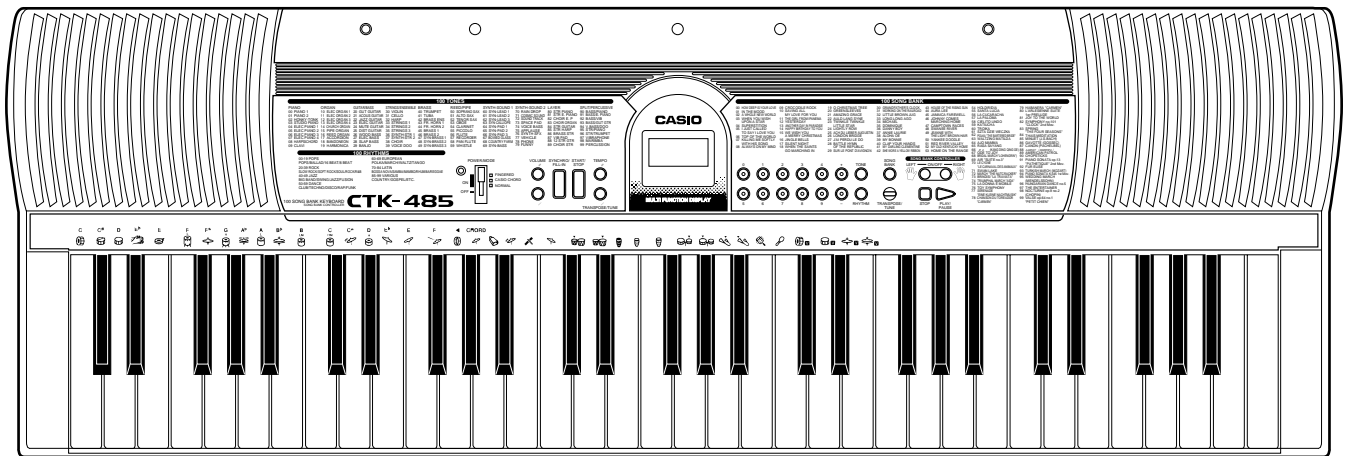


CASIO®

Service Manual

(without price)

CTK-485



CTK-485

ELECTRONIC KEYBOARD

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SPECIFICATIONS

GENERAL

Model:	CTK-485
Keyboard:	61 standard-size keys, 5 octaves
Tones:	100
Polyphony:	12 notes maximum (6 for certain tones)
Auto accompaniment	
Rhythm Patterns:	100
Tempo:	Variable (236 steps, ♩ = 20 to 255)
Chords:	2 fingering methods (CASIO CHORD, FINGERED)
Rhythm controller:	START/STOP, SYNCHRO/FILL-IN
Song Bank	
Tunes:	100
Controllers:	PLAY/PAUSE, STOP, LEFT (ON/OFF), RIGHT (ON/OFF)
Multi function display	
Name display:	TONE, RHYTHM, SONG BANK name/number, keyboard settings name/ value
Tempo:	Tempo value, metronome, synchro standby, beat indicator
Other functions	
Transpose:	12 steps (–6 semitones to +5 semitones)
Tuning:	Variable (A4 = approximately 440 Hz ± 50 cents)
Volume:	0 to 9 (10 steps)
Terminals	
Phones/output terminal:	Stereo standard jack Output Impedance: 70 Ω Output Voltage: 2.4 V (RMS) MAX
Power supply terminal:	9 V DC
Power supply:	Dual power supply system
Batteries:	6 AA-size batteries
Battery life:	Approximately 2 hours (SUM-3/R6P)/4 hours (AM3/LR6)
AC adaptor:	AD-5
Auto power off:	Turns power off approximately 6 minutes after last key operation. Enabled under battery power only, can be disabled manually.
Speaker output:	2.0 W + 2.0 W
Power consumption:	9 V ⎓ 7.0 W
Dimensions (HWD):	91.0 × 32.2 × 9.0 cm (35 7/8 × 12 11/16 × 3 9/16 inches)
Weight:	Approximately 4.0 kg (8.8 lbs) (without batteries)

ELECTRICAL

Current drain with 9 V DC:

No sound output

137 mA \pm 20 %

Maximum volume

710 mA \pm 20 %

with white keys C1 to G2 pressed in Synth-Lead 1

Volume: maximum.

Speaker output level (Vrms with 40 Ω load each channel):

with key A1 pressed in Synth-Lead 1

L-ch: 1,260 mV \pm 20%

R-ch: 1,200 mV \pm 20%

Phone output level (Vrms with 8 Ω load each channel):

with key A2 pressed in Synth-Lead 1

L-ch: 93 mV \pm 20%

R-ch: 90 mV \pm 20%

Minimum operating voltage:

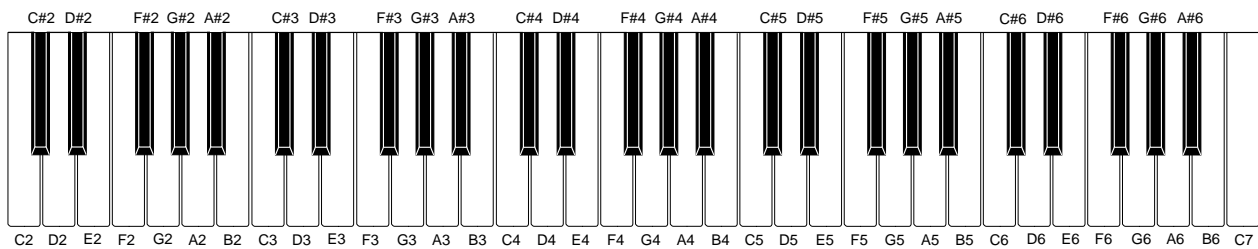
6.0 V

CIRCUIT DESCRIPTION

KEY MATRIX

	KI0	KI1	KI2	KI3	KI4	KI5	KI6	KI7
KO0	C1	G#1	E2	C3	G#3	E4	C5	G#5
KO1	C#1	A1	F2	C#3	A3	F4	C#5	A5
KO2	D1	A#1	F#2	D3	A#3	F#4	D5	A#5
KO3	D#1	B1	G2	D#3	B3	G4	D#5	B5
KO4	E1	C2	G#2	E3	C4	G#4	E5	C6
KO5	F1	C#2	A2	F3	C#4	A4	F5	
KO6	F#1	D2	A#2	F#3	D4	A#4	F#5	
KO7	G1	D#2	B2	G3	D#4	B4	G5	
KO8	—	+	0	Tempo ▼	Tempo ▲	Volume ▼	Volume ▲	
KO9	3	2	1	Start/Stop	Synchro/ Fill in			
KO10	6	5	4	Transpose/ Tune	Song Bank	Rhythm	Tone	
KO11	9	8	7	Fingered	Casio Chord	Normal	Power off	
KO12		Right	Play/Pause	Stop	Left			

NOMENCLATURE OF KEYS



CPU (LSI1: MSM6755B-17)

The CPU reads sound data from the ROM in accordance with the pressed key and the selected tone; the CPU can read rhythm data simultaneously when a rhythm pattern is selected. Then it provides the left and the right channels' waveforms separately, by converting the data into the waveforms with two built-in DACs. The CPU also controls key and button input. The following table shows the pin functions of LSI1.

