Mark PRO 2i

Service Manual

KURZWEIL
music Systems

IMPORTANT SAFETY & INSTALLATION INSTRUCTIONS
INSTRUCTIONS PERTAINING TO THE RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS

WARNING: When using electric products, basic precautions should
always be followed, including the following:

1. Read all of the Safety and Installation Instructions and Explanation of Graphic Symbols before using the product.

2. Do not use this product near water—for example, near a bathtub, washbowl, kitchen sink, in a wet basement, or near a swimming pool, or the like.

3. This product should be used only with a stand or cart that is recommended by the manufacturer.

4. This product, either alone or in combination with an amplifier and speakers or headphones, may be capable of producing sound levels that could cause permanent hearing loss. Do not operate for
a long period of time at a high volume level or at a level that is uncomfortable. If you experience any hearing loss or ringing in the ears, you should consult an audiologist.

5. The product should be located so that its location or position does not interfere with its proper ventilation.

6. The product should be located away from heat sources such as radiators, heat registers, or other products that produce heat.

7. The product should be connected to a power supply only of the type described in the operating instructions or as marked on the product.

8. This product may be equipped with a polarized line plug (one blade wider than the other). This is a safety feature. If you are unable to insert the plug into the outlet, contact an electrician to replace your obsolete outlet. Do not defeat the safety purpose of the plug.

9. The power supply cord of the product should be unplugged from the

outlet when left unused for a long period of time. When unplugging the power supply cord, do not pull on the cord, but grasp it by the plug.

10. Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.

11. The product should be serviced by qualified service personnel when:

    A. The power supply cord or the plug has been damaged;

    B. Objects have fallen onto, or liquid has been spilled into the product;

    C. The product has been exposed to rain;

    D. The product does not appear to be operating normally or exhibits a marked change in performance;

    E. The product has been dropped, or the enclosure damaged.

12. Do not attempt to service the product beyond that described in the user maintenance instructions. All other servicing should be referred to qualified service personnel.

13. **WARNING:** Do not place objects on the product's power supply cord, or place the product in a position where anyone could trip over, walk on, or roll anything over cords of any type. Do not allow the product to rest on or be installed over cords of any type. Improper installations of this type create the possibility of a fire hazard and/or personal injury.

RADIO AND TELEVISION INTERFERENCE

WARNING: Changes or modifications to this instrument not expressly approved by Young Chang could void your authority to operate the instrument.

IMPORTANT: When connecting this product to accessories and/or other equipment use only high quality shielded cables.

NOTE: This instrument has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the instrument is used in a commercial environment. This instrument generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this instrument in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his or her own expense.

Changes and modifications not expressly approved by the manufacturer

or registrant of this instrument can void the user's authority to operate this instrument under Federal Communications Commission rules.

In order to maintain compliance with FCC regulations, shielded cables must be used with this instrument. Operation with unapproved equipment or unshielded cables is likely to result in harmful interference to radio and television reception.

NOTICE

This apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

AVIS

Le present appareil numerique n'emet pas de bruits radioelectriques depassant les limites applicables aux appareils numeriques de la class A prescrites dans le Reglement sur le brouillage radioelectrique edicte par le ministere des Communications du Canada.

SAVE THESE INSTRUCTIONS

Young Chang Distributors

Contact the nearest Young Chang office listed below to locate your local Young Chang/Kurzweil representative.

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Contents

Chapter 1
Introduction

This chapter provides the service technician with a layout of the front and rear panel features, as well as a brief explanation of their functions. For in-depth descriptions of the many features the Mark PRO 2i instruments include, consult the Musician's Guide.

This chapter also includes a description the symbols used throughout this manual.

Note: If possible, all user programs and setups should be saved prior to opening the unit, entering the Boot Block to run diagnostics or to perform a hard reset. For instructions to save all user programs and setups.

Notes, Cautions, Warnings

Please pay special attention to all Notes, Cautions, and Warnings used throughout this manual. A brief description of these symbols follows:

Note: Provides additional information emphasizes specific instructions.

Caution: Instructs you to proceed cautiously so that damage does not occur to the unit or individual components.

Warning: Alerts you so that damage does not occur to yourself, others, or external devices.

Introduction to Mark Pro 2i

Mark Pro 2i Rear Panel
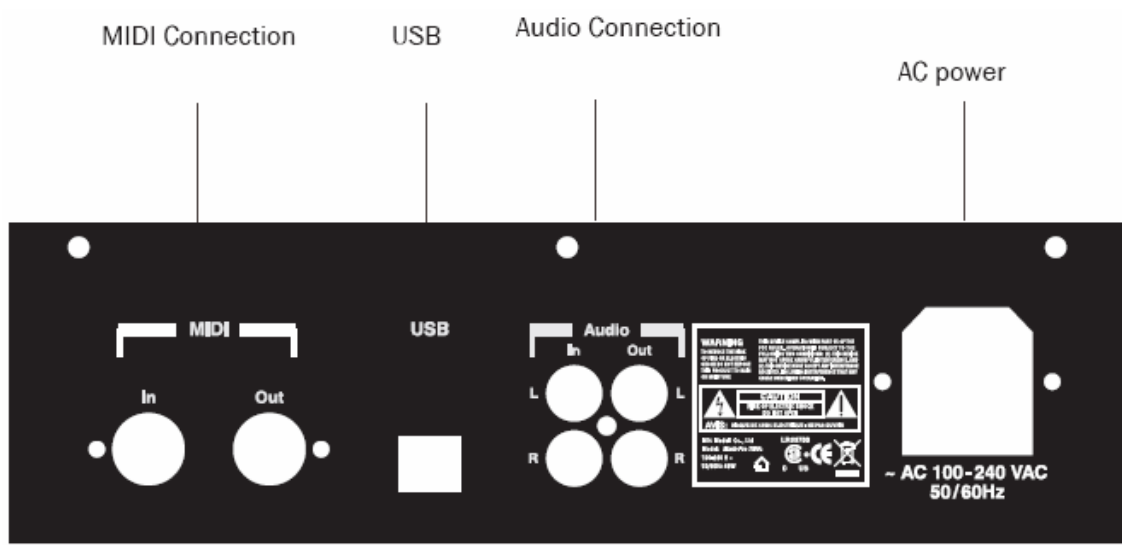
Figure 1-1   Mark PRO 2i rear panel

Rear Panel Features

Power Connector— AV 100~240 VAC 50/60Hz

Audio Connection – Balanced **1/4"** left and right audio output jacks to connect to an amplifier, mixer or sound system.

