CASIO®
Service Manual

(with price)

GZ-500

GZ-500

GM SOUND KEYBOARD

CONTENTS

SPECIFICATIONS

GENERAL

Number of keys:	61
Polyphonic:	32-note
Preset tones:	128, Drum set: 8
Keyboard controls:	Touch response: On/Off
Digital effects:	10, including Reverb-1, Reverb-2, Reverb-3, Chorus, Tremolo, Phase Shifter, Organ SP, Enhancer, Flanger, EQ Loudness
Modulation:	On/Off, Depth setting range: 0 - 127
Pitch bend wheel:	Bend sense: 0 - 12
Tuning control:	440Hz $\pm$ 50 cents
Built-in speakers:	12 cm dia. 2 W input rating: 2 pcs.
Terminals:	Phone Jack [Output impedance: 100 Ω, Output voltage: 4.5 V(rms) MAX], MIDI Jacks (IN, OUT), Assignable Jack, AC Adapter Jack (9 V)
Auto power off:	Approximately 6 minutes after the last operation
Power source:	2-way AC or DC source AC: AC adapter DC: 6 D size dry batteries
Power consumption:	7.7 W
Dimensions (HWD):	129 x 942 x 367 mm (5-1/16 x 37-1/16 x 14-1/2 inches)
Weight:	5.3 kg (11.7 lbs) excluding batteries

ELECTRICAL

Current drain with 9 V DC:	
No sound output	294 mA $\pm$ 20%
Maximum volume	940 mA $\pm$ 20%
with 32 polyphonic notes in tone No. 078	
Volume; maximum, Velocity: maximum	
Phone output level (Vrms with 8 load each channel):	
with key A5 pressed in tone No. 078	100 mV $\pm$ 20%
Line output level (Vrms with 47 k load each channel):	
with key A5 pressed in tone No. 078	1350 mV $\pm$ 20%
Minimum operating voltage:	6.0 V

OPERATION

SETTING UP THE KEYBOARD

Item	Setting	Setting operation
System Reset	1*	1. Press the control button and repeat it until the display shows "Srt". "SUr" and "Srt" will appear alternately on the display. 2. Press the + key.
Assignable Jack	Sustain pedal	1. Press the control button and repeat it until the display shows "JAC". 2. Using the +/- key, select "SUS" on the dispaly.
	Sostenuto pedal	1. Press the control button and repeat it until the display shows "JAC". 2. Using the +/- key, select "SoS" on the dispaly.
	Soft pedal	1. Press the control button and repeat it until the display shows "JAC". 2. Using the +/- key, select "SFt" on the dispaly.
GM Reset 3*	2*	1. Press the MIDI button and repeat it until the display shows "Grt". "SUr" and "Grt" will appear alternately on the display. 2. Press the + key. 3. Press the + key again.

Notes: 1* See the initial settings list as shown below.
2* See the initial settings in The General MIDI system on next page.
3* The exclusive message of "GM system on" will be tramsmitted when completing the operation.
System exclusive: GM system on   [F0][7E][7F][09][01][F7]

The initial settings

Tone:	000 (Piano)	Channel 1 - 9 & 11 - 16
	dr0 (Drum set 0)	Channel 10

Modulation: 0 (Off)
MIDI control change
 Volume: 100
 Pan: 64 (Center)
 Expression: 127 (Maximum)
 Effect depth: 127 (Maximum)
 Pitch bend sense: 2
 Coarse tune: 0 (Center)
 Fine tuning: 0 (Center)
Digital effect: E-0 (Digital effect 0)
MIDI channel: 01
Channel On/Off: On
Octave shift: 0
Modulation depth: 064
Touch response: r-0 (Touch curve 0)
Velocity at touch
        response OFF: 100
Assignable jack: SUS (Sustain pedal)
Local control On/Off: On

The initial settings in The General MIDI system

Channel 1 - 9 & 11 - 16

Program change:	000 (Piano)
Pitch bend:	LSB: 40H, MSB: 00H
Modulation:	0 (Off)
Volume:	100
Pan:	64 (Center)
Expression:	127 (Maximum)
Sustain:	0 (Off)
Soft:	0 (Off)
Effect depth:	127 (Maximum)
Pitch bend sense:	02 (2 seminotes)
Coarse tune:	LSB:40H, MSB:00H
Fine tune:	LSB:40H, MSB:00H
RPN:	Null
Channel pressure:	0 (Off)

Channel 10

Drum set No.:	0
Volume:	100
Pan:	64 (Center)
Expression:	127 (Maximum)
Soft:	0 (Off)
Effect depth:	127 (Maximum)

TRANSMITTING MIDI MESSAGES

Operation 1

MIDI messages of note on/off, velocity and modulation are transmitted no matter which MIDI channel is selected.

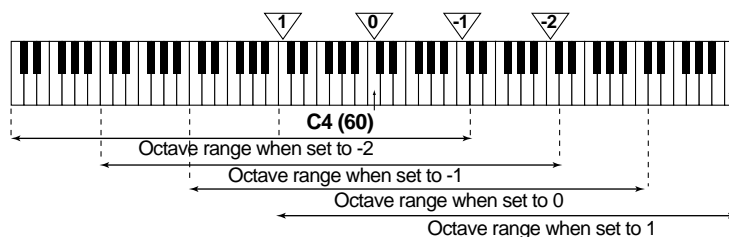Note on/off message is transmitted when the corresponding key is pressed/released.

Use the Octave Shift Button, shift the octave range up or down so that GZ-500 is able to send note numbers 17 to 108 but the keyboard has 61 keys only.

Velocity is also transmitted when a key is pressed. GZ-500 sends the velocity in accordance with the strength of the pressed key and the selected touch curve (sensitivity).

Data of modulation is transmitted when the corresponding wheel is operated.

MIDI Message	Setting	Setting operation
Note On/Off	Octave shift	1. Press the octave shift button. 2. Using the +/- key, select an octave range -2 to 1 you want.
Velocity	Velocity curve	1. Press the control button and repeat it until the display shows "tCH". 2. Using the 10-key, enter a number from 0 to 7.
	Touch response OFF	1. Press the control button and repeat it until the display shows "tCH". 2. Using the 10-key, enter a number 0. 3. Press the - key. The display will show "oFF".
	Velocity at touch response OFF	1. Press the control button and repeat it until the display shows "tCH". 2. Using the 10-key, enter a 3-digit number from 001 to 127.
Modulation	Modulation depth	1. Press the control button and repeat it until the display shows "dEP". 2. Using the 10-key, enter a 3-digit number from 001 to 127.

Octave shift setting and keyboard range

Octave range when set to -2
Octave range when set to -1
Octave range when set to 0
Octave range when set to 1

Operation 2
The MIDI messages listed in the following table are transmitted when completing the setting operation. The setting affects only on the currently selected MIDI channel. First select the desire MIDI channel before changing settings.

Selecting a MIDI channel
1. Press the MIDI button.
        The display shows the current MIDI channel, eg. "C01" means Channel 1.
2. Using the 10-key, enter a number from 1 to 16.

Changing Program Change / Control Change

MIDI Message		Setting Operation
Program change		1. Reffering to the tone number list on the panel, find the 3-digit tone number you desire. 2. Press the tone button. 3. Using the 10-key, enter the 3-digit number.
Control change	Volume	1. Press the MIDI button and repeat it until "voL" appears on the display. 2. Using the 10-key, enter a 3-digit number from 000 to 127.
	Pan	1. Press the MIDI button and repeat it until "PAn" appears on the display. 2. Using the 10-key, enter a 3-digit number from 000 to 127.
	Expression	1. Press the MIDI button and repeat it until "EPS" appears on the display. 2. Using the 10-key, enter a 3-digit number from 000 to 127.
	Effect depth	1. Press the MIDI button and repeat it until "EFt" appears on the display. 2. Using the 10-key, enter a 3-digit number from 000 to 127.
	Fine tune	1. Press the MIDI button and repeat it until "tUn" appears on the display. 2. Using the 10-key and the - key, enter a 2-digit number from -50 to 50.
	Transpose	1. Press the MIDI button and repeat it until "trn" appears on the display. 2. Using the 10-key and the - key, enter a 2-digit number from -12 to 12.
	All notes off	1. Press the MIDI button and repeat it until "Ano" appears on the display. "SUr" and "Ano" will appear alternately on the display. 2. Press the + key. 3. Press the + key again to transmit the message.
	All sounds off	1. Press the MIDI button and repeat it until "ASo" appears on the display. "SUr" and "ASo" will appear alternately on the display. 2. Press the + key. 3. Press the + key again to transmit the message.
	Reset all controllers	1. Press the MIDI button and repeat it until "rAC" appears on the display. "SUr" and "rAC" will appear alternately on the display. 2. Press the + key. 3. Press the + key again to transmit the message.

The initial settings of MIDI control change

Pitch bend:	+/- 0 (Center)
Modulation:	0 (Off)
Expression:	127 (Maximum)
Sustain:	0 (Off)
Sostenuto:	0 (Off)
Soft:	0 (Off)
Channel pressure:	0 (Off)
RPN:	null

Operation 3

Messages of Digital Effect Type, which are system exclusive messages, are transmitted when completing the following operation.

Transmitting a digital effect type

1. Press the tone button.
2. Press the digital effect button once when the digital effect indicator is off.
   Press the digital effect button twice when the digital effect indicator is lighting up.
3. Using the 10-key, enter a number from 0 to 9.
4. The display shows the degital efffect type entered, eg. "E_3" means digital effect 3 (Chorus)
5. Wait for about a few seconds unitl the display show the tone number at Step 1.

System exclusive: Effect change   [F0][44][0B][09][xx][F7]

                                       [xx]: [00] - [09], [0F]

                                              [00]:   Reverb1 (Stage)
                                              [01]:   Reverb2 (Hall)
                                              [02]:   Reverb3 (Room)
                                              [03]:   Chorus
                                              [04]:   Tremolo
                                              [05]:   Phase shifter
                                              [06]:   Organ speaker
                                              [07]:   Enhance
                                              [08]:   Flanger
                                              [09]:   EQ Loundness
                                              [0F]:   Effect OFF

RECEIVING MIDI MESSAGES

The MIDI monitor blinks during receiving a MIDI message.
To recognize Note On/Off messages, set a MIDI channel on.

