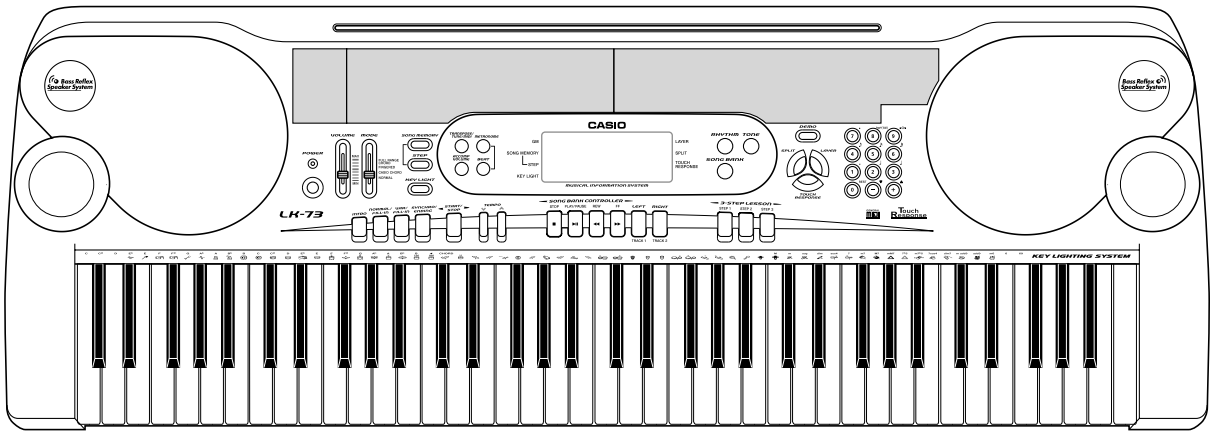
CASIO®

Service Manual

(without price)

LK-73

JUL. 2002



KEY LIGHTING KEYBOARD

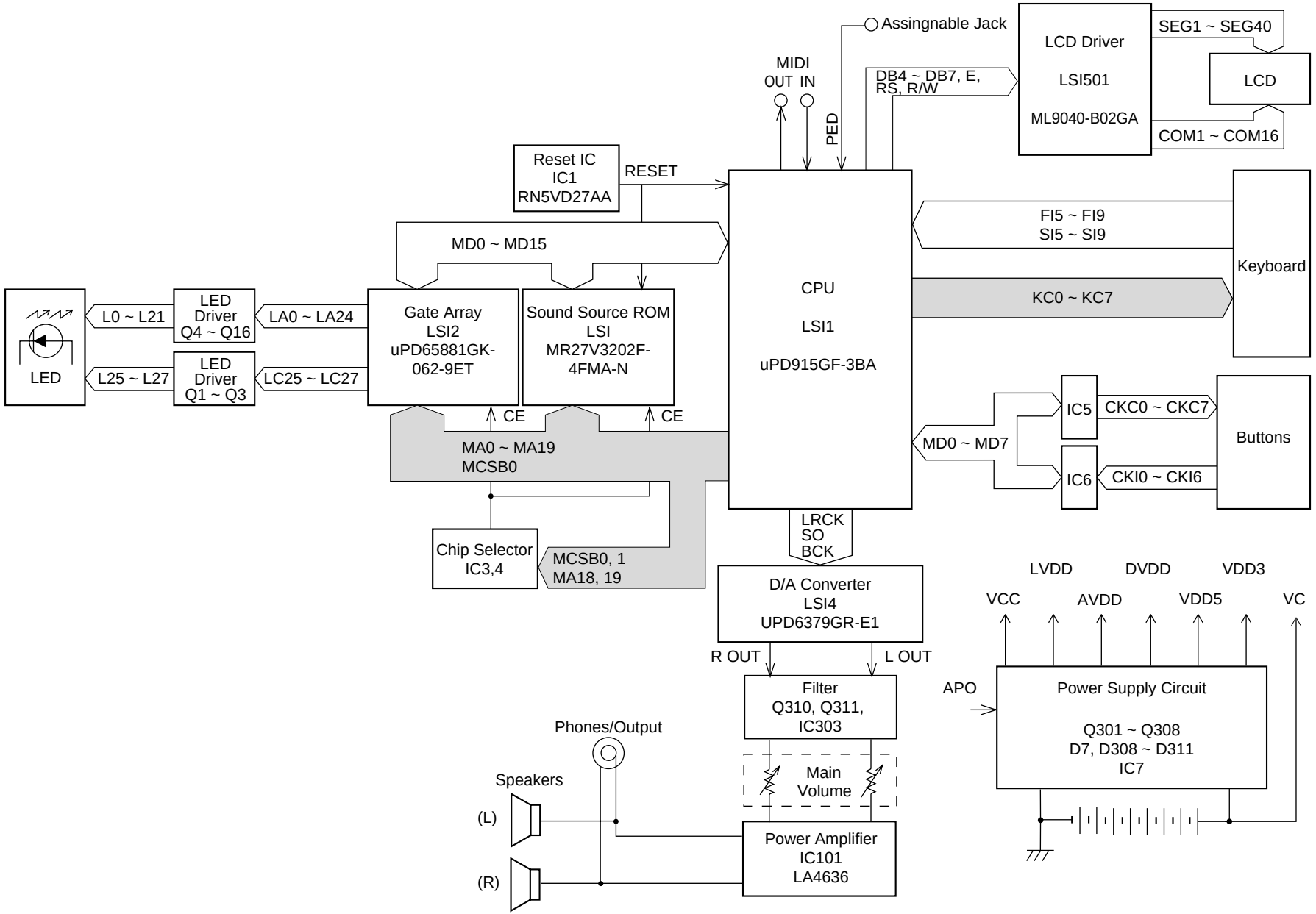
INDEX

CONTENTS

SPECIFICATIONS

Keyboard:	73 standard-size keys, 6 octaves (with touch response on/off)
Key Light System:	Can be turned on and off (up to 10 keys can be lit at the same time)
Tones:	137 (128 General MIDI tones + 9 drum tones); with layer and split
Rhythm Instrument Tones:	61
Polyphony:	24 notes maximum (12 for certain tones)
Auto Accompaniment	
Rhythm Patterns:	100
Tempo:	Variable (216 steps, ♩ = 40 to 255)
Chords:	3 fingering methods (CASIO CHORD, FINGERED, FULL RANGE CHORD)
Rhythm Controllers:	START/STOP, INTRO, NORMAL/FILL-IN, VAR/FILL-IN, SYNCHRO/ENDING
Accomp Volume:	0 to 127 (128 steps)
3-step Lesson:	3 lessons (Step 1, 2, 3)
Playback:	Repeat play of a single tune
Song Bank	
Number of Tunes:	100
Controllers:	PLAY/PAUSE, STOP, FF, REW, LEFT/TRACK 1, RIGHT/TRACK 2
Musical Information Function:	Tone, Auto Accompaniment, Song Bank numbers and names; staff notation, tempo, metronome, measure and beat number, step lesson display, chord name, dynamicmark, fingering, octave mark, pedal operation
Metronome:	On/Off
Beat Specification:	1 to 6
Song Memory	
Songs:	2
Recording Tracks:	2
Recording Methods:	Real-time, step
Memory Capacity:	Approximately 5,200 notes (total for two songs)
MIDI:	16 multi-timbre receive, GM Level 1 standard
Other Functions	
Transpose:	25 steps (–12 semitones to +12 semitones)
Tuning:	101 steps (A 4 = approximatery 440Hz ±50Cents)
Terminals	
MIDI Terminals:	IN, OUT
Sustain/Assignable Terminal:	Standard jack (sustain, sostenuto, soft, rhythm start/stop)
Headphone/Output Terminal:	Stereo standard jack
Output Impedance:	100 Ω
Output Voltage:	4V (RMS) MAX
Power Jack:	9V DC
Power Supply:	2-way
Batteries:	6 D-size batteries
Battery Life:	Approximately 5 hours continuous operation on manganese batteries
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:	3W + 3W
Power Consumption:	9V ⎓ 7.7W
Dimensions:	116.2 x 42.1 x 14.2 cm (45 13 / 16 x 16 9 / 16 x 5 5 / 8 inch)
Weight:	Approximately 8.7 kg (19.2 lbs)(without batteries)

BLOCK DIAGRAM



CIRCUIT DESCRIPTION

KEY MATRIX

	KC0	KC1	KC2	KC3	KC4	KC5	KC6	KC7
FI0	C1 (1)	C#1 (1)	D1 (1)	D#1 (1)	E1 (1)	F1 (1)	F#1 (1)	G1 (1)
SI0	C1 (2)	C#1 (2)	D1 (2)	D#1 (2)	E1 (2)	F1 (2)	F#1 (2)	G1 (2)
FI1	G#1 (1)	A1 (1)	A#1 (1)	B1 (1)	C2 (1)	C#2 (1)	D2 (1)	D#2 (1)
SI1	G#1 (2)	A1 (2)	A#1 (2)	B1 (2)	C2 (2)	C#2 (2)	D2 (2)	D#2 (2)
FI2	E2 (1)	F2 (1)	F#2 (1)	G2 (1)	G#2 (1)	A2 (1)	A#2 (1)	B2 (1)
SI2	E2 (2)	F2 (2)	F#2 (2)	G2 (2)	G#2 (2)	A2 (2)	A#2 (2)	B2 (2)
FI3	C3 (1)	C#3 (1)	D3 (1)	D#3 (1)	E3 (1)	F3 (1)	F#3 (1)	G3 (1)
SI3	C3 (2)	C#3 (2)	D3 (2)	D#3 (2)	E3 (2)	F3 (2)	F#3 (2)	G3 (2)
FI4	G#3 (1)	A3 (1)	A#3 (1)	B3 (1)	C4 (1)	C#4 (1)	D4 (1)	D#4 (1)
SI4	G#3 (2)	A3 (2)	A#3 (2)	B3 (2)	C4 (2)	C#4 (2)	D4 (2)	D#4 (2)
FI5	E4 (1)	F4 (1)	F#4 (1)	G4 (1)	G#4 (1)	A4 (1)	A#4 (1)	B4 (1)
SI5	E4 (2)	F4 (2)	F#4 (2)	G4 (2)	G#4 (2)	A4 (2)	A#4 (2)	B4 (2)
FI6	C5 (1)	C#5 (1)	D5 (1)	D#5 (1)	E5 (1)	F5 (1)	F#5 (1)	G5 (1)
SI6	C5 (2)	C#5 (2)	D5 (2)	D#5 (2)	E5 (2)	F5 (2)	F#5 (2)	G5 (2)
FI7	G#5 (1)	A5 (1)	A#5 (1)	B5 (1)	C6 (1)	C#6 (1)	D6 (1)	D#6 (1)
SI7	G#5 (2)	A5 (2)	A#5 (2)	B5 (2)	C6 (2)	C#6 (2)	D6 (2)	D#6 (2)
FI8	E6 (1)	F6 (1)	F#6 (1)	G6 (1)	G#6 (1)	A6 (1)	A#6 (1)	B6 (1)
SI8	E6 (2)	F6 (2)	F#6 (2)	G6 (2)	G#6 (2)	A6 (2)	A#6 (2)	B6 (2)
FI9	C7 (1)							
SI9	C7 (2)							

