MUSIC PLAYER

MT-90U

SERVICE NOTES
Issued by RJA

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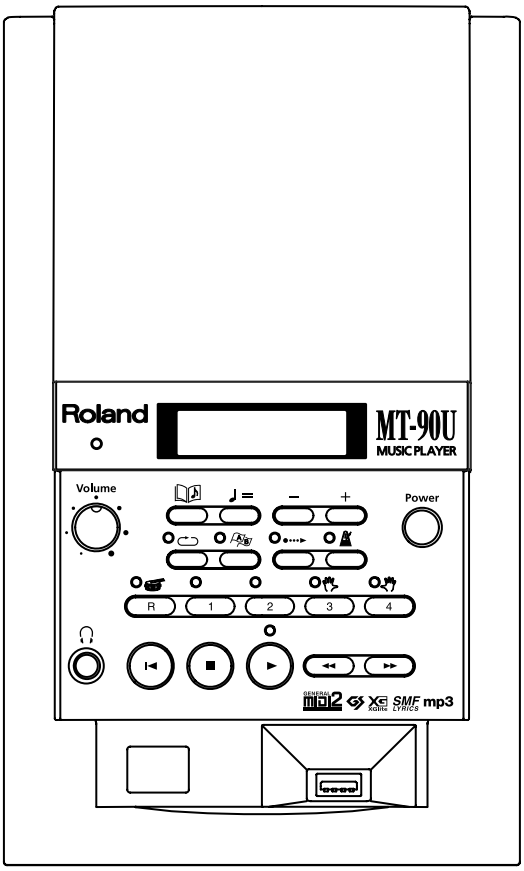


Roland
17058572E0
Printed in Japan (0285) (CC-KWS)

Cautionary Notes

Before beginning the procedure, please read through this document. The matters described may differ according to the model.

Back Up User Data!

Executing a Factory Reset returns the following settings to their factory defaults. These cannot be backed up. Note them down on paper as required.

- Tuning settings (Owner's Manual p. 17)
- Metronome tone (Owner's Manual p. 47)
- Count sound settings (Owner's Manual p. 48)
- Lyrics-display language setting (Owner's Manual p. 49)
- Track Assign settings (Owner's Manual p. 50)
- Setting the Type and Timing of CD to be Played Back (Owner's Manual p.51)
- USB memory settings (Owner's Manual p. 52)
- USB driver settings (Owner's Manual p. 52)

Part Replacement

When replacing components near the power-supply circuit or a heat-generating circuit (such as a circuit provided with a heat sink or including a cement resistor), carry out the procedure according to the instructions with respect to the part number, direction, and attachment position (mounting so as to leave an air gap between the component and the circuit board, etc.).

Parts List

A component whose part code is ******* cannot be supplied as a service part because one of the following reasons applies.

- Because it is supplied as an assembled part (under a different part code).
- Because a number of circuit boards are grouped together and supplied as a single circuit board (under a different part code).
- Because supply is prohibited due to copyright restrictions.
- Because reissuance is restricted.
- Because the part is made to order (at current market price).

Circuit Diagram

In the circuit diagram, "NIU" is an abbreviation for "Not in Use," and "UnPop" is an abbreviation for "Unpopulated." They both mean non-mounted components. The circuit board and circuit board diagram show silk-screened indications, but no components are mounted.

In the Main Board Circuit Diagram (p. 24), red parts on the PDF and gray parts on paper media service notes mean non-mounted components. The circuit board and circuit diagram show silk-screened indications, but no components are mounted.

Main Specifications

MT-90U: Music Player

Playback Composer

External Memory

- USB Memory (sold separately)
- Floppy Disk

* *Read only*

* *USB 3.5 in. floppy disk drive (FD-01 series) required (sold separately)*

- CD-ROM
- Audio CD

* *Read only*

* *Commercial USB CD drive required*

Supported Data

- Standard MIDI Files (format 0/1)
- Roland Original Format
- Audio files (WAV; 44.1 kHz, 16 bit linear format)
- MP3 files (44.1 kHz, 32 to 320 kbps)
- Audio CD

* *Commercial USB CD drive required*

Tracks

16 tracks

Control

Reset, Stop, Play, Bwd, Fwd, Repeat, Marker, Song, Tempo, [+], [-], Track Selection, Count In, Metronome (MIDI only), Center Cancel (audio only)

Tempo

Quarter note = 10 to 500 (MIDI only)
75 to 125% (audio only)

Resolution

120 ticks per quarter note (MIDI only)

Transpose

-6 to +5 (semitones)

Demo Songs

14 songs

Sound Generator

Max. Polyphony

128 voices (MIDI only)

Tones

348 tones (including 8 drum sets, 1 effects set)

Internal Sounds

Conforms to GM2 system/GS format/XGlite supported

Master Tuning

415.3 Hz to 466.2 Hz (0.1 Hz units)

Effects

Reverb (MIDI only)
Chorus (MIDI only)
Sound Control: Sharp, Clear, Power

Sequencer

Metronome

Time Signatures:	2/2, 0/4, 2/4, 3/4, 4/4, 5/4, 6/4, 7/4, 3/8, 6/8, 9/8, 12/8
Volume:	11 levels
Pattern:	11 patterns

Other Functions

- Infrared Transmission
- Mic Echo
- Song List
- Floppy Disk Backup

Others

Display

Beat Indicator
122 x 32 dot, Graphic LCD (with backlight)

Language

Japanese (song title, lyrics), English

Lyric Display

Yes (LCD display)

Controls

- Volume
- Mic volume
- Mic echo
- Speaker switch

Rated Power Output

5 W

Speakers

10 cm x 1

Connectors

External memory connector:	USB type A
USB connector:	USB type B
Output jack (R/L):	RCA pin type
Microphone jack (Mono):	Standard type
Headphones jack:	Stereo, mini type

MIDI In connector
Start/Stop jack

Power Supply

DC9V

Current Draw

2000 mA

Dimensions

165 (W) x 186 (D) x 270 (H) mm
6-1/2 (W) x 7-3/8 (D) x 10-11/16 (H) inches

Weight

2.5 Kg / 5 lbs 9 oz

Accessories

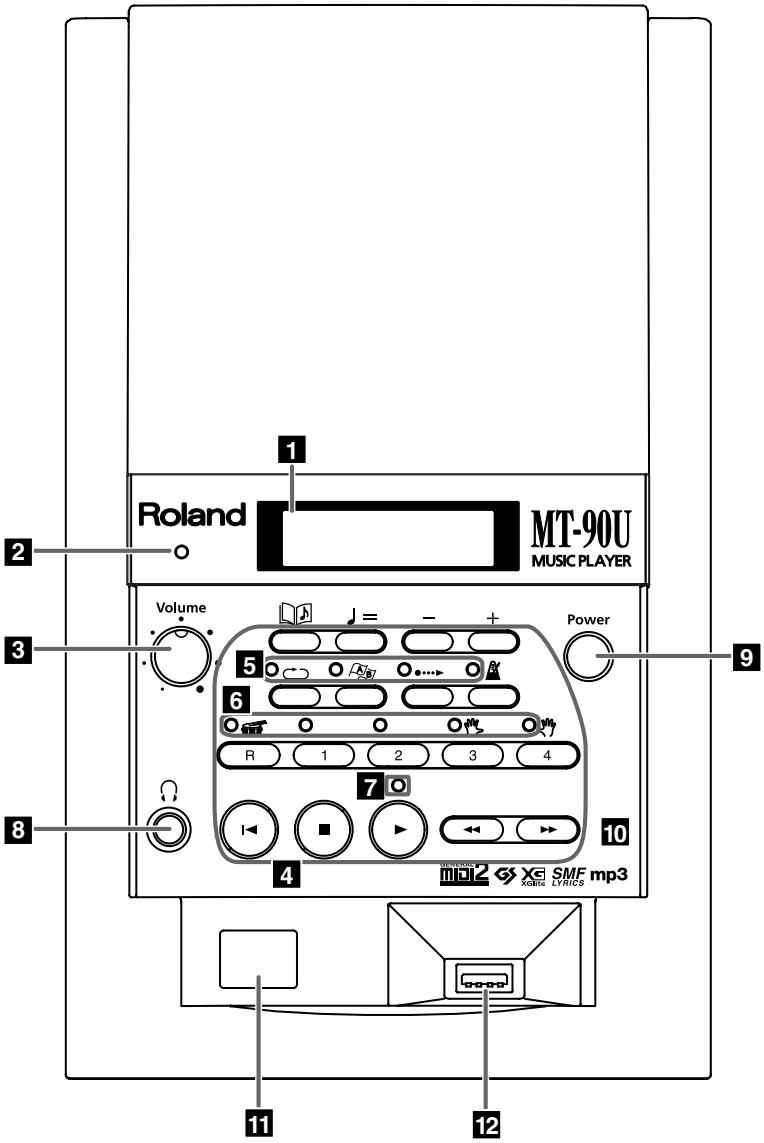
AC Adaptor (#04236101)
Power Code for 120 V (#02562456)
for 220 V CN (#5100000564)
for 230 V E (#5100000115)
for 230 V EU (#01903356)
for 240 V A (#03785590)
Remote Control (#04898434)
Lithium Battery (CR2025) (#********)
Owner's Manual English (#04787745)

Options

USB Memory (M-UF1GB)
Floppy Disk Drive (FD-01 series)
Roland Microphone (DR-10/20)
Pedal Switch (DP-2)

* *In the interest of product improvement, the specifications and/or appearance of this unit are subject to change without prior notice.*

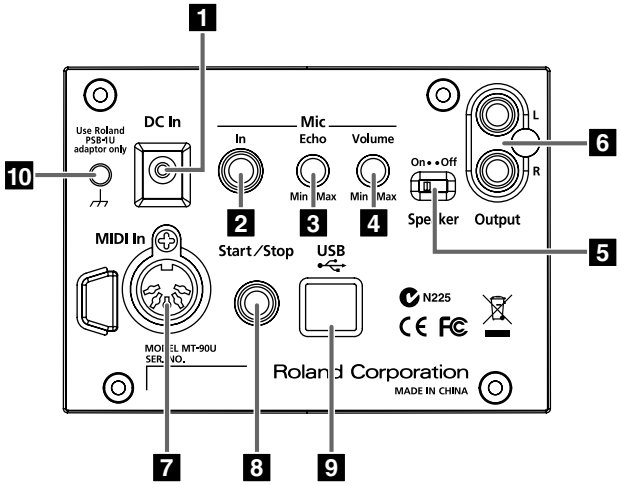
Location of Controls (Front Panel)



Location of Controls (Front Panel) Parts List

No.	Part Code	Part Name	Description	Q'ty
1	04787512	DISPLAY COVER		1
	04780545	LCD	221-3065-0784	1
2	04892901	RADIAL LED (2COLOR RED/GREEN)	L-3749ESGC	1
3	04787623	R-KNOB MF		1
	05017756	14MM ROTARY VOLUME (STEREO)	F14KH-1 B10K L15 FCX7	1
4	04787612	RUBBER SWITCH		1
5	04787567	LED LENS 4P		1
6	04787590	LED LENS 5P		1
	04780456	LED (RED)	L-314ED	4
7	04787589	LED LENS 1P		1
	02015623	LED (GREEN)	SLR-342MG3F	6
8	02341689	3.5MM JACK	HTJ-035-28	1
9	04787490	BUTTON		1
	05017823	POWER SWITCH	PWL-2P1TL-6SASTC-001	1
10	04787645	FRONT PANEL		1
11	04787556	IRDA COVER		1
	04673667	INFRARED TRANSCEIVER MODULE	TFDU4101-TT3	1
	03342178	IC	GP1UM261RK0F	1
12	04560101	USB CONNECTOR A TYPE FEMALE	UAR27-4K5J00	1

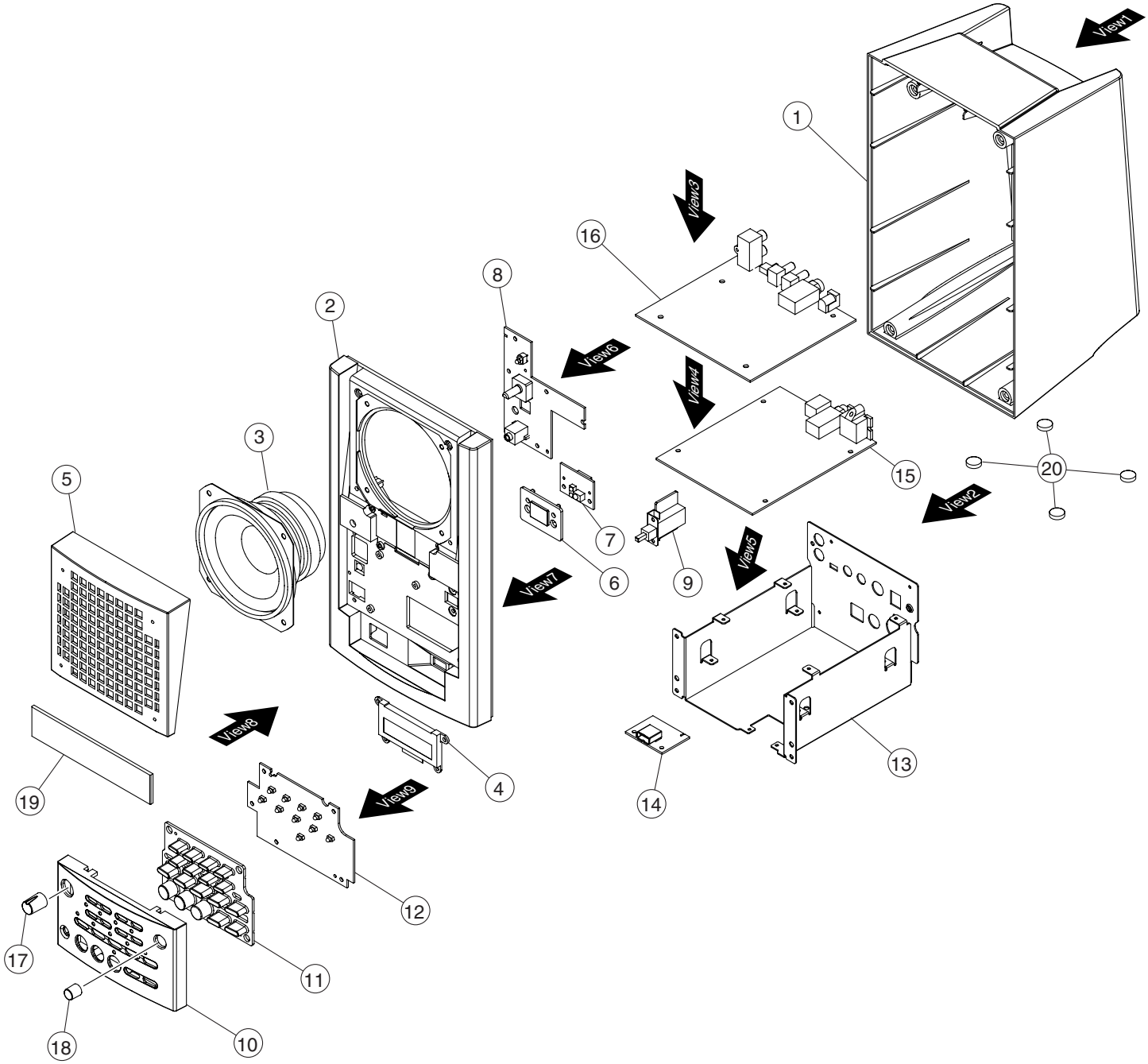
Location of Controls (Rear Panel)



Location of Controls (Rear Panel) Parts List

No.	Part Code	Part Name	Description	Q'ty
1	02341634	DC JACK HTJ-020-05A	(610-00100-04-00)	1
2, 8	00569278	6.5MM JACK	LGR4609-7100F	2
3, 4	04890223	9MM VOLUME	VX09211NPP20U1B20K	2
5	04890689	SLIDE SWITCH	SKA-22D01N-G6-NA	1
6	05014890	PIN JACK 2L2P WR NI	HSP-242V1P-01	1
7	03909767	DIN CONNECTOR	HDC-052A-11	1
9	01459945	USB CONNECTOR	YKF45-0002	1
10	40454856	SCREW M4X10	BINDING NI	1

Exploded View (All)

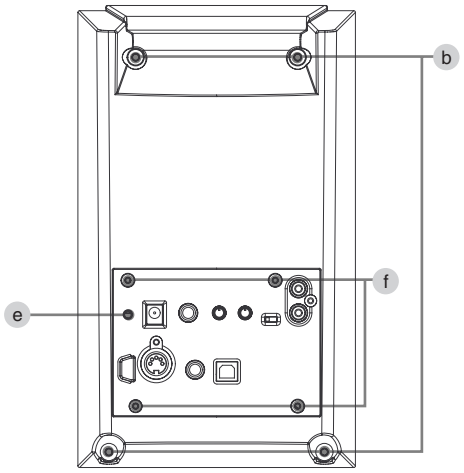


Exploded View (All) Parts List

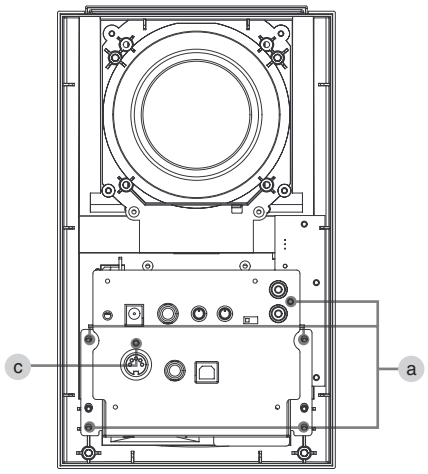
No.	Part Code	Part Name	Description	Q'ty
1	04787601	REAR CASE		1
2	04787534	FRONT CASE		1
3	02342712	SPEAKER FULL-RANGE		1
4	04780545	LCD	221-3065-0784	1
5	04787634	SP GRILLE + NET		1
6	04787556	IRDA COVER		1
7	04898312	IR BOARD ASSY		1
8	04898334	VOLUME BOARD ASSY		1
9	04898367	SW BOARD ASSY		1
10	05122112	FRONT PANEL WITH LED LENS		1
11	04787612	RUBBER SWITCH		1
12	04898378	PANEL BOARD ASSY		1
13	04787501	CHASSIS		1
14	04898301	USB BOARD ASSY		1
15	04785823	MAIN BOARD ASSY		1
16	04898290	JACK BOARD ASSY		1
17	04787623	R-KNOB MF		1
18	04787490	BUTTON		1
19	04787512	DISPLAY COVER		1
20	01235378	FOOT		4

Exploded View (1)

