

SERVICE MANUAL

& PARTS LIST

(with price)

ELECTRONIC KEYBOARD

SK-1

MAY. 1986



SK-1

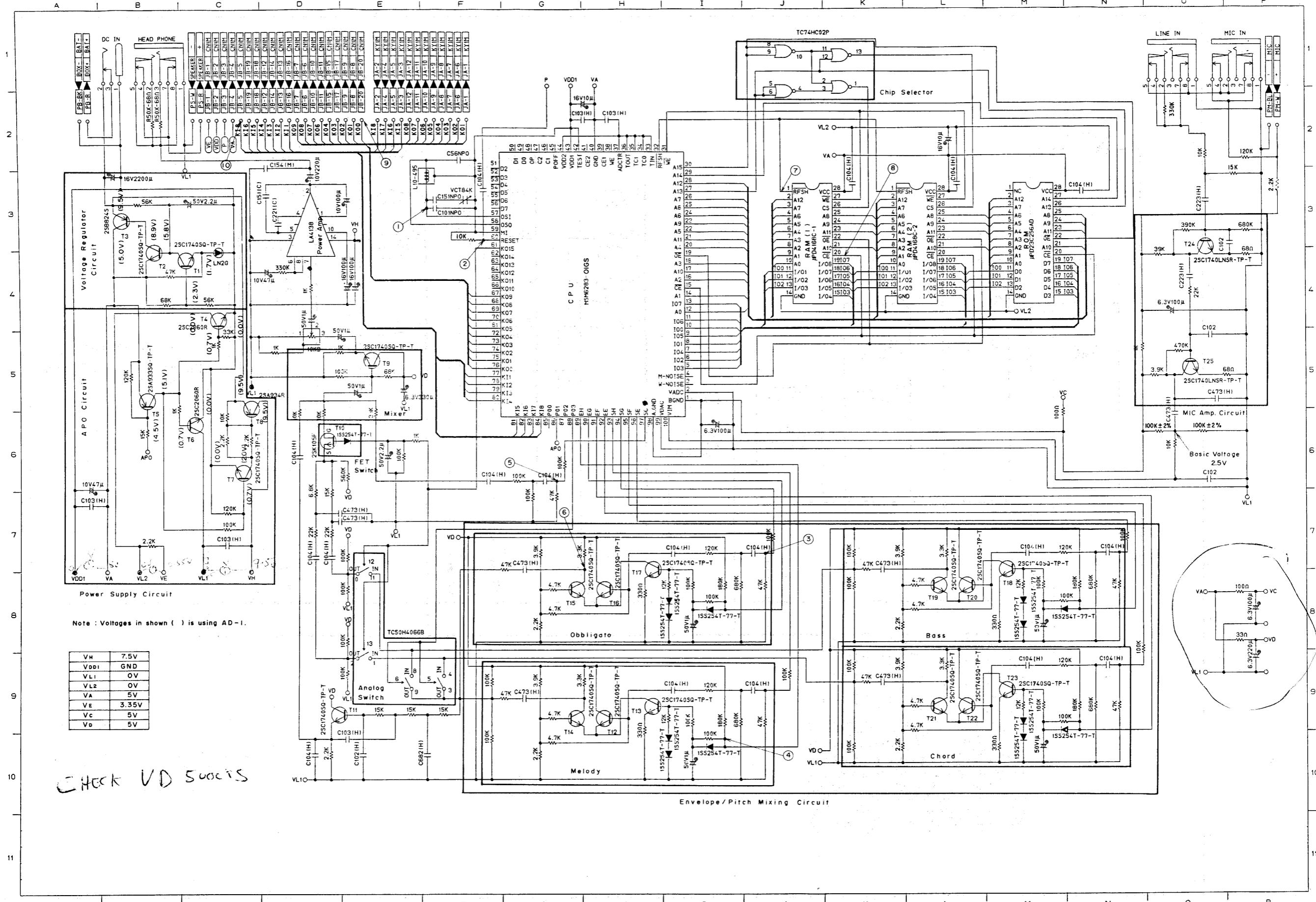
CASIO®

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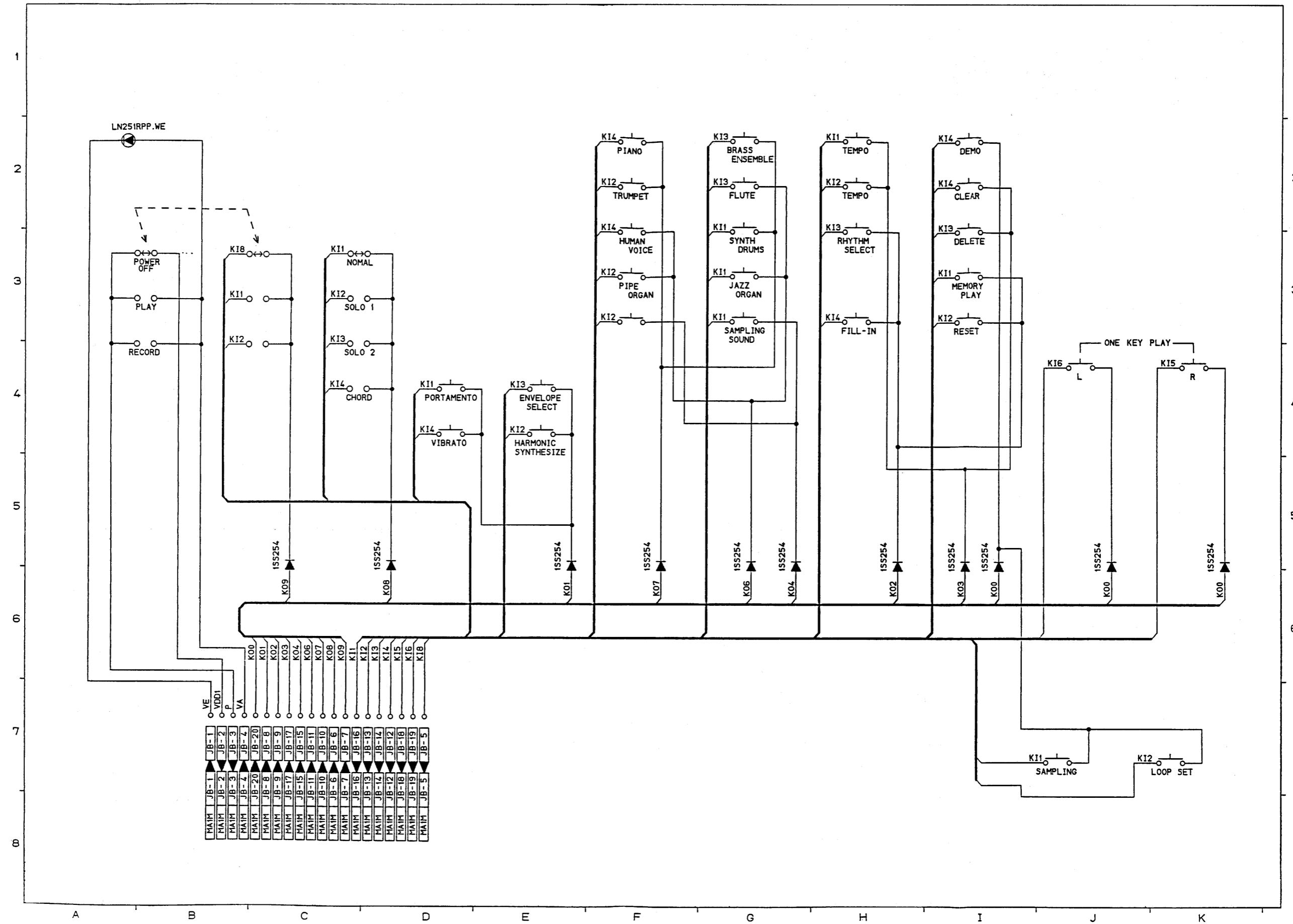
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1. SCHEMATIC DIAGRAM

