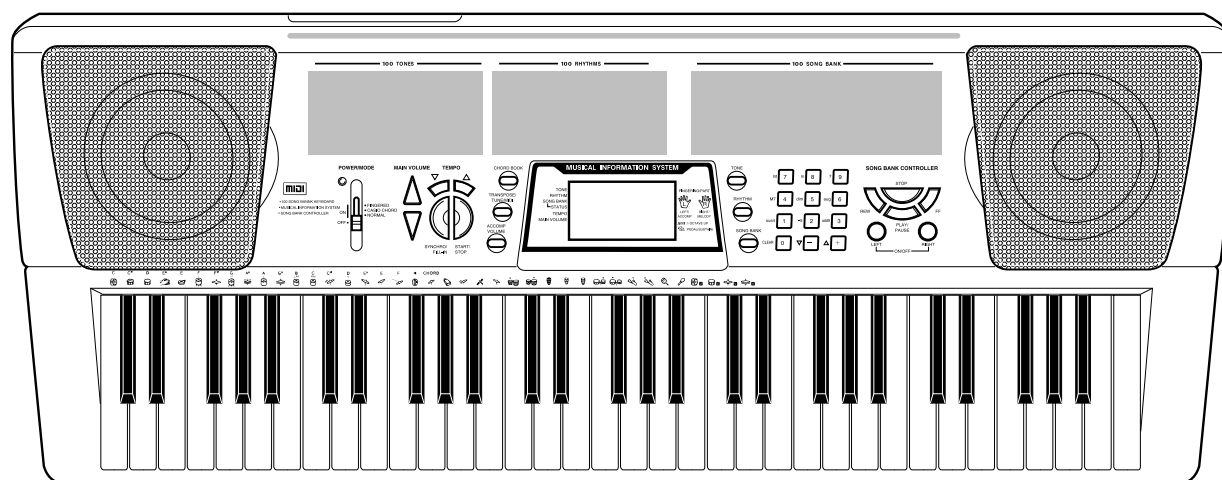


CASIO®

Service Manual

(without price)

CTK-511



CTK-511

ELECTRONIC KEYBOARD

CONTENTS

| | |
|------------------------------|----|
| Specifications | 1 |
| Block Diagram | 2 |
| Circuit Description | 3 |
| Adjustment | 7 |
| Major Waveforms | 8 |
| Printed Circuit Boards | 9 |
| Schematic Diagrams | 10 |
| Exploded View | 15 |
| Parts List | 16 |

SPECIFICATIONS

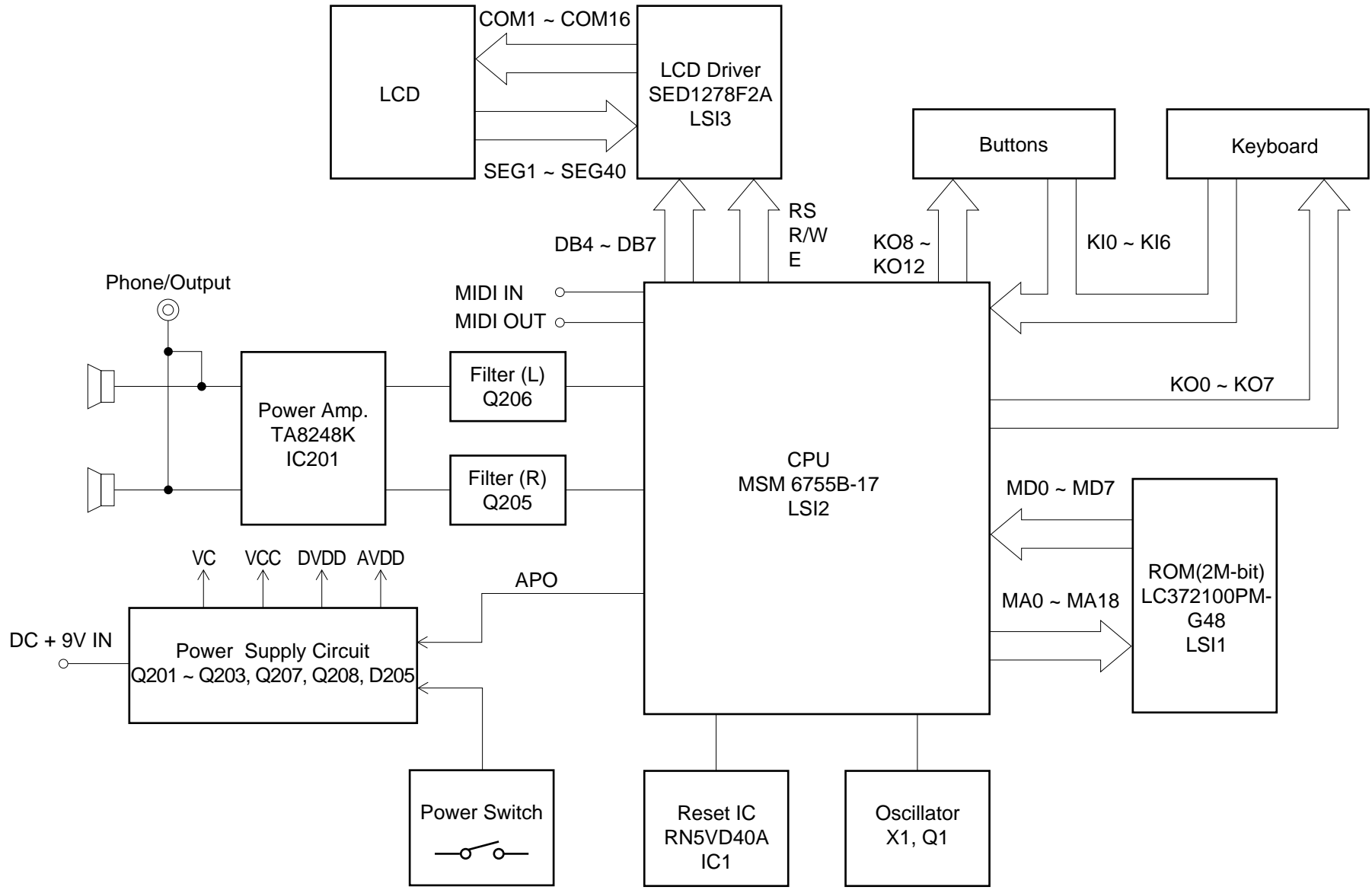
GENERAL

| | |
|-------------------------|---|
| 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, $\text{♩} = 20$ to 255) |
| Chords: | 2 fingering methods (CASIO CHORD, FINGERED) |
| Rhythm controller: | START/STOP, SYNCHRO/FILL-IN |
| Accomp volume: | 0 to 9 (10 steps) |
| Song bank | |
| Tunes: | 100 |
| Controllers: | PLAY/PAUSE, STOP, REW, FF, LEFT ON/OFF (ACCOMP), RIGHT ON/OFF (MELODY) |
| Display | |
| Name display: | TONE, RHYTHM, SONG BANK name/number, keyboard settings name/value |
| Tempo: | Tempo value, metronome, synchro standby, beat indicator |
| Chord: | Chord name, Chord form |
| Fingering: | Fingering indicators, parts, pedal |
| Song bank status: | PLAY, PAUSE, REW, FF |
| Staff: | 5 octaves with sharp and flat indications |
| Keyboard: | 5 octaves |
| MIDI: | 5 multi-timbre receive |
| Other functions | |
| Transpose: | 12 steps (–6 semitones to +5 semitones) |
| Tuning: | Variable (A4 = approximately 440 Hz \pm 50 cents) |
| Volume: | 0 to 9 (10 steps) |
| Terminals | |
| MIDI terminals: | IN, OUT |
| Sustain terminal: | Standard jack |
| Phones/Output terminal: | Stereo standard jack |
| | Output Impedance: 78 Ω |
| | Output Voltage: 4 V (RMS) MAX |
| Power supply terminal: | 9 V DC |
| Power supply | Dual power supply system |
| Batteries: | 6 D-size batteries |
| Battery life: | Approximately 8 hours on manganese batteries |
| AC adaptor: | AD-5 |
| Auto power off: | Turns power off approximately six 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 \approx 7.7 W |
| Dimensions (HWD): | 961 \times 381 \times 139 mm (37-7/8 \times 15-1/16 \times 5-1/2 inches) |
| Weight: | Approximately 5.4 kg (11.91 lbs) (without batteries) |