Pin No.	Terminal	In/Out	Function
1	MA14	Out	Address bus
2, 3	NCO	—	Not used
4 ~ 19	MA0 ~ MA13	Out	Address bus
13	MRDB	Out	Read enable signal
17	MCSB	—	Not used
20 ~ 27	MD0 ~ MD7	In/Out	Data bus
28, 29	NC1, NC2	—	Not used
30	DGND	In	Ground (0 V) source
31	DVCC	In	+5 V source
32, 33	XTLO, XTLI	In/Out	20 MHz clock input/output
34	NC3	—	Not used
35	RSTB	In	Reset signal input
36, 37	P24/RXD, P25/TXD	—	Not used
38	NMI	In	Power ON signal input. Connected to +5 V.
39	APO	Out	APO (Auto Power Off) signal output
40	NC4	—	Not used
41	REFH	Out	Terminal for the internal DAC
42, 43	NC5, NC6	—	Not used
44	DAOR	Out	Right channel sound waveform output
45	NC7	—	Not used
46	AVdac	In	+5 V source for the internal DAC
47	DAOL	Out	Left channel sound waveform output
48	REFL	Out	Terminal for the internal DAC and ADC
49	AGdac	In	Ground source for internal DAC
50	AGadc	In	Ground source for internal ADC
51	ANI	In	APO cancellation signal
52	AVadc	In	+5 V source for the internal ADC
53	NC8	—	Not used
54	MOD0	In	Mode selection terminal. Connected to +5 V.
55, 56	MOD1, MOD2	In	Mode selection terminal. Connected to ground.
57	P40	—	Not used
58 ~ 65	KI0/P30 ~ KI7/P37	In	Terminals for key/button input signal
66 ~ 73	KO0/P50 ~ KO7/P57	Out	Terminals for key scan signal
74 ~ 77	DB4 ~ DB7	Out	Data bus for the LCD driver
78	NC9	—	Not used
79	LVCC	In	+5 V source

Pin No.	Terminal	In/Out	Function
80 ~ 84	KO8 ~ KO12	Out	Terminals for button scan signal
85 ~ 87	P65 ~ P67	—	Not used
88	RS	Out	Control signal for the LCD driver
89	R/W	Out	Read/Write signal for the LCD driver
90	E	Out	Chip enable signal for the LCD driver
91 ~ 95	P73 ~ P77	—	Not used
96	LGND	In	Ground source
97, 100	MA18, MA15	Out	Address bus

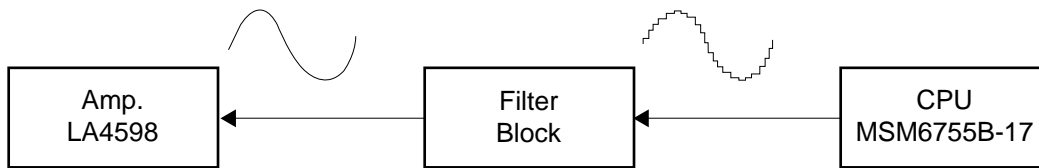
LCD DRIVER (LSI3: KS0066U-10B)

The LCD driver can drive a dot matrix LCD having 40 segment and 16 common lines. The LSI contains 240 graphic symbols in the built-in character generator ROM, and stores 80 characters in the built-in display data RAM. In accordance with command from the CPU, the LSI is capable of displaying up to 16 characters simultaneously. The following table shows the pin functions of LSI3.

Pin No.	Terminal	In/Out	Function
1 ~ 22, 63 ~ 80	SEG1 ~ SEG40	Out	Segment signal output
23	VSS	—	GND (0 V) source
24, 25	OSC1, OSC2	In/Out	Terminals for the built-in clock pulse generator. The external resistor connected determines the oscillation frequency.
26 ~ 30	V1 ~ V5	In	LCD drive voltage input. Those voltages are used for generating the stepped pulse of the LCD drive signals.
31, 32	LP, XCLS	—	Not used
33	VDD	In	DVDD (+5 V) source
34, 35	FR, DO	—	Not used
36	RS	In	Data/command determination terminal. High: data, Low: command
37	R/W	In	Read/Write terminal. High: read, Low: write
38	E	In	Chip enable signal. High: enable, the writing is done at fall edge. Low: disenable
39 ~ 42	DB0 ~ DB3	—	Not used. Connected to GND (0 V)
43 ~ 46	DB4 ~ DB7	In/Out	Data bus
47 ~ 62	COM1 ~ COM16	Out	Common signal/output

FILTER BLOCK

Since the sound signals from the CPU is stepped waveforms, the filter block is added to smooth the waveforms.



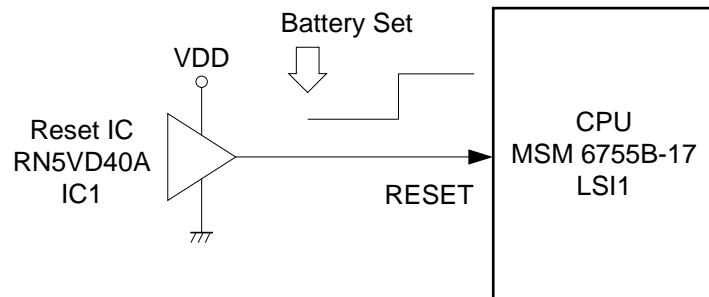
POWER AMPLIFIER (IC101: LA4598)

The power amplifier is a two-channel amplifier with standby switch. The following table shows the pin function of IC101.

Pin No.	Terminal	In/Out	Function
1	Power	GND	In Ground (0 V) source
2	Ch1 B.S.	—	Terminal for a bootstrap capacitor
3	Ch1 OUT	Out	Channel 1 output
4	VCC	In	+9 V source
5	Ch1 N.F.	In	Negative feedback input
6	Ch1 IN	In	Channel 1 input
7	D.C.	—	Terminal for a decoupling capacitor
8	Pre GND	In	Ground (0 V) source
9	Stand by	In	Power control signal input. 0 V: Off, +9 V: On
10	Ch2 IN	In	Channel 2 input
11	Ch2 N.F.	In	Negative feedback input
12	Ch2 OUT	Out	Channel 2 output
13	Ch2 B.S.	—	Terminal for a bootstrap capacitor
14	NC	—	Not used

INITIAL RESET CIRCUIT

When batteries are set or an AC adapter is connected, the reset IC provides a low pulse to the CPU. The CPU then initializes its internal circuit.



