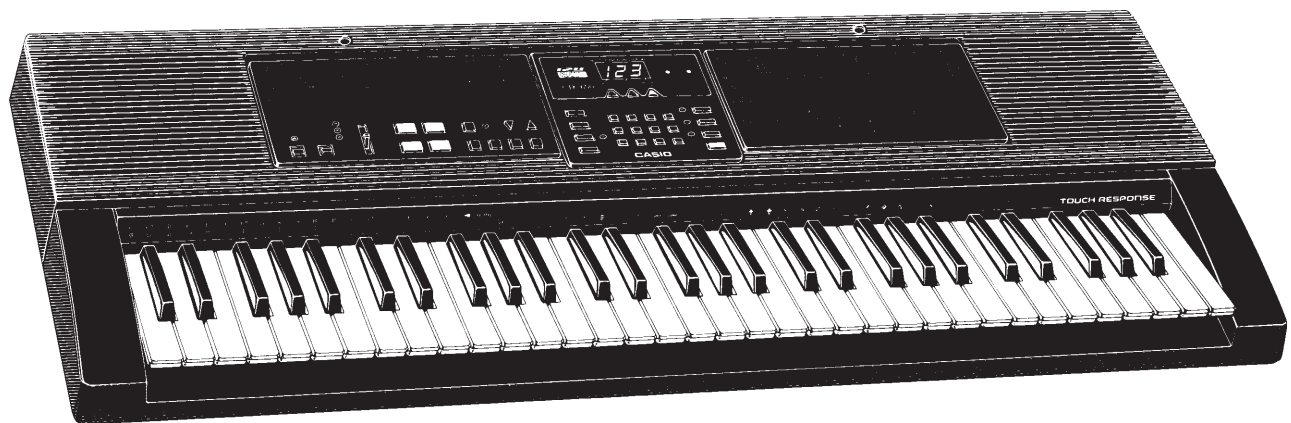


# CASIO<sup>®</sup>

# Service Manual

(with price)

## CTK-650



CTK-650

**INDEX**

**ELECTRONIC KEYBOARD**

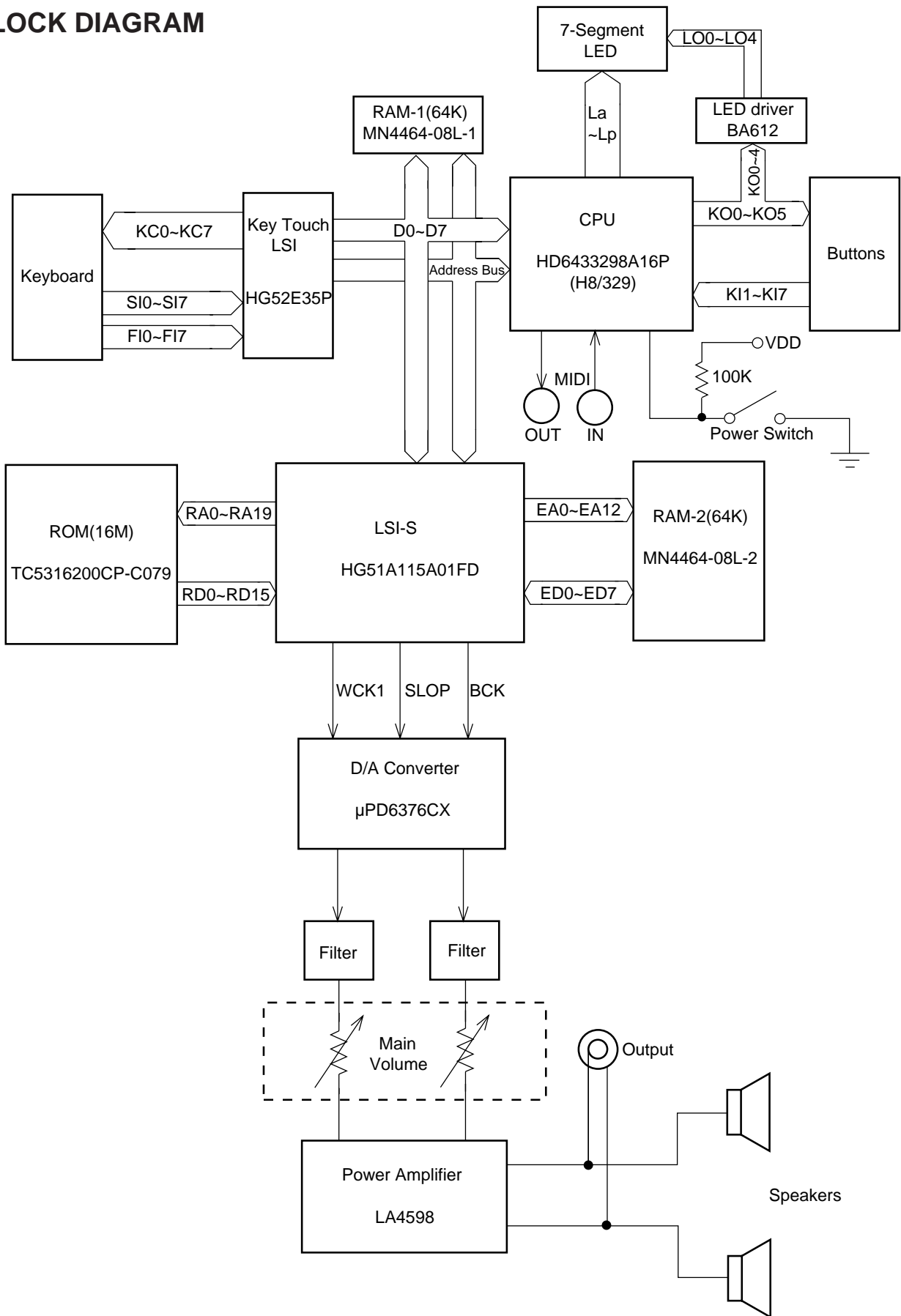
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## SPECIFICATION

