI-052 (1)	1	All Markets	
10	236286	MI-055 (1)	1	All Markets	
11	919385	Fixing metal for Main P.W.B.	1	All Markets	
12	915405	Fixing metal for Keyboard (R)	1	All Markets	
13	236283	MI-051 (1)	1	Japan, 110/220/240V	
	236284	MI-051 (2)	1	U.S.A., Canada	
	236285	MI-051 (3)	1	Australia, U.K., West Germany	
14	805341	LCD tape	1	All Markets	
15	804967	LCD cover	1	All Markets	
16	805037	Wheel 3	2	All Markets	
17	915415	Fixing metal for wheel	2	All Markets	
18	805038	Rubber for stopper	3	All Markets	
19	805995	Volume : RK163110 50K	1	All Markets	
20	806018	Volume knob	2	All Markets	
21		Knob 1	3	All Markets	
		Knob 2	4	All Markets	
		Knob 4	5	All Markets	
22	236286	MI-054 (1)	1	All Markets	
23	236286	MI-053 (1)	1	All Markets	
24	806201	S.V. cover	2	All Markets	
25	803498	Scotch tape	4	All Markets	
26	915410	Fixing metal for Keyboard (L)	1	All Markets	
27	805996	Volume T(C,T):RK163110 50K	1	All Markets	
28	915955	Wheel spring 3	1	All Markets	