MIDI Connection – In, Thru/Out, and Out ports to connect the **Mark Pro 2i** to other MIDI devices to receive, pass, and send MIDI data.

USB – Transmit/receive MIDI message over USB with host system(typically, PC).

Mark Pro 2i Front Panel

Figure 1-2   Mark PRO 2i Front Left panel
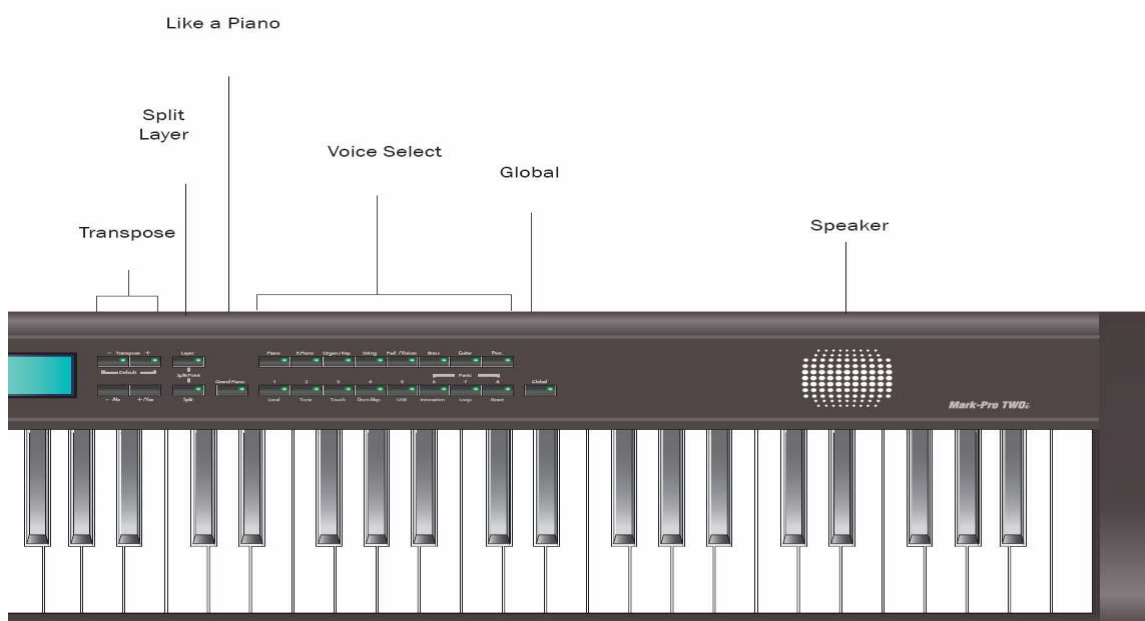
Figure 1-3   Mark PRO 2i Front Right panel

Front Panel Features

Figure 1-4   Mark PRO 2i Front left section

Volume Knob — Use the volume knob located on the far left of the front panel to adjust the volume. Set the volume to the minimum when turning on the instrument and adjust it to the desired level later. Moving the knob clockwise increases volume, while moving it counter clockwise decreases volume.
(turn to the left is Soft, right is Loud)

Demo/Edu. — The Mark-Pro 2i has 3 ensemble demos, 50 piano demos and 8 instrumental demos that will aquaint you with the sound of the Mark-Pro 2i.

Effect & Reverb — Use the buttons to select from two blocks of effects to apply effects and reverb to programs and setups.

Recording & Playing — The Mark-Pro 2i allows you to record and playback your performance. Two song spaces are available each with two tracks.

Metro & Rhythm — Use the buttons, you can change the tempo of the metronome.

Figure 1-5   Mark PRO 2i Front center section

3 X 7 Segment — Three character & Seven segment display.

Figure 1-6   Mark PRO 2i Front right section

Transpose — Use this button to change tonality, using Transpose + / Transpose – button can be up/down up to 2 octaves.

Split & Layer — Use the buttons you can add a voice other than strings or sounds (**Layer**) and divide the keyboard of the Mark-Pro2i into two, left and right, and assign a different voice for each(**Split**).

Grand piano — Use the button can be just as simple to use as an acoustic piano by disabling all of the non piano functions.

Voice select — Use the buttons selects the piano voice by default when turned on, which can also be selected by the Grand Piano button on the left as shown in the figure 1-6. And the Grand Piano voice, the Mark Pro-TWOi has 64 voices which can be classified to as 8 categories: 8 piano voices, 8 elec pianos, 8 organs/ keyboards, 8 strings, 8 pads, 8 brasses, 8 guitars/voices, 8 percussion sets.

Global — Use the button , in connection with the 8 buttons on its left (Local, Tune, Touch, etc) lets you to control various functions affecting the keyboard globally.
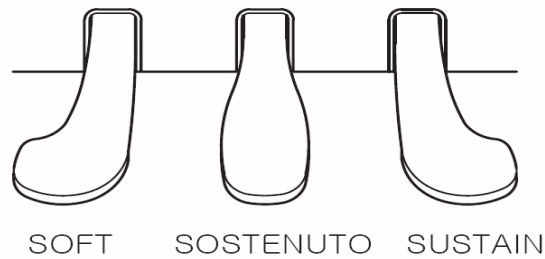
Figure 1-6   Mark PRO 2i Pedal

SUSTAIN — The Sustain pedal lets the notes ring on after the keys are released. Releasing the pedal will silence the sustained notes.

SOSTENUTO — Press the sostenuto pedal while holding a note on the keyboard, and the note will sustain as long as you hold the pedal. But all the subsequently play notes will not be sustained.

SOFT — The soft pedal makes the volume softer when pressed. But it will not affect the volume of notes that are already played.

Power On. Off.
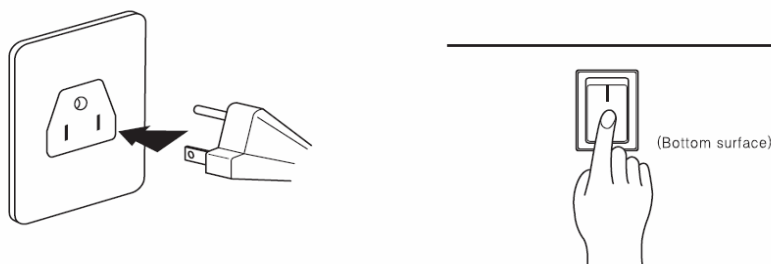
Figure 1-7   Mark PRO 2i Power On & Off

The Mark Pro 2i is a free volt product which can be used both on **110V and 220V**. You can power this digital piano by plugging it into a standard household power outlet. Make sure the power switch on the bottom surface of the keyboard is turned off before you connect the power cord to the electrical outlet.