Setting on/off of a MIDI channel

1. Press the MIDI channel button.
2. Press the channel on/off button.
   The LED lights when the MIDI channel is on.
   The LED goes out when the MIDI channel is off.

Active sensing

This message checks if the MIDI cable is disconnected.
Once GZ-500 has received this message, it always counts time of an interval to a next MIDI message.
In case when GZ-5 receives no MIDI message for 420 msec of time, it will stop sound output and reset all controllers, then it will cancel the function of active sensing.

Transmittable Messages

Note No.:	12 ~ 72 (Oct. shift -2), 24 ~ 84 (Oct. shift -1)
	36 ~ 96 (Oct. shift 0), 48 ~ 108 (Oct. shift 1)
Velocity:	1 ~ 127
Note Off:	velocity 0
Program Change:	0 ~ 127 (Channels 1 - 9 & 11 - 16), 0 ~ 7 (Channel 10)
Pitch Bend:	00H / 00H ~ 7FH / 7FH

Control Change:

Modulation	0 ~ 127
Volume	0 ~ 127
Pan	0 ~ 127
Expression	0 ~ 127
Sustain	0: Off, 127: On
Sosutenuto	0: Off, 127: On
Soft	0: Off, 127: On
Effect Depth	0 ~ 127
Pitch Bend Sense	00H / --H ~ 0CH / --H (12 seminotes)
Coarse Tune	34H / --H ~ 40H / --H ~ 4CH / --H
	(-12 seminotes) ~ (center) ~ (+12 seminotes)
Fine Tune	20H / 00H ~ 40H / 00H ~ 60H / 00H
	(-50 cents) ~ (center) ~ (+50 cents)
All Notes Off	
All Sounds Off	
Reset All Controllers	

Exclusive:	Effect Change
	General MIDI On

Receivable Messages

Note No.:	0 ~ 127
Velocity:	1 ~ 127
Note Off:	velocity 0
Program Change:	0 ~ 127(Channels 1 - 9 & 11 - 16), 0 ~ 7 (Channel 10)
Pitch Bend:	00H / 00H ~ 7FH / 7FH

Control Change:

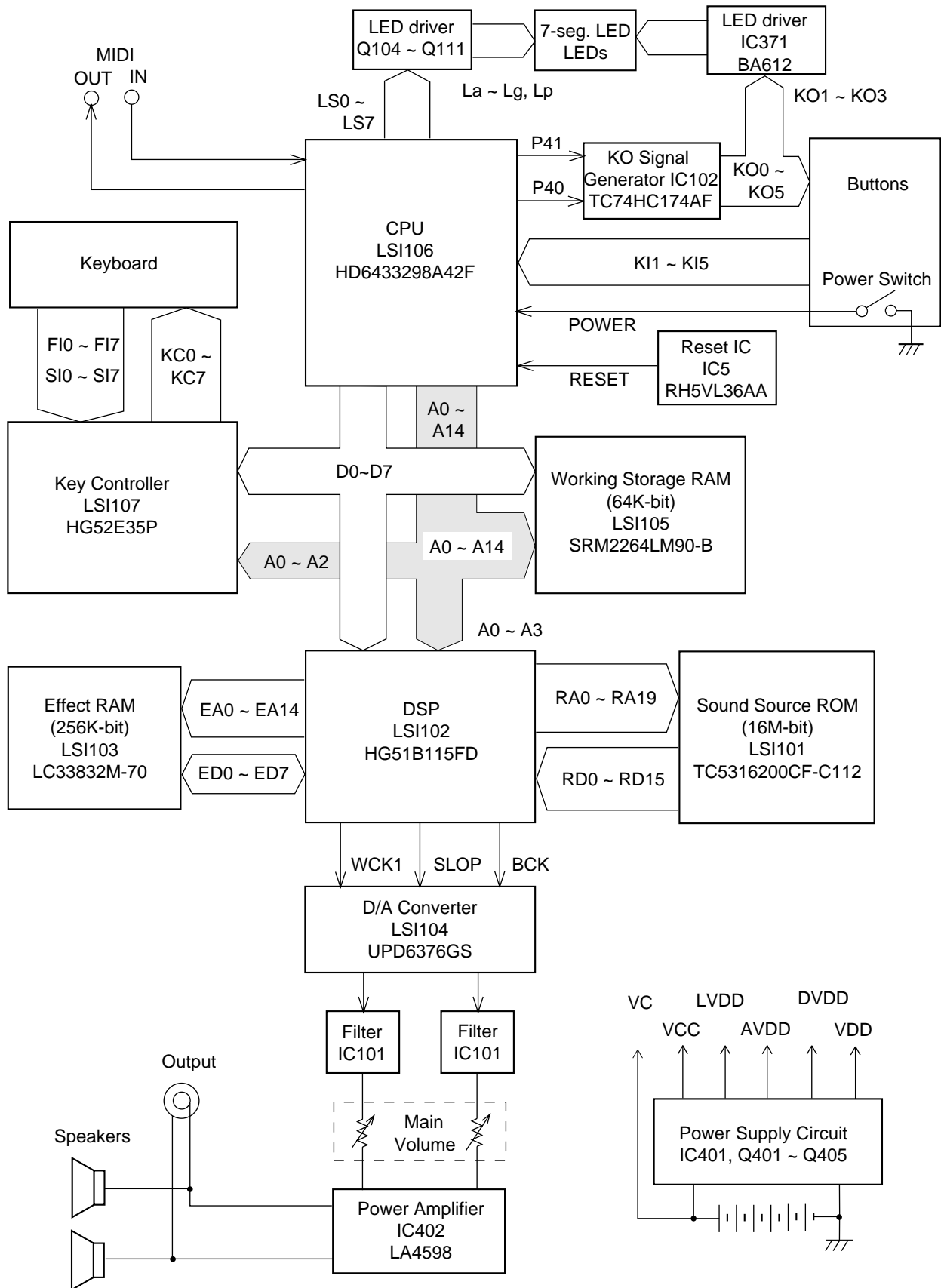|	
Modulation	0 (0 cent) ~ 127 (+/-50 cents)
Volume	0 ~ 127
Pan	0 (Left) ~ 64 (Center) ~ 127 (Right)
Expression	0 ~ 127
Sustain	0 ~ 63: Off, 64 ~ 127: On
Sosutenuto	0 ~ 63: Off, 64 ~ 127: On
Soft	0 ~ 63: Off, 64 ~ 127: On
Effect Depth	0 ~ 127
Pitch Bend Sense	00H / --H ~ 0CH / --H (12 seminotes)
Coarse Tune	34H / 00H ~ 40H / 00H ~ 4CH / 00H
	(-12 seminotes) ~ (center) ~ (+12 seminotes)
Fine Tune	20H / 00H ~ 40H / 00H ~ 60H / 00H
	(-50 cents) ~ (Center) ~ (+50 cents)
RPN Null	
All Notes Off	
All Sounds Off	
Reset All Controllers	

Channel Pressure:	0 (0 cent) ~ 127 (+/-50 cents)
Exclusive:	Effect Change
	General MIDI On
Active Sensing	

BLOCK DIAGRAM

LED driver
Q104 ~ Q111

7-seg. LED
LEDs

LED driver
IC371
BA612

La ~ Lg, Lp

LS0 ~
LS7

MIDI
OUT   IN

KO1 ~ KO3

CPU
LSI106
HD6433298A42F

P41

P40

KO Signal
Generator IC102
TC74HC174AF

KO0 ~
KO5

Buttons

Keyboard

KI1 ~ KI5

Power Switch

FI0 ~ FI7
SI0 ~ SI7

KC0 ~
KC7

POWER

Reset IC
IC5
RH5VL36AA

RESET

A0 ~
A14

D0~D7

Key Controller
LSI107
HG52E35P

Working Storage RAM
(64K-bit)
LSI105
SRM2264LM90-B

A0 ~ A14

A0 ~ A2

A0 ~ A3

Effect RAM
(256K-bit)
LSI103
LC33832M-70

EA0 ~ EA14

ED0 ~ ED7

DSP
LSI102
HG51B115FD

RA0 ~ RA19

RD0 ~ RD15

Sound Source ROM
(16M-bit)
LSI101
TC5316200CF-C112

WCK1   SLOP   BCK

D/A Converter
LSI104
UPD6376GS

VC   LVDD   DVDD
     VCC   AVDD   VDD

Output

Filter
IC101

Filter
IC101

Main
Volume

Speakers

Power Supply Circuit
IC401, Q401 ~ Q405

Power Amplifier
IC402
LA4598

CIRCUIT DESCRIPTION

KEY MATRIX

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

Note: Each key has two contacts, the first conatct (1) and second contact (2).
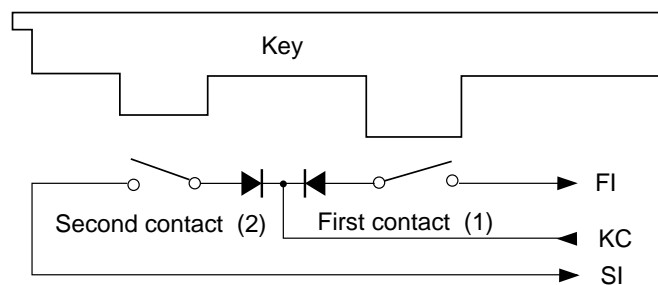
NOMENCLATURE OF KEYS
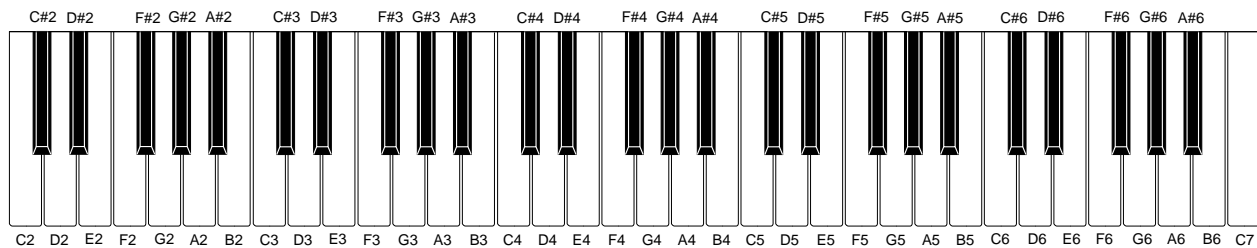
BUTTON MATRIX