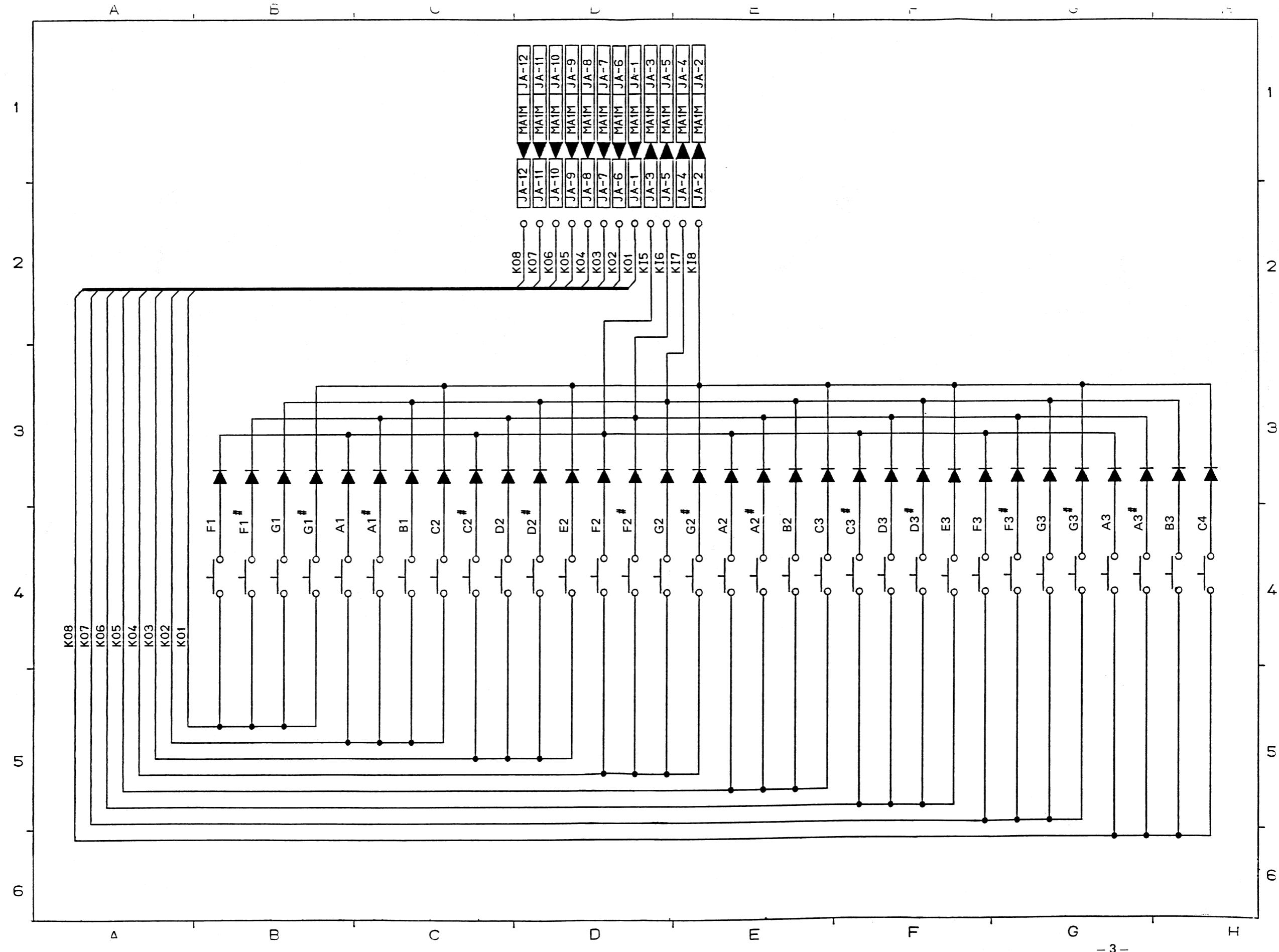
1-1. Main PCB M3129-MA1M



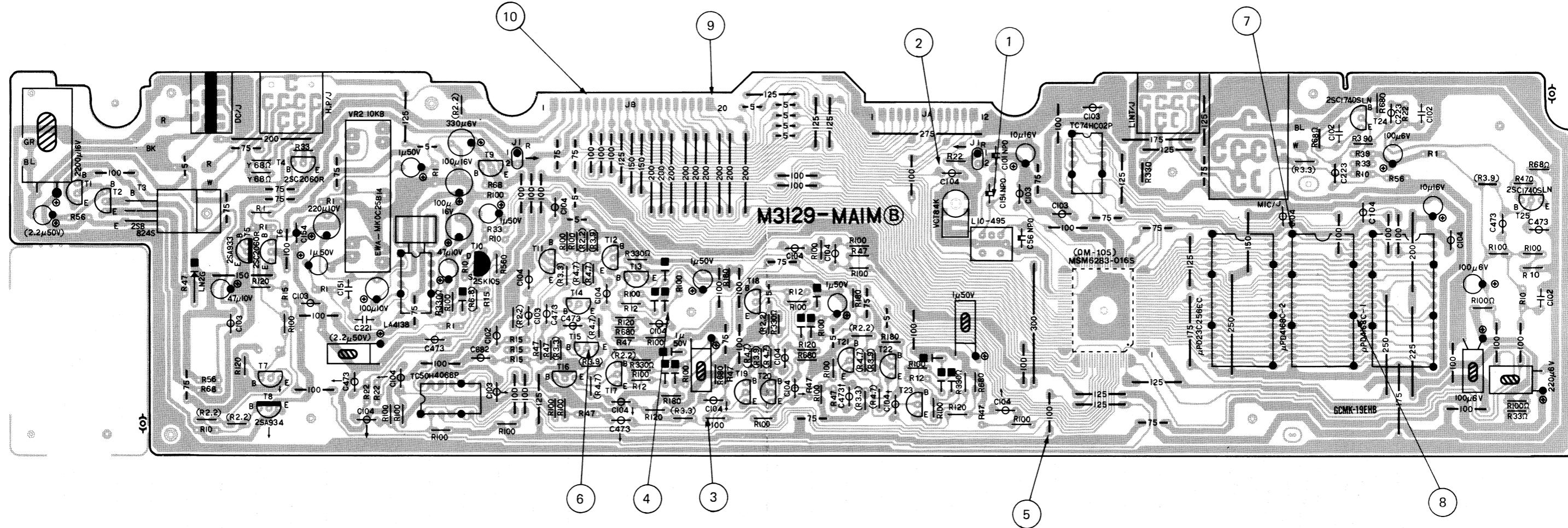
1-2. Console PCB M3129-CN1M



1-3. Keyboard PCB M3129-KY1M



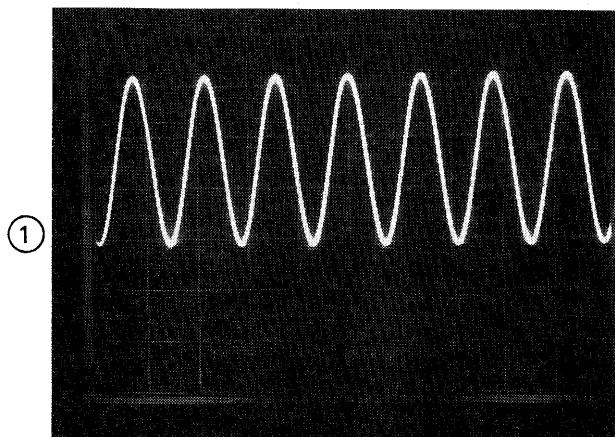
2. PCB VIEW & MAJOR CHECKPOINTS



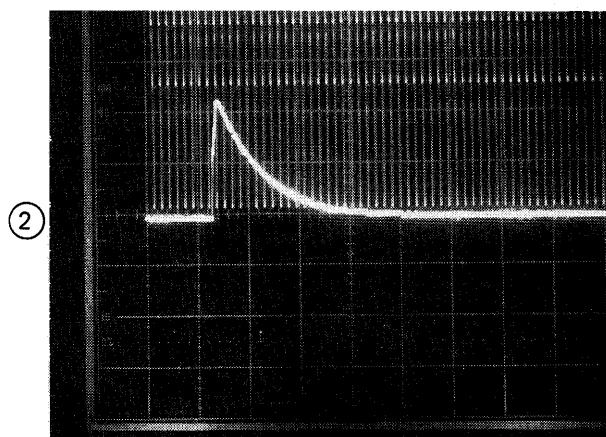
3. MAJOR WAVEFORMS

Note: Probe reduction: 10:1

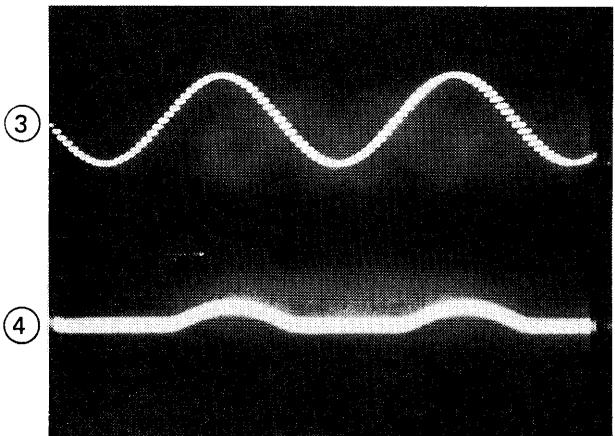
Checkpoint : Refer to page 4 for the checkpoints.



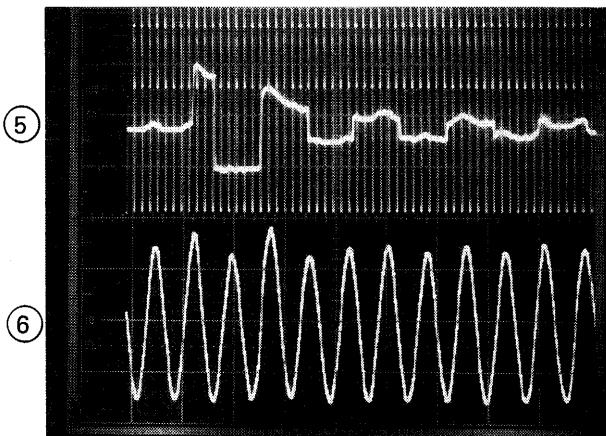
① Clock Pulse Signal
0.1V/div, 0.1 μ S/div



② Reset Signal
0.2V/div, 2mS/div



③ Pitch Signal for Flute
50mV/div, 0.5mS/div

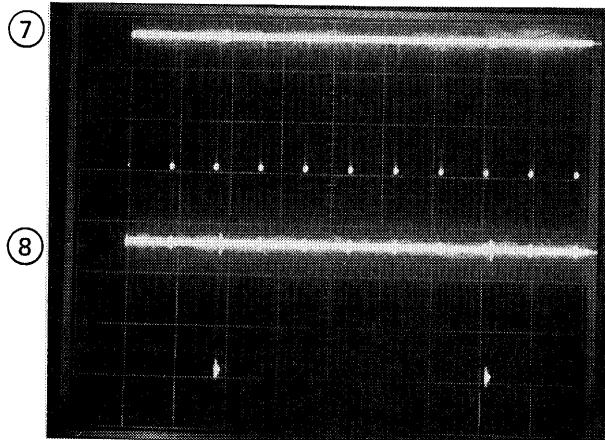


⑤ Percussion Signal
50mV/div, 5mS/div
Rhythm: Rock, Tempo: Maximum

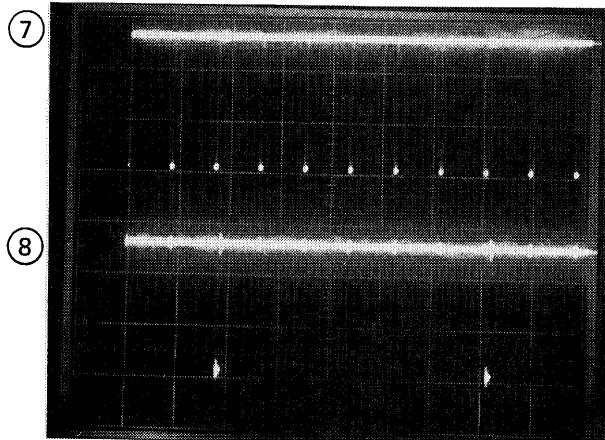
④ Envelope Signal for Flute
2mV/div, 0.5mS/div