BUTTON MATRIX

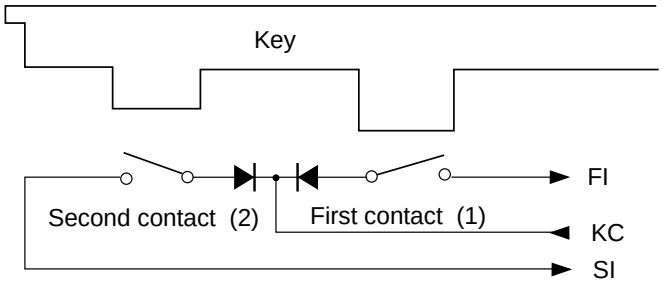
	CKC0	CKC1	CKC2	CKC3	CKC4	CKC5	CKC6	CKC7
CKI0	LAYER	RIGHT	2	RHYTHM	9	PLAY	STOP	KEY LIGHT
CKI1	SPLIT	LEFT	1	SONG BANK	8	FF	REW	TRANSPOSE TUNE/ MIDI
CKI2	MEMORY	STEP2	3	TONE	5	TEMPO DOWN	TEMPO UP	SYNCHRO/ ENDING
CKI3	STEP	STEP3	–	7	6	ACCOMP VOLUME	BEAT	METRONOME
CKI4	STEP1	0	+	4	DEMO	TOUCH		
CKI5	INTRO	NORMAL/ FILL-IN	VARIATION/ FILL-IN	START/ STOP				
CKI6	FULL RANGE CHORD	FINGERED	CASIO CHORD	NORMAL				

BUTTON MATRIX

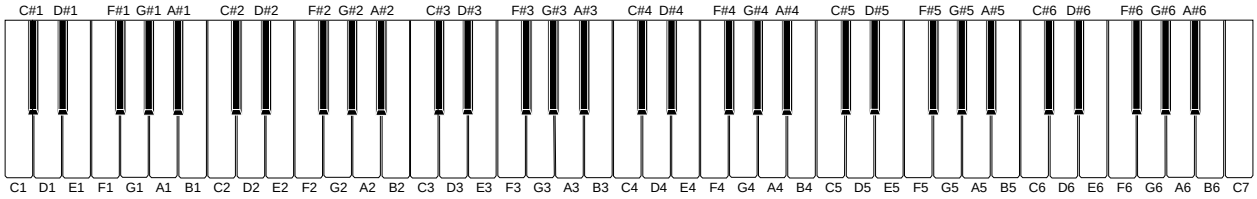
	L0	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12
L21		F4	B4	E5	A5	D6	G6	C7					
L22		E4	A4	D5	G5	C6	F6	B6					
L23	C2	D4	G4	C5	F5	B5	E6	A6					
L25	A2#								A6#	G6#	F6#	C3#	D3#
L26	G2#								A5#	C6#	D6#	F2#	D2#
L27									G5#	F5#	D5#		

	L13	L14	L15	L16	L17	L18	L19	L20	L21	L22	L23	L24	
L21		G2	C3	F3									
L22		F2	B2	E3									
L23	D2	E2	A2	D3	G3	A3	B3	C4					
L25	F3#				D4#	C4#	A3#	G3#	C1	A1#	G1#	F1#	
L26	C2#				F4#	G4#	A4#	C5#	D1	G1	C1#	D1#	
L27									E1	F1	A1	B1	

Note: Each key has two contacts,
the first conatct (1) and second contact (2).



NOMENCLATURE OF KEYS



CPU (LSI1: uPD915GF-3BA)

The 16-bit CPU contains a RAM, three 8-bit I/O ports, two timers, a key controller and serial interfaces. The CPU detects key velocity by counting the time between first-key input signal FI and second-key SI from the keyboard. The CPU reads sound data and velocity data from the sound source ROM in accordance with the selected tone; the CPU can read rhythm data simultaneously when a rhythm pattern is selected. Then the CPU provides 16-bit serial sound data to the DSP. The CPU also controls MIDI input/output.
The following table shows the pin functions of LSI1.

Pin No.	Terminal	In/Out	Function
1	TXD0	Out	MIDI signal output
2	RXD0	In	MIDI signal input
3	SCK0	Out	APO (Auto Power Off) signal output
4, 5	TXD1, RXD2	In/Out	Data bus for the LCD driver
6	SCK1	Out	36.058 KHz synchronizing pulse output
7	AVCC	In	DVDD3 (+3 V) source
8	AN0	In	AC adaptor detection terminal. +5 V when the keyboard is powered by batteries and becomes 0 V to cancel the APO function when AC adaptor is connected.
9	AN1	—	Not used. Connected to ground.
10	AGND	In	Ground (0 V) source
11	BCK	Out	Bit clock output
12	SO	Out	Serial sound data output
13	LRCK	Out	Word clock output
14	GND	In	Ground (0 V) source
15, 16	XLT0, XLT1	In/Out	30 MHz clock input/output
17	VCC	In	+3 V source
18, 19	MD0, MD1	In	Mode selection terminal
20	RSTB	In	Reset signal input
21	NMI	In	Power ON signal input
22	VDD	In	+5 V source
23 ~ 30	FI0 ~ FI3 SI0 ~ SI3	In	Terminal for key input signal
31 ~ 38	KC0 ~ KC7	Out	Terminal for key scan signal
39 ~ 46	FI4 ~ FI7 SI4 ~ SI7	In	Terminal for key input signal
47 ~ 50	FI8, FI9 SI8, SI9	—	Not used
51	FI10	In	Terminal for button input signal
52	SI10/P23	Out	Chip enable signal for the LCD driver
53 ~ 55	KI0 ~ KI2	In	Terminal for button input signal
56	MWNB	Out	Write enable signal for the DSP
57 ~ 76	MA0 ~ MA17	Out	Address bus
77	MCSB01	Out	Chip enable signal output for the sound source ROM
78	MCSB0	Out	Address bus
79	P10	Out	Data bs for the LCD driver

Pin No.	Terminal	In/Out	Function
80	VCC	In	+3 V source
81	GND	In	Ground (0 V) source
82	MRDB	Out	Read enable signal output for the sound source ROM
83 ~ 98	MD0 ~ MD15	In/Out	Data bus
99	PLE	Out	Reset signal output for the DSP
100	P17	In/Out	Data bus for the LCD driver

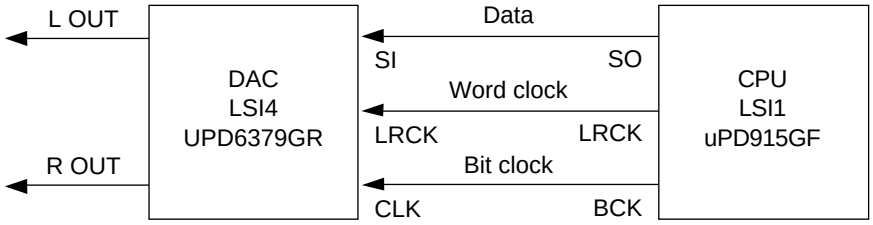
GATE ARRAY (LSI2: uPD65881GK-062-9ET)

The gate array can control 63 LEDs of key illuminators. In accordance with the command from the CPU, the LSI is capable of controlling the illuminator LEDs. The following table shows the pin functions of LSI2.

Pin No.	Terminal	In/Out	Function
1 ~ 4, 9	GND, XTLO, XTLI, GND	NC	Not Connected
5 ~ 8	DB0 ~ DB3	In	Data bus
10, 16	VDD	In	LVDD (5V) source
11 ~ 13	A0 ~ A2	In	Address bus
14	NCE	In	Chip enable signal
15	NWR	In	Write enable signal
17	RSTB	In	Reset signal
18, 27, 41	MODE, GND	In	GND (0V) source
19 ~ 26, 28 ~ 36	L0 ~ L16	Out	LED drive signal
37 ~ 40, 42 ~ 44	SW00 ~ SW06	NC	Not Connected
45 ~ 52	L17 ~ L24	Out	LED drive signal
53 ~ 55	L25 ~ L27	Out	LED common signal
56	L28	Out	Chip enable signal for LCD driver
57 ~ 64	I0 ~ I3, SWI4 ~ SWI7	NC	Not Connected

DAC (LSI4: UPD6379GR)

The DAC receives 16-bit serial data output from the CPU. The data contains digital sound data of the melody, chord, bass, and percussion for the right and left channels. The DAC converts the data into analog waveforms and output them to each channel separately.



LCD DRIVER (LSI501: ML9040-B02GA)

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 LSI501.

Pin No.	Terminal	In/Out	Function
1 ~ 22, 63 80	SEG1 - SEG4O	Out	Segment signal output
23	GND		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, XSCL		Not used
33	VDD	In	DVDD (+5.0 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 ~ 53, 55 ~ 62	COM1 ~ COM7 COM9 ~ COM16	Out	Common signal/output
54	COM8		Not used

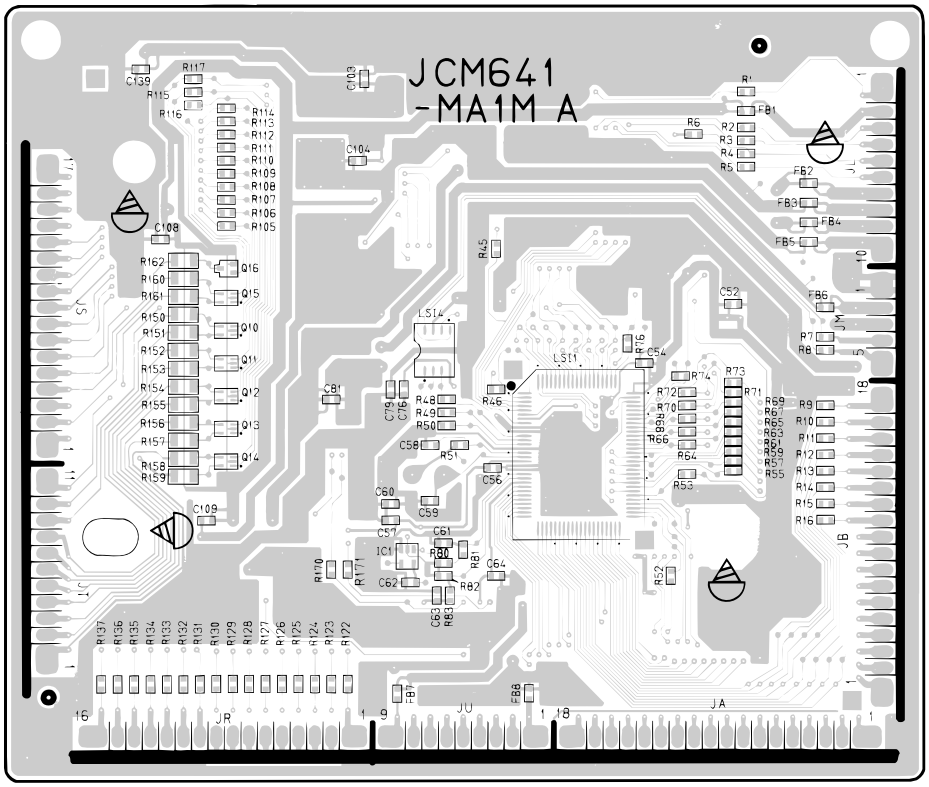
POWER SUPPLY CIRCUIT

The power supply circuit generates six voltages as shown in the following table. VDD5 voltage is always generated. The others are controlled by APO signal from the CPU.