|   |   |                                    |   |                               |                      |                                      |   |              |   |                 |                                    |           |         |             |    |  |  |
|---|---|------------------------------------|---|-------------------------------|----------------------|--------------------------------------|---|--------------|---|-----------------|------------------------------------|-----------|---------|-------------|----|--|--|
| Number of keys:                         | 61  |                                    |   |                               |                      |                                      |   |              |   |                 |                                    |           |         |             |    |  |  |
| Polyphony:                              | 32-note(max.)   |                                    |   |                               |                      |                                      |   |              |   |                 |                                    |           |         |             |    |  |  |
| Preset tones:                           | 128   |                                    |   |                               |                      |                                      |   |              |   |                 |                                    |           |         |             |    |  |  |
| Magical preset:                         | <table> <tr> <td>BREAK BEAT</td> <td>16</td> <td>MELODYCOMP</td> <td>8</td> </tr> <tr> <td>SHADOW DRUM</td> <td>4</td> <td>FREE SESSION</td> <td>32</td> </tr> <tr> <td>TONE STACK</td> <td>40</td> <td>KEY SPLIT</td> <td>12</td> </tr> <tr> <td>HYPERACTIVE</td> <td>16</td> <td></td> <td></td> </tr> </table>                                       | BREAK BEAT                         | 16                                      | MELODYCOMP                    | 8                    | SHADOW DRUM                          | 4   | FREE SESSION | 32  | TONE STACK      | 40                                 | KEY SPLIT | 12      | HYPERACTIVE | 16 |  |  |
| BREAK BEAT                              | 16  | MELODYCOMP                         | 8                                       |                               |                      |                                      |   |              |   |                 |                                    |           |         |             |    |  |  |
| SHADOW DRUM                             | 4   | FREE SESSION                       | 32                                      |                               |                      |                                      |   |              |   |                 |                                    |           |         |             |    |  |  |
| TONE STACK                              | 40  | KEY SPLIT                          | 12                                      |                               |                      |                                      |   |              |   |                 |                                    |           |         |             |    |  |  |
| HYPERACTIVE                             | 16  |                                    |   |                               |                      |                                      |   |              |   |                 |                                    |           |         |             |    |  |  |
| Auto-accompaniment:                     | <table> <tr> <td>Rhythm patterns</td> <td>128</td> </tr> <tr> <td>Tempo</td> <td>Adjustable(40 - 255)</td> </tr> <tr> <td>Chords</td> <td>Three system: CASIO CHORD, FINGERD,<br/>FULL-RANGE CHORD</td> </tr> <tr> <td>Other</td> <td>Variation pattern, fill-in pattern, intro/ending pattern for each rhythm.</td> </tr> </table>                     | Rhythm patterns                    | 128                                     | Tempo                         | Adjustable(40 - 255) | Chords                               | Three system: CASIO CHORD, FINGERD,<br>FULL-RANGE CHORD | Other        | Variation pattern, fill-in pattern, intro/ending pattern for each rhythm. |                 |                                    |           |         |             |    |  |  |
| Rhythm patterns                         | 128   |                                    |   |                               |                      |                                      |   |              |   |                 |                                    |           |         |             |    |  |  |
| Tempo                                   | Adjustable(40 - 255)  |                                    |   |                               |                      |                                      |   |              |   |                 |                                    |           |         |             |    |  |  |
| Chords                                  | Three system: CASIO CHORD, FINGERD,<br>FULL-RANGE CHORD   |                                    |   |                               |                      |                                      |   |              |   |                 |                                    |           |         |             |    |  |  |
| Other                                   | Variation pattern, fill-in pattern, intro/ending pattern for each rhythm.   |                                    |   |                               |                      |                                      |   |              |   |                 |                                    |           |         |             |    |  |  |
| Song memory:                            | <table> <tr> <td>song:</td> <td>one</td> </tr> <tr> <td>System:</td> <td>Real-time recording</td> </tr> <tr> <td>Memory capacity:</td> <td>Up to 1,300 notes</td> </tr> </table>  | song:                              | one                                     | System:                       | Real-time recording  | Memory capacity:                     | Up to 1,300 notes                                       |              |   |                 |                                    |           |         |             |    |  |  |
| song:                                   | one   |                                    |   |                               |                      |                                      |   |              |   |                 |                                    |           |         |             |    |  |  |
| System:                                 | Real-time recording   |                                    |   |                               |                      |                                      |   |              |   |                 |                                    |           |         |             |    |  |  |
| Memory capacity:                        | Up to 1,300 notes   |                                    |   |                               |                      |                                      |   |              |   |                 |                                    |           |         |             |    |  |  |
| Registration memory:                    | 4 setups  |                                    |   |                               |                      |                                      |   |              |   |                 |                                    |           |         |             |    |  |  |
| Sound control pads:                     | <table> <tr> <td>Phrases</td> <td>10</td> </tr> <tr> <td>Drums</td> <td>10</td> </tr> <tr> <td>SE/Percussion</td> <td>10</td> </tr> <tr> <td>Controller</td> <td>2</td> </tr> </table>  | Phrases                            | 10                                      | Drums                         | 10                   | SE/Percussion                        | 10  | Controller   | 2   |                 |                                    |           |         |             |    |  |  |
| Phrases                                 | 10  |                                    |   |                               |                      |                                      |   |              |   |                 |                                    |           |         |             |    |  |  |
| Drums                                   | 10  |                                    |   |                               |                      |                                      |   |              |   |                 |                                    |           |         |             |    |  |  |
| SE/Percussion                           | 10  |                                    |   |                               |                      |                                      |   |              |   |                 |                                    |           |         |             |    |  |  |
| Controller                              | 2   |                                    |   |                               |                      |                                      |   |              |   |                 |                                    |           |         |             |    |  |  |
| Digital effects:                        | REVERB 1, REVERB 2, REVERB 3, CHORUS, TREMOLO, PHASE SHIFTER, ORGAN SP, ENHANCER, FLANGER, EQLOUDNESS   |                                    |   |                               |                      |                                      |   |              |   |                 |                                    |           |         |             |    |  |  |
| DEMO tunes:                             | 3 tunes   |                                    |   |                               |                      |                                      |   |              |   |                 |                                    |           |         |             |    |  |  |
| Other functions:                        | <table> <tr> <td>Transpose (F# ~ C ~ F : half-note)</td> <td></td> </tr> <tr> <td>Tuning adjustable A4 = 440KHz</td> <td>50 cents increments</td> </tr> <tr> <td>Volume control (Main /Accompaniment)</td> <td></td> </tr> </table>   | Transpose (F# ~ C ~ F : half-note) |   | Tuning adjustable A4 = 440KHz | 50 cents increments  | Volume control (Main /Accompaniment) |   |              |   |                 |                                    |           |         |             |    |  |  |
| Transpose (F# ~ C ~ F : half-note)      |   |                                    |   |                               |                      |                                      |   |              |   |                 |                                    |           |         |             |    |  |  |
| Tuning adjustable A4 = 440KHz           | 50 cents increments   |                                    |   |                               |                      |                                      |   |              |   |                 |                                    |           |         |             |    |  |  |
| Volume control (Main /Accompaniment)    |   |                                    |   |                               |                      |                                      |   |              |   |                 |                                    |           |         |             |    |  |  |
| Speakers:                               | 12cm diameter X 2 (Output:2W+2W)  |                                    |   |                               |                      |                                      |   |              |   |                 |                                    |           |         |             |    |  |  |
| I/O terminals:                          | <table> <tr> <td>Power supply</td> <td>9V DC jack</td> </tr> <tr> <td>Headphones</td> <td>Stereo mini jack</td> </tr> <tr> <td></td> <td>Output impedance:100 ohm</td> </tr> <tr> <td></td> <td>Output voltage:4.5V(RMS. max)</td> </tr> <tr> <td>Assignable jack</td> <td>Standard jack</td> </tr> <tr> <td>MIDI</td> <td>IN, OUT</td> </tr> </table>  | Power supply                       | 9V DC jack                              | Headphones                    | Stereo mini jack     |                                      | Output impedance:100 ohm                                |              | Output voltage:4.5V(RMS. max)   | Assignable jack | Standard jack                      | MIDI      | IN, OUT |             |    |  |  |
| Power supply                            | 9V DC jack  |                                    |   |                               |                      |                                      |   |              |   |                 |                                    |           |         |             |    |  |  |
| Headphones                              | Stereo mini jack  |                                    |   |                               |                      |                                      |   |              |   |                 |                                    |           |         |             |    |  |  |
|   | Output impedance:100 ohm  |                                    |   |                               |                      |                                      |   |              |   |                 |                                    |           |         |             |    |  |  |
|   | Output voltage:4.5V(RMS. max)   |                                    |   |                               |                      |                                      |   |              |   |                 |                                    |           |         |             |    |  |  |
| Assignable jack                         | Standard jack   |                                    |   |                               |                      |                                      |   |              |   |                 |                                    |           |         |             |    |  |  |
| MIDI                                    | IN, OUT   |                                    |   |                               |                      |                                      |   |              |   |                 |                                    |           |         |             |    |  |  |
| Power supply:                           | <table> <tr> <td>3-way AC/DC power sources;</td> <td></td> </tr> <tr> <td>Batteries</td> <td>Six D-size</td> </tr> <tr> <td>Battry life</td> <td>Approximately 5 hours on R20P(SUM-1)</td> </tr> <tr> <td>AC</td> <td>Required optional AD-5 AC adaptor</td> </tr> <tr> <td>Car battery</td> <td>Required optional CA-5 car adaptor</td> </tr> </table> | 3-way AC/DC power sources;         |   | Batteries                     | Six D-size           | Battry life                          | Approximately 5 hours on R20P(SUM-1)                    | AC           | Required optional AD-5 AC adaptor   | Car battery     | Required optional CA-5 car adaptor |           |         |             |    |  |  |
| 3-way AC/DC power sources;              |   |                                    |   |                               |                      |                                      |   |              |   |                 |                                    |           |         |             |    |  |  |
| Batteries                               | Six D-size  |                                    |   |                               |                      |                                      |   |              |   |                 |                                    |           |         |             |    |  |  |
| Battry life                             | Approximately 5 hours on R20P(SUM-1)  |                                    |   |                               |                      |                                      |   |              |   |                 |                                    |           |         |             |    |  |  |
| AC                                      | Required optional AD-5 AC adaptor   |                                    |   |                               |                      |                                      |   |              |   |                 |                                    |           |         |             |    |  |  |
| Car battery                             | Required optional CA-5 car adaptor  |                                    |   |                               |                      |                                      |   |              |   |                 |                                    |           |         |             |    |  |  |
| Auto power off:                         | Approximately 6 minutes after the last operation  |                                    |   |                               |                      |                                      |   |              |   |                 |                                    |           |         |             |    |  |  |
| Power consumption:                      | 7.7W  |                                    |   |                               |                      |                                      |   |              |   |                 |                                    |           |         |             |    |  |  |
| Dimensions:                             | <table> <tr> <td>942 X 367 X 135 mm(HWD)</td> </tr> <tr> <td>31 7/16" X 14 1/2" X 4 3/8" inches(HWD)</td> </tr> </table>  | 942 X 367 X 135 mm(HWD)            | 31 7/16" X 14 1/2" X 4 3/8" inches(HWD) |                               |                      |                                      |   |              |   |                 |                                    |           |         |             |    |  |  |
| 942 X 367 X 135 mm(HWD)                 |   |                                    |   |                               |                      |                                      |   |              |   |                 |                                    |           |         |             |    |  |  |
| 31 7/16" X 14 1/2" X 4 3/8" inches(HWD) |   |                                    |   |                               |                      |                                      |   |              |   |                 |                                    |           |         |             |    |  |  |
| Weight:                                 | 5.2kg(11.7lbs) excluding batteries  |                                    |   |                               |                      |                                      |   |              |   |                 |                                    |           |         |             |    |  |  |
| Accessory:                              | Score stand   |                                    |   |                               |                      |                                      |   |              |   |                 |                                    |           |         |             |    |  |  |

# BLOCK DIAGRAM



## CIRCUIT DESCRIPTION

### CPU(HD6433298A16P : H8/329)

The 16-bit CPU contains a 32K-byte ROM, a 1K-byte RAM, an 8-bit A/D converter, timers and I/O ports. The CPU accesses to the DSP, Key Touch LSI, RAM, buttons and LEDs. But the CPU directly receives MIDI and pedal signals.

| Pin No. | Terminal          | In/Out                         | Function   |     |     |      |   |   |                            |   |   |                                |   |   |                           |
|---------|-------------------|--------------------------------|--|-----|-----|------|---|---|----------------------------|---|---|--------------------------------|---|---|---------------------------|
| 1       | P40/IRQ2          | In                             | KO signal data.  |     |     |      |   |   |                            |   |   |                                |   |   |                           |
| 2       | P41/IRQ1          | In                             | Timing signal for KO signal.   |     |     |      |   |   |                            |   |   |                                |   |   |                           |
| 3       | P42/IRQ0          | In                             | APO signal output.   |     |     |      |   |   |                            |   |   |                                |   |   |                           |
| 4       | P43/-RD           | Out                            | Read signal output.  |     |     |      |   |   |                            |   |   |                                |   |   |                           |
| 5       | P44/-WR           | Out                            | Write signal output.   |     |     |      |   |   |                            |   |   |                                |   |   |                           |
| 7       | P46/PHI           | Out                            | System clock output.   |     |     |      |   |   |                            |   |   |                                |   |   |                           |
| 8       | P47/-WAIT         | In                             | Wait signal input  |     |     |      |   |   |                            |   |   |                                |   |   |                           |
| 9       | P50/Txd           | Out                            | MIDI signal output.  |     |     |      |   |   |                            |   |   |                                |   |   |                           |
| 10      | P51/Rxd           | In                             | MII signal input.  |     |     |      |   |   |                            |   |   |                                |   |   |                           |
| 11      | P52/SCK           | Out                            | Reset signal output.   |     |     |      |   |   |                            |   |   |                                |   |   |                           |
| 12      | -RESET            | In                             | Reset signal input.  |     |     |      |   |   |                            |   |   |                                |   |   |                           |
| 13      | -NMI              | In                             | Power on signal input.(Low active)   |     |     |      |   |   |                            |   |   |                                |   |   |                           |
| 14      | Vcc               | In                             | +5V source.  |     |     |      |   |   |                            |   |   |                                |   |   |                           |
| 15      | -STBY             | In                             | Standby signal input. Connected to +5V.  |     |     |      |   |   |                            |   |   |                                |   |   |                           |
| 16      | Vss               | In                             | Ground(0V) source.   |     |     |      |   |   |                            |   |   |                                |   |   |                           |
| 17,18   | XTAL,EXTAL        | In/Out                         | 20MHz clock pulse input/output. Connected to crystal.  |     |     |      |   |   |                            |   |   |                                |   |   |                           |
| 19,20   | MD1,MD0           | In                             | Selection for system.<br><table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>MD1</th> <th>MD0</th> <th>MODE</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>1</td> <td>MODE-1 : Internal ROM mode</td> </tr> <tr> <td>1</td> <td>0</td> <td>MODE-2 : Non internal ROM mode</td> </tr> <tr> <td>1</td> <td>1</td> <td>MODE-3 : Single chip mode</td> </tr> </tbody> </table> | MD1 | MD0 | MODE | 0 | 1 | MODE-1 : Internal ROM mode | 1 | 0 | MODE-2 : Non internal ROM mode | 1 | 1 | MODE-3 : Single chip mode |
| MD1     | MD0               | MODE                           |  |     |     |      |   |   |                            |   |   |                                |   |   |                           |
| 0       | 1                 | MODE-1 : Internal ROM mode     |  |     |     |      |   |   |                            |   |   |                                |   |   |                           |
| 1       | 0                 | MODE-2 : Non internal ROM mode |  |     |     |      |   |   |                            |   |   |                                |   |   |                           |
| 1       | 1                 | MODE-3 : Single chip mode      |  |     |     |      |   |   |                            |   |   |                                |   |   |                           |
| 21      | AVss              | In                             | Analog ground source.  |     |     |      |   |   |                            |   |   |                                |   |   |                           |
| 22      | P70/AN0           | In                             | Connected to ground.   |     |     |      |   |   |                            |   |   |                                |   |   |                           |
| 23~29   | P71/AN0~P77/AN7   | In                             | KI signal input.   |     |     |      |   |   |                            |   |   |                                |   |   |                           |
| 30      | AVcc              | In                             | +5V source.  |     |     |      |   |   |                            |   |   |                                |   |   |                           |
| 31~38   | P60/FTCI~P67/TMO1 | Out                            | Control signal for 7-segment LED.  |     |     |      |   |   |                            |   |   |                                |   |   |                           |
| 39      | Vcc               | In                             | +5V source.  |     |     |      |   |   |                            |   |   |                                |   |   |                           |
| 41~56   | P26/A14~P10/A0    | Out                            | Address bus.   |     |     |      |   |   |                            |   |   |                                |   |   |                           |
| 48      | Vss               | In                             | Ground(0V) source.   |     |     |      |   |   |                            |   |   |                                |   |   |                           |
| 57~64   | P30/D0~P37/D7     | In/Out                         | Data bus.  |     |     |      |   |   |                            |   |   |                                |   |   |                           |

