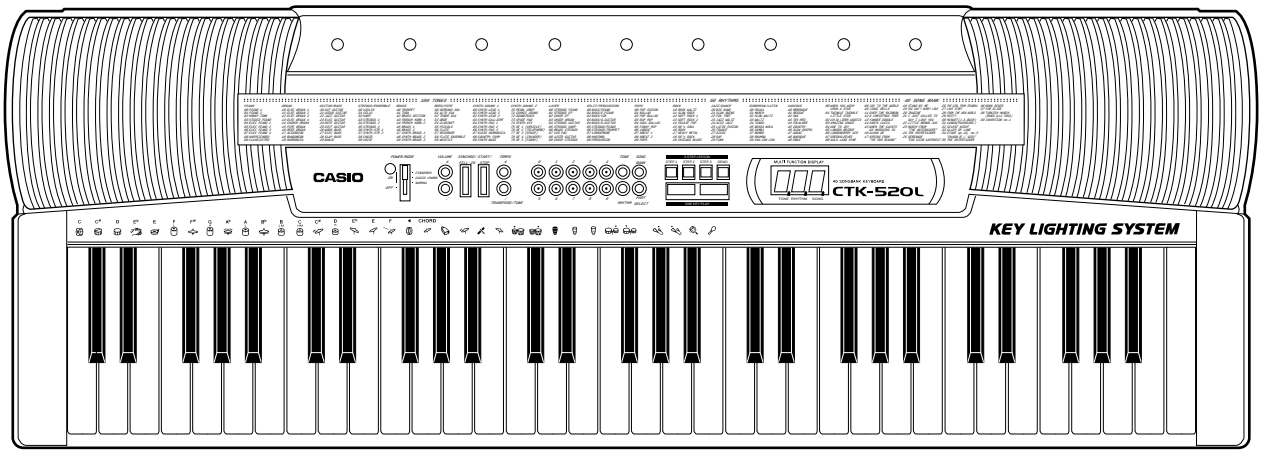
CASIO®

Service Manual

(without price)

CTK-520L



CTK-520L

ELECTRONIC KEYBOARD

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SPECIFICATIONS

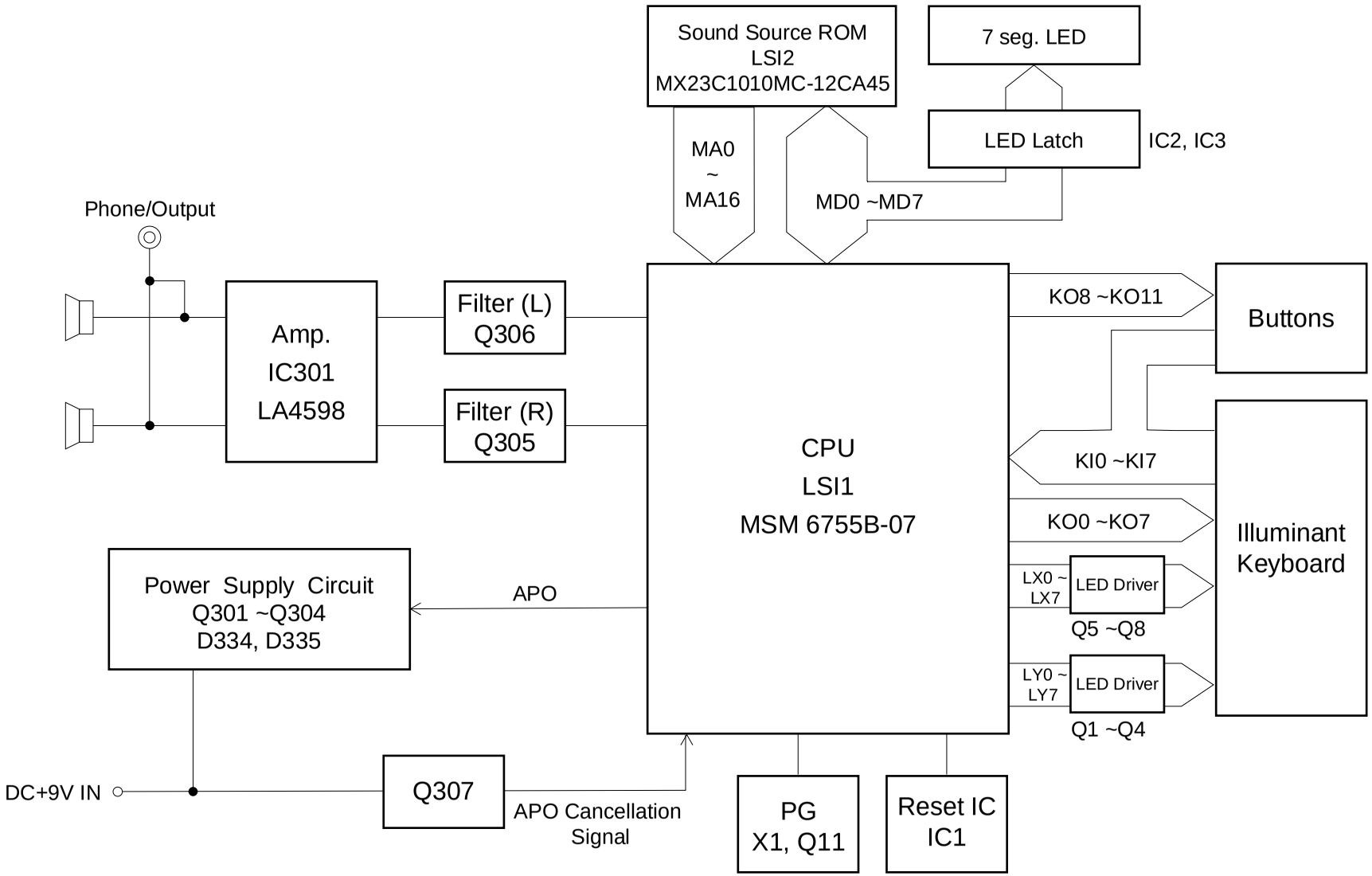
GENERAL

Number of keys:	61
Polyphonic:	12-note
Preset tones:	100
Transpose:	F# ~ C ~ F: half-note
Auto-rhythms:	50, Tempo: Adjustable, 216 steps (40 ~ 255), initial value: 120
Accompaniment:	CASIO Chord, Fingered
Song bank:	40-tune
Digital volume control:	10 steps (0 ~ 9), initial value: 7
Tuning control:	440 Hz ± 50 cents
Built-in speakers:	10 cm dia. 2 W input rating: 2 pcs
Terminals:	Headphone Jack (Output impedance: 50 ohm, Output voltage: 4.6 V (rms) MAX AC Adapter Jack (9 V) , Stereo standard Jack [Output impedance: 50 Ω, Output voltage: 2 V(rms) MAX]
Auto power off:	Approximately 6 minutes after the last operation
Power source:	2-way AC or DC source AC: AC adapter DC: 6 AA size
Power consumption:	7.7 W
Dimensions (HWD):	89 × 924 × 325 mm (3-1/2 × 36-7/16 × 12-13/16 inches)
Weight:	4.35 kg (9.6 lbs) excluding batteries

ELECTRICAL

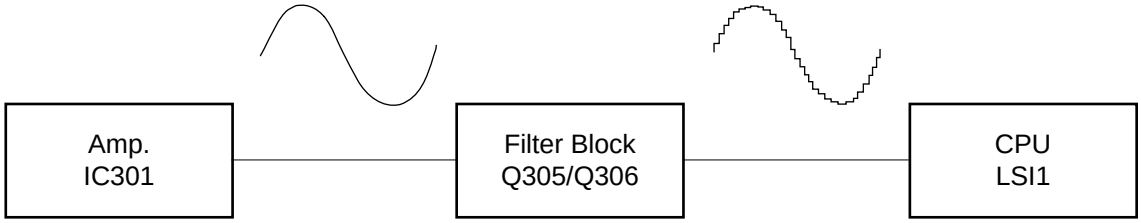
Current drain with 9 V DC:	
No sound output	130 mA ± 20%
Maximum volume	810 mA ± 20%
with white keys C1 to G2 pressed in Synth-Lead 1 Volume: Maximum	
Phone output level (Vrms with 8 ohm load each channel):	
with key D3 pressed in Synth-Lead 1	95 mV ± 20%
Speaker output level (Vrms with 4 ohm load each channel):	
with key D3 pressed in Synth-Lead 1	1050 mV ± 20%
Minimum operating voltage:	6.3 V