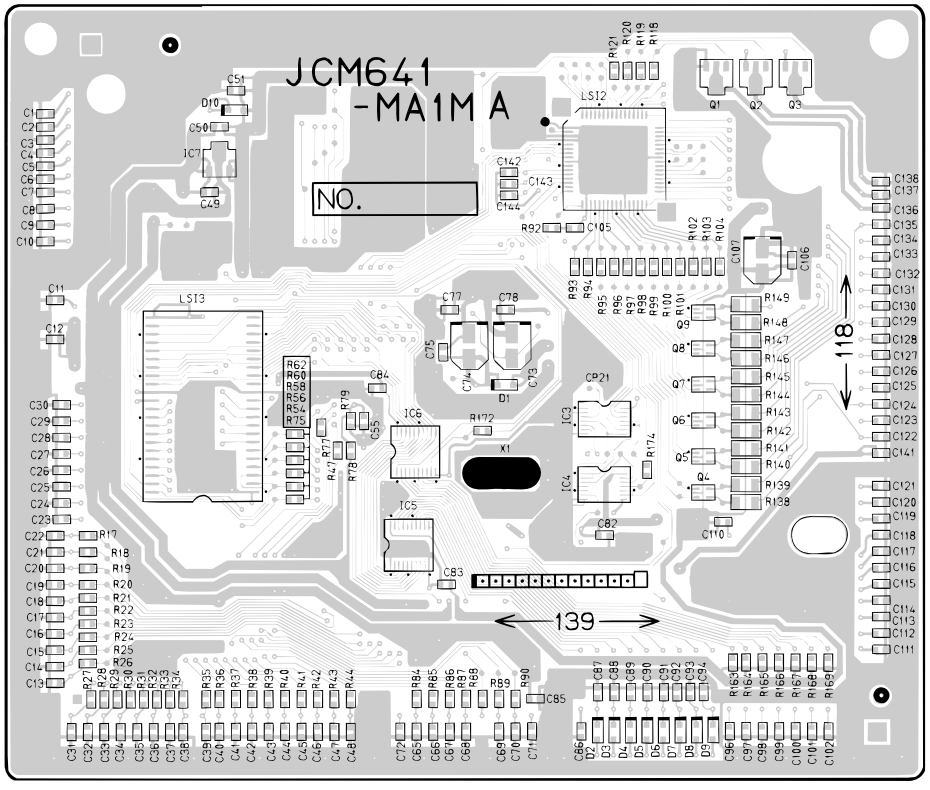
Name	Voltage	For operation of
VDD3	+3 V	CPU, Reset IC, Sound source ROM
DVDD	+5 V	Power jack, Sustain jack, MIDI jack, LCD Driver
AVDD	+5 V	DAC, Filter
LVDD	+5 V	LED Driver, Gate Array
VCC	+9 V	Pilot lamp
VC	+9 V	Power amplifier