After connecting to the outlet, you may turn on the power switch located at the bottom left of the keyboard. Check the main volume knob is fully down to the left. When the power switch is turned on, the front panel lights up. In 3 seconds the Mark-Pro 2i is ready to play.

Chapter 2
Mark Pro 2i Assembly

Introduction

This chapter contains all the procedures for the disassembly and reassembly of Mark Pro 2i as well as instruments with factory-installed. There are three main sections: Opening the Mark Pro 2i, Top Enclosure, Mark Pro 2 Keyboard Assembly.

⚡ **Warning**: If possible, save all user programs and setups before disassembly. For instructions.

Notes, Cautions, Warnings

Please pay special attention to all Notes, Cautions, and Warnings as they not only point out specific instructions.

Cables, Connectors

Flat Ribbon Cables

All flat ribbon cables with connectors are keyed, and therefore cannot be reversed. Most flat ribbon cables have locking cable clips. Be sure to reapply the clips when connecting cables. When disconnecting and connecting these cables, you must look for the marking on the edge of the cable denoting Pin 1 and be sure that you match it correctly with Pin 1 on the board.

Cable Routing

In some cases, tape secures cable connections or fastens cables to the Top enclosure. Always peel back the tape from one side when disconnecting cables so that the tape remains properly positioned.

Required Tools and Materials

- screwdriver

Installation

Checking the Parts

Check that you have all the parts below before you start assembling.

Item	No.	Item	No.
1. Main set	1EA	8. Screws for Side Panel and Keyboard (Rear)	2EA
2. Side Panel (Left)	1EA	9. Screws for Side Panel and Keyboard (Front)	2EA
3. Side Panel (Right)	1EA	10. Screws for Side Panel and Pedal Box	4EA
4. Pedal Box	1EA	11. Screws for Rear Panel	2EA
5. Rear Panel	1EA	12. Screws for keyboard and the stand	4EA
6. Support Legs	2EA		
7. Headphone Hanger	1EA		

Table 2-1 Mark PRO 2i All the parts list
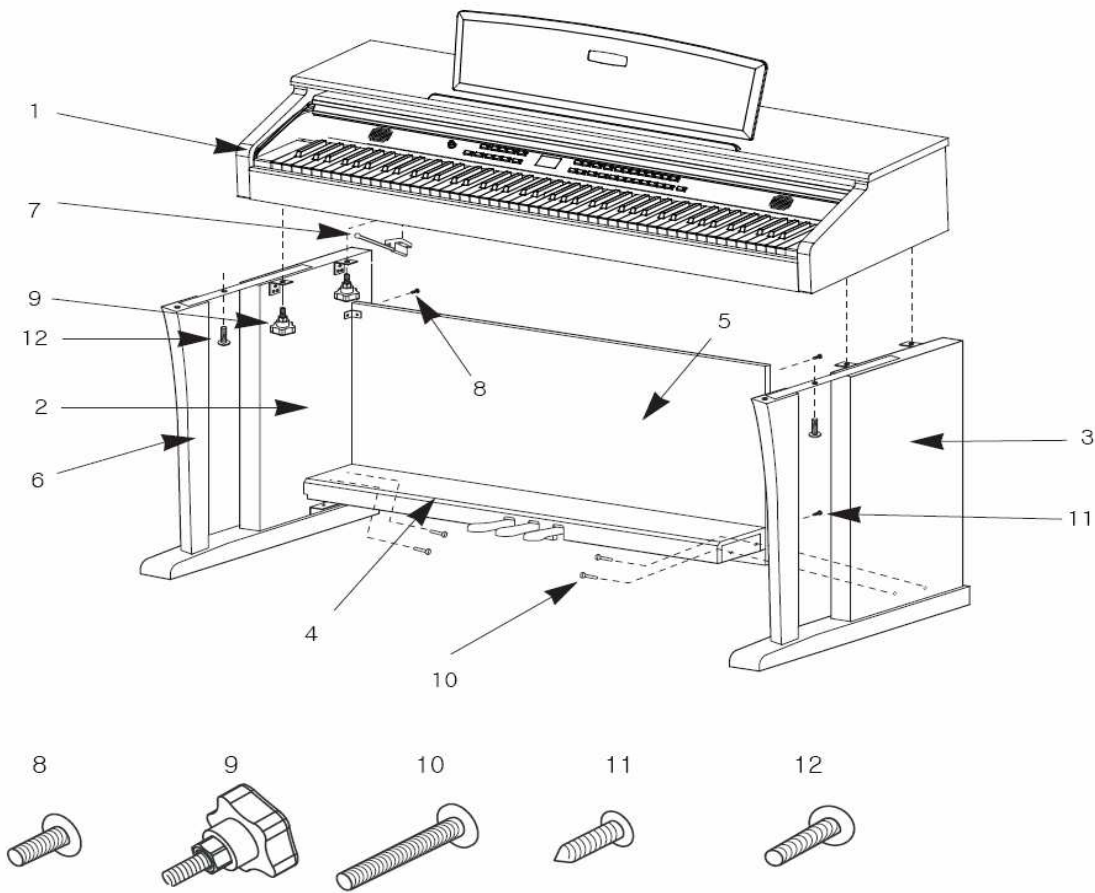
Figure 2-1   Mark PRO 2i Parts

Assembling the Stand

⚠   * Be careful when placing the Main set in the stand. Do not push down or pull forward the Main set without tightening all the screws on the stand.