Tone: Flute, Key: C3

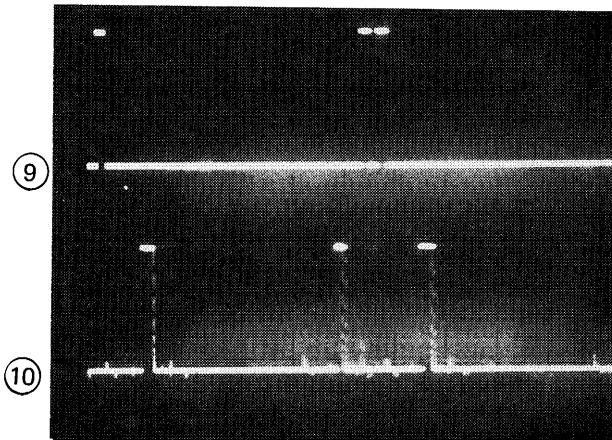
⑥ Envelope/Pitch Mixing Signal
20mV/div, 5mS/div
Tone: Flute, Key: C3



⑧



⑨



⑩

⑦ Refresh Signal
0.2V/div, 10μS/div

⑧ CE Signal
0.2V/div, 10μS/div

⑨ Key Common Signal K00
0.2V/div, 0.5mS/div

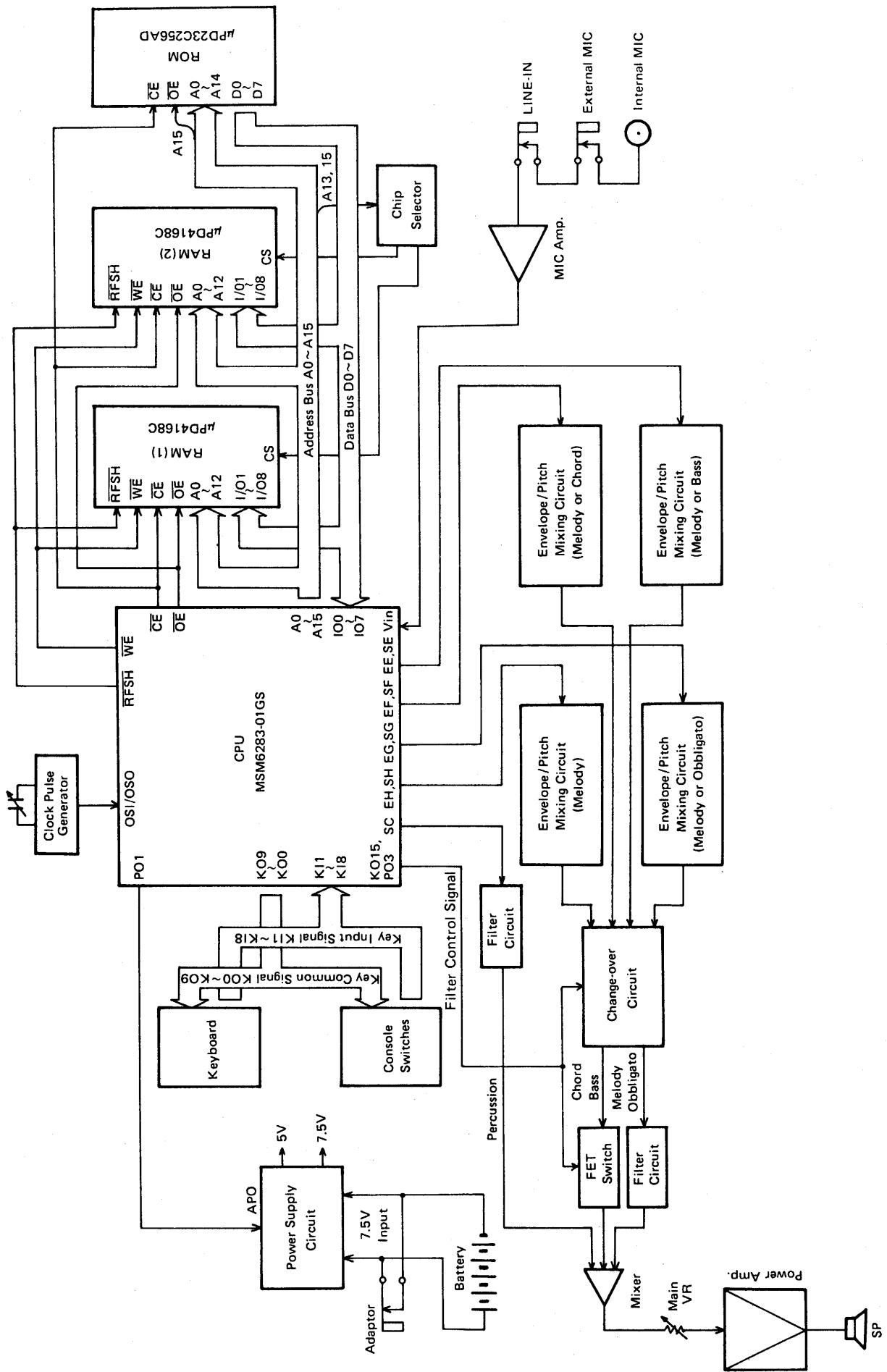
⑩ Key Input Signal KI8
0.2V/div, 0.5mS/div

Tone: Sampling, Key: G3

4. KEYBOARD MATRIX

	KI1	KI2	KI3	KI4	KI5	KI6	KI7	KI8
KC0	SAMPLING	LOOP SET		DEMO	ONE KEY PLAY R	ONE KEY PLAY L		
KC1	PORTAMENTO	HARMO. SYNTH.	ENVELOPE SELECT	VIBRATO	F1	F1#	G1	G1#
KC2	MEMORY PLAY	RESET	RHYTHM SELECT	FILL-IN	A1	A1#	B2	C2
KC3	TEMPO	TEMPO	DELETE	CLEAR	C2#	D2	D2#	E2
KC4	SAMPLING SOUND	HARMONIC SOUND			F2	F2#	G2	G2#
KC5					A2	A2#	B2	C3
KC6	JAZZ ORGAN	PIPE ORGAN	FLUISTE	HUMAN VOICE	C3#	D3	D3#	E3
KC7	SYNTH DRUMS	TRUMPET	BRASS ENSEMBLE	PIANO	F3	F3#	G3	G3#
KC8	NORMAL	SOLO 1	SOLO 2	CHORD	A3	A3#	B3	C3
KC9	PLAY	RECORD						POWER OFF

5. BLOCK DIAGRAM



6. CPU (MSM6283-01GS)

- Generates pitch and envelope signals for melody, chord, bass, and obbligato sounds.
- Provides percussion sounds.
- Controls keys, switches, RAM, and ROM.

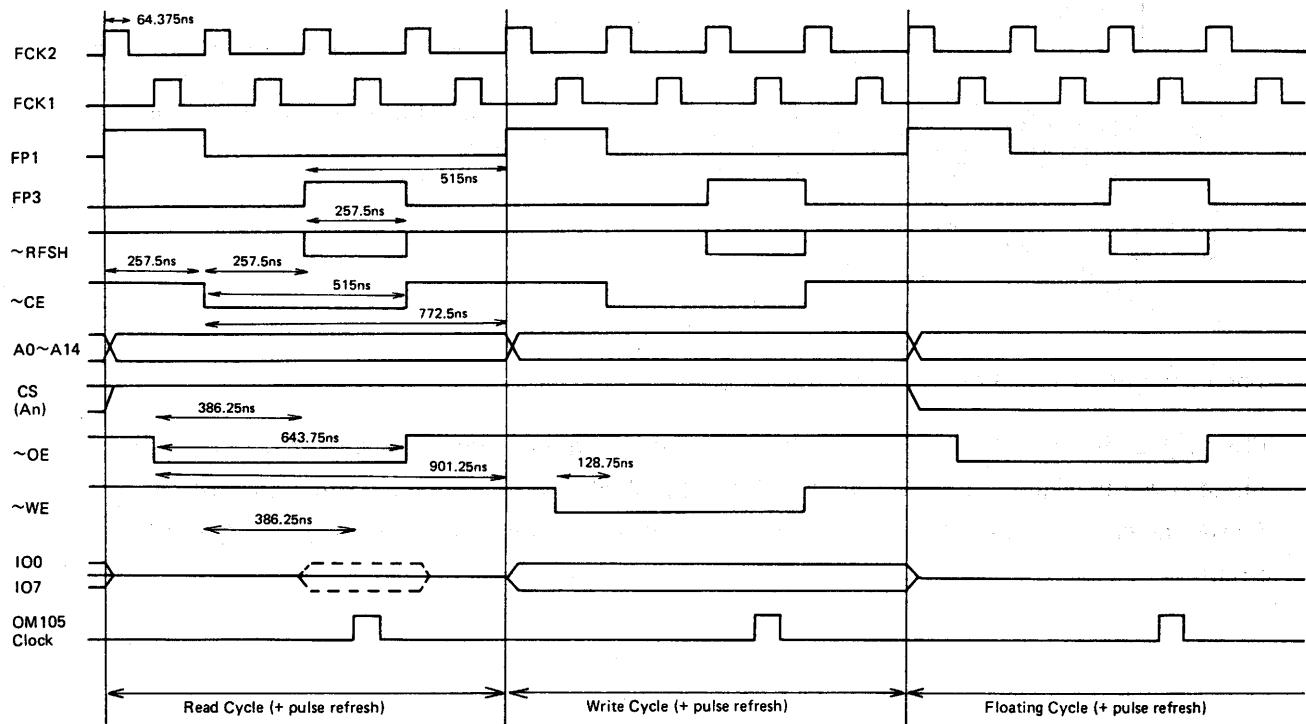
The following lists the pin functions of the CPU.