PRINTED CIRCUIT BOARDS

Main PCB JCM641-MA1M

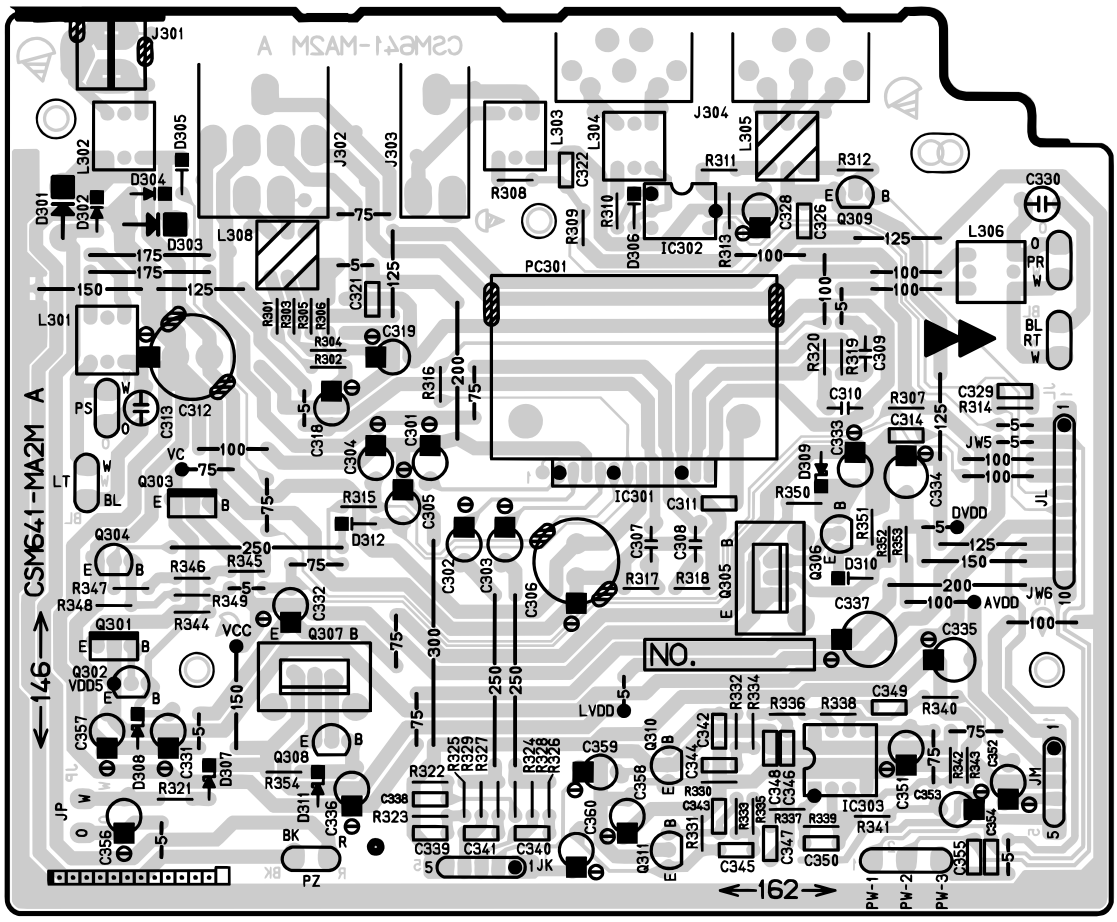


Top view



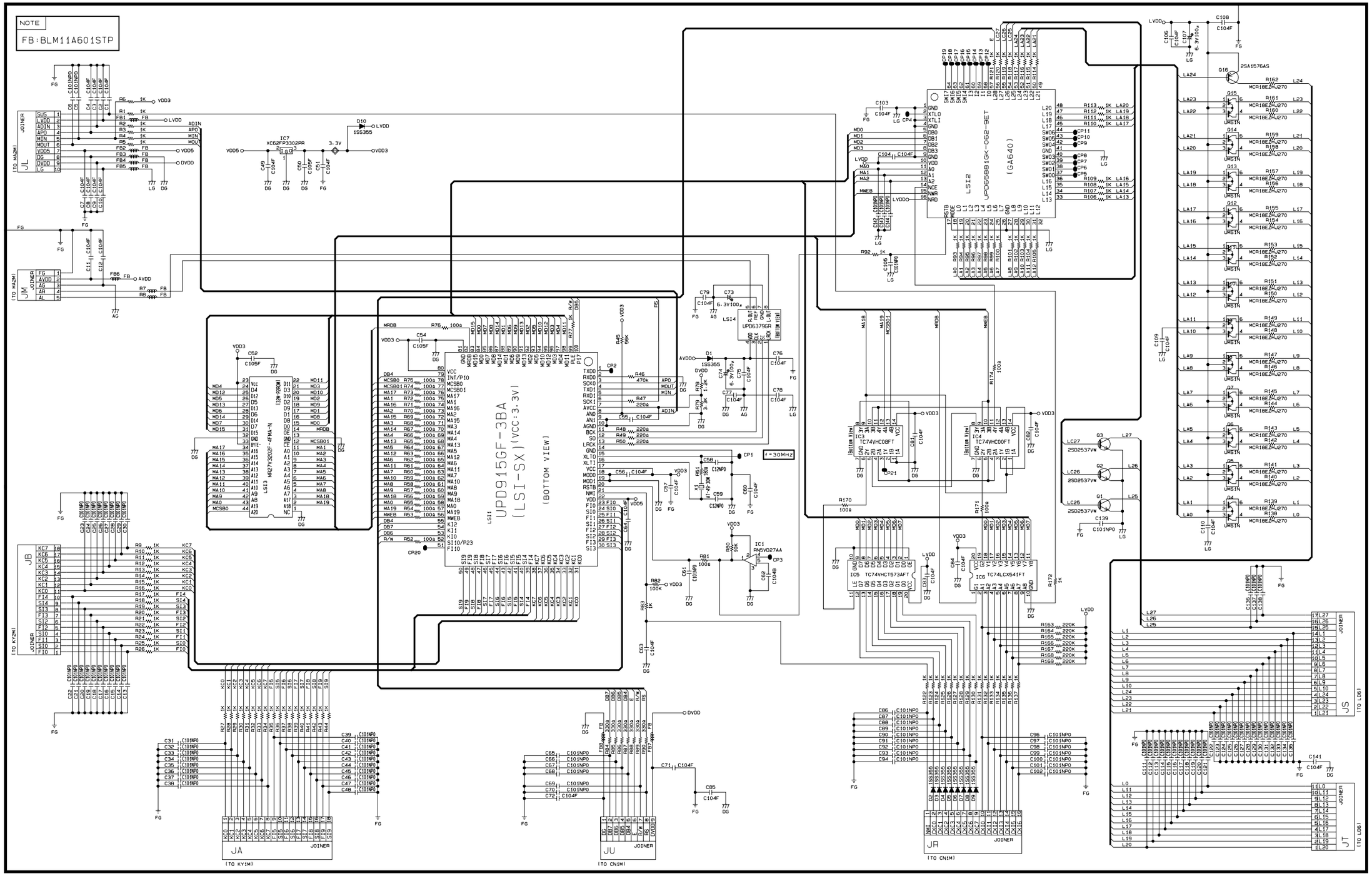
Bottom view

Main PCB CSM641-MA2M

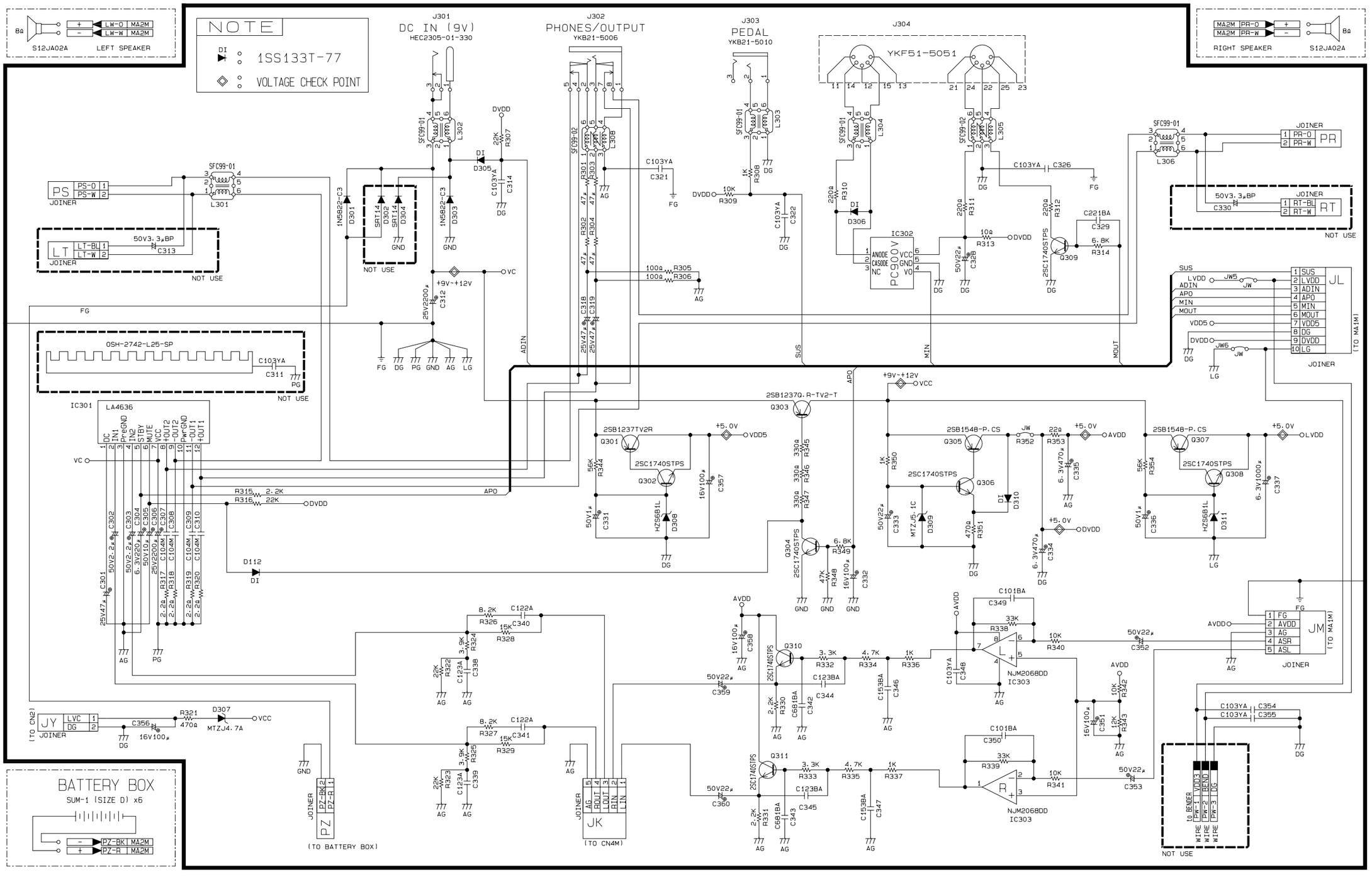


SCHEMATIC DIAGRAMS

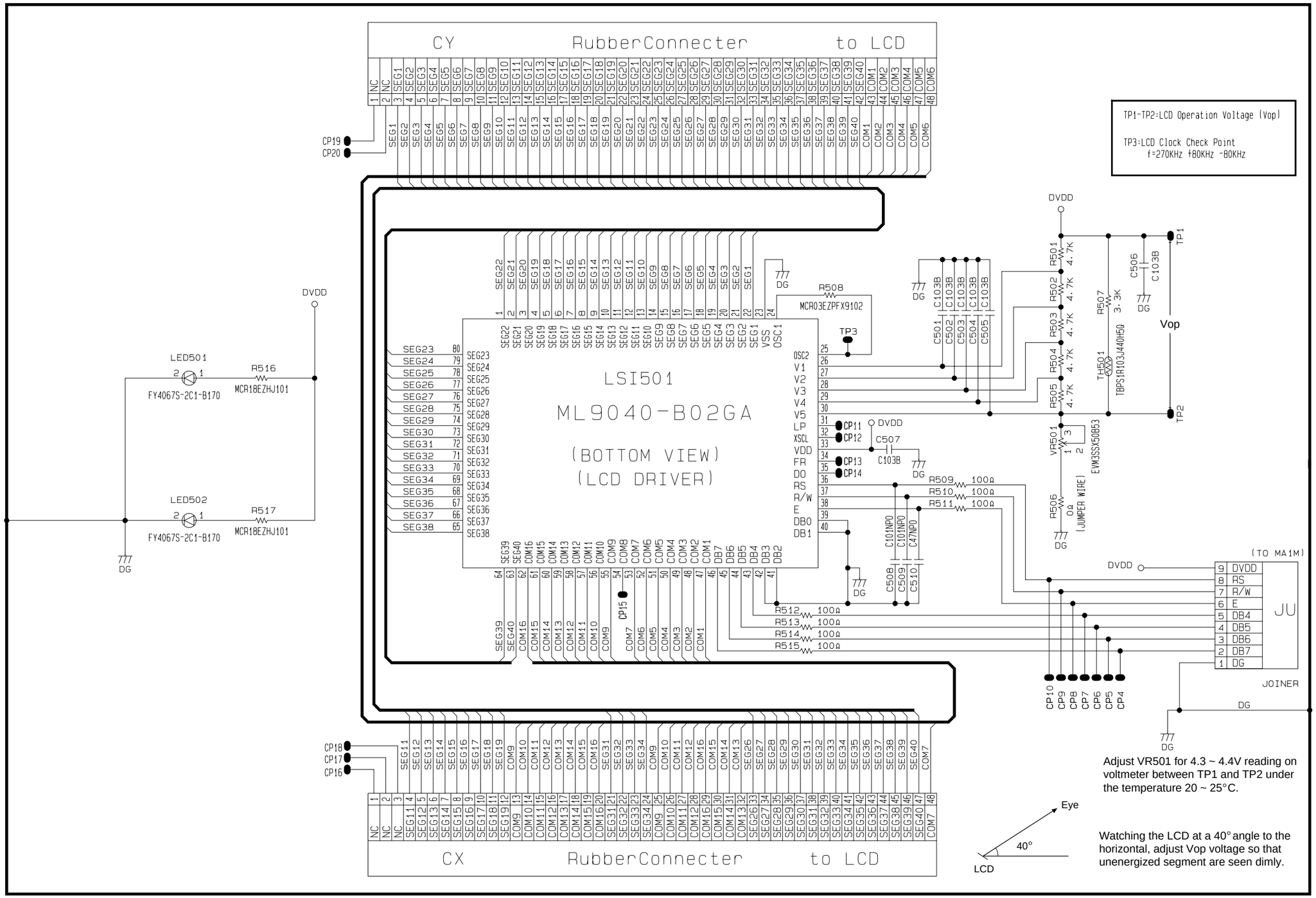
MAIN PCB JCM641-MA1M



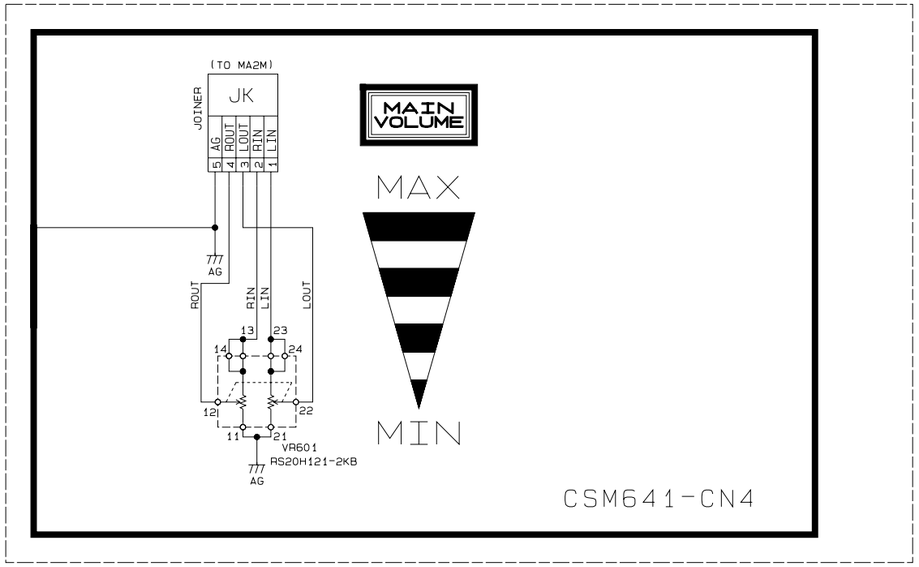
MAIN PCB CSM641-MA2M

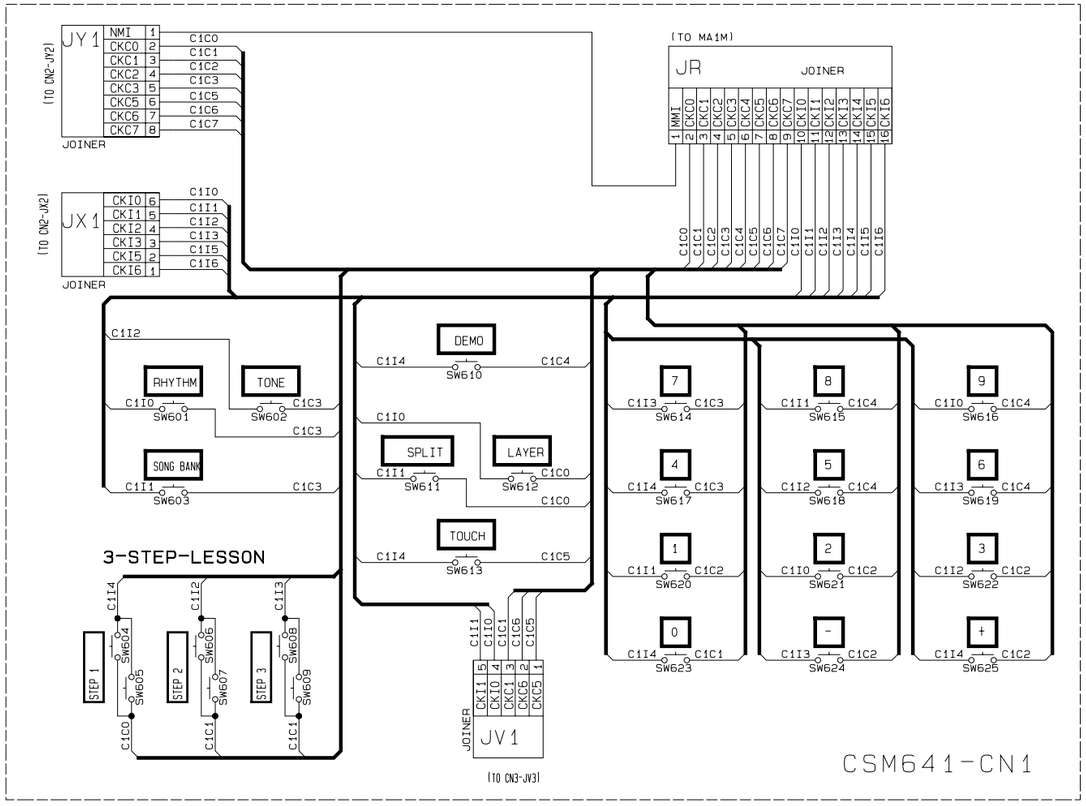


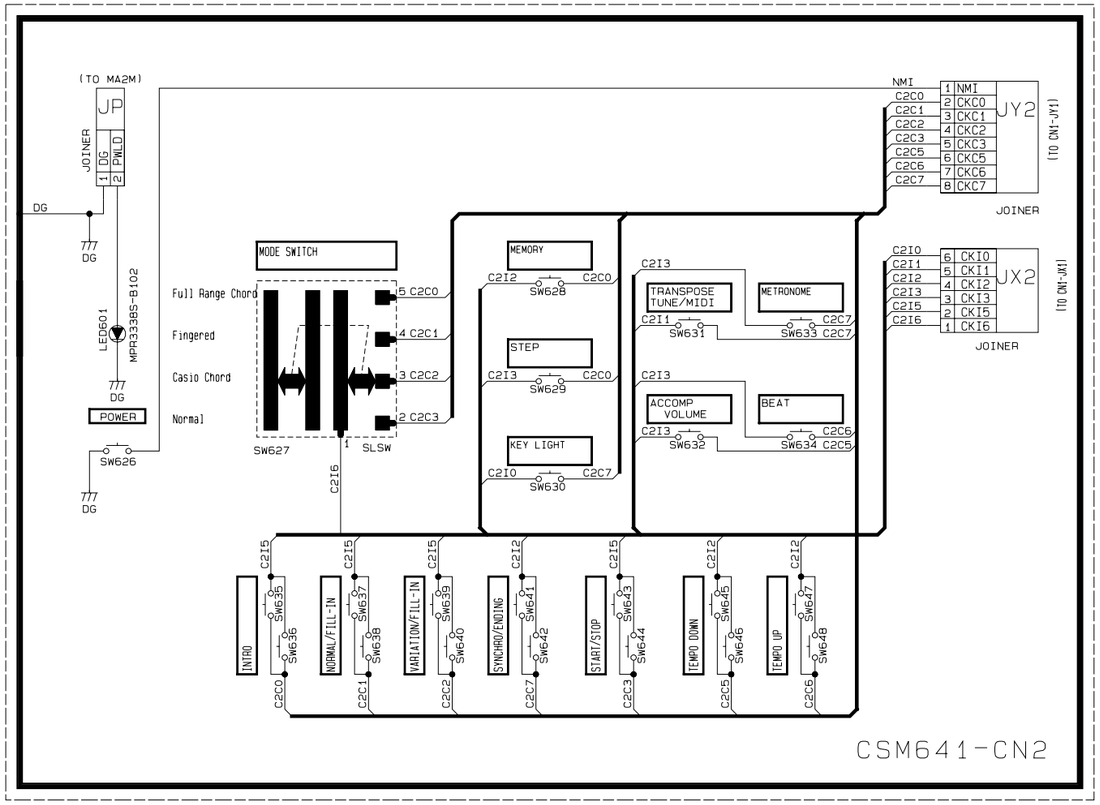
LCD PCB KDM641-LCD1M

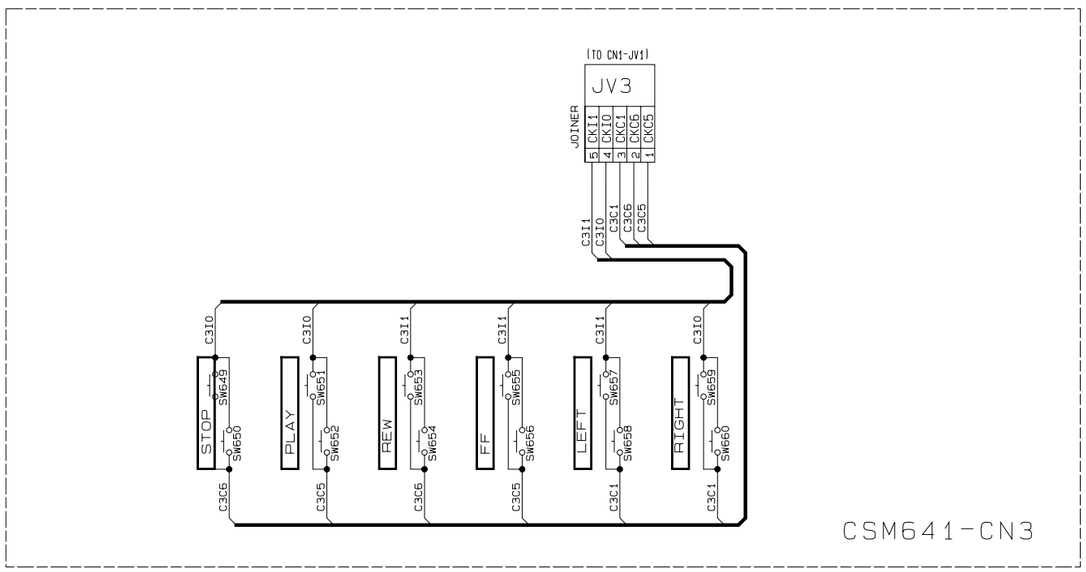


CONSOLE PCBs CSM641-CN1/CN2/CN3/CN4

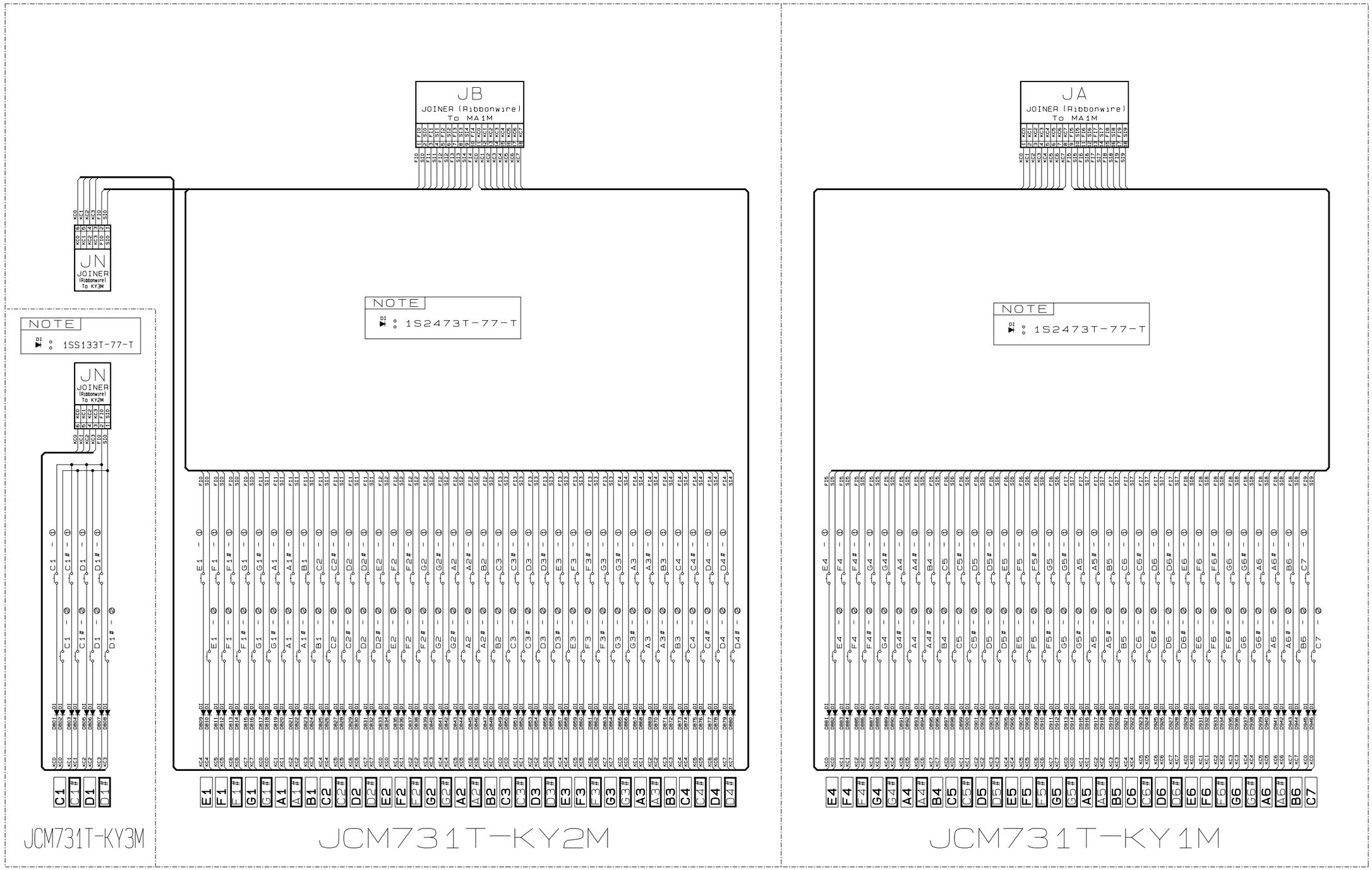




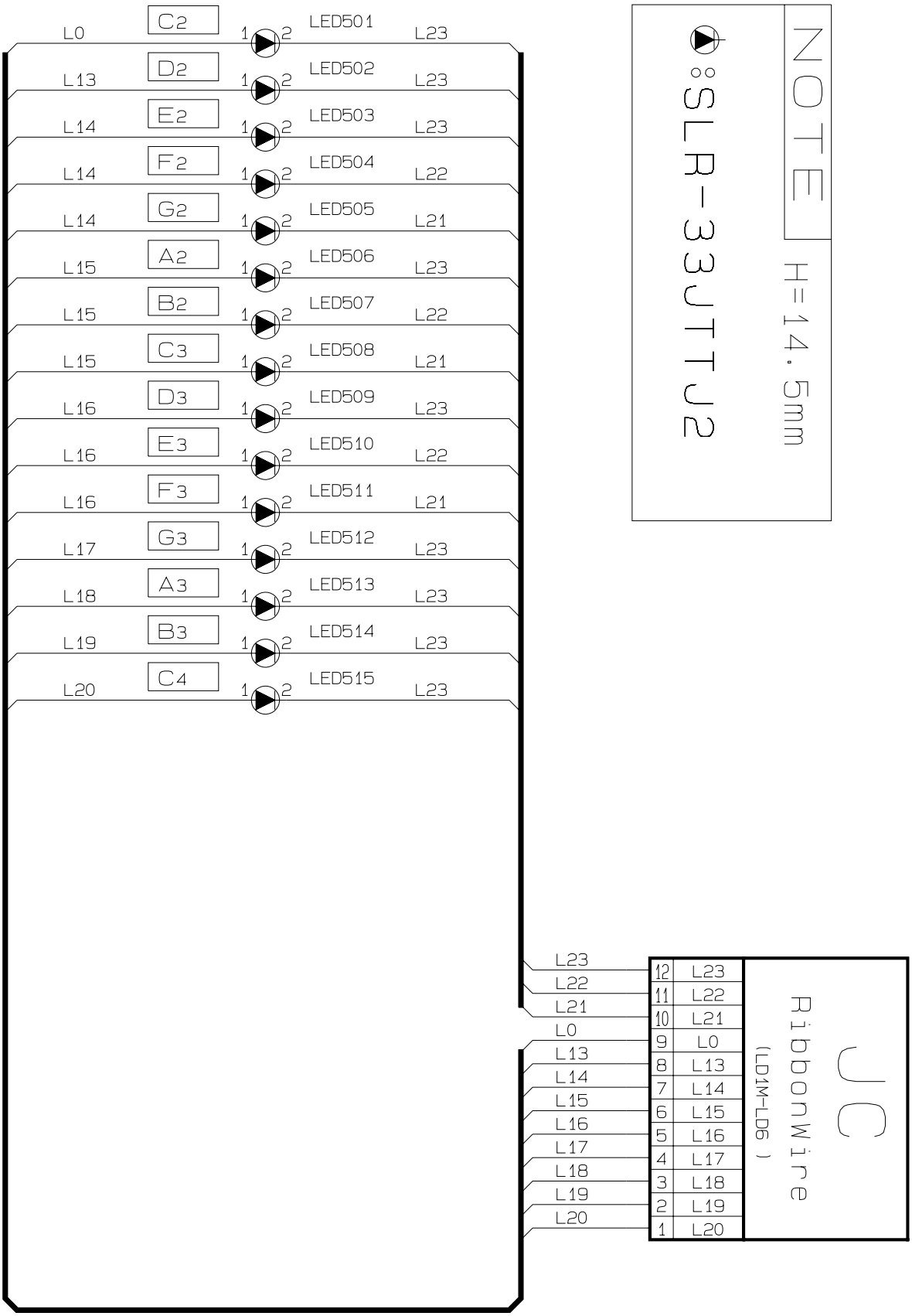




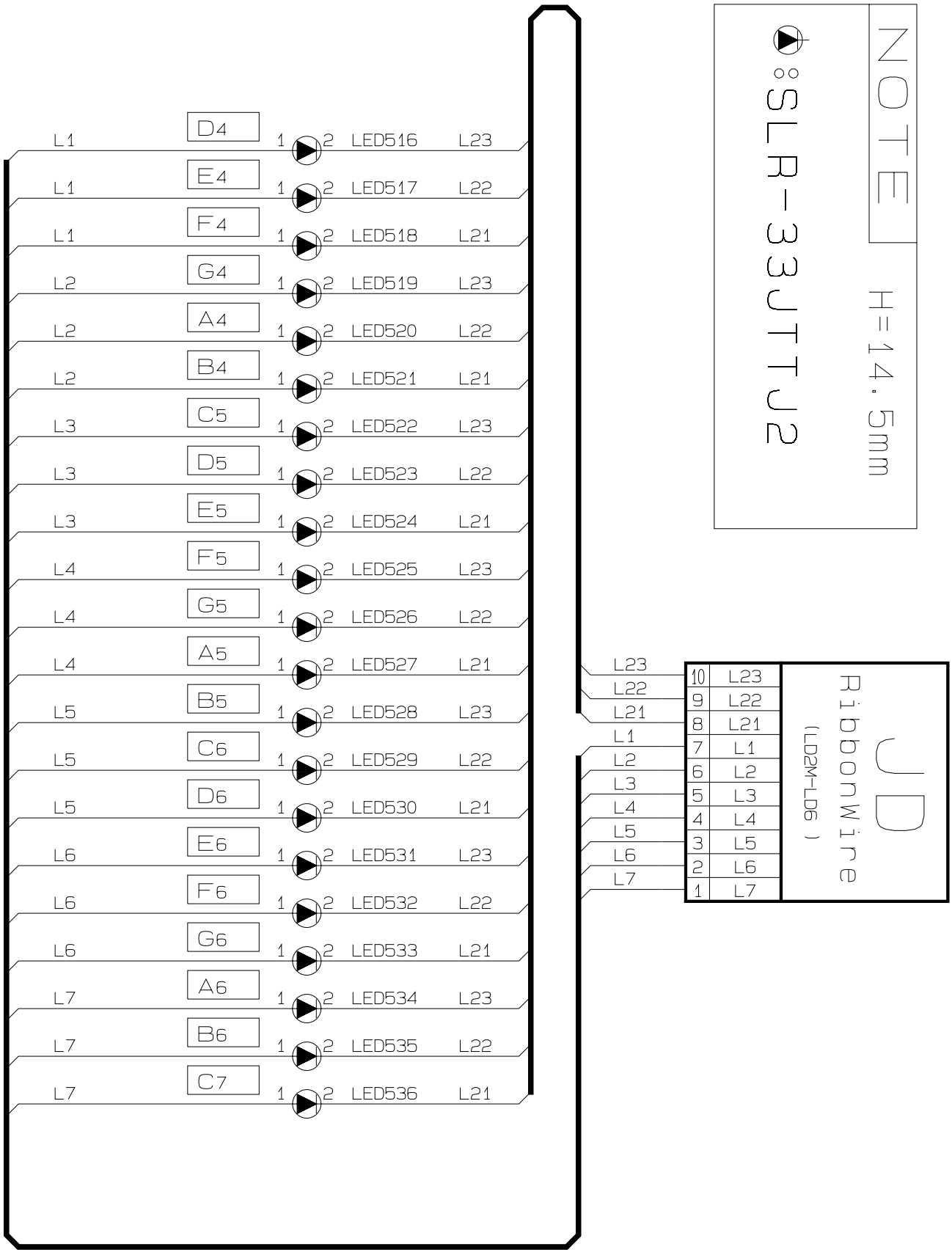
KEYBOARD PCBs JCM731T-KY1M/KY2M/KY3M



LED PCB JCM447-LD1M

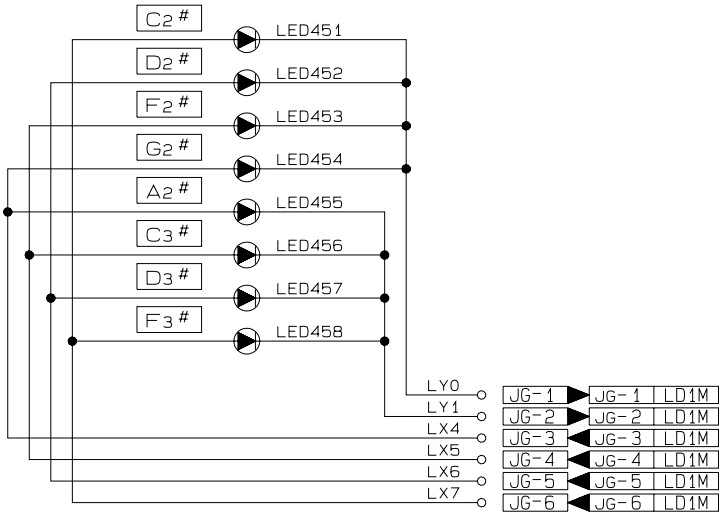


LED PCB JCM447-LD2M

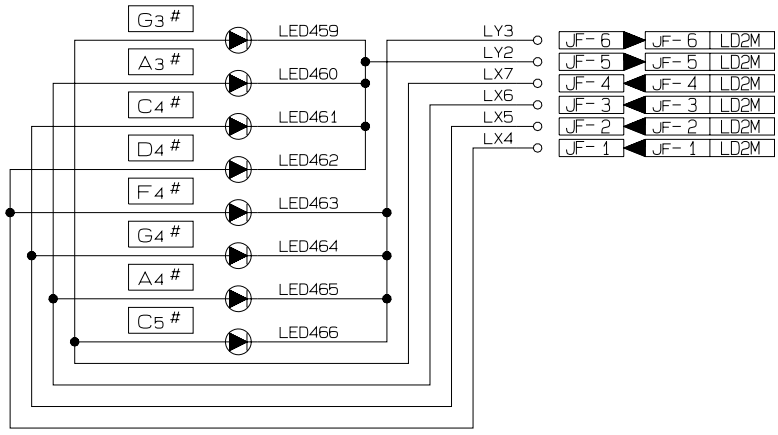


LED PCBs KDM446-LD3M/LD4M/LD5M

KDM446-LD3M



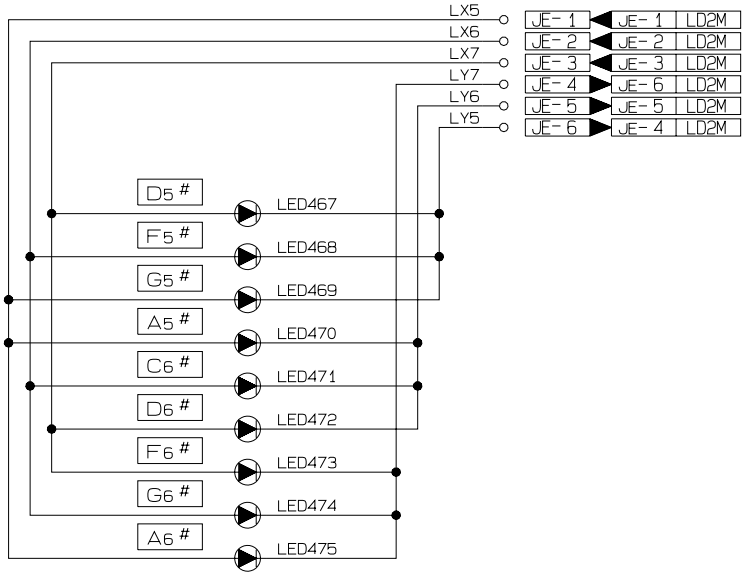
KDM446-LD4M



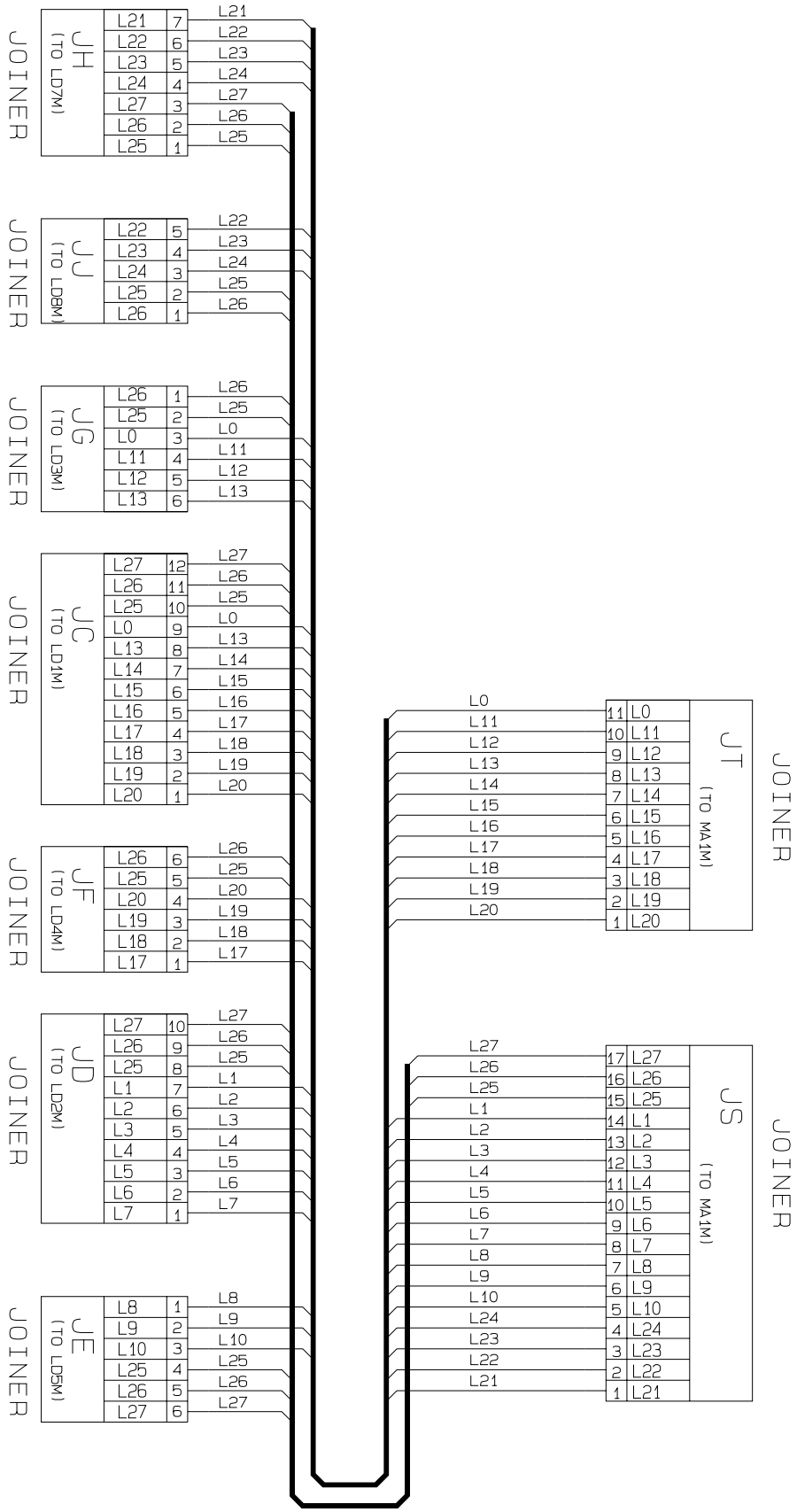
NOTE

▲:KR3302X-J345K

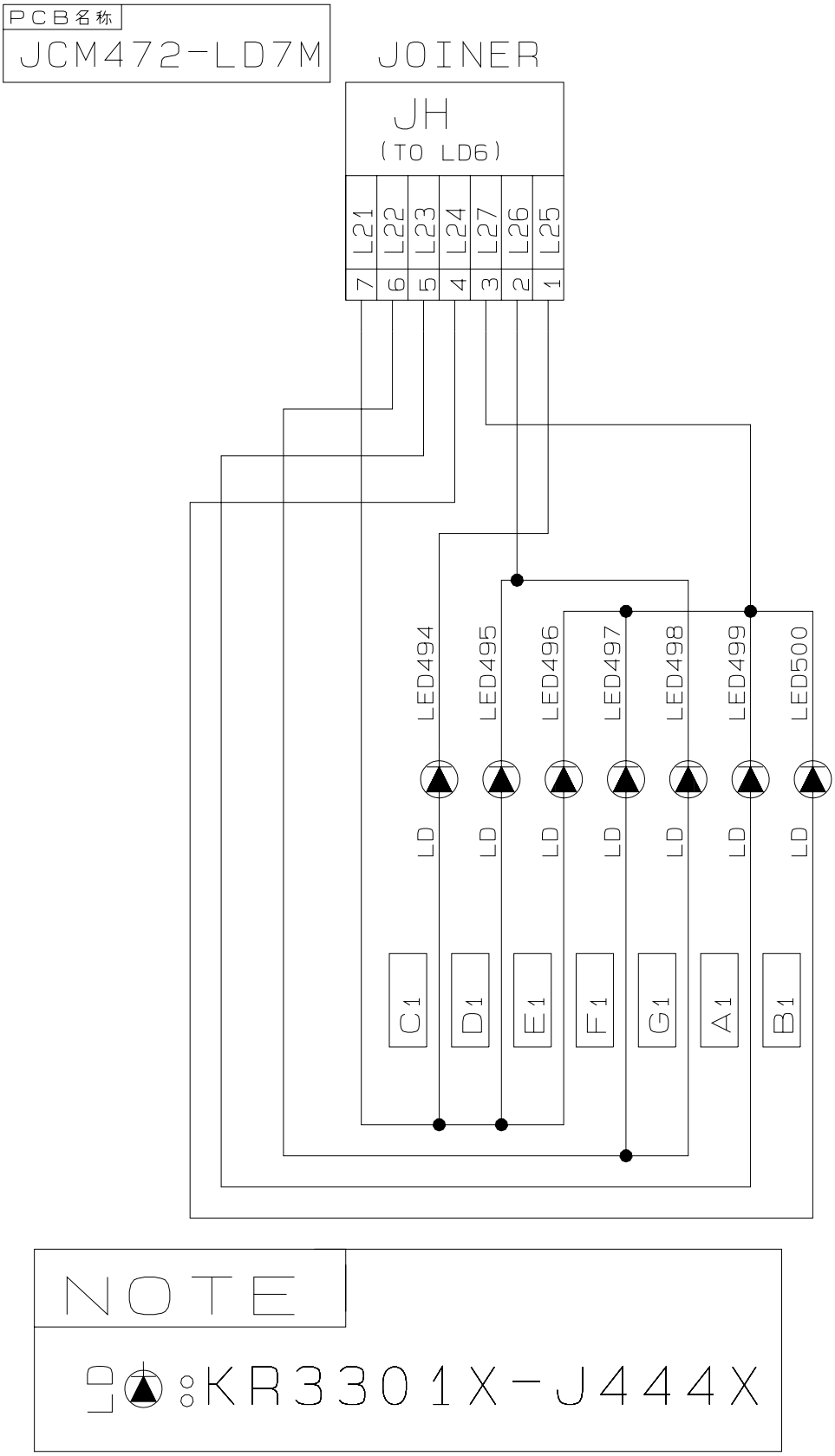
KDM446-LD5M



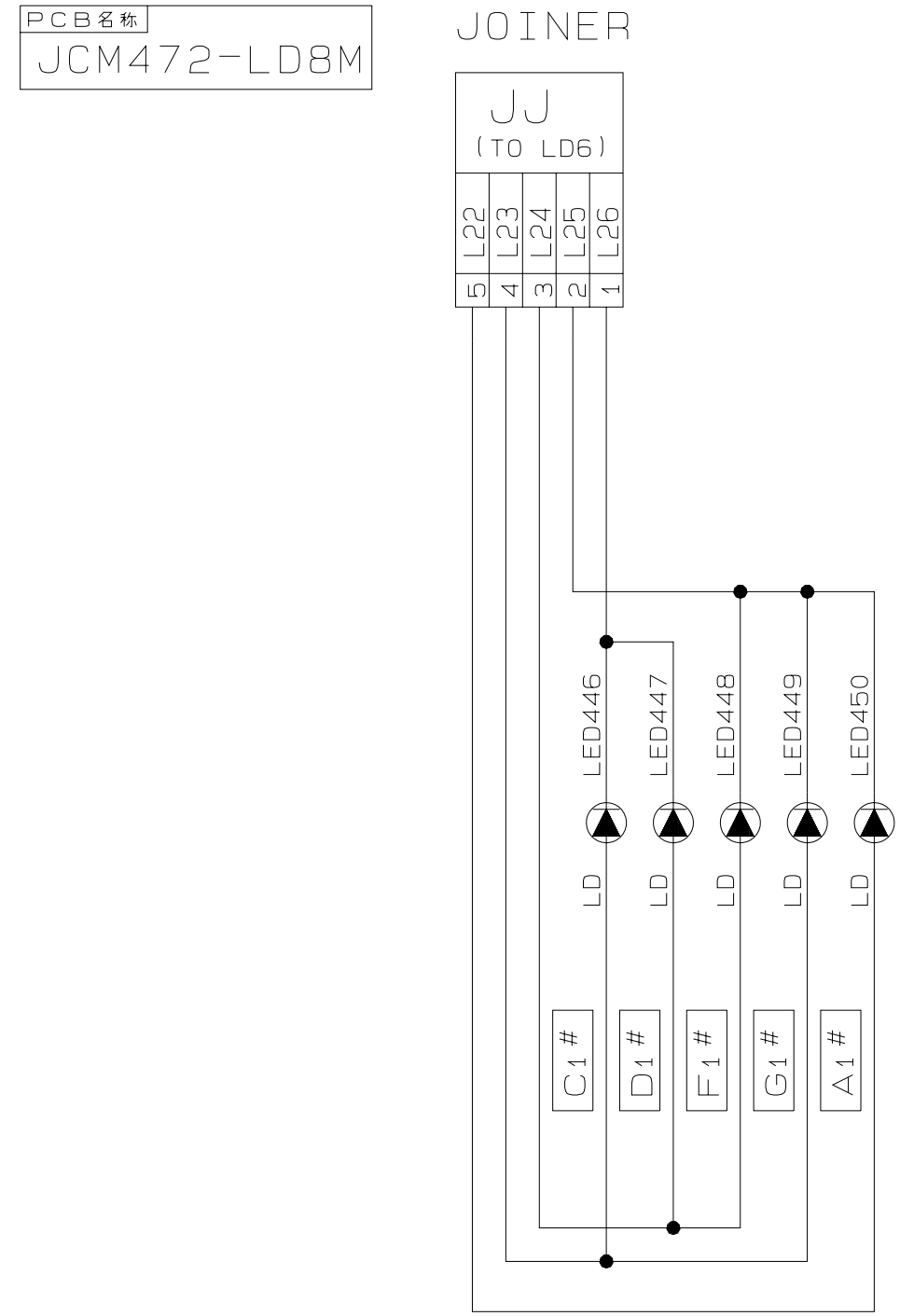
LED PCB JCM472-LD6M



LED PCB JCM472-LD7M



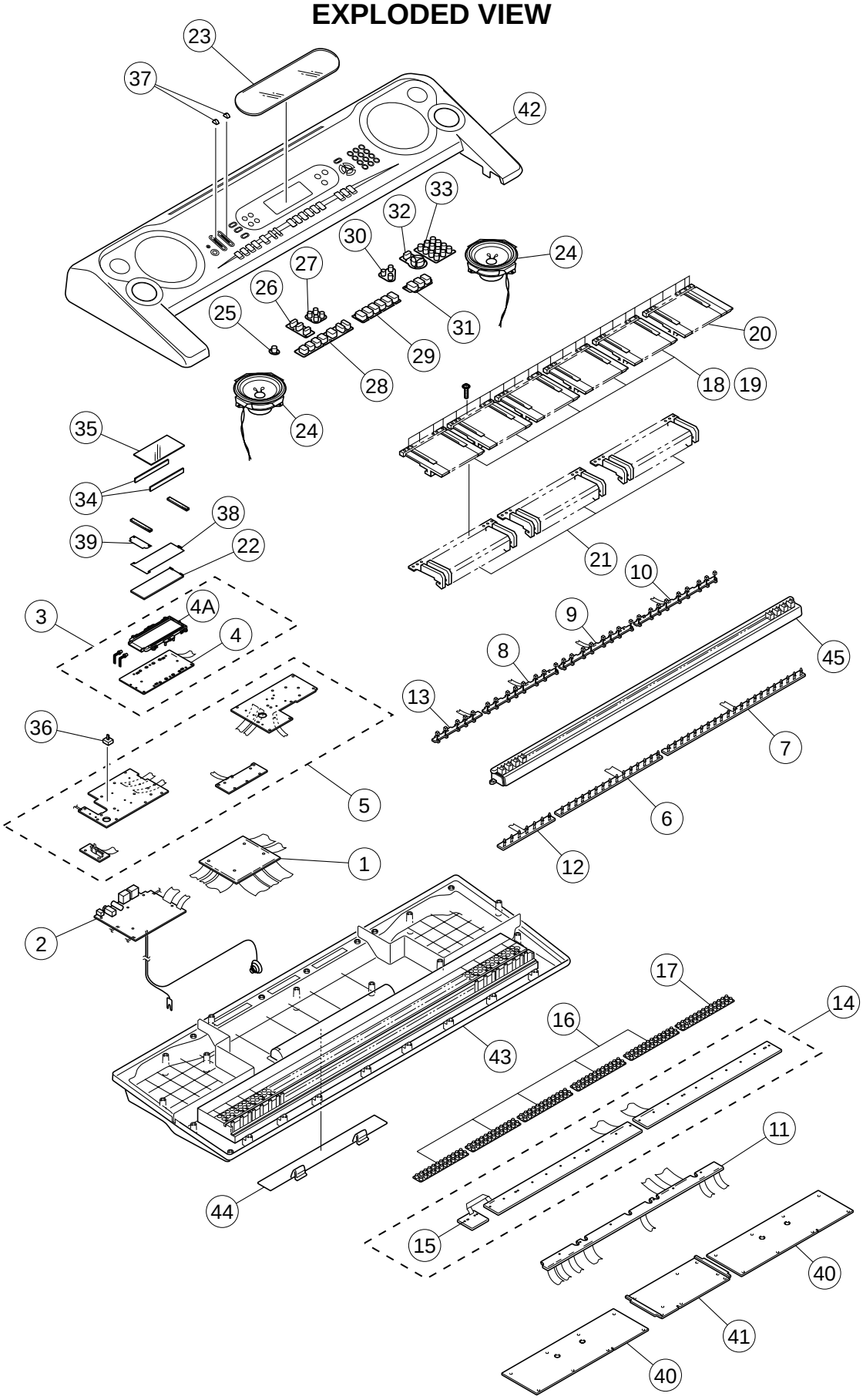