	KI1	KI2	KI3	KI4	KI5
KO0	3	0	2	1	
KO1	Control	Demo	Effect	MIDI	
KO2	+	9	7	8	
KO3	6	-	5	4	
KO4	Tone	MIDI Channel	Channel On/Off	Octave Shift	Modulation

POWER SUPPLY CIRCUIT

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

Name	Voltage	For operation of
VDD	+5 V	CPU, Reset IC, Working storage RAM
DVDD	+5 V	DSP, Key touch LSI, Sound source ROM, Effect RAM, KO siginal generator
AVDD	+5V	DAC, Filter
LVDD	+4.5 V	LED Driver
VCC	+9 V	Power amplifier, Pilot lamp
VC	+9 V	Power amplifier

RESET CIRCUIT

When batteries are set or an AC adapter is connected, the reset IC provides a low pulse to the CPU.
The CPU then initializes its internal circuit and clears the working storage RAM.
When the power switch is pressed, the CPU receives a low pulse of POWER signal. The CPU provides APO signal to the power supply circuit and raises RESET signal to +5V to reset the DSP, the key controller and the KO signal generator.
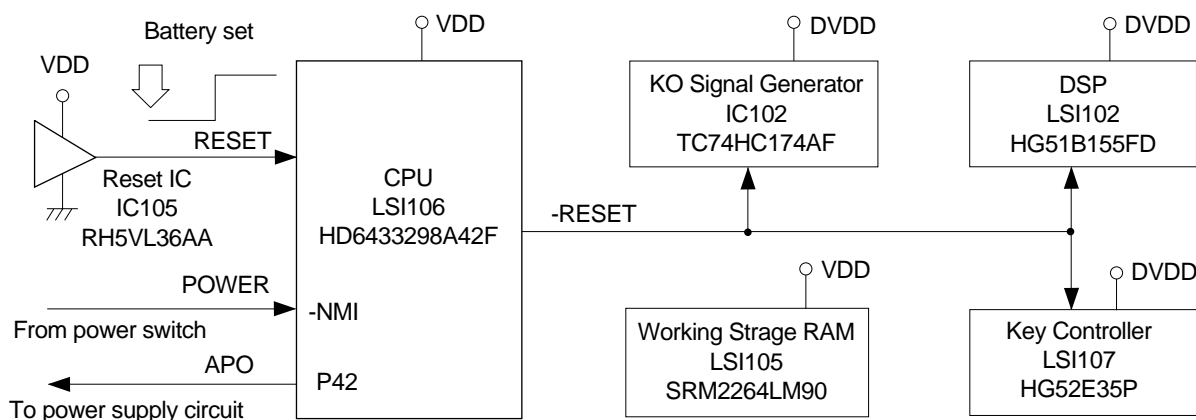
CPU (LSI106: HD6433298A42F)

The 16-bit CPU contains a 32k-bit ROM, a 1k-bit RAM, seven 8-bit I/O ports, an A/D convertor and MIDII interfaces. The CPU accesses to the working storage RAM, the DSP and the key touch LSI. The CPU interprets MIDI message using the working storage RAM. The CPU also controls buttons and LEDs. The following table shows the pin functions of LSI106.

Pin No.	Terminal	In/Out	Function
1	P50/TXD	Out	MIDI signal output
2	P51/RXD	In	MIDI signal input
3	P52/SCK	Out	Reset signal output
4	-RESET	In	Reset signal input
5	-NMI	In	Power ON trigger signal input
6	VCC	In	+5V source
7	-STBY	In	Standby signal input. Connected to +5V.
8	VSS	In	Ground (0V) source
9, 10	XTAL, EXTAL	In	20MHz clock input
11, 12	MD1, MD0	In	Mode selection input
13	AVSS	In	Ground (0V) source
14	P70	In	Analog input terminal for the pitch bend wheel
15	P71	In	APO cancellation signal input
16	P72	——	Not used. Connected to +5 V source.
17 ~ 21	P73 ~ P77	Out	LED drive signal output
22	AVCC	In	+5V source
23 ~ 30	P60 ~ P67	Out	LED drive signal output
31	VCC	In	+5V source
32	P27	——	Not used
33 ~ 48	A0 ~ A14	Out	Address bus
40	VSS	In	Ground (0V) source
49 ~ 56	D0 ~ D7	In/Out	Data bus
57	P40	Out	Clock for KO signal generator
58	P41	Out	KO signal data
59	P42	Out	APO signal output
60	P43	Out	Read enable signal output
61	P44	In	Write enable signal output
62	P45	——	Not used
63	P46	Out	10 MHz clock output
64	P47	——	Not used. Connected to +5 V source.

## DIGITAL SIGNAL PROCESSOR (LSI102: HG51B155FD)

Upon receipt of note numbers and their velocities, the DSP reads sound and velocity data from the sound source ROM in accordance with the selected tone; the DSP can read rhythm data simultaneously when a rythm pattern is selected. Then it provides 16-bit serial signal containing data of the melody, chord, bass, and percussion to the DAC. When an effect selected, the DSP adds the effect to the sound data using a 256k-bit RAM.
The following table shows the pin functions of LSI102.

Pin No.	Terminal	In/Out	Function
1 ~ 8	CD0 ~ CD7	In/Out	Data bus
9, 10	CE1, TRSB	——	Not used
11	GND7	In	Ground (0V) source
12	CK16	Out	Terminal for 24.576 MHz clock check point
13	VCC1	In	+5V source
14	CK0	In	Clock input. Connected to terminal CK16.
15	TCKB	——	Not used
16	VCC1	In	+5V source
17	GND1	In	Ground (0V) source
18, 19	XT0, XT1	In/Out	24.576 MHz clock input/output
20	SGL	In	System control terminal. Single chip system: Open
21	CCSB	In	Chip select signal input
22 ~ 25	CA0 ~ CA3	In	Address bus
26	CE0	In	Not used. Connected to ground.
27	CWRB	In	Write enable signal
28	CRDB	In	Read enable signal
29 ~ 32	——	——	Not used
33	RESB	In	Reset signal input
34	TESB	In	Not used. Connected to +5V.
35 ~ 39	——	——	Not used
40 ~ 49 52 ~ 57	RD0 ~ RD15	In	Data bus for the sound source ROM
50	VCC2	In	+5V source
51	GND2	In	Ground (0V) source
58	RA23	Out	Not used
59	RA22	Out	Chip select signal for the sound source ROM
60, 61	RA20, RA21	Out	Not used
62 ~ 73 75 ~ 82	RA0 ~ RA19	Out	Address bus for the sound source ROM
74	GND5	In	Ground (0V) source
83	WOK2	Out	Not used
84	VCC3	In	+5V source
85	GND3	In	Ground (0V) source
86	WOK1	Out	Word clock for the DAC
87	SOLM	Out	Not used
88	SOLP	Out	Serial sound data output
89	BOK	Out	Bit clock output
90 ~ 92	——	——	Not used
93	VCC5	In	+5V source
94, 95 97 ~ 105 107,109 110, 112	EA0 ~ EA12	Out	Address bus for the effect RAM
96	EWEB	Out	Write enable signal for the effect RAM

Pin No.	Terminal	In/Out	Function
106	EOEB	Out	Read enable signal output for the effect RAM
108	VCC7	In	+5V source
111	ECEB	Out	Chip select signal output for the effect RAM
113 ~ 117	ED11 ~ ED15	——	Not used
118	VCC4	In	+5V source
119	GND4	In	Ground (0V) source
120 ~ 122	ED8 ~ ED10	——	Not used
123 ~ 130	ED0 ~ ED7	In/Out	Data bus for the effect RAM
131	GND5	In	Ground (0V) source
132 ~ 134	——	——	Not used. Connected to ground.
135, 136	——	——	Not used

Block diagram of DSP and DAC circuit
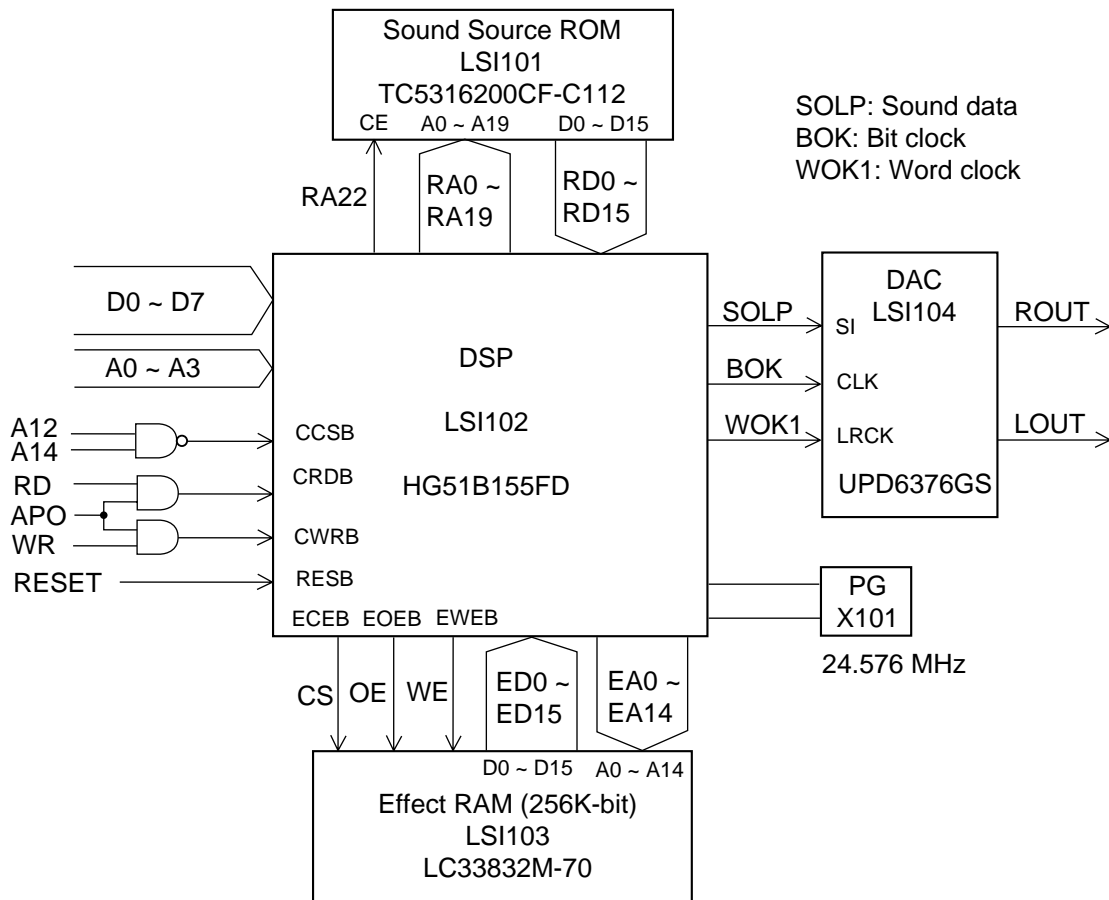
DAC (LSI104: UPD6376GS)

The DAC receives 16-bit serial data output from the DSP. 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 by each channel and output them separately.
The following table shows the pin functions of LSI1.