TROUBLESHOOTING

Nature of Trouble	Faulty Block	Cause/Remedy
No power	Power supply circuit	Faulty IC101. Replace IC101.
		Faulty D104 ~ D106. Replace D104 ~ D106.
		Faulty Q101 ~ Q104. Replace Q101 ~ Q104.
	Power switch	Poor contact. Clean the contacts.
	Power jack (J101)	Open J101 or poor soldering. Replace J101 or resolder.
No sound at all	Power Amp (IC101: LA4596)	Open or shorted IC101. Replace IC101.
	CPU (LSI1: MSM6755B-17)	Faulty LSI1. Replace LSI1.
	Oscillator	Faulty Q1. Replace Q1. Open X1. Replace X1.
Certain keys or switches do not function	Key and switch matrix	Open circuit on KO or KI line. Replace keyboard PCB assembly.
	CPU (LSI1: MSM6755B-17)	Faulty LSI1. Replace LSI1.
A certain key or switch does not function	Key and switch matrix	Dust on the contact.

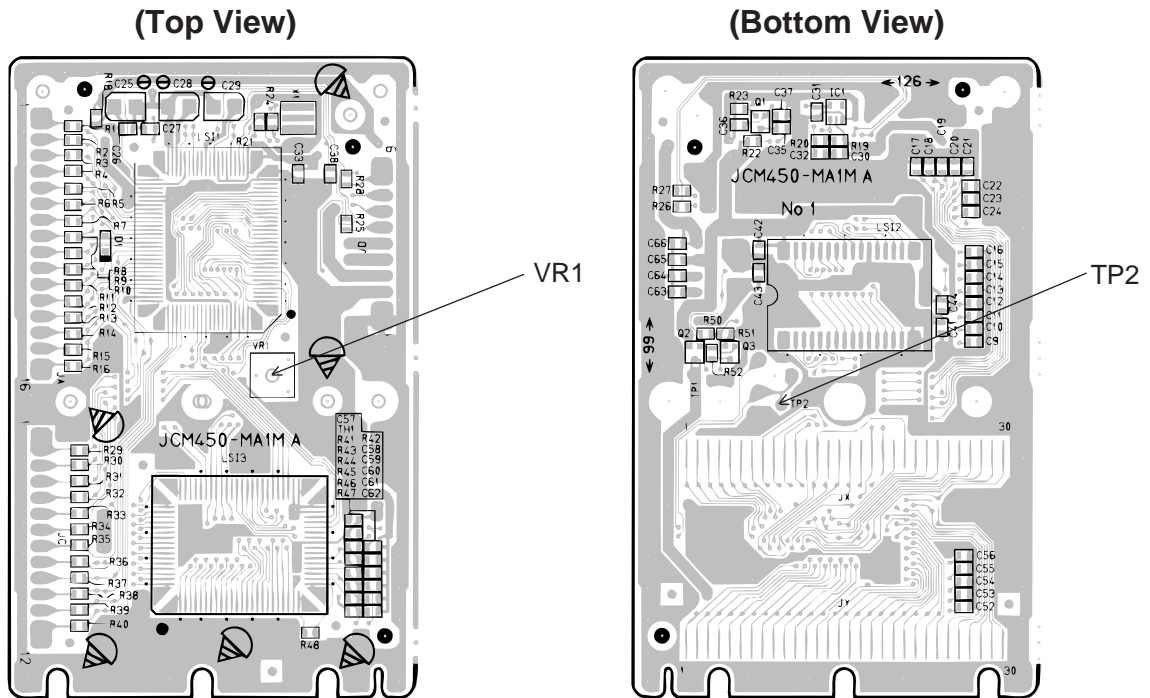
ADJUSTMENT

MAIN PCB

1) Items to be adjusted:

Item	Measuring Instrument
Vop voltage setting	Voltmeter

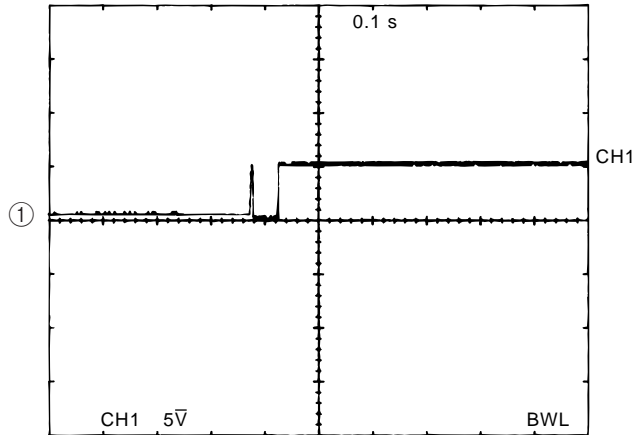
2) Adjustment and Test Point Locations



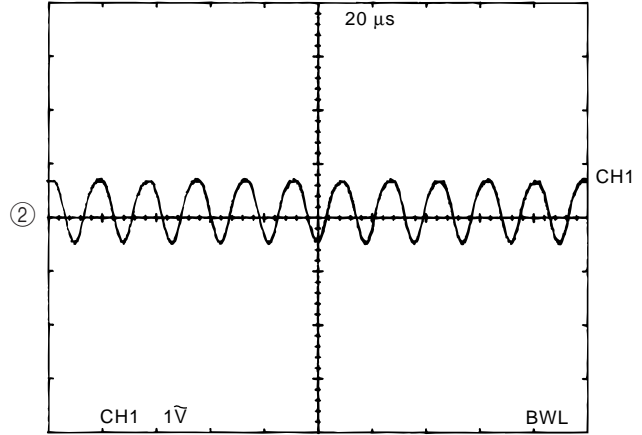
3) Equipment connection/Procedure

Vop voltage setting						
Input Connection	Input Point	Input Signal	Adjust	Output Connection	Output Point	Adjust for
—	—	—	VR1	Voltmeter	TP2	Adjust for 4.2 ~ 4.3 V reading on voltmeter under the temperature 20 ~ 25 °C. Make fine adjustment according to the following instruction.
<p>Watching the LCD at a 41.20° angle to the horizontal, adjust Vop voltage so that unenergized segments are seen dimly.</p>						