LED PCB JCM472-LD8M



NOTE

LD:LNJ298RKCAB

EXPLODED VIEW



PARTS LIST

LK-73

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.

PARTS PRICE LIST

LK-73

N	Item	Code No.	Part Name	Specification	Q	Price Code	R
		Main PCB					
N	1	1008 9393	PCB/ASSY(MA1M)	TK-RJM501992*001	1	BH	A
	LSI1	1005 2108	LSI	UPD915GF-3BA	1	BW	A
	LSI2	6932 4293	LSI	UPD65881GK-062-9ET	1	AT	A
N	LSI3	1008 1284	LSI	MR27V3202F-4FMA-N	1	BK	A
	LSI4	2105 4746	LSI	UPD6379GR-E1	1	AN	A
	IC1	7911 3782	IC	RN5VD27AA-TR	1	AC	A
	IC7	2105 6350	IC	XC62FP3302PR	1	AC	A
	IC3	2105 6631	IC	TC74VHC08FT(EL)	1	AC	A
	IC4	1004 6049	IC	TC74VHC00FT(EL)	1	AC	A
N	IC5	1008 1286	IC	TC74VHCT573AFT(EL)	1	AH	A
N	IC6	1008 1285	IC	TC74LCX541FT(EL)	1	AG	A
	Q16	2250 1169	TRANSISTOR/CHIP	2SA1576AT106S	1	AA	B
	Q1-Q3	2259 2737	TRANSISTOR/CHIP	2SD2537T100VW	3	AC	B
	Q4-Q15	2259 2562	TRANSISTOR/CHIP	UMS1NTL	12	AB	B
	D1-D10	2390 1820	DIODE/CHIP	1SS355TE-17	10	AA	B
	X1	2590 2742	OSCILLATOR/CRYSTAL	AT-49-30M	1	AG	B
		Sub PCB					
N	2	1008 9394	PCB/ASSY(MA2M)	TK-RJM501994*001	1	CQ	A
N	IC301	1006 2671	IC	LA4636	1	AV	A
	IC302	2114 1421	IC	PC900V	1	AK	B
	IC303	2114 5897	IC	NJM2068DD	1	AC	B
	Q305,Q307	2251 0672	TRANSISTOR	2SB1548-P.CS	2	AD	A