BLOCK DIAGRAM



FILTER BLOCK

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

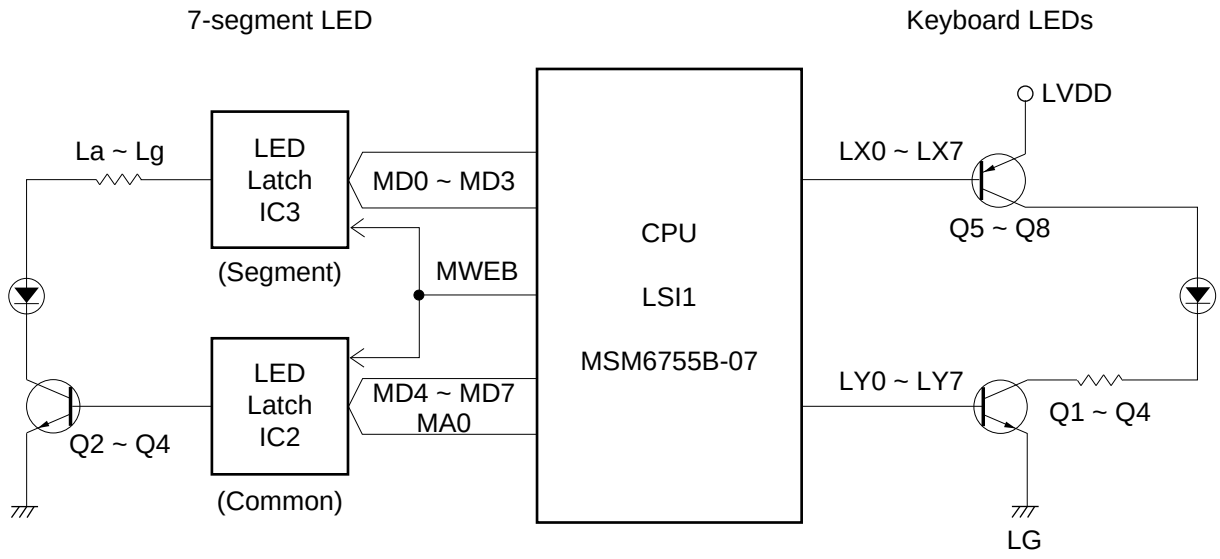


POWER AMPLIFIER (IC301: LA4598)

The power amplifier is a two-channel amplifier with standby switch.
The following table shows the pin function of IC301.

Pin No.	Terminal	In/Out	Function
1	Power GND	In	Ground (0V) source
2	Ch1 B.S.	—	Terminal for a bootstrap capacitor
3	Ch1 OUT	Out	Channel 1 output
4	VCC	In	+9V 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 (0V) 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

LED DRIVING



CIRCUIT DESCRIPTION

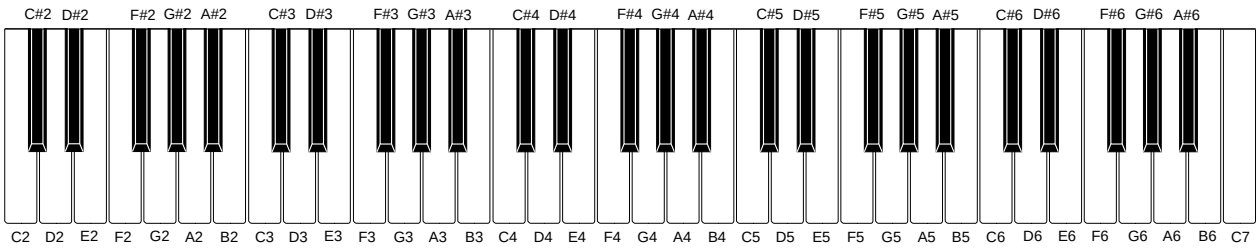
KEY MATRIX

	KI0	KI1	KI2	KI3	KI4	KI5	KI6	KI7
KO0	C2	G#2	E3	C4	G#4	E5	C6	G#6
KO1	C#2	A2	F3	C#4	A4	F5	C#6	A6
KO2	D2	A#2	F#3	D4	A#4	F#5	D6	A#6
KO3	D#2	B2	G3	D#4	B4	G5	D#6	B6
KO4	E2	C3	G#3	E4	C5	G#5	E6	C7
KO5	F2	C#3	A3	F4	C#5	A5	F6	
KO6	F#2	D3	A#3	F#4	D5	A#5	F#6	
KO7	G2	D#3	B3	G4	D#5	B5	G6	
KO8	0	1	2	3	4	Start/ Stop	Up	Volume Down
KO9	5	6	7	8	9	Down	Volume Down	Synchro/ Fill-In
K10	Tone	Rhythm	Song Bank	Part Select	One Key	One Key		Demo
K11	Step-1	Step-2	Step-3		Fingered	Casio Chord	Normal	Off

LED MATRIX

	LX0	LX1	LX2	LX3	LX4	LX5	LX6	LX7
LY0	D4	D3	C3	C2	G#2	F#2	D#2	C#2
LY1	C4	E3	B2	D2	A#2	C#3	D#3	F#3
LY2	B3	F3	A2	E2	D#4	C#4	A#3	G#3
LY3	A3	G3	G2	F2	F#4	G#4	A#4	C#5
LY4	E4	E5	F5	F6	G6			
LY5	F4	D5	G5	E6	A6	G#5	F#5	D#5
LY6	G4	C5	A5	D6	B6	A#5	C#6	D#6
LY7	A4	B4	B5	C6	C7	A#6	G#6	F#6

NOMENCLATURE OF KEYS



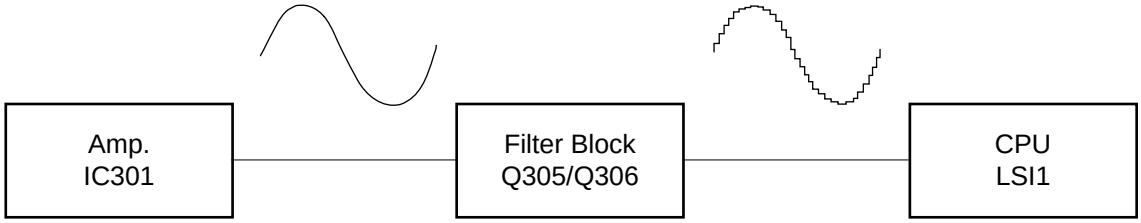
CPU (LSI1: MSM6755B-07)

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 input, button input and LED driving. The following table shows the pin functions of LSI1.

Pin No.	Terminal	In/Out	Function
1	MA14	Out	Address bus
2	MWEB	Out	Clock for LED latches
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. Connected to ground.
35	RSTB	In	Reset signal input
36	P24/RXD	—	Not used. Connected to +5 V.
37	P25/TXD	—	Not used.
38	NMI	In	Power ON signal input
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 and ADC
47	DAOL	Out	Left channel sound waveform output
48	REFL	Out	Terminal for the internal DAC and ADC
49	AGdac	In	Ground source for the internal DAC
50	AGadc	In	Ground source for the internal ADC
51	ANI	—	Not used. Connected to ground.
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	In	APO cancellation signal
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	KO8/P20 ~ KO11/P23	Out	Terminals for button input signal
78	NC9	—	Not used.
79	LVCC	In	+5 V source
80 ~ 95	LX0 ~ LX7, LY0 ~ LY7	Out	LED drive signal
96	LGND	In	Ground source
97, 98	MA18, MA17	—	Not used.
99, 100	MA16, MA15	Out	Address bus

FILTER BLOCK

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



POWER AMPLIFIER (IC301: LA4598)