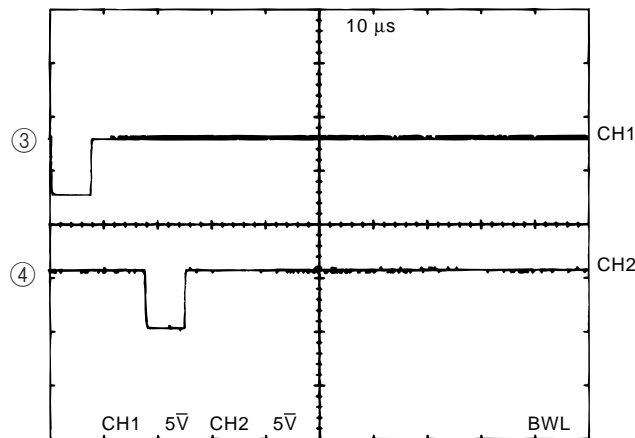
MAJOR WAVEFORMS



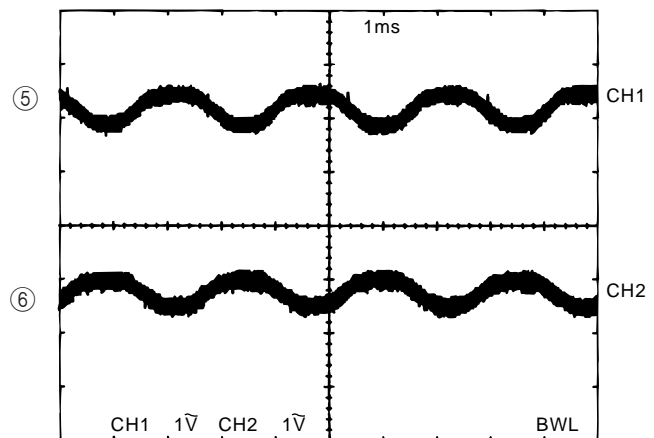
① RESET signal
IC 1 pin 1



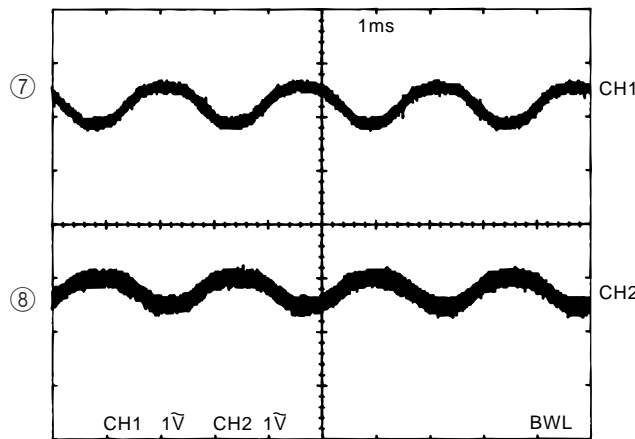
② Main clock pulse
MSM6755B-17 pin 32



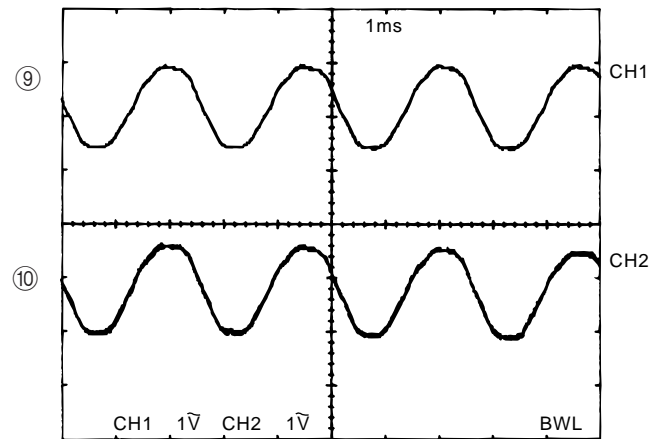
③ Key scan signal KO10
MSM6755B-17 pin 72
④ Key scan signal KO11
MSM6755B-17 pin 73



⑤ Sound signal output (L-ch)
MSM6755B-17 pin 47
⑥ Sound signal output (L-ch)
Q106 2SC1740SQ Emitter



⑦ Sound signal output (R-ch)
MSM6755B-17 pin 44
⑧ Sound signal output (R-ch)
Q107 2SC1740SQ Emitter

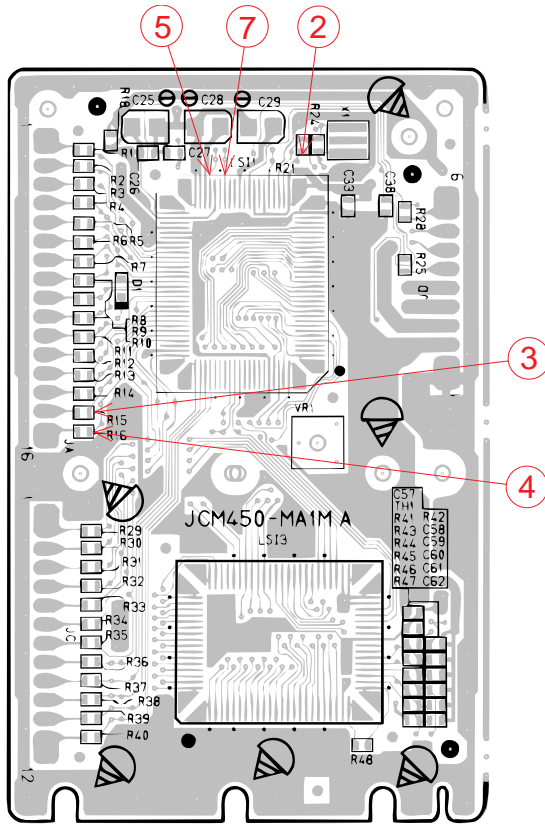


⑨ Sound signal output (R-ch)
LA4598 pin 3
⑩ Sound signal output (L-ch)
LA4598 pin 12