4. DISASSEMBLY DRAWING For K4

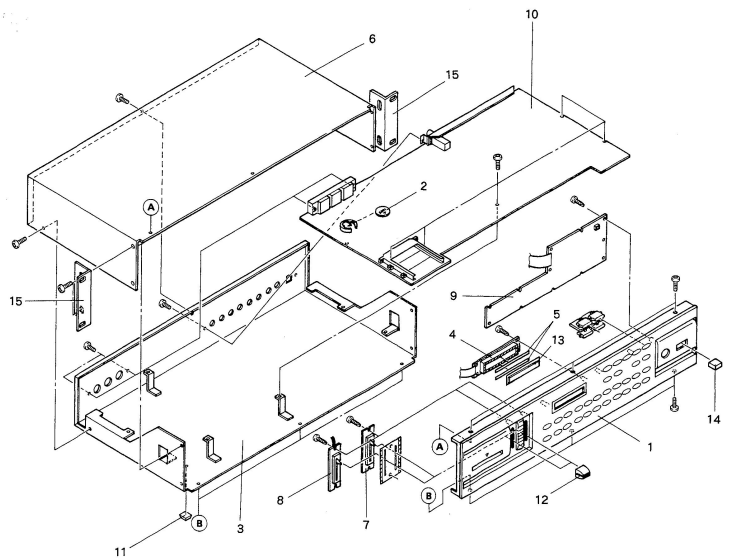


5. PARTS LIST For K4r

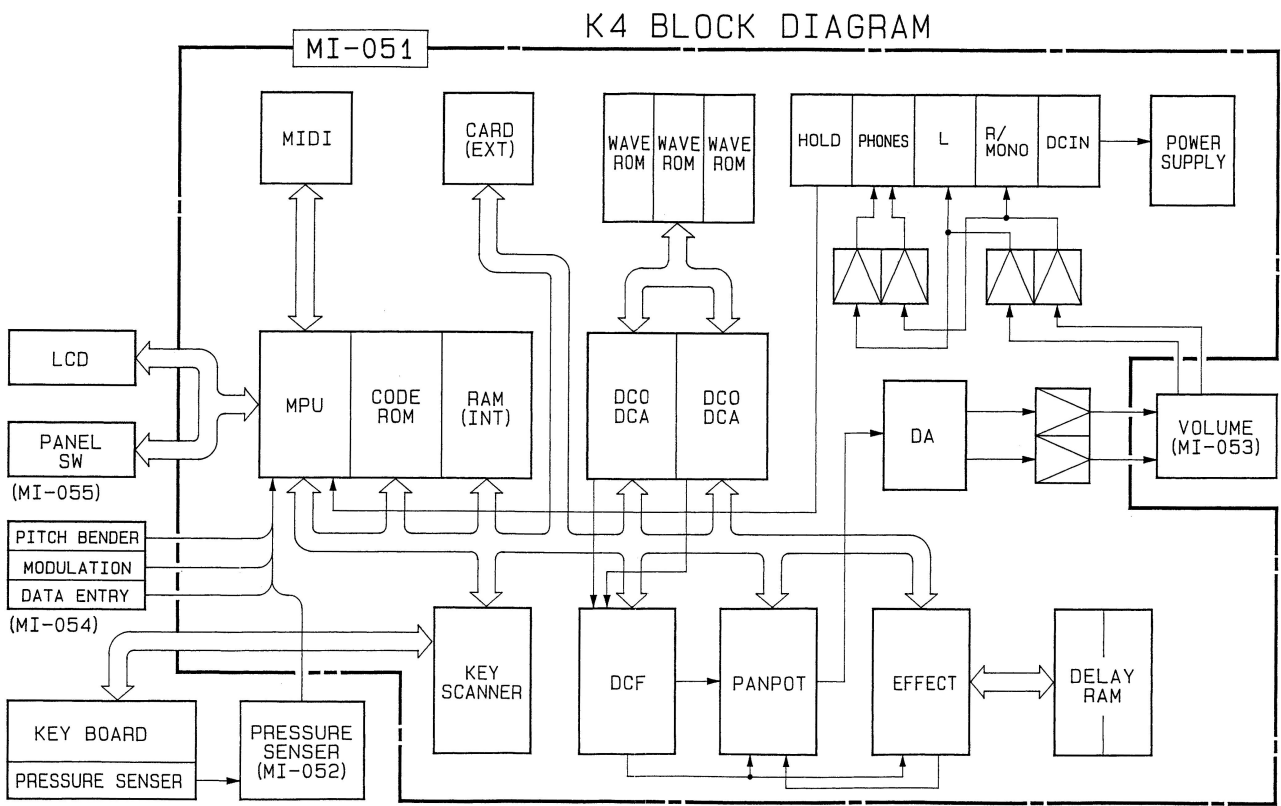
K4r

No.	Code No.	Name	Pieces	Country
	803349	AC Adapter PS-121 D	1	Japan
	803350	AC Adapter PS-121 U	1	U.S.A., CSA, 110V Markets
	803351	AC Adapter PS-121 N	1	200V Markets
	803352	AC Adapter PS-121 S	1	Australia
	804351	AC Adapter PS-121 G	1	U.K., 220/240V Markets
	804504	AC Adapter PS-121 W	1	West Germany
	803363	Power Jack	1	All Markets
	805123	Fuse TSC 1A 250V	1	Japan
	803622	Fuse MT4 1A 250V	1	U.S.A., Canada
	803628	Fuse SET 1A	1	Europe
	805000	Jack	8	All Markets
	805736	MIDI Connector	1	All Markets
	806070	Power Supply Switch	1	All Markets
1	806072	Front panel	1	All Markets
2	806046	Lithium Battery : CR2032	1	All Markets
3	919695	Lower Case	1	All Markets
4	806071	LCD : DMC16205-NY-LY1	1	All Markets
5	803501	Scotch tape	2	All Markets
6	919690	Upper Case	1	All Markets
7	236290	MI-059 (1)	1	Japan, 110/220/240V
	236291	MI-059 (2)	1	U.S.A., Canada
	236292	MI-059 (3)	1	Australia, U.K., West Germany
8	236290	MI-058 (1)	1	Japan, 110/220/240V
	236291	MI-058 (2)	1	U.S.A., Canada
	236292	MI-058 (3)	1	Australia, U.K., West Germany
9	236290	MI-057 (1)	1	Japan, 110/220/240V
	236291	MI-057 (2)	1	U.S.A., Canada
	236292	MI-057 (3)	1	Australia, U.K., West Germany
10	236290	MI-056 (1)	1	Japan, 110/220/240V
	236291	MI-056 (2)	1	U.S.A., Canada
	236292	MI-056 (3)	1	Australia, U.K., West Germany
11	806063	Foot (black)	4	All Markets
12	806060	Volume knob	2	All Markets
13	806081	LCD cover	1	All Markets
14	802715	Knob (black)	1	All Markets
15	909630	Rack Adapter	2	All Markets