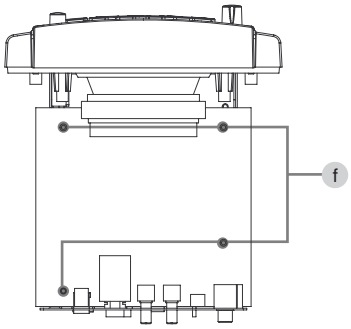
View1



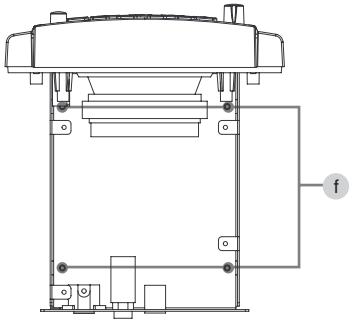
View2



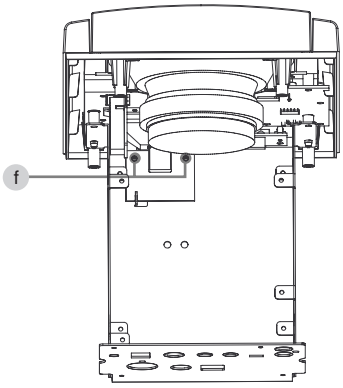
View3



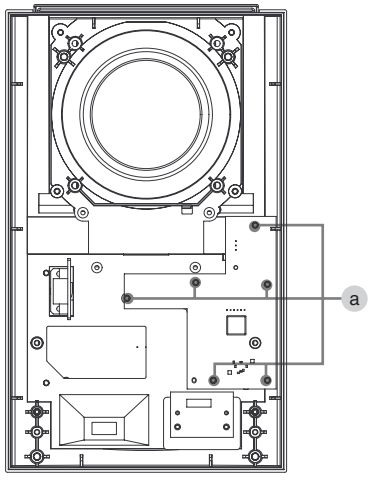
View4



View5



View6



Exploded View (1) Parts List

View 1, 2

No.	Part Code	Part Name	Description	Q'ty
a	40011312	SCREW 3X8	BINDING TAPTITE P BZC	5
b	40012490	SCREW 4X10	BINDING TAPTITE P BZC	4
c	40011334	SCREW 3X12	BINDING TAPTITE-P FE BZC	1
e	40454856	SCREW M4X10	BINDING NI	1
f	03904456	SCREW 3X6	B-TITE BIND BZC	4

View 3, 4

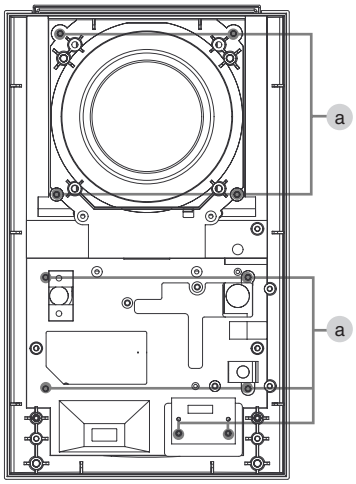
No.	Part Code	Part Name	Description	Q'ty
f	03904456	SCREW 3X6	B-TITE BIND BZC	8

View 5, 6

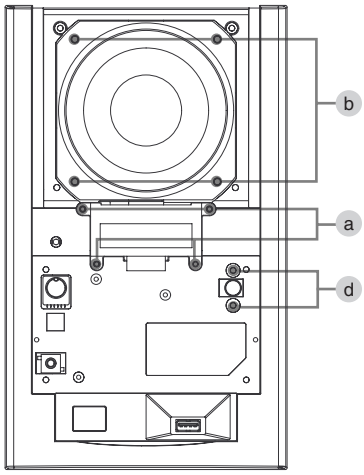
No.	Part Code	Part Name	Description	Q'ty
a	40011312	SCREW 3X8	BINDING TAPTITE P BZC	6
f	03904456	SCREW 3X6	B-TITE BIND BZC	2

Exploded View (2)

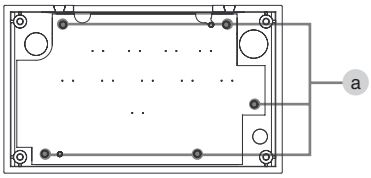
View7



View8



View9



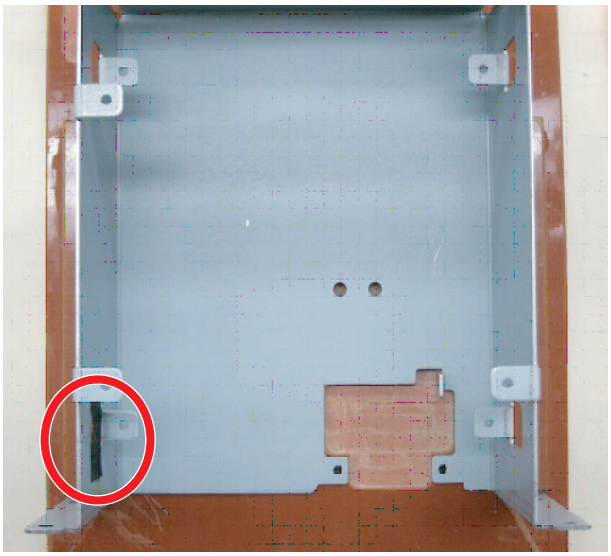
Exploded View (2) Parts List

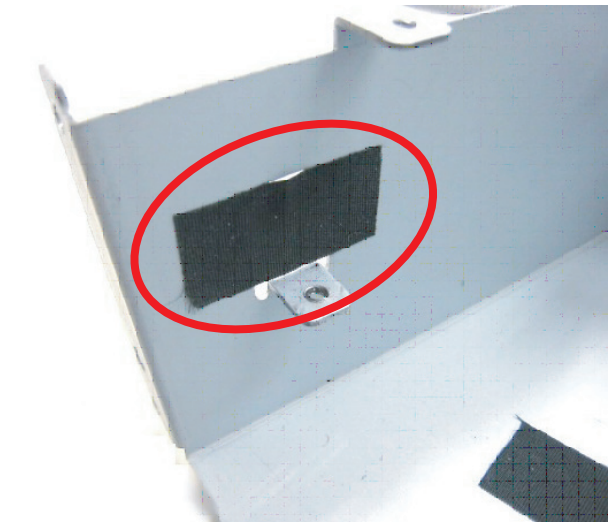
View 7, 8, 9

No.	Part Code	Part Name	Description	Q'ty
a	40011312	SCREW 3X8	BINDING TAPTITE P BZC	19
b	40012490	SCREW 4X10	BINDING TAPTITE P BZC	4
d	40012867	SCREW M3X8	PAN MACHINE W/SW+PW ZC	2

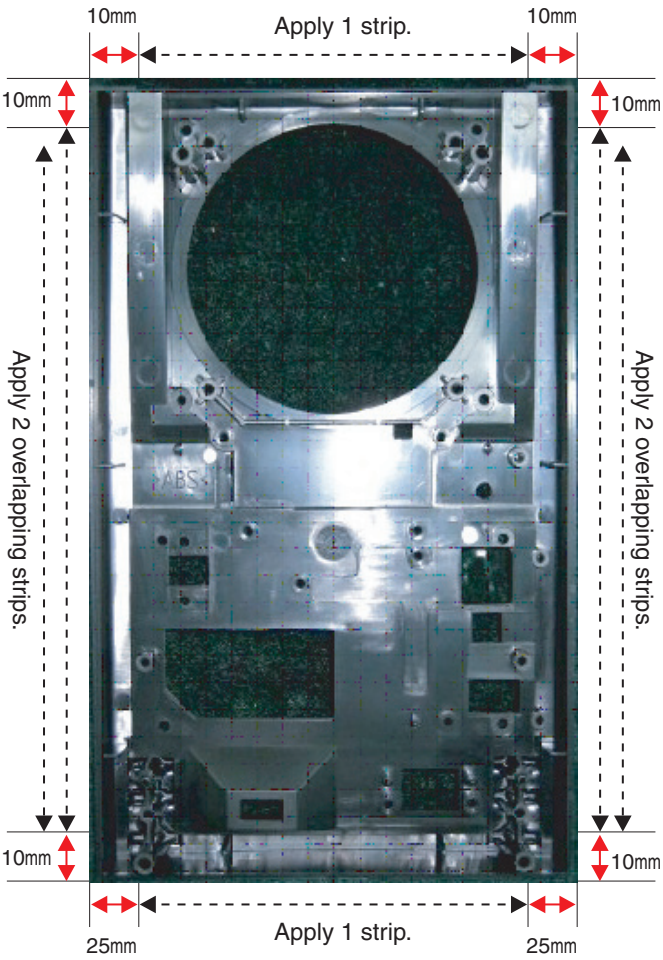
Important Notes on Assembly

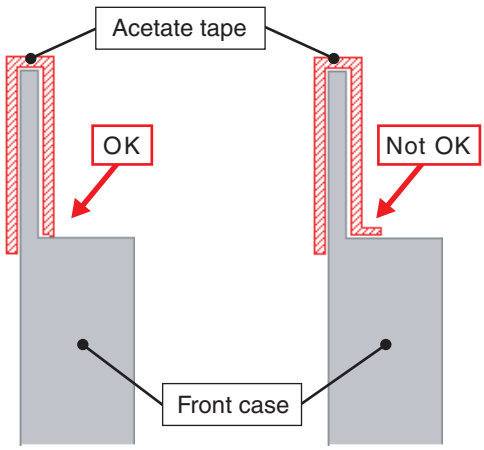
To prevent damage to the wiring, cover edges using acetate tape.



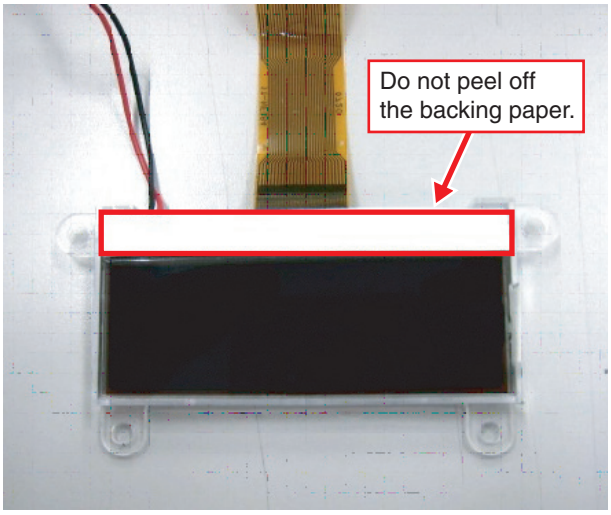


To prevent screeching (unpleasant noise caused by vibration), apply acetate tape having a width of 10 mm to the front case.

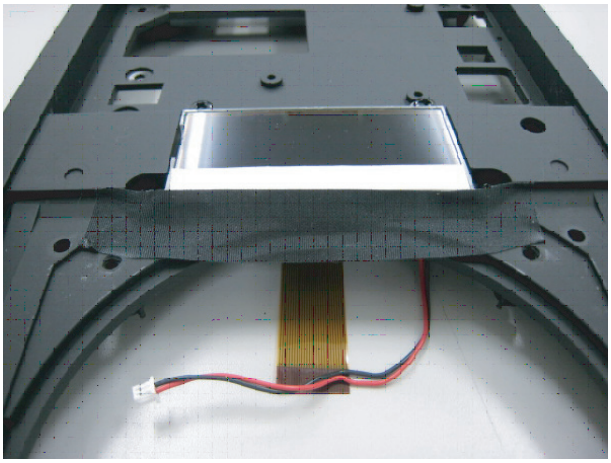


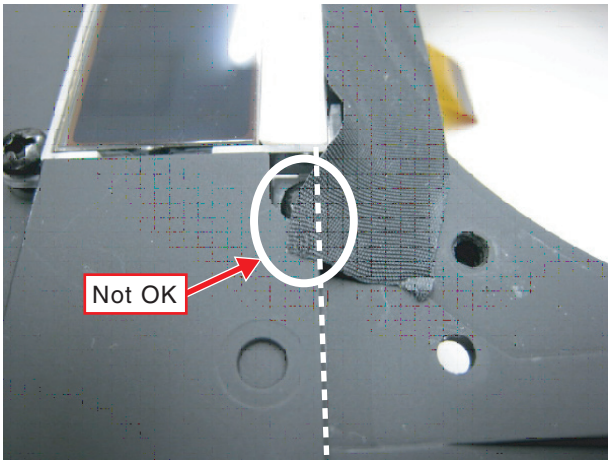


To prevent dust entry, apply cushion tape to the LCD unit. Do not peel off the backing paper.

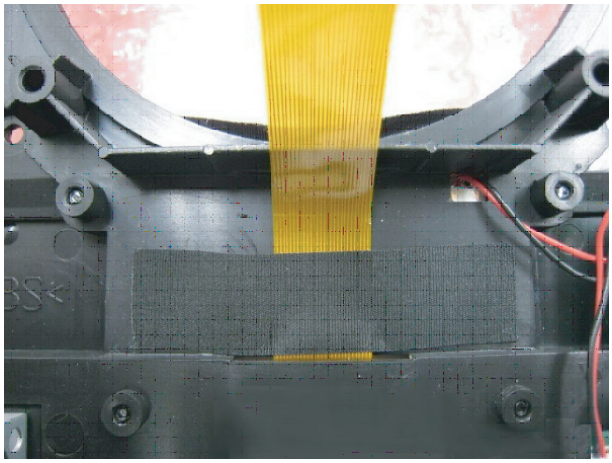


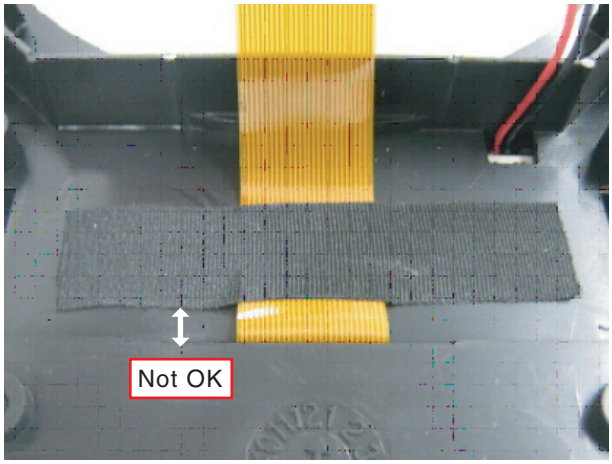
To prevent light leakage by the LCD backlight from the speaker grille, apply acetate tape having a width of 12 mm.



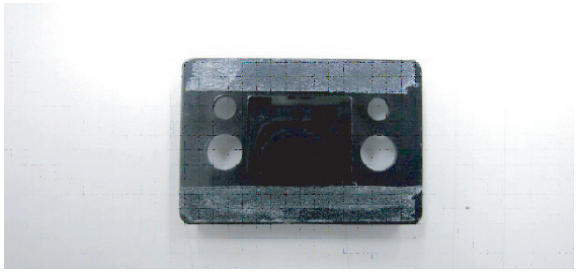


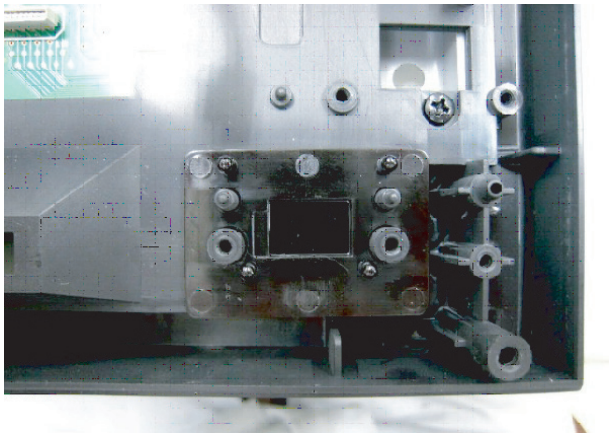
Secure the LCD wiring in place on the back of the front case using acetate tape.



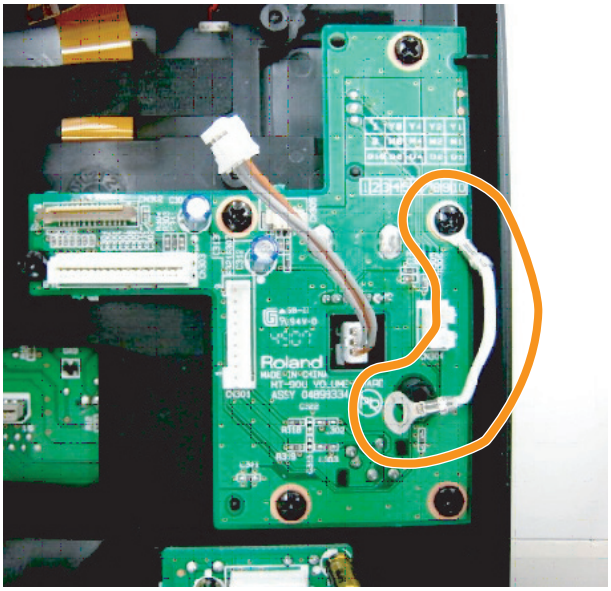


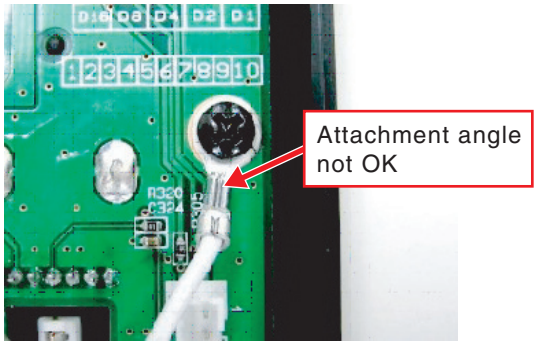
Secure the IrDA cover in place using double-sided adhesive tape having a width of 5 mm.



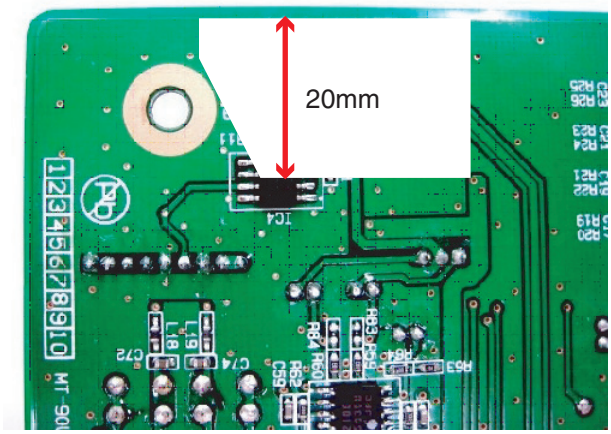


As a measure to prevent electromagnetic interference (EMI), attach Wiring J-2 to the Volume Board. Be careful to attach at the correct angle.