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4	VCC	In	+9V source
5	Ch1 N.F.	In	Negative feedback input
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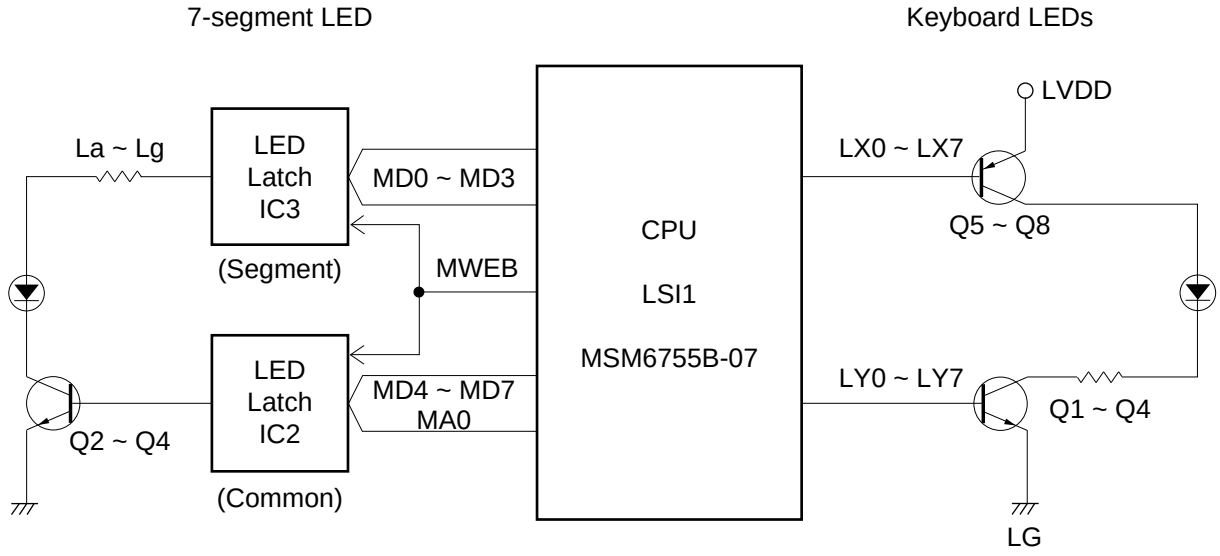
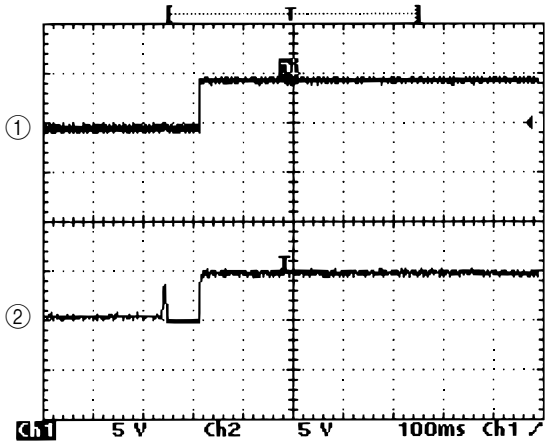
10	Ch2 IN	In	Channel 2 input
11	Ch2 N.F.	In	Negative feedback input
12	Ch2 OUT	Out	Channel 2 output
13	Ch2 B.S.	—	Terminal for a bootstrap capacitor
14	NC	—	Not used