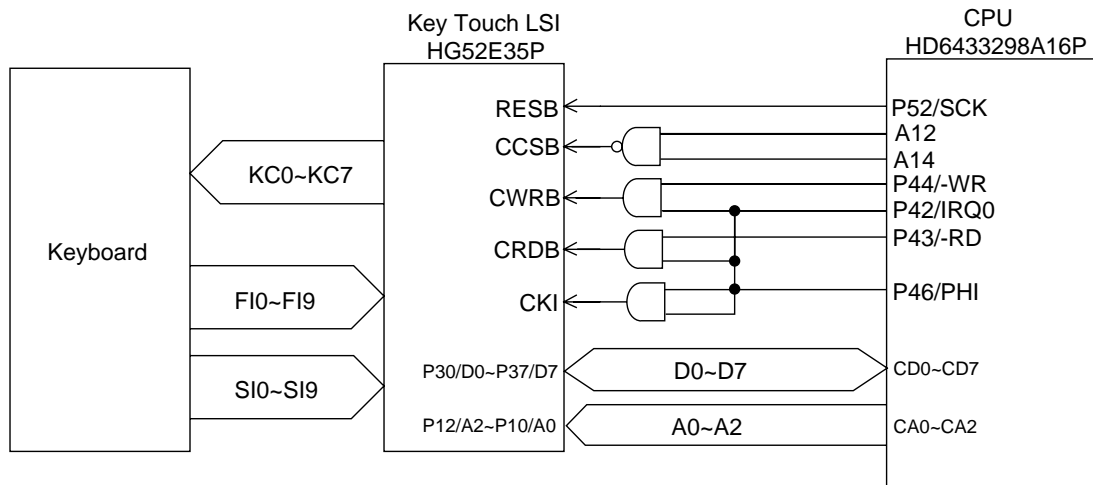
## DIGITAL SIGNAL PROCESSOR, LSI-S (HG51A115A01FD)

The LSI-S is a 16-bit DSP(Digital Signal Processor) and accessible to 16M-bit sound source ROM and to 64K-bit RAM. The DSP can read data of 32 polyphonic note from the ROM and provides two 16-bit serial data with timing signals to each channel's D/A converter.

| Pin No.                               | Terminal | In/Out | Function  |
|---------------------------------------|----------|--------|---|
| 1~7                                   | D7~D0    | I/O    | Data bus.   |
| 11                                    | GND7     | In     | Ground(0V) source.  |
| 12                                    | CK16     | Out    | 16.384MHz clock pulse output.                             |
| 13                                    | VCC6     | In     | +5V source  |
| 14                                    | CK0      | In     | Clock pulse input. Connected to terminal CK16.            |
| 16                                    | VCC1     | In     | +5V source.   |
| 17                                    | GND1     | In     | Ground(0V) source.  |
| 18,19                                 | XTI, XTO | In/Out | 16.384MHz clock pulse input/output. Connected to crystal. |
| 21                                    | CCSB     | I      | Chip select signal input.                                 |
| 22~25                                 | CA0~CA3  | In     | Address bus.  |
| 26                                    | CE0      | In     | Connected to ground.(ROM interface control terminal)      |
| 27                                    | CWRB     | In     | Write enable signal.                                      |
| 28                                    | CRDB     | In     | Read enable signal.                                       |
| 33                                    | RESB     | In     | Reset signal input  |
| 34                                    | TESB     | In     | Connected to +5V.   |
| 40~49<br>52~57                        | RD0~RD15 | In     | Data bus for sound source ROM.                            |
| 50                                    | VCC2     | In     | +5V source.   |
| 51                                    | GND2     | In     | Ground(0V) source.  |
| 59                                    | RA22     | Out    | Chip enable signal output for ROM.                        |
| 62~73<br>75~82                        | RA0~RA19 | Out    | Address bus for sound source ROM.                         |
| 74                                    | GND5     | In     | Ground(0V) source.  |
| 84                                    | VCC3     | In     | +5V source.   |
| 85                                    | GND3     | In     | Ground source.  |
| 86                                    | WOK1     | Out    | Word clock for DAC.                                       |
| 88                                    | SOLP     | Out    | 16-bit serial data for L-channel DAC.                     |
| 89                                    | BOK      | Out    | Bit clock for DAC.  |
| 93                                    | VCC5     | In     | +5V source.   |
| 95,97<br>99~105<br>107,109<br>110,112 | EA0~EA12 | Out    | Address bus for RAM.                                      |
| 96                                    | EWEB     | Out    | Write enable signal for RAM.                              |
| 106                                   | EOEB     | Out    | Read enable signal for RAM.                               |
| 108                                   | VCC7     | In     | +5V source.   |
| 111                                   | ECEB     | Out    | Chip enable signal for RAM.                               |
| 118                                   | VCC4     | In     | +5V source.   |
| 119                                   | GND4     | In     | Ground(0V) source.  |
| 123~130                               | ED0~ED7  | In/Out | Data bus for RAM.   |
| 131                                   | GND6     | In     | Connected to Ground.                                      |
| 132                                   | SSI      | In     | Connected to Ground.                                      |
| 133                                   | SBCK     | In     | Connected to Ground.                                      |
| 134                                   | SWCK     | In     | Connected to Ground.                                      |

## KEY TOUCH LSI(HG52E35P)

By counting the time between the first key input signal FI and the second SI from the keyboard unit, the key touch LSI detects key velocity of 256-step. Then the LSI sends the CPU note numbers and their velocities.



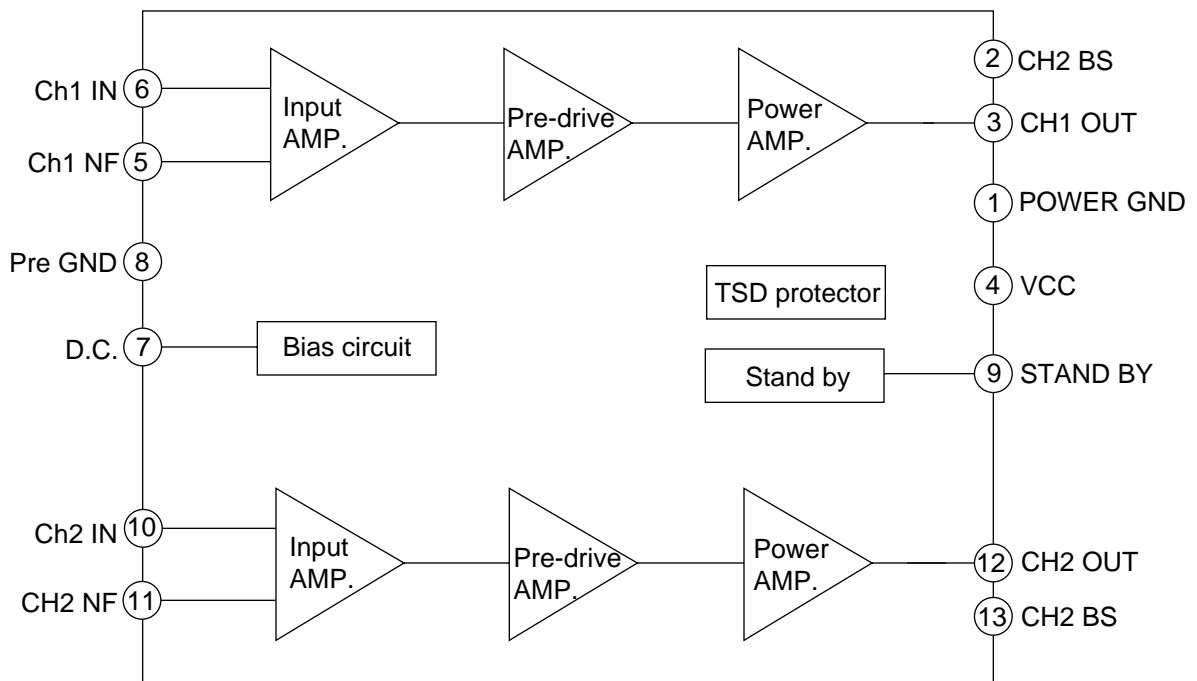
| Pin No.                 | Terminal           | In/Out | Function                                |
|-------------------------|--------------------|--------|---|
| 1                       | REQB               | Out    | Interrupt request. Not used.            |
| 2,3                     | FI10,SI10          | In     | Connected to +5V.                       |
| 4                       | VCC                | In     | +5V source.                             |
| 5                       | CRDB               | In     | Read enable signal.                     |
| 6                       | CWRB               | In     | Write enable signal.                    |
| 7                       | CCBB               | In     | Chip select signal.                     |
| 8                       | T                  | In     | Test terminal. Connected to +5V.        |
| 9                       | STYB               | In     | Standby terminal. Connected to +5V.     |
| 10                      | RESB               | In     | Reset signal.                           |
| 11                      | W                  | In     | Test terminal. Connected to +5V.        |
| 12                      | CKI                | In     | External clock input.                   |
| 13                      | TMD                | In     | Test terminal. Connected to ground.     |
| 14                      | TST                | In     | Test terminal. Connected to ground.     |
| 15                      | CKO                | Out    | External clock output. Not used.        |
| 16                      | GND                | In     | Ground(0V) source.                      |
| 17                      | XIN                | In     | Clock pulse input. Connected to ground. |
| 18                      | XOUT               | Out    | Clock pulse output. Not used.           |
| 19                      | TRES               | In     | Test terminal. Connected to ground.     |
| 20~28                   | CD0~CD7            | In/Out | Data bus.                               |
| 24                      | GND                | In     | Ground(0V) source.                      |
| 29~31                   | CA0~CA2            | Out    | Address bus.                            |
| 32                      | VCC                | In     | +5V source.                             |
| 33~43<br>53~55<br>57~63 | FI0~FI9<br>SI0~SI9 | In     | Key input signal.                       |
| 40                      | VCC                | In     | +5V source.                             |
| 44~53                   | KC0~KC7            | Out    | Key scan signal.                        |
| 48,56                   | GND                | In     | Ground(0V) source.                      |
| 54                      | VCC                | In     | +5V source.                             |

## POWER AMPLIFIER(LA4598)

LA4598 is 2-channel power amplifier with standby switch.

| Pin No. | Terminal  | In/Out | Function                              |
|---------|-----------|--------|---------------------------------------|
| 1       | Power GND | In     | Ground(0V) source.                    |
| 2       | Ch1 B.S.  | -      | Terminal for 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 decoupling capacitor.    |
| 8       | Pre GND   | In     | Ground(0V) source.                    |
| 9       | Standby   | In     | Control signal input. 0V:OFF / +9V: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 bootstrap capacitor.     |
| 14      | NC        | -      | Not used.                             |