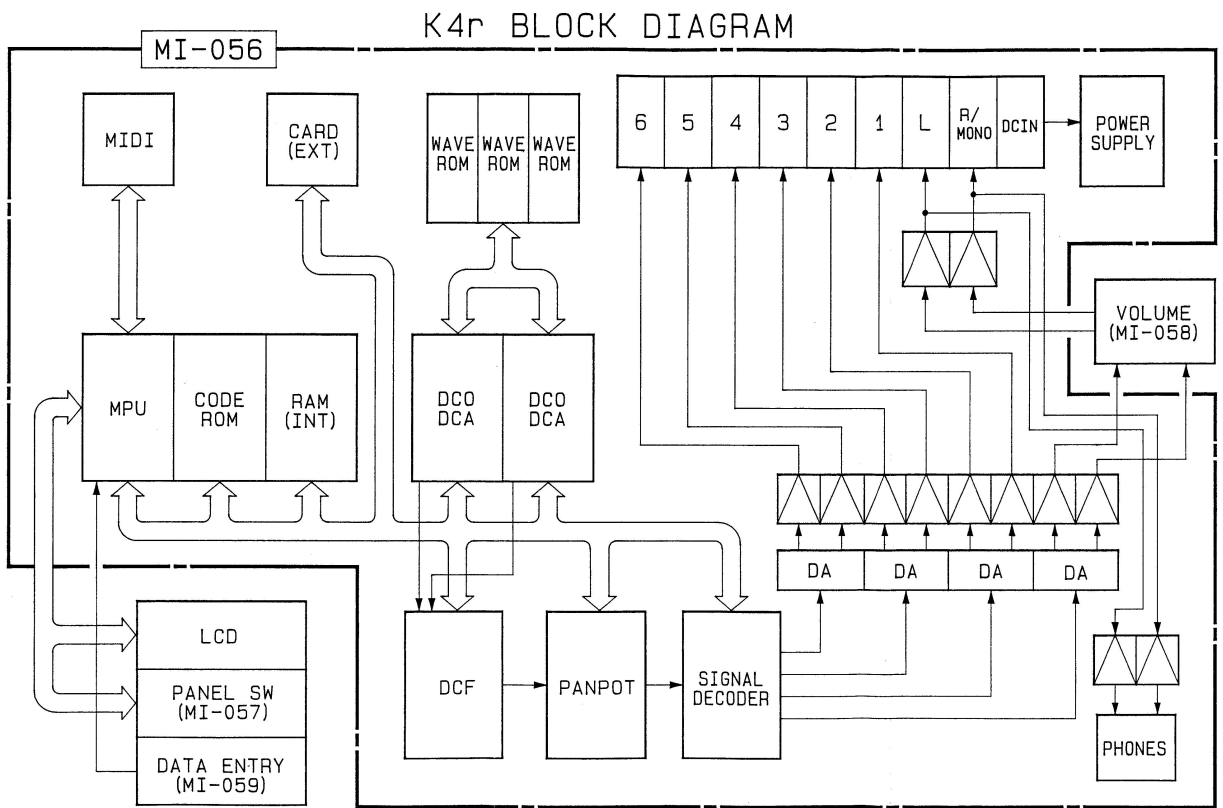
6. DISASSEMBLY DRAWING For K4r



7. K4 BLOCK DIAGRAM



8. K4r BLOCK DIAGRAM



9. MI-051 PRINTED WIRING BOARD For K4

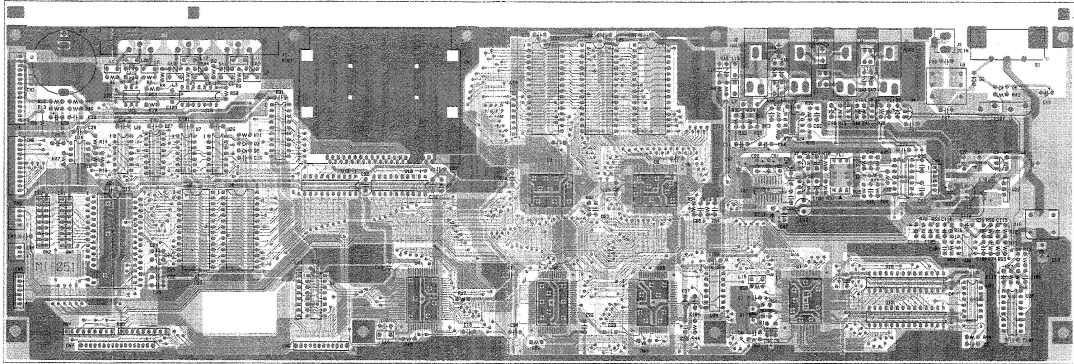
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PD4	5
PD5	4
PD6	3
PD7	2
K	1

PAD	12
PAT	11
PAP	10
PAS	9
POT	8
PDS	7
PD6	6
PD3	4
PD2	3
PD1	2
PDS	1

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AN3	3
+5	2
GN2	1

+5	7
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AN1	5
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AN2	2
GN2	1