ELECTRICAL

| | |
|--|-------------------|
| Current drain with 9 V DC: | |
| No sound output | 250 mA \pm 20% |
| Maximum volume | 830 mA \pm 20% |
| with 12 keys C1 to B1 pressed in Synth-Lead 1 | |
| Volume: Maximum | |
| Phone output level (Vrms with 8 Ω load each channel): | |
| with key G2 pressed in Synth-Lead 1 | 78 mV \pm 20% |
| Speaker output level (Vrms with 4 Ω load each channel): | |
| with key G1 pressed in Synth-Lead 1 | 1250 mV \pm 20% |
| Output level (Vrms with 47 K Ω load each channel): | |
| with key B1 pressed in Synth-Lead 1 | 1050 mV \pm 20% |
| Minimum operating voltage: | 6.0 V |

BLOCK DIAGRAM

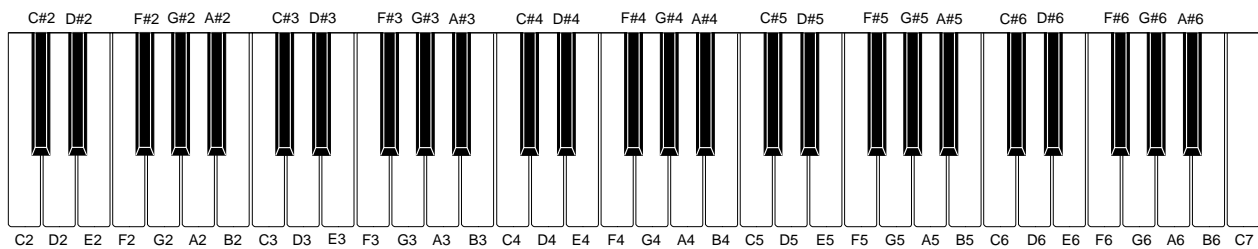


CIRCUIT DESCRIPTION

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 | Tempo Down | Tempo Up | Volume Down | Volume Up | |
| KO9 | 3 | 2 | 1 | Start/ Stop | Synchro/ Fill-In | Chord Book | Accomp Volume | |
| KO10 | 6 | 5 | 4 | Transpose/ Tune/MIDI | Song Bank | Rhythm | Tone | |
| KO11 | 9 | 8 | 7 | Fingered | CASIO Chord | Normal | Off | |
| KO12 | FF | Right | Play/ Pause | Stop | Left | REW | | |

NOMENCLATURE OF KEYS



CPU (LSI2: 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 LSI2.

| 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 | P24/RXD | In | MIDI signal input |
| 37 | P25/TXD | Out | MIDI signal output |
| 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 | In | Pedal signal input |
| 58 ~ 64 | KI0/P30 ~ KI7/P36 | In | Terminals for key/button input signal |
| 65 | KI7/P37 | — | Not used |
| 66 ~ 73 | KO0/P50 ~ KO7/P57 | Out | Terminals for key scan signal |

| Pin No. | Terminal | In/Out | Function |
|---------|------------|--------|---------------------------------------|
| 74 ~ 77 | DB4 ~ DB7 | Out | Data bus for the LCD driver |
| 78 | NC9 | — | Not used |
| 79 | LVCC | In | +5 V source |
| 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 |

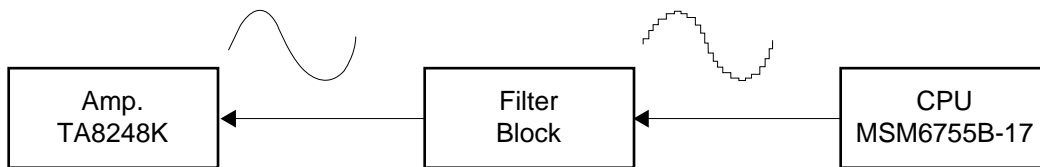
LCD DRIVER (LSI3: SED1278F2A)

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 (IC201: TA8248K)

The power amplifier is a two-channel amplifier with standby switch. The following table shows the pin function of IC201.

| Pin No. | Terminal | In/Out | Function |
|---------|-----------|--------|--|
| 1 | NC | — | Not used |
| 2 | B.S.2 | — | Terminal for a bootstrap capacitor |
| 3 | OUT2 | Out | Channel 2 output |
| 4 | VCC | In | +9 V source |
| 5 | OUT1 | Out | Channel 1 output |
| 6 | B.S.1 | — | Terminal for a bootstrap capacitor |
| 7 | Power GND | In | Ground (0 V) source |
| 8 | Stand by | In | Power control signal input. 0 V: Off, +9 V: On |
| 9 | DC | — | Terminal for a decoupling capacitor |
| 10 | NF1 | In | Negative feedback input |
| 11 | IN1 | In | Channel 1 input |
| 12 | IN2 | In | Channel 2 input |
| 13 | NF2 | In | Negative feedback input |
| 14, 15 | Pre GND | In | Ground (0 V) source |

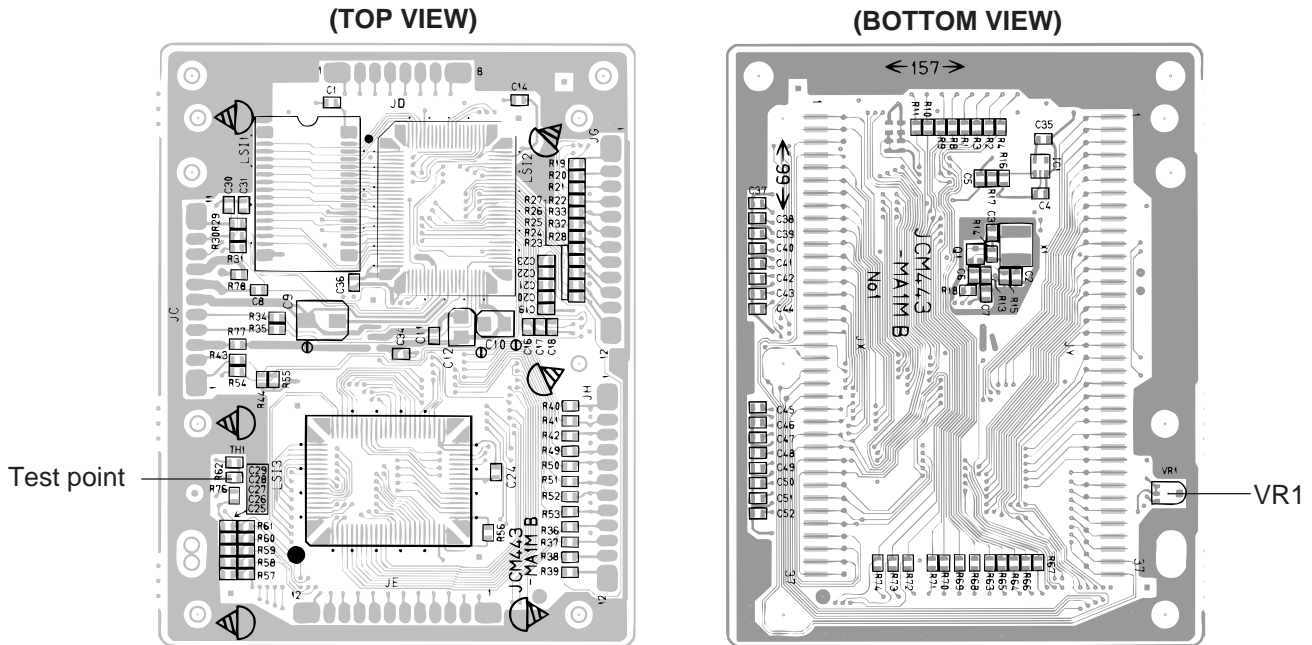
ADJUSTMENT

MAIN PCB

1) Items to be adjusted:

| Item | Measuring Instrument |
|---------------------|----------------------|
| Vop voltage setting | Voltmeter |