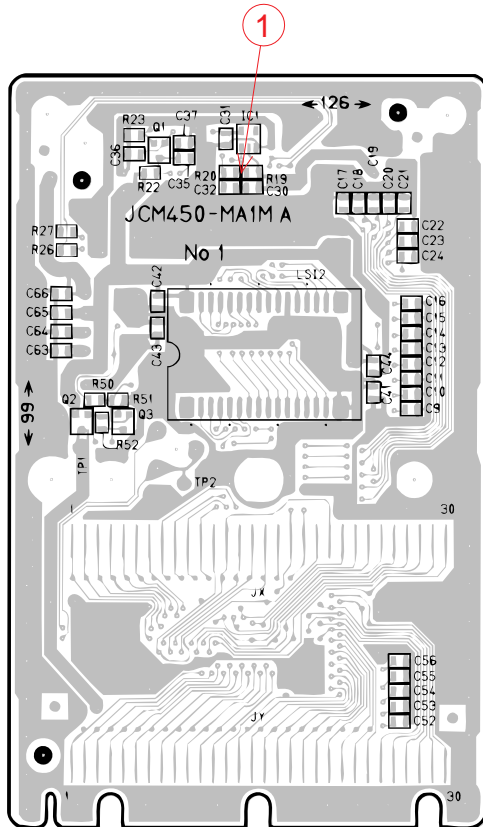
Tone: Flute Ensemble
Key: A3
Volume: 7

PRINTED CIRCUIT BOARDS

Main PCB JCM450-MA1M

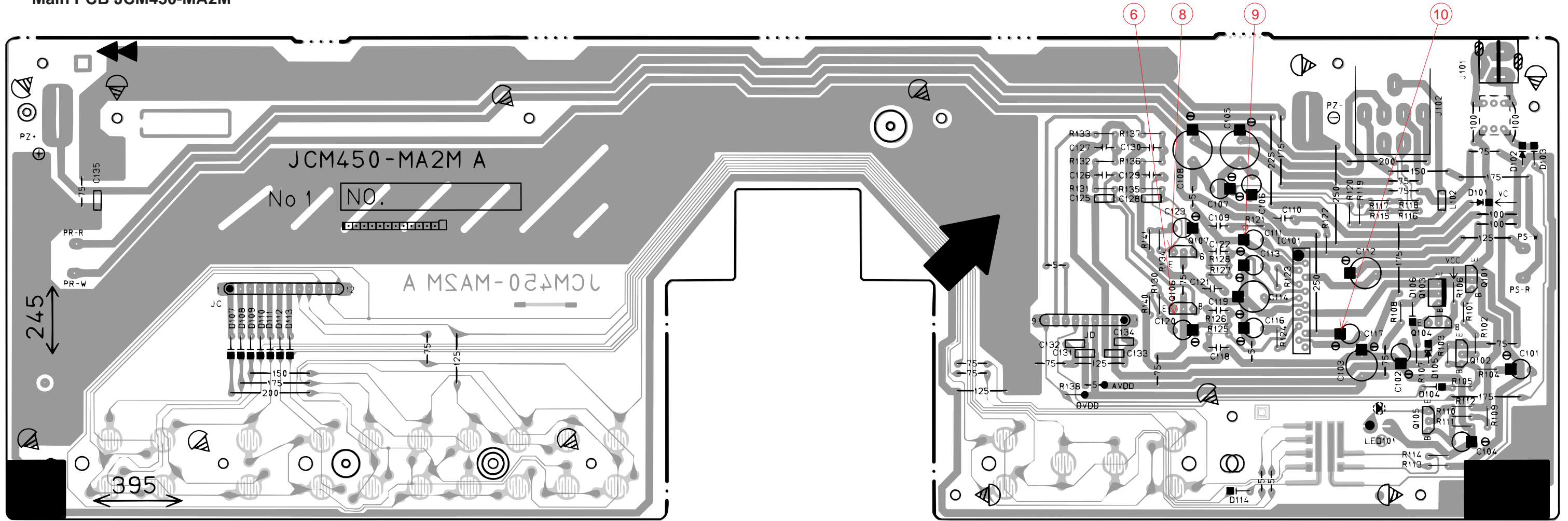


Top View