	Q302,Q304, Q306, Q308-Q311	2250 1592	TRANSISTOR	2SC1740STPR	7	AA	B
	Q301,Q303	2250 1591	TRANSISTOR	2SB1237TV2R	2	AB	A
N	D301,D303	1009 4579	DIODE	1N5822	2	AC	B
	D305,D306, D310,D312	2390 1344	DIODE	1SS133T-77-T	3	AA	B
	D308,D311	2360 1085	DIODE/ZENER	HZS6B1LTD	2	AA	B
N	D307	1009 0296	DIODE/ZENER	DZ4.7BSATA	1	AA	B
N	D309	1004 2160	DIODE/ZENER	MTZJT-775.1C	1	AA	B
	J301	3501 3731	JACK/POWER	HEC2305-01-330	1	AC	B
	J302	3612 0665	JACK/PHONE	YKB21-5006	1	AG	B
	J303	3612 0789	JACK	YKB21-5010	1	AC	B
	J304	3501 4816	JACK/DIN	YKF51-5051	1	AH	B
		BL ass'y					
N	3	1008 9395	BL/ASSY	TK-RJM502016*001	1	CI	B
N	4	1008 9396	PCB/ASSY(LCD1M)	TK-RJM501996*001	1	CF	A
	LSI501	1000 6502	LSI/LCD DRIVER	ML9040-B02GA	1	AU	A
	VR501	2775 3286	POTENTIOMETER	EVM3SSX50B53	1	AC	C
N	4A	1008 1734	REFLECTOR	RJM501961-001V01	1	AE	C
	LED501,LED502	1003 2149	LED	FY4067S-2C1-B170	2	AD	C
		Console PCB					
N	5	1008 9397	PCB/ASSY(CN1234M)	TK-RJM501995*001	1	BZ	B
	LED601	2370 1106	LED	MPR3338S-B102	1	AB	B
	VR601	2765 2213	VOLUME	RS20H121-2KB	1	AD	A

N	Item	Code No.	Part Name	Specification	Q	Price Code	R
		LED PCBs					
N	6	1008 9398	PCB ASS'Y / LD1M	TK-M240777*006	1	BW	B
N	7	1008 9399	PCB ASS'Y / LD2M	TK-M240778*006	1	BY	B
