

CASIO®

Service Manual

(without price)

M-200



M-200

ELECTRONIC KEYBOARD

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SPECIFICATIONS

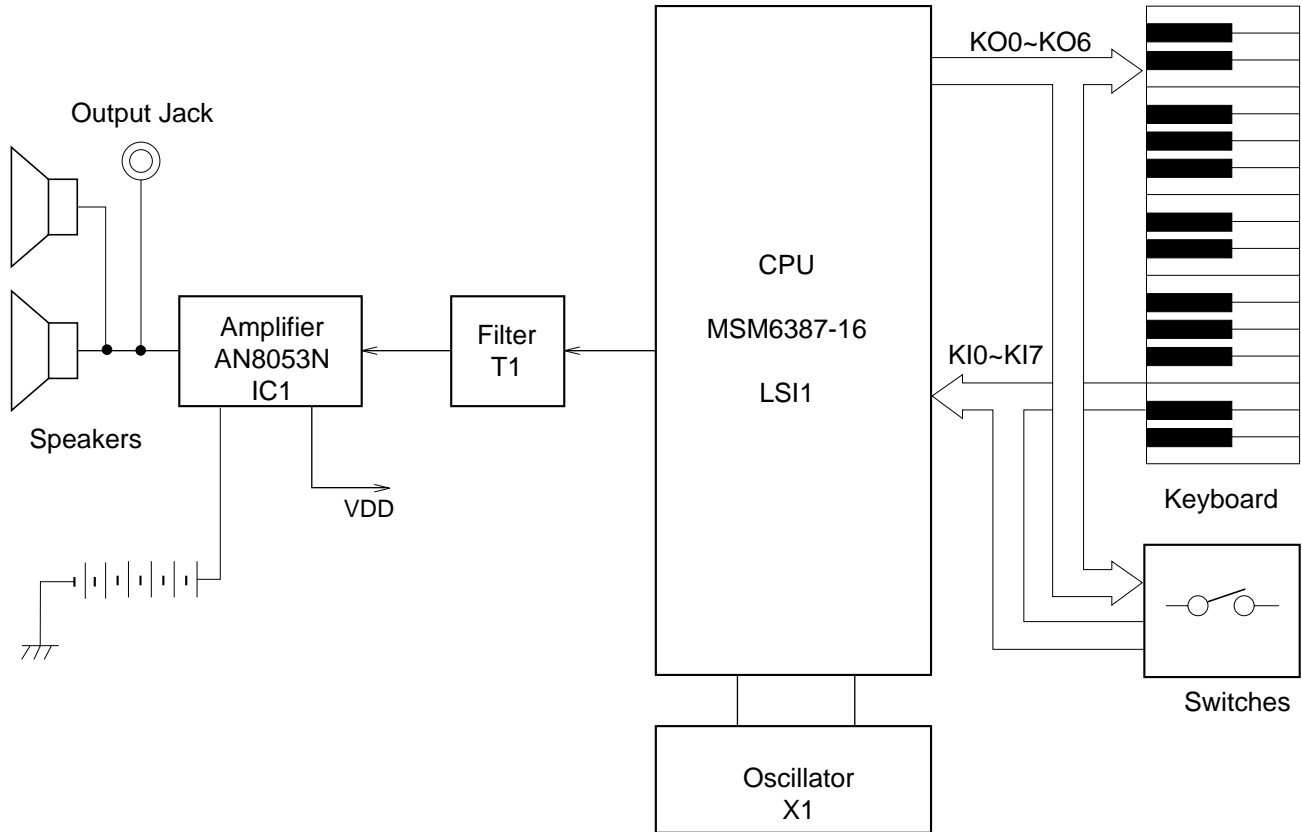
General

Number of Keys:	32
Polyphonic:	4-note
Preset Tones:	25
Tone Edit Variations:	4
Patterns:	Auto-Rhythms: 8, including; 8-Beat, 16-Beat, Swing, Slow Rock, Shuffle, March, Samba, Waltz Accompaniments: 8, including; Rock, Pops, Jazz, Funk, House, Country, Ratin, Classical Funny Sounds: 8, including; Fanfare, Hpper, Computer Sound, Horror, Child's Play, Orient, Jungle, Comedy
Demonstration Tunes:	10 tunes with Lesson Function 1. Twinkle Twinkle Little Star 6. Home, Sweet Home 2. Minuet (J.S. Bach) 7. Little Brown Jug 3. Oh! Susanna 8. The Skaters Waltz 4. Aura Lee 9. Jingle Bells 5. Lullaby (Brahms) 10. When The Saints Go Marching In
Built-In Speakers:	8.0 cm dia. 1.0 W Input Rating: 2 pcs.
Terminals:	Output Jack [Output Impedance:100 Ω , Output Voltage: 2.1 V (rms) MAX] AC Adapter Jack (DV 7.5 V)
Power Source:	DC: 5 AA size dry batteries Battery life: Approx. 6 hours (SUM-3/R6P) AC: AC Adapter AD-1
Power Consumption:	1.6 W
Dimensions (HWD):	57 x 619 x 178 mm (2-1/4 x 24-3/8 x 6 inches)
Weight:	1.1 kg (2.4 lbs) including batteries