Pin No.	Terminal Name	In/Out	Function
1	BGND		Ground (0V) source for ADC (Analog to Digital Converter).
2	VADC		-5V source for ADC.
3, 4			No function.
5~11	IO0 ~ IO6	In/Out	Data bus (IO0 ~ IO6).
12	A0	Out	Address bus (A0).
13	IO7	In/Out	Data bus (IO7).
14	A1	Out	Address bus (A1).
15	CE	Out	Chip enable signal for memory devices.
16~18	A2, A10, A3	Out	Address bus (A2, A3, A10).
19	OE	Out	Output enable signal for memory devices.
20~30	A4~9, A11~15	Out	Address bus (A4 ~ A9, A11 ~ A15).
31	WE	Out	Write signal output. CPU writes data into memory devices when "L".
32	RFSH	Out	Refresh signal output. CPU refreshes RAM memory data when "L".
33~39			No function.
40	GND		Ground(0V) source.
41, 42			No function.
43	VDD1		-5V source.
44~56			No function.
57, 58	OSI, OSO	In/Out	7.24 MHz clock pulse inputs.
59			No function.
60	RESET	In	Reset signal input. Terminal receives "H" level pulse initializing CPU internal circuits at power ON.
61	KO15	Out	Control signal for external filter circuit.
62~66			No function.
67~76	KO9 ~ KO0	Out	Key and switch common signals outputs.
77~84	KI1 ~ KI8	In	Key and switch input signals inputs.
85			No function.
86	PO1	Out	APO (Auto Power Off) signal output. Terminal drops to "L" level to shut voltage off when instrument is not operated for approximately 7 minutes.
87			No function.
88	PO3	Out	Control signal for external filter circuit.
89	EH (4ch)	Out	Melody envelope signal output.
90	EG (3ch)	Out	Melody or obbligato envelope signal output.
91	EF (2ch)	Out	Melody or chord envelope signal output.

Pin No.	Terminal Name	In/Out	Function
92	EE (1ch)	Out	Melody or bass envelope signal output.
93	SH (4ch)	Out	Melody pitch signal output.
94	SG (3ch)	Out	Melody or obbligato pitch signal output.
95	SF (2ch)	Out	Melody or chord pitch signal output.
96	SE (1ch)	Out	Melody or bass pitch signal output.
97	SC	Out	Analog percussion signal output.
98	AGND		Ground(0V) source for DAC (Digital to Analog Converter).
99	VDAC		-5V source for DAC.
100	Vin	In	Sampling sound signal input.

Note: Since this LSI functions as negative logic, 0V is provided to VDD1 terminal while +5V source is applied to GND terminal.

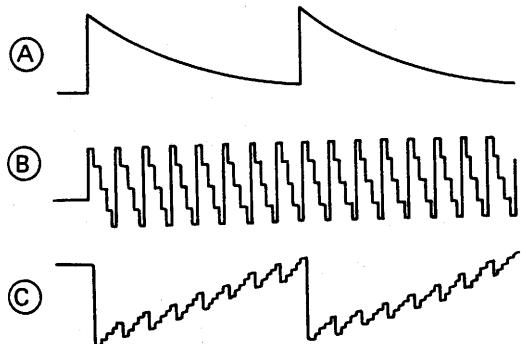
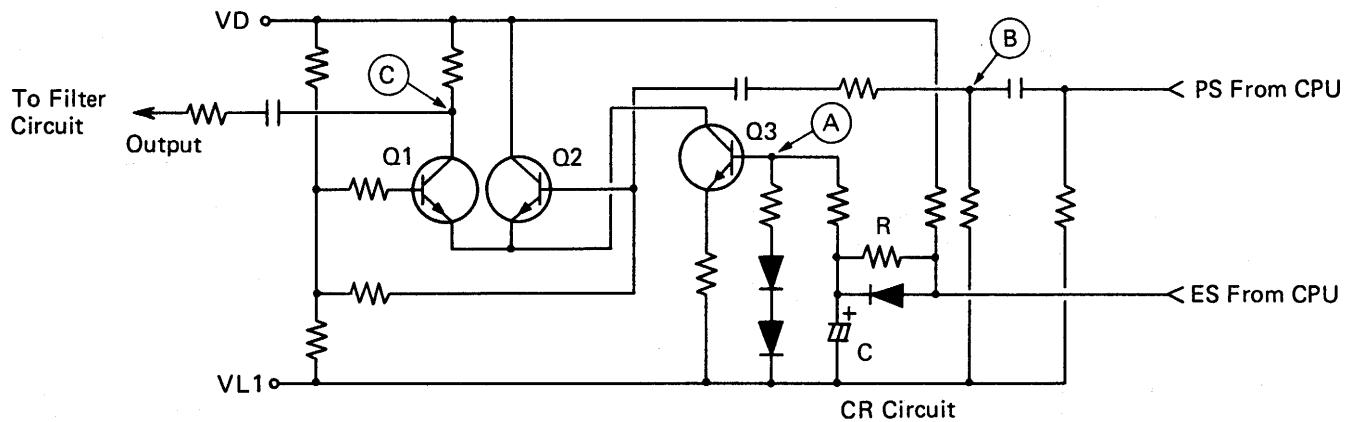
CPU, RAM and ROM control time chart



7. ENVELOPE/PITCH MIXING CIRCUIT

The SK-1 has four Envelope/Pitch mixing circuits. The circuits generate melody, obbligato, chord and bass sounds by means of a mixing envelope and pitch signals from the CPU.

In the "NORMAL" mode, all of the four circuits generate melody signals, while creating melody, obbligato, chord, and bass sounds individually in other modes.



Note: Waveforms are only for understanding the principle of the above circuit. Actual waveforms differ from illustration.
 $(A):(B)=10:1$

The principle of the circuit is as follows:

Pitch signal PS from the CPU is amplified by differential amplifiers (transistors Q1 and Q2). Since envelope signal ES from the CPU is a stepped waveform, the CR circuit smoothes it. These signals are mixed in transistor Q3, and the mixed sound signal is provided to the filter circuit.