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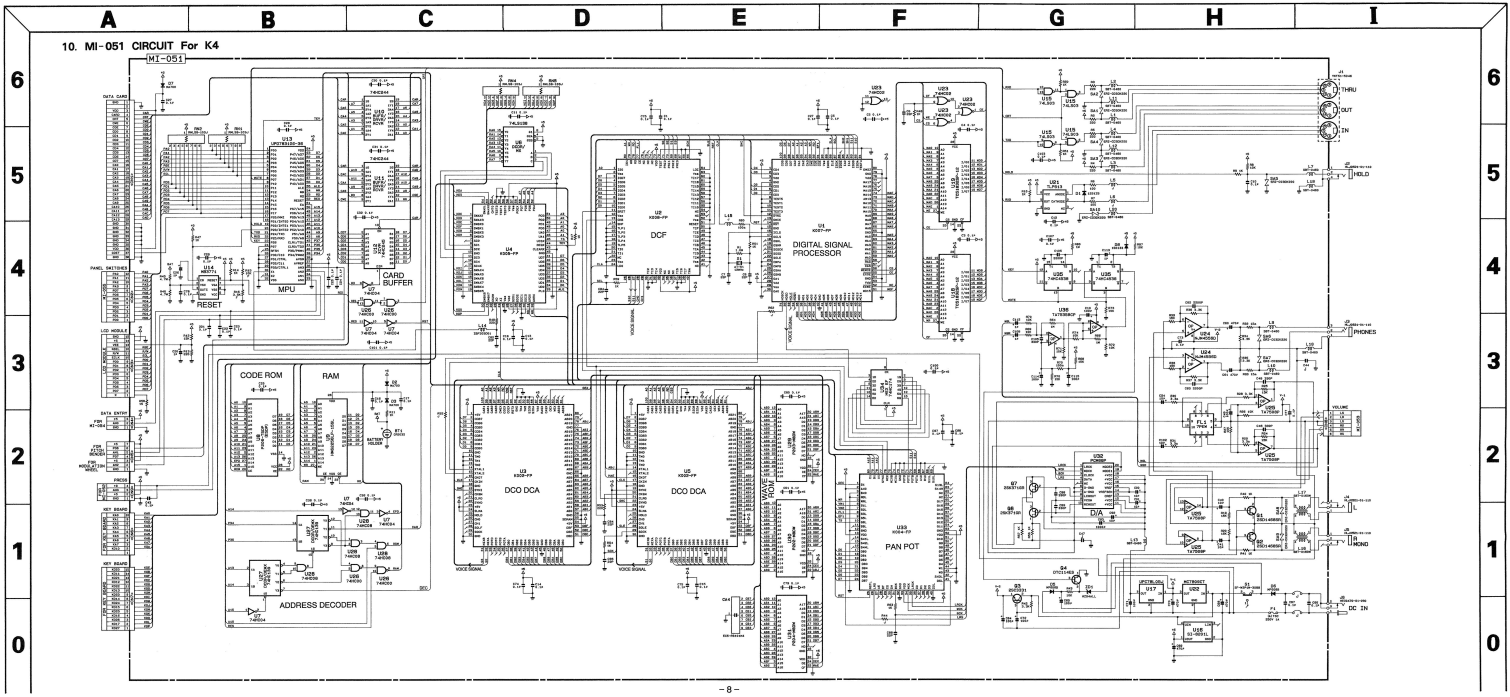
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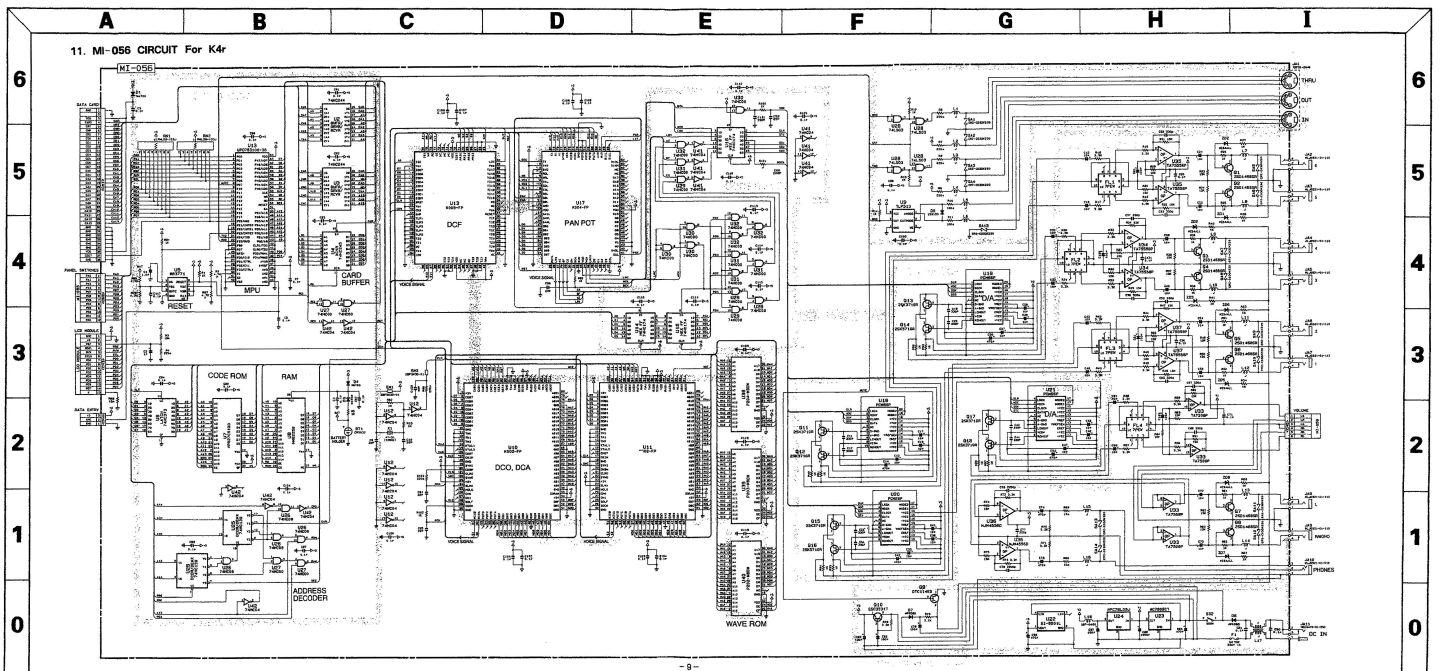
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6	LR