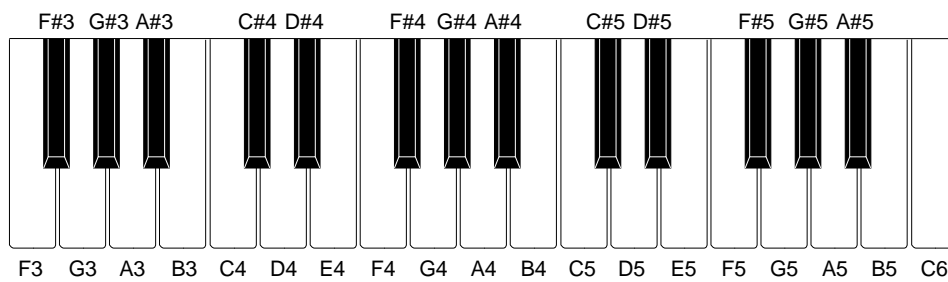
Electrical

Current Drain with 7.5 V DC:	
No Sound Output	28 mA \pm 20%
Maximum Volume	90 mA \pm 20%
with keys C4 and E4 pressed in Flute tone	
Volume: Maximum, Accmpaniment: Latin,	
Tempo: Maximum	
Sound Pressure Level at 10 cm away from the speaker	100 dB \pm 10 dB
with key C6 pressed in Clarinet, Volume: Maximum	
Minimum Operating Voltage:	5.0 V

BLOCK DIAGRAM



Nomenclature of Keys



CIRCUIT DESCRIPTION

Key Matrix

	KI0	KI1	KI2	KI3	KI4	KI5	KI6	KI7
KO0	F3	F#3	G3	G#3	A3	A#3	B3	C4
KO1	C#4	D4	D#4	E4	F4	F#4	G4	G#4
KO2	A4	A#4	B4	C5	C#5	D5	D#5	E5
KO3	F5	F#5	G5	G#5	A5	A#5	B5	C6
KO4	Keyboard	Wind	String	Synth	S.E.	Tempo Up	Volume Up	Tone Edit
KO5			Rhythm	Accomp.	Funny Accomp.	Stop	Tempo Down	Volume Down
KO6						Lesson	MelodyOff	Demo

CPU (LSI1: MSM6387-16)

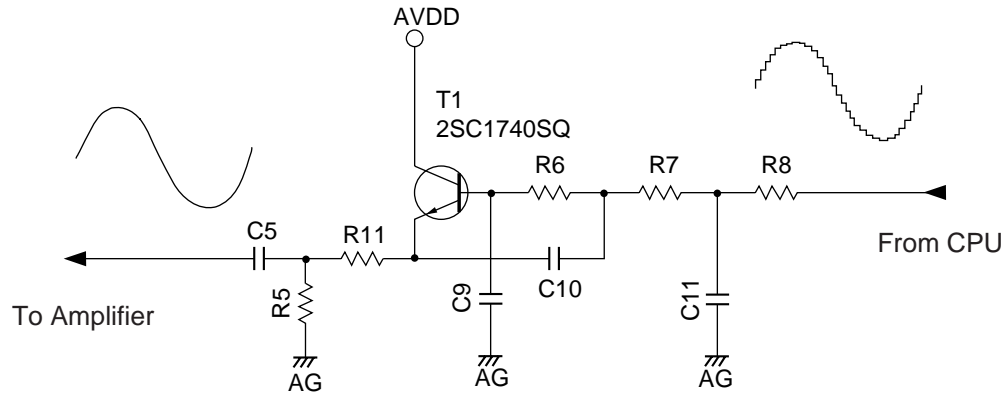
Containing a sound data ROM and a DAC (Digital to Analog Converter), the CPU provides sound waveform in accordance with the pressed key and the selected tone.

The following table shows the pin functions of LSI1.