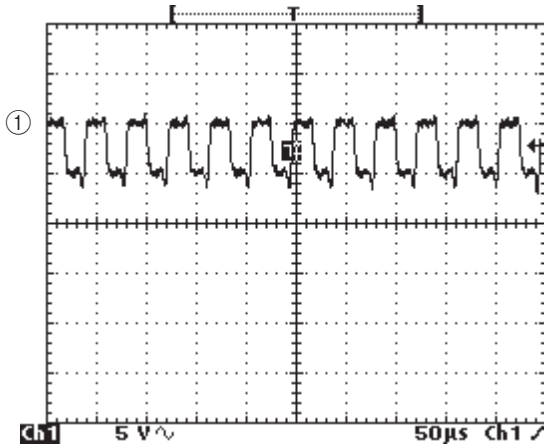
2) Adjustment and Test Point Locations



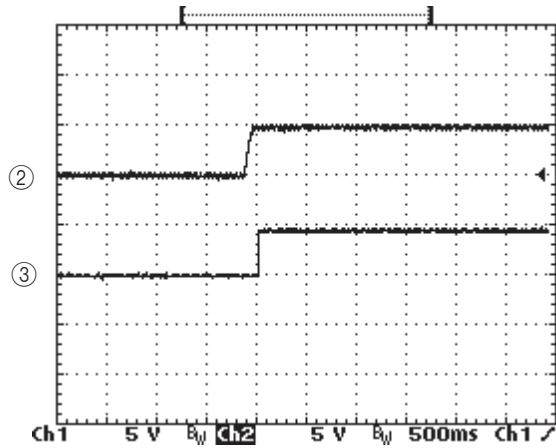
3) Equipment connection/Procedure

| Vop voltage setting | | | | | | |
|---|-------------|--------------|--------|-------------------|--------------|--|
| | | | | | | |
| Input Connection | Input Point | Input Signal | Adjust | Output Connection | Output Point | Adjust for |
| | | | VR1 | Voltmeter | R62 | Adjust for 4.40 ~ 4.46 V reading on voltmeter under the temperature 20 ~ 25 °C. Make fine adjustment according to the following instruction. |
| | | | | | | |
| <p>Watching the LCD at a 37° angle to the horizontal, adjust Vop voltage so that unenergized segments are seen dimly.</p> | | | | | | |

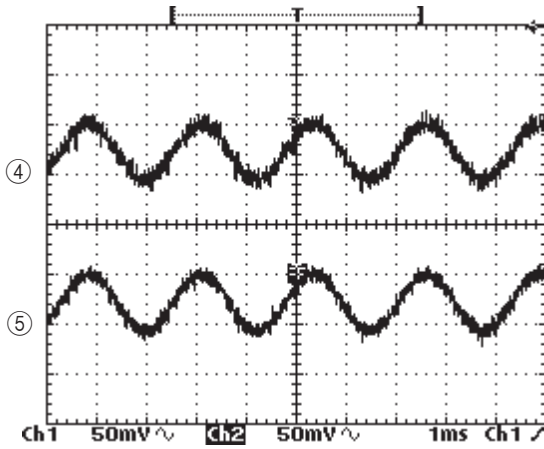
MAJOR WAVEFORMS



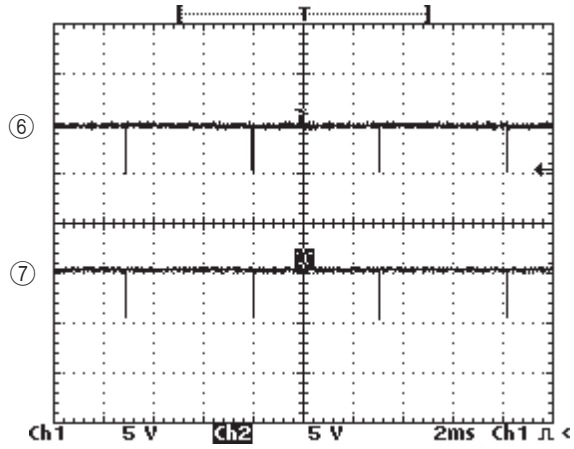
① Clock pulse
MSM6755B-17 pin 32



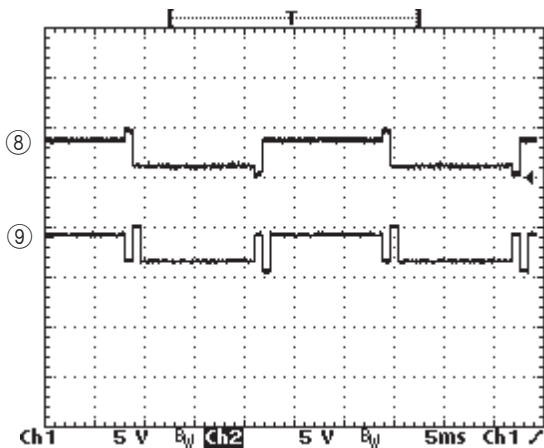
② Power source DVDD
JC connector pin 8
③ APO signal
JC connector pin 2



④ Sound waveform (R-ch) Tone: Whistle (59)
JC connector pin 5 Key: A4
⑤ Sound waveform (L-ch) Volume: Max.
JC connector pin 4



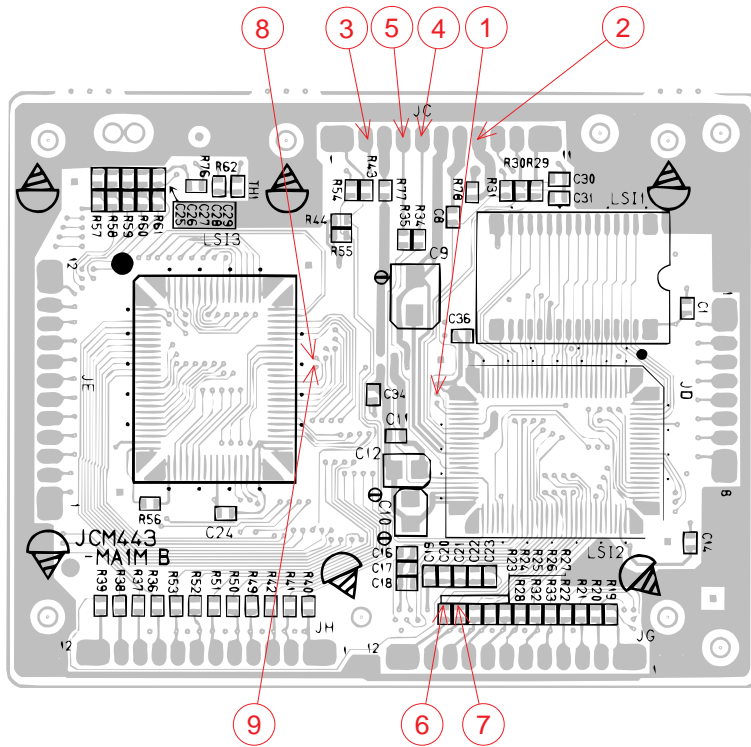
⑥ Button scan signal KO0
MSM6755B-17 pin 66
⑦ Button scan signal KO1
MSM6755B-17 pin 67