LED DRIVING

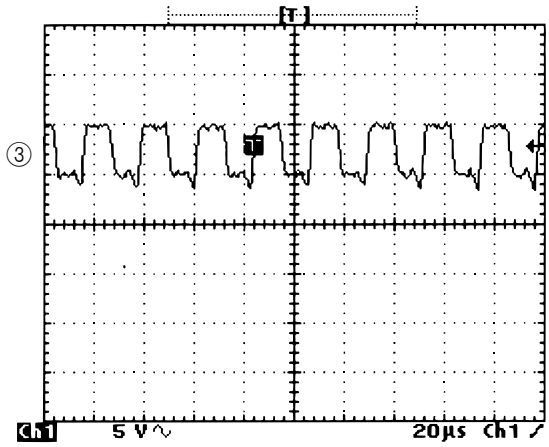


MAJOR WAVEFORMS

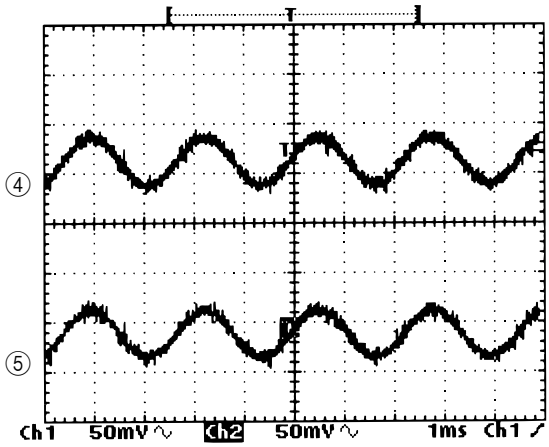


① APO signal
MSM6755B-07 pin 39

② Reset signal
RH5VL40AA pin 1



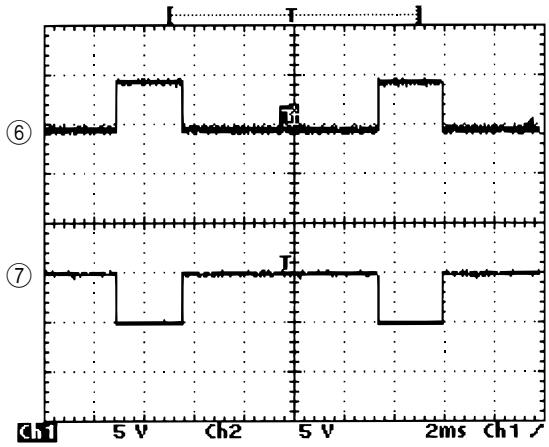
③ Clock
MSM6755B-07 pin 32



④ Sound signal (R-ch)
JH connector pin 3

⑤ Sound signal (L-ch)
JH connector pin 1

Tone: Whistle (59)
Key : A4

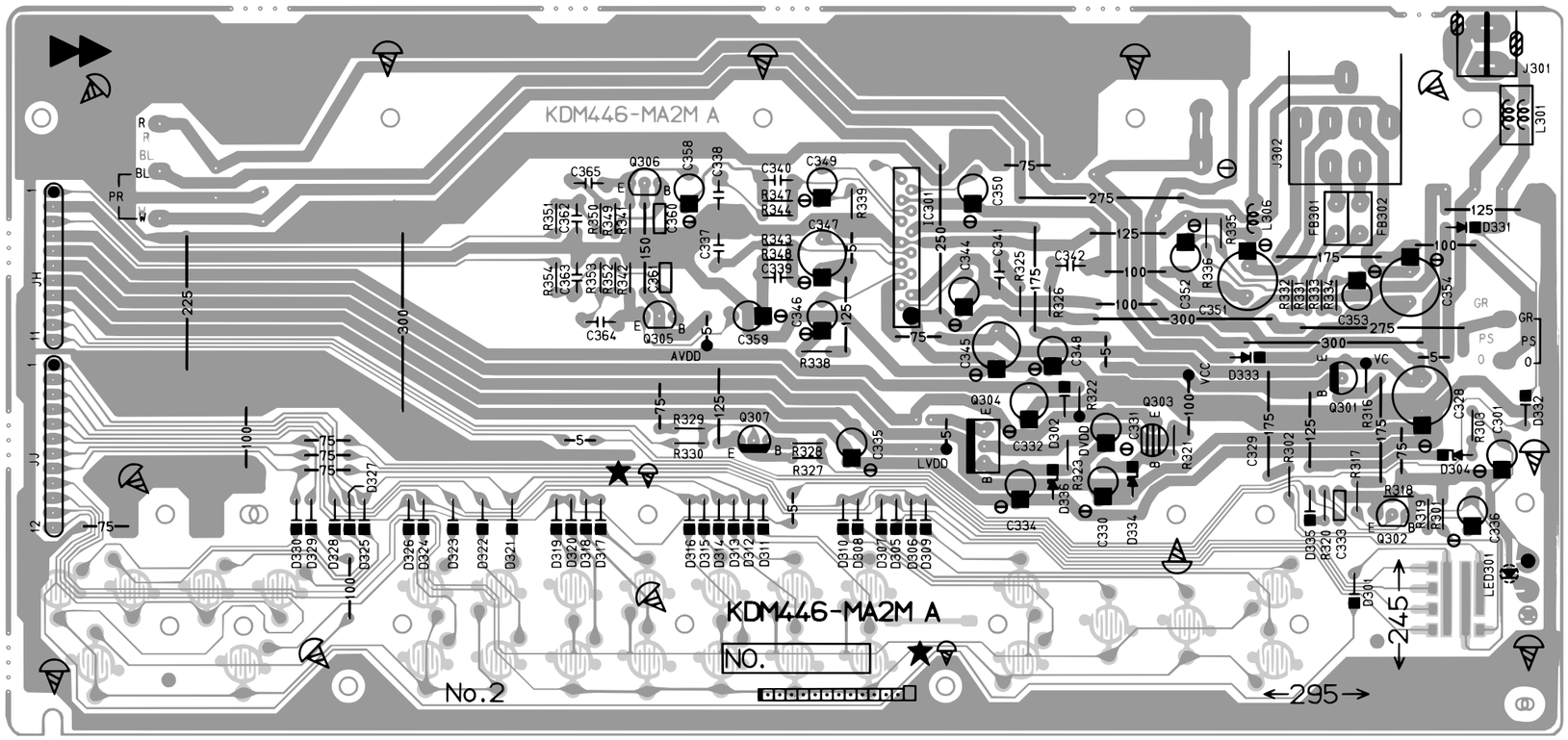


⑥ LED drive signal LX0
MSM6755B-07 pin 88

⑦ LED drive signal LY0
MSM6755B-07 pin 80

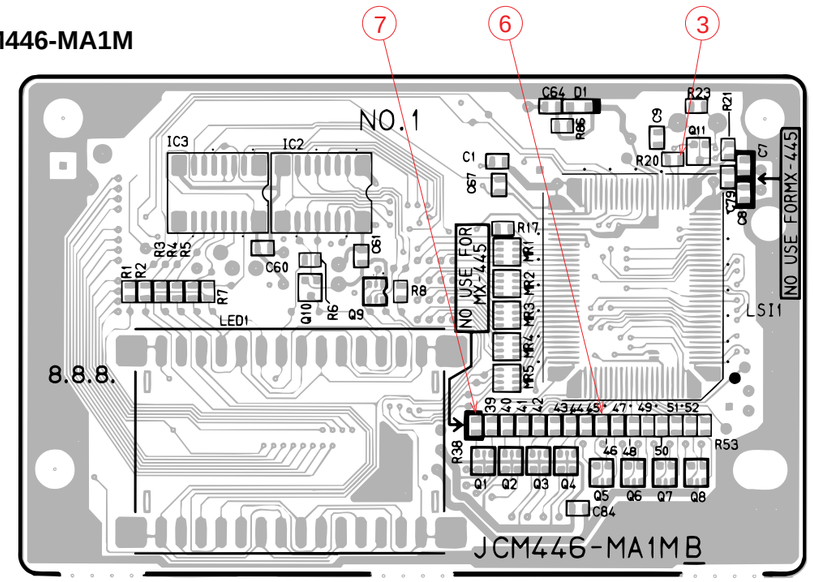
Key: D4

Sub PCB KDM446-MA2M

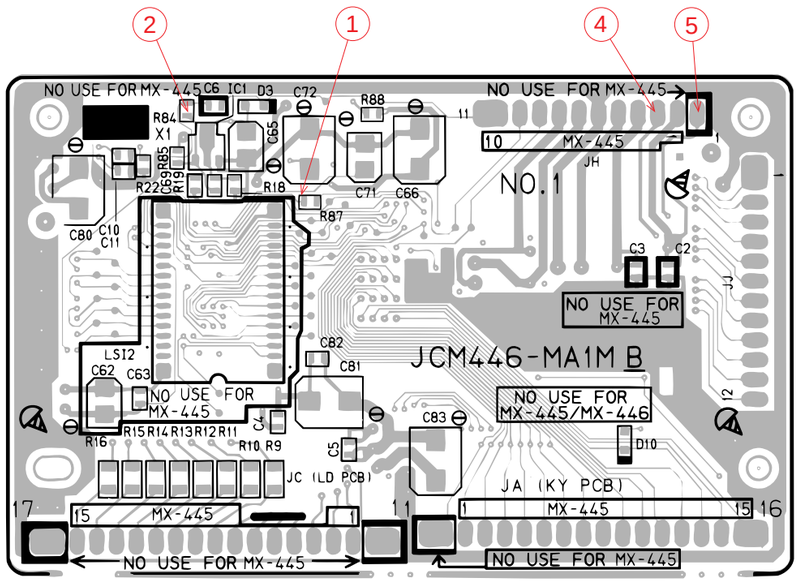


Top view

Main PCB JCM446-MA1M



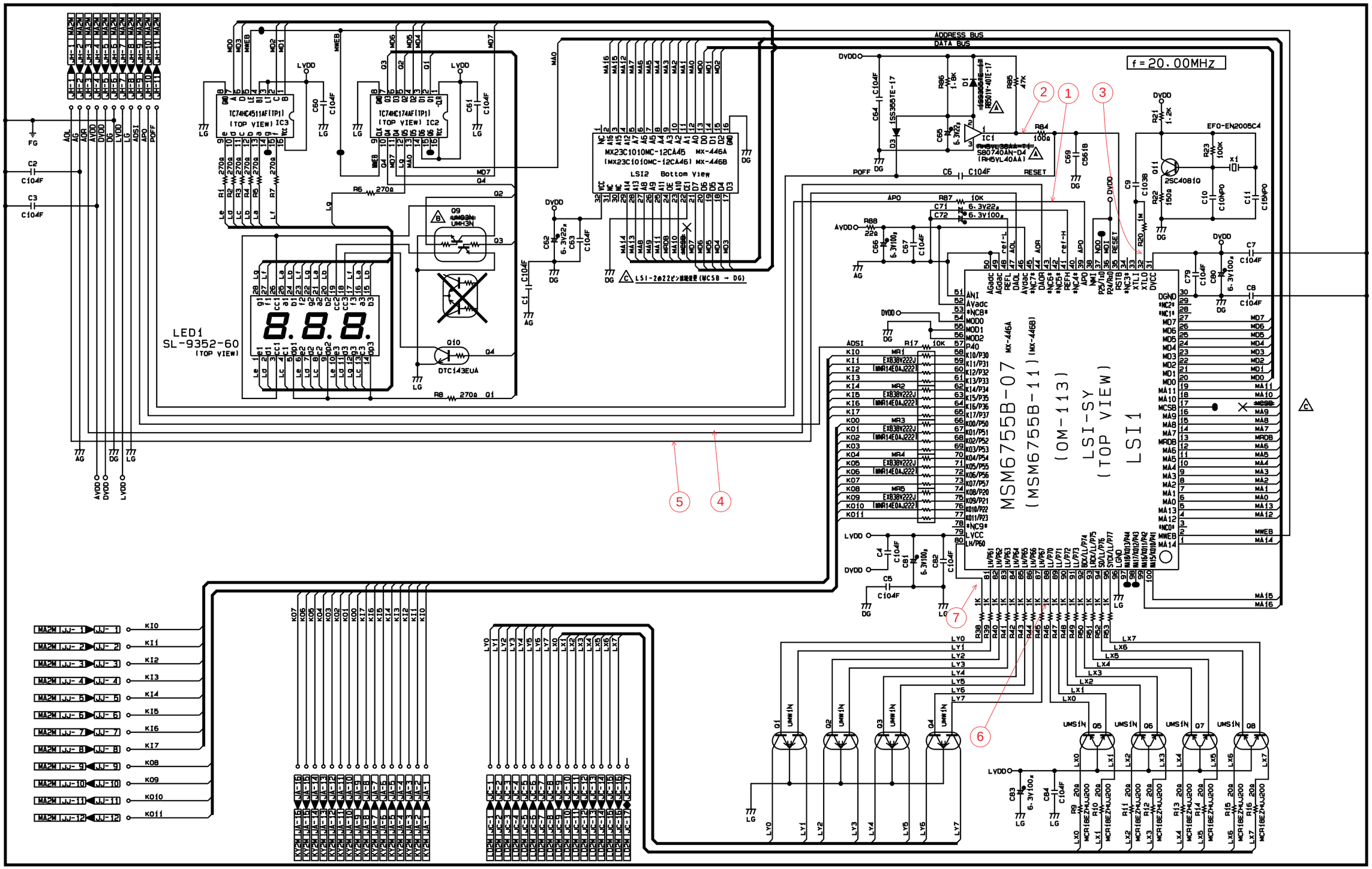
Bottom view



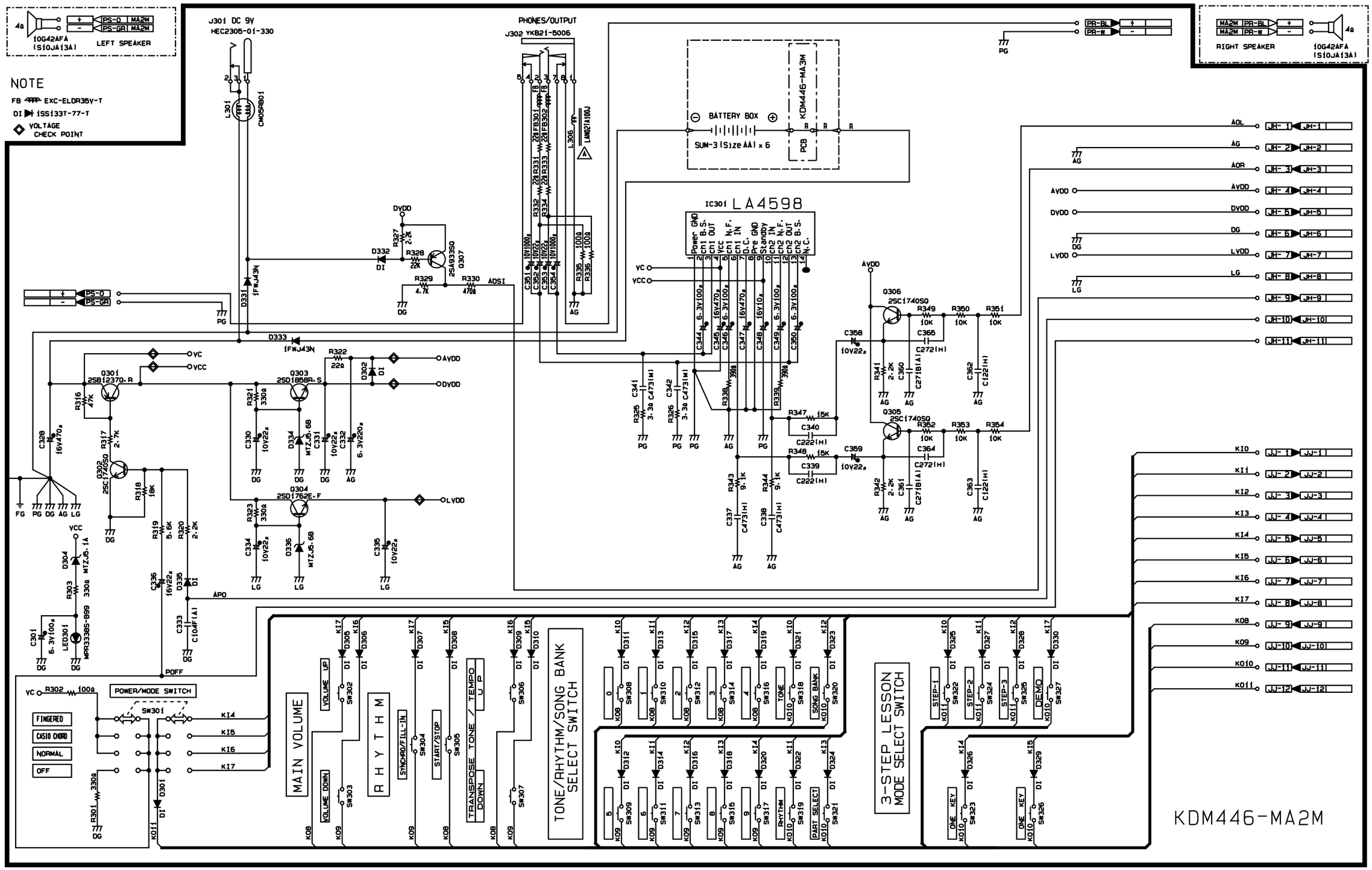
Top view

SCHEMATIC DIAGRAMS

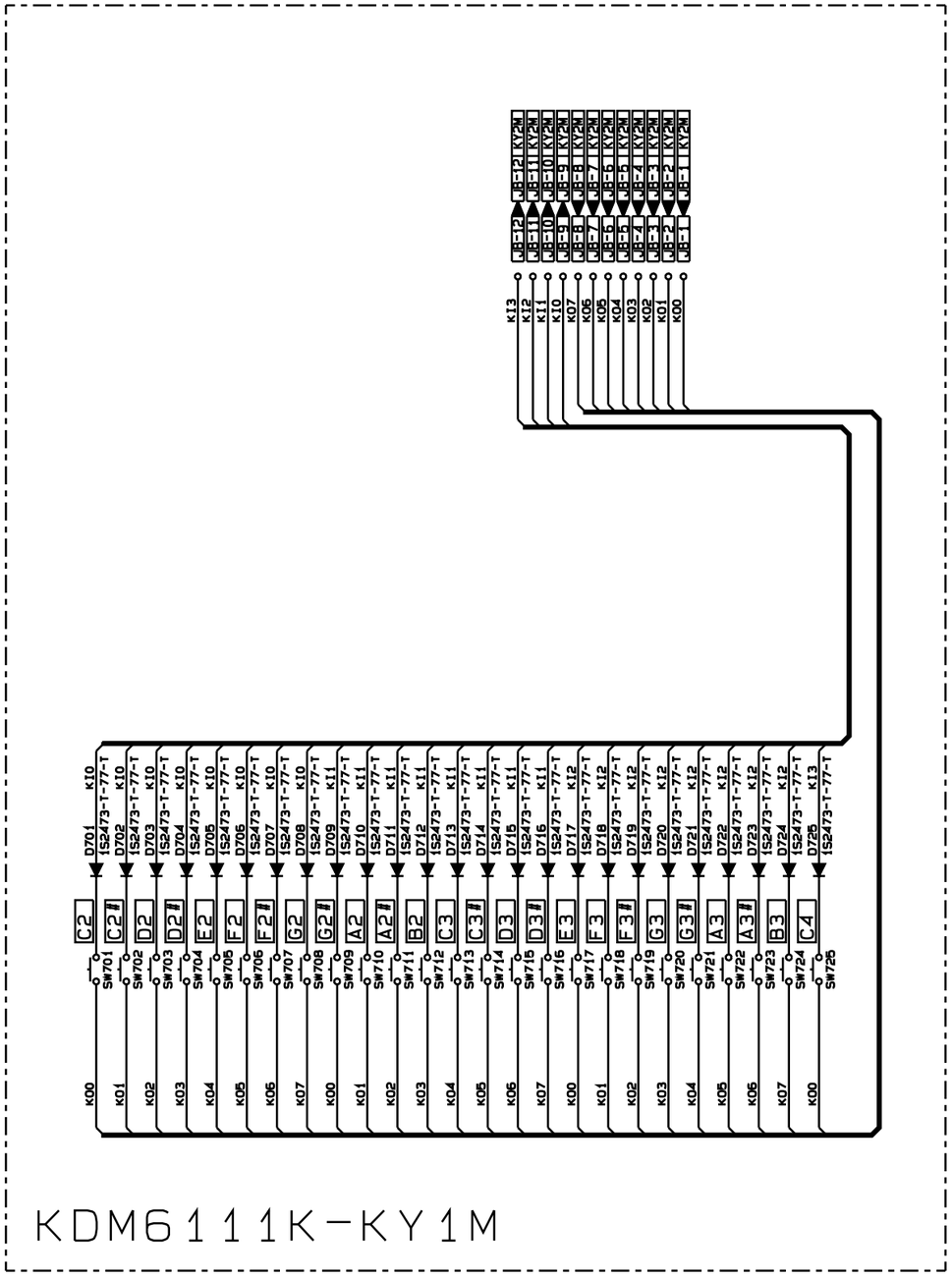
Main PCB JCM446-MA1M