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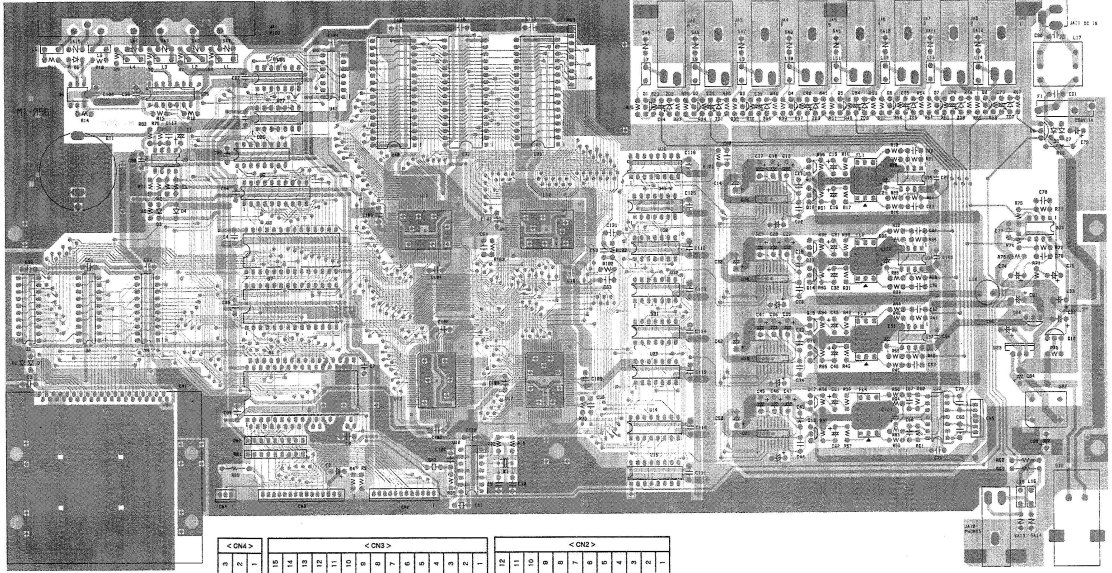
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12. MI-056 PRINTED WIRING BOARD For K4r