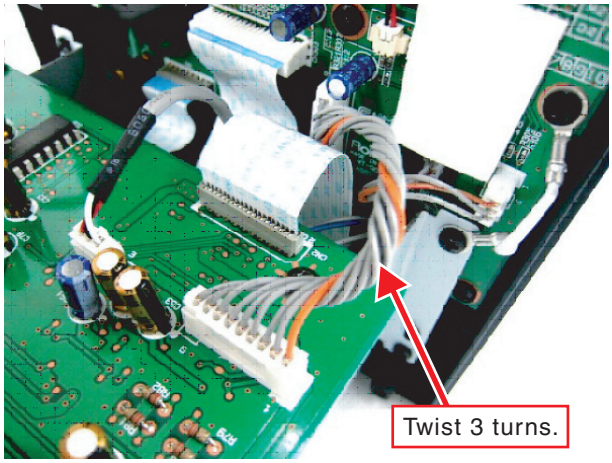




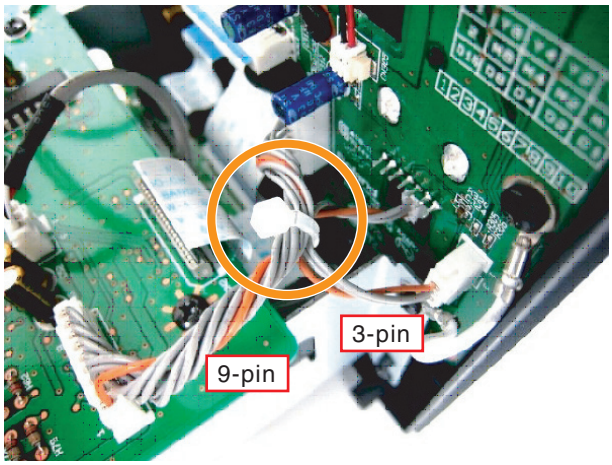
Apply cushion tape for protecting the wiring to the Jack Board. Take care not to cover the screw hole.



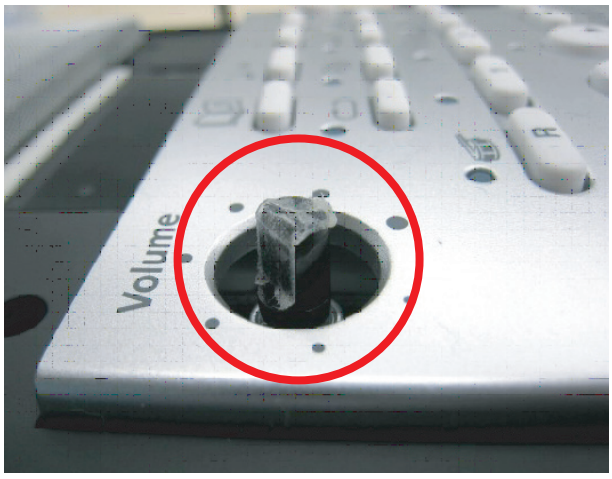
Twist the 9-pin wiring connecting the Jack Board and Volume Board 3 turns.

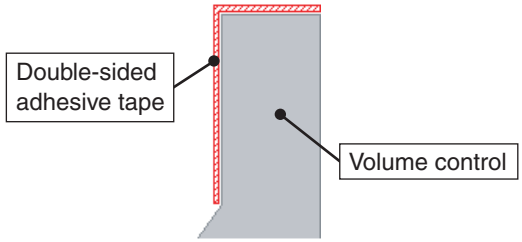


Also secure the 9-pin wiring and 3-pin wiring using a sub-tie.

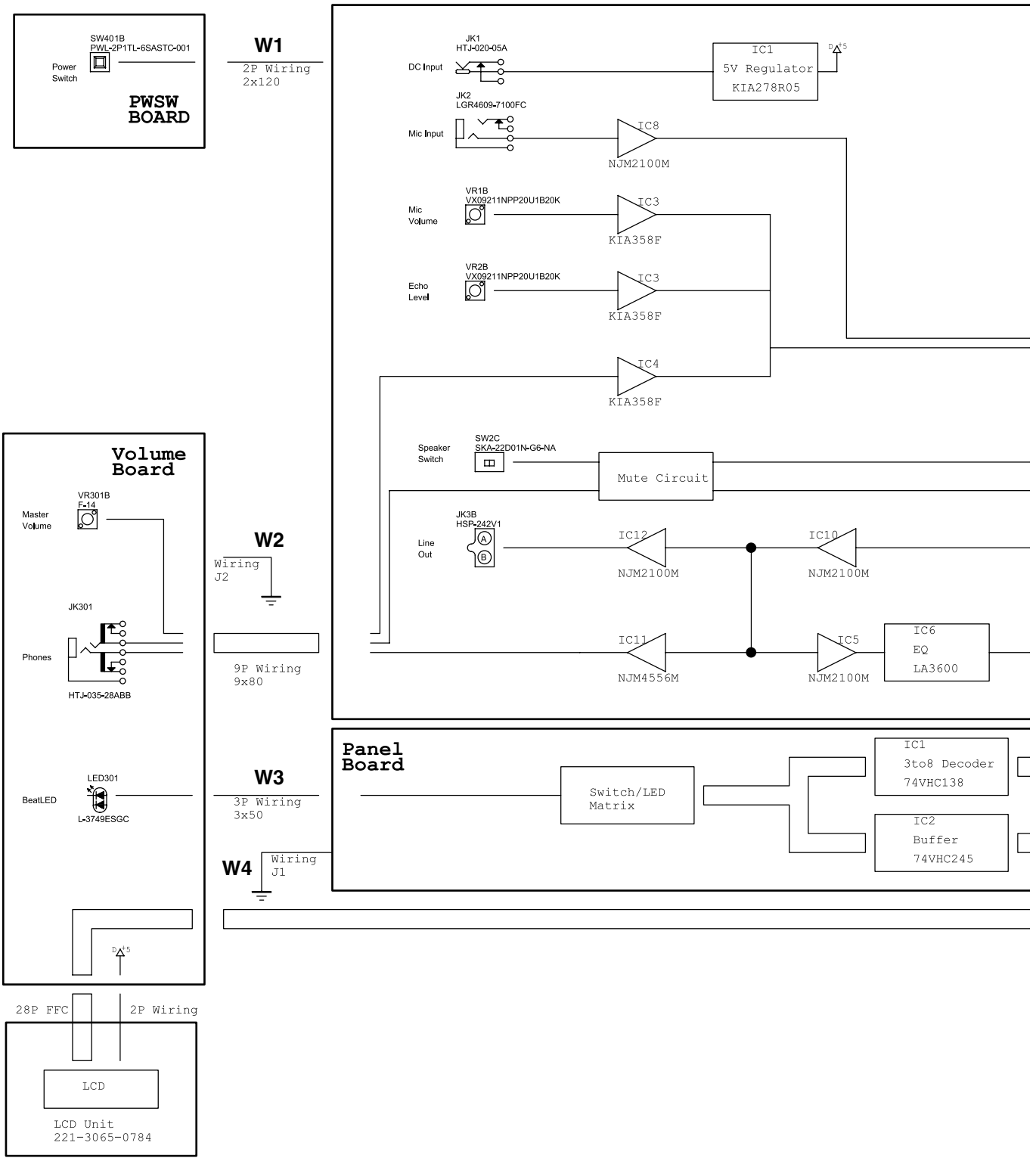


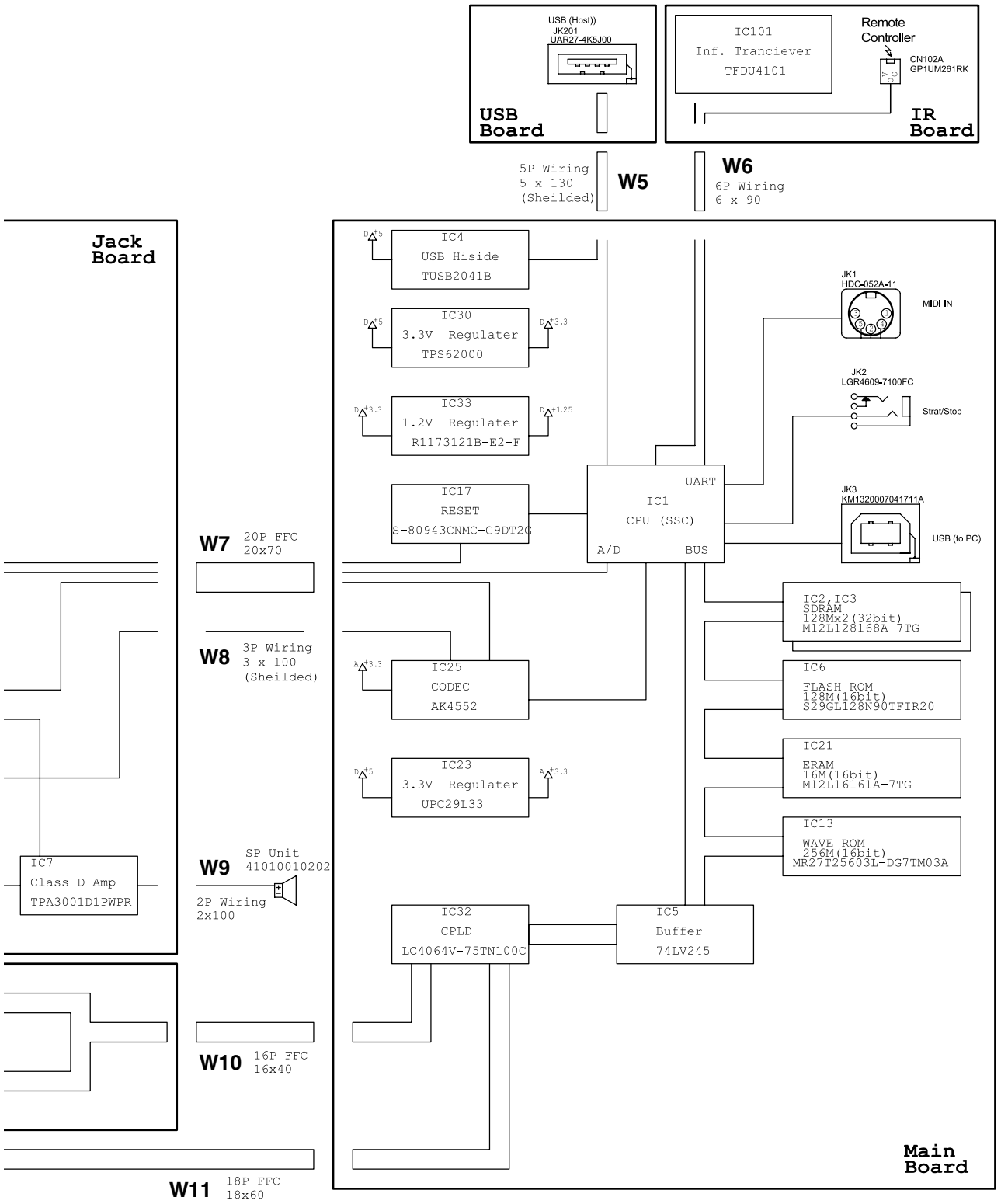
To keep the volume control from coming loose, apply double-sided adhesive tape having a width of 5 mm to the volume shaft.





Block Diagram/Wiring Diagram





No.	Part Code	Part Name	Description	Q'ty
W1	04894167	WIRING	SW 2P L=120 UL1061 AWG22 VHR	1
W2	05012456	WIRING J-2		1
W3	04894145	WIRING	3P L=50 UL1061 AWG26 PHR-PHR	1
W4	05012067	WIRING J-1		1
W5	04894156	WIRING USB	5P L=130 UL20276 PHR-PHR	1
W6	04894134	WIRING	6P L=90 UL1061 AWG26 PHR-PHR	1
W7	04894201	WIRING FFC	20624FWRP1.00K1(0.05 x 0.7)20	1
W8	05011167	WIRING SHIELD	3P L=100 UL2791 AWG28 PHR-PHR	1
W9	04894178	WIRING SP	2P L=100 UL1061 AWG20 XHP	1
W10	04894189	WIRING FFC	20624FWRP1.00K1(0.05 x 0.7)16	1
W11	04894190	WIRING FFC	20624FWRP1.25K1(0.05 x 0.8)18	1

Parts List

SAFETY PRECAUTIONS:
The parts marked ⚠ have safety-related characteristics. Use only listed parts for replacement.

Due to one or more of the following reasons, parts with parts code ******** cannot be supplied as service parts.

- Part supplied only as a component in a complete assembly
- Copyright does not permit the part to be supplied
- Part is sold commercially

NOTE: The parts marked # are new. (initial parts) The description "Q'TY" means a necessary number of the parts per one product.

CASING

#	04787501	CHASSIS			1
#	04787512	DISPLAY COVER			1
#	04787534	FRONT CASE			1
#	04787556	IRDA COVER			1
#	04787601	REAR CASE			1
#	04787634	SP GRILLE + NET			1
#	04787645	FRONT PANEL			1
#	05122112	FRONT PANEL WITH LED LENS			1

KNOB, BUTTON

#	04787490	BUTTON			1
#	04787623	R-KNOB MF			1

SWITCH

#	04787612	RUBBER SWITCH			1
#	04890689	SLIDE SWITCH	SKA-22D01N-G6-NA	SW2 on Jack Board	1
#	05017823	POWER SWITCH	PWL-2P1TL-6SASTC-001	SW401 on Power SW Board	1

JACK, EXT TERMINAL

	00569278	6.5MM JACK	LGR4609-7100F	JK2 on Jack Board, JK4 on Main Board	2
	01459945	USB CONNECTOR	YKF45-0002	JK2 on Main Board	1
	02341634	DC JACK HTJ-020-05A	(610-00100-04-00)	JK1 on Jack Board	1
	02341689	3.5MM JACK	HTJ-035-28	JK301 on Volume Board	1
	03909767	DIN CONNECTOR	HDC-052A-11	JK3 on Main Board	1
#	05014890	PIN JACK 2L2P WR NI	HSP-242V1P-01	JK3 on Jack Board	1
	04560101	USB CONNECTOR A TYPE FEMALE	UAR27-4K5J00	JK201 on USB Board	1

DISPLAY UNIT

	04780545	LCD	221-3065-0784		1

SPEAKER, BUZZER

	02342712	SPEAKER FULL-RANGE			1

PWB ASSY

#	04785823	MAIN BOARD ASSY			1
#	04898290	JACK BOARD ASSY			1
#	04898301	USB BOARD ASSY			1
#	04898312	IR BOARD ASSY			1
#	04898334	VOLUME BOARD ASSY			1
#	04898367	SW BOARD ASSY			1
#	04898378	PANEL BOARD ASSY			1

IC

	03342178	IC	GP1UM261RK0F	CN102 on IR Board	1
#	04673667	INFRARED TRANSCEIVER MODULE	TFDU4101-TT3	IC101 on IR Board	1

DIODE

	02015623	LED (GREEN)	SLR-342MG3F	LED5, LED6, LED7, LED8, LED9, LED10 on Panel Board	6
	04780456	LED (RED)	L-314ED	LED, LED2, LED3, LED4 on Panel Board	4
#	04787567	LED LENS 4P			1
#	04787589	LED LENS 1P			1
#	04787590	LED LENS 5P			1
#	04892901	RADIAL LED (2COLOR RED/GREEN)	L-3749ESGC	LED301 on Volume Board	1

POTENTIOMETER

#	04890223	9MM VOLUME	VX09211NPP20U1B20K	VR1, VR2 on Jack Board	2
#	05017756	14MM ROTARY VOLUME (STEREO)	F14KH-1 B10K L15 FCX7	VR301 on Volume Board	1

WIRING, CABLE

#	04894134	WIRING	6P L=90 UL1061 AWG26 PHR-PHR		1
#	04894145	WIRING	3P L=50 UL1061 AWG26 PHR-PHR		1
#	04894156	WIRING USB	5P L=130 UL20276 PHR-PHR		1
#	04894167	WIRING	SW 2P L=120 UL1061 AWG22 VHR		1
#	04894178	WIRING SP	2P L=100 UL1061 AWG20 XHP		1
#	04894189	WIRING FFC	20624FWRP1.00K1(0.05 x 0.7)16		1
#	04894190	WIRING FFC	20624FWRP1.25K1(0.05 x 0.8)18		1
#	04894201	WIRING FFC	20624FWRP1.00K1(0.05 x 0.7)20		1
#	05011167	WIRING SHIELD	3P L=100 UL2791 AWG28 PHR-PHR		1
#	05012067	WIRING J-1			1
#	05012456	WIRING J-2			1

SCREWS

	03904456	SCREW 3X6	B-TITE BIND BZC		14
	40011312	SCREW 3X8	BINDING TAPTITE P BZC		30
	40011334	SCREW 3X12	BINDING TAPTITE-P FE BZC		1
	40012490	SCREW 4X10	BINDING TAPTITE P BZC		8
	40012867	SCREW M3X8	PAN MACHINE W/SW+PW ZC		2
	40012878	SCREW M3X10	PAN MACHINE W/SW+PW ZC		1
	40454856	SCREW M4X10	BINDING NI		1

MISCELLANEOUS

	01235378	FOOT			4
#	5100000542	LABEL	ADHES NAMEPLATE CCC	for China	1

ACCESSORIES (Standard)

#	04898434	REMOTE CONTROL UNIT			1
⚠	04236101	AC ADAPTOR WITHOUT AC CORD	PSB-1U(S) UNIVERSAL		1
⚠	01903334	AC CORD SET PSE	100V 1.0M FOR PSB-1U	for 100V	1
⚠	02562456	AC CORD SET	120V 1.0M (NON POLAR)	for 117V	1
⚠	5100000564	AC CORD (CCC) 220V CN		for 220VCN	1
⚠	01903356	AC CORD SET	230V 1.0M FOR PSB	for 230VEU	1
⚠	5100000115	AC CORD SET 230VE 1.0M FOR PS		for 230VE	1
⚠	03785590	AC CORD SET	SC-078-NA05 240VA	for 240VA	1
#	04787734	NIHONGO PANEL SHEET		for Japan Only	1
#	04787745	OWNER'S MANUAL	ENGLISH		1
#	04787801	OWNER'S MANUAL	JAPANESE		1
	40232334	WARRANTY CARD	MOCHIKOMI JAPAN ONLY		1

Verifying the Version Number

1. Hold down the [1] button and the [|◀] button and switch on the power.
   The version number appears on the screen.
2. After carrying out verification, switch off the power.

Performing a Factory Reset

Executing a Factory Reset returns the following settings to their factory defaults. These cannot be backed up. Note them down on paper as required.

- Tuning settings (Owner's Manual p. 17)
- Metronome tone (Owner's Manual p. 47)
- Count sound settings (Owner's Manual p. 48)
- Lyrics-display language setting (Owner's Manual p. 49)
- Track Assign settings (Owner's Manual p. 51)
- USB memory settings (Owner's Manual p. 52)
- USB driver settings (Owner's Manual p. 52)

1. Hold down [🕮] and press [4].
   The Function screen appears.
2. Press [◀◀] or [▶▶] to display a screen like the one shown below.

   To cancel the factory reset, press [🕮].
3. Press [+].
   The screen shown below appears and the [▶] light flashes.

   To cancel the Factory Reset, press [■].
4. Pressing [▶] executes the Factory Reset.
5. Turn the power off, then back on.

Updating the System

1. Unarchive the update file, then copy all files and folders to the root folder on a USB memory device.
2. Load the USB memory device in the MT-90U.
3. Hold down the [|◀] and [▶] buttons and switch on the power.
   The update starts automatically.
   * *Never switch off the power while the update is in progress.*

   When the message **Complete** appears, the update has finished.
4. Switch off the power and detach the USB memory device.
5. Execute a Factory Reset.