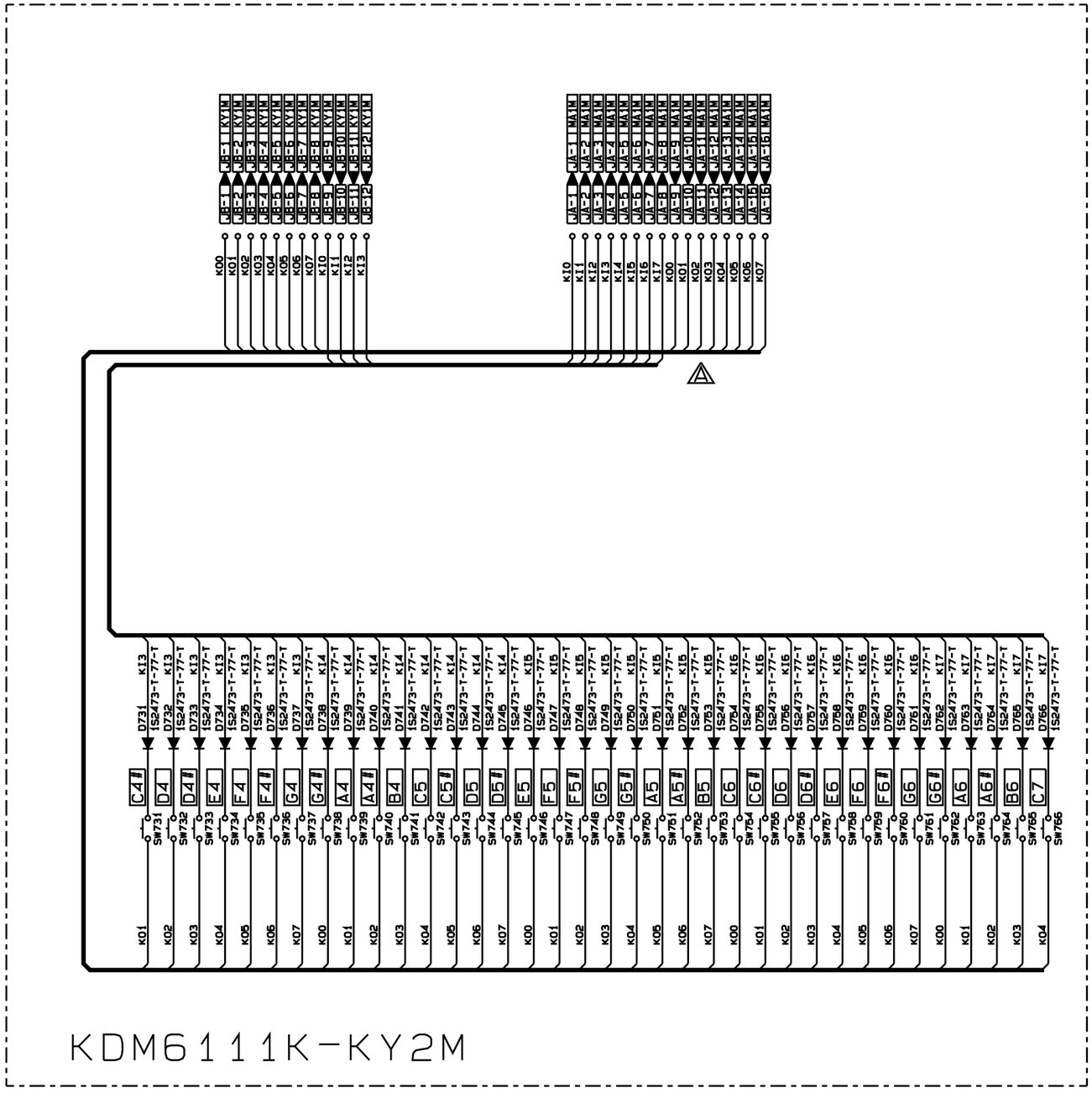


Sub PCB KDM446-MA2M

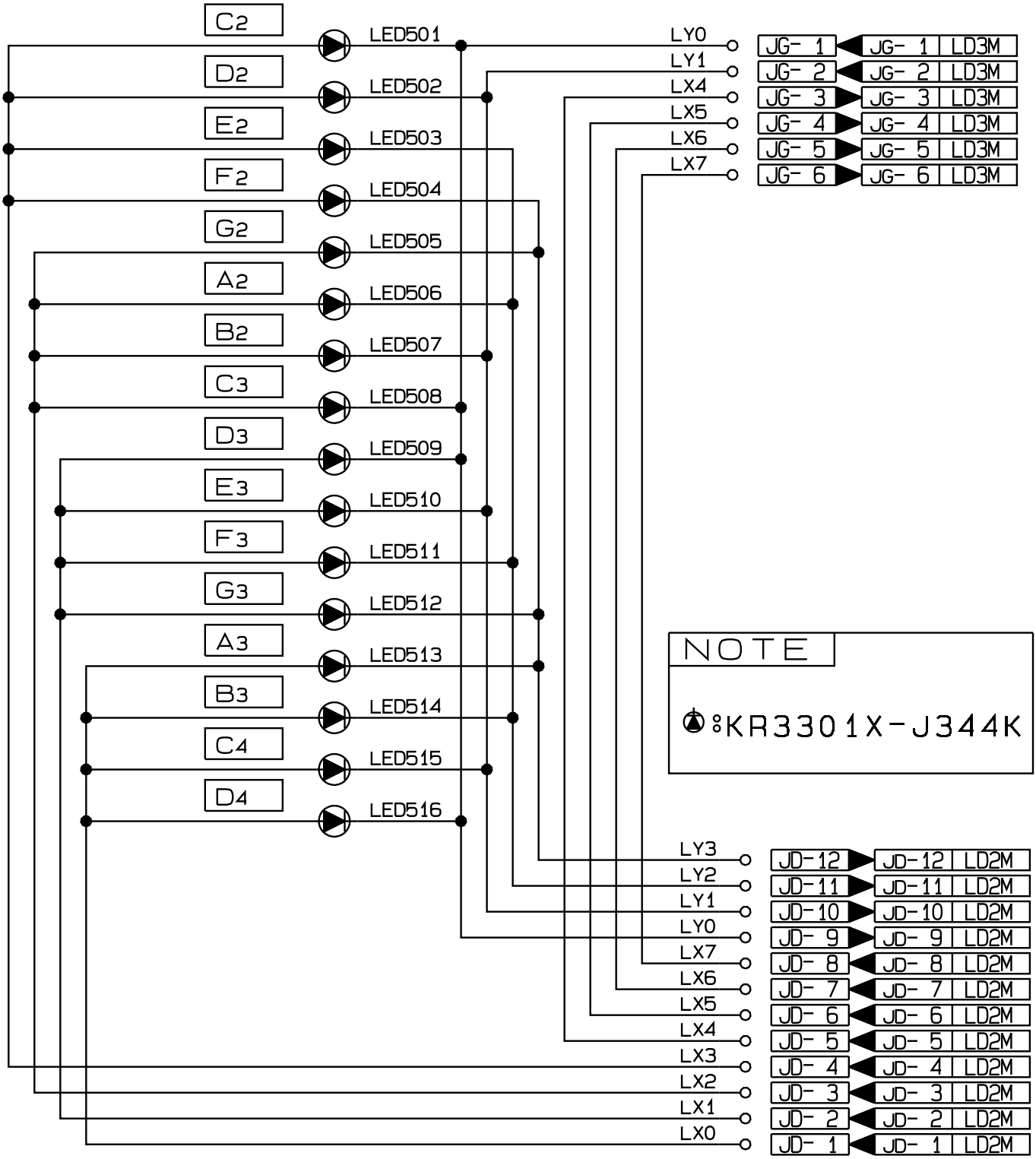


Keyboard PCBs KDM6111K-KY1M/KY2M

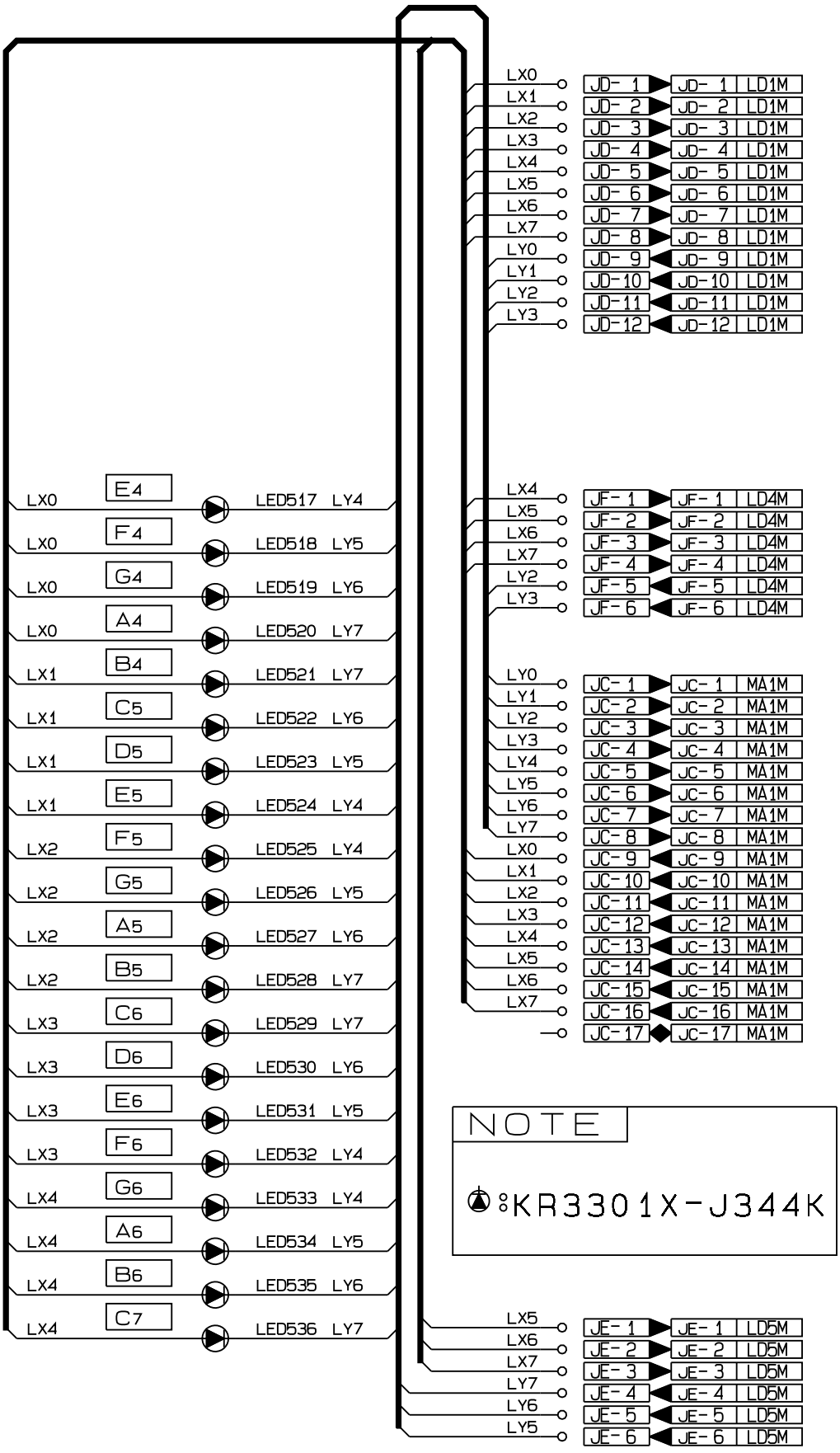




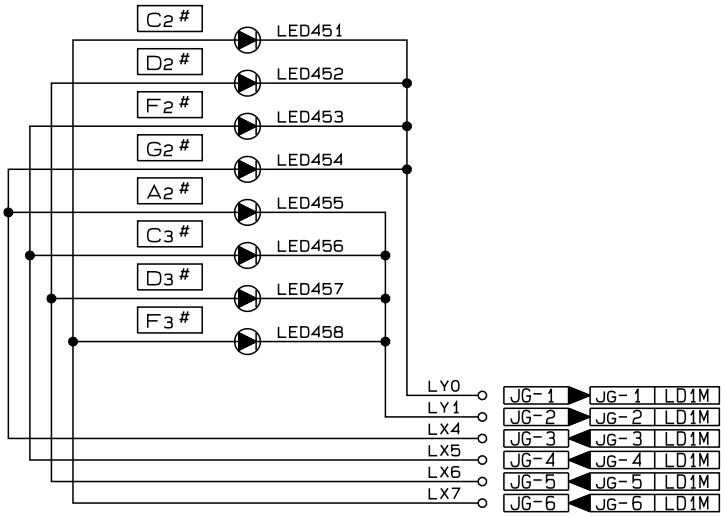
LED PCB KDM446-LD1M



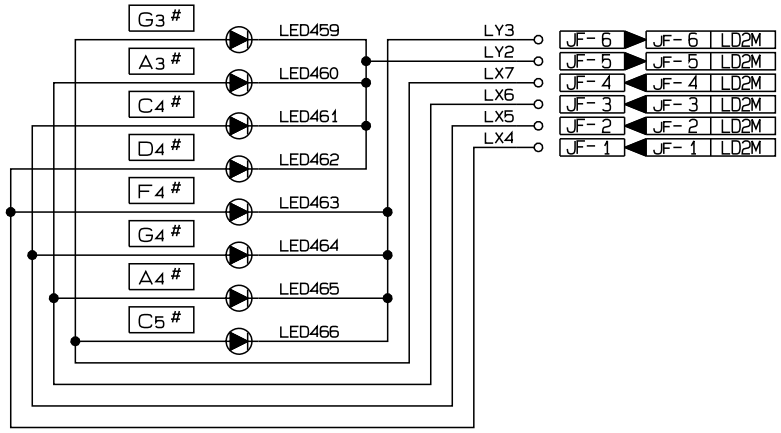
LED PCB KDM446-LD2M



LED PCBs KDM446-LD3M/LD4M/LD5M



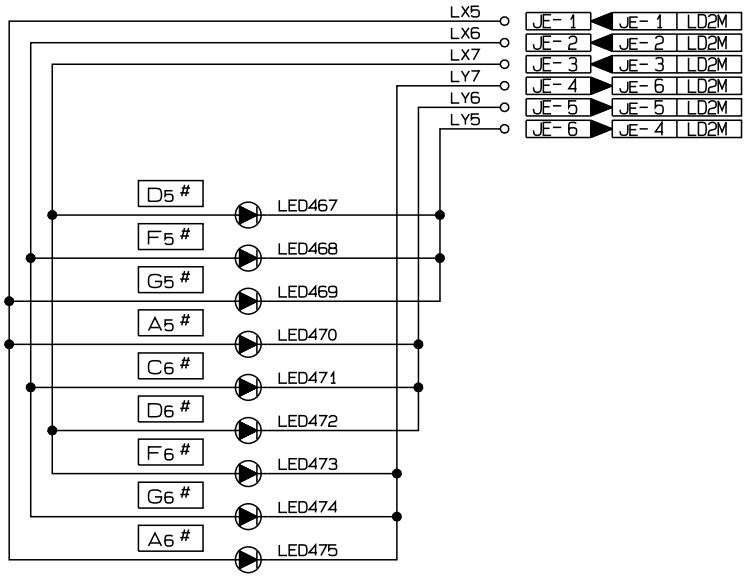
KDM446-LD3M



KDM446-LD4M

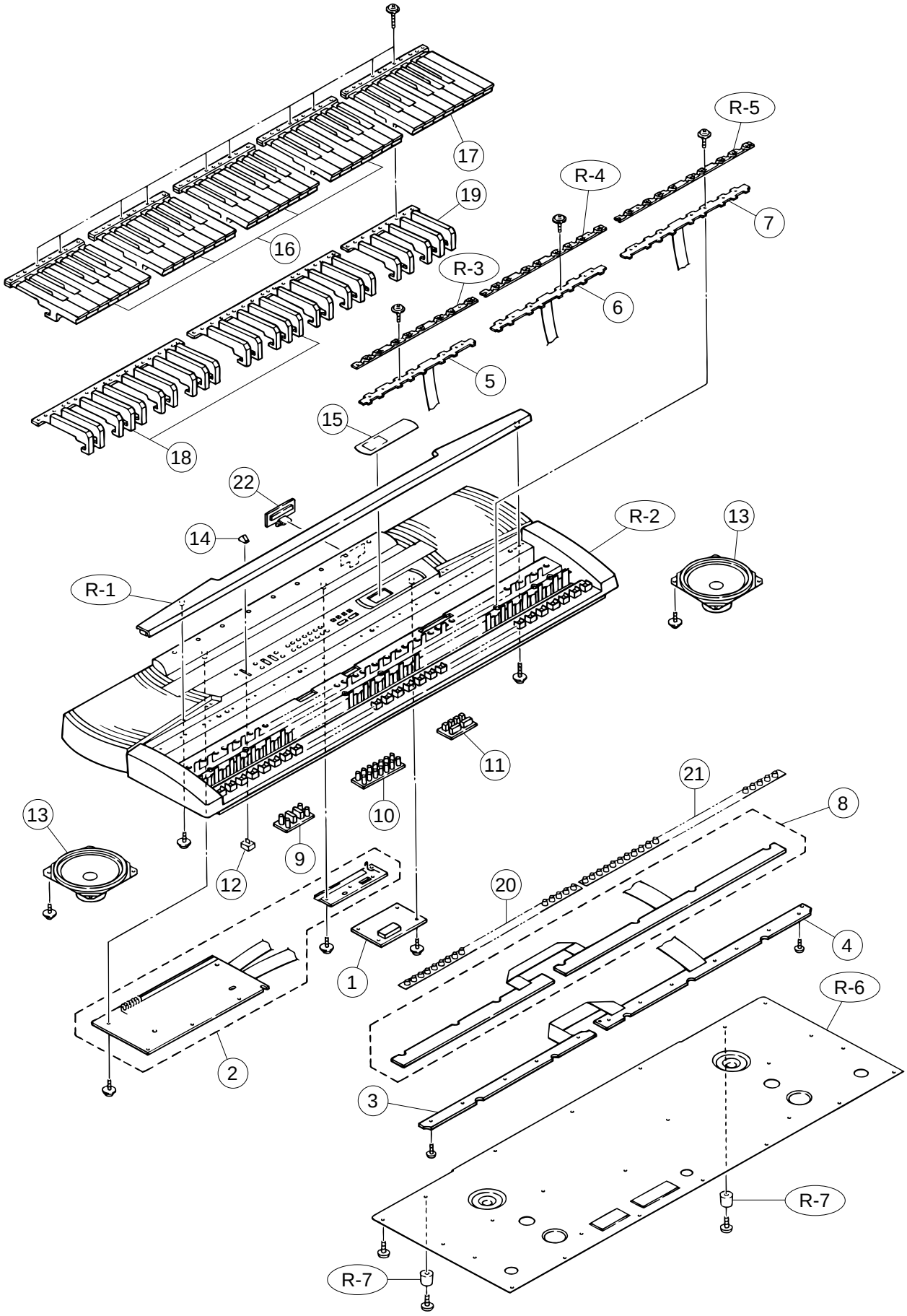
NOTE

⚠ : KR3302X-J345K



KDM446-LD5M

EXPLODED VIEW



PARTS LIST

CTK-520L

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 seperately.

3. The numbers in item column correspond to the same numbers in drawing.

Item	Code No.	Parts Name	Specification	Q	R
	Main PCB				
1	6925 1290	Main PCB ass'y	M240438*1	1	B
LSI1	2012 3430	LSI, CPU	MSM6755B-07	1	A
LSI2	2012 3843	LSI, ROM	MX23C1010MC-12CA45	1	A