Pin No.	Terminal	In/Out	Function
1	SEL	In	Mode selection terminal. Connected to ground.
2	D.GND	In	Ground (0V) source for the internal digital circuit
3	NC	——	Not used.
4	DVDD	In	+5V source for the internal digital circuit
5	A.GND	In	Ground (0V) source for the right channel
6	R.OUT	Out	Right channel sound waveform output
7, 8	A.VDD	In	+5V source for the internal analog circuit
9	R.REF	In	Right channel reference voltage terminal
10	L.REF	In	Left channel reference voltage terminal
11	L.OUT	Out	Left channel sound waveform output
12	A.GND	In	Ground (0V) source for the left channel
13	LRCK	In	Word clock input
14	LRSEL	In	Not used. Connected to ground.
15	SI	In	Sound data input
16	CLK	In	Bit clock input

KEY CONTROLLER (LSI107: HG52E35P)

The key controller generates key scan signals and provides them to the keyboard. By counting the time between first-key input signal FI and second-key SI from the keyboard, the key controller detects key velocity. The note number and its velocity data are read at regular intervals by the CPU.
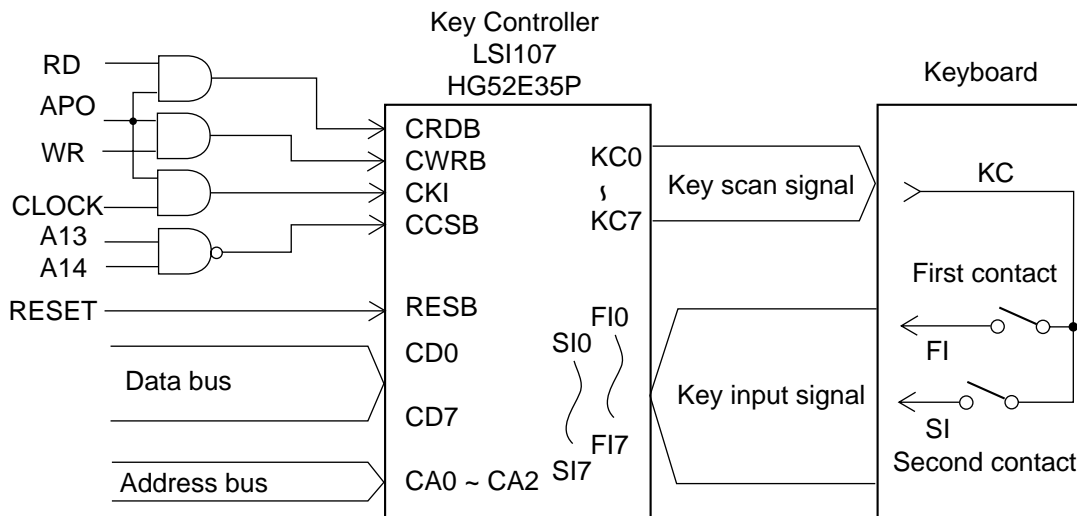
The following table shows the pin functions of LSI107.

Pin No.	Terminal	In/Out	Function
1	REQB	Out	Not used
2, 3, 60 ~ 63	FI8 ~ FI10, SI8 ~ SI10	In	Not used. Connected to + 5V.
4	VCC	In	+5V source
5	CRDB	In	Read enable signal input
6	CWRB	In	Write enable signal input
7	CCBB	In	Chip select signal input
8, 9, 11	T, STBY, W	In	Not used. Connected to +5V.
10	RESB	In	Reset signal input
12	CKI	In	10 MHz clock input
13, 14	TMD, TST	In	Not used. Connected to ground.
15	CKO	Out	Not used.
16	GND	In	Ground (0V) source
17	XIN	In	Not used. Connected to ground.
18	XOUT	Out	Not used.
19	TRES	In	Not used. Connected to ground.
20 ~ 23, 25 ~ 28	CD0 ~ CD7	In/Out	Data bus
24	GND	In	Ground (0V) source
29 ~ 31	CR0 ~ CR2	In	Address bus
32	VCC	In	+5V source
33 ~ 39, 41 ~ 43 53 ~ 55, 57 ~ 59	FI0 ~ FI7, SI0 ~ SI7	In	Key input signal input
40	VCC	In	+5V source
44 ~ 47, 49 ~ 52	KC0 ~ KC7	Out	Key scan signal
48, 56	GND	In	Ground (0V) source
64	VCC	In	+5V source

FILTER BLOCK

Since the sound signals from the DAC are stepped waveforms, the filter block is added to smooth the waveforms.
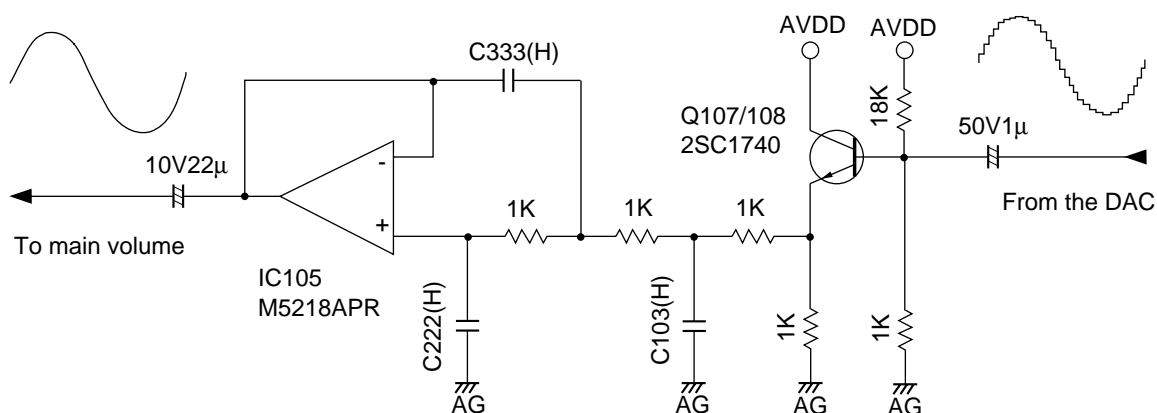
POWER AMPLIFIER (IC402: LA4598)

The power amplifier is a two-channel amplifier with standby switch.
 The following table shows the pin function of IC402.

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

LED DRIVING

MAJOR WAVEFORMS

A . 1 s

CH1
CH2

CH1: 5 V̄   CH2: 5 V̄
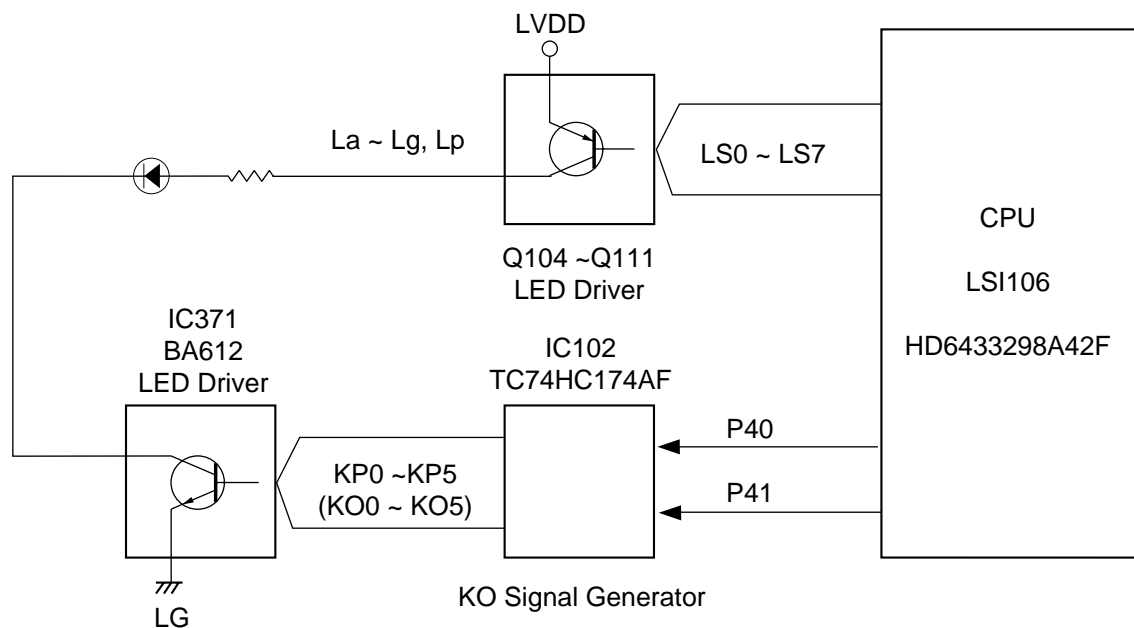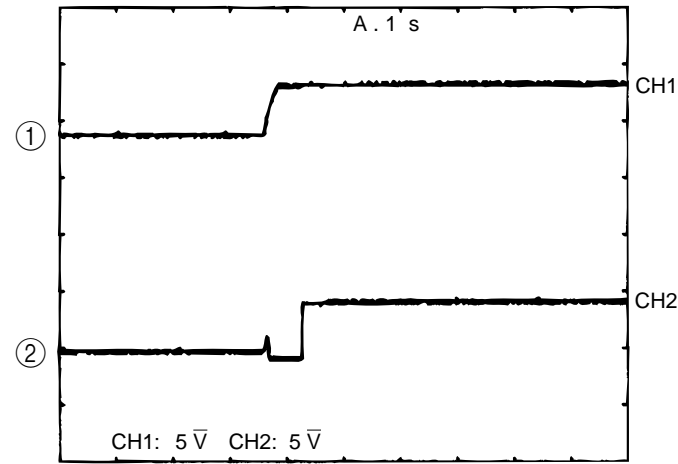
① Voltage VDD
   CG connector pin 6
② Initial reset signal
   RH5VL36A pin 1