Pin No.	Terminal	In/ Out	Function
1, 2	TEST1, TEST2	—	Not used. Connected to ground.
3	RESET	In	Power ON reset input. On: +6 V Off: 0 V
4	AVDD	In	+5 V source for the built-in DAC
5	OUT	Out	Sound waveform output
6	AGND	In	Ground (0 V) source for the built-in DAC
7	GND	In	Ground (0 V) source
8, 9	COSI, COSO	In/Out	21.725 MHz clock pulse input/output
10	VDD	In	+5 V source
11 ~ 18	KI0 ~ KI7	In	Input terminal from keys and switches
19 ~ 22	KO11 ~ KO8	—	Not used.
23 ~ 30	KO7 ~ KO0	Out	Key and switch scan signal output

Filter Block

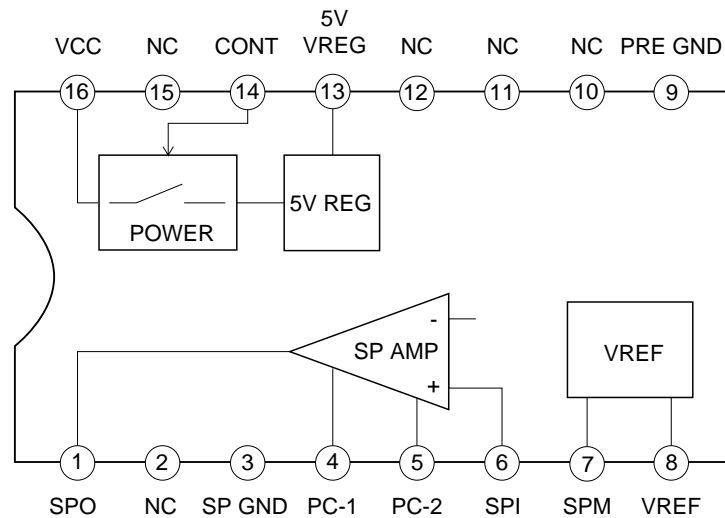
Since the sound signal from the CPU is a stepped waveform, the filter block is added to smooth the waveform.



Amplifier/Voltage Regulator (IC1: AN8053N)

Consisting of an amplifier and a voltage regulator, AN8053N amplifies the sound signal from the CPU and also provides the CPU +5V source.

The following figure shows the internal block of IC1.

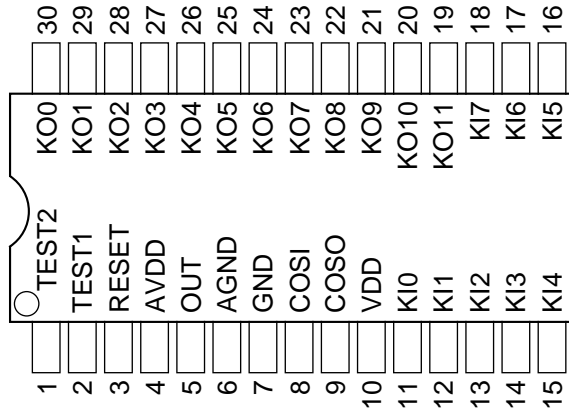


TROUBLESHOOTING

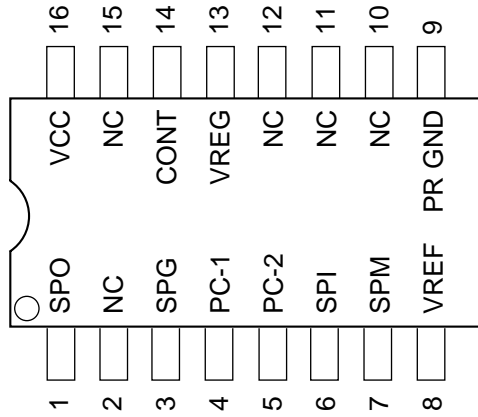
Nature of Trouble	Faulty Block	Checkpoint
No sound at all	Power amp. (IC1: AN8053N)	Pin 13 should have +5V. An amplified waveform should be observed at pin 1.
	Power Switch	Voltage at pin 3 of the CPU should be raised from 0V to +5V when the power switch is turned on. Switch contact.
	CPU (LSI1: MSM6387-16)	Pins 24 ~ 30 should provide pulses. Pin 5 should provide a sound waveform when a key is pressed.
	Oscillator (X1)	Pins 8 and 9 of the CPU should receive an oscillation signal.
Certain key(s) or switch(es) do(es) not work.	Key or Switch Contact	
	Open Circuit on KO or KI Lines	