IC1	2105 5922	IC	RH5VL40AA-T1	1	A
IC2	2105 4452	IC	HD74HC174FPTR	1	A
IC3	2105 5796	IC	HD74HC4511FPTR	1	A
Q1 - Q4	2259 2555	Transistor, Chip, Digital	UMW1NTL	4	A
Q5 - Q8	2259 2562	Transistor, Chip, Digital	UMS1NTL	4	A
Q9	2259 2646	Transistor, Chip, Digital	UMH3NTN	1	A
Q10	2259 2548	Transistor, Chip, Digital	DTC143EUAT106	1	A
Q11	2252 1239	Transistor, Chip	2SC4081-T106Q	1	A
D1	2390 2576	Diode, Chip, Schottky	RB501V-40TE-17	1	B
D3	2390 1820	Diode, Chip	1SS355TE-17	1	B
X1	2590 1526	Oscillator, Ceramic	EFO-EN2005C4	1	B
LED1	2370 1141	LED, 7-seg.	SL-9352-60	1	B
	Sub PCB				
2	6925 1300	Sub PCB ass'y	M140411*1	1	B
IC301	2114 2891	IC, Power amp.	LA4598	1	A
Q301	2251 0469	Transistor	2SB1237Q,R-TV6-T	1	A
Q302, Q305, Q306	2220 1387	Transistor	2SC1740SQ-TP-T	3	A
Q304	2253 0455	Transistor	2SD1762E,F	1	A
Q307	2200 2449	Transistor	2SA933SQ-TP-T	1	A