A . 1 s

CH1
CH2

CH1: 5 V̄   CH2: 5 V̄
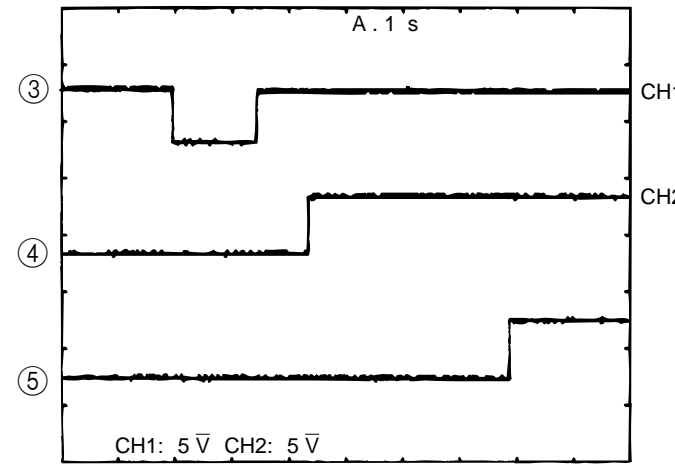
③ Power ON signal PSW
   HD6433298A42F pin 5
④ APO signal
   HD6433298A42F pin 59
⑤ Reset signal
   HD6433298A42F pin 3

A 1 μs

CH1
CH2
CH3

CH1: 5 V̄   CH2: 5 V̄   CH3: 5 V̄
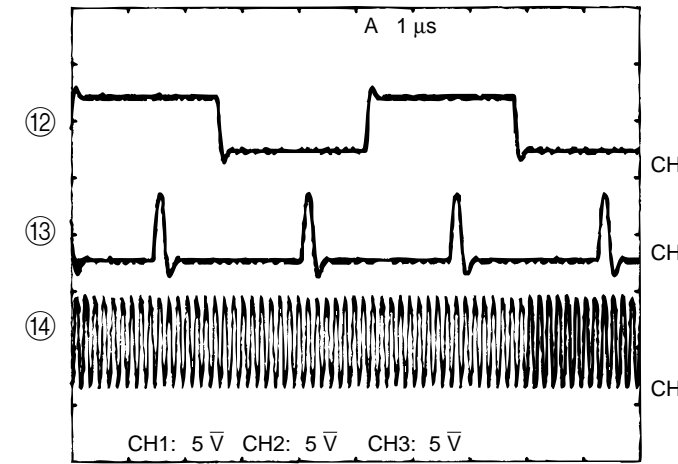
⑫ Word clock WOK1
   UPD6376GS pin 13
⑬ Data S1 (Note OFF)
   UPD6376GS pin 15
⑭ Bit clock BOK
   UPD6376GS pin 16

A 1 ms

CH1
CH2

CH1: 20 mV̄   CH2: 20 mV̄
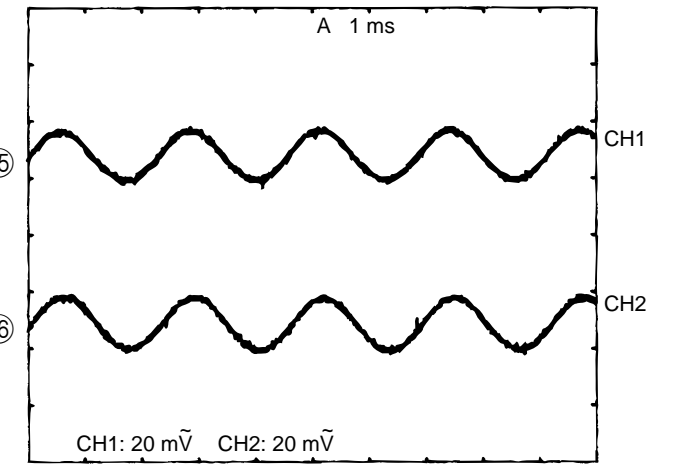
⑮ Filter output AOR
   CG connector pin 3
⑯ Filter output AOL
   CG connector pin 4

   Tone :   Whistle (No. 078)
   Key :   A4
   Touch response :   OFF

A 20 μs

CH1
CH2
CH3

CH1: 5 V̄   CH2: 5 V̄   CH3: 5 V̄
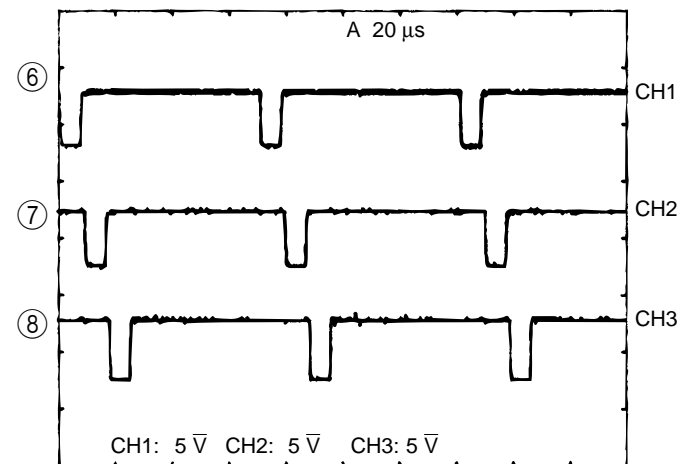
⑥ Key scan signal KC0
   HG52E35P pin 44
⑦ Key scan signal KC1
   HG52E35P pin 45
⑧ Key scan signal KC2
   HG52E35P pin 46

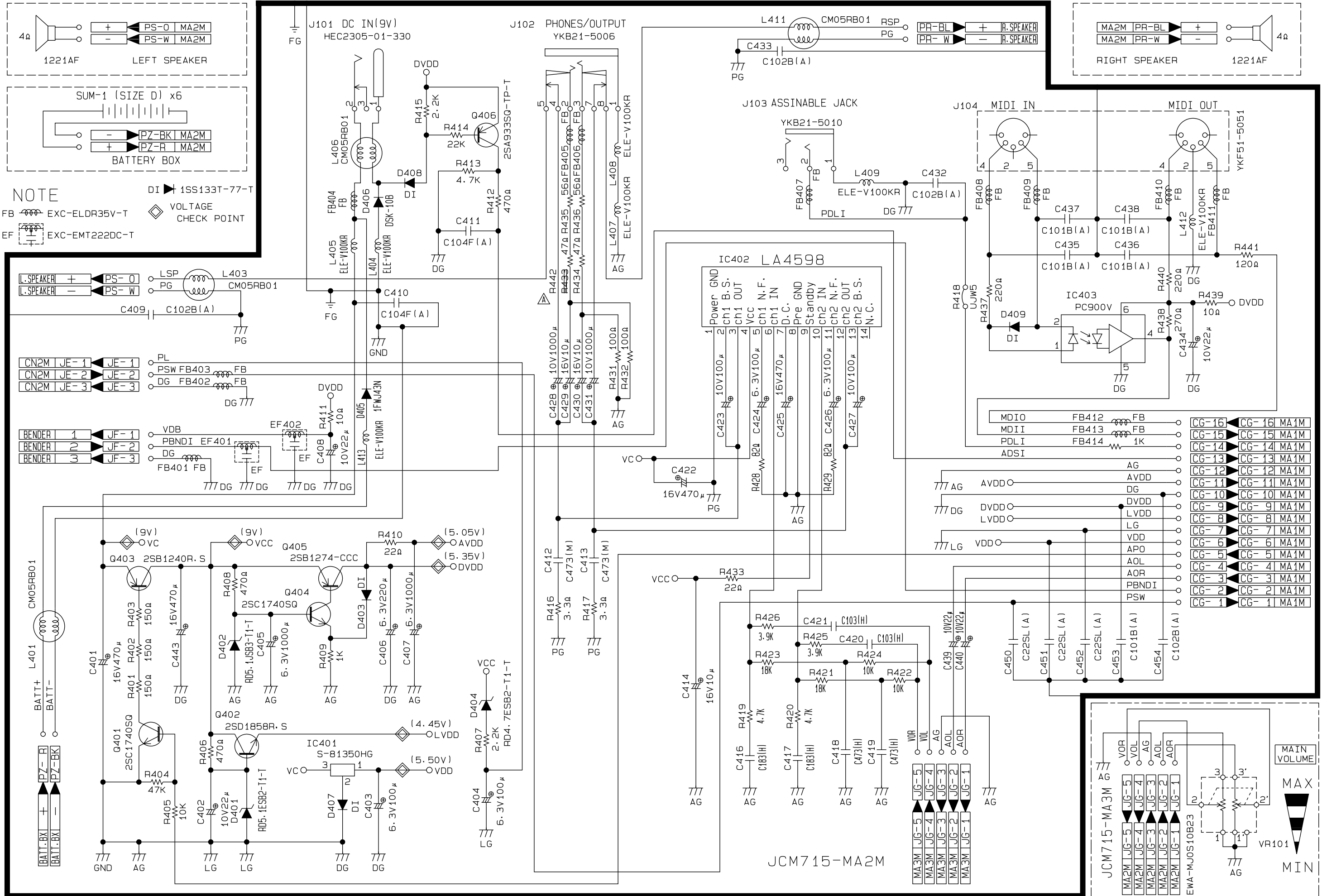A 10 ms

CH1
CH2
CH3

CH1: 5 V̄   CH2: 5 V̄   CH3: 5 V̄
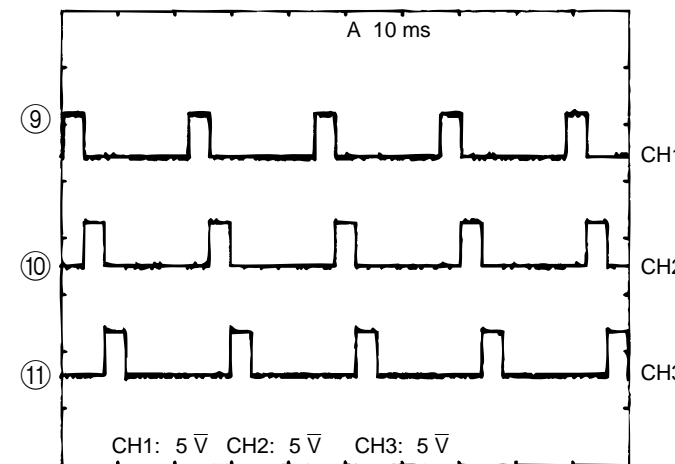
⑨ Button scan signal KO0
   CE connector pin 1
⑩ Button scan signal KO1
   CE connector pin 2
⑪ Button scan signal KO2
   CE connector pin 4