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4	RG
5	RR
6	RS

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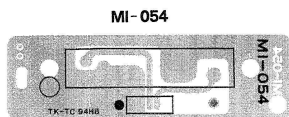
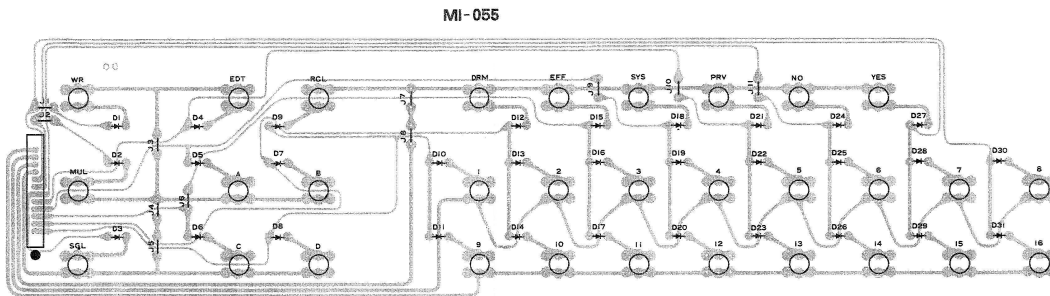
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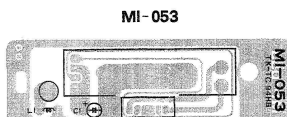
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13. MI-052, 053, 054, 055 PRINTED WIRING BOARDS

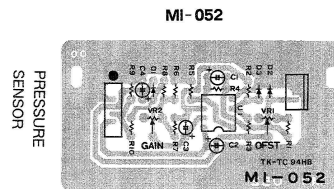
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PO7	8
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P00	1



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MI-057
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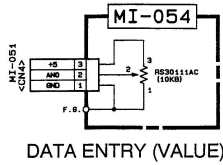
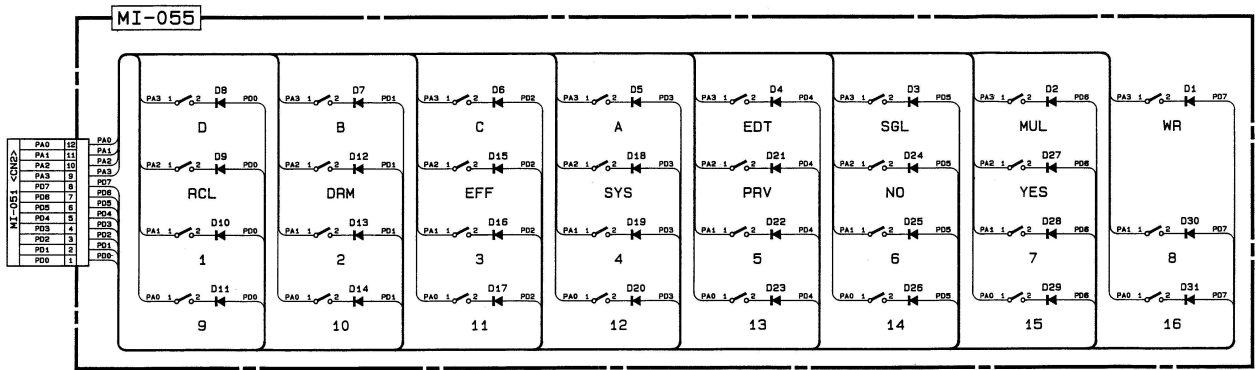


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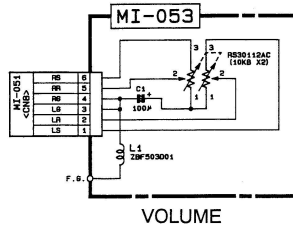


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MI-057
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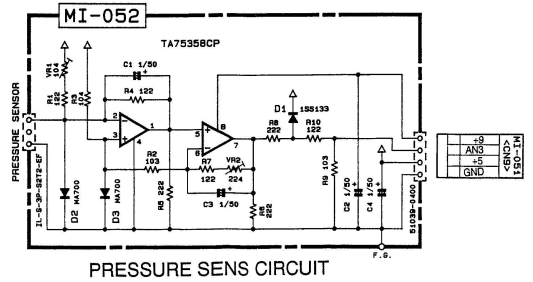
14. MI-052, 053, 054, 055 CIRCUITS



DATA ENTRY (VALUE)