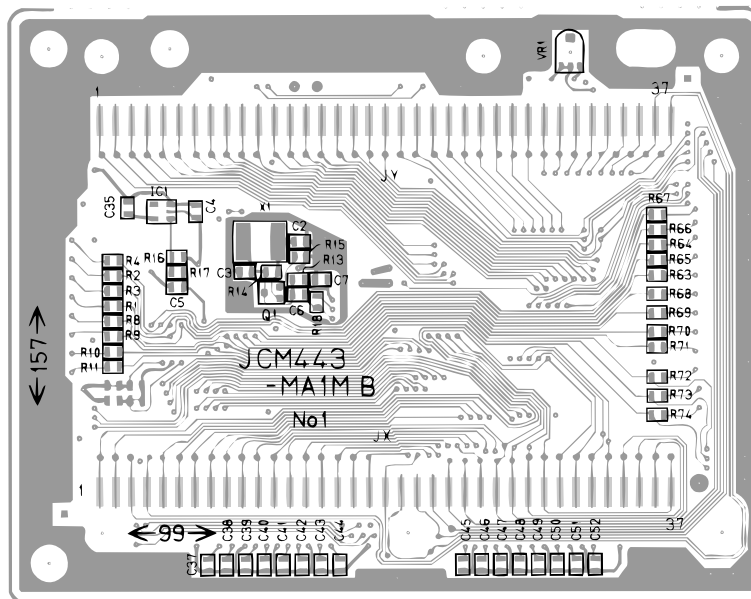
⑧ LCD common signal COM6
SED1278F2A pin 52
⑨ LCD common signal COM7
SED1278F2A pin 53

PRINTED CIRCUIT BOARDS

Main PCB JCM443-MA1M



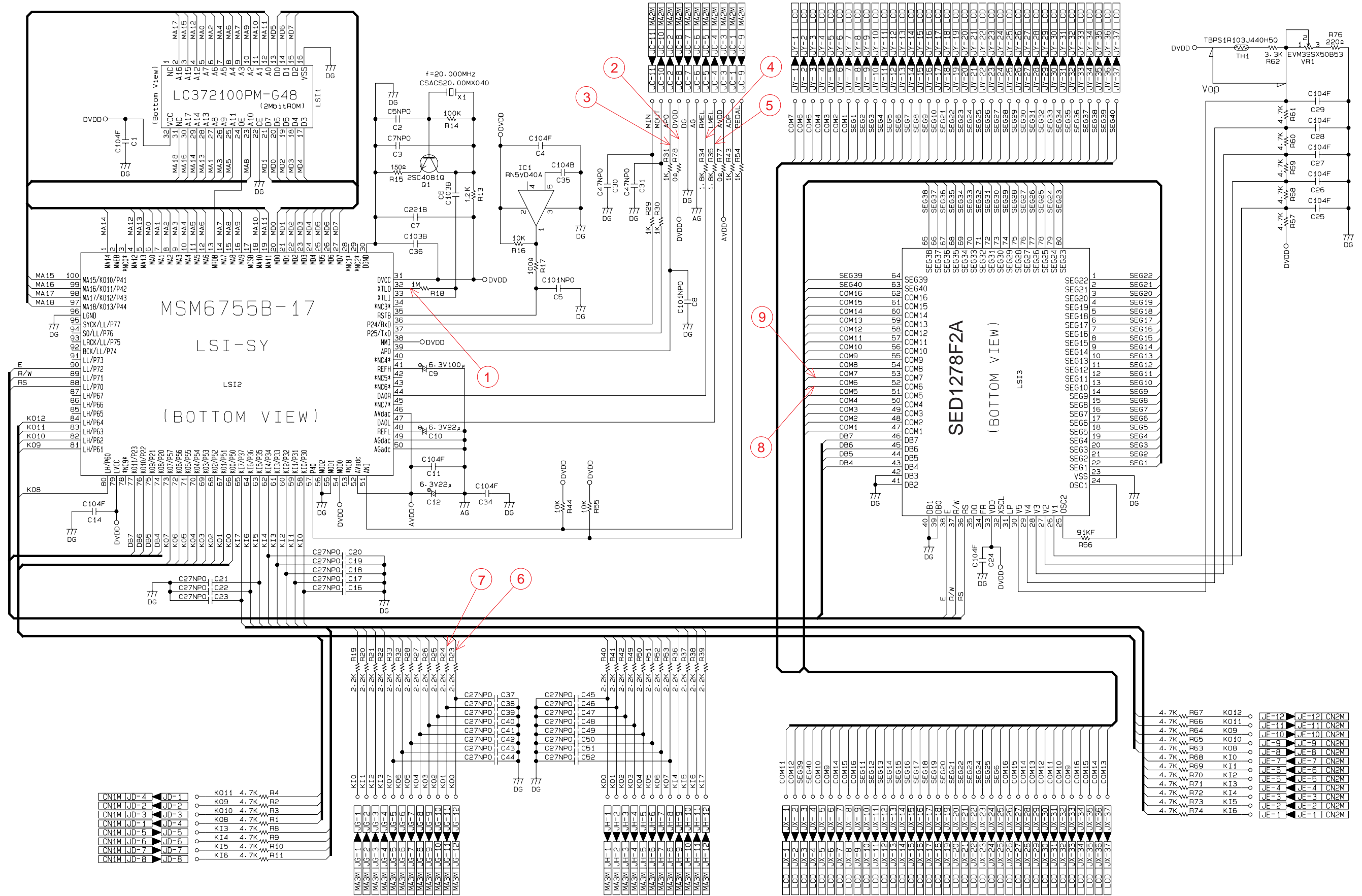
Top View



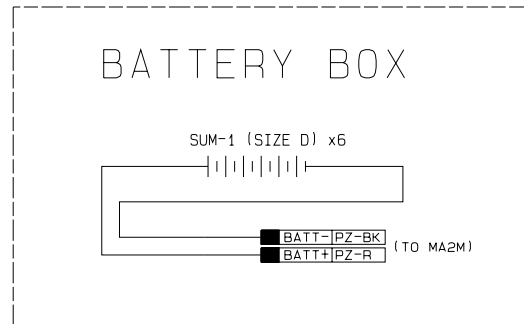
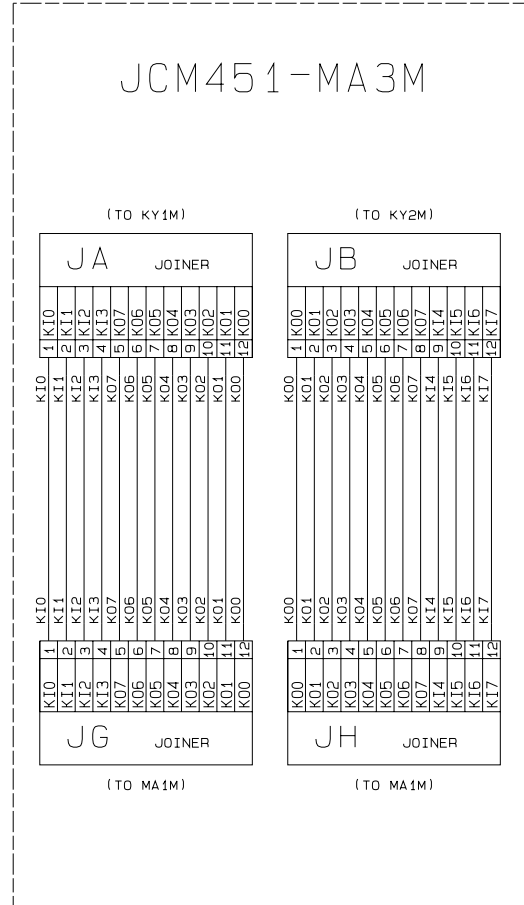
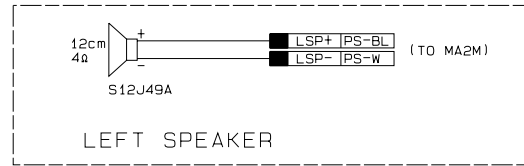
Bottom View