Side Panel and Pedal Assembly
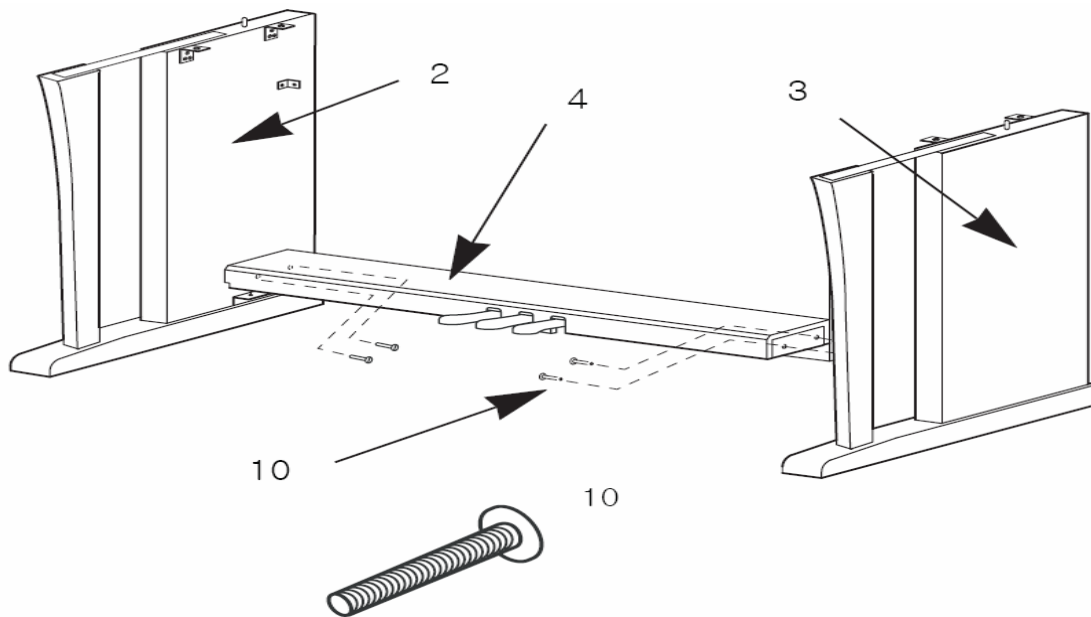
Figure 2-2   **Mark PRO 2i Side panel and Pedal Assembly**

1. Place pedal box 4 on the left side panel 2 and fasten the screw 10 on the hole.
2. Put on the right side panel 3 in the same way.
3. Take out the pedal cable from inside of the pedal box 4.

Rear Panel Assembly
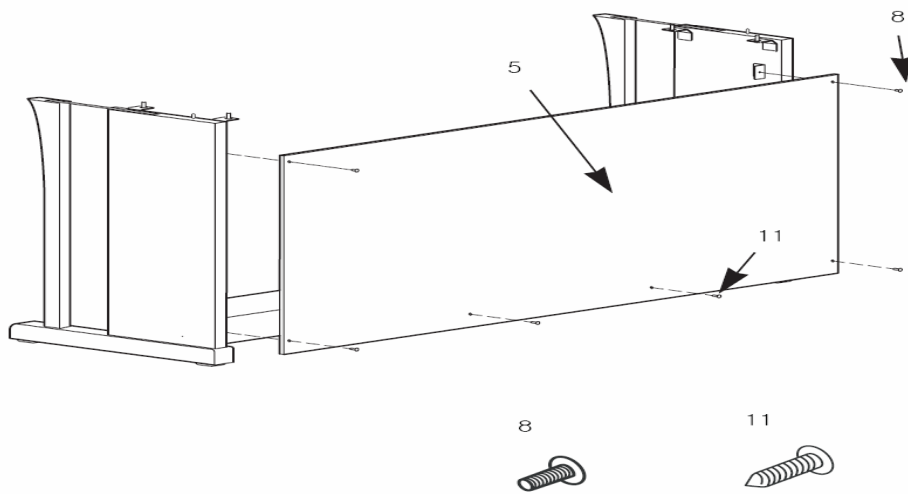
Figure 2-3   Mark PRO 2i Rear panel Assembly

1. Fit the rear panel 5 into side panel brackets and fasten the   screws 8.
2. After fastening all four screws of 8, fasten the screws 11 to lock to the pedal box.

Installing the Main set onto the Stand
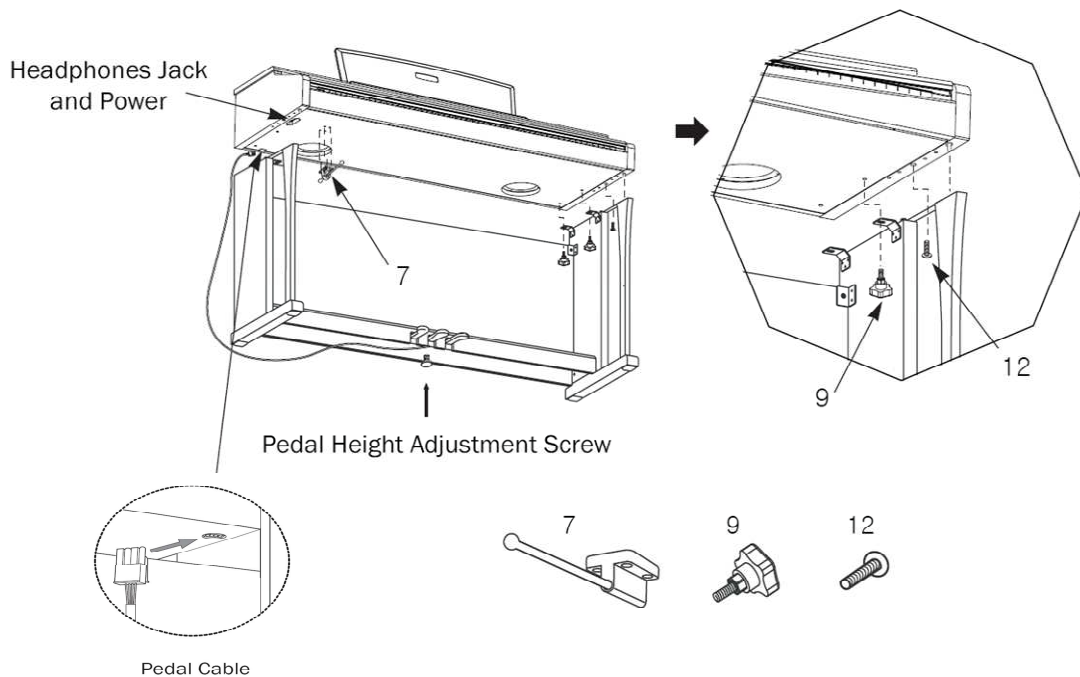
Figure 2-4   Mark PRO 2i Installing the Main set onto the Stand

1. Place the Main set on the stand so that the wood pegs on the top of the side panel fit into the holes on the bottom surface of the keyboard.
2. Attach the side panels to the Main set with the metal brackets. Use the bolt 12 for the front hole, and 9 for the rear.
3. Insert the pedal cable connector to the jack on the bottom surface of the Main set as shown in the left figure.
4. Locate the unit to the desired place and rotate the height adjustment screw until it supports the pedal box, preventing the pedal box from bending when you press the pedals.