IC AND TRANSISTOR LEAD IDENTIFICATION

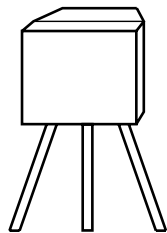
LSI1: MSM6387-16



IC1: AN8053N



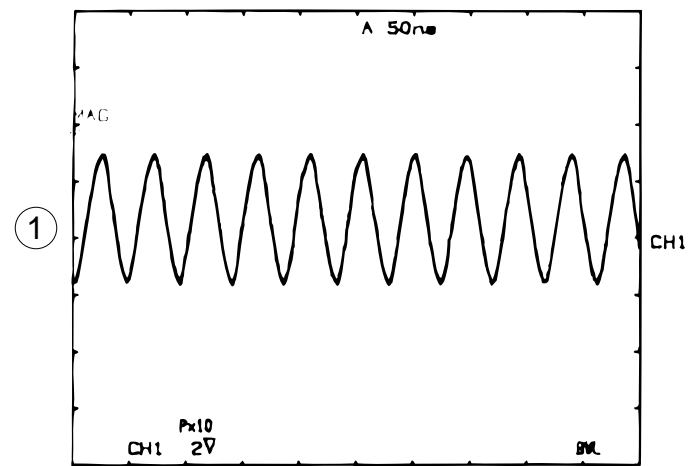
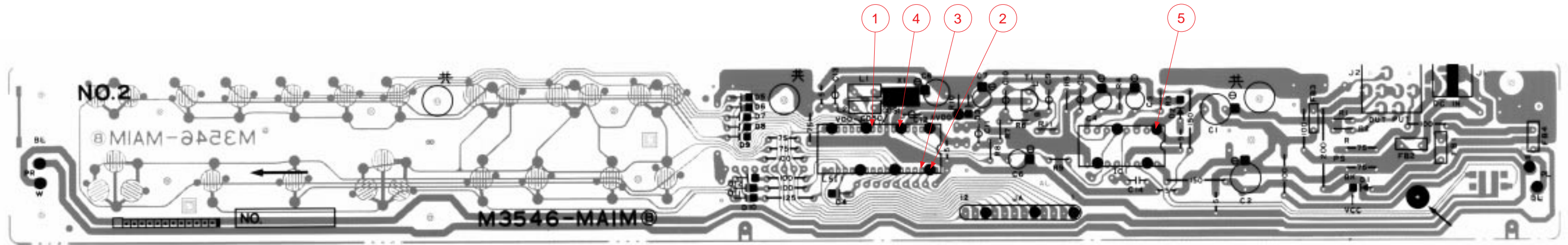
T1: 2SC1740SQ



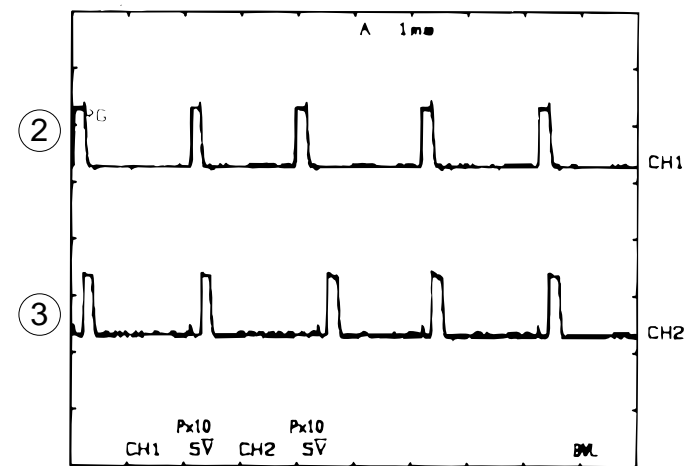
E C B

PCB VIEW & MAJOR WAVEFORMS

Main PCB M3546-MA1M (Top View)