8. SAMPLE SOUND INPUT CIRCUIT

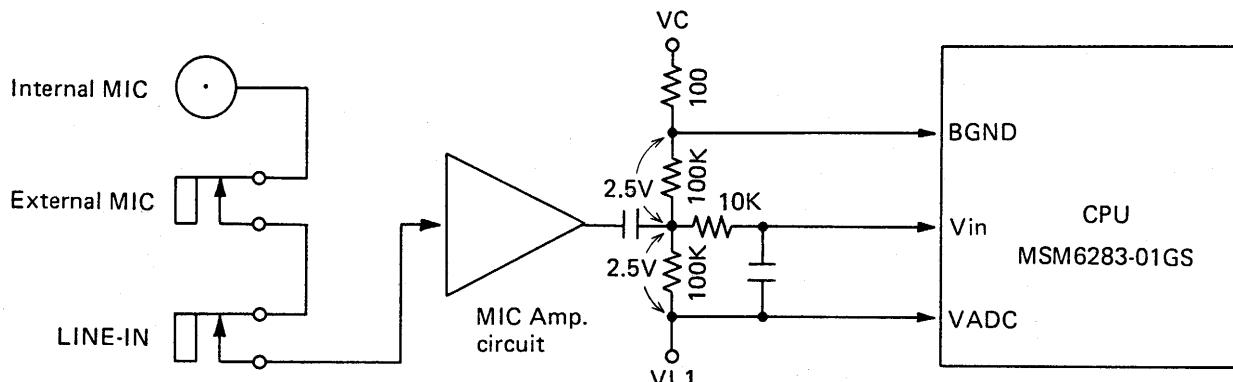


Fig. 1 Sample Sound Input Circuit

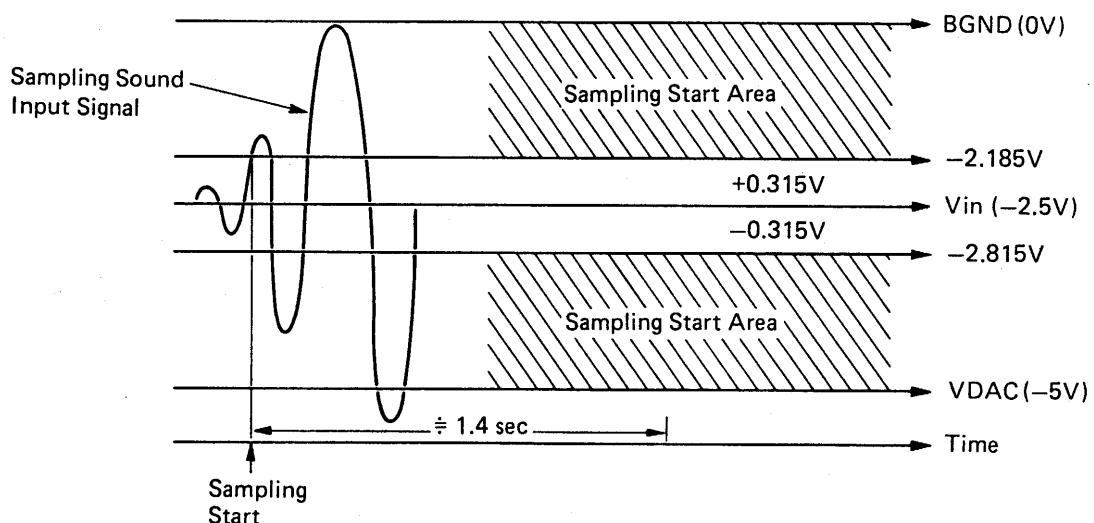


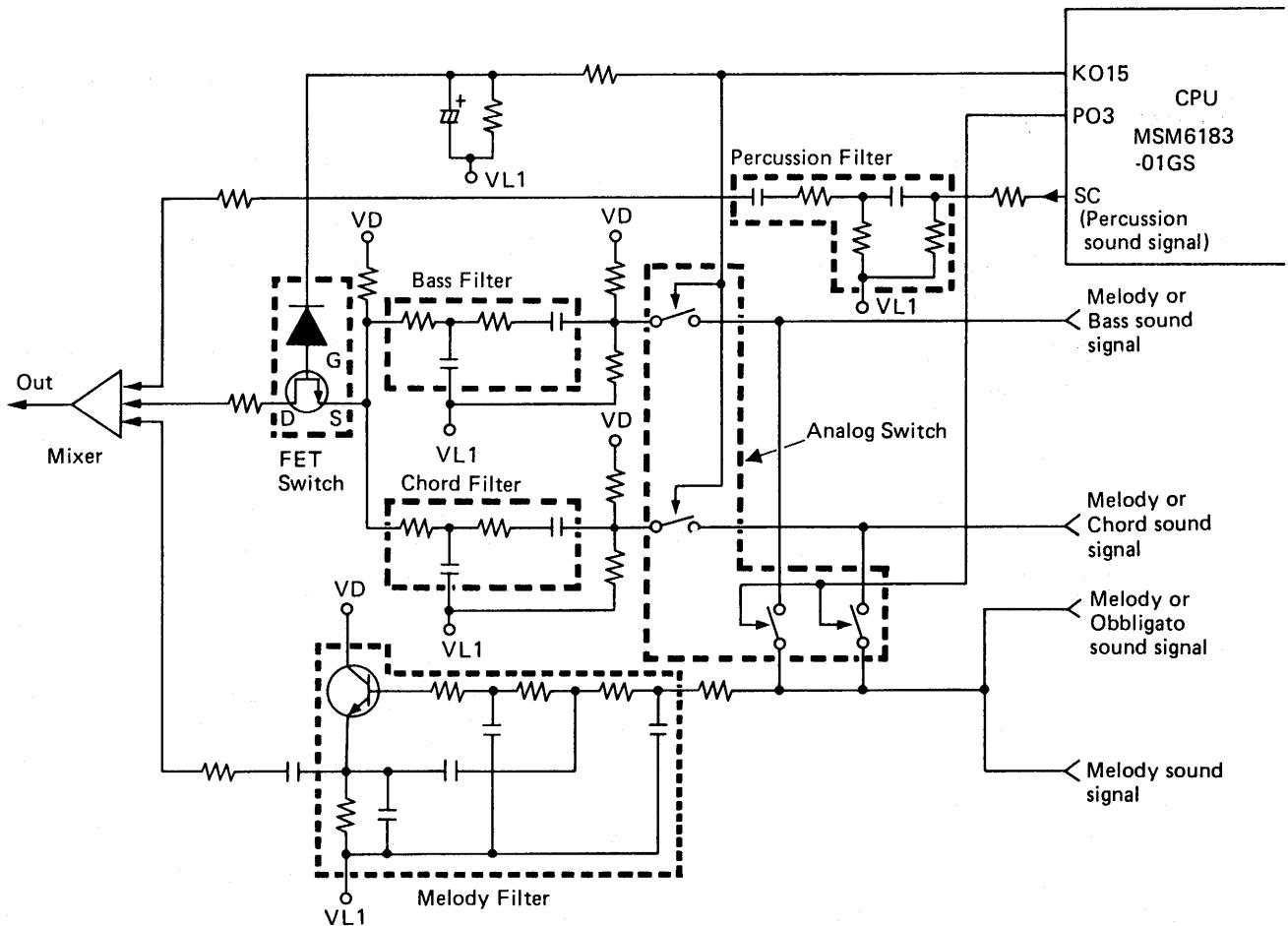
Fig. 2 Vin Input Trigger Level

As shown in Fig. 1, the circuit provides sampling signals to the Vin terminal of the CPU. A divider circuit consisting of 2 100Kohm resistors biases the sampling signal on 2.5V. When the sampling sound level exceeds $\pm 0.315V$ as shown in Fig. 2, the CPU starts to transmit the sampling sound data to the RAMs during the following period.

$$\begin{aligned}
 \text{Sampling time} &= \frac{\text{RAM Capacity (Kbit)}}{\text{Sampling Data Bit (bit)} \times \text{Sampling Frequency (KHz)}} \\
 &= \frac{108.544 \text{ (Kbit)}}{8 \text{ (bit)} \times 9.387 \text{ (KHz)}} \\
 &= 1.4454 \text{ Sec.} \\
 &\approx 1.4 \text{ Sec.}
 \end{aligned}$$

While sampling, the CPU does not output key common signals (K00~K09). So the keyboard cannot be operated.

9. FILTER CHANGE-OVER CIRCUIT & PERCUSSION CIRCUIT



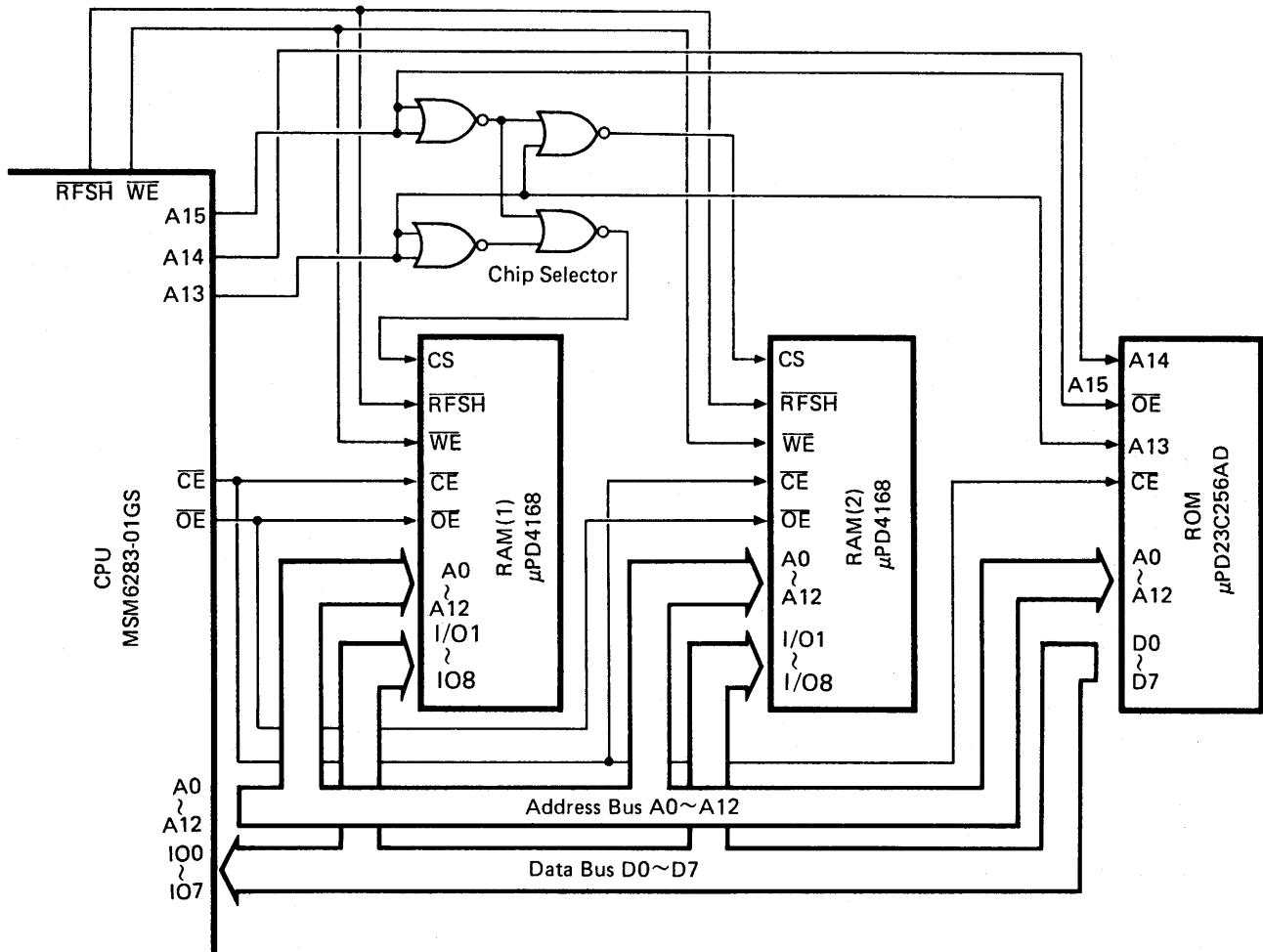
The SK-1 has four Envelope/Pitch mixing circuits. In accordance with the mode switch position, signals PO3 and KO15 turn the analog switches on or off so that the sound signals pass through the appropriate filters.

Mode \ Signal	PO3	KO15
NORMAL	H	L
SOLO 1	L	
SOLO 2		H
CHORD		

In the "NORMAL" mode, all Envelope/Pitch mixing circuits generate melody signals, and the signals pass through the melody filter. When the mode switch is in the other position, each Envelope/Pitch circuit creates different sound signals. These signals pass through the corresponding filters.

The percussion signal directly comes out from the CPU, no matter what the position of the mode switch. Since the signal is a stepped waveform, the percussion filter shapes it.

10. ROM & RAM ACCESSES



RAM1 and RAM2 are dynamic 64 Kbit RAM. Since they are dynamic type, data must be refreshed every 2msec. at least. The memory is used as the demonstration, memory play, and sampling data area.

The chip select condition and memory assignments are as shown below.