   Be sure to install the adjustment screw and perform the adjustment procedure before depressing the pedals. Failure to do so may result in damage to the pedal box.
5. Attach the headphone hanger wherever you wish.
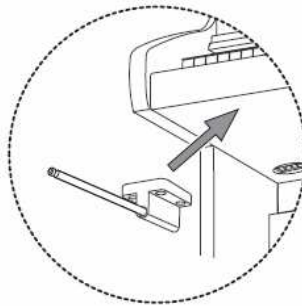
Figure 2-5   Mark PRO 2i Headphone hanger

Disassembling the Main set

Check the 5 steps below before you start disassembling.

1. Top Cover Disassembly
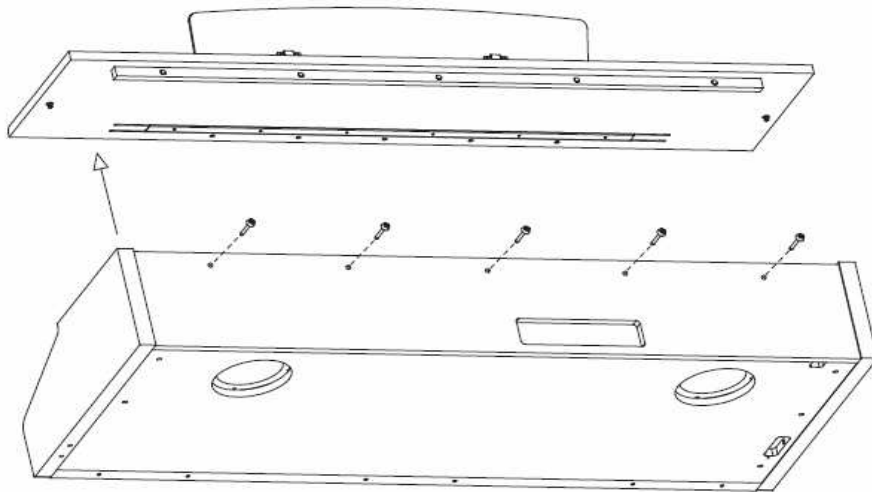
Figure 2-6   Mark PRO 2i Disassemble top cover

2. Dust Cover Disassembly
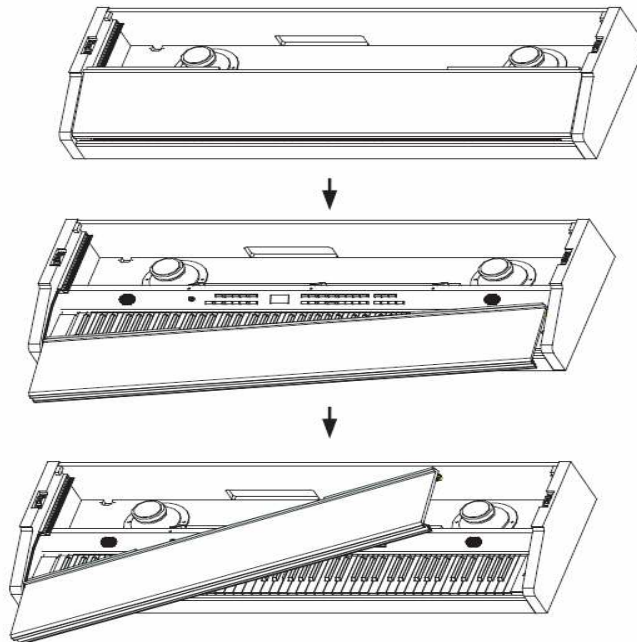
Figure 2-7   Mark PRO 2i Disassemble Dust cover

3. Grill Disassembly
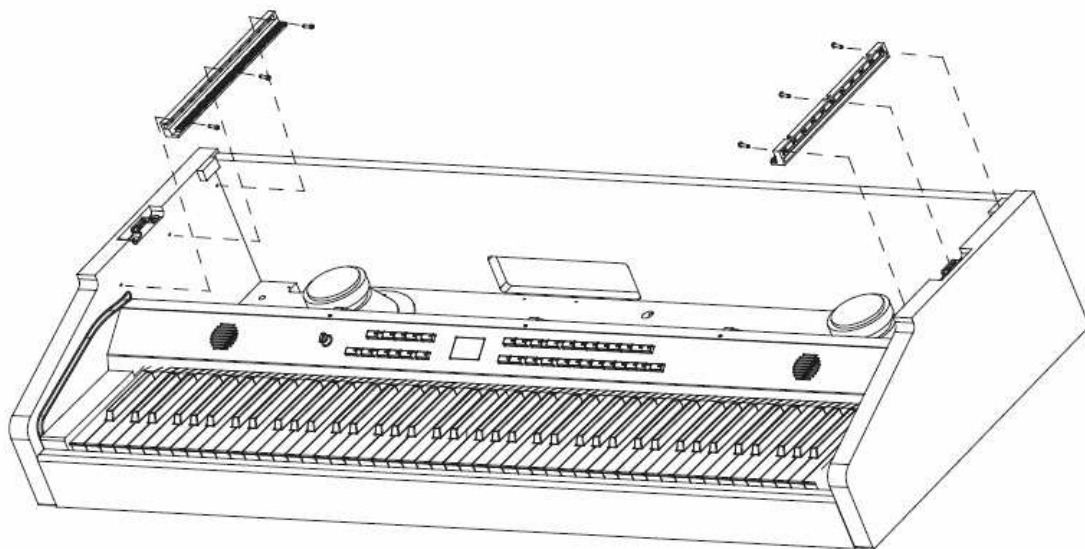
Figure 2-8   Mark PRO 2i Disassemble Grill

4. Front panel Disassembly
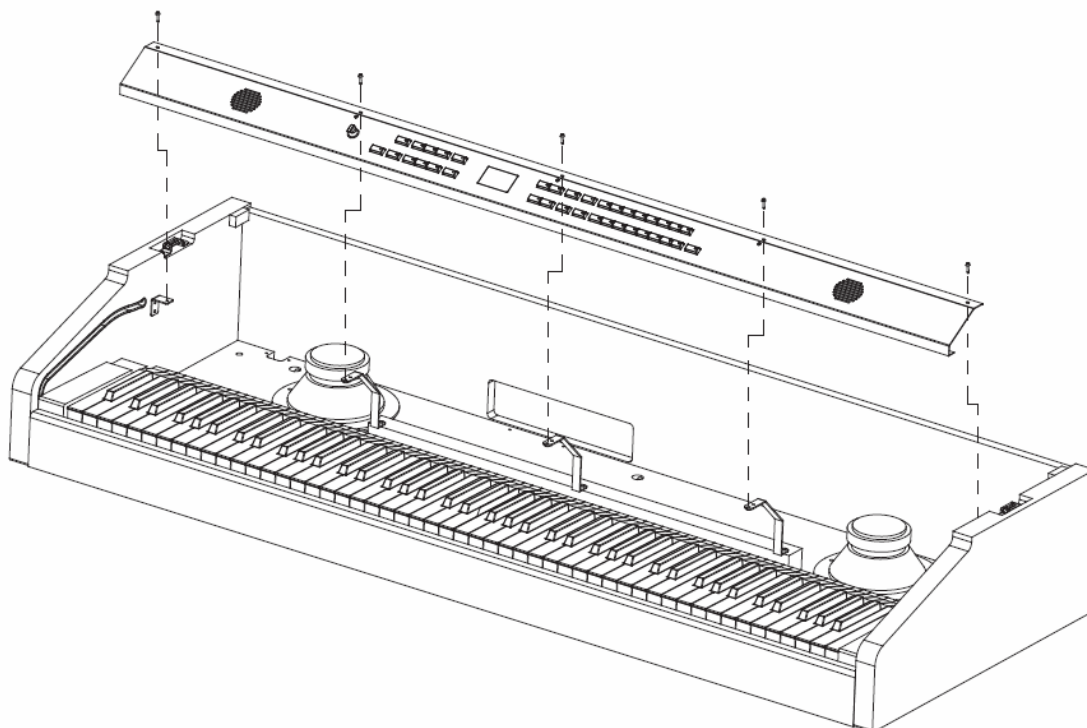
Figure 2-9   Mark PRO 2i Disassemble Front panel

5. Keyboard Disassembly
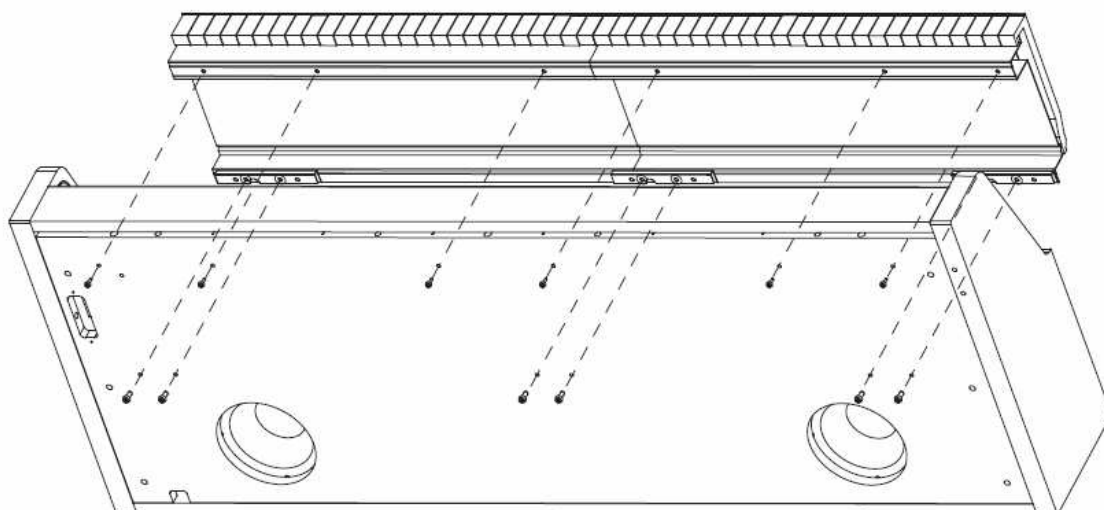
Figure 2-10   Mark PRO 2i Disassemble Keyboard

Bottom Surface

Pedal Cable Jack

Headphone Hanger

Two
1/4" Headphone Jacks
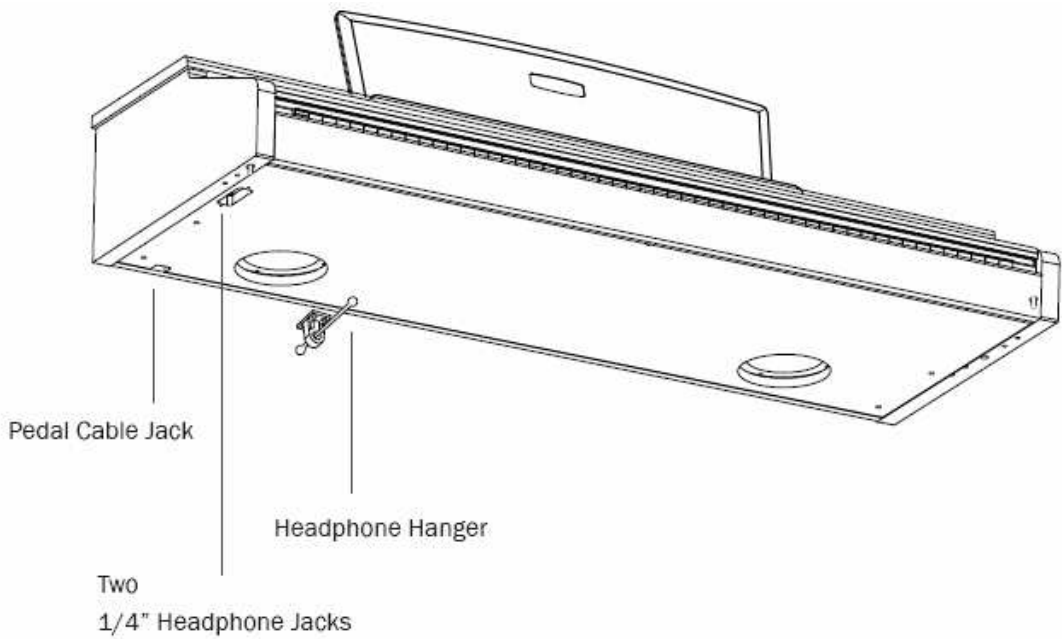
Figure 2-6   Mark PRO 2i Bottom surface

The Mark Pro2i has two 1/4" headphone jackes on the surface of the keyboard so that two can listen and play at the same time. The volume for both jacks is controlled identically by the main volume knob located at the far left side on the front panel.

Removing the Scanner Board

1.   Follow the procedure described to remove the top panel Assy.
2.   Following Steps 3–5, disconnect the cables listed in Table 2-2

Ref.	Name	Cable Type	Destination
J6	MIDI/CPU	standard wire	Engine Board
J4	Front Panel	flat ribbon	Front Panel Board
J2	Treble	flat ribbon	Keyboard Assembly
J3	Bass	flat ribbon	Keyboard Assembly
J12	Engine I/O	Standard wire	Amp Board
J9	Piano Pedals	Standard wire	Pedals

Table 2-2   Connector Board cables

3.   Disconnect the hook-up wire cable on the Scanner Board.

4.   Remove the cable locking clips and disconnect the flat ribbon cables from J2, J3, and J4. Be sure to set the cable locking clips safely aside so that you can install them when you reconnect the cables.