Test Mode

Items Required

- MT-90U
- AC Adapter: PSB-1U and power cord (included)
- Remote Controller for the MT-90U (included)
- Headphones
- MIDI Keyboard
- Microphone
- Monitor Speaker (with amp)
- Noise Meter
- Pedal Switch
- USB Memory Device (128 MB or larger, containing an MP3 file)

Entering the Test Mode

Hold down the [R] and [|◀] buttons and switch on the power.

Quitting the Test Mode

Switch off the power.

Selecting Test Items

1. Hold down the [■] button and press the [▶] button.
   The Test menu appears.
2. Use [▶▶] and [◀◀] to choose the test item you want to execute.
3. Press [▶].

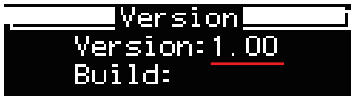
Test Items

Test Items Outside the Test Mode

1. Version

Verify the version of the system.

1. Hold down the [R] and [|◀] buttons and switch on the power.
   The Test mode is enabled.
2. Verify that [SYS] has been selected and press the [▶] button.



3. Verify that the unit is at the latest version.
4. Press the [▶] button to advance to the next item.

2. Device Test

This automatically checks the operation of the Wave ROM.

When **OK** is displayed, press the [▶] button to advance to the next item.

3. USB Test

This performs a USB connection check.

1. Using a USB cable, connect the **USB** connector on the front panel to the USB connector on the rear panel.
2. Verify that the message displayed on the LCD screen changes from **Disconnected** to **Connected**.

If no problem is found, execution automatically advances to the next item.

4. IrDA Test

This performs testing of infrared communication.

* *Outside Japan, this test is not required. Press the [▶] button to advance to the next item.*

5. Switch Test

This tests switch operation.

1. Press the [📖], [♩=], [-], and [+] buttons on the front panel in sequence, one at a time, and verify that each button name is displayed on the LCD screen.
2. Connect the pedal switch to the **Start/Stop** jack on the rear panel.
3. Depress the pedal and verify that the message **Pedal** is displayed on the LCD screen.

4. Aim the remote-control unit at the infrared port on the front panel.
5. Press the [REPEAT] button on the remote control and verify that the message **RemoteRepeat** is displayed on the LCD screen.

When verification for all switches has finished, execution automatically advances to the next item.

6. Red LED Test

This tests illumination of the red LEDs.

1. Press the [⟲], [A/B], [•••▸], and [🎸] buttons in sequence, one at a time.
2. Verify that the corresponding LED for each lights up.
3. Press the [▶▶] button.
4. Verify that the Beat LED (to the left of the LCD screen) lights up.
   When verification for all red LEDs has finished, execution automatically advances to the next item.

7. Green LED Test

This tests illumination of the green LEDs.

1. Press the [R], [1], [2], [3], [4], and [▶] buttons in sequence, one at a time.
2. Verify that the corresponding LED for each lights up.
3. Press the [◀◀] button.
4. Verify that the Beat LED (to the left of the LCD screen) lights up.
   When verification for all green LEDs has finished, execution automatically advances to the next item.

8. LCD Test

This tests the display of the LCD screen.

1. Verify that pressing the [|◀] button makes the entire screen go dark and that pressing the [■] button makes the entire screen light up.
2. Press the buttons just described in alternation and verify that no dot drop-out is present.
3. Press the [▶] button to advance to the next item.

9. Volume Test

This tests the volume controls.

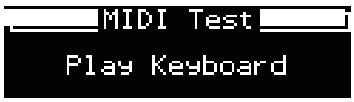
1. Turn the **Mic Echo** control on the rear panel and verify that the value of **Echo** displayed on the LCD screen changes from **0** to **127**.

2. Turn the **Mic Volume** control and verify that the value of **Mic** displayed on the LCD screen changes from **0** to **127**.

3. Turn the **Volume** control on the front panel and verify that the value of **Master** displayed on the LCD screen changes from **0** to **127**.

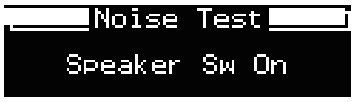
When verification for all volume controls has finished, execution automatically advances to the next item.

10. MIDI Test



1. Connect the MIDI keyboard to **MIDI IN** on the rear panel, play the keyboard, and verify that the MT-90U produces sound.
2. Press the [►] button to advance to the next item.

11. Noise Test

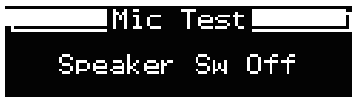


1. Connect the noise meter to the **Output** jack on the rear panel.
2. Make settings like those shown below, then measure the noise level on both the left and right.

   Volume: Max
   Mic Volume: Min
   Mic Echo: Min
   Noise meter: DIN AUDIO

   The noise levels are acceptable if at **-80 dBm** or lower on both the left and right.
3. Press the [►] button to advance to the next item.

12. Mic Test



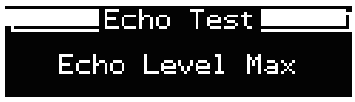
1. Connect the microphone to **Mic In** and make settings like those shown below.

   Volume: Max
   Mic Volume: Max
2. Input vocals via the microphone and verify that sound is heard from the speaker.
3. Press the [►] button to advance to the next item.

13. Phase Test

This test is required only at the time of shipment from the factory. Press the [►] button to advance to the next item.

14. Echo Test



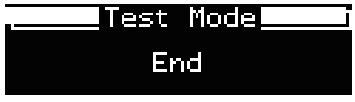
1. Connect the microphone to **Mic In** and make settings like those shown below.

   Volume: Middle position
   Mic Volume: Middle position
2. Input vocals via the microphone and verify that no echo is applied.
3. Increase the **Echo** level to **Max**.
4. Input vocals via the microphone and verify that echo is applied.
5. Press the [►] button to advance to the next item.

15. Factory Reset

1. Press the [◄◄] button to select **OK**, then press [►].
   A factory Reset is executed.

After a short interval, the message **Completed** appears, then the message **End** is displayed.



2. Switch off the power.

Speaker Test

1. Adjust **Volume** to maximum and switch on the power.
2. Verify that the built-in speaker does not produce a large amount of noise when the power is switched on.
3. Press [🕮] to play the built-in demo song, and verify that the music playback from the built-in speaker is free of distortion.
4. Operate the **Volume** control and verify that the volume level changes smoothly.
5. Shake the unit from front to back and from side to side, and verify that music can be played back without interruption or sound drop-out.

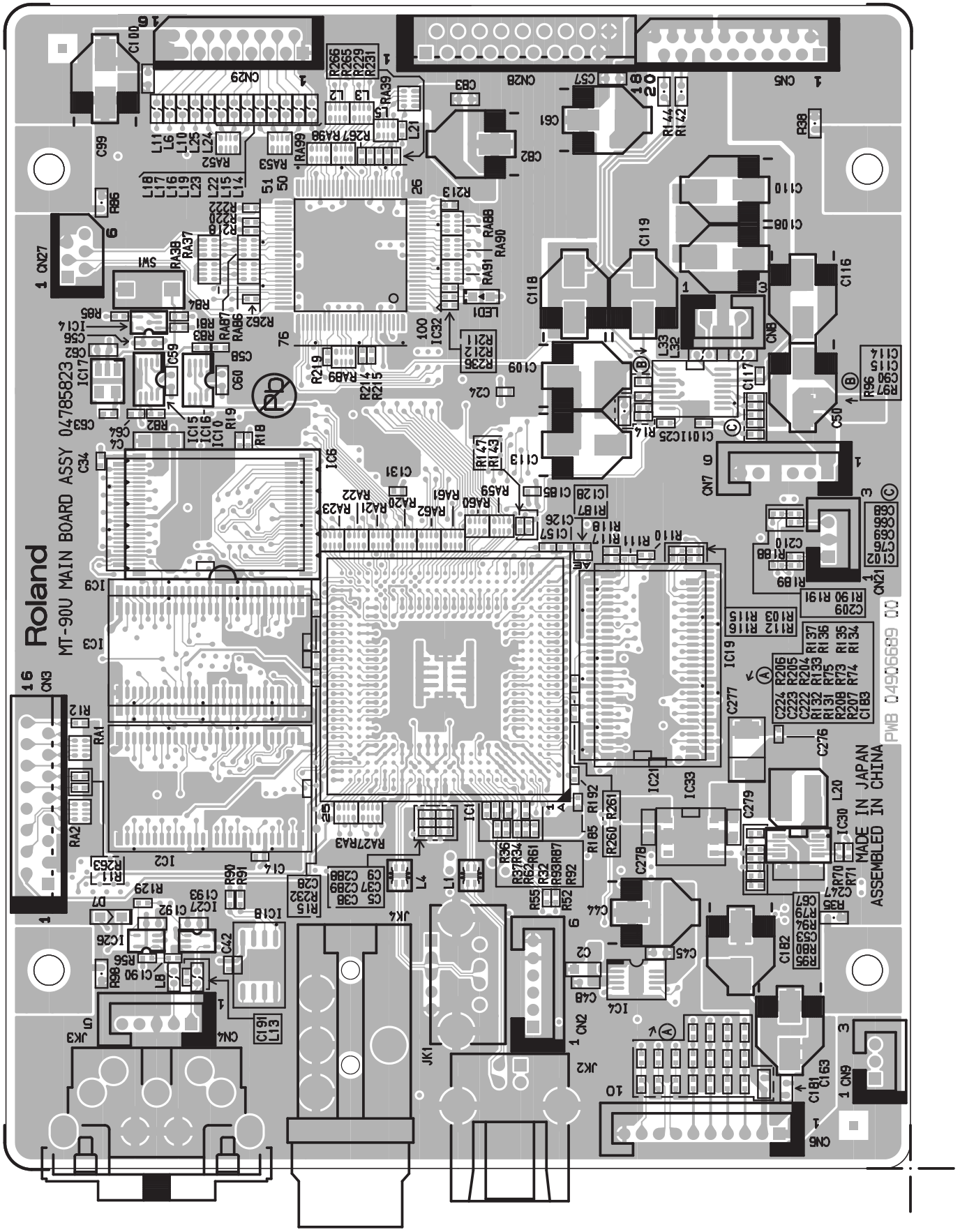
Headphones Test

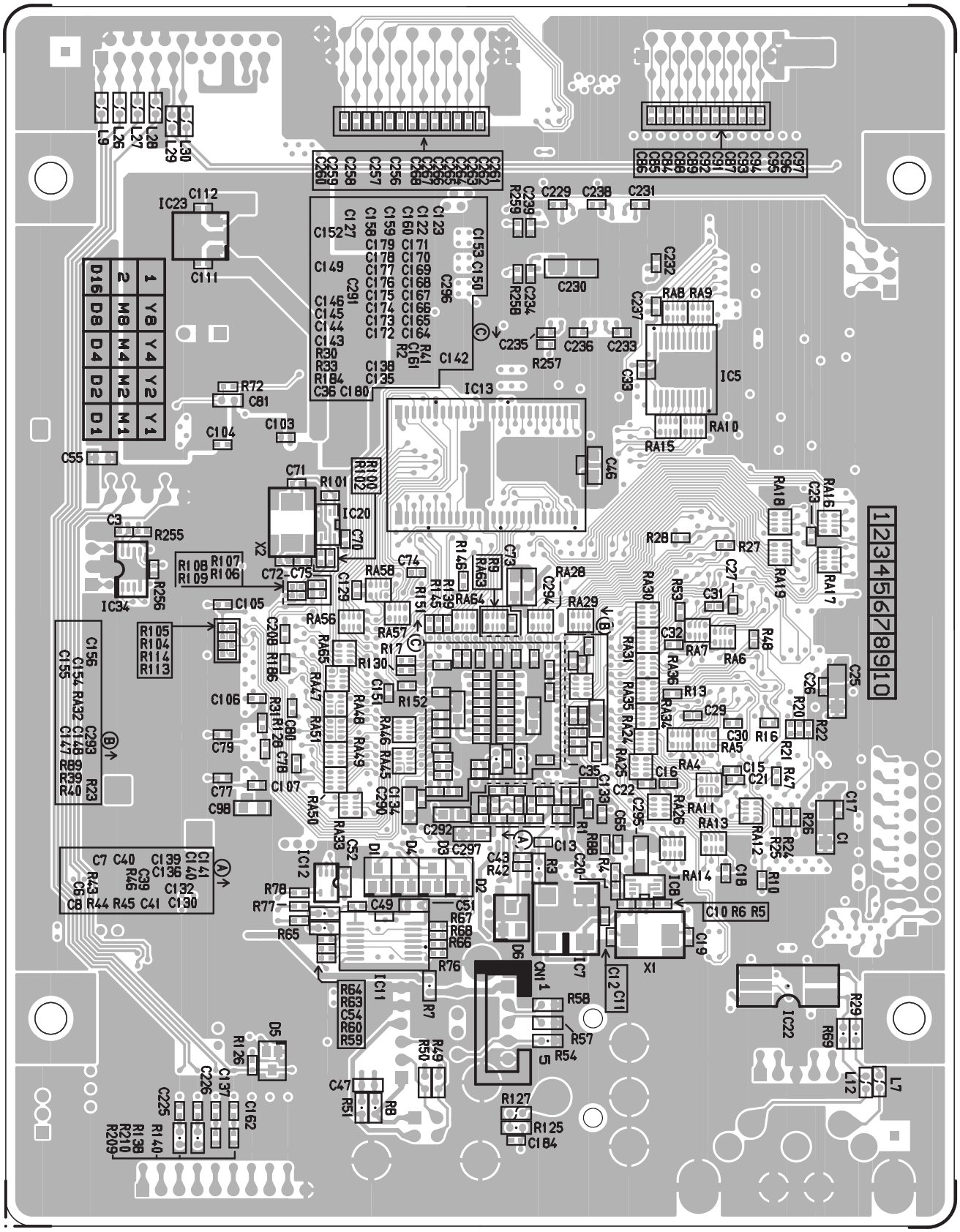
1. While continuing to play back the demo song, connect the headphones.
2. Verify that the built-in speaker stops producing sound.
3. Verify that the music is played back through the headphones without distortion.
4. Operate the **Volume** control and verify that the volume level changes smoothly.
5. Switch off the power, wait 5 seconds, then switch the power on again.
6. Verify that the headphones do not produce a large amount of noise when the power is switched on.

External Speaker Test

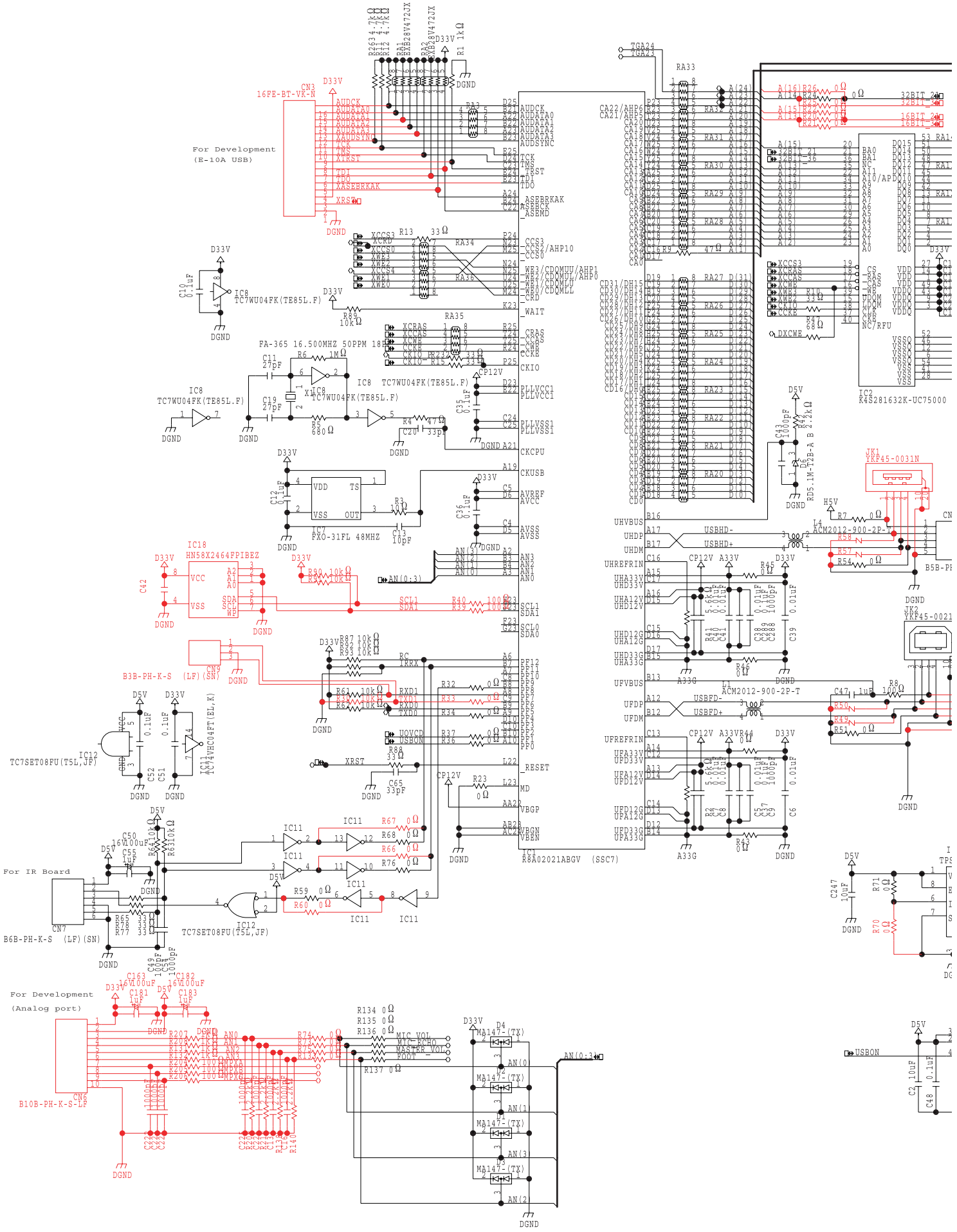
1. Connect the external speaker to the **Output** jack.
2. Play back the demo song and verify that sound is heard from both the built-in speaker and the external speaker.
3. Set the **Speaker** switch on the rear panel to **Off**.
4. Verify that the built-in speaker stops producing sound.
5. Verify that the music is played back through the external speaker without distortion.
6. Operate the **Volume** control and verify that the volume level changes smoothly.
7. Switch off the power, wait 5 seconds, then switch the power on again.
8. Verify that the external speaker does not produce a large amount of noise when the power is switched on.
9. Disconnect the external speaker and set the **Speaker** switch to **On**.
10. Connect the USB memory device containing the MP3 file to the USB connector on the front panel.
11. While playing back the MP3 file, shake the unit from front to back and from side to side, and verify that no interruption or drop-out of the sound occurs.