D301, D302, D305~D330, D332, D335	2390 1344	Diode	1SS133T-77-T	30	B
D304	2360 1729	Diode, Zener	MTZJ5.1A-T77-T	1	B
D331, D333	2390 2408	Diode	1FWJ43N(TPA3)	2	B
D334, D336	2360 2002	Diode	MTZJ5.6B-T77-T	2	B
LED301	2370 1106	LED	MPR3338S-B99	1	C
J301	3501 7049	Jack	HEC2305-01-330	1	B
J302	3612 0665	Jack	YKB21-5006	1	B
	LED PCBs				
3	6925 1320	LED PCB ass'y LD1M	M240426*1	1	C
4	6925 1330	LED PCB ass'y LD2M	M240427*1	1	C
5	6925 1340	LED PCB ass'y LD3M	M240428*1	1	C
6	6925 1350	LED PCB ass'y LD4M	M240429*1	1	C
7	6925 1360	LED PCB ass'y LD5M	M240430*1	1	C
	2370 1330	LED	KR3302X-J345K	61	B
	Keyboard PCB				
8	6925 1310	Keyboard PCB ass'y	M140402*2	1	B
D701~D725, D731~D766	2301 0101	Diode	1S2473-T-77-T	61	C
	Mechanical Parts				
9	6925 1640	Rubber button	M240413-1	1	B
10	6925 1650	Rubber button	M240414-1	1	B
11	6925 1660	Rubber button	M240374-1	1	B
12	6909 5890	Slide contact	CSB-12D	1	B
13	3831 1043	Speaker	S10JA13B	2	B
14	6921 5030	Slide knob	M311859-1	1	B
15	6925 1550	Display plate	M340415-1	1	C
16	6925 1700	White key set, LSK-CB	M340489*1	4	A
17	6925 1710	White key set, LSK-CS	M340489*2	1	A
18	6925 1720	Black key set, LSK-10P	M140369-1	2	A

Notes: Q – Quantity used per unit
R – Rank

Item	Code No.	Parts Name	Specification	Q	R
19	6925 1730	Black key set, LSK-5P	M140369-2	1	A
20	6922 3990	Key contact rubber	M111764-1	1	A
21	6922 4000	Key contact rubber	M111765-1	1	A
22	6925 2160	Battery cover	M340490*1	1	B
	Accessory				
	6916 7880	Music stand	M310827-1	1	C

Notes: Q – Quantity used per unit
R – Rank

CASIO COMPUTER CO.,LTD.
Service Division

8-11-10, Nishi-Shinjuku
Shinjuku-ku, Tokyo 160, Japan
Telephone: 03-3347-4926

MA0800761A

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