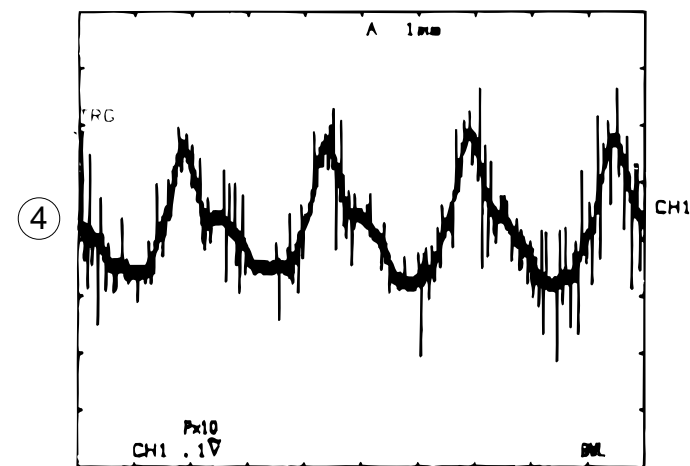


① Clock pulse COSO
MSM6387-16 Pin 9

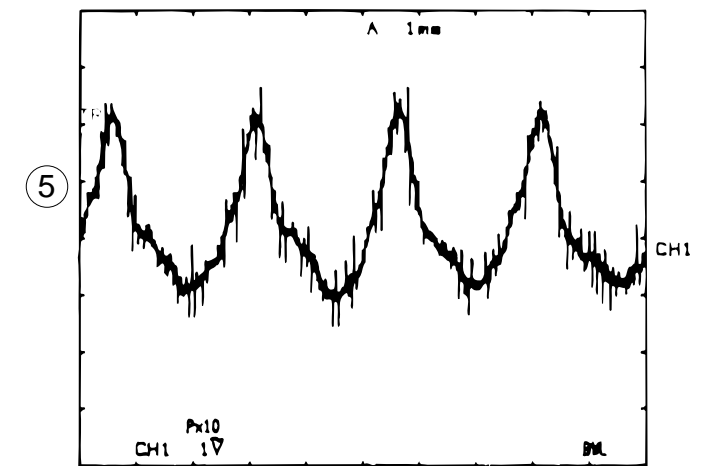


② Key scan signal KO0
MSM6387-16 Pin 30

③ Key scan signal KO1
MSM6387-16 Pin 29



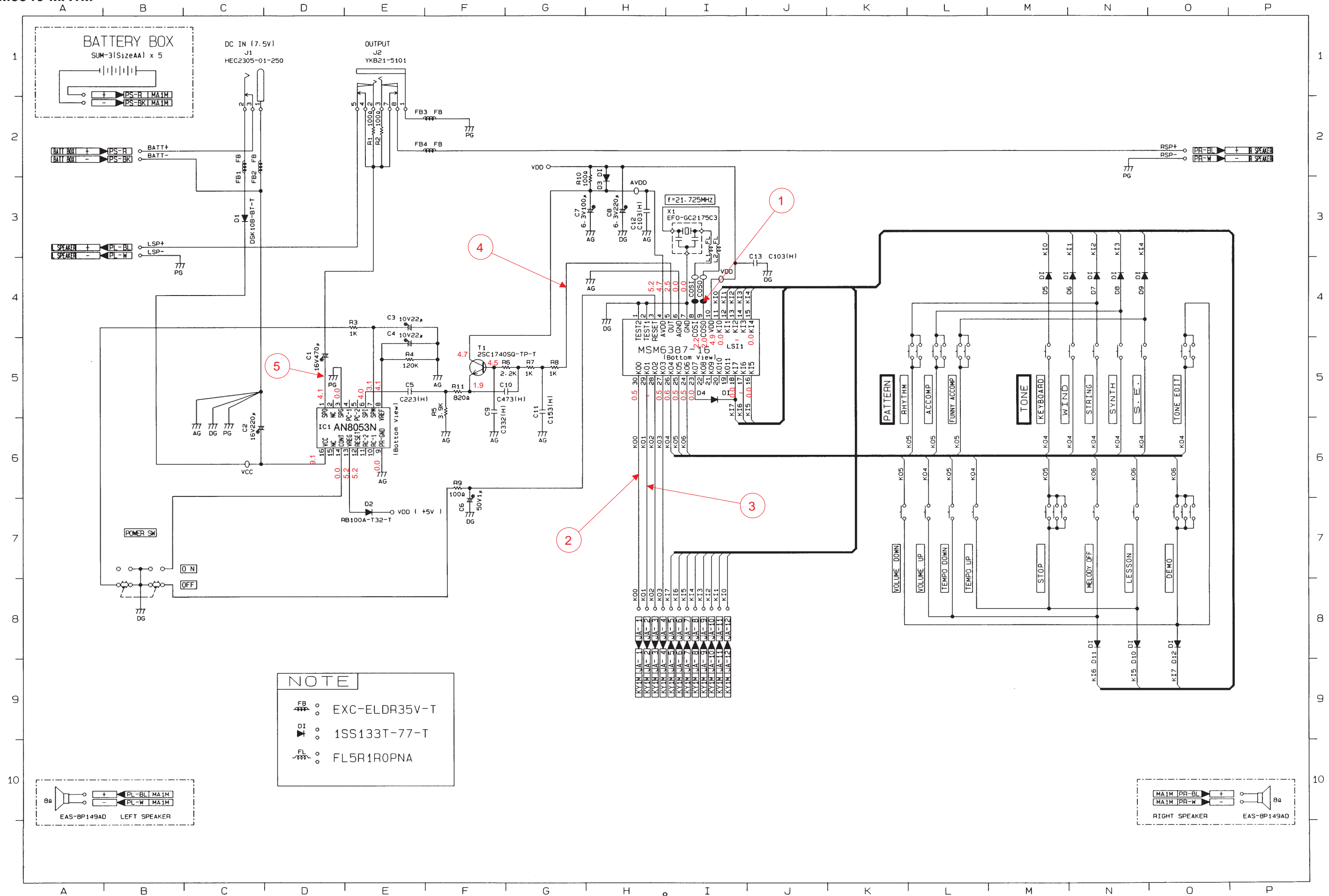
④ Sound output
MSM6387-16 Pin 5
Tone : Piano
Key : G4