A . 1 ms

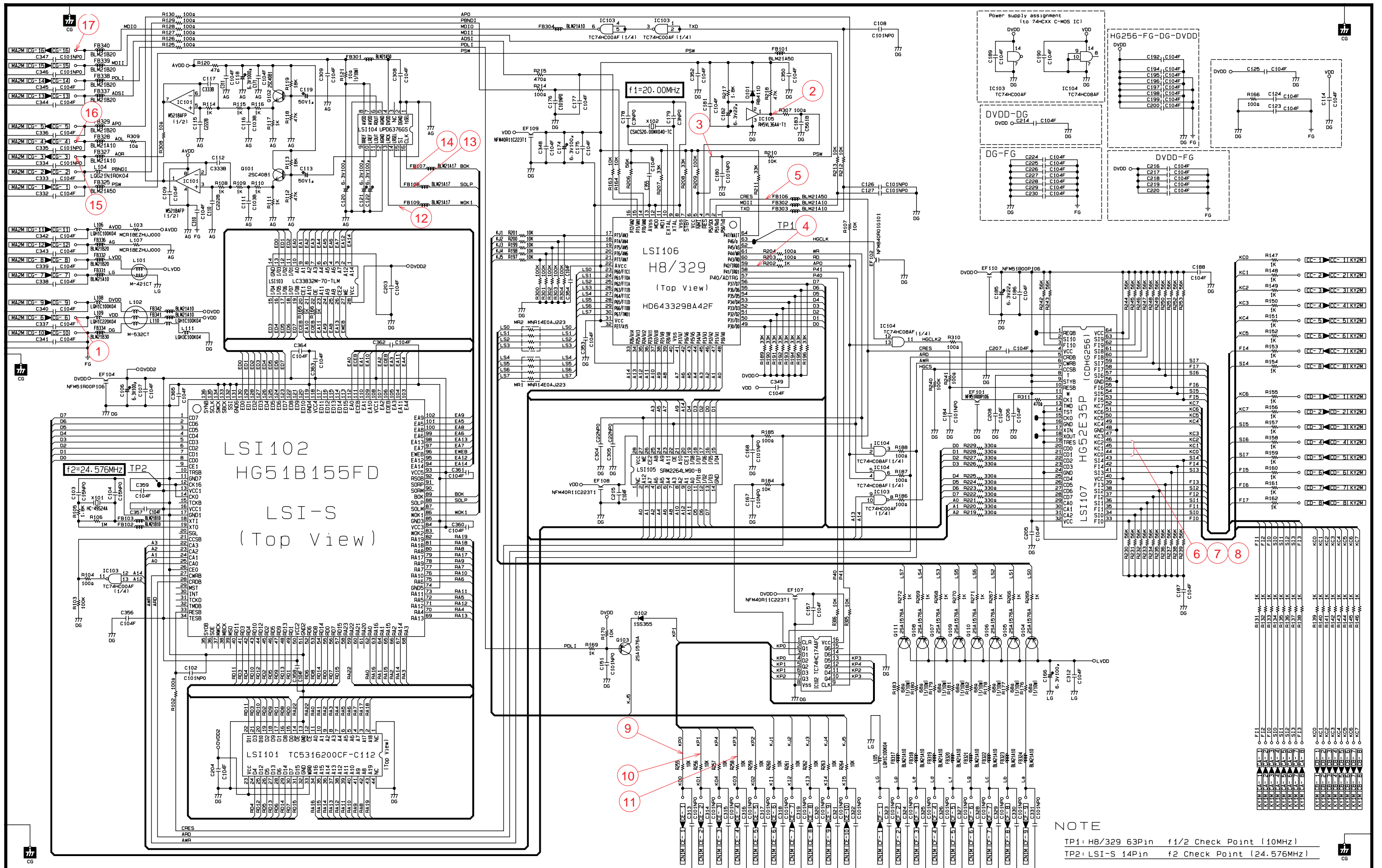Note OFF
CH1
Note ON

CH1: 5 V̄
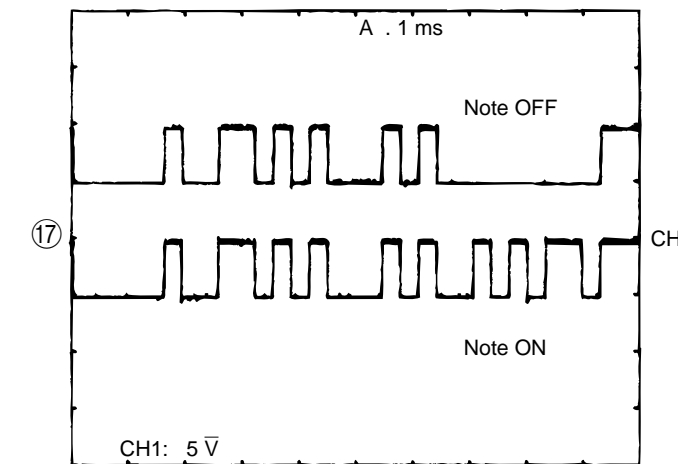
⑰ MIDI signal output
   CG connector pin 16

SCHEMATIC DIAGRAMS

AMP./VOLUME PCBs   JCM715-MA2M/MA3M

CONSOLE PCBs   JCM715-CN1M/2M/3M
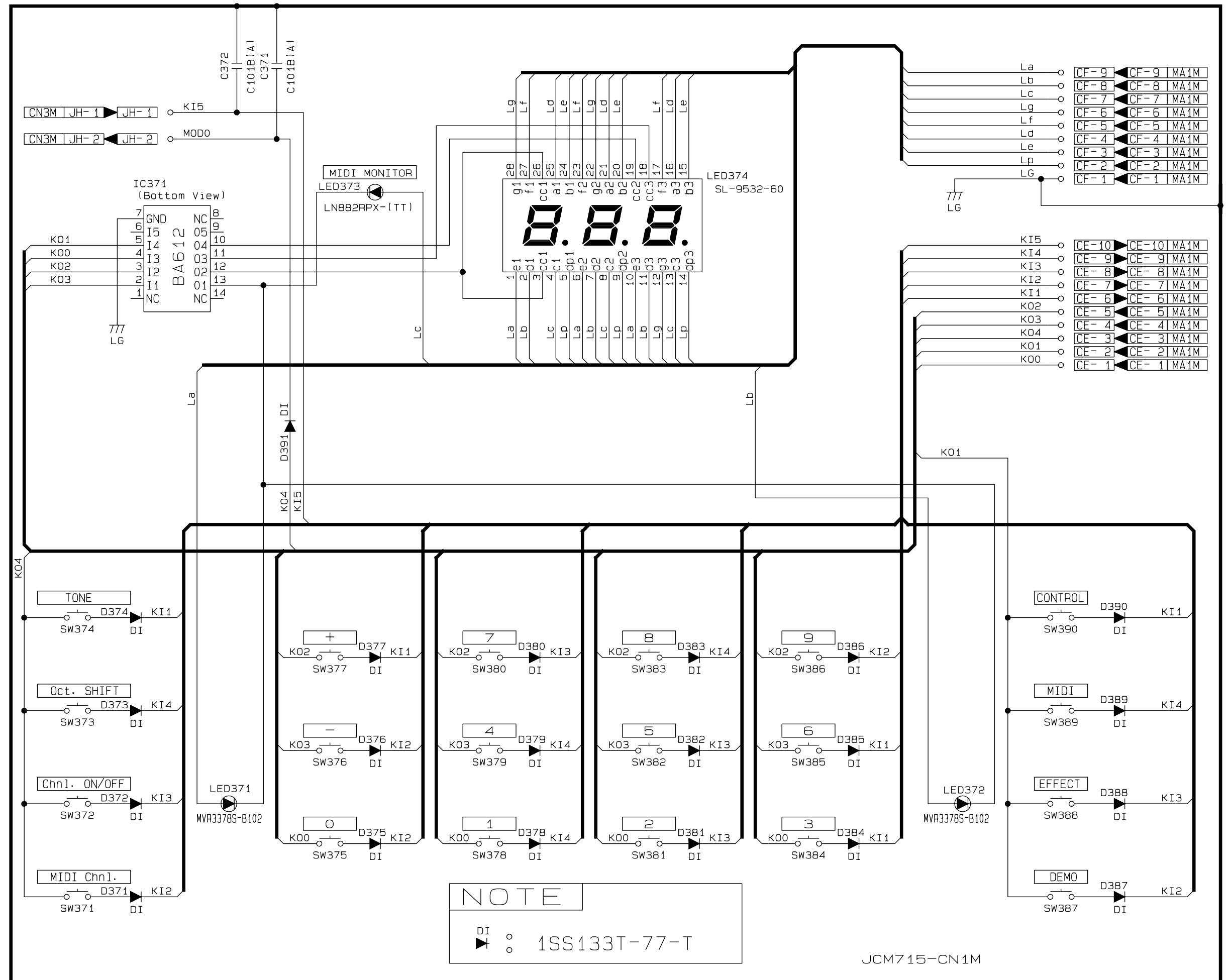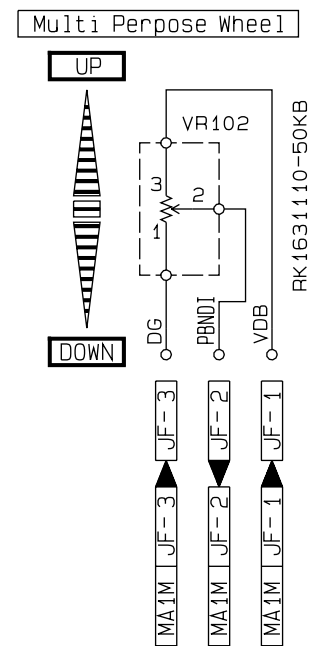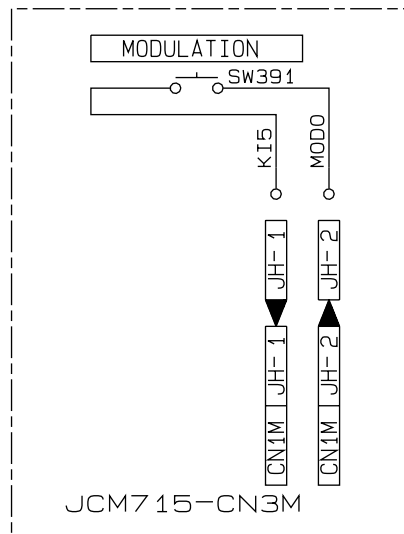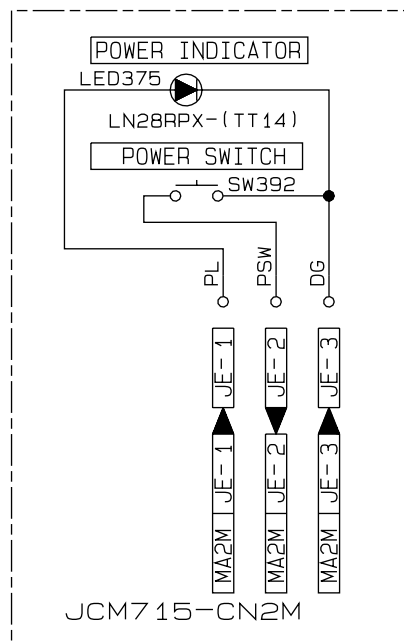
KEYBOARD PCBs   M616T-KY1M/KY2M