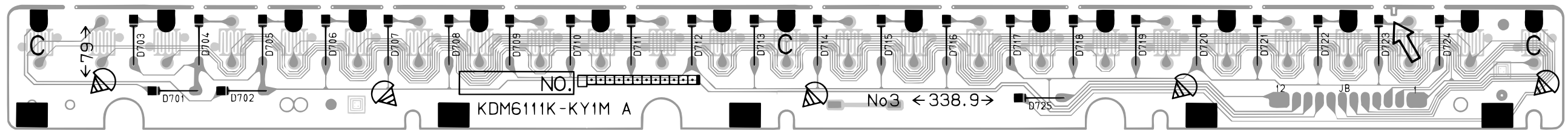


Bottom View

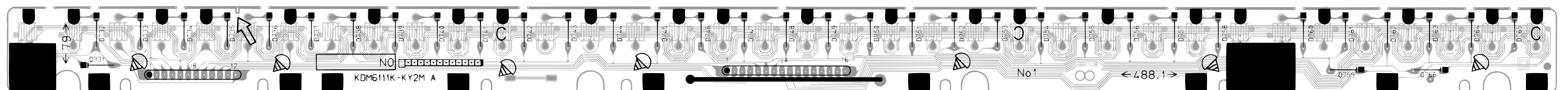
Main PCB JCM450-MA2M



Keyboard PCB KDM6111K-KY1M

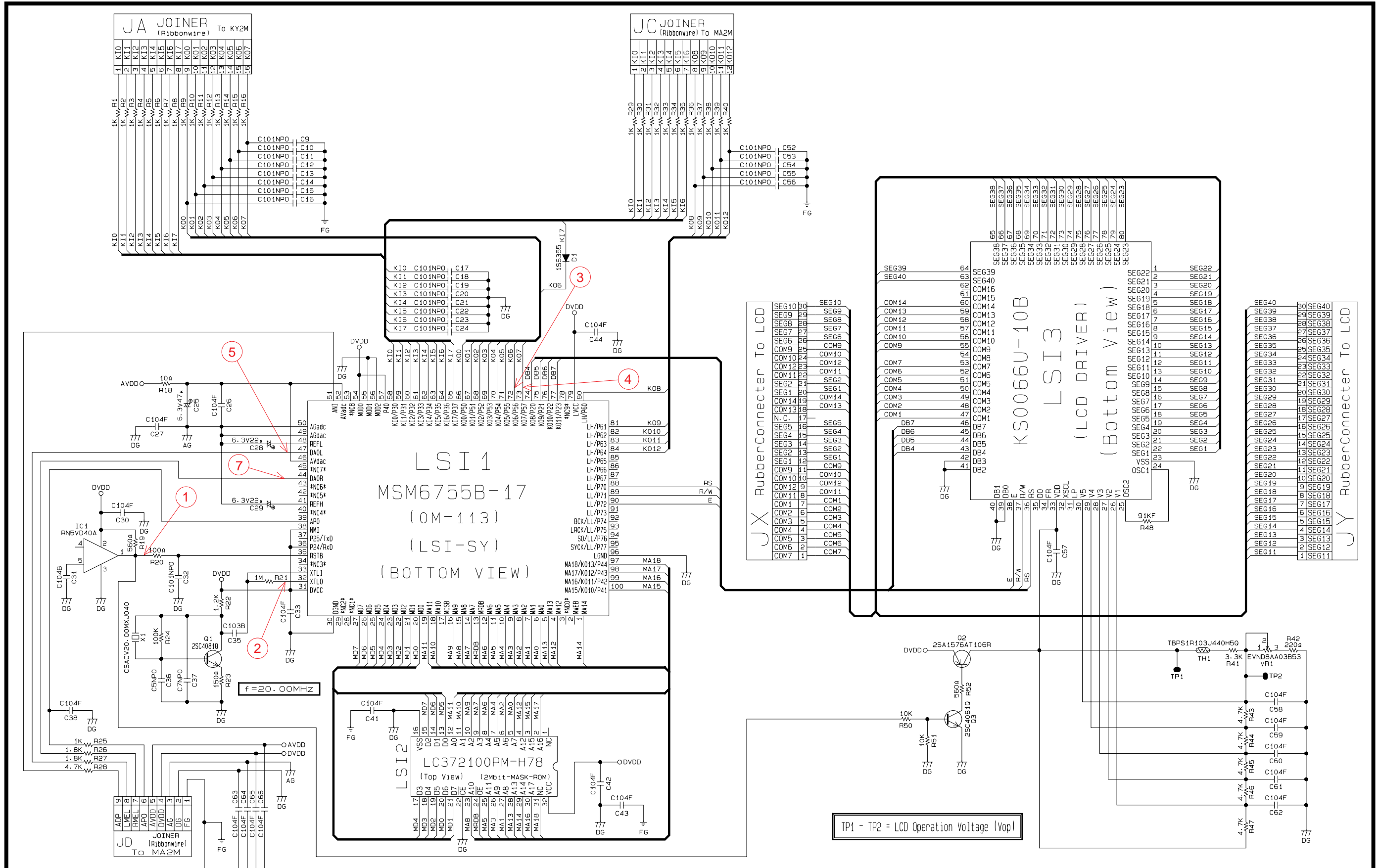