### INTERNAL BLOCK DIAGRAM

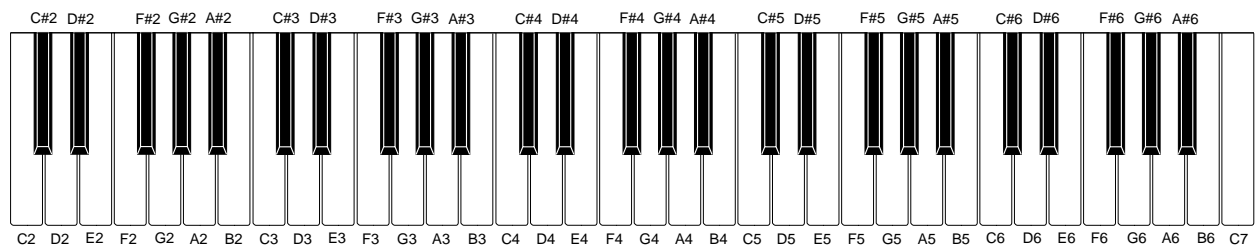




## BUTTON MATRIX

|     | KI1         | KI2                         | KI3              | KI4               | KI5         | KI6                 | KI7               |
|-----|-------------|-----------------------------|------------------|-------------------|-------------|---------------------|-------------------|
| KO0 | 3           | 0                           | ACCOMP<br>VOLUME |                   | 2           | 1                   | SONG NO.          |
| KO1 | SPLIT       | REGIST-<br>RATION<br>MEMORY | DEMO             |                   | LAYER       | TOUCHCOVE<br>ON/OFF | MULTI<br>EFFECTOR |
| KO2 | +           | 9                           | TONE             | MAGICAL<br>PRESET | 7           | 8                   | RHYTHM            |
| KO3 | VARIATION-A | TEMPO<br>DOWN               | INTRO            | TEMPO<br>UP       | VARIATION-B | END/<br>SYNCHRO     | START/STOP        |
| KO4 | 6           | -                           |                  | MIDI              | 5           | 4                   | TRANSPOSE<br>TUNE |
| KO5 | B           | CHORD                       | D                | A                 |             |                     | C                 |

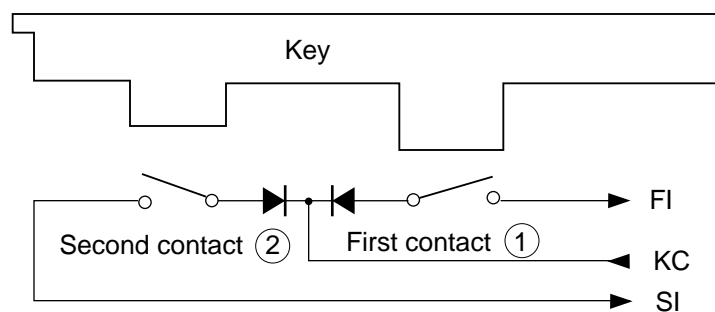
## Nomenclature of Keys



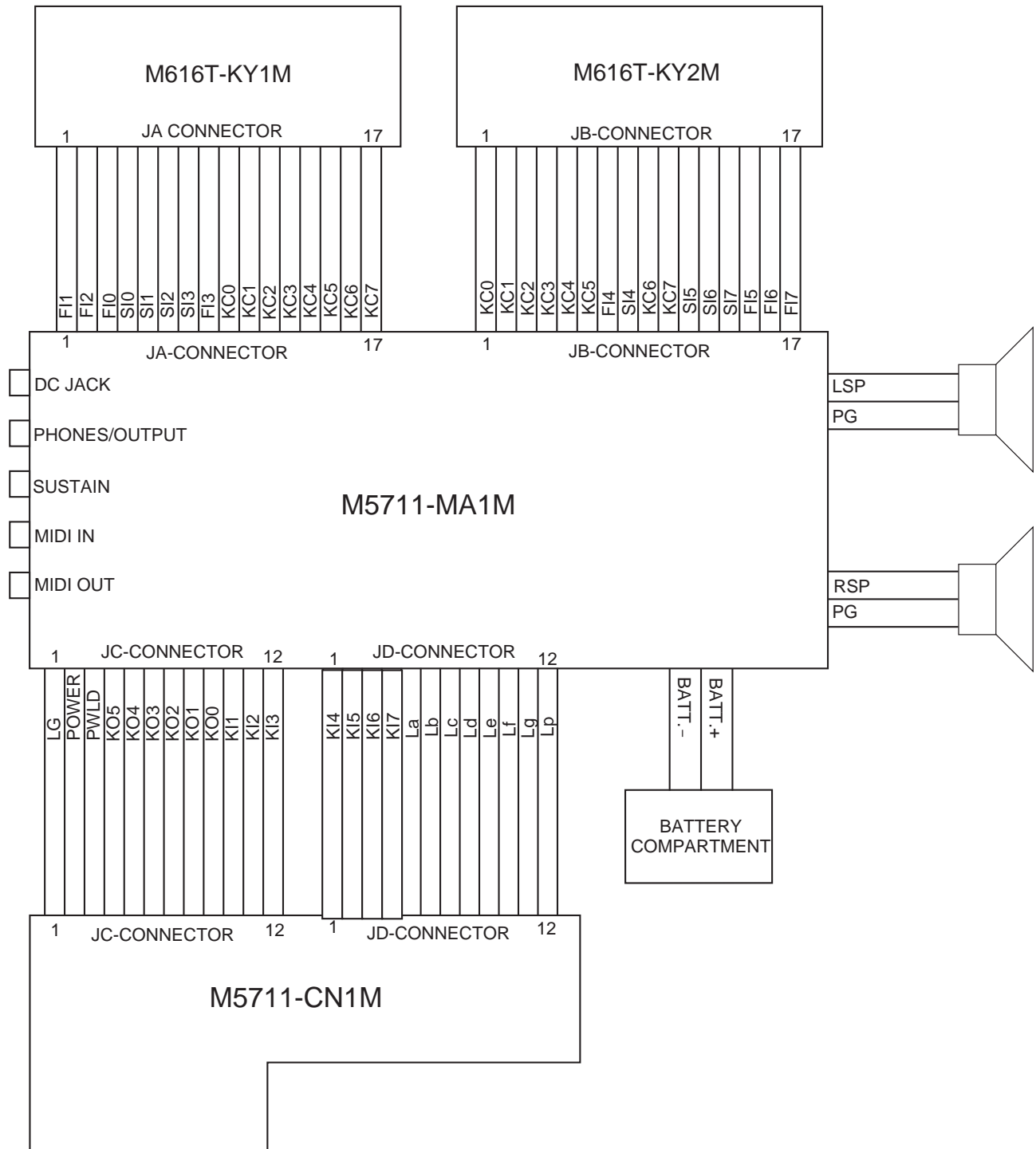
## KEY MATRIX

|            | KC0   | KC1   | KC2   | KC3   | KC4   | KC5   | KC6   | KC7   |
|------------|-------|-------|-------|-------|-------|-------|-------|-------|
| <b>F10</b> | C2 ①  | C#2 ① | D2 ①  | D#2 ① | E2 ①  | F2 ①  | F#2 ① | G2 ①  |
| <b>SI0</b> | C2 ②  | C#2 ② | D2 ②  | D#2 ② | E2 ②  | F2 ②  | F#2 ② | G2 ②  |
| <b>F11</b> | G#2 ① | A2 ①  | A#2 ① | B2 ①  | C3 ①  | C#3 ① | D3 ①  | D#3 ① |
| <b>SI1</b> | G#2 ② | A2 ②  | A#2 ② | B2 ②  | C3 ②  | C#3 ② | D3 ②  | D#3 ② |
| <b>F12</b> | E3 ①  | F3 ①  | F#3 ① | G3 ①  | G#3 ① | A3 ①  | A#3 ① | B3 ①  |
| <b>SI2</b> | E3 ②  | F3 ②  | F#3 ② | G3 ②  | G#3 ② | A3 ②  | A#3 ② | B3 ②  |
| <b>F13</b> | C4 ①  | C#4 ① | D4 ①  | D#4 ① | E4 ①  | F4 ①  | F#4 ① | G4 ①  |
| <b>SI3</b> | C4 ②  | C#4 ② | D4 ②  | D#4 ② | E4 ②  | F4 ②  | F#4 ② | G4 ②  |
| <b>F14</b> | G#4 ① | A4 ①  | A#4 ① | B4 ①  | C5 ①  | C#5 ① | D5 ①  | D#5 ① |
| <b>SI4</b> | G#4 ② | A4 ②  | A#4 ② | B4 ②  | C5 ②  | C#5 ② | D5 ②  | D#5 ② |
| <b>F15</b> | E5 ①  | F5 ①  | F#5 ① | G5 ①  | G#5 ① | A5 ①  | A#5 ① | B5 ①  |
| <b>SI5</b> | E5 ②  | F5 ②  | F#5 ② | G5 ②  | G#5 ② | A5 ②  | A#5 ② | B5 ②  |
| <b>F16</b> | C6 ①  | C#6 ① | D6 ①  | D#6 ① | E6 ①  | F6 ①  | F#6 ① | G6 ①  |
| <b>SI6</b> | C6 ②  | C#6 ② | D6 ②  | D#6 ② | E6 ②  | F6 ②  | F#6 ② | G6 ②  |
| <b>F17</b> | G#6 ① | A6 ①  | A#6 ① | B6 ①  | C7 ①  |       |       |       |
| <b>SI7</b> | G#6 ② | A6 ②  | A#6 ② | B6 ②  | C7 ②  |       |       |       |

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

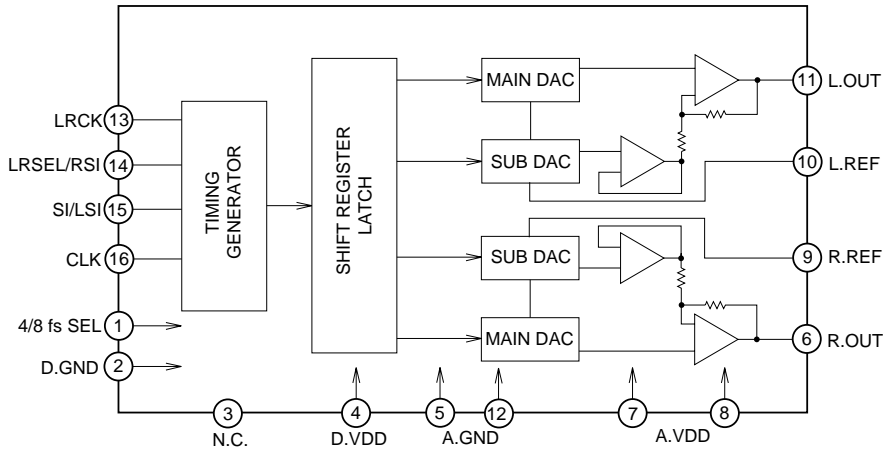


# WIRING DIAGRAM

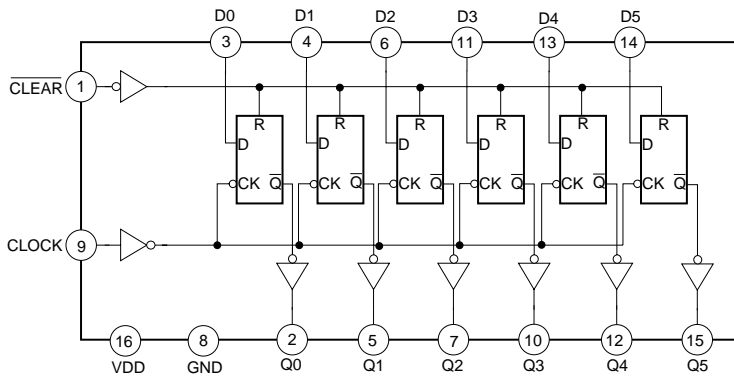


# IC LEAD IDENTIFICATION AND INTERNAL CIRCUIT

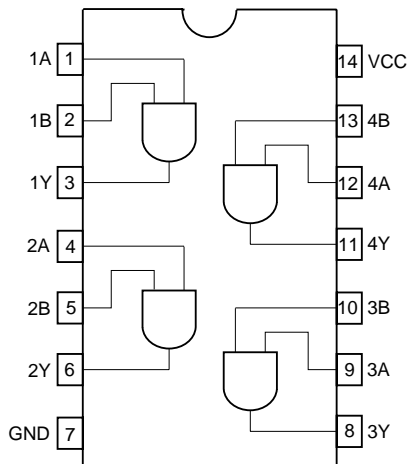
## UPD6376CX (D/A converter)