⑤ Power Amp. output
AN8053N Pin 1
Tone : Piano
Key : G4
Volume : Max.

SCHEMATIC DIAGRAM

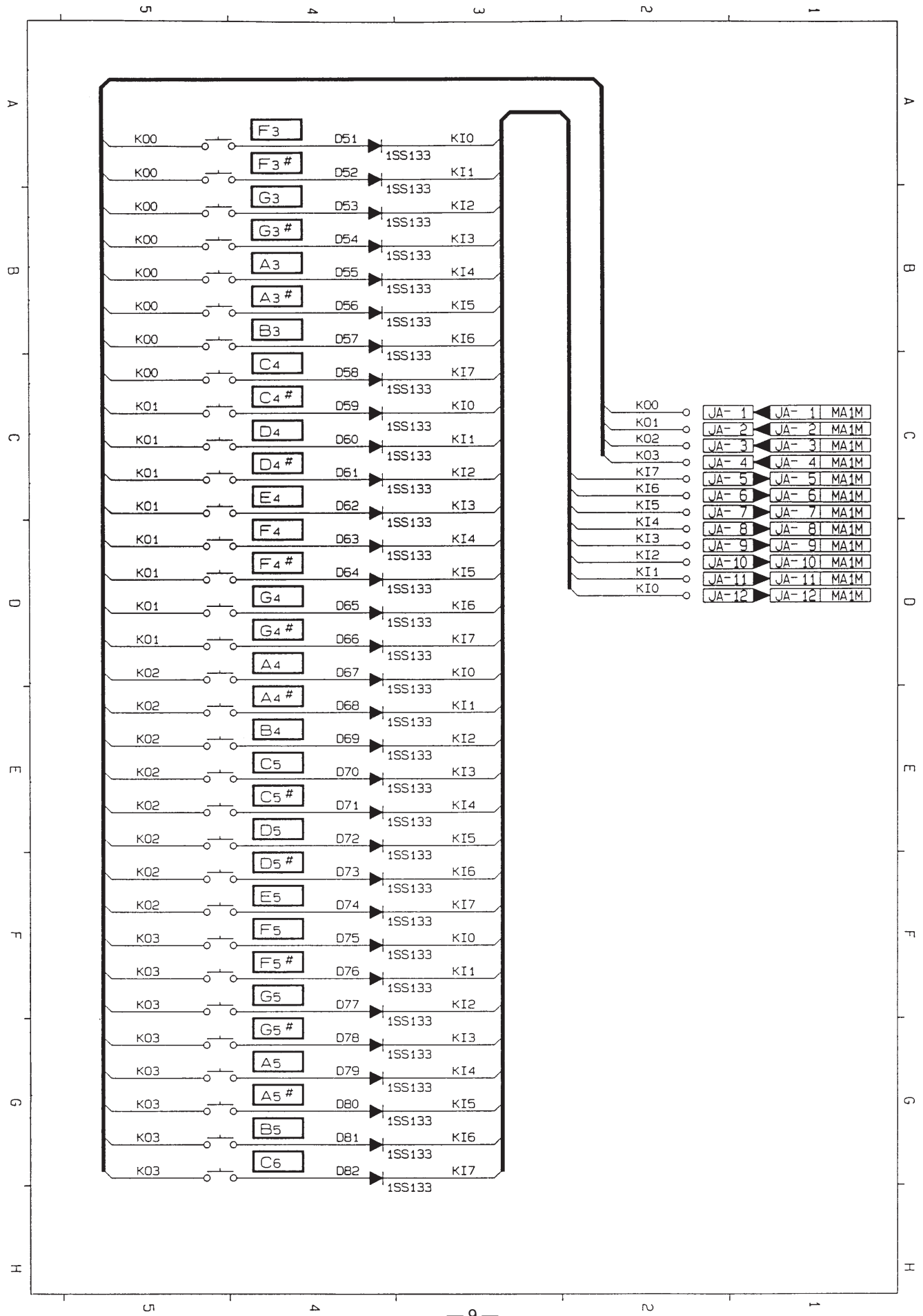
PCB M3546-MA1M



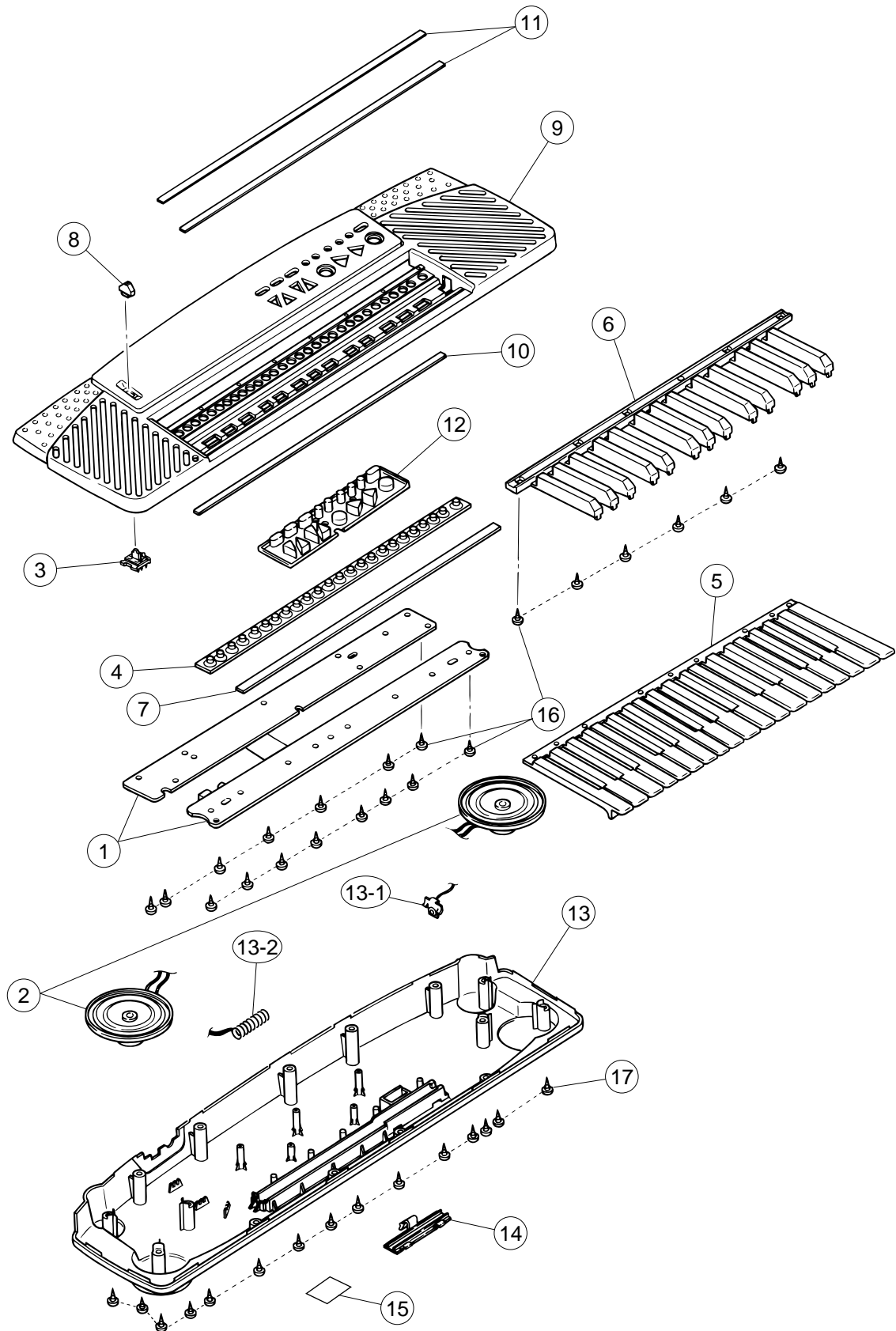
NOTE

- FB ○ EXC-ELDR35V-T
- DI ○ 1SS133T-77-T
- FL ○ FL5R1R0PNA

KY1M KEYBOARD PCB



EXPLODED VIEW



PARTS LIST

M-200

- 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.