Note: The cables used throughout the Mark PRO 2i are bundled and routed so that their locations and destinations seem obvious. However, to avoid reversing the Bass and Treble cables when reconnecting, mark one or both cables designating B for Bass and T for Treble.

5.   Remove the all screws .

Note: Do not remove any other hardware from this portion of the rear panel.

6 .   Remove the Scanner Board.

Replacing the Scanner Board

1.   Hold the Scanner Board and position it so that the power switch, and the rear panel jacks are correctly positioned through the rear panel portion of the top enclosure.

2.   Install the all screws.

3.   Connect the ribbon cables in the following order.

Caution: Be sure to look for the marking on the edge of the cable denoting Pin 1 and that you match it correctly with Pin 1 on the board. Make certain that the wires are straight prior to inserting them into the connector and that each wire is correctly inserted into its respective position.

4.   Connect the flat ribbon cables from the Keyboard Assembly to J2 and J3. Be sure to install a cable locking clip on each connector.

5.   Connect the flat ribbon cable from the Front Panel Board to J4 on the Connector Board. Be sure to install a cable locking clip on the connector.

6.   Connect all the stranded wire cable from the Engine Board to the Scanner Board and from Front board to Scanner board..

Removing the Amp Board

1.   Follow the procedure described to remove the top panel Assy.

2.   Following Steps 3–5, disconnect the cables listed in Table 2-3

Ref.	Name	Cable Type	Destination
J1	Power supply	standard wire	POWER SUPPLY
J3	Main Volume	standard wire	Front Panel Board
J4	Headphone	standard wire	Headphone
J5	R-woofer	standard wire	Right Speaker
J6	R-woofer	standard wire	Right Speaker
J7	L-woofer	standard wire	Light Speaker
J8	L-woofer	standard wire	Light Speaker
J11	Mark Pro 2i power	standard wire	Engine Board
J12	Engine I/O	standard wire	Scanner Board
J13	USB	standard wire	Scanner Board
J15	Audio	standard wire	Engine Board

Table 2-3   Amp Board cables

3.   Disconnect the hook-up wire cable on the Amp Board.

4.   Remove the cable locking clips. Be sure to set the cable locking clips safely aside so that you can install them when you reconnect the cables.

5.   Remove the all screws .

Note: Do not remove any other hardware from this portion of the rear panel.

6 .   Remove the Amp Board.

Replacing the Amp Board

1.   Hold the Amp Board and position it so that the power switch, and the rear panel jacks are correctly positioned through the rear panel portion of the top enclosure.

2.   Install the all screws.

3.   Connect the ribbon cables in the following order.

⚠ **Caution**:   Be sure to look for the marking on the edge of the cable denoting Pin 1 and that you match it correctly with Pin 1 on the board. Make certain that the wires are straight prior to inserting them into the connector and that each wire is correctly inserted into its respective position.

6.   Connect all the stranded wire cable from the Engine Board to the Amp Board and from Front board to Amp board..

Removing the Front Panel Board

1.   Follow the procedure described on page 19 to remove the Connector Board.
2.   Following Steps 4 and 5, disconnect the cables listed in Table 4-3.

Top Enclosure

Ref.	Name	Cable Type	Destination
J4	FP Brige	Flat ribbon	Front Board
J5	FP Bridge	flat ribbon	Front Board

Table 4-3   Front Panel Board cables

3.   Remove the cable locking clip and disconnect the flat ribbon cable at J4, J5 on the Front Panel Board. Be sure to set the cable locking clip safely aside so that you can install it when you reconnect the cable.

4.   Remove the eighteen screws that secure the three PC board clamps
5.   Remove slider volume handle and 4 control knob handles also
6.   Lift the Front Panel Board up from the top enclosure.

⚠ **Caution**: Each switch button cap uses a set of small pegs to mount the cap to the Front Panel Board. The button caps are mounted individually or in clusters. If a cap becomes separated from the board, be careful that a peg is not inadvertently broken.

Replacing the Front Panel Board

1. Position the Front Panel Board onto the top enclosure, then raise the top enclosure up slightly to verify that the volume slider and switch button caps are correctly positioned through their openings in the top enclosure.

2. Align the center screw holes of the three-hole groupings on the front panel edge of the board with the thread marks in the extrusion and install the two screws that secure the front panel edge. See Figure 4-8.

3. Connect ribbon cable cables in the following order.

⚠ **Caution**: Be sure to look for the marking on the edge of the cable denoting Pin 1 and that you inserting them into the connector and that each wire is correctly inserted into its respective position. connector..

4. If you have disconnected the flat ribbon cable from J4, J5, reconnect it. Be sure to install the cable locking clip.

Removing the Engine Board

1. Following Step 2, disconnect the cables listed in Table 4-4.

Ref.	Name	Cable Type	Destination
J6	Mark Pro 2i PWR	stranded wire	Amp Board
J4	MIDI & CPU	Standard wire	Scanner Board
J9	Mark Pro 2i AUDIO OUT	standard wire	Amp Board
J10	Mark Pro 2i USB	standard wire	Amp Board

Table 4-4   Engine Board cables

2. Disconnect the stranded wire cables from J6 to J10.

3. Remove the Engine Board

Replacing the Engine Board

1. Place the Engine Board in position on the top enclosure.

2. Align the center screw hole on the front panel edge with the thread marks in the extrusion and install the screw that secures the front panel edge.

3. Connect the stranded wire cable from the Connector Board to on the Engine Board.

⚠ **Caution**: Be sure to look for the marking on the edge of the cable denoting Pin 1 and that you match it correctly with Pin 1 on the board. Make certain that the wires are straight prior to inserting them into the connector and that each cable is correctly inserted into its respective position.