Keyboard PCB KDM6111K-KY2M

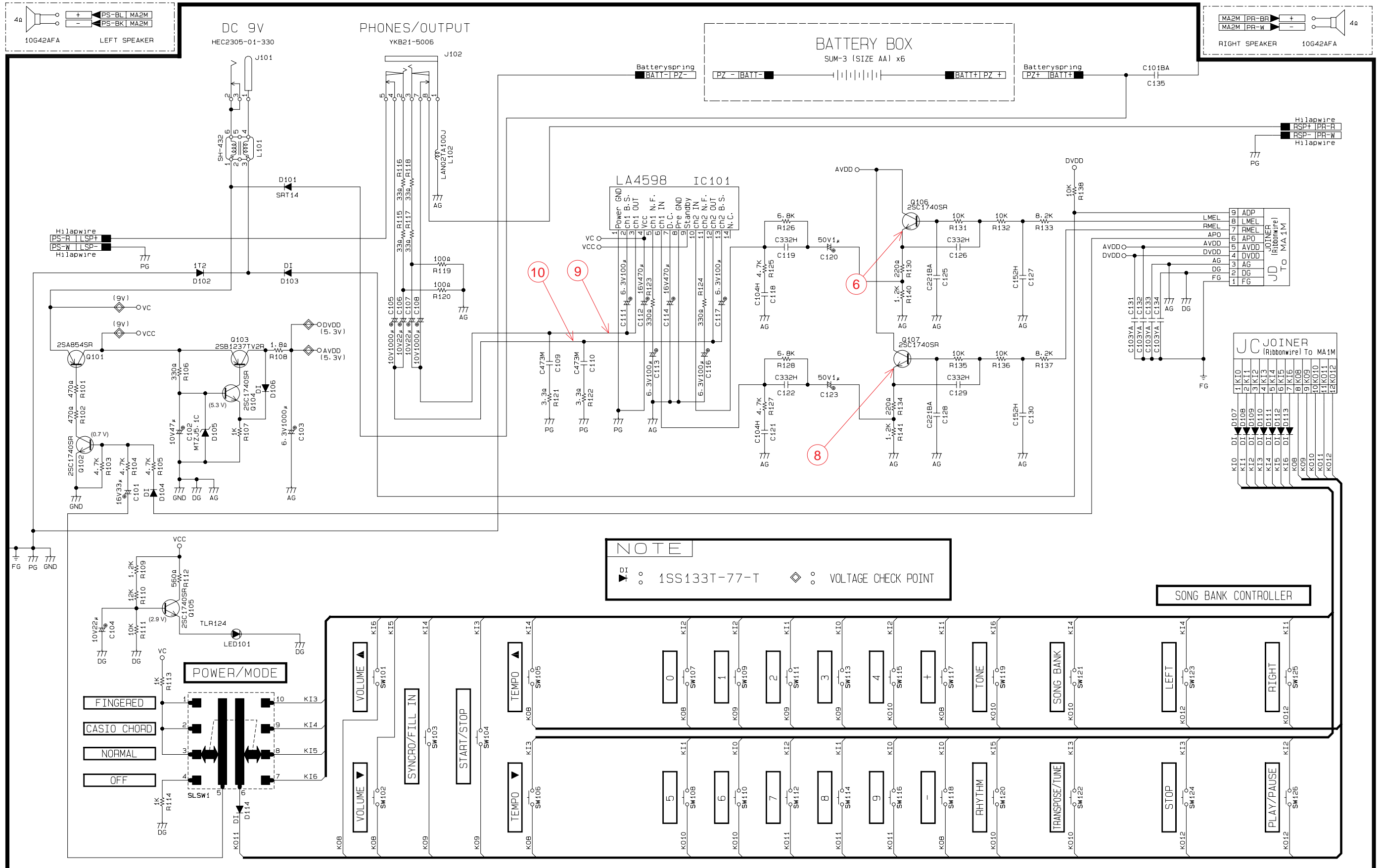


SCHEMATIC DIAGRAMS

Main PCB JCM450-MA1M

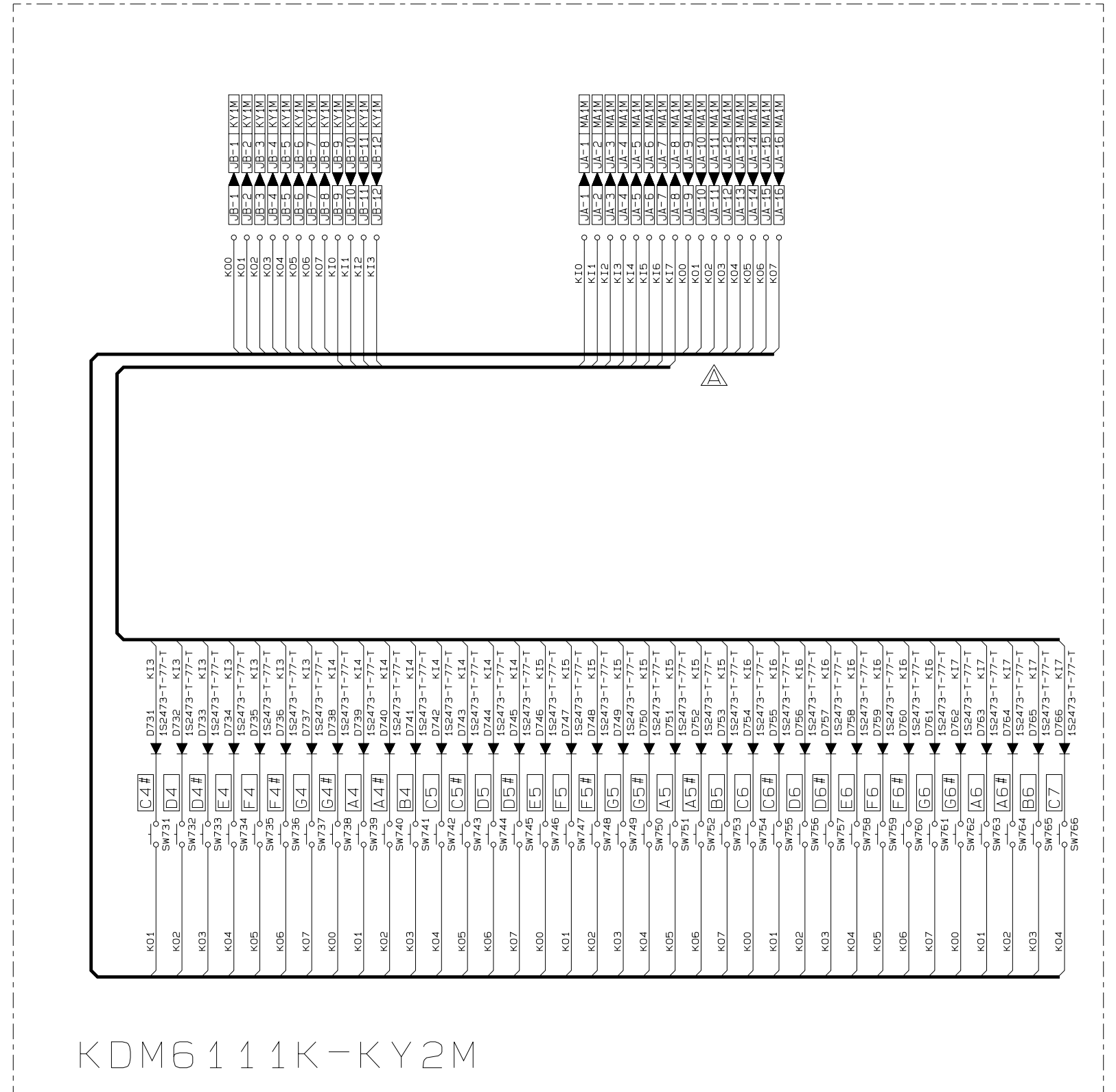
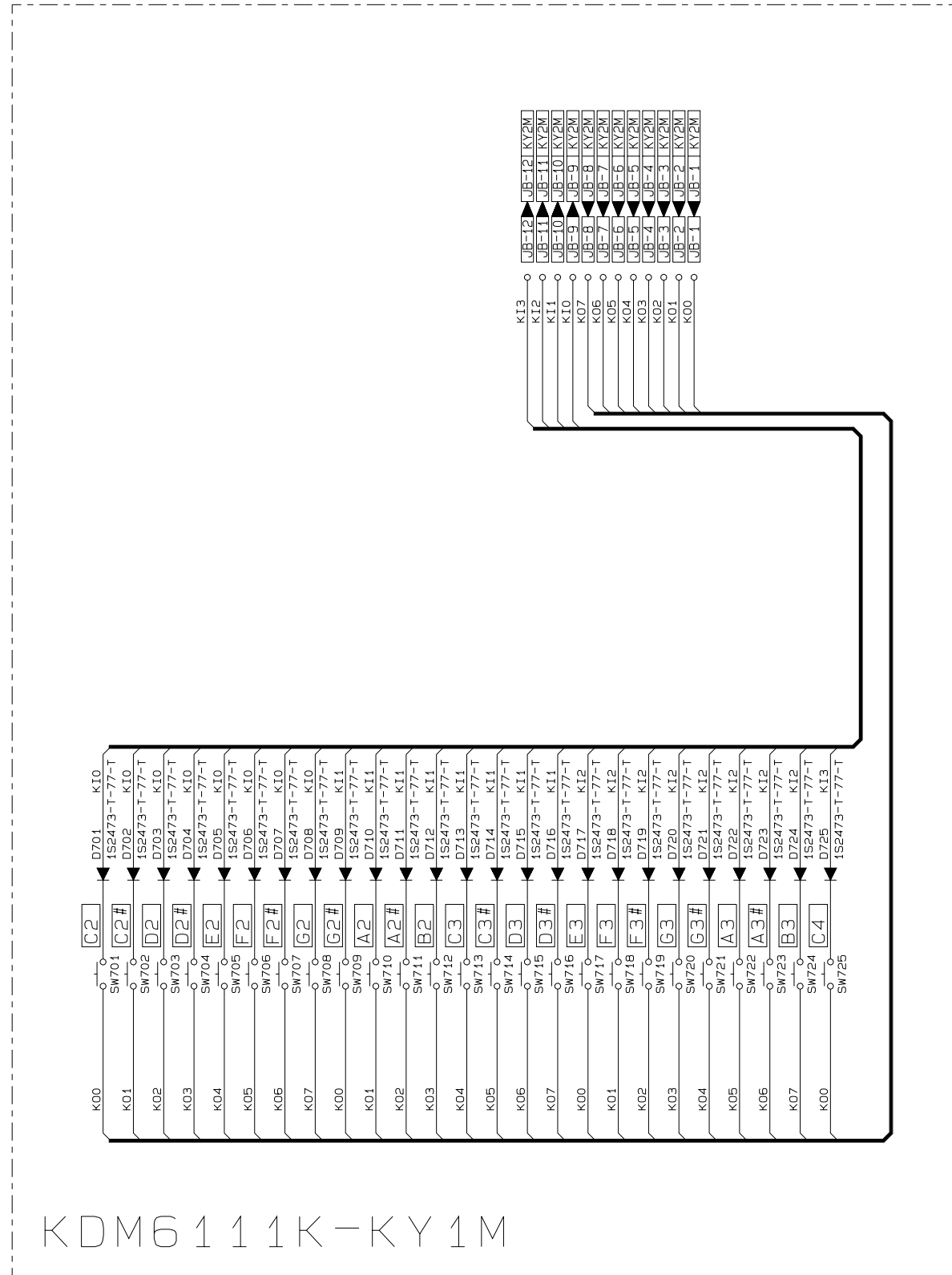