N	8	1008 9400	PCB ASS'Y / LD3M	TK-M240428*008	1	BT	B
N	9	1008 9401	PCB ASS'Y / LD4M	TK-M240429*008	1	BT	B
N	10	1008 9402	PCB ASS'Y / LD5M	TK-M240430*008	1	BU	B
N	11	1008 9403	PCB ASS'Y / LD6M	TK-M241186*002	1	BX	B
N	12	1008 9404	PCB ASS'Y / LD7M	TK-M241187*002	1	BT	B
N	13	1008 9405	PCB ASS'Y / LD8M	TK-M241188*002	1	BS	B
	LED494-LED500	2370 1400	LED	LNJ276CKCALJ	43	AA	B
	LED501-LED536						
	LED446-LED450	1004 9406	LED	SLI-332URCTD7	30	AH	B
	LED451-LED475						
		Keyboard PCBs					
	14	6928 4100	PCB ASSY / KY1,2M	M140614*3	1	BQ	B
	D809-D946	2301 0101	DIODE	1S2473-T-77-T	138	AA	B
	15	6925 8940	PCB ASSY /KY3M	M340666*1	1	AE	B
	D801-D808	2390 1344	DIODE	1SS133T-77-T	8	AA	B
		Keyboard Unit					
	16	6926 2500	RUBBER / CONTACT	M240699-2	5	AL	A
	17	6926 2510	RUBBER / CONTACT	M240700-2	1	AL	A
	18	6925 2110	W-KEY-LSK-GEGB	M140366-1	4	BC	A
	19	6925 2120	W-KEY-LSK-DFA	M140367-1	4	BF	A
	20	6927 3400	WHITE KEY SET / LSK-CS	M340489*4	1	AV	A
	21	6925 1720	BLACK KEY SET / LSK 10P	M140369-1	3	BN	A
		Mechanical Parts					
N	22	1008 3525	BL-PLATE-M641	RJM501962-001V01	1	AR	X
N	23	1008 6229	DP-PLATE-M641	RJM501966-001V02	1	AI	X
	24	3831 1105	SPEAKER	S12JA02A	2	BM	B