N	Item	Code No.	Parts Name	Specification	Q	M	FOB Japan N.R.Yen Unit Price	R	*
Electrical Parts									
	LSI1	2011 4767	LSI	MSM6387-16SS-106	1	1		A	E
	IC1	2114 3269	Monolithic IC	AN8053N	1	1		A	B
	T1	2252 0497	Transistor	2SC3199Y-AT-T	1	20		B	A
	D1	2390 0371	Diode	DSK10B-BT-T	1	10		B	A
	D2	2390 1316	Diode	SB10-04A3-BT-T	1	5		B	A
	D4~12,51~82	2390 1589	Diode	MA165P-(TA5)-T	42	20		C	A
	X1	2590 0742	Ceramic oscillator	EFO-GC2175C3	1	1		B	B
	R3,7,8	2606 1141	Carbon film resistor	R-20-1K-J-T23-T	3	20		C	A
	R1,2,9,10	2606 1169	Carbon film resistor	R-20-100-J-T23-T	4	20		C	A
	R6	2606 1288	Carbon film resistor	R-20-2.2K-J-T23-T	1	20		C	A
	R5	2606 1365	Carbon film resistor	R-20-3.9K-J-T23-T	1	20		C	A
	R11	2606 1484	Carbon film resistor	R-20-820-J-T23-T	1	20		C	A
	R4	2606 1554	Carbon film resistor	R-20-120K-J-T23-T	1	20		C	A
	C1	2802 9777	Electrolytic capacitor	16RE3-470-T20-T	1	20		C	A
	C8	2805 3061	Electrolytic capacitor	6.3RE2-220-T2-T	1	10		C	A
	C3/4	2805 3134	Electrolytic capacitor	10RE2-22-T2-T	2	20		C	A
	C6	2807 1023	Electrolytic capacitor	50RE2-1-T2-T	1	10		C	A
	C7	2807 1091	Electrolytic capacitor	6.3RE2-100-T2-T	1	10		C	A
	C2	2807 1710	Electrolytic capacitor	16RE3-220-T2-T	1	20		C	A
	C9	2813 0651	Semiconductive capacitor	RT-C40TKYR332K-T	1	20		C	A
	C5	2813 1932	Semiconductive capacitor	RT-C50TKYR223K-T	1	20		C	A
	C10	2813 1939	Semiconductive capacitor	RT-B70TKYR473K-T	1	20		C	A
	C12/13	2813 2093	Semiconductive capacitor	TR-B50TKYR103K-T	2	20		C	A
	C11	2813 2415	Semiconductive capacitor	RT-B50TKYR153K-T	1	20		C	A
	FB1~4	2845 3220	Ferrite beads	EXC-ELDR35V-T	4	20		C	A
	J1	3501 3731	DC jack	HEC2305-01-250	1	5		A	A
	J2	3612 0711	Miniature jack	YKB21-5101	1	1		A	B
		3719 3990	Ribbon cable M546A	DF5H12065-80008000	1	20		C	A
	L1/2	3841 0910	Coil	FL5R1R0PNA	2	5		C	A
		4317 3550	Blank PCB M3546-MA1M	M111579-1	1	1		C	B
		4317 3560	Blank PCB M3546-KY1M	M111579-2	1	1		C	B
	1	6921 6390	PCB ass'y M3546-MA,KY	M111578*1	1	1		B	P
Mechanical Parts									
	2	3831 0385	Speaker	EAS-8P149AD	1	2		C	B
	3	6909 7380	SL contact 9D	CSB-09D	1	10		B	A
	4	6917 1471	Key contact rubber	M210670A-1	1	5		B	B
	5	6917 1511	White key set	M110550A-1	1	1		A	B
	6	6917 1522	Black key set	M110551B-1	1	5		A	B
	7	6917 4510	Stopper 216	M411074-1	1	10		C	A
	8	6921 6480	Slide knob 601	M311859-2	1	10		B	A
N	9	6922 7180	Upper case sub ass'y	M211568*6	1	1		C	E
	10	6917 1491	Upper key stopper	M310881A-1	1	10		C	A
	11	6917 1500	Key stopper 216	M411040-1	2	10		C	A
N	12	6922 6230	Rubber button M546	M211555-3	1	1		C	C
N	13	6906 6965	Lower case sub ass'y	M211570E*5	1	1		C	E
	13-1	6345 2238	Battery spring (+) A-G55	A42606B-1	1	20		C	A
	13-2	6912 2630	Battery spring (-) 120	M42382-1	1	10		C	A
	14	6921 6500	Battery cover 546	M311914-1	1	5		B	A
N	15	6922 9490	Rating label	M411126-17	1	10		C	A
	16	0009 2682	Screw	2.6 x 8 ZMC-3	21	20		C	A
	17	0009 5573	Screw	2.6 x 10 ZMC-3	15	20		C	A

Notes: N – New parts
M – Minimum order/supply quantity
R – Rank

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