Main PCB JCM450-MA2M



NOTE
 ▲ ○ : 1SS133T-77-T ◇ ○ : VOLTAGE CHECK POINT

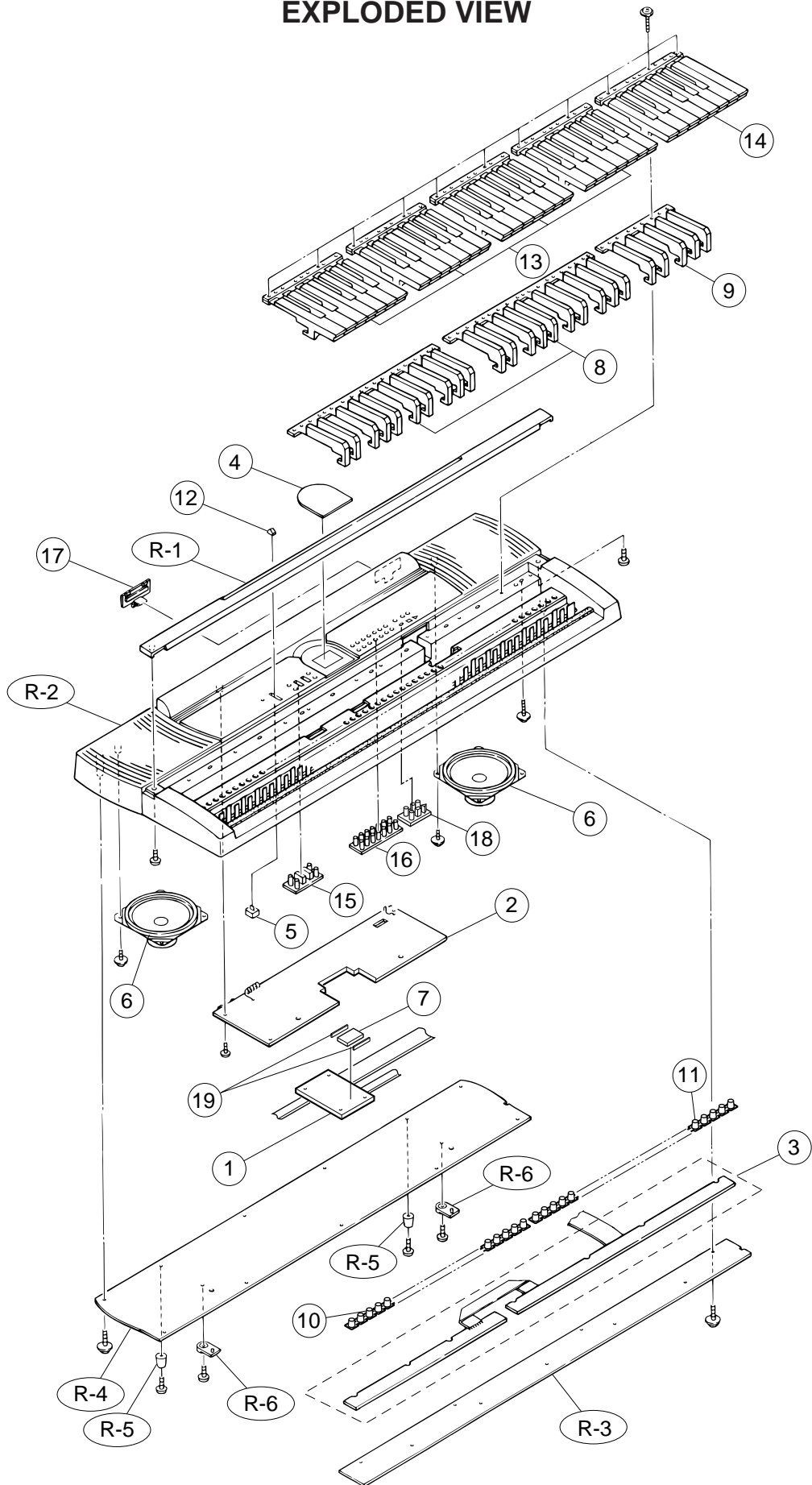
Keyboard PCBs KDM6111K-KY1M/KY2M



Notes:

1. All capacitance values are indicated in "μF" (p=10⁻⁶ μF).
2. All resistance values are indicated in "Ω" (k=10³Ω, M=10⁶Ω).

EXPLODED VIEW



PARTS LIST

CTK-485

Notes: This parts list does not include the cosmetic parts, which parts are marked with item No. "R-X" in the exploded view.

Contact our spare parts department if you need these parts for refurbish.

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.	Parts Name	Specification	Q	R
Main PCB					
1	6926 6310	PCB ASSY/M450-MA1M	M240821*1	1	B
2	6926 6320	PCB ASSY/M450-MA2M	M140731*1	1	B
D1	2390 1820	DIODE/CHIP	1SS355TE-17	1	C
D101	2390 3021	DIODE	SRT14	1	C
D102	2390 3018	DIODE	1T2	1	C
D103,D104 D106 - D114	2390 1344	DIODE	1SS133T-77-T	11	C
D105	2360 1939	DIODE	MTZJ5.1CT-77-T	1	C
IC1	2012 1883	IC/MOS	RN5VD40AA-TR	1	B
IC101	2114 2891	IC/LINEAR	LA4598	1	B
J101	3501 7049	JACK/POWER	HEC2305-01-330	1	C
J102	3612 0665	JACK/PHONE	YKB21-5006	1	C
L102	3841 2051	INDUCTOR	LAN02TA100J	1	C
LED101	2320 3146	LED	TLR124	1	C
LS1	2012 5603	LSI	MSM6755B-17	1	A
LSI2	2012 5937	LSI	LC372100PM-H78TE-L	1	A
LSI3	2012 5935	LSI	KS0066U-10B	1	A
Q1 / Q3	2252 1239	TRANSISTOR	2SC4081T106Q	2	B
Q101	2200 2481	TRANSISTOR	2SA854SR-TP-T	1	B
Q102, Q104 - Q107	2220 1409	TRANSISTOR	2SC1740SR-TP-T	5	B
Q103	2250 1591	TRANSISTOR	2SB1237TV2R	1	B
Q2	2250 1162	TRANSISTOR	2SA1576AT106R	1	B
VR1	2775 0994	VOLUME/SEMI-FIXED	EVND8AA03B53	1	C
X1	2590 2741	OSCILLATOR/CERAMIC	CSACV20.00MXJ040-TC	1	C
Console PCB ass'y					
3	6925 1310	PCB ASSY/KY	M140402*4	1	B
D701 - D725	2301 0101	DIODE	1SS2473	25	C
D731 - D766	2301 0101	DIODE	1SS2473	36	C
Mechanical Parts					
4	6926 6790	PANEL/DISPLAY	M340785-1	1	C
5	6909 5890	KNOB	CSB-12D	1	C
6	3831 0665	SPEAKER	10G42AFA	2	B
7	3335 6677	LCD	CA480-TS	1	A
8	6922 2740	KEY SET/BLACK 10-KEY	M111726-1	2	A
9	6922 2750	KEY SET/BLACK 5-KEY	M111726-2	1	A
10	6922 3990	RUBBER/CONTACT	M111764-1	1	B
11	6922 4000	RUBBER/CONTACT	M111765-1	1	B
12	6921 5030	KNOB/SLIDE	M311859-1	1	C
13	6922 2720	KEY SET/LT-CB WHITE	M312118*1	4	A
14	6922 2730	KEY SET/LT-CB WHITE	M312118*2	1	A
15	6926 6750	RUBBER/BUTTON	M340417-4	1	C
16	6926 6760	RUBBER/BUTTON	M340418-3	1	C
17	6925 9840	COVER/BATTERY	M340485*2	1	C
18	6926 6770	RUBBER/BUTTON	M340783-1	1	C
19	6926 6780	INTERCONNECTOR	M440581-1	2	C
Accessory					
	6916 7880	STAND/MUSIC	M310827-1	1	C

Notes: Q – Quantity per unit

R – Rank

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