SCHEMATIC DIAGRAMS

Main PCB JCM443-MA1M



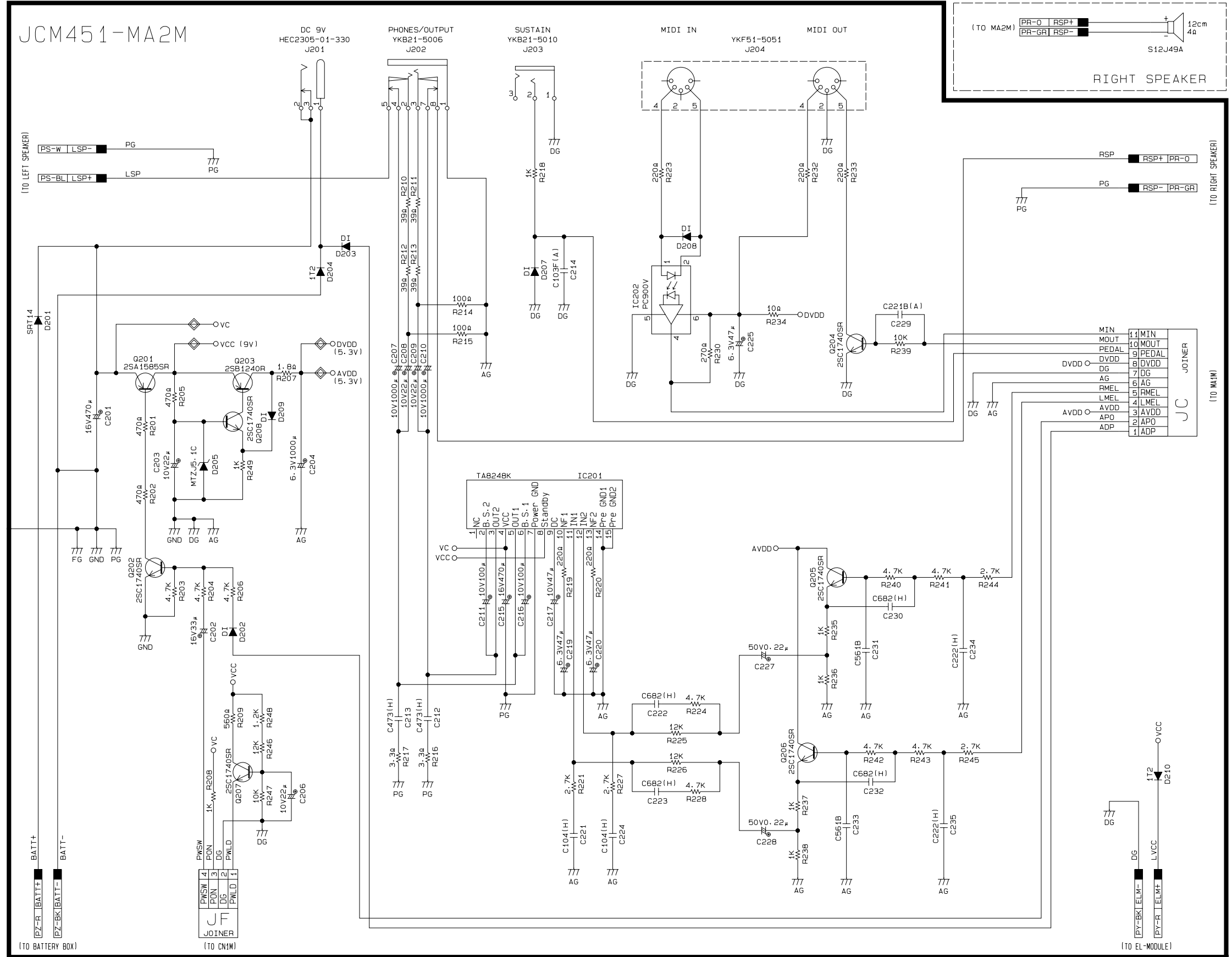
Sub PCBs JCM451-MA2M/MA3M



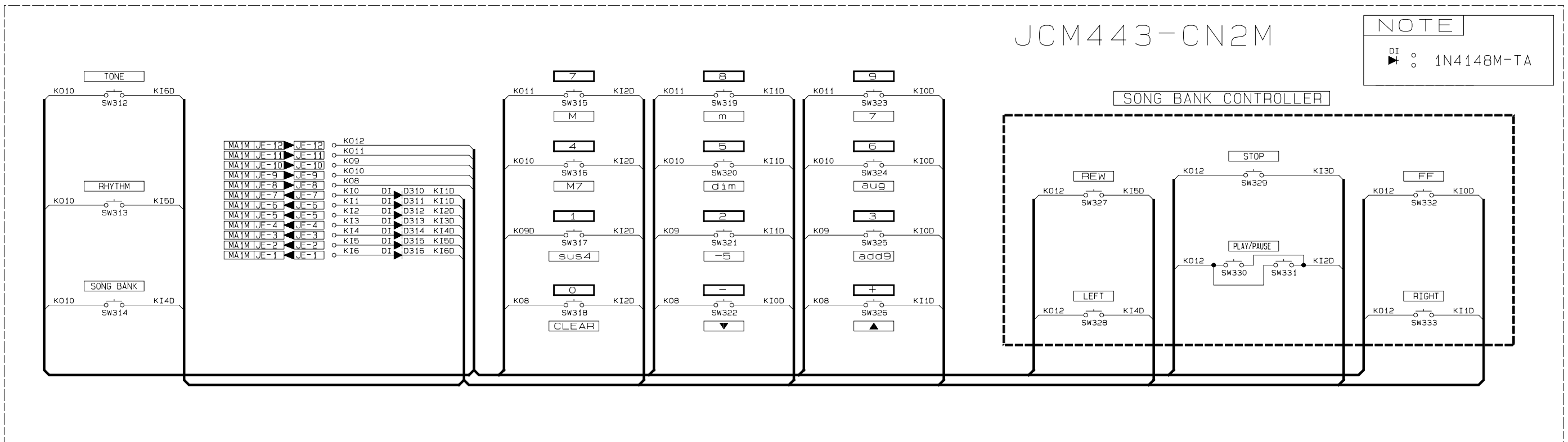
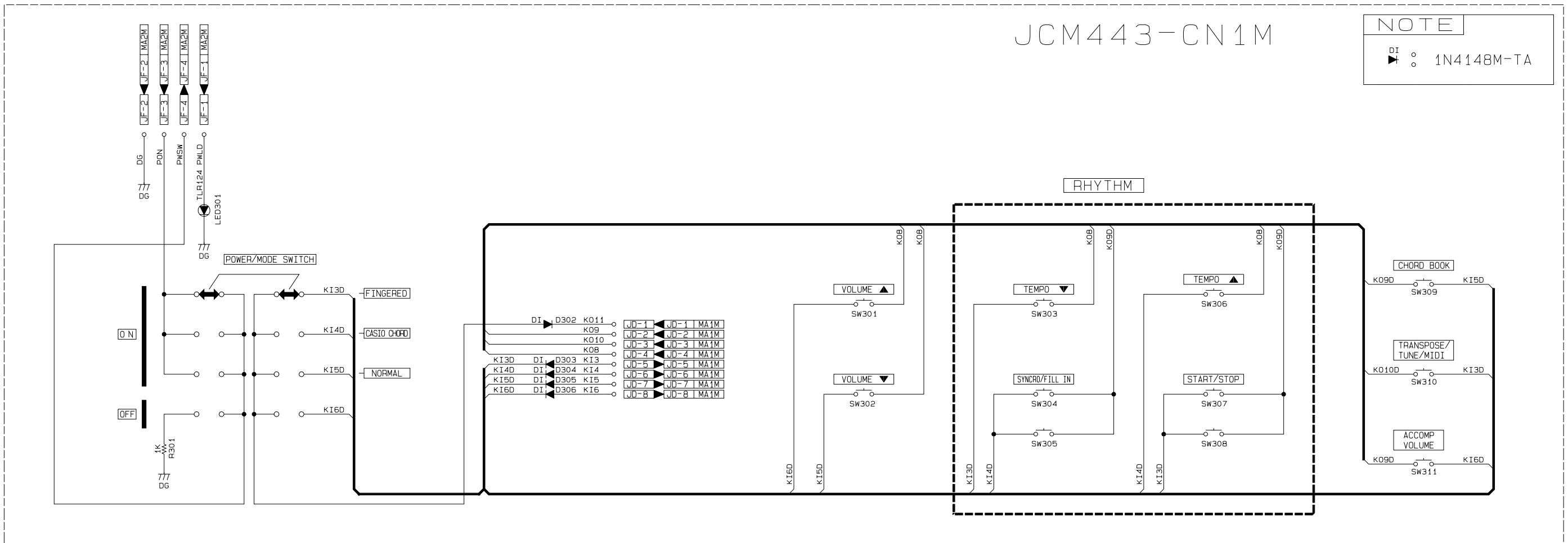
NOTE