Signal Chip	A15	A13	\overline{CE}	\overline{OE}	Memory Assignment
RAM1	L	H	L	L	(LSB) 22,528 bits
					43,008 bits (MSB) Demonstration/Memory play Sampling
RAM2	L	L	L	L	(LSB) 65,536 bits
					(MSB) Sampling

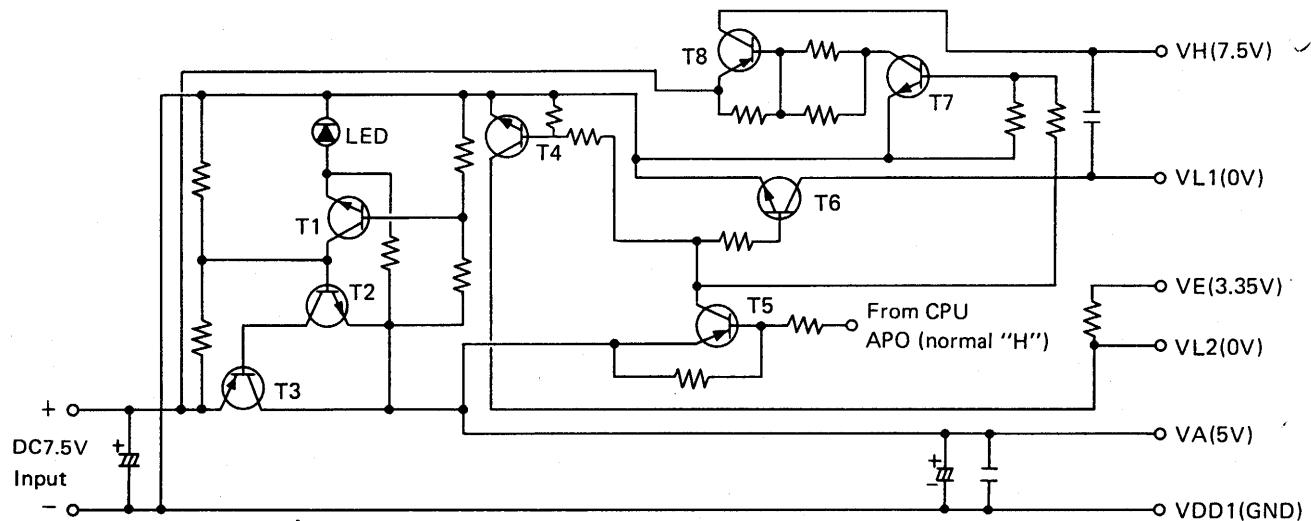
RAM1 cannot record demonstration data and memory play data simultaneously.

The capacity of ROM is 256 Kbit and it contains the program for system execution.

The chip select condition is shown below.

Signal Chip	A15	CE
ROM	H	L

11. POWER SUPPLY CIRCUIT



The power supply consists of voltage regulator and an APO (Auto Power Off) circuit.

When power is ON and operation is normal, the APO signal from the CPU maintains "H" level.

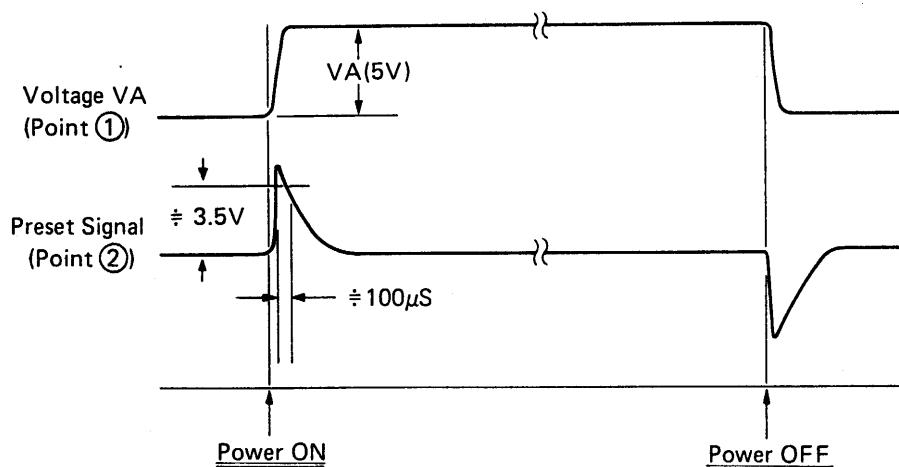
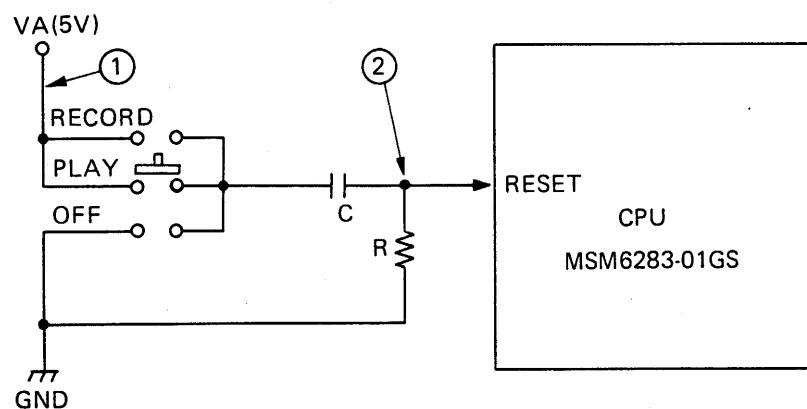
Transistors T4~T8 turn on, so voltages VH, VL1, VL2 and VE are provided to the circuits.

The APO signal becomes "L", when the keyboard is not operated for seven minutes, and transistors T4 ~ T8 turn off causing the voltage to shut off.

Voltages VA (5V) and VDD1 (ground) are always provided to the CPU even during APO.

Transistors T1, T2 and T3 form a voltage regulator. Using the LED characteristic of current regulation, transistor T1 stabilizes the battery voltage at 5V and the darlington-connected transistor T2 and T3 amplifies the current.

12. RESET CIRCUIT



Point ② provides a pulse by the differential circuit of resistor R and capacitor C at power ON. The pulse initializes the internal circuits of the CPU.

13. TROUBLESHOOTING

Trouble	Countermeasure	Reference waveform
Does not work at all (Pilot lamp does not light).	Check voltages VA (+5V), VE (+3.35V), VC (+5V) and VD (+5V). Check Reset and APO signal. Faulty parts (transistor T1 ~ T4, LED, power switch, or CPU).	Waveform 2
Does not work at all (Pilot lamp lights).	Check voltages VH (+7.5V), VC (+5V) and VD (+5V). Check clock pulse and key common signal. Faulty parts (transistor T5 ~ T8, ceramic trimmer VCT84K, or ROM).	Waveforms 1 and 9
Preset tone does not sound in PLAY mode.	Check voltage VH (+7.5V). Check analog signal at base of transistor T11 or at pin 2 of power amp. LA4138. Faulty parts (transistor T7 ~ T9, T11, CPU, or power amp. LA4138).	Waveform 5
Chord or Bass tone does not sound in CHORD mode.	Check analog signal at collector of transistor T19 or T21. Check analog signal at source of FET T10. Faulty parts (transistor T18 ~ T23, T10, or IC TC50HC4066P).	
Melody or Obbligato tone does not sound in SOLO 1, SOLO 2 modes.	Check analog signal at collector of transistor T14 or T15, and at emitter of transistor T11. Faulty parts (transistor T12 ~ T17 or T11).	
Memory/Demo play cannot be performed.	Faulty parts (RAM1, ROM, CPU, or IC TC74HC02P)	
Sampling impossible.	Check analog signal at collector of transistor T25 at sampling. Check voltage (2.5V) of pin 100 of the CPU. Faulty parts (transistor T24, 25, CPU RAM1, RAM2, or IC TC74HC02P)	
Distorted sound.	Faulty parts (transistor T14 ~ T18, T9, or power amp. LA4138).	
Certain key or switch does not respond.	Check contact of the PC joiner or contact rubber. Clear keyboard, switches PCB or contact rubber.	
Percussion tone does not sound.	Check analog signal at pin 97 of CPU. Check poor contact at pin 97 of CPU or faulty parts (CPU).	Waveform 6

PARTS LIST

Ref. No. MPL-063

SK-1

- Notes:
1. Prices and specifications are subject to change without prior notice.
 2. As for spare parts order and supply, refer to the "GUIDEBOOK for Spare Parts Supply", published separately.
 3. The numbers in item column correspond to the same numbers in drawing.