MARK-PRO TWO i CONNECTION DIAGRAM

14-NOV-2007, TW KIM
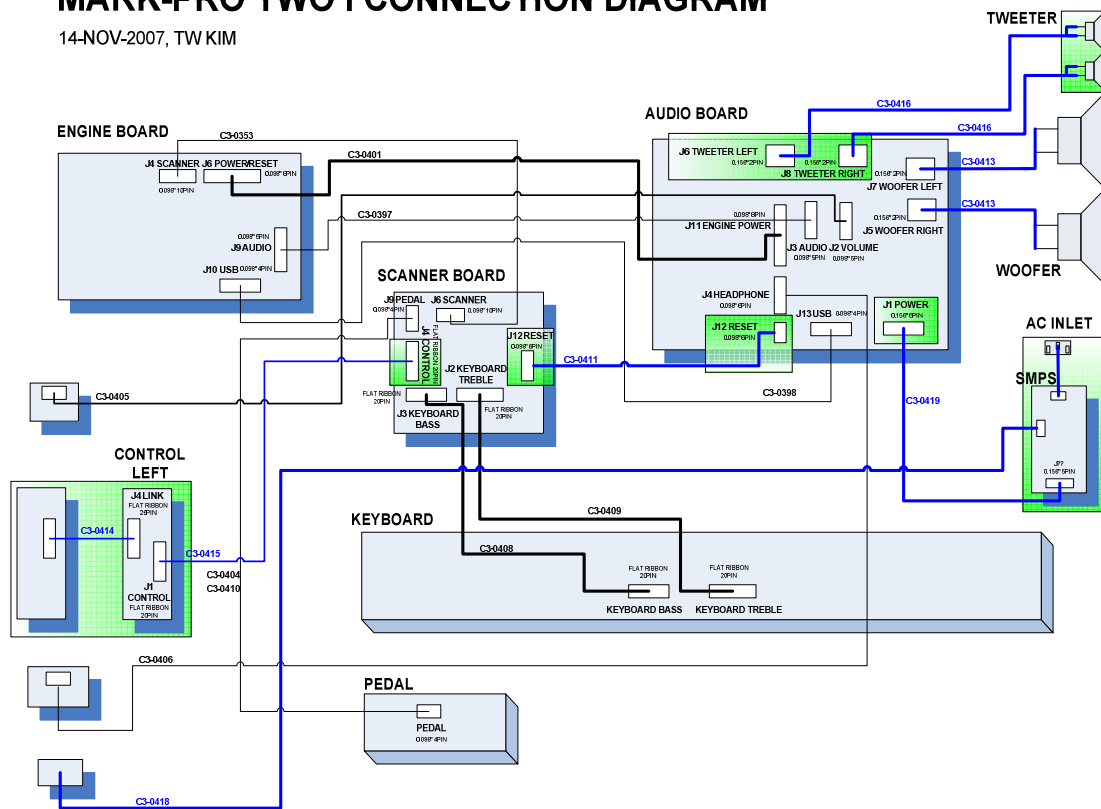
Chapter 3
Diagnostics

Diagnostic Tests

The following lists the diagnostic tests available for the SP2X.

- ROM
- RAM
- MARA
- Sound ROM
- DRAM
- Sine
- MIDI
- NVRAM

Warning: Some diagnostic tests erase user programs and setups. If possible, be sure to save all user programs and setups, before entering diagnostics.

Entering Diagnostics

Apply power to the unit. Press **Global** button one time while three dots blinking in the 7-segment. After a while, segment display the following message.
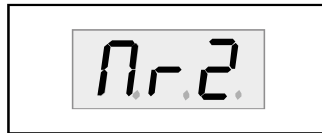
Figure 3-1   7 segment example, entering diagnostics

Press either the **+/Yes or -/No** until . Appears in the segment.

And Press the **Transpose +** button for enter into menu item display the following.

Figure 3-2   7 segment example, entering diagnostics

Press **Transpose +** button to select the run one test mode. To select the run burn-in test mode, press either the **+/Yes** or **-/No** button then press the **Transpose +** button to begin the tests.

Diagnostic Test Modes

Run One Test

Run One Test allows you to select an individual test, or to step through and run each available test. To step through the different tests, the **+/Yes** or **-/No** button Press the **Transpose +** button to select the test.

Figure 3-3   7 segment example, Run One Test

At the completion of a test, whether pass or fail, press the **Transpose -** button to exit the test. Press either the +/**Yes** or -/**No** button to advance to the next test or another test in the sequence.

At the completion of a test, press the **Transpose -** button to return to the test menu. To exit diagnostics, turn the power off and on to return to normal operation.

Run Burn Test

Burn-in mode, segment display and   continuously runs the following sequence of tests.

- ROM   **Figure 3-4 segment example, Run Burn Test**
- RAM
- MARA
- Sound ROM
- DRAM
- MIDI

The 7 segment displays the test results at the completion of each test. To stop the burn-in process and view the test results for each test run, press the **Transpose -** button. Use the **+/Yes** or -/**No** button to scroll through the results of each test.

To exit Run Burn-in and return to the main menu, press the **Transpose -** button.
To exit diagnostics, turn the power off and on to return to normal operation.

Test Results

At the completion of an individual test, the segment displays the test results. An expected.

Result is | `PAS` | means passed, | `FAL` | means failed.
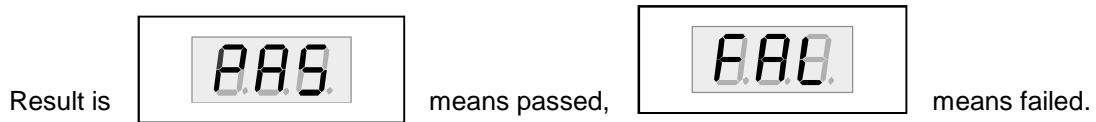
Figure 3-5   segment example, Test results

Description of Tests

ROM | `ROM` |

This test checks the software data (engine, boot, and setups) stored in Flash ROM on the Engine Board.

RAM | `rAM` |

The RAM test writes to the microprocessor RAM space and verifies that the write was successful. A failure of this test may indicate a problem with the RAM or related circuitry in the Engine Board.

MARA | `MAr` |

This test performs a read-write of the MARA registers and verifies that the data written can be read back successfully. A failure of this test may indicate a problem with a MARA, related circuitry or the Engine Board.

Sound ROM | `SrA` |

This test confirms that the Sound ROMs can be read by the MARA by performing a checksum of the Sound ROMs. The computed checksum is then compared to the stored checksum. A failure of this test may indicate a problem with a Sound ROM (U47), or the Engine Board.

Delay RAM

This test performs a quick read-write of the internal RAM and verifies that the data was successfully written and retained. A failure of this test may indicate a problem with the RAM or the Engine Board.

Sine Wave

This test generate sine wave from MARA, wave sample located in Sound ROM, and plays through DAC and analog audio output. A failure of this may indicate a problem with a MARA or Sound ROM (U47), or the analog audio section including DAC and OP-AMPs.

Caution: The