ＰＣＢ－Ｍ６１６Ｔ－ＫＹ１Ｍ

ＰＣＢ－Ｍ６１６Ｔ－ＫＹ２Ｍ

▶○ : 1S2473T-77-T

Ⓒ ＰＣＢより対応

ⒸＰＣＢより対応

Key labels (KY1M): C2, C2#, D2, D2#, E2, F2, F2#, G2, G2#, A2, A2#, B2, C3, C3#, D3, D3#, E3, F3, F3#, G3, G3#, A3, A3#, B3, C4, C4#, D4, D4#, E4, F4, F4#, G4

Key labels (KY2M): G4#, A4, A4#, B4, C5, C5#, D5, D5#, E5, F5, F5#, G5, G5#, A5, A5#, B5, C6, C6#, D6, D6#, E6, F6, F6#, G6, G6#, A6, A6#, B6, C7
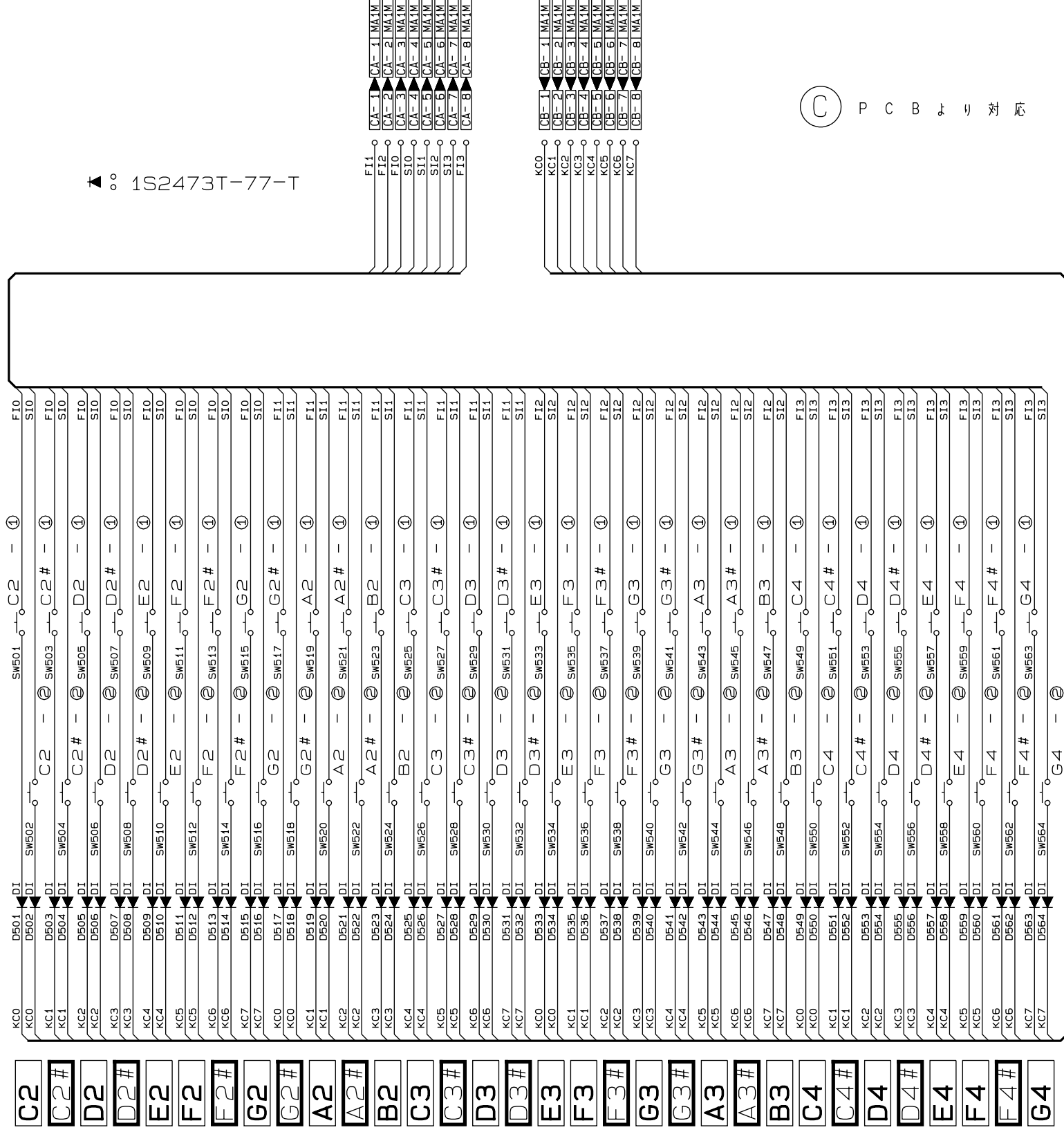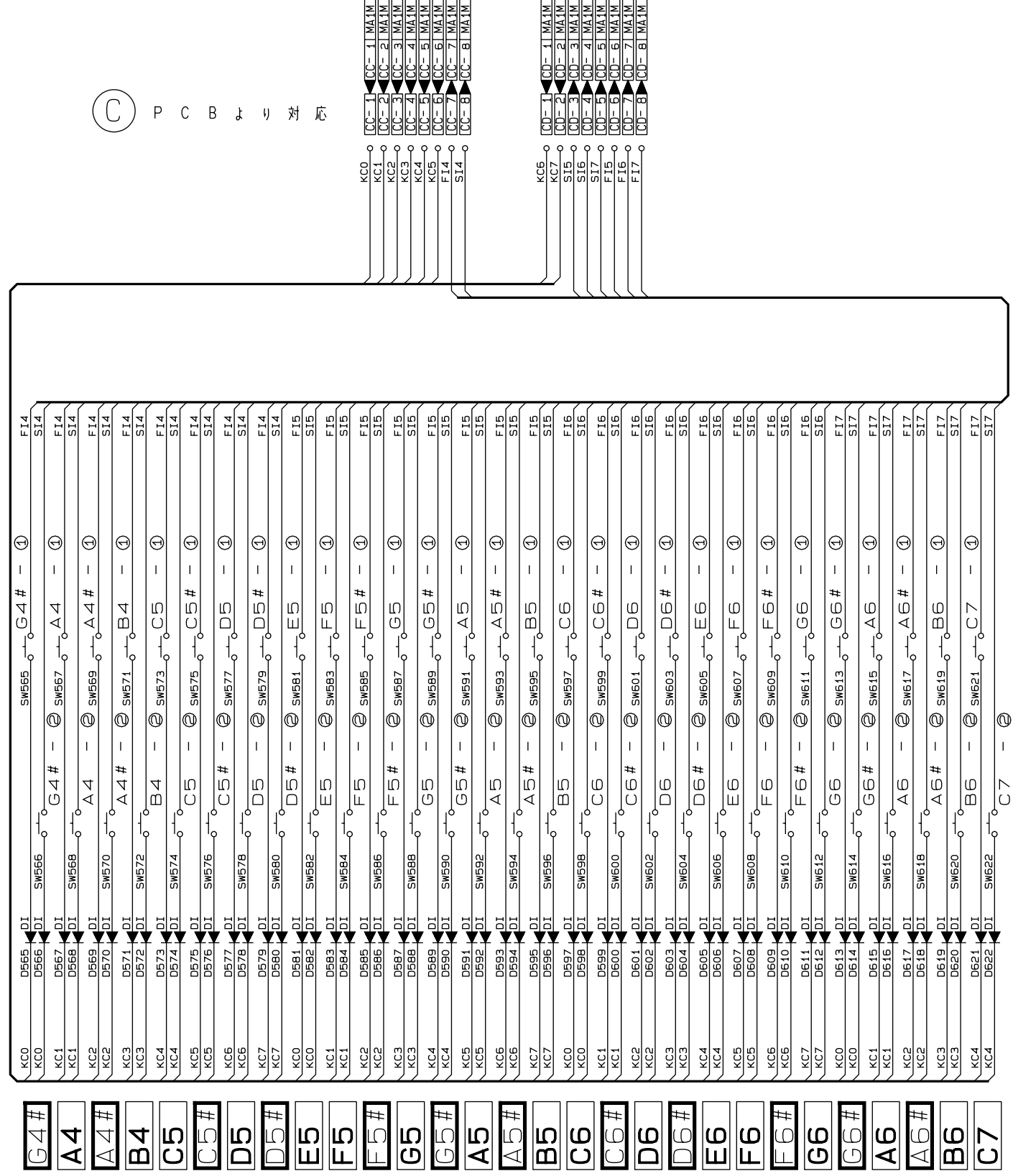
EXPLODED VIEW

PARTS LIST

GZ-500

Notes: 1.   Prices and specifications are subject to change with-
             out 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.