VOLUME

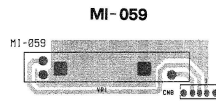
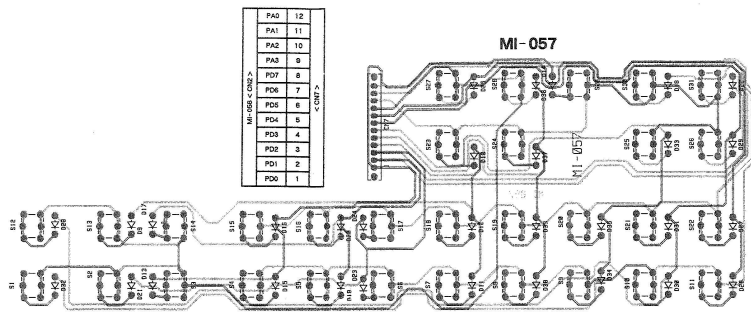


PRESSURE SENS CIRCUIT

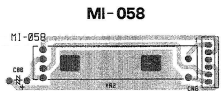
**A B C D E F G H I**  
**15. MI-057, 058, 059 PRINTED WIRING BOARDS**

**6**  
**5**  
**4**  
**3**  
**2**  
**1**  
**0**

**6**  
**5**  
**4**  
**3**  
**2**  
**1**  
**0**

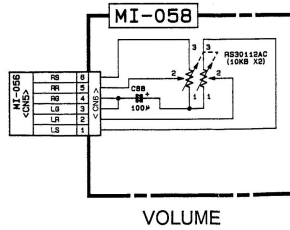
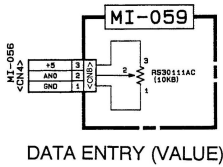
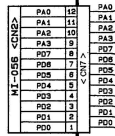
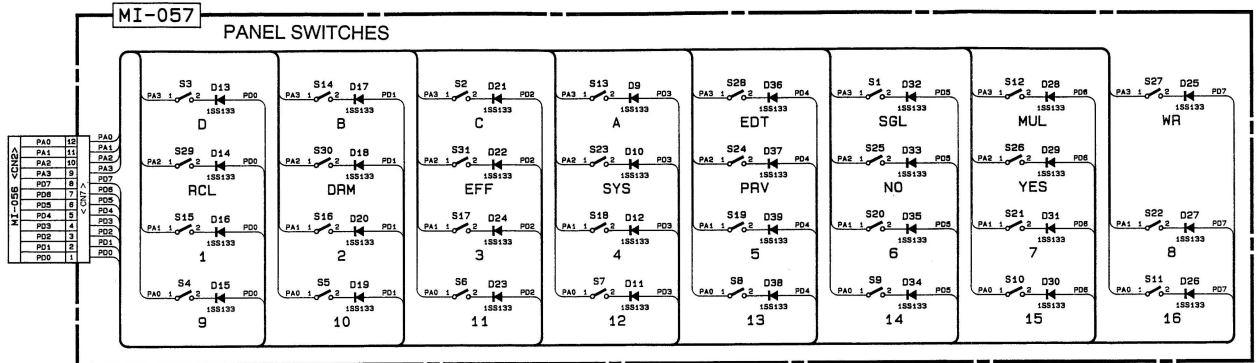