▶ DI ○ 1SS133T-77

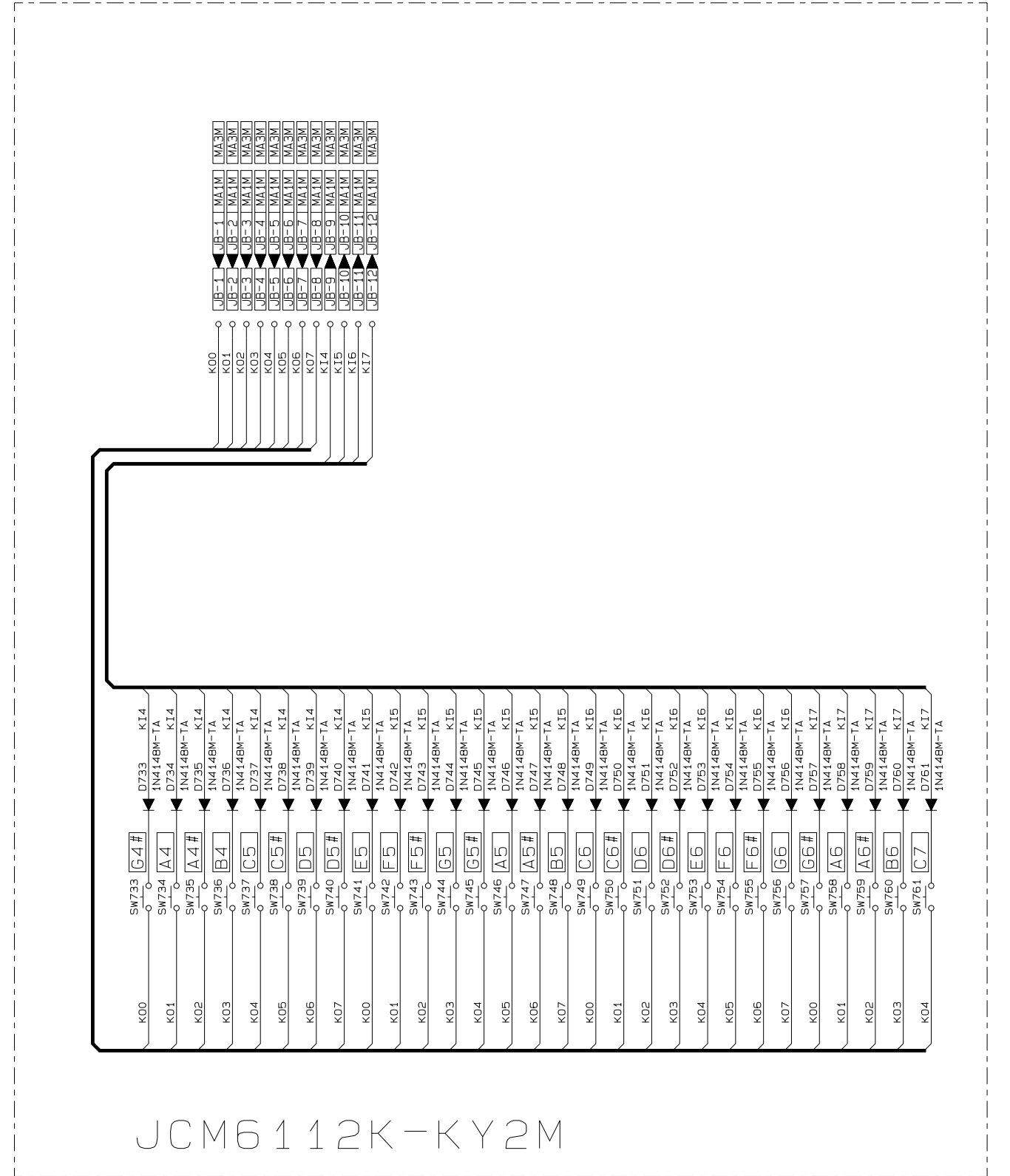
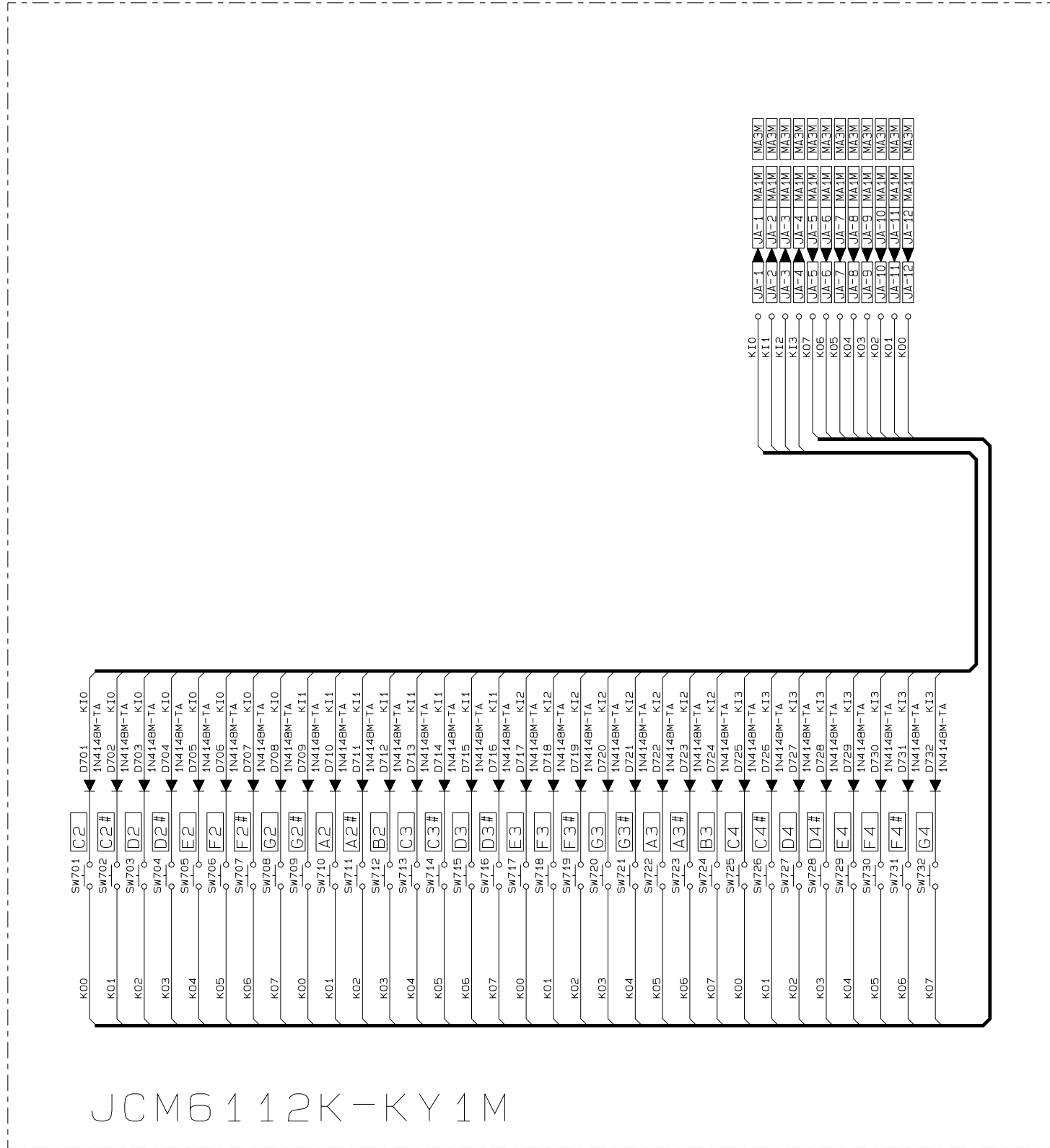
◇ ○ VOLTAGE CHECK POINT