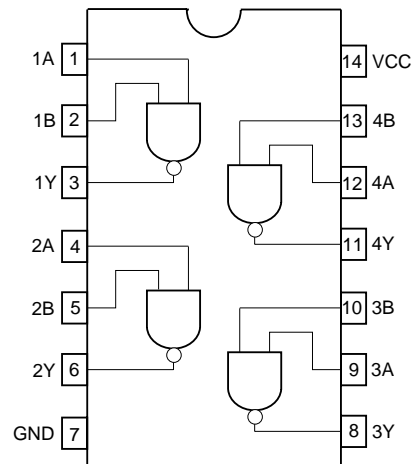
## TC74HC174AP (HEX D-TYPE FLIP FLOP WITH CLEAR )



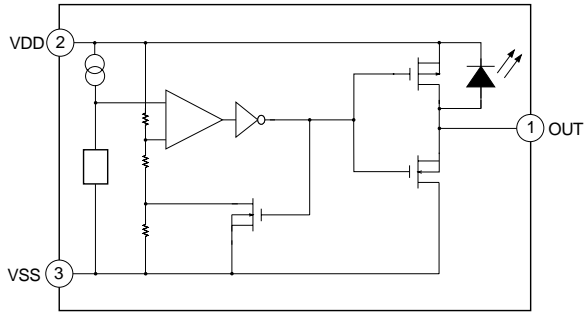
## TC74HC08AP (QUAD 2-INPUT AND GATE)



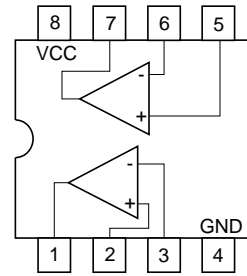
## TC74HC00AP (QUAD 2-INPUT NAND GATE)



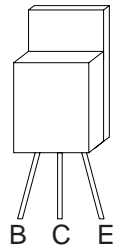
**S-8053ANO**



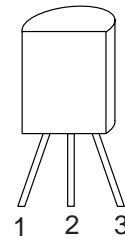
**M5218APR**



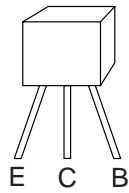
**2SB1274**



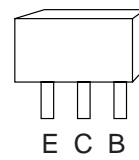
**S-81350HG  
S-8053ANO**



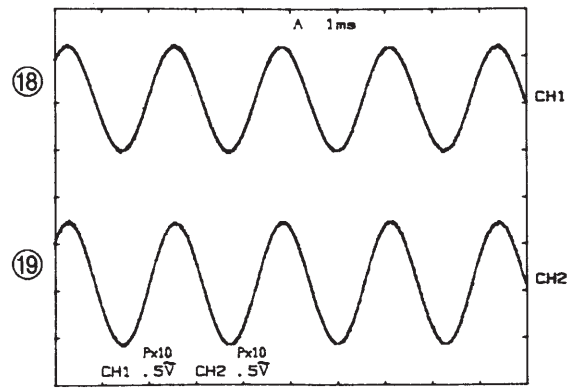
**2SC1740  
DTA114TS  
2SA933**



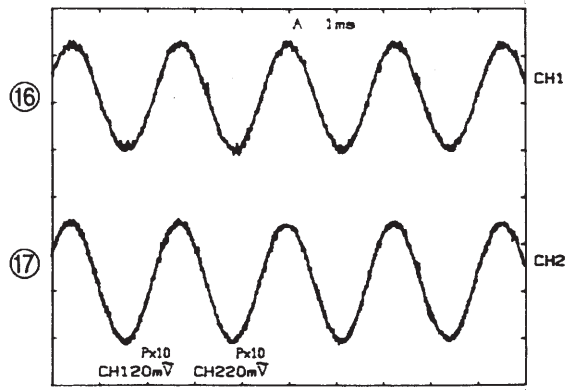
**2SB1240  
2SD1858**



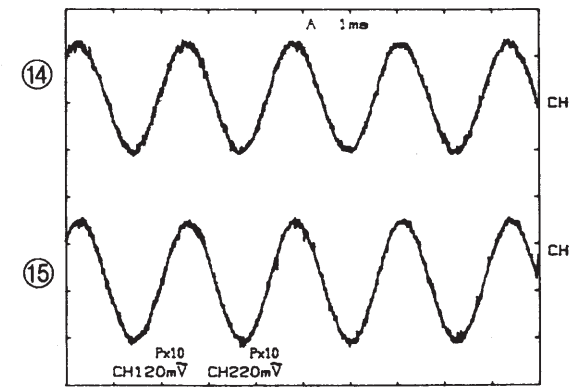
# PCB VIEW & MAJOR WAVEFORMS



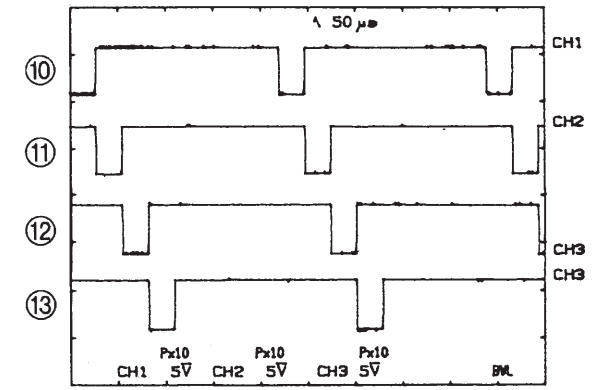
⑱ Power AMP. R-ch output  
LA4598 Pin 3  
⑲ Power AMP. L-ch output  
LA4598 Pin 12



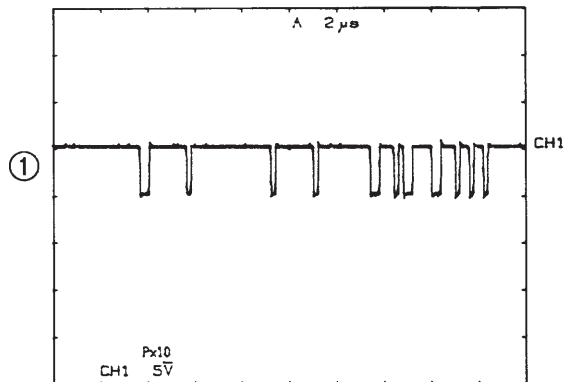
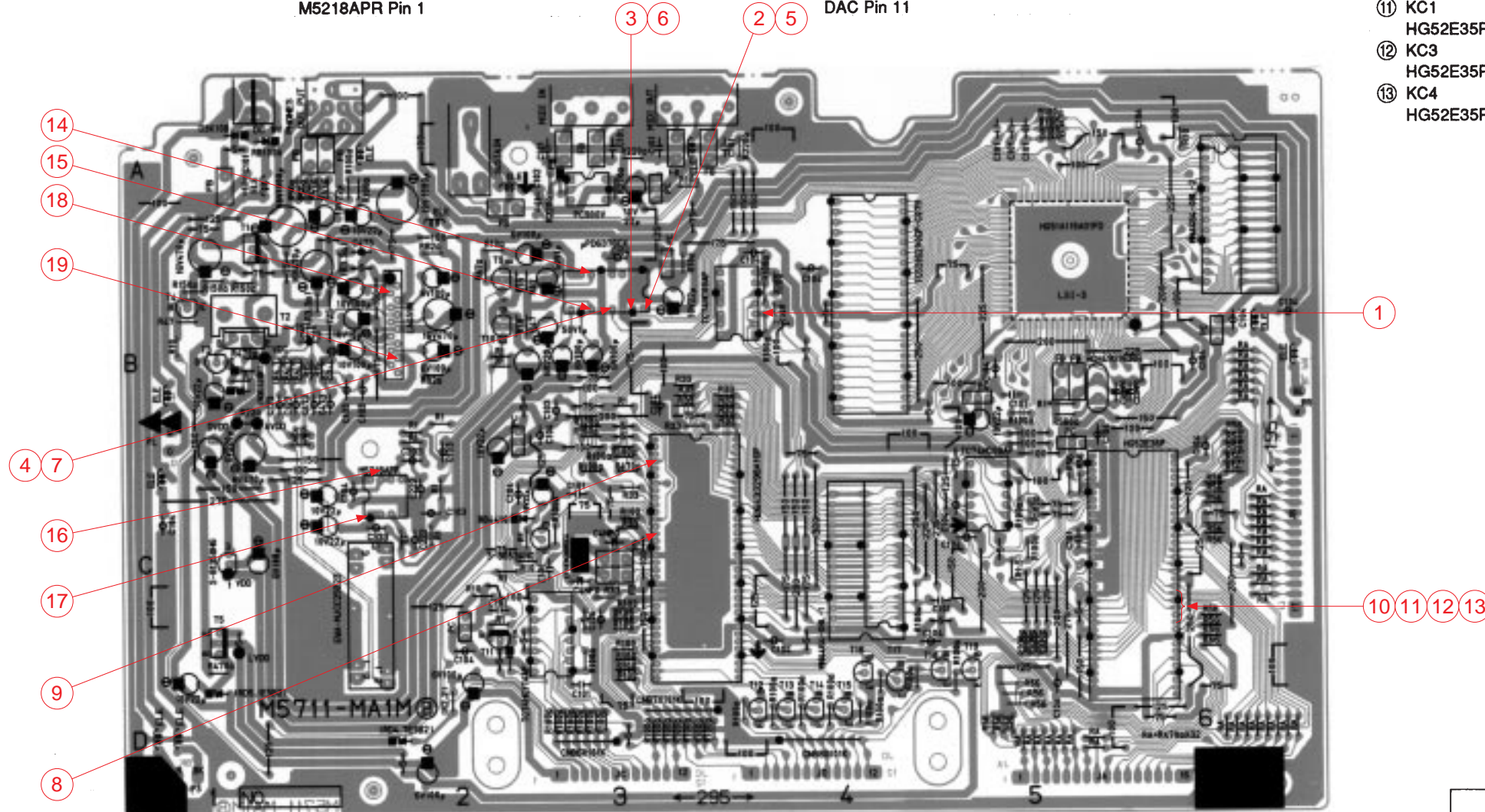
⑳ Filter R-ch output  
M5218APR Pin 7  
㉑ Filter L-ch output  
M5218APR Pin 1  
Tone : 078  
Key : A4  
Touch : Max



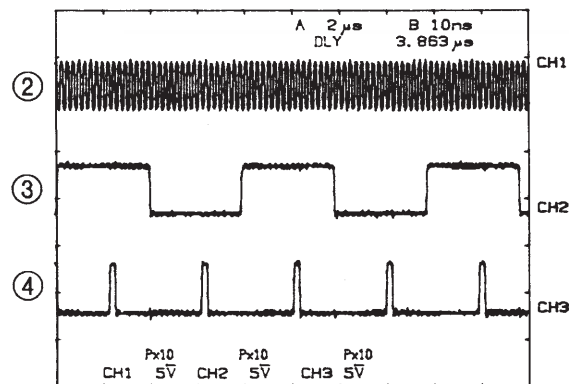
㉒ DAC R-ch output  
DAC Pin 6  
㉓ DAC L-ch output  
DAC Pin 11  
Tone : 078  
Key : A4  
Touch : Max