< CDR >
5
4
3
2
1
MI-059
< CDR >



1	LR
2	LR
3	LR
4	LR
5	LR
6	LR
7	LR
8	LR
9	LR
10	LR
11	LR
12	LR
MI-058 < CDR >	

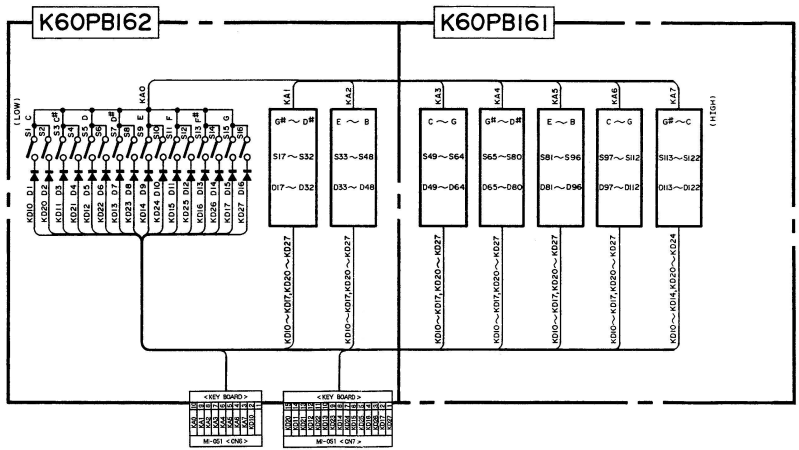
16. MI-057, 058, 059 CIRCUITS



**A B C D E F G H I**  
**17. K60PB161, 162 (KEYBOARD) CIRCUITS**

6  
5  
4  
3  
2  
1  
0

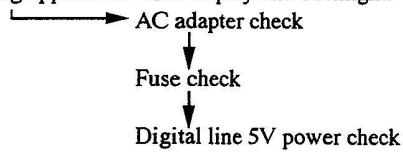
6  
5  
4  
3  
2  
1  
0



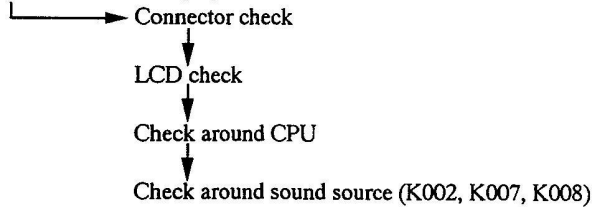


## 18. TROUBLESHOOTING

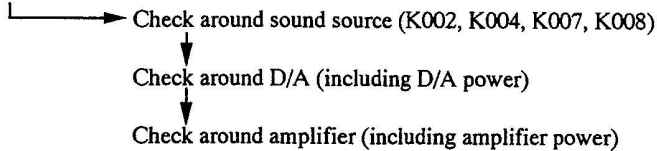
① Nothing appears on LCD display and backlight.



② Backlight goes on but display is abnormal.

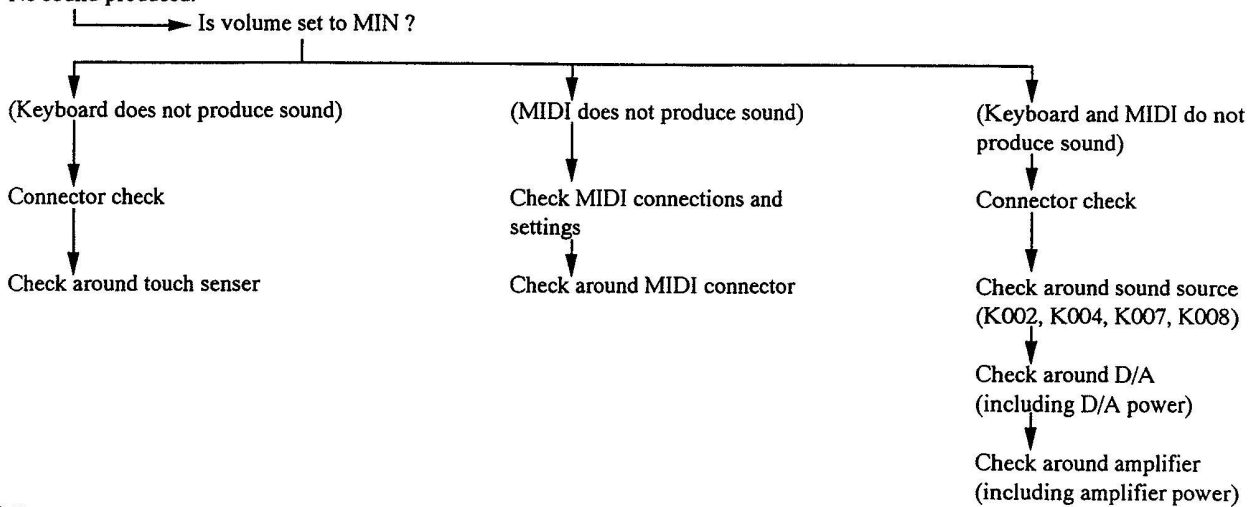


③ Sound is abnormal.



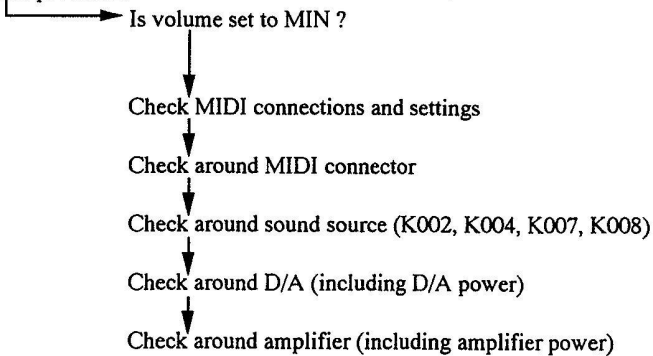
④ (Only K4)

No sound produced.



④ (Only K4r)

No sound produced.



**SE606E**

**8911M**