Console PCBs JCM443-CN1M/CN2M

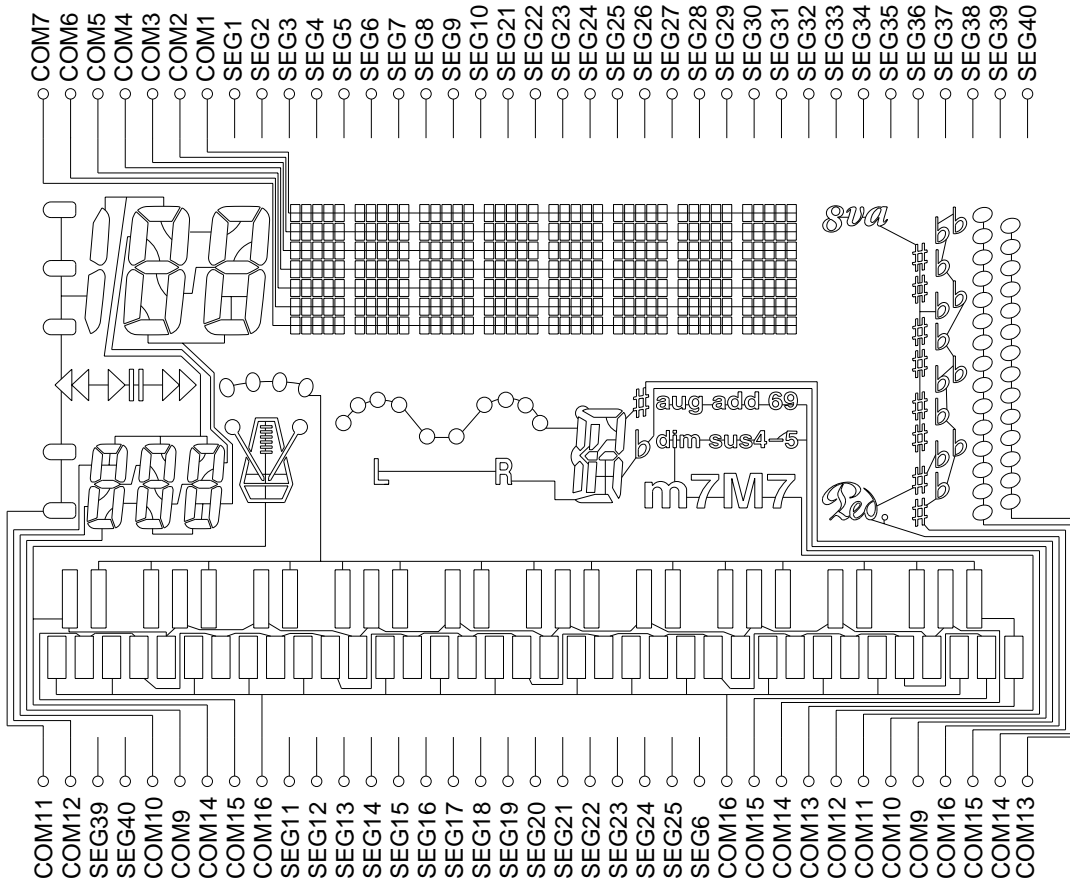


Keyboard PCBs JCM6112K-KY1M/KY2M

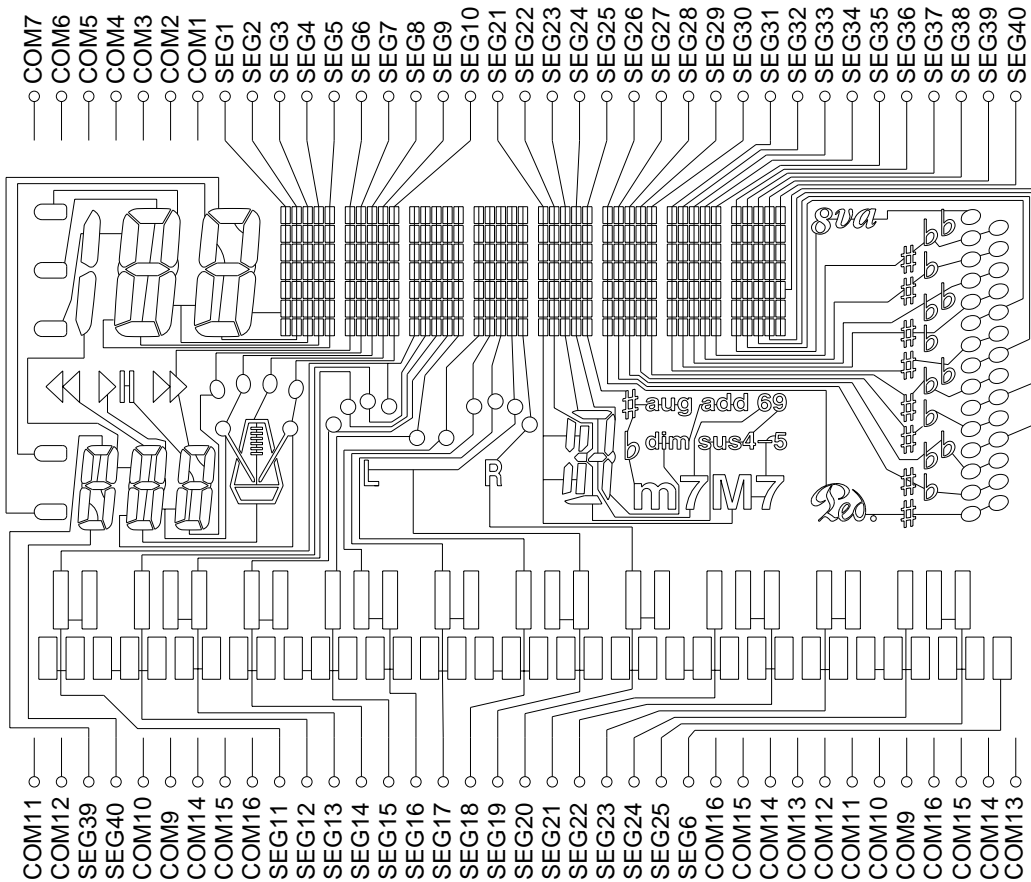


LCD

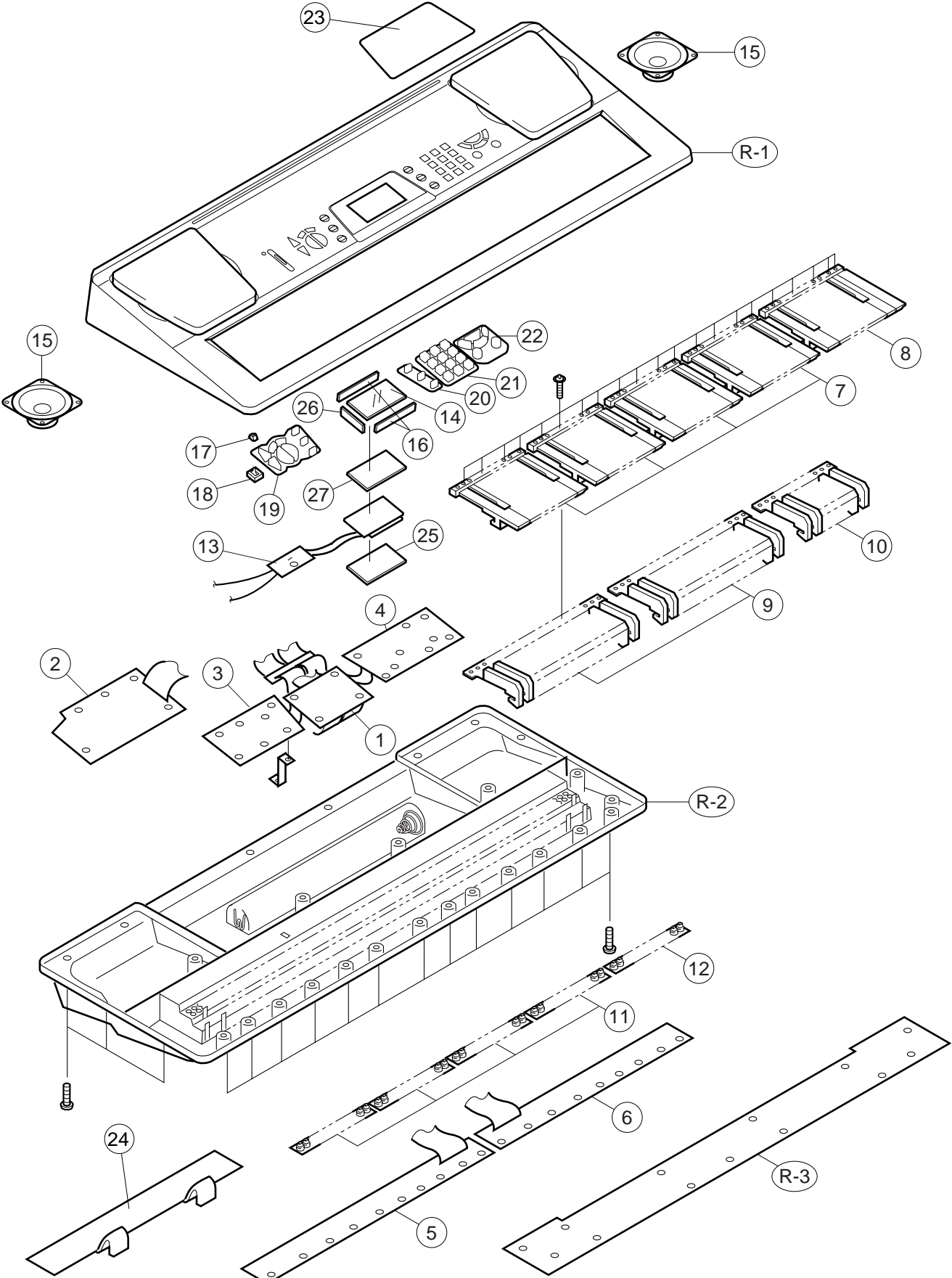
Common



Segment



EXPLODED VIEW



PARTS LIST

CTK-511

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 0460 | PCB/ASS'Y (MA1M) | M240626*1 | 1 | B |
| LSI1 | 2012 5638 | LSI/MASK-ROM | LC372100PM-G48TE-L | 1 | A |
| LSI2 | 2012 5603 | LSI/MC | MSM6755B-17 | 1 | A |
| LSI3 | 2012 5569 | LSI/LCD DRIVER | SED1278F0A | 1 | A |
| IC1 | 2012 1883 | IC/MOS | RN5VD40AA-TR | 1 | B |
| Q1 | 2252 1239 | TRANSISTOR/CHIP | 2SC4081T106Q | 1 | B |
| VR1 | 2775 3286 | POTENTIOMETER | EVM3SSX50B53 | 1 | B |
| X1 | 2590 2100 | OSCILLATOR/CERAMIC | CSACS20.00MX040-TC | 1 | B |
| Sub PCB ass'y | | | | | |
| 2 | 6926 7640 | PCB/ASS'Y (MA2M) | M140765*1 | 1 | B |
| IC201 | 2114 5775 | IC/LINEAR (POWER AMP) | TA8248K | 1 | A |
| IC202 | 2114 1421 | IC/PHOTOCOUPLER | PC900V | 1 | B |
| Q201 | 2250 1594 | TRANSISTOR | 2SA1585STPR | 1 | B |
| Q202, Q204 - Q208 | 2220 1409 | TRANSISTOR | 2SC1740SR-TP-T | 6 | B |
| Q203 | 2251 0921 | TRANSISTOR | 2SB1240R-TV2-T | 1 | B |
| D201 | 2390 1323 | DIODE/SHOTTKY | RB100A-T32-T | 1 | B |
| D202,D203, D207 - D209 | 2390 1344 | DIODE | 1SS133T-77-T | 5 | C |
| D204,D210 | 2390 3018 | DIODE | 1T2 | 2 | C |
| D205 | 2360 1939 | DIODE/ZENER | MTZJ5.1C-T77-T | 1 | C |
| J201 | 3501 7049 | JACK (POWER) | HEC2305-01-330 | 1 | C |
| J202 | 3612 0665 | JACK (PHONE) | YKB21-5006 | 1 | C |
| J203 | 3612 0789 | JACK | YKB21-5010 | 1 | C |
| J204 | 3501 4816 | JACK/DIN | YKF51-5051 | 1 | C |
| Console PCBs | | | | | |
| 3 | 6926 0440 | PCB/ASS'Y (CN1M) | M240623*1 | 1 | C |
| D302 -D306 | 2390 1344 | DIODE | 1SS133T-77-T | 5 | C |
| LED301 | 2370 1383 | LED | TLR124(TPJ56,KT) | 1 | C |
| 4 | 6926 0450 | PCB/ASS'Y (CN2M) | M240624*1 | 1 | C |