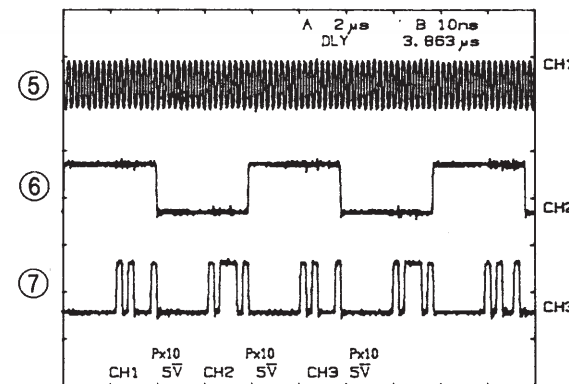
Key scan signals  
⑩ KC0  
HG52E35P Pin 44  
⑪ KC1  
HG52E35P Pin 45  
⑫ KC3  
HG52E35P Pin 46  
⑬ KC4  
HG52E35P Pin 47



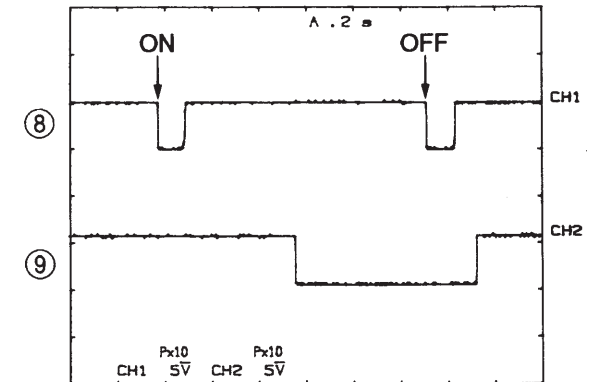
① Chip select for HG52E35P  
TC74HC00AP Pin 3



② Basic clock  
DAC Pin 16  
③ LR clock  
DAC Pin 15  
④ Sound data  
DAC Pin 13  
No sound

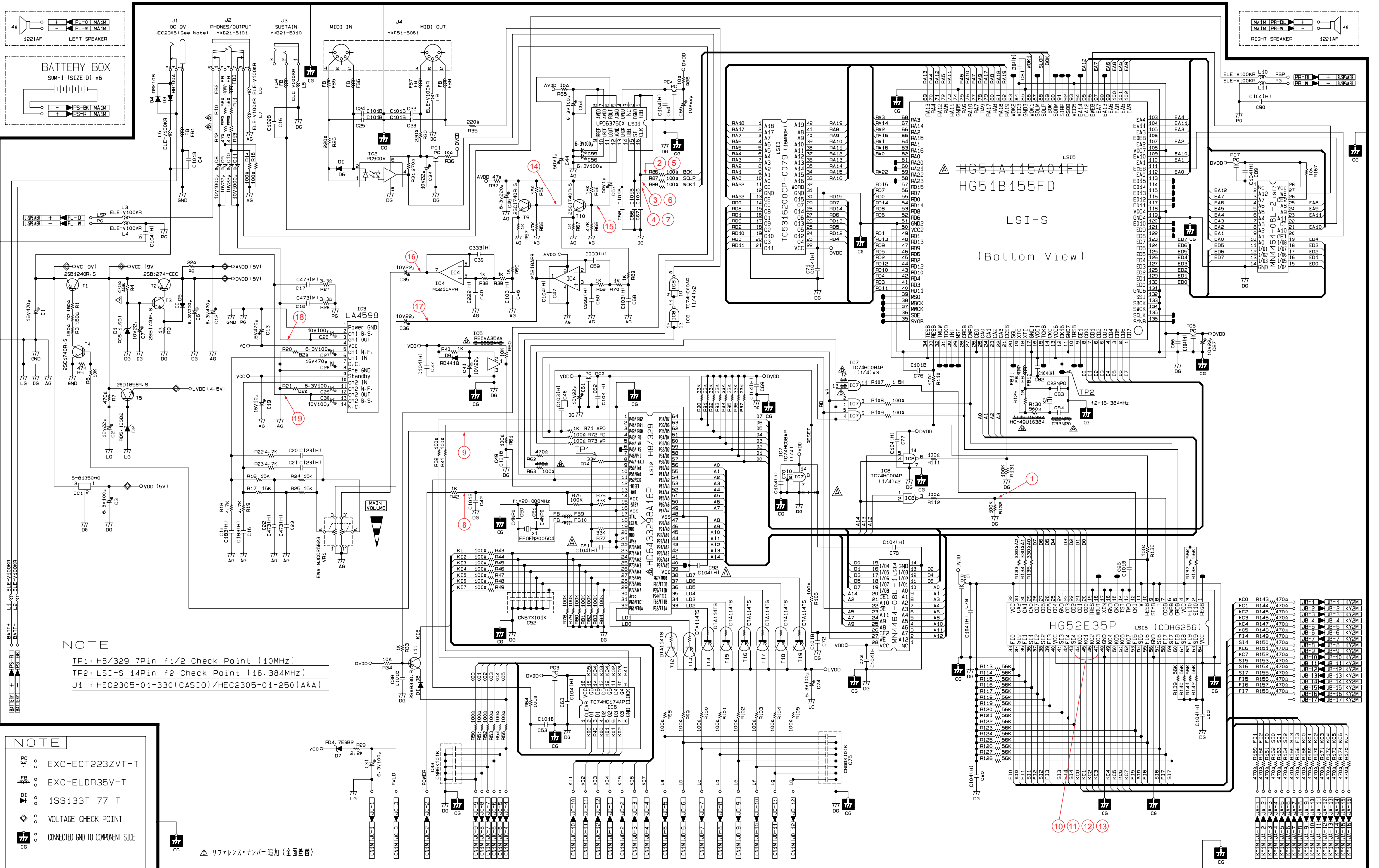


⑤ Basic clock  
DAC Pin 16  
⑥ LR clock  
DAC Pin 15  
⑦ Sound data  
DAC Pin 13  
Tone : 000  
Key : A4



⑧ Power ON/OFF signal  
Power switch  
⑨ Auto power off signal  
CPU Pin 3

# SCHEMATIC DIAGRAM M5711-MA1M



**NOTE**

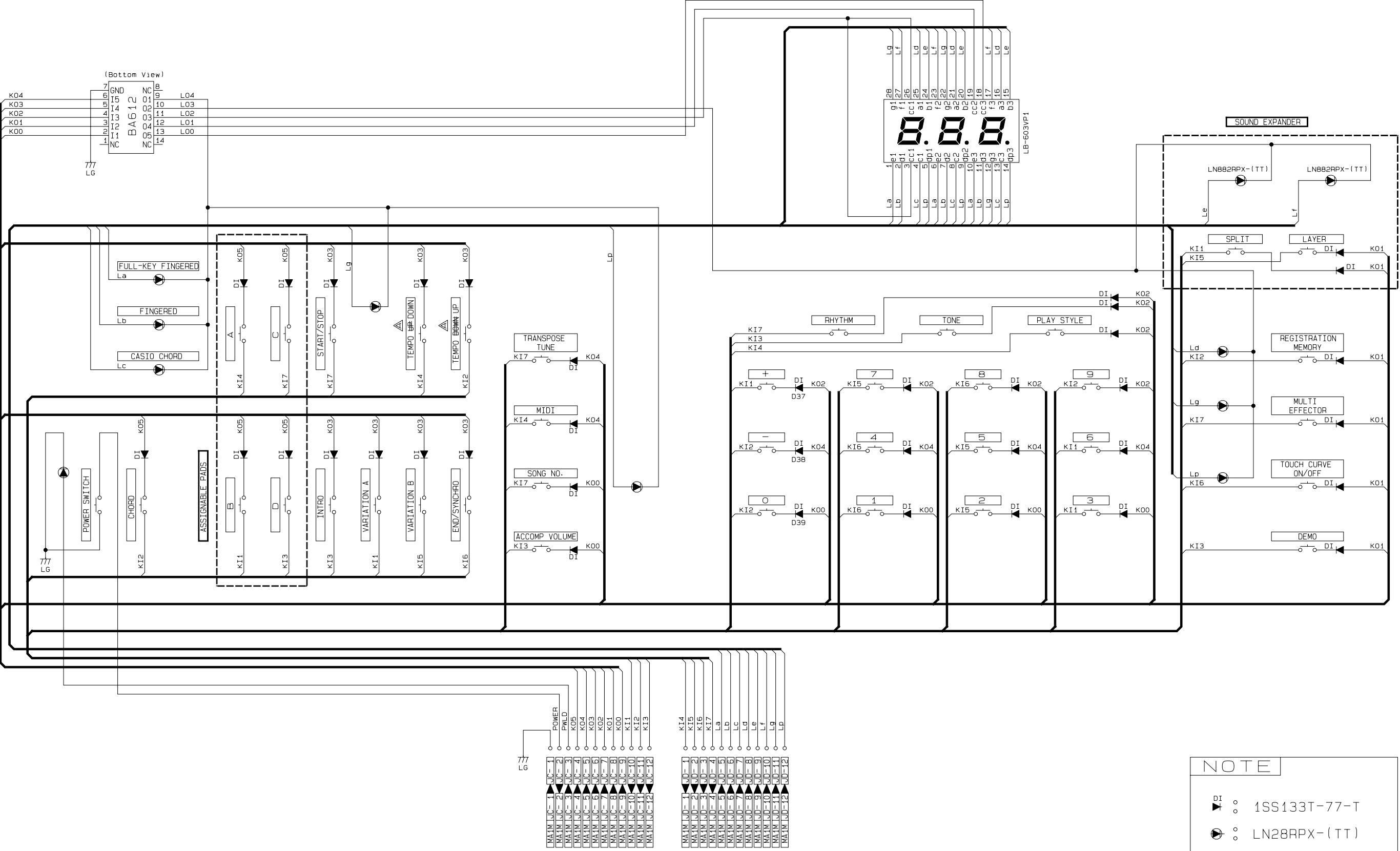
- TP1: H8/329 7Pin f1/2 Check Point (10MHz)
- TP2: LSI-S 14Pin f2 Check Point (16.384MHz)
- J1: HEC2305-01-330(CASIO)/HEC2305-01-250(A&A)

**NOTE**

- 1KΩ
- EXC-ECT223ZVT-T
- EXC-ELDR35V-T
- 1SS133T-77-T
- VOLTAGE CHECK POINT
- CONNECTED TO COMPONENT SIDE

△ リファレンス・ナンバー追加 (全品共通)