N	25	1008 1180	RUBBER-KEY-A-M641	RJM501950-001V01	1	AA	B
N	26	1008 1181	RUBBER-KEY-B-M641	RJM501951-001V01	1	AB	B
N	27	1008 1182	RUBBER-KEY-C-M641	RJM501952-001V01	1	AA	B
N	28	1008 1183	RUBBER-KEY-D-M641	RJM501953-001V01	1	AE	B
N	29	1008 1184	RUBBER-KEY-E-M641	RJM501954-001V01	1	AE	B
N	30	1008 1185	RUBBER-KEY-F-M641	RJM501955-001V01	1	AB	B
N	31	1008 1187	RUBBER-KEY-G-M641	RJM501959-001V01	1	AC	B
N	32	1008 1188	RUBBER-KEY-H-M641	RJM501960-001V01	1	AE	B
N	33	1008 1186	RUBBER-KEY-J-M641	RJM501958-001V01	1	AC	B
N	34	1008 3431	INTERCONNECTOR	RJM501983-002V01	2	AE	C
N	35	1008 5286	LCD	CG1919-TTP	1	BG	B
	36	6927 0510	SWITCH / SL KNOB	CSB-08D	1	AD	B
	37	6921 5030	KNOB	M311859-1	2	AA	C
N	38	1008 1189	FILM-M641	RJM501963-001V01	1	AA	C
N	39	1008 1190	TOP-PIECE-M641	RJM501982-001V01	1	AA	X
	40	6925 9320	L-PLATE-730A	M240642-1	2	AJ	X
	41	6925 9410	L-PLATE-730C	M340640-1	1	AB	X
N	42	1008 9406	U-CASE-SUB ASSY	RJM502014*001	1	CX	X
N	43	1008 9407	L-CASE-SUB ASSY	M140625*003	1	CW	X
	44	6906 6856	COVER / BATTERY	M311164*7	1	AS	B
	45	1008 3422	FK-CASE-SUB ASSY	M241151*002	1	BZ	X
		Accessory					
		6931 4261	STAND / MUSIC	M140719-3	1	AZ	B

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