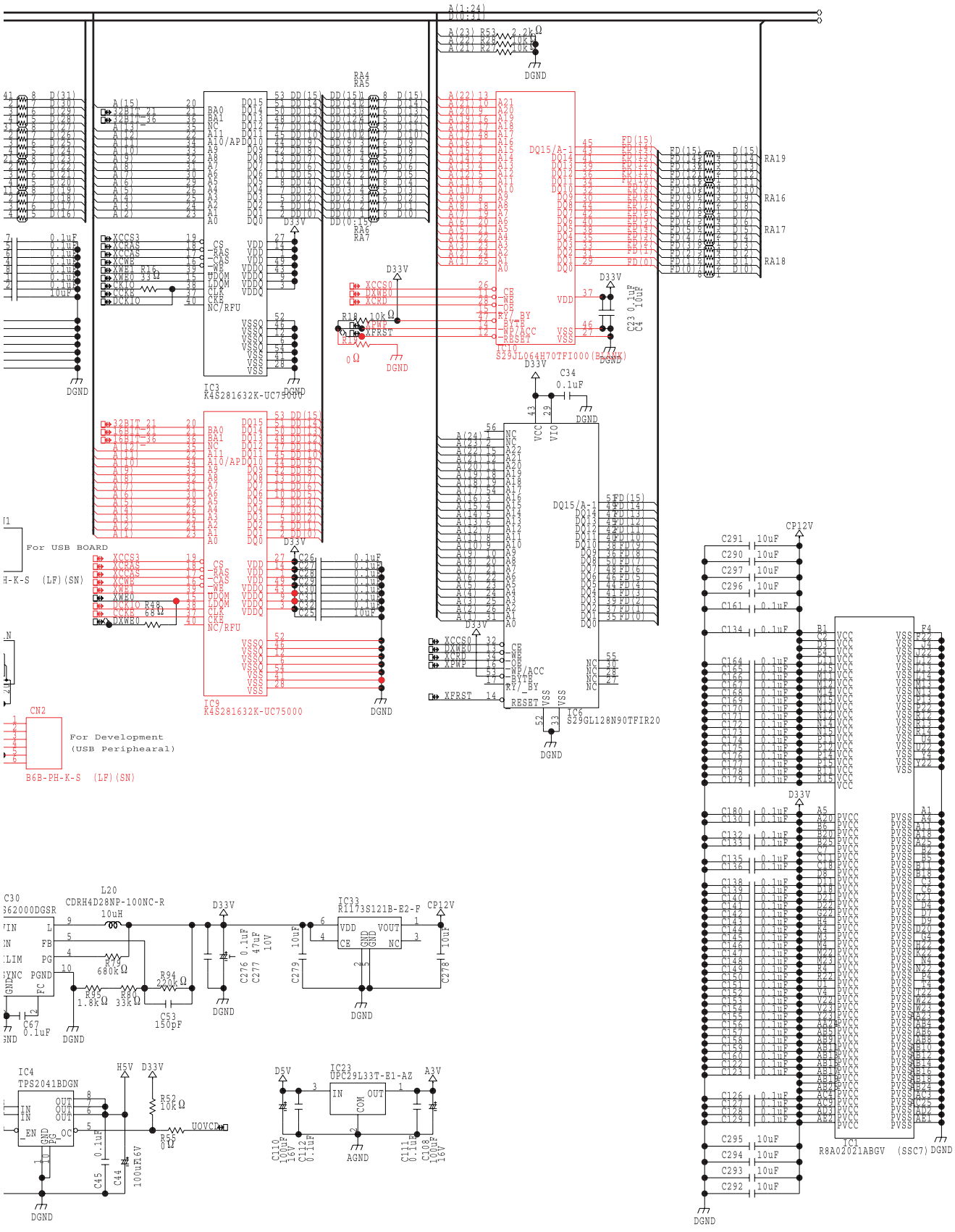
Circuit Board (Main Board)





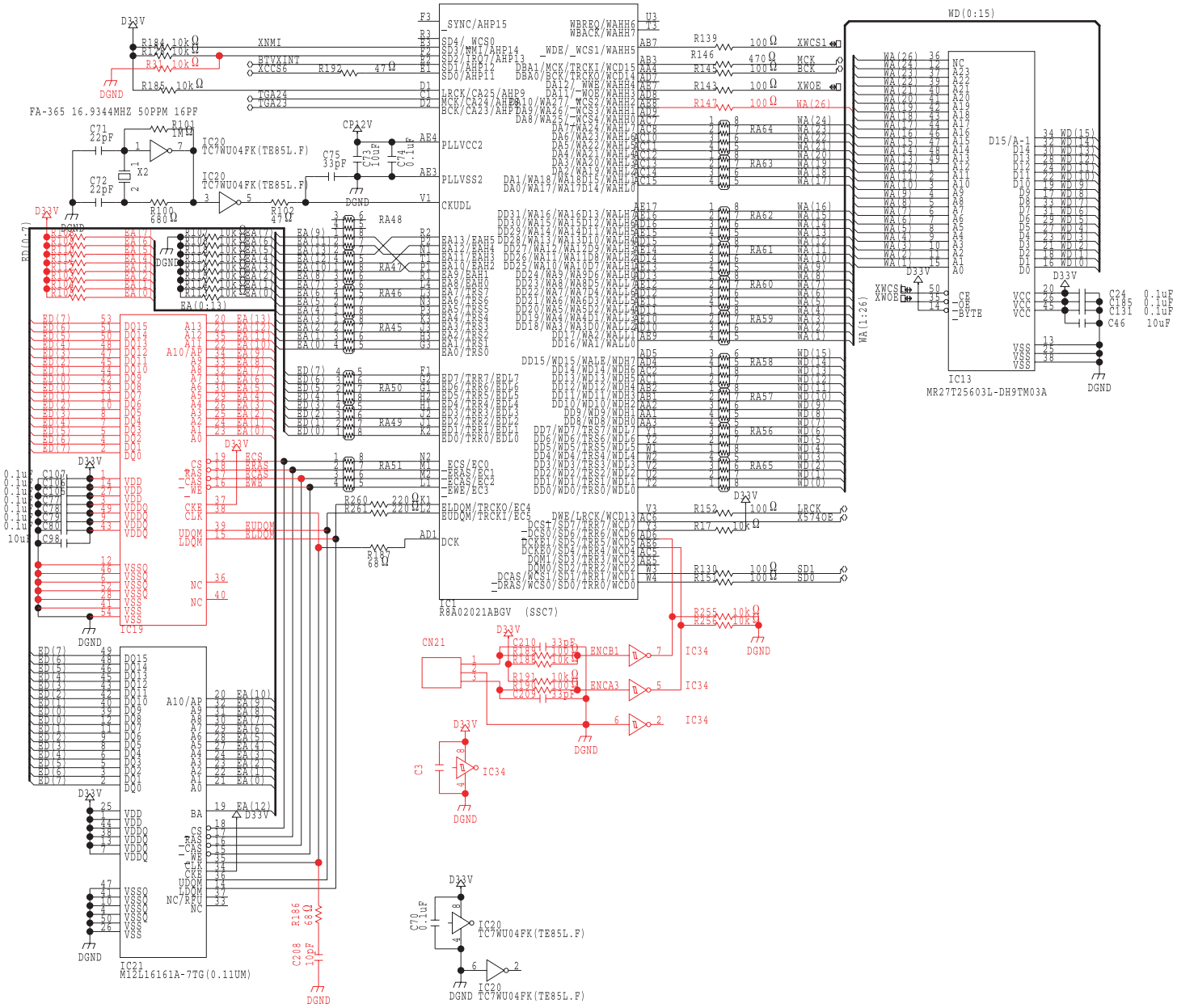
Circuit Diagram (Main Board: 1/4)





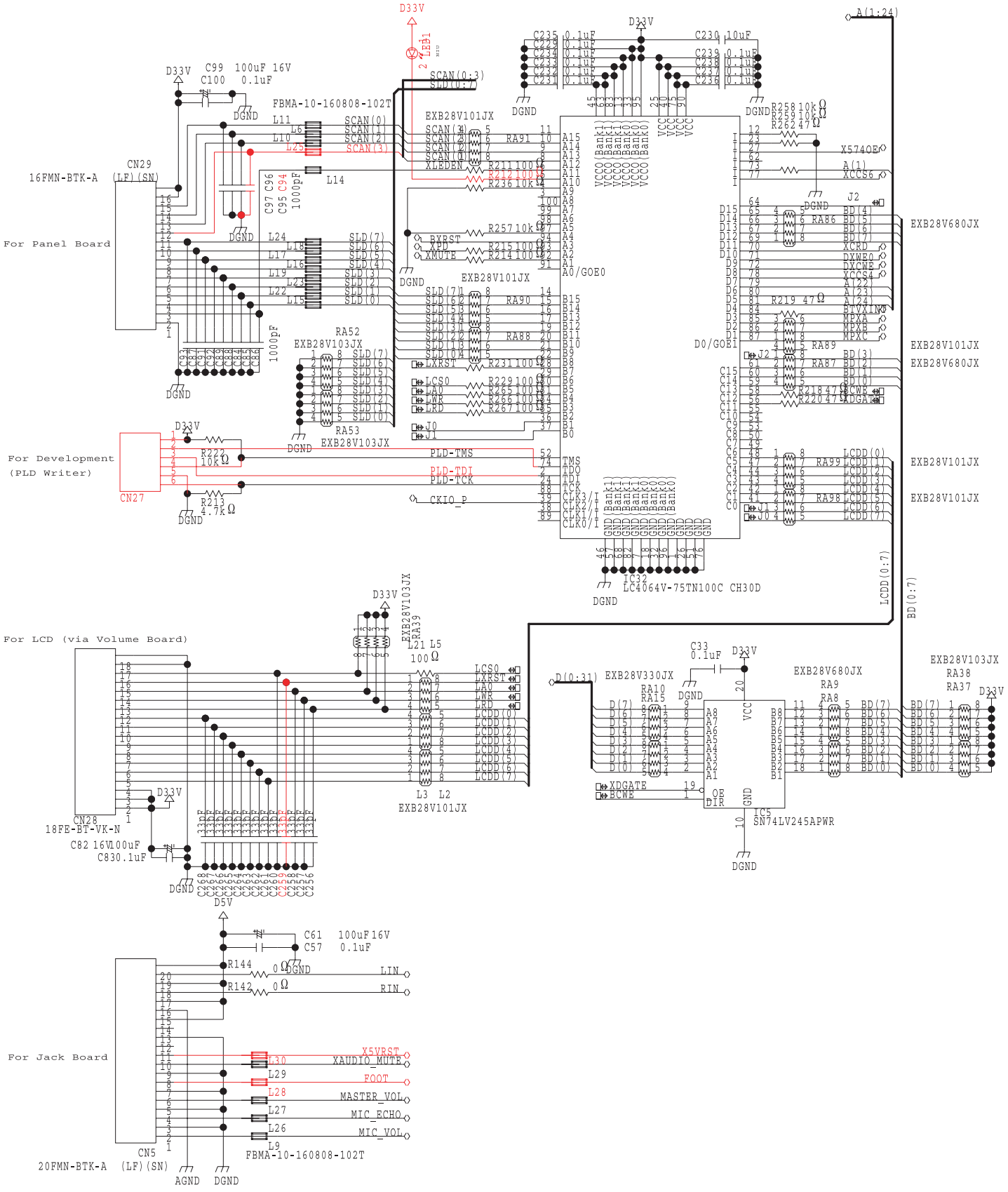
* *No components are mounted on gray parts (or red parts on PDF).*

Circuit Diagram (Main Board: 2/4)



* *No components are mounted on gray parts (or red parts on PDF).*

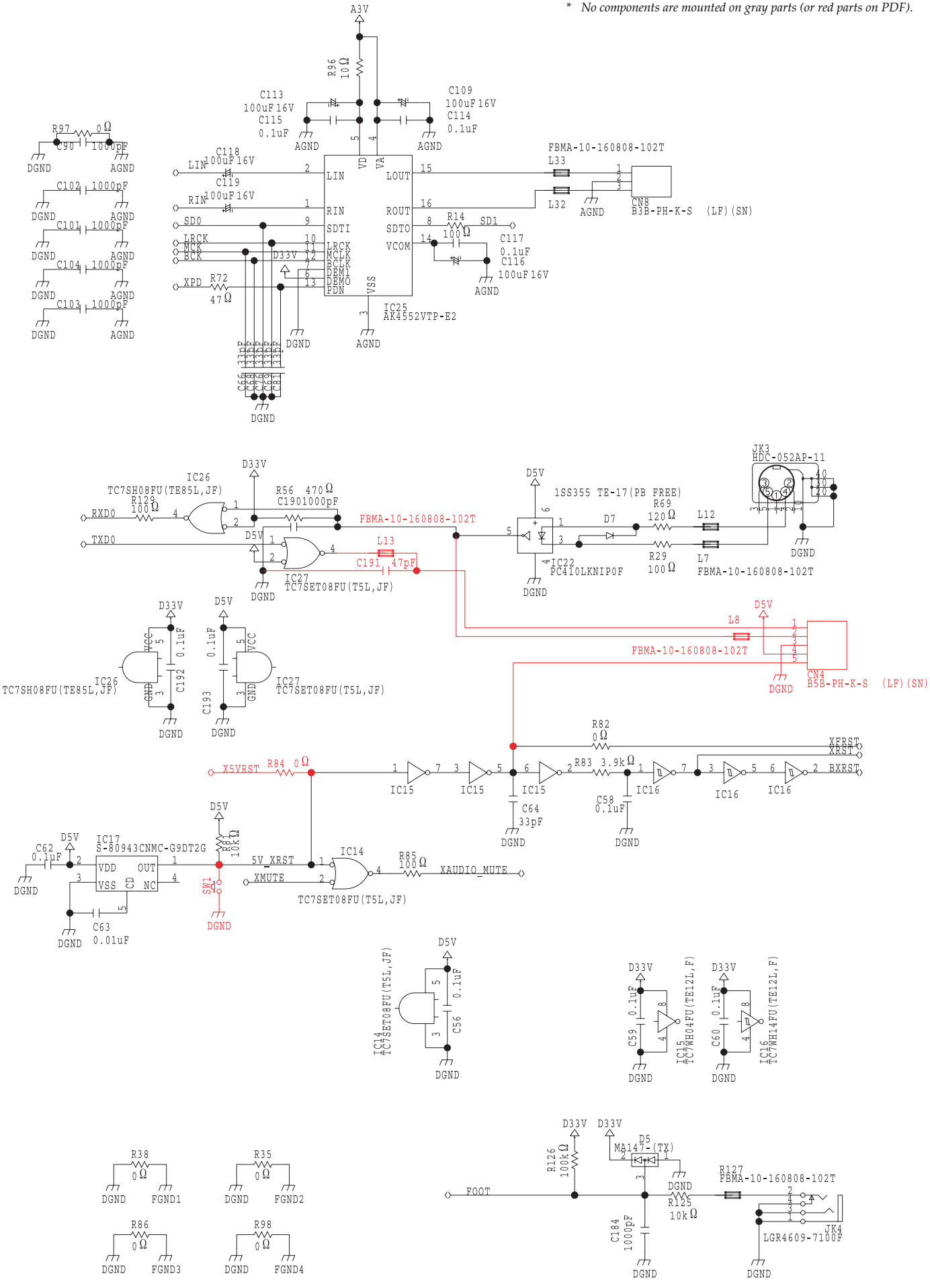
Circuit Diagram (Main Board: 3/4)



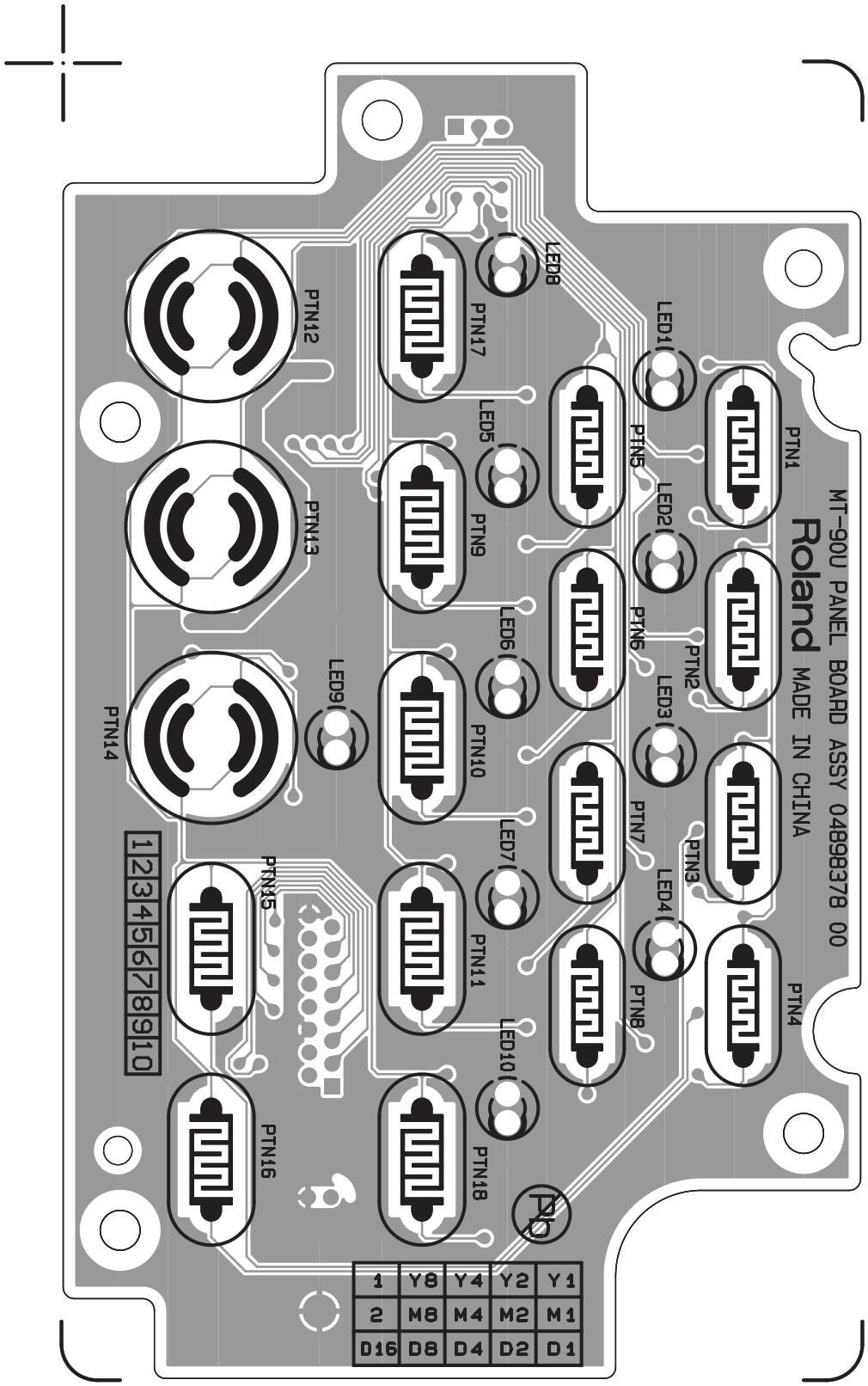
* *No components are mounted on gray parts (or red parts on PDF).*