| D310 - D316 | 2390 1344 | DIODE | 1SS133T-77-T | 7 | C |
| Keyboard PCBs | | | | | |
| 5 | 6926 0490 | PCB/ASS'Y (KY1M) | M240628*1 | 1 | B |
| D701 - D732 | 2390 1344 | DIODE | 1SS133T-77-T | 32 | C |
| 6 | 6926 0500 | PCB/ASS'Y (KY2M) | M240629*1 | 1 | B |
| D733 - D761 | 2390 1344 | DIODE | 1SS133T-77-T | 29 | C |
| Keyboard unit | | | | | |
| 7 | 6922 2720 | KEY SET/LT WHITE | M312118*1 | 4 | B |
| 8 | 6922 2730 | KEY SET/LT WHITE | M312118*2 | 1 | B |
| 9 | 6906 8481 | KEY SET/LT BLACK 10P | M140369A-3 | 2 | B |
| 10 | 6906 8591 | KEY SET/LT BLACK 5P | M140369A-4 | 1 | B |
| 11 | 6906 9191 | RUBBER/CONTACT | M240549A-2 | 4 | C |
| 12 | 6906 9201 | RUBBER/CONTACT | M240550A-2 | 1 | C |
| Panel unit | | | | | |
| 13 | 3122 3545 | EL-MODULE | YML-101 | 1 | B |
| 14 | 3335 6723 | LCD | LD-B10114E | 1 | B |
| 15 | 3831 0833 | SPEAKER | S12J49A | 2 | C |
| 16 | 6926 0270 | RUBBER/INTERCONNECTOR | M440435-2 | 2 | C |
| 17 | 6921 5031 | KNOB | M311859A-1 | 1 | C |
| 18 | 6909 5890 | SWITCH/SLIDE | CSB-12D | 1 | C |
| 19 | 6926 8030 | RUBBER/BUTTON | M140524-2 | 1 | C |
| 20 | 6926 8040 | RUBBER/BUTTON | M240560-2 | 1 | C |

Notes: Q – Quantity per unit

R – Rank

| Item | Code No. | Parts Name | Specification | Q | R |
|------------------|-----------|---------------|---------------|---|---|
| 21 | 6926 8050 | RUBBER/BUTTON | M240561-2 | 1 | C |
| 22 | 6926 8060 | RUBBER/BUTTON | M140525-2 | 1 | C |
| 23 | 6926 8090 | PANEL/DISPLAY | M240574-2 | 1 | C |
| 24 | 6918 1630 | COVER/BATTERY | M311164*1 | 1 | C |
| 25 | 6926 8071 | SPACER | M440667A-1 | 1 | X |
| 26 | 6926 8140 | SPACER | M440668-1 | 1 | X |
| 27 | 6926 8160 | FILM | M440675-1 | 1 | X |
| Accessory | | | | | |
| | 6906 9043 | STAND/NOTE | M340701C*2 | 1 | C |

Notes: Q – Quantity per unit
R – Rank

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