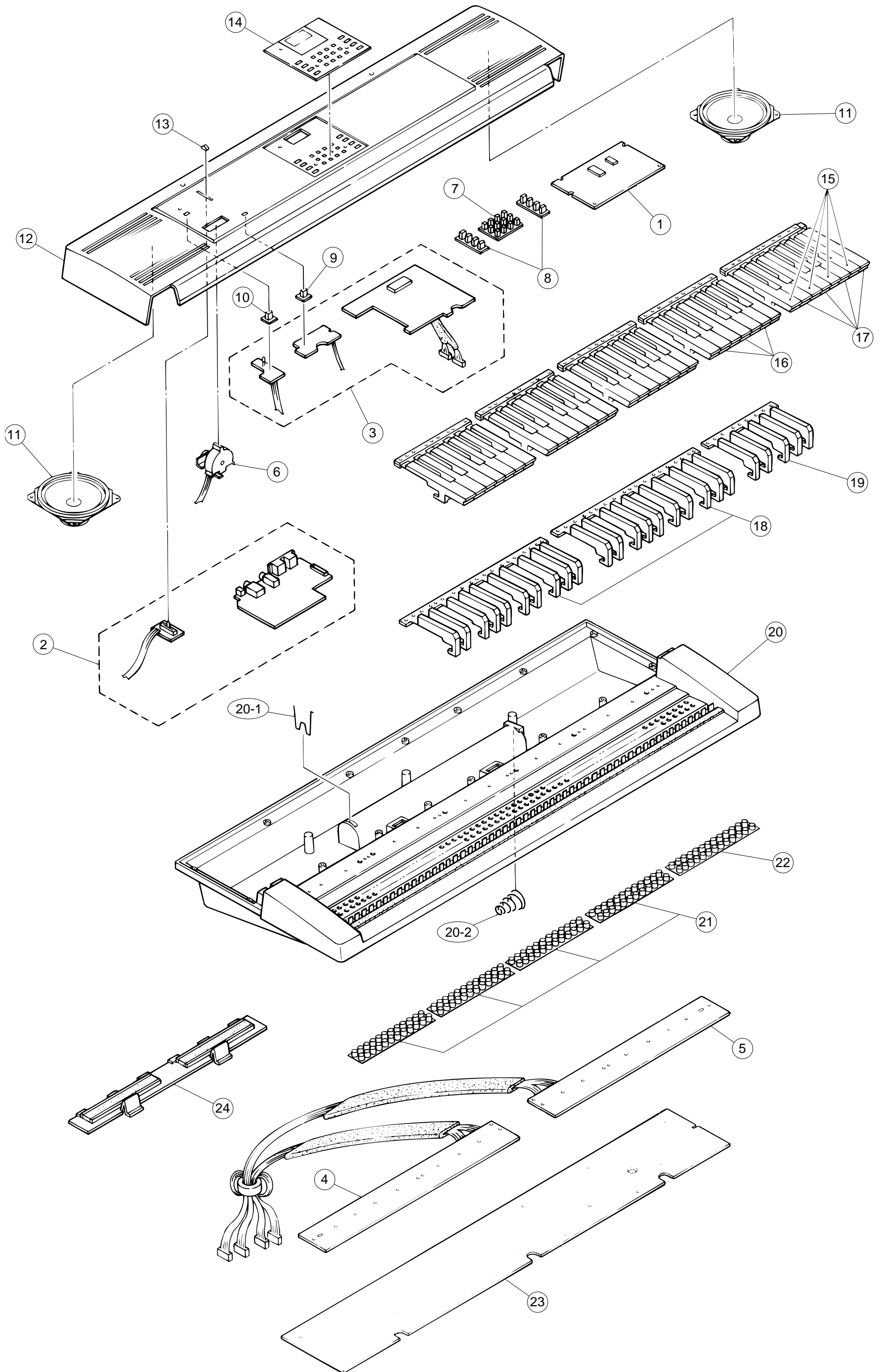| N	Item	Code No.	Parts Name	Specification	Q	FOB Japan N.R.Yen Unit Price	R
			Main PCB				
N	1	6923 6180	PCB ass'y M715-MA1M	M140244*1	1	7,810	A
N	LSI101	2012 1498	LSI	TC5316200CF-C117	1	980	A
N	LSI102	2012 1316	LSI	HG51B155FD-1	1	1,160	A
N	LSI103	2012 0777	LSI	LC33832M-70-TLM	1	410	A
N	LSI104	2114 4221	LSI	UPD6376GS-E1	1	200	A
N	LSI105	2012 0770	LSI	SRM2264LM90-B	1	280	A
N	LSI106	2012 0462	LSI	HD6433298A42F	1	860	A
	LSI107	2011 5194	LSI	HG52E35P	1	600	A
N	IC101	2114 4214	IC	M5218AFP-600C	1	39	B
N	IC102	2105 4452	IC	HD74HC174FPTR	1	51	B
N	IC103	2105 3122	IC	HD74HC00FP-TR	1	35	B
N	IC104	2105 4445	IC	HD74HC08FPTR	1	34	B
N	IC105	2105 4536	IC	RH5VL36AA-T1	1	44	B
N	Q101, Q102	2252 1169	Chip transistor	2SC4081-T106S	2	8	B
N	Q103 ~ Q111	2250 1169	Chip transistor	2SA1576AT106S	9	8	B
N	D101	2390 1729	Chip diode	RB411DT146	1	24	C
N	D102	2390 1820	Chip diode	1SS355TE-17	1	9	C
N	X101	2590 2107	Crystal oscillator	HC-49S24A	1	130	B
N	X102	2590 2100	Ceramic oscillator	CSACS20.00MX040-TC	1	70	B
			Amp./Volume PCBs				
N	2	6923 6190	PCB ass'y M715-MA2,3M	M140245*1	1	2,350	B
	IC401	2105 2114	IC, Regulator	S-81350HG	1	65	A
	IC402	2114 2891	IC	LA4598	1	140	A
	IC403	2114 1421	IC, Photocoupler	PC900V	1	210	B
	Q401, Q404	2220 1387	Transistor	2SC1740SQ-TP-T	2	13	A
	Q402	2253 0581	Transistor	2SD1858R.S-TV6-T	1	24	A
	Q403	2251 0665	Transistor	2SB1240R.S-TV6-T	1	26	A
	Q405	2251 0651	Transistor	2SB1274-CCC	1	47	A
	Q406	2200 4409	Transistor	2SA933-SQ-TP-T	1	14	B
	D401	2360 0098	Zener diode	RD5.1ESB2-T1-T	1	14	A
	D402	2360 2261	Zener diode	RD5.1JSB3-T1-T	1	9	A
	D403, D407~D409	2390 1344	Diode	1SS133T-77-T	4	3	C
	D404	2310 7996	Zener diode	RD4.7ESB2-T1-T	1	12	B
N	D405	2390 2408	Diode	1FWJ43N(TPA3)	1	27	C
	D406	2390 0371	Diode	DSK10B-BT-T	1	11	C
	J101	3501 7049	Power jack	HEC2305-01-330	1	29	A
	J102	3612 0665	Phone jack	YKB21-5006	1	60	B
	J103	3612 0789	Jack	YKB21-5010	1	60	B
	J104	3501 4816	DIN jack	YKF51-5051	1	110	B
	VR101	2765 1575	Slide volume	EWA-MJ0S10B23	1	110	B
			Console PCBs				
N	3	6923 6200	PCB ass'y M715-CN123M	M240232*1	1	1,170	B
	IC371	2114 3318	IC	BA612	1	98	B
	D372~D391	2390 1344	Diode	1SS133T-77-T	21	3	C
N	LED371/372	2370 1197	LED	MVR3378S-B102	2	18	C
	LED373	2370 0959	LED	LN882RPX-(TT)	1	27	C
	LED374	2370 1141	LED	SL-9352-60	1	200	B
	LED375	2370 0987	LED	LN28RPX-(TT14)	1	17	C
			Keyboard PCBs				
N	4	6923 6240	PCB ass'y M616T-KY1M	M111750*3	1	870	B
		2301 0101	Diode	1S2473-T-77-T	64	8	C
N	5	6923 6250	PCB ass'y M616T-KY2M	M111751*3	1	830	B

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

N	Item	Code No.	Parts Name	Specification	Q	FOB Japan N.R.Yen Unit Price	R
		2301 0101	Diode	1S2473-T-77-T	58	8	C
	Bender						
	VR102	2765 1141	Rotary volume	RK1631110-50KB	1	190	B
N	6	6923 6450	Bender knob	M340169-2	1	60	C
	Mechanical Parts						
N	7	6906 7781	Rubber button, Light gray	M312088A-3	1	97	B
N	8	6923 6420	Rubber button, White	M312125-3	2	67	B
N	9	6923 6410	Rubber button, Gray	M312123-3	1	28	B
N	10	6923 6400	Rubber button, Pink	M312122-3	1	28	B
N	11	3831 0357	Speaker	1221AF	2	1,000	B
N	12	6923 6390	Top panel	M140150-1	1	1,340	C
N	13	6923 6430	Slide knob	M311860-2	1	13	B
N	14	6923 6381	Display plate	M340172A-1	1	170	C
	15	6922 2840	White key set, CEGB	M111723-1	5	100	A
	16	6922 2850	White key set, DFA	M111724-1	4	100	A
	17	6922 2860	White key set, DFAS	M111725-1	1	100	A
	18	6922 2740	Black key set,10-key	M111726-1	2	120	A
	19	6922 2750	Black key set, 5-key	M111726-2	1	86	A
N	20	6906 7805	Case	M111732E*3	1	1,340	C
	20-1	6902 6140	Battery spring	M41226-1	1	27	C
	20-2	6903 2150	Battery spring	M41330-1	1	18	C
	21	6922 2761	Key contact rubber LT-CB	M211704A-1	4	89	B
	22	6922 2771	Key contact rubber LT-CS	M211705A-1	1	91	B
	23	6922 2631	Bottom plate	M211706A-1	1	360	C
N	24	6906 7876	Battery cover	M311164F*9	1	180	B
	Accessory						
		6920 8691	Music stand	M311760A-1	1	130	B

Notes: N – New parts
M – Minimum order/supply quantity
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— 24 —

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