Item	Code No.	Part Name	Specification	Q'ty	*	Unit Price N.R. Yen (¥) (FOB: JAPAN)	RANK
		1) M3129-MA1M PCB ASS'Y					
☆	2010 0035	LSI (CPU)	MSM6283-01GS	1		1,920	A
☆	2010 0049	LSI (ROM)	μ PD23C256EC-121	1		720	A
☆	2010 0056	LSI (RAM)	μ PD4168C-15, 20	2		360	A
	2100 4669	MOS IC	TC74HC02P	1		80	A
	2100 5045	MOS IC	TC50H4066P	1		80	A
	2120 8329	Linear IC (Power Amp.)	LA4138	1		150	A
	2210 6261	Transistor	2SB824-S	1	10	112	A
	2320 9616	LED (Red)	LN2G	1	10	14	B
36	2770 9800	VR	EWA-MK0C25B14 (1Kohm)	1	5	88	B
	2804 9731	Electrolytic Capacitor	16RE2-2200 (2200 μ F, 16V, $\pm 20\%$)	1	10	84	C
☆	2898 0007	Trimmer Capacitor	VCT84K	1	5	65	C
37	3512 3288	Power Jack	HEC0470-01-230	1		50	B
38	3612 0665	Phone Jack	YKB21-5006	1		100	B
39	3612 0711	Jack	YKB21-5101	2	5	90	B
40	3841 0695	Coil	L10-495	1		50	B
☆	6907 1080	Parallel Wire M129A	M42739-1	1	20	10	X
	2200 3721	Transistor	2SA933-SQ	1	10	19	A
	2220 1395	Transistor	2SC1740-SQ	17	10	11	A
	0002 8740	Transistor	2SC1740-LNSR	2	20	17	A
	0002 9076	FET	2SK105E	1	10	30	A
☆	0002 9175	Transistor	2SA934R	1	10	34	A
	2220 2632	Transistor	2SC2060R	2	10	26	A
	0002 8721	Diode	1SS254	13	20	6	C
☆	0002 9176	Carbon Film Resistor	ELR50X-68-J (1/2W, 68ohm, $\pm 5\%$)	2	20	5	C
	0002 8723	Carbon Film Resistor	R-20-100-J (1/5W, 100ohm, $\pm 5\%$)	2	10	5	C
	0002 8726	Carbon Film Resistor	R-20-1K-J (1/5W, 1Kohm, $\pm 5\%$)	7	10	5	C
	0002 8727	Carbon Film Resistor	R-20-2.2K-J (1/5W, 2.2Kohm, $\pm 5\%$)	9	10	5	C
	0002 8946	Carbon Film Resistor	R-20-3.3K-J (1/5W, 3.3Kohm, $\pm 5\%$)	5	20	3	C
	0002 8728	Carbon Film Resistor	R-20-4.7K-J (1/5W, 4.7Kohm, $\pm 5\%$)	9	10	5	C
	0002 8729	Carbon Film Resistor	R-20-10K-J (1/5W, 10Kohm, $\pm 5\%$)	5	10	2	C
	0002 8730	Carbon Film Resistor	R-20-33K-J (1/5W, 33Kohm, $\pm 5\%$)	3	10	5	C
	0002 8731	Carbon Film Resistor	R-20-47K-J (1/5W, 47Kohm, $\pm 5\%$)	10	10	5	C
	0002 8947	Carbon Film Resistor	R-20-68K-J (1/5W, 68Kohm, $\pm 5\%$)	2	20	3	C
	0002 8733	Carbon Film Resistor	R-20-100K-J (1/5W, 100Kohm, $\pm 5\%$)	30	10	5	C
	0002 8735	Carbon Film Resistor	R-20-220K-J (1/5W, 220Kohm, $\pm 5\%$)	1	10	5	C
	0002 8948	Carbon Film Resistor	R-20-470K-J (1/5W, 470Kohm, $\pm 5\%$)	1	20	3	C
	0002 8738	Carbon Film Resistor	R-20-39K-J (1/5W, 39Kohm, $\pm 5\%$)	1	10	5	C

Note: ☆ — New parts

Q'ty — Quantity used per unit

* — Minimum order and supply quantity

Rank A: Essential

B: Stock recommended

C: Others

X: No stock recommended

Item	Code No.	Part Name	Specification	Q'ty	*	Unit Price N.R. Yen (¥) (FOB: JAPAN)	RANK
	0002 9018	Carbon Film Resistor	R-20-270-J (1/5W, 270ohm, ±5%)	1	20	3	C
	0002 8951	Carbon Film Resistor	R-20-12K-J (1/5W, 12Kohm, ±5%)	4	20	3	C
	0002 8953	Carbon Film Resistor	R-20-120K-J (1/5W, 120Kohm, ±5%)	6	20	3	C
	0002 9002	Carbon Film Resistor	R-20-15K-J (1/5W, 15Kohm, ±5%)	5	20	3	C
	0002 8956	Carbon Film Resistor	R-20-22K-J (1/5W, 22Kohm, ±5%)	3	20	3	C
	0002 8957	Carbon Film Resistor	R-20-56K-J (1/5W, 56Kohm, ±5%)	3	20	3	C
	0002 8958	Carbon Film Resistor	R-20-560K-J (1/5W, 560Kohm, ±5%)	1	20	3	C
	0002 8961	Carbon Film Resistor	R-20-390K-J (1/5W, 390Kohm, ±5%)	1	20	3	C
	0002 9059	Carbon Film Resistor	R-20-3.9K-J (1/5W, 3.9Kohm, ±5%)	5	20	3	C
	0002 9104	Carbon Film Resistor	R-20-330-J (1/5W, 330ohm, ±5%)	4	20	3	C
	0002 9020	Carbon Film Resistor	R-20-680K-J (1/5W, 680Kohm, ±5%)	5	20	3	C
	0002 9021	Carbon Film Resistor	R-20-6.8K-J (1/5W, 6.8Kohm, ±5%)	1	20	3	C
	0002 9100	Carbon Film Resistor	R-20-68-J (1/5W, 68ohm, ±5%)	2	20	3	C
	0002 9012	Carbon Film Resistor	R-20-33-J (1/5W, 33ohm, ±5%)	1	20	3	C
	0002 9023	Carbon Film Resistor	R-20-180K-J (1/5W, 180Kohm, ±5%)	4	20	3	C
	2804 5069	Electrolytic Capacitor	10RE47 (47μF, 10V, ±20%)	2	20	18	C
	2804 4925	Electrolytic Capacitor	50RE1 (1μF, 50V, ±20%)	7	10	6	C
	2804 5051	Electrolytic Capacitor	16RE10 (10μF, 16V, ±20%)	2	10	9	C
	2804 4879	Electrolytic Capacitor	10RE100 (100μF, 10V, ±20%)	1	10	7	C
	2804 4933	Electrolytic Capacitor	16RE100 (100μF, 10V, ±20%)	2	10	11	C
	2804 5140	Electrolytic Capacitor	10RE220 (220μF, 10V, ±20%)	1	10	12	C
	2804 9374	Electrolytic Capacitor	6.3RE100 (100μF, 6.3V, ±20%)	2	10	18	C
	2804 5336	Electrolytic Capacitor	50RE2R2 (2.2μF, 50V, ±20%)	3	10	8	C
	2804 5638	Electrolytic Capacitor	6.3RE220 (220μF, 6.3V, ±20%)	1	10	24	C
	2804 5808	Electrolytic Capacitor	6.3RE2-330 (330μF, 6.3V, ±20%)	1	10	29	C
	2819 0107	Ceramic Capacitor	HE70SJS1221K (220pF, 50V, ±10%)	1	10	4	C
	2818 0110	Ceramic Capacitor	HE50SJYB102K (1000pF, 50V, ±10%)	3	10	3	C
	2819 0654	Ceramic Capacitor	HE90SJCH151J (150pF, 50V, ±5%)	1	10	11	C
	2818 3054	Ceramic Capacitor	HE80SJCH101J (100pF, 50V, ±5%)	1	10	4	C
	2819 0344	Ceramic Capacitor	HE60SJCH560KJ (56pF, 50V, ±5%)	1	10	5	C
	2818 0039	Ceramic Capacitor	HE40SJYB151K (150pF, 50V, ±10%)	1	10	3	C
	0002 9177	Semi-conductive Capacitor	DD408SR104M16 (100000pF, 16V, ±20%)	18	10	9	C
	0002 8894	Semi-conductive Capacitor	DD405SR223K25 (2200pF, 25V, ±10%)	2	10	9	C
	0002 8898	Semi-conductive Capacitor	DD404SR102K25 (1000pF, 25V, ±10%)	1	10	8	C
	0002 8903	Semi-conductive Capacitor	DD404SR103K25 (10000pF, 25V, ±10%)	7	10	8	C

Note: ★ — New parts

Q'ty — Quantity used per unit

* — Minimum order and supply quantity

Rank A: Essential

B: Stock recommended

C: Others

X: No stock recommended

Item	Code No.	Part Name	Specification	Q'ty	*	Unit Price N.R. Yen (¥) (FOB: JAPAN)	RANK
	0002 9178	Semi-conductive Capacitor	DD406SR473K16 (47000pF, 16V, ±10%)	7	20	11	C
	0002 9179	Semi-conductive Capacitor	DD404SR682K25 (6800pF, 25V, ±10%)	1	20	8	C
	2830 6067	Mylar Capacitor	AMZ-154K50 (150000pF, 50V, ±10%)	1	10	15	C
☆	4307 5020	Blank PCB-M3129-MA1M	M1952-1	1		300	X
	2) M3129-CN1M PCB ASS'Y						
33	2320 9764	LED (Red)	LN251 RPP. WE	1	10	28	B
☆34	3717 0007	EL Wire M129B	SMVJU-20-55M	1	10	30	X
	0002 8721	Diode	1SS254	11	20	6	C
☆	4307 5060	Blank PCB-M3129-CN1M	M1953-1	1		200	X
	3) M3129-KY1M PCB ASS'Y						
☆ 35	3717 0014	EL Wire M129A	SMVJU-12-105M	1	10	47	X
	0002 8721	Diode	1SS254	32	20	6	C
☆	4307 5040	Blank PCB-M3129-KY1M	M21332-1	1		170	X
	4) UPPER CASE UNIT						
	4-a) Upper Case Ass'y						
☆ 1	6907 0140	Upper Case Sub Ass'y	M21333*1	1		790	C
☆ 2	6907 0290	Slide knob	M32084-1	3	20	15	C
☆ 3	6907 0060	Button Set	M32105*1 (14 pcs.)	1		120	C
☆ 4	6907 0070	CN Spacer 129	M42610-1	1	20	4	C
☆ 5	6907 0100	Contact Rubber 129A	M42606-1	1	10	25	B
☆ 6	6907 0110	Contact Rubber 129B-1	M42607-1	1	10	43	B
☆ 7	6907 0120	Contact Rubber 129B-2	M42607-2	2	10	26	B
☆ 8	6907 0130	Contact Rubber 129C	M42608-1	1	10	28	B
☆ 9	6907 4530	Parallel Wire M129B	M42739-2	1	20	11	X
☆10	6907 4561	Shield Plate 129B	M21392A-1	1	10	37	X
☆11	3831 0014	Speaker	EAS-8P109H	1		280	B
	4-b) Slide Board 96BA Ass'y						
12	6910 0480	Slide Spring	M4491-1	1	50	2	C
13	6911 9150	Slide Board 96	M31673-1	1	10	20	C
14	6911 9160	Slide Contact 96	M42184-1	2	10	12	C
15	5580 1274	Ball Bearing	SUS304 2 pi	1	50	2	X