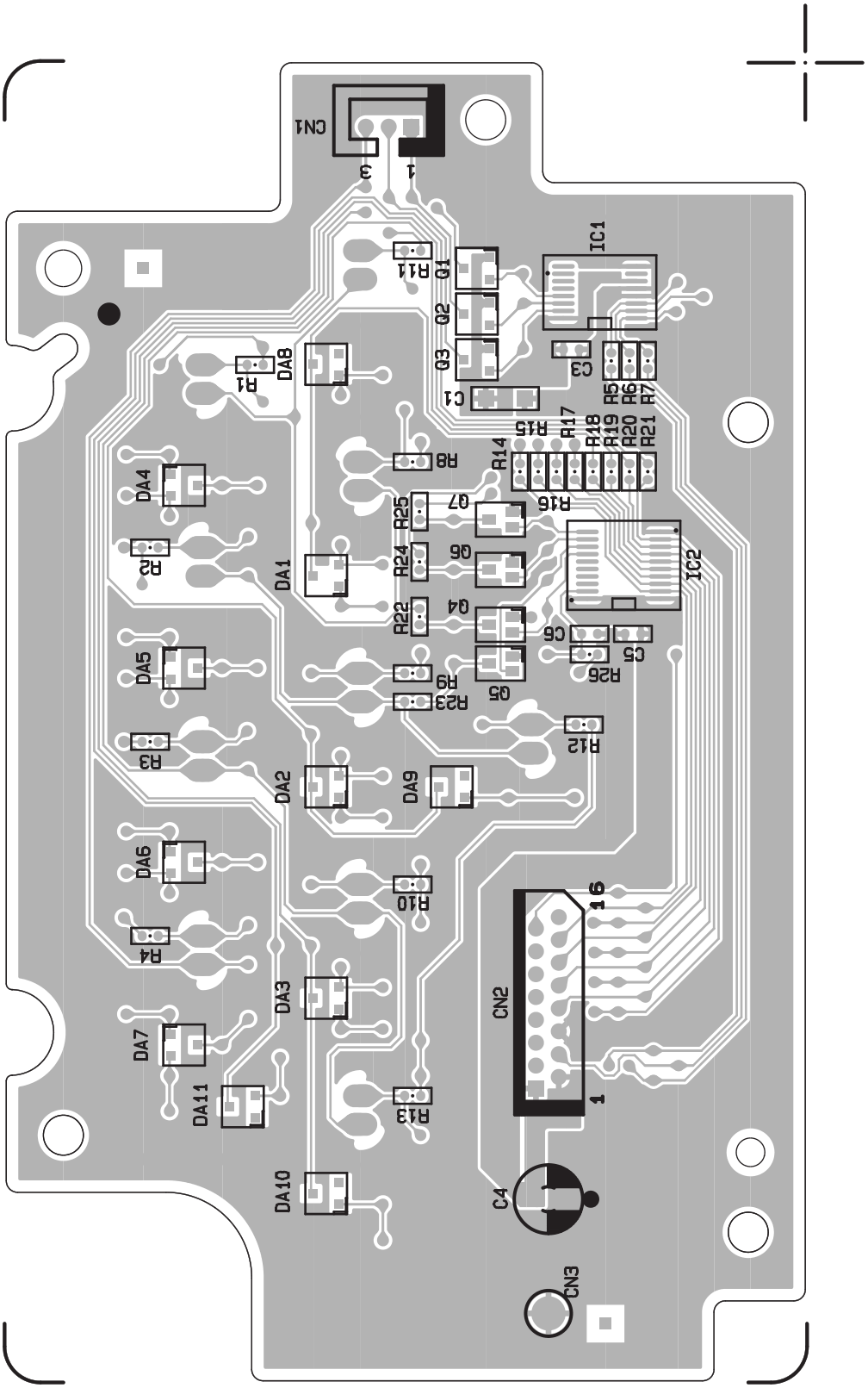
Circuit Diagram (Main Board: 4/4)

* *No components are mounted on gray parts (or red parts on PDF).*



Circuit Board (Panel Board)




CN1
3
1
IC1
R11
Q1
Q2
Q3
C3
R5
R6
R7
C1
R1
DA8
R15
R17
R18
R19
R20
R21
R14
R8
DA4
R25
Q7
R16
R2
R24
Q6
DA1
IC2
R22
Q4
C6
C5
R26
DA5
R9
R23
Q5
R3
R12
DA2
DA9
DA6
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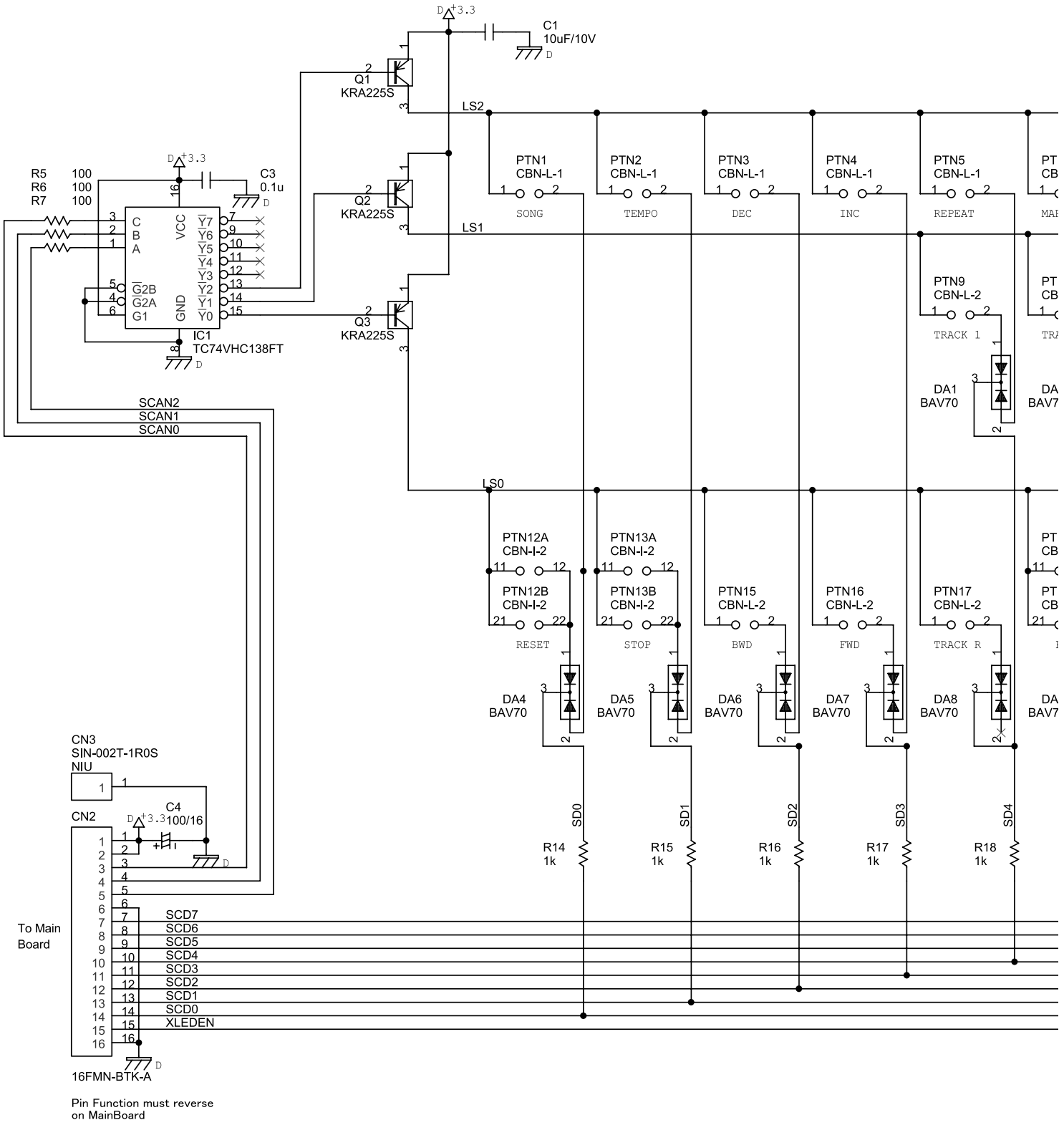
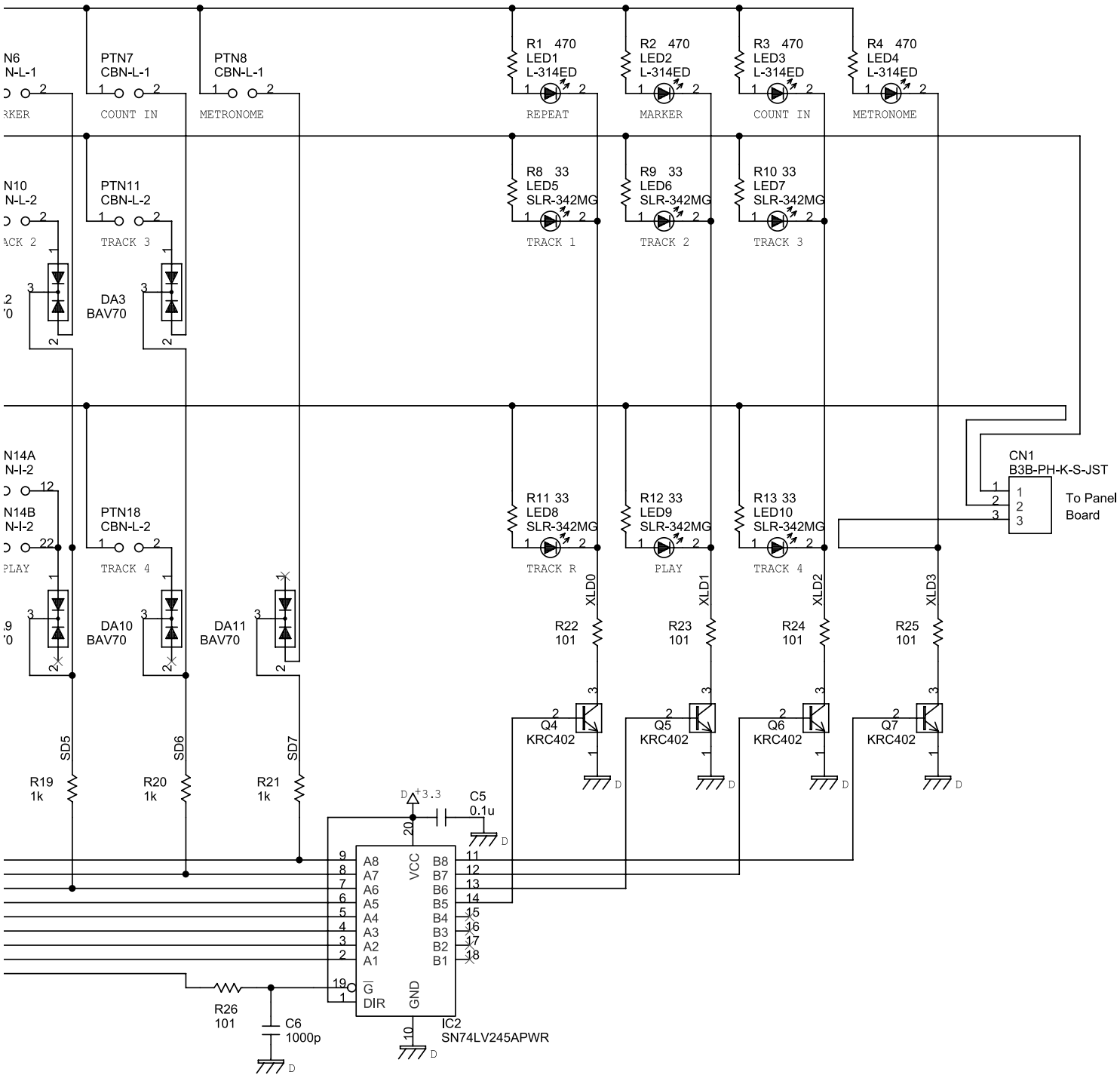
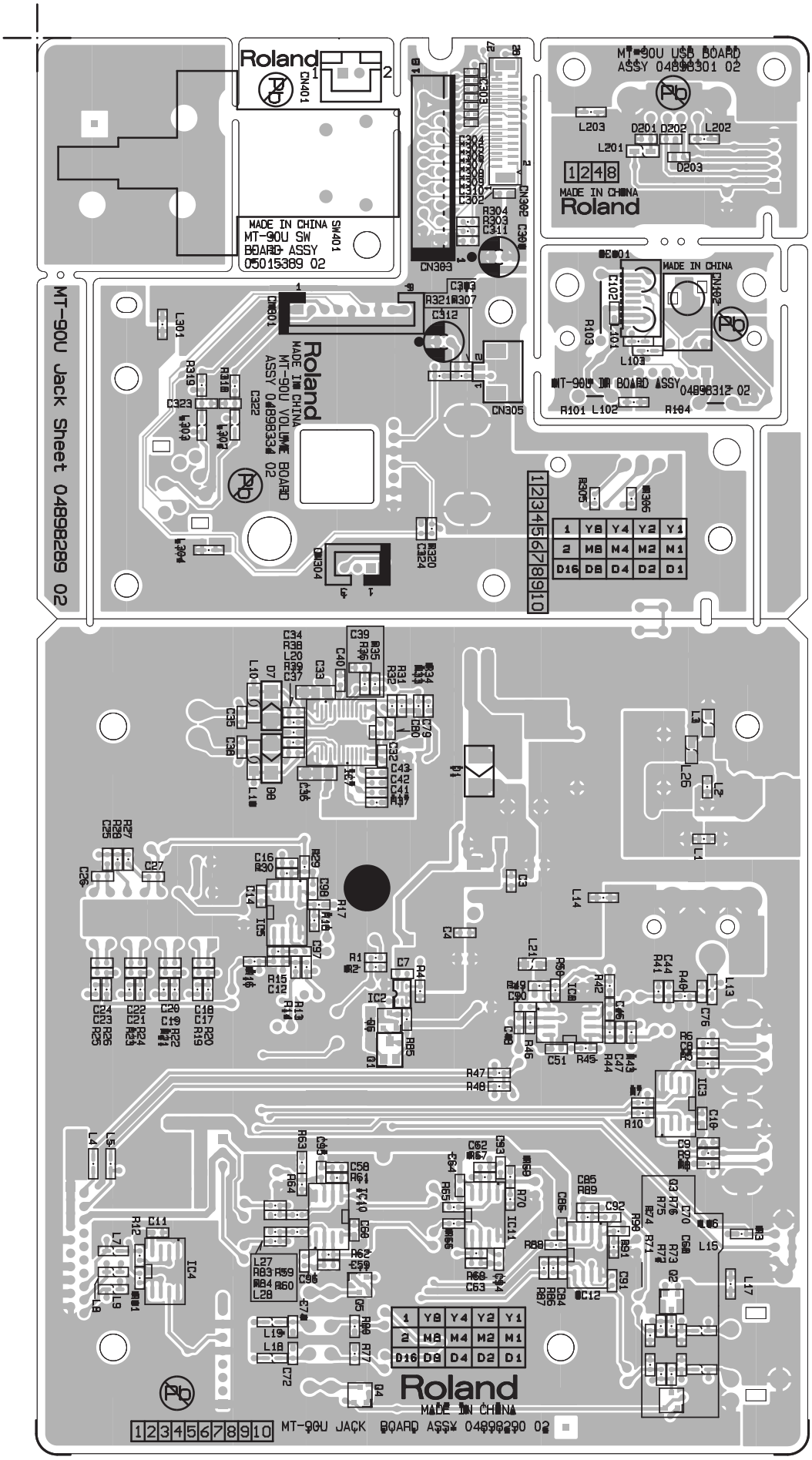
R4
CN2
DA3
DA7
1
DA11
R13
DA10
C4
CN3

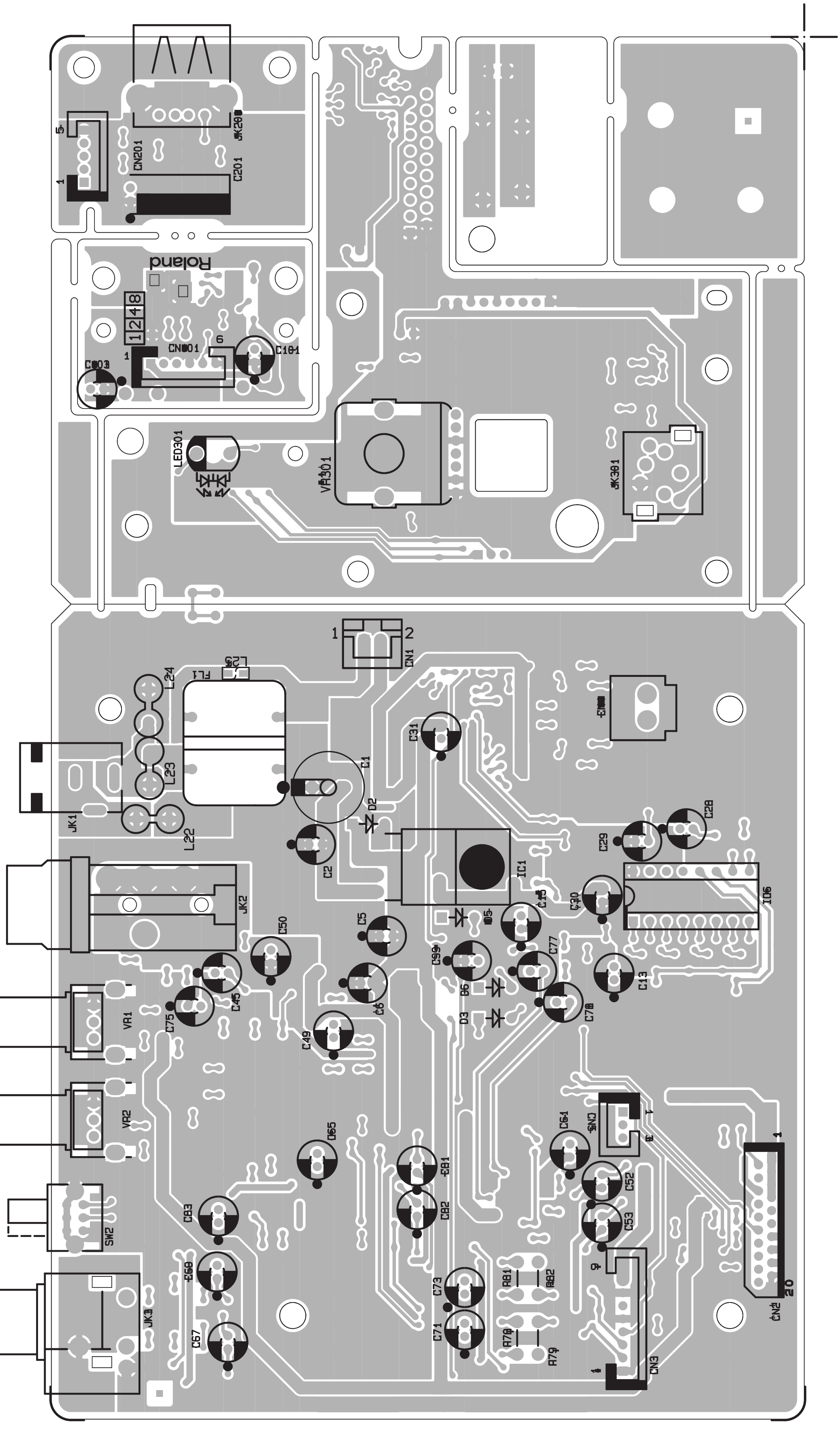
Circuit Diagram (Panel Board)