**SCHEMATIC DIAGRAM M5711-CN1M**





# PARTS LIST

## CTK-650

- 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<br>N.R.Yen<br>Unit Price | R | * |
|-----------------------------|------|-----------|----------------------|-------------------|----|----|------------------------------------|---|---|
| <b>PCB ass'y M5711-MA1M</b> |      |           |                      |                   |    |    |                                    |   |   |
|                             |      | 2011 3325 | LSI                  | UPD6376CX         | 1  | 1  | 230                                | A | C |
|                             |      | 2011 5194 | LSI                  | HG52E35P          | 1  | 1  | 600                                | A | F |
|                             |      | 2011 5201 | LSI                  | HG51A115A01FD     | 1  | 1  | 2,820                              | A | T |
| N                           |      | 2011 6797 | LSI                  | LC3564Q-85.10     | 2  | 1  | 280                                | A | C |
| N                           |      | 2011 6944 | LSI                  | TC5316200CP-C079  | 1  | 1  | 1,230                              | A | N |
| N                           |      | 2011 7021 | LSI                  | HD6433298A16P     | 1  | 1  | 880                                | A | J |
| N                           |      | 2105 2114 | IC, Regulator        | S-81350HG         | 1  | 5  | 65                                 | A | B |
|                             |      | 2105 2219 | MOS IC               | S-8053ANO         | 1  | 5  | 60                                 | A | B |
| N                           |      | 2105 2912 | C-MOS                | HD74HC08P         | 1  | 10 | 28                                 | A | A |
|                             |      | 2105 3045 | C-MOS                | HD74HC174P        | 1  | 5  | 49                                 | A | A |
| N                           |      | 2105 3136 | C-MOS                | HD74HC00P         | 1  | 10 | 28                                 | A | A |
|                             |      | 2114 1421 | IC, Photo-coupler    | PC900V            | 1  | 1  | 210                                | A | C |
|                             |      | 2114 1799 | IC, Monolithic       | M5218APR          | 1  | 1  | 38                                 | A | A |
|                             |      | 2114 2891 | IC, Monolithic       | LA4598            | 1  | 1  | 140                                | A | B |
| N                           |      | 2251 0665 | Transistor           | 2SB1240R.S-TV6-T  | 1  | 20 | 26                                 | A | A |
| N                           |      | 2251 0672 | Transistor           | 2SB1548-P.CS      | 1  | 10 | 44                                 | A | A |
|                             |      | 2252 0889 | Transistor           | 2SA1267Y,GR-AT-T  | 1  | 20 | 8                                  | A | A |
|                             |      | 2252 0896 | Transistor           | 2SC1740S-R,S-TP-T | 4  | 20 | 8                                  | A | A |
| N                           |      | 2253 0581 | Transistor           | 2SD1858R.S-TV6-T  | 1  | 20 | 24                                 | A | A |
| N                           |      | 2259 1883 | Digital transistor   | DTA114TS-TP-T     | 8  | 20 | 10                                 | A | A |
|                             |      | 2310 7996 | Zener diode          | RD4.7ESB2-T1-T    | 1  | 20 | 12                                 | A | A |
|                             |      | 2360 0098 | Zener diode          | RD5.1ESB2-T1-T    | 1  | 20 | 14                                 | A | A |
| N                           |      | 2360 2233 | Zener diode          | RD5.1JSB1-T1-T    | 1  | 20 | 8                                  | A | A |
|                             |      | 2390 0371 | Diode                | DSK10B-BT-T       | 1  | 20 | 11                                 | B | A |
|                             |      | 2390 1316 | Diode                | SB10-04A3-BT-T    | 1  | 20 | 28                                 | B | A |
|                             |      | 2390 1344 | Diode                | 1SS133T-77-T      | 3  | 20 | 3                                  | C | A |
| N                           |      | 2390 1995 | Diode                | RB441Q-T77-T      | 1  | 20 | 16                                 | B | A |
| N                           |      | 2590 1519 | Crystal oscillator   | HC-49U16384       | 1  | 1  | 100                                | A | B |
| N                           |      | 2590 1526 | Ceramic oscillator   | EFO-EN2005C4      | 1  | 5  | 62                                 | A | B |
|                             |      | 2606 1141 | Carbon film resistor | R-20-1K-J-T23-T   | 13 | 20 | 2                                  | C | A |
|                             |      | 2606 1148 | Carbon film resistor | R-20-220-J-T23-T  | 3  | 20 | 2                                  | C | A |
|                             |      | 2606 1155 | Carbon film resistor | R-20-330-J-T23-T  | 3  | 20 | 2                                  | C | A |
|                             |      | 2606 1162 | Carbon film resistor | R-20-10-J-T23-T   | 3  | 20 | 2                                  | C | A |
|                             |      | 2606 1169 | Carbon film resistor | R-20-100-J-T23-T  | 40 | 20 | 2                                  | C | A |
|                             |      | 2606 1176 | Carbon film resistor | R-20-100K-J-T23-T | 10 | 20 | 2                                  | C | A |
|                             |      | 2606 1183 | Carbon film resistor | R-20-10K-J-T23-T  | 4  | 20 | 2                                  | C | A |
|                             |      | 2606 1197 | Carbon film resistor | R-20-22-J-T23-T   | 1  | 20 | 2                                  | C | A |
|                             |      | 2606 1204 | Carbon film resistor | R-20-3.3-J-T23-T  | 2  | 20 | 2                                  | C | A |
|                             |      | 2606 1218 | Carbon film resistor | R-20-56-J-T23-T   | 2  | 20 | 2                                  | C | A |
|                             |      | 2606 1232 | Carbon film resistor | R-20-82-J-T23-T   | 2  | 20 | 2                                  | C | A |
|                             |      | 2606 1253 | Carbon film resistor | R-20-4.7K-J-T23-T | 4  | 20 | 2                                  | C | A |
|                             |      | 2606 1274 | Carbon film resistor | R-20-1.5K-J-T23-T | 1  | 20 | 2                                  | C | A |
|                             |      | 2606 1288 | Carbon film resistor | R-20-2.2K-J-T23-T | 1  | 20 | 2                                  | C | A |
|                             |      | 2606 1302 | Carbon film resistor | R-20-270-J-T23-T  | 1  | 20 | 2                                  | C | A |
|                             |      | 2606 1309 | Carbon film resistor | R-20-470-J-T23-T  | 35 | 20 | 2                                  | C | A |
|                             |      | 2606 1316 | Carbon film resistor | R-20-47K-J-T23-T  | 3  | 20 | 2                                  | C | A |
|                             |      | 2606 1323 | Carbon film resistor | R-20-56K-J-T23-T  | 22 | 20 | 2                                  | C | A |
|                             |      | 2606 1337 | Carbon film resistor | R-20-1M-J-T23-T   | 1  | 20 | 2                                  | C | A |
|                             |      | 2606 1372 | Carbon film resistor | R-20-33K-J-T23-T  | 11 | 20 | 2                                  | C | A |
|                             |      | 2606 1386 | Carbon film resistor | R-20-15K-J-T23-T  | 4  | 20 | 2                                  | C | A |
|                             |      | 2606 1435 | Carbon film resistor | R-20-560-J-T23-T  | 1  | 20 | 2                                  | C | A |
|                             |      | 2606 1442 | Carbon film resistor | R-20-18K-J-T23-T  | 2  | 20 | 2                                  | C | A |
| N                           |      | 2606 1526 | Carbon film resistor | R-20-150-J-T23-T  | 3  | 20 | 2                                  | C | A |
| N                           |      | 2606 1708 | Carbon film resistor | R-20-47-J-T23-T   | 3  | 20 | 2                                  | C | A |