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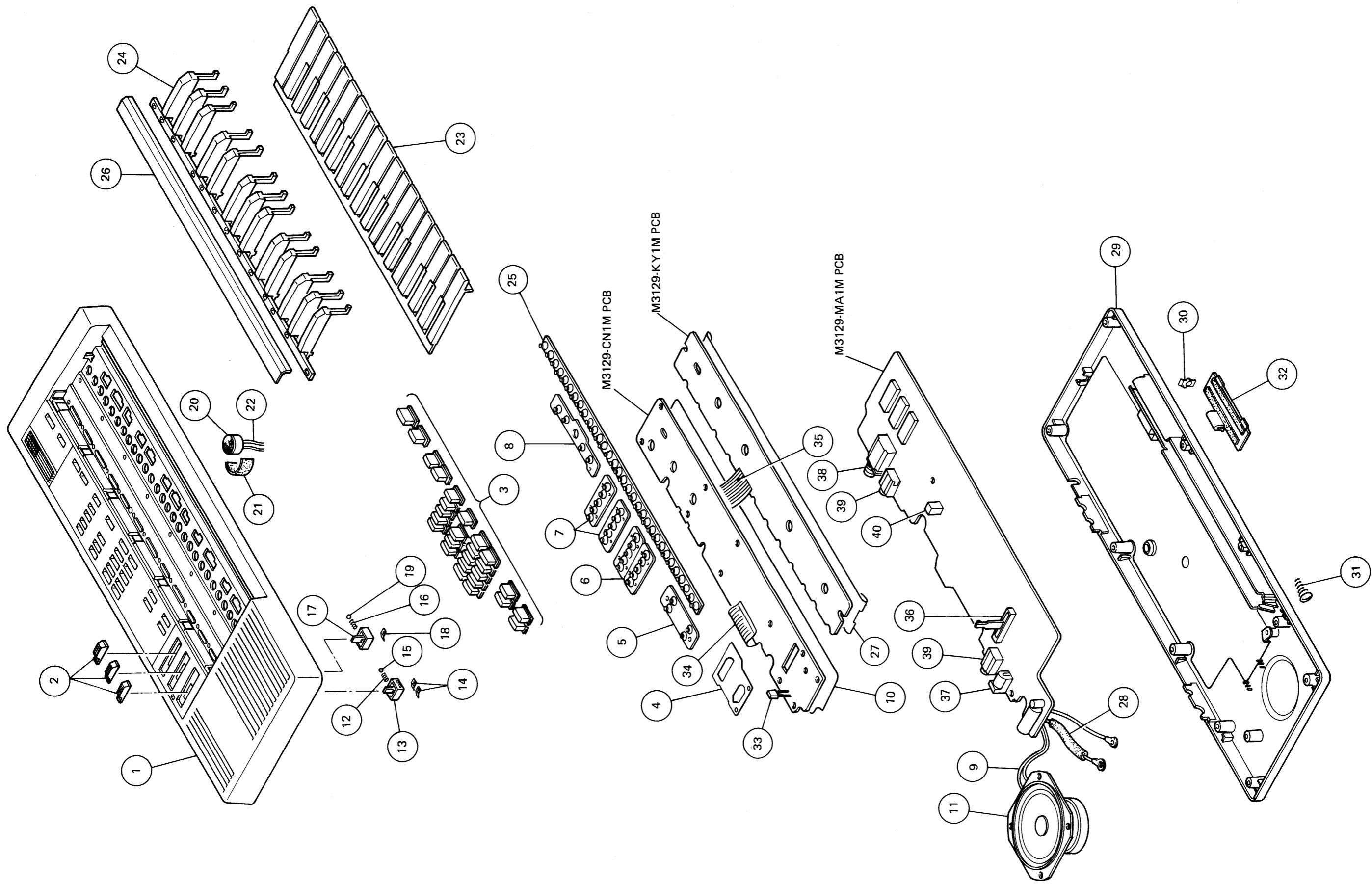
Item	Code No.	Part Name	Specification	Q'ty	*	Unit Price N.R. Yen (¥) (FOB: JAPAN)	RANK
	4-c) Slide Board 96 Ass'y						
16	6910 0480	Slide Spring	M4491-1	1	50	2	C
17	6911 9150	Slide Board 96	M31673-1	1	10	20	C
18	6911 9160	Slide Contact 96	M42184-1	1	10	12	C
19	5580 1274	Ball Bearing	SUS 304 2 pi	1	50	2	X
	4-d) Microphone 129 Ass'y						
☆20	3830 9021	Microphone	WM-034CY	1	5	70	C
☆21	6907 0321	Sponge 129	M42612A-1	1	20	3	X
☆22	6907 4540	Parallel Wire M129C	M42739-3	1	20	9	X
	4-e) Keyboard Ass'y						
☆23	6907 0150	White Key Set NM	M1843-1	1		110	C
☆24	6907 0160	Black Key Set NM	M1844-1	1		100	C
☆25	6907 0300	Contact Rubber NM	M31953-1	1		120	B
☆26	6907 0310	Keyboard Panel	M21282-1	1		180	X
☆27	6907 4551	Shield Plate 129A	M21391A-1	1	10	27	X
☆28	6910 3840	Sponge L	M4918-1	1	20	6	X
	5) LOWER CASE ASS'Y						
☆29	6907 0040	Lower Case Sub Ass'y (Including Item No.29 and 30)	M21334*1	1		490	C
(30)	6345 2238	Battery Spring A-G55	A42606A-1	1	10	5	C
(31)	6912 2630	Battery Spring 120	M42382-1	1	20	14	C
☆32	6905 8341	Battery Cover 115	M31417A*8	1	10	29	C

Note: ☆ — New parts

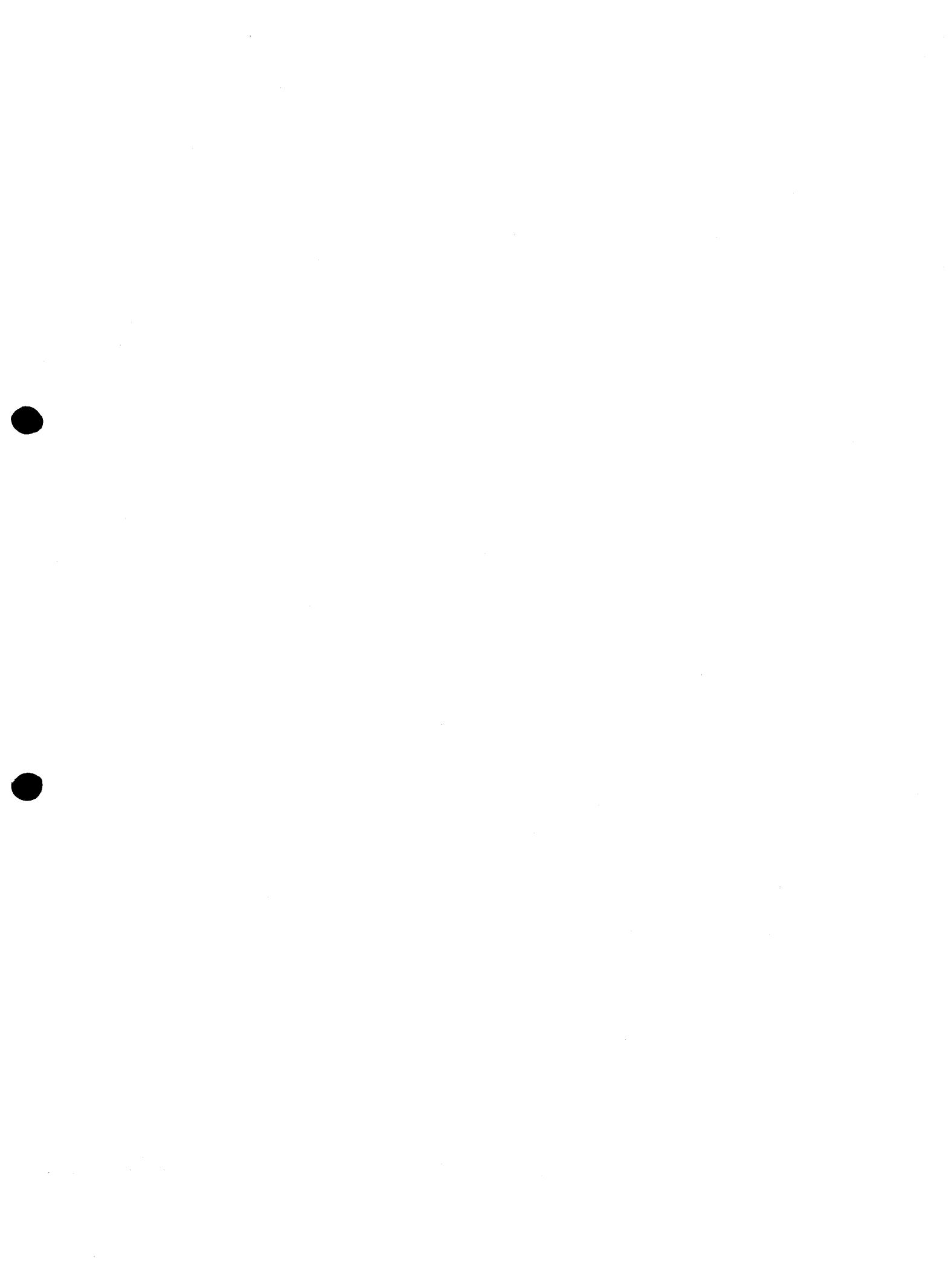
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