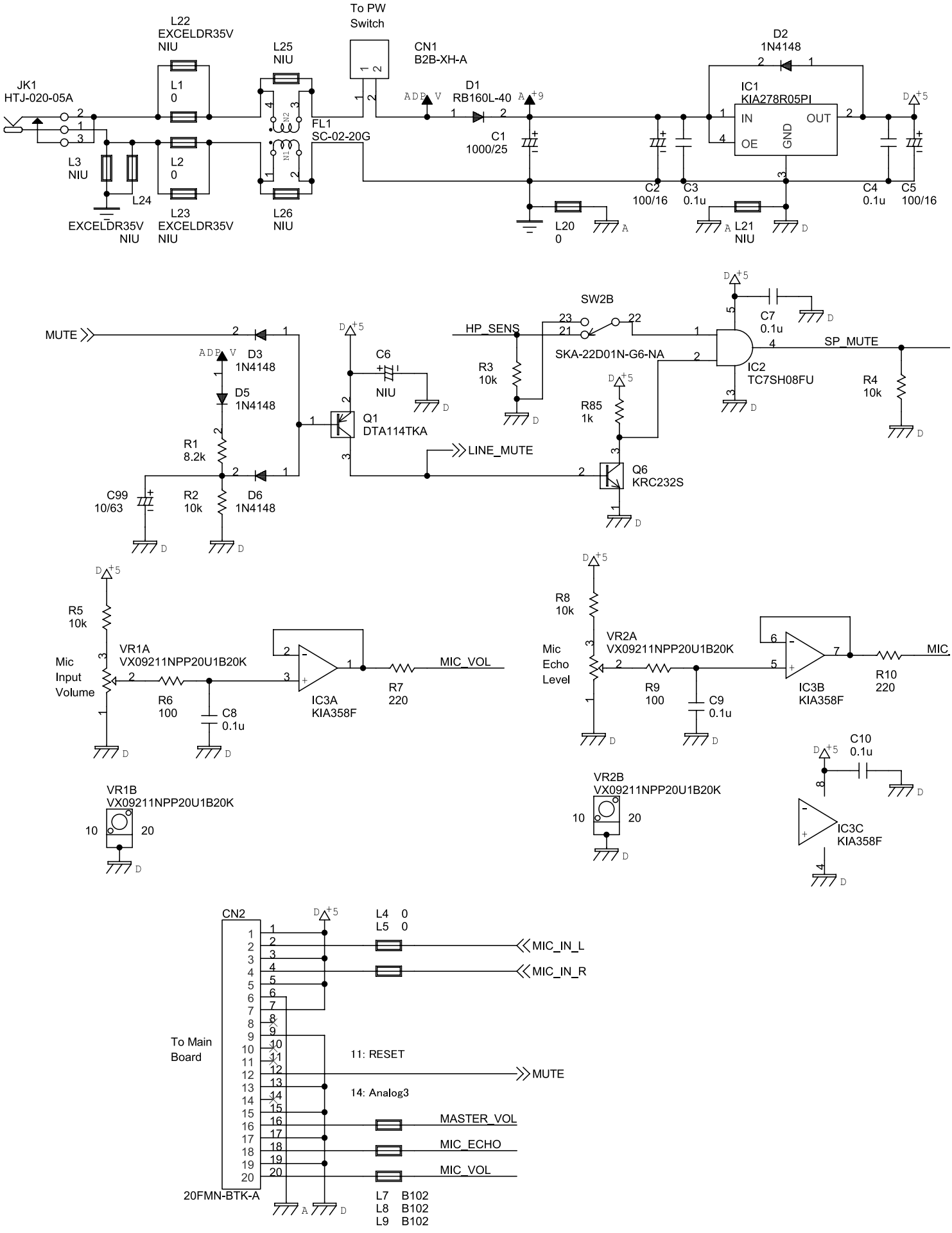

PTN7
CBN-L-1
COUNT IN
PTN8
CBN-L-1
METRONOME
R1 470
LED1
L-314ED
REPEAT
R2 470
LED2
L-314ED
MARKER
R3 470
LED3
L-314ED
COUNT IN
R4 470
LED4
L-314ED
METRONOME
PTN11
CBN-L-2
TRACK 3
DA3
BAV70
R8 33
LED5
SLR-342MG
TRACK 1
R9 33
LED6
SLR-342MG
TRACK 2
R10 33
LED7
SLR-342MG
TRACK 3
PTN18
CBN-L-2
TRACK 4
DA10
BAV70
DA11
BAV70
R11 33
LED8
SLR-342MG
TRACK R
R12 33
LED9
SLR-342MG
PLAY
R13 33
LED10
SLR-342MG
TRACK 4
CN1
B3B-PH-K-S-JST
To Panel
Board
XLD0
XLD1
XLD2
XLD3
R22
101
R23
101
R24
101
R25
101
Q4
KRC402
Q5
KRC402
Q6
KRC402
Q7
KRC402
SD5
SD6
SD7
R19
1k
R20
1k
R21
1k
+3.3
C5
0.1u
A8
A7
A6
A5
A4
A3
A2
A1
VCC
B8
B7
B6
B5
B4
B3
B2
B1
G
DIR
GND
R26
101
C6
1000p
IC2
SN74LV245APWR

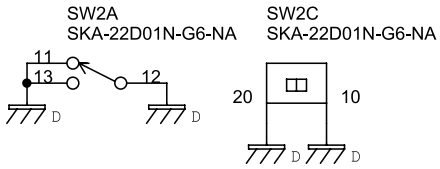
Circuit Board (Jack, Volume, IR, USB, Power SW Board)



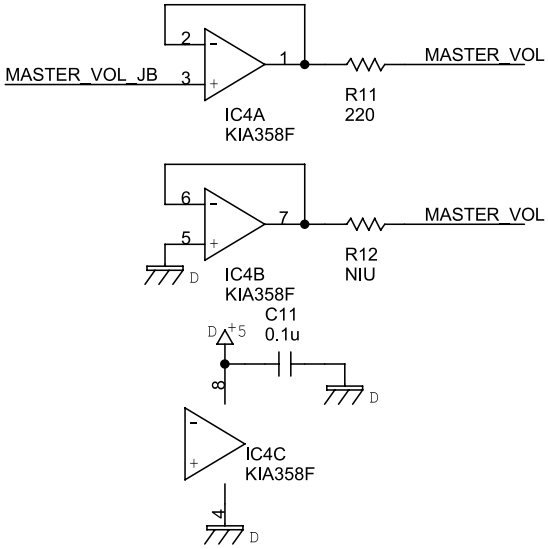


Circuit Diagram (Jack Board: 1/3)

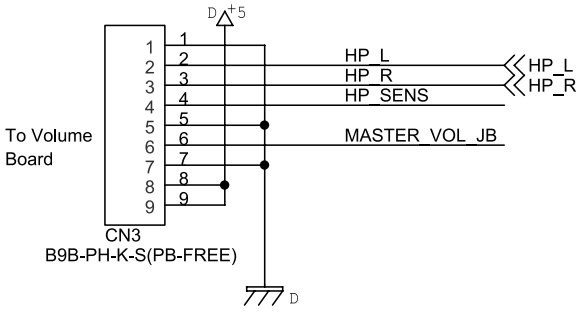



SW2A
SKA-22D01N-G6-NA
SW2C
SKA-22D01N-G6-NA
11
13
12
20
10
D
D
D
D

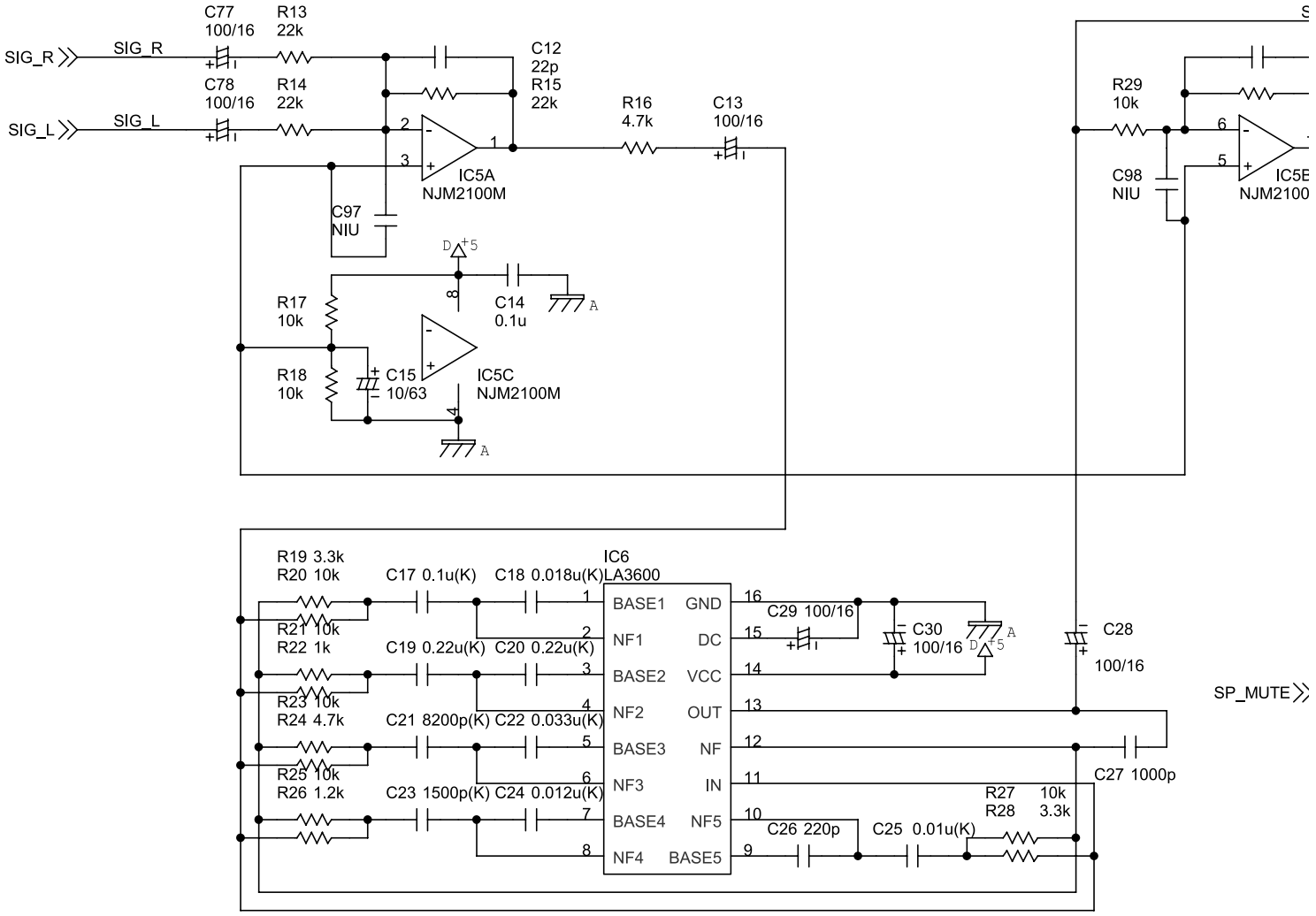
SP_MUTE

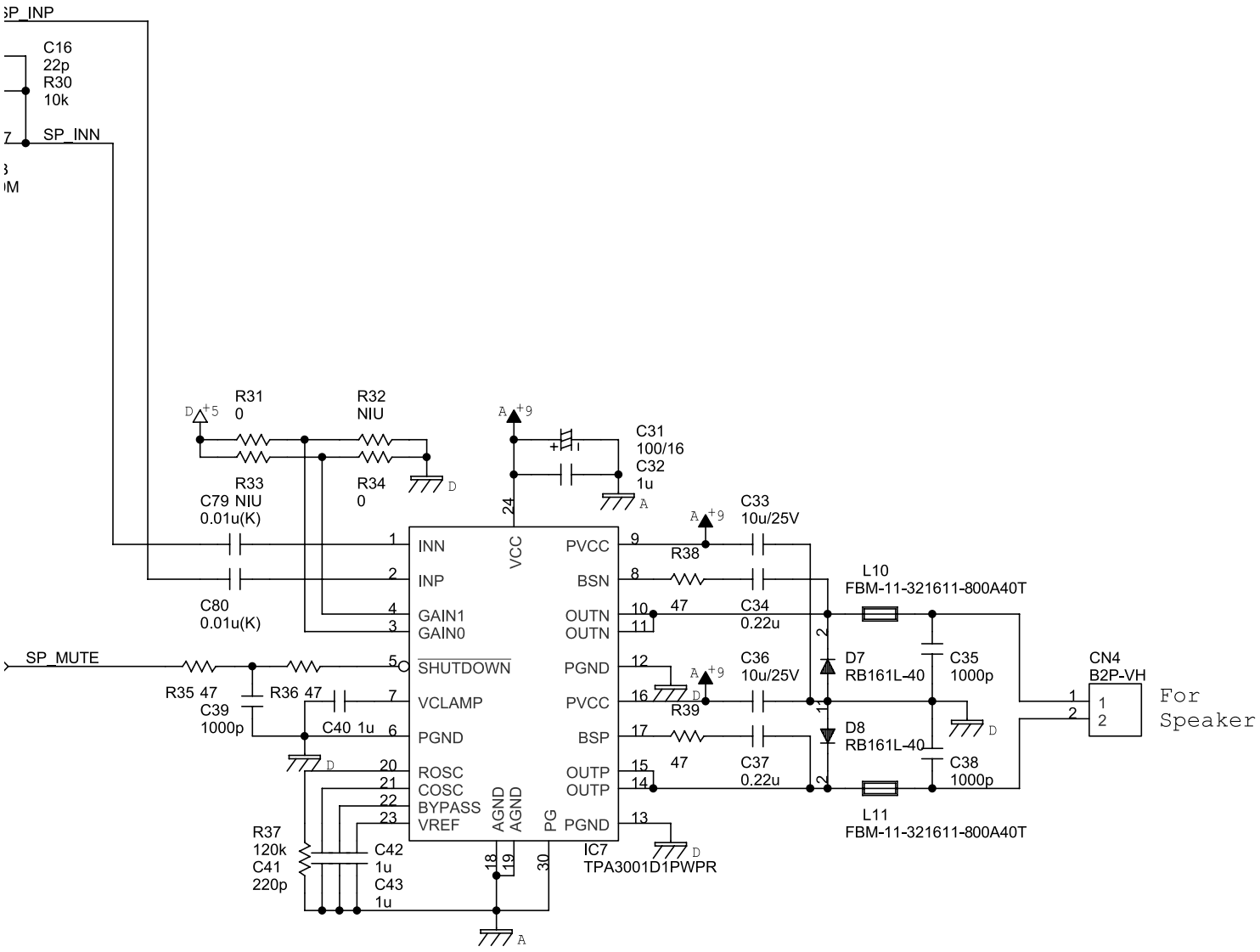

MASTER_VOL_JB
MASTER_VOL
R11
220
IC4A
KIA358F
MASTER_VOL
R12
NIU
IC4B
KIA358F
C11
0.1u
+5
IC4C
KIA358F

ECHO

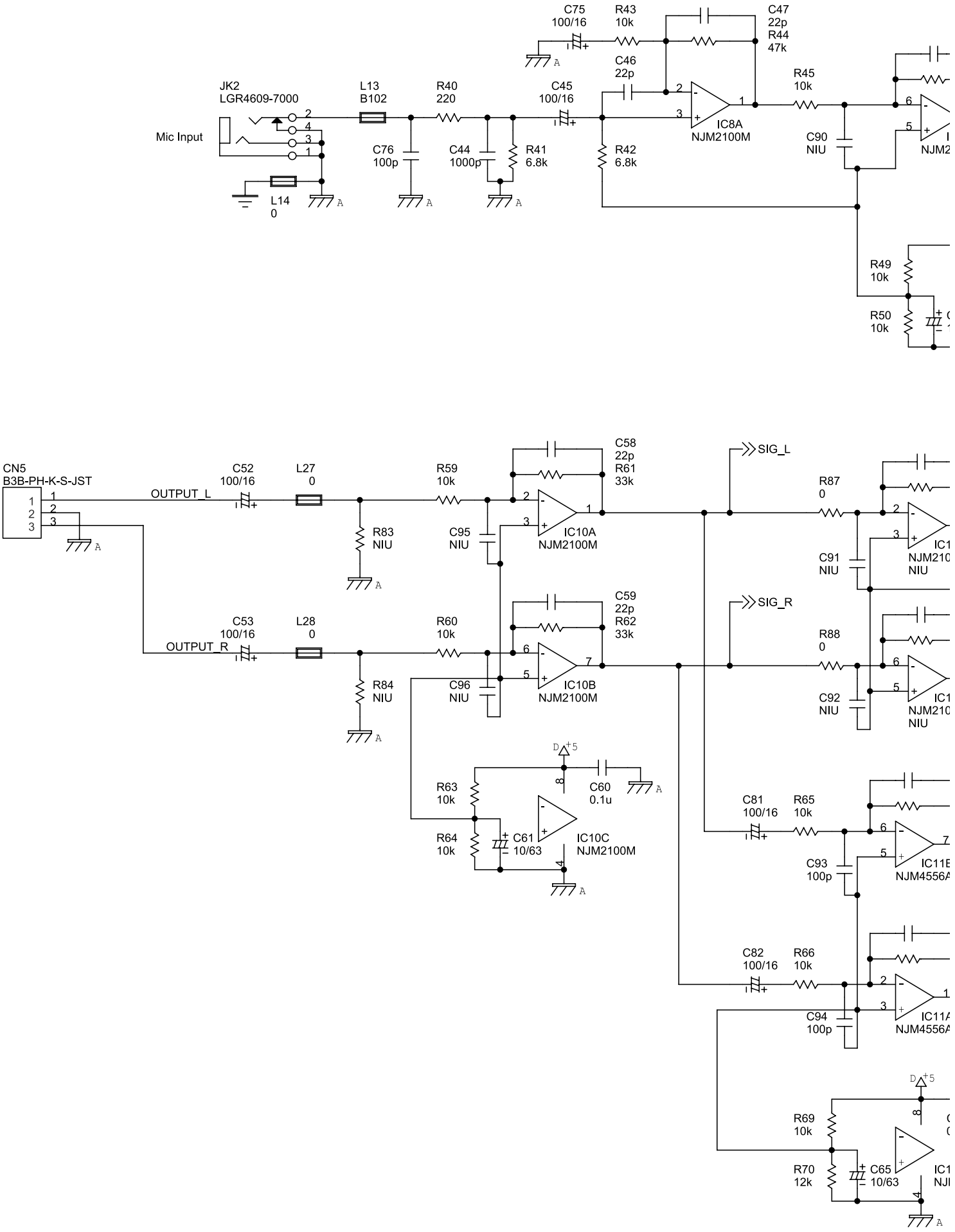

+5
To Volume
Board
HP_L
HP_R
HP_SENS
MASTER_VOL_JB
HP_L
HP_R
CN3
B9B-PH-K-S(PB-FREE)