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

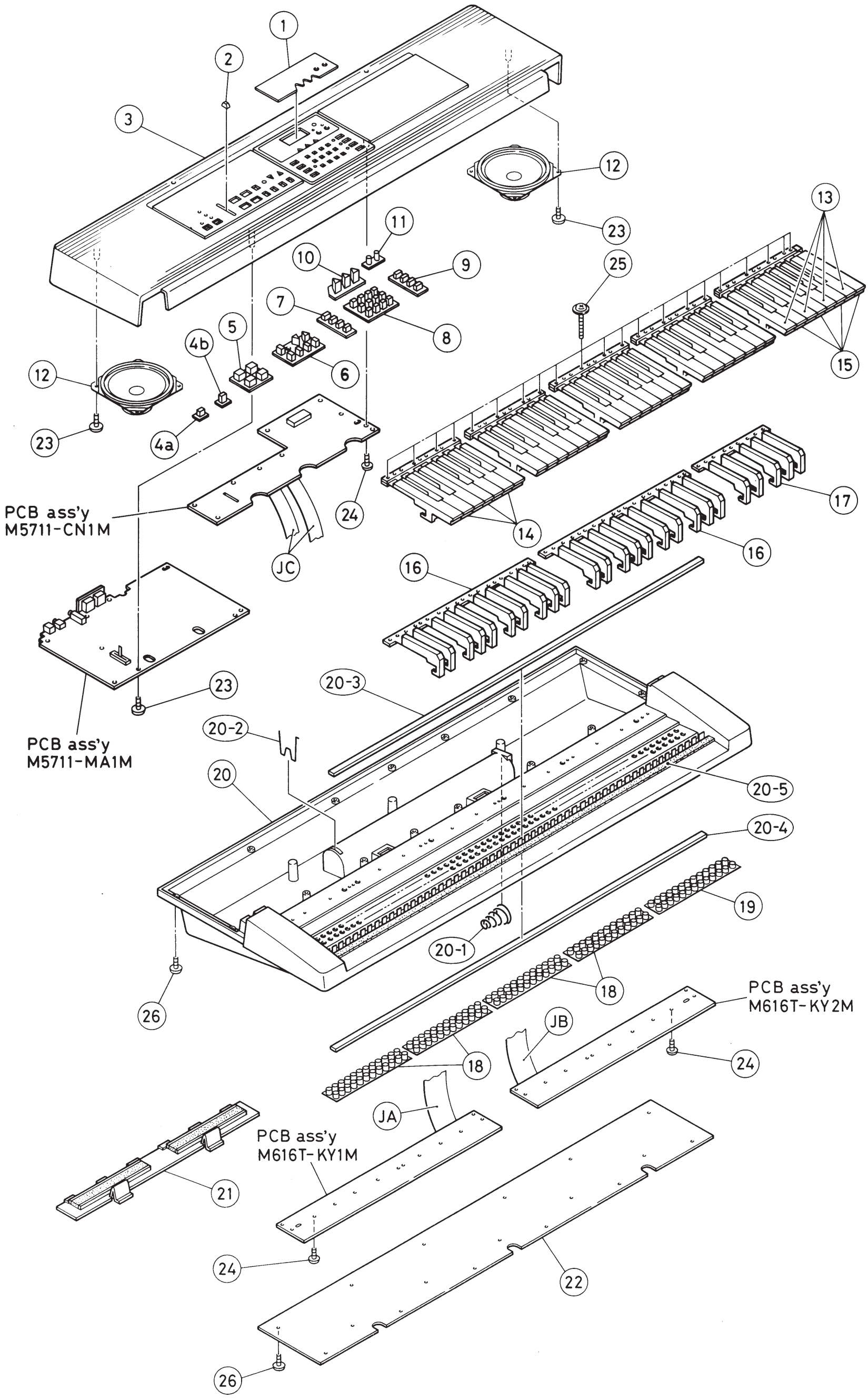
| N                           | Item | Code No.  | Parts Name               | Specification        | Q          | M  | FOB Japan<br>N.R.Yen<br>Unit Price | R   | *  |
|-----------------------------|------|-----------|--------------------------|----------------------|------------|----|------------------------------------|-----|----|
| N                           |      | 2765 1344 | Slide volume             | EWA-MJCC25B23        | 1          | 1  | 110                                | A   | B  |
|                             |      | 2801 7910 | Electrolytic capacitor   | 16RE3-470-T2-T       | 3          | 10 | 27                                 | C   | A  |
|                             |      | 2805 2341 | Electrolytic capacitor   | 10RE2-1000-S1        | 2          | 10 | 45                                 | C   | A  |
|                             |      | 2805 3061 | Electrolytic capacitor   | 6.3RE2-220-T2-T      | 2          | 10 | 26                                 | C   | A  |
|                             |      | 2805 3134 | Electrolytic capacitor   | 10RE2-22-T2-T        | 11         | 20 | 14                                 | C   | A  |
|                             |      | 2805 3142 | Electrolytic capacitor   | 16RE2-10-T2-T        | 1          | 20 | 14                                 | C   | A  |
|                             |      | 2807 1023 | Electrolytic capacitor   | 50RE2-1-T2-T         | 2          | 20 | 15                                 | C   | A  |
|                             |      | 2807 1040 | Electrolytic capacitor   | 6.3RE2-470-T2-T      | 1          | 10 | 27                                 | C   | A  |
|                             |      | 2807 1091 | Electrolytic capacitor   | 6.3RE2-100-T2-T      | 8          | 20 | 18                                 | C   | A  |
|                             |      | 2807 1112 | Electrolytic capacitor   | 10RE2-100-T2-T       | 2          | 20 | 12                                 | C   | A  |
|                             |      | 2813 1197 | Semiconductive capacitor | DD404SR103K16-T      | 3          | 20 | 6                                  | C   | A  |
|                             |      | 2813 1218 | Semiconductive capacitor | DD404SR222K16-T      | 2          | 20 | 15                                 | C   | A  |
|                             |      | 2813 1722 | Semiconductive capacitor | DD407SR104K16-T      | 22         | 20 | 9                                  | C   | A  |
|                             |      | 2813 2128 | Semiconductive capacitor | DD405SR473K16-T      | 2          | 20 | 7                                  | C   | A  |
|                             |      | 2813 2254 | Semiconductive capacitor | DD405SR333K16-T      | 2          | 20 | 6                                  | C   | A  |
|                             |      | 2813 2429 | Semiconductive capacitor | DD404SR183K16-T      | 2          | 20 | 5                                  | C   | A  |
|                             |      | 2813 3353 | Semiconductive capacitor | DD404SR123K16-T      | 2          | 20 | 5                                  | C   | A  |
|                             |      | 2818 0365 | Ceramic capacitor        | RT-HE50TKYB102K-T    | 1          | 20 | 3                                  | C   | A  |
|                             |      | 2818 0446 | Ceramic capacitor        | RT-HE40TKYB101K-T    | 15         | 20 | 4                                  | C   | A  |
|                             |      | 2818 2465 | Ceramic capacitor        | RT-HE40TKCH040D-T    | 2          | 10 | 8                                  | C   | A  |
|                             |      | 2818 3275 | Ceramic capacitor        | RT-HE40TKCH220J-T    | 2          | 20 | 5                                  | C   | A  |
|                             |      | 2830 6436 | Mylar capacitor          | AMZV-473K50-T        | 2          | 10 | 9                                  | C   | A  |
|                             |      | 2845 0168 | Module capacitor         | CNB8X101K            | 1          | 5  | 58                                 | C   | B  |
|                             |      | 2845 0175 | Module capacitor         | CNB7X101K            | 1          | 10 | 44                                 | C   | A  |
|                             |      | 2845 0182 | Module capacitor         | CNB6X101K            | 1          | 10 | 43                                 | C   | A  |
|                             |      | 2845 3934 | Three polarity capacitor | DS310-92D223S-T      | 7          | 10 | 18                                 | C   | A  |
|                             |      | 3035 0266 | Ferrite beads            | BL02RN2-R62T4-T      | 12         | 10 | 13                                 | C   | A  |
|                             |      | 3501 4816 | DIN jack                 | YKF51-5051           | 1          | 1  | 110                                | B   | B  |
|                             |      | 3501 7049 | DC jack                  | HEC2305-01-330       | 1          | 10 | 29                                 | A   | A  |
|                             |      | 3612 0711 | Miniature jack           | YKB21-5101           | 1          | 5  | 90                                 | B   | B  |
|                             |      | 3612 0789 | Jack                     | YKB21-5010           | 1          | 5  | 60                                 | B   | B  |
|                             |      | 3841 0539 | Inductor                 | ELE-V100KR-T         | 11         | 20 | 26                                 | C   | A  |
|                             | N    |           | 4317 4221                | Blank PCB M5711-MA1M | M111758A-1 | 1  | 1                                  | 680 | C  |
| N                           |      | 6922 3740 | PCB ass'y M5711-MA1M     | M111774*1            | 1          |    | 9,570                              | B   | CC |
| <b>PCB ass'y M5711-CN1M</b> |      |           |                          |                      |            |    |                                    |     |    |
| N                           |      | 2114 3318 | IC, Monolithic           | BA612                | 1          | 5  | 98                                 | A   | B  |
|                             |      | 2370 0343 | LED                      | LN28RPX-(TT)         | 9          | 20 | 16                                 | C   | A  |
|                             |      | 2370 0952 | LED                      | LB-603VP1            | 1          | 1  | 240                                | C   | C  |
| N                           |      | 2370 0959 | LED                      | LN882RPX-(TT)        | 2          | 20 | 27                                 | C   | A  |
|                             |      | 2390 1344 | Diode                    | 1SS133T-77-T         | 37         | 20 | 3                                  | C   | A  |
| N                           | JC   | 3719 4235 | Ribbon cable M711C       | DF5H12120-MM         | 2          | 10 | 33                                 | C   | A  |
| N                           |      | 4317 4231 | Blank PCB M5711-CN1M     | M111759A-1           | 1          | 1  | 280                                | C   | C  |
| N                           |      | 6922 3760 | PCB ass'y M5711-CN1M     | M111775*1            | 1          | 1  | 1,280                              | C   | N  |
| <b>PCB ass'y M616T-KY1M</b> |      |           |                          |                      |            |    |                                    |     |    |
| N                           | JA   | 2301 0101 | Diode                    | 1S2473-T-77-T        | 64         | 20 | 8                                  | C   | A  |
|                             |      | 3719 4242 | Ribbon cable M711A       | DF5H16220-MM         | 1          | 5  | 68                                 | C   | B  |
|                             |      | 4317 4151 | Blank PCB M616T-KY1M     | M111748A-1           | 1          | 1  | 240                                | C   | C  |
| N                           |      | 6922 3900 | PCB ass'y M616T-KY1M     | M111750*2            | 1          | 1  | 710                                | C   | H  |
| <b>PCB ass'y M616T-KY2M</b> |      |           |                          |                      |            |    |                                    |     |    |
| N                           | JB   | 2301 0101 | Diode                    | 1S2473-T-77-T        | 58         | 20 | 8                                  | C   | A  |
|                             |      | 3719 4249 | Ribbon cable M711B       | DF5H17310-MM         | 1          | 5  | 93                                 | C   | B  |
|                             |      | 4317 4161 | Blank PCB M616T-KY2M     | M111749A-1           | 1          | 1  | 190                                | C   | C  |
|                             |      | 6909 6240 | Sponge 35X200            | M42674-2             | 1          | 20 | 25                                 | C   | A  |
| N                           |      | 6922 3910 | PCB ass'y M616T-KY2M     | M111751*2            | 1          | 1  | 860                                | C   | I  |

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

| N                       | Item | Code No.  | Parts Name               | Specification | Q  | M  | FOB Japan<br>N.R.Yen<br>Unit Price | R | * |
|-------------------------|------|-----------|--------------------------|---------------|----|----|------------------------------------|---|---|
| <b>Mechanical Parts</b> |      |           |                          |               |    |    |                                    |   |   |
| N                       | 1    | 6922 3800 | Display window 711       | M312128-1     | 1  | 5  | 93                                 | C | B |
|                         | 2    | 6921 5040 | Slide volume knob 601    | M311860-1     | 1  | 10 | 13                                 | B | A |
| N                       | 3    | 6922 3820 | Panel 711                | M111744-1     | 1  | 1  | 890                                | C | J |
| N                       | 4a   | 6922 3830 | Rubber button 711A       | M312122-1     | 1  | 10 | 31                                 | B | A |
| N                       | 4b   | 6922 3840 | Rubber button 711B       | M312123-1     | 1  | 10 | 32                                 | B | A |
| N                       | 5    | 6922 3850 | Rubber button 711C       | M312124-1     | 1  | 1  | 110                                | B | B |
| N                       | 6    | 6922 3860 | Rubber button 711F       | M211727-1     | 1  | 1  | 130                                | B | B |
| N                       | 7    | 6922 3870 | Rubber button 711D       | M312125-1     | 1  | 5  | 72                                 | B | B |
|                         | 8    | 6922 2660 | Rubber button 710C       | M312088-1     | 1  | 1  | 97                                 | B | B |
| N                       | 9    | 6922 3880 | Rubber button 711D       | M312125-2     | 1  | 5  | 73                                 | B | B |
| N                       | 10   | 6922 3890 | Rubber button 711E       | M312126-1     | 1  | 5  | 73                                 | B | B |
|                         | 11   | 6922 2680 | Rubber button 710D       | M312082-2     | 1  | 10 | 29                                 | B | A |
|                         | 12   | 3831 0357 | Speaker                  | 1221AF        | 2  | 1  | 1,000                              | B | K |
|                         | 13   | 6922 2840 | LT White key set CEGB    | M111723-1     | 5  | 1  | 100                                | A | B |
|                         | 14   | 6922 2850 | LT White key set DFA     | M111724-1     | 4  | 1  | 100                                | A | B |
|                         | 15   | 6922 2860 | LT White key set DFAS    | M111725-1     | 1  | 1  | 100                                | A | B |
|                         | 16   | 6922 2740 | LT Black key set10P      | M111726-1     | 2  | 1  | 120                                | A | B |
|                         | 17   | 6922 2750 | LT Black key set 5P      | M111726-2     | 1  | 5  | 86                                 | A | B |
|                         | 18   | 6922 2760 | Key contact rubber LT-CB | M211704-1     | 4  | 5  | 89                                 | A | B |
|                         | 19   | 6922 2770 | Key contact rubber LT-CS | M211705-1     | 1  | 5  | 91                                 | A | B |
| N                       | 20   | 6922 3923 | Case ass'y               | M111732C*2    | 1  | 1  | 1,300                              | C | N |
| N                       | 21   | 6918 1634 | Battery cover sub ass'y  | M311164D*1    | 1  | 1  | 200                                | B | C |
|                         | 22   | 6922 2631 | Bottom plate 710         | M211706A-1    | 1  | 1  | 360                                | C | D |
|                         | 20-1 | 6902 6140 | Battery spring 90        | M41226-1      | 1  | 10 | 27                                 | B | A |
|                         | 20-2 | 6903 2150 | Battery spring B         | M41330-1      | 1  | 10 | 18                                 | B | A |
|                         | 20-3 | 6922 2810 | Lower stopper 710        | M412287-1     | 1  | 1  | 98                                 | C | B |
|                         | 20-4 | 6922 2820 | Upper stopper 710        | M412286-1     | 1  | 1  | 75                                 | C | B |
|                         | 20-5 | 6922 4480 | Key damper 710           | M412324-1     | 1  | 1  | 55                                 | C | B |
|                         |      | 6920 8691 | Music stand 590          | M311760A-1    | 1  | 1  | 130                                | B | B |
| <b>Screws</b>           |      |           |                          |               |    |    |                                    |   |   |
|                         | 23   | 0009 2680 | Screw                    | 4 x 8         | 15 | 50 | 2                                  | C | A |
|                         | 24   | 0009 2682 | Screw                    | 2.6 x 8       | 43 | 50 | 2                                  | C | A |
|                         | 25   | 0009 4588 | Screw                    | 2.6 x 18      | 21 | 50 | 2                                  | C | A |
|                         | 26   | 0009 6417 | Screw                    | 4 x 10        | 32 | 50 | 2                                  | C | A |

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EXPLODED VIEW



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