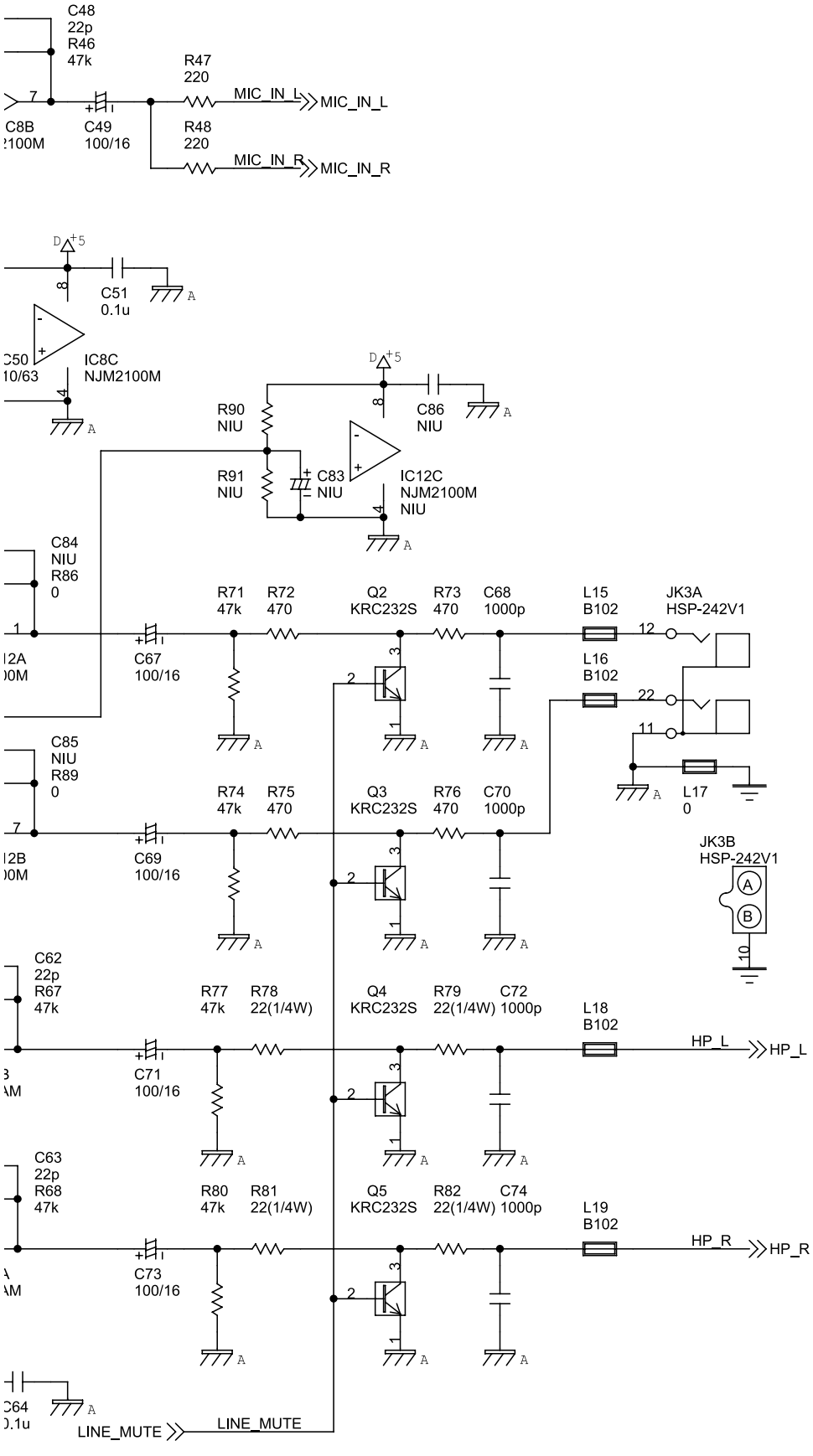
Circuit Diagram (Jack Board: 2/3)



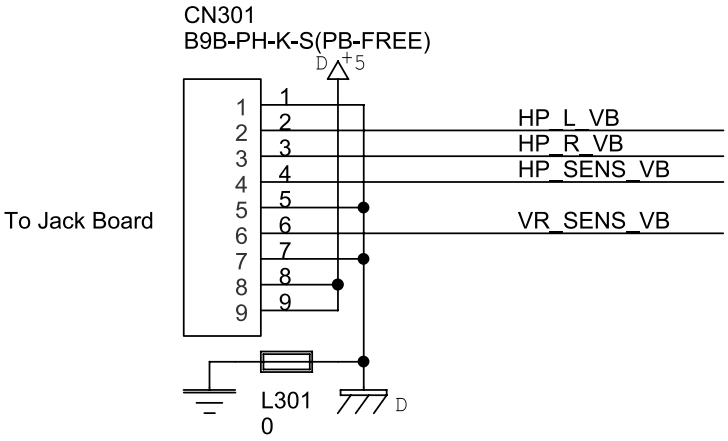

SP_INP
C16
22p
R30
10k
SP_INN
R31
0
R32
NIU
R33
C79 NIU
0.01u(K)
R34
0
C31
100/16
C32
1u
C33
10u/25V
R38
C80
0.01u(K)
INN
INP
GAIN1
GAIN0
SHUTDOWN
VCLAMP
PGND
ROSC
COSC
BYPASS
VREF
AGND
AGND
PG
VCC
PVCC
BSN
OUTN
OUTN
PGND
PVCC
BSP
OUTP
OUTP
PGND
IC7
TPA3001D1PWPR
L10
FBM-11-321611-800A40T
C34
0.22u
C36
10u/25V
R39
C37
0.22u
L11
FBM-11-321611-800A40T
D7
RB161L-40
D8
RB161L-40
C35
1000p
C38
1000p
CN4
B2P-VH
For
Speaker
SP_MUTE
R35 47
R36 47
C39
1000p
C40 1u
R37
120k
C41
220p
C42
1u
C43
1u

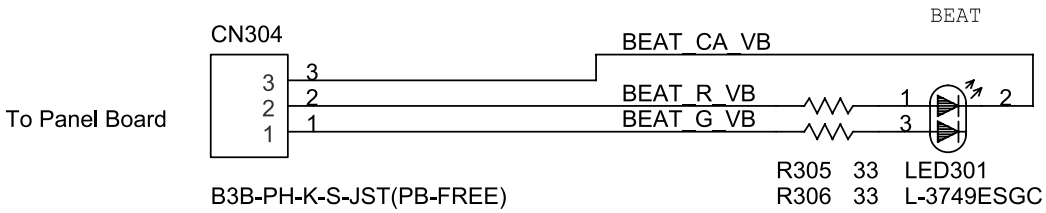
Circuit Diagram (Jack Board: 3/3)

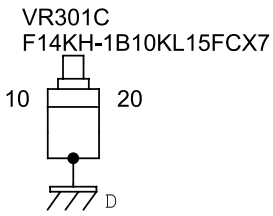


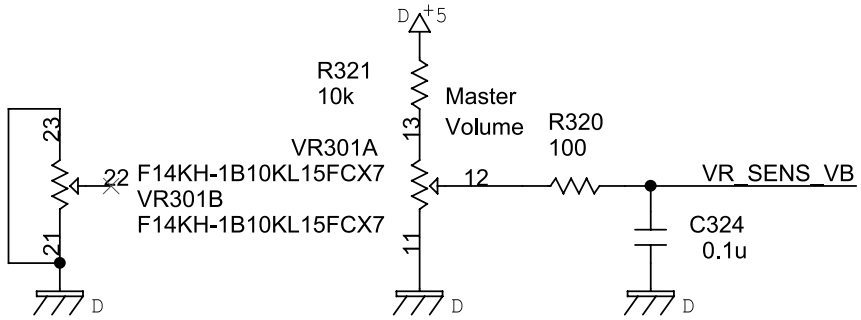

C48
22p
R46
47k
R47
220
MIC_IN_L
MIC_IN_L
C8B
2100M
C49
100/16
R48
220
MIC_IN_R
MIC_IN_R
C51
0.1u
C50
10/63
IC8C
NJM2100M
R90
NIU
C86
NIU
R91
NIU
C83
NIU
IC12C
NJM2100M
NIU
C84
NIU
R86
0
R71
47k
R72
470
Q2
KRC232S
R73
470
C68
1000p
L15
B102
JK3A
HSP-242V1
L16
B102
C67
100/16
C85
NIU
R89
0
R74
47k
R75
470
Q3
KRC232S
R76
470
C70
1000p
L17
0
JK3B
HSP-242V1
C69
100/16
C62
22p
R67
47k
R77
47k
R78
22(1/4W)
Q4
KRC232S
R79
22(1/4W)
C72
1000p
L18
B102
HP_L
HP_L
C71
100/16
C63
22p
R68
47k
R80
47k
R81
22(1/4W)
Q5
KRC232S
R82
22(1/4W)
C74
1000p
L19
B102
HP_R
HP_R
C73
100/16
C64
0.1u
LINE_MUTE
LINE_MUTE

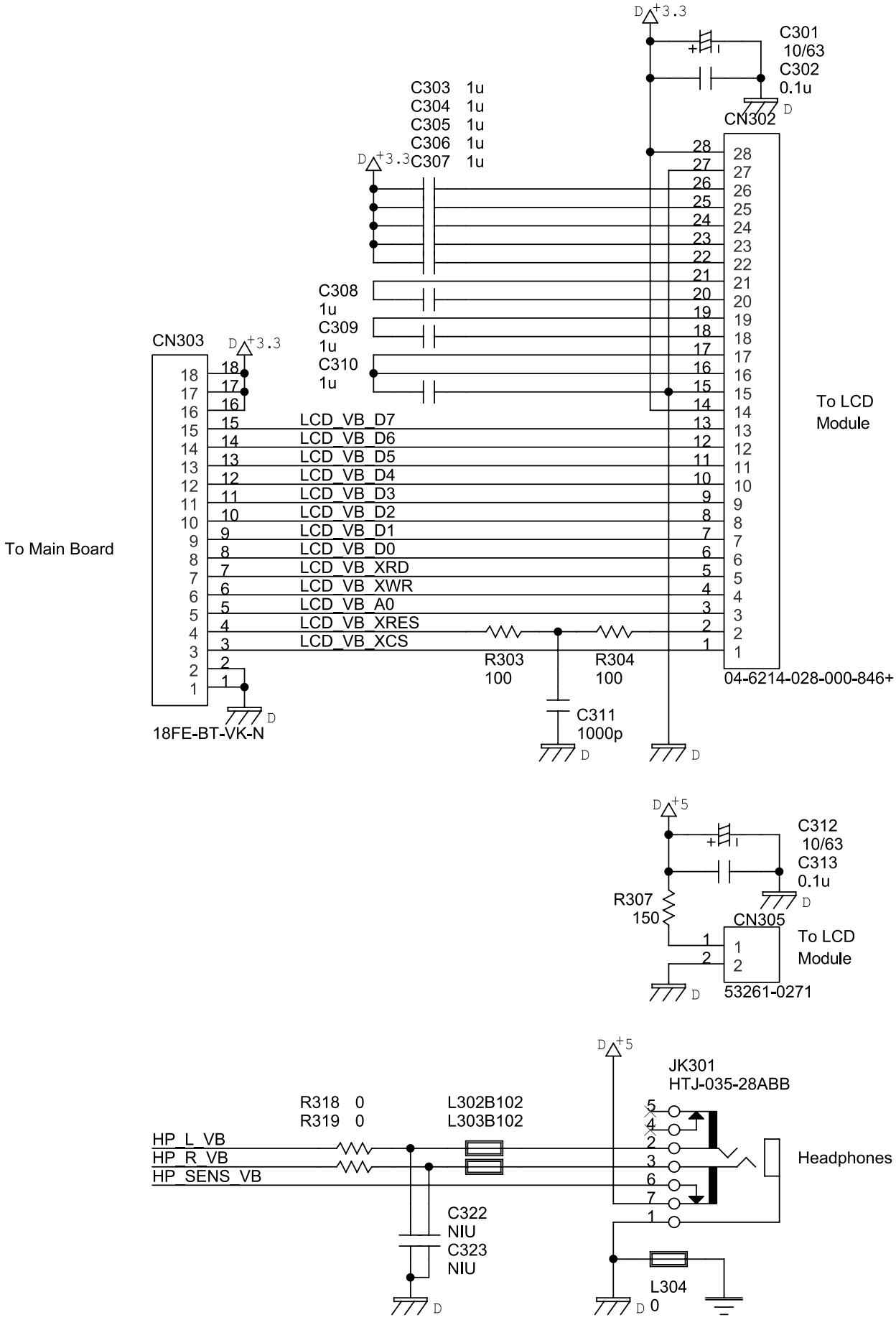
Circuit Diagram (Volume Board)



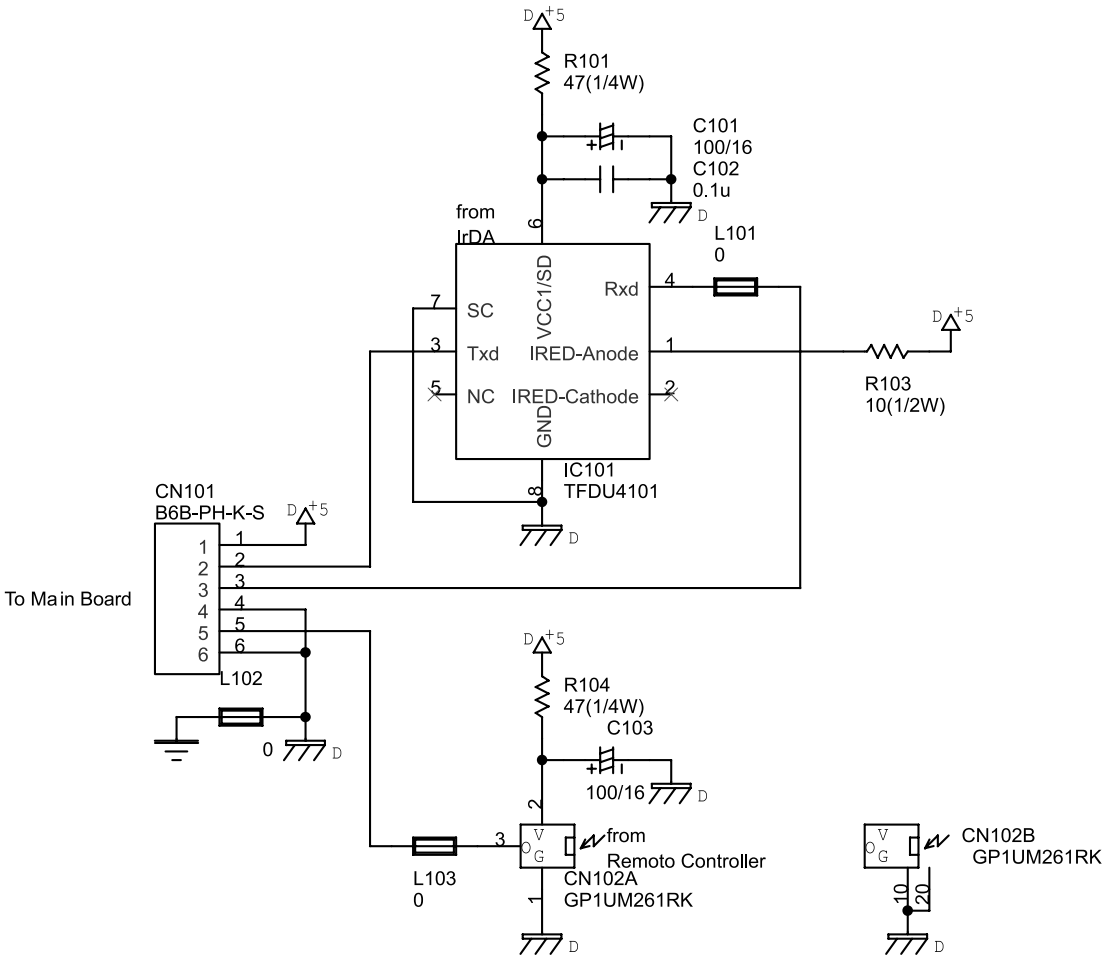




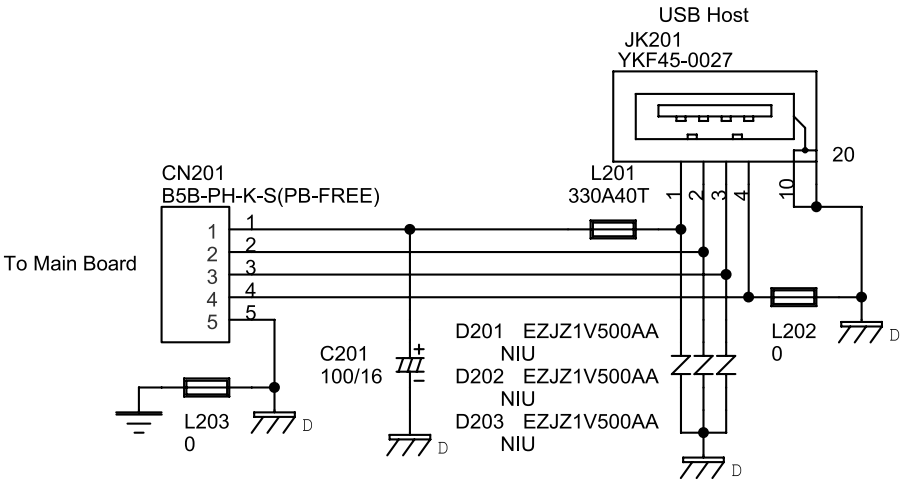



D +3.3
C301
10/63
C302
0.1u
D
CN302
C303 1u
C304 1u
C305 1u
C306 1u
C307 1u
D +3.3
C308
1u
C309
1u
C310
1u
CN303
D +3.3
To Main Board
LCD_VB_D7
LCD_VB_D6
LCD_VB_D5
LCD_VB_D4
LCD_VB_D3
LCD_VB_D2
LCD_VB_D1
LCD_VB_D0
LCD_VB_XRD
LCD_VB_XWR
LCD_VB_A0
LCD_VB_XRES
LCD_VB_XCS
R303
100
R304
100
C311
1000p
D
D
To LCD
Module
04-6214-028-000-846+
18FE-BT-VK-N
D +5
C312
10/63
C313
0.1u
R307
150
CN305
To LCD
Module
53261-0271
D +5
JK301
HTJ-035-28ABB
R318 0
R319 0
L302B102
L303B102
HP_L_VB
HP_R_VB
HP_SENS_VB
Headphones
C322
NIU
C323
NIU
L304
0

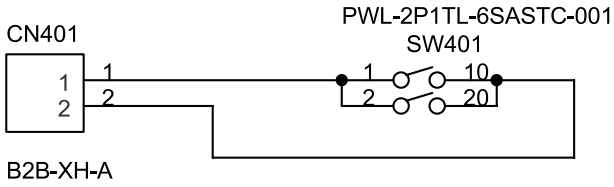
Circuit Diagram (IR Board)



Circuit Diagram (USB Board)



Circuit Diagram (Power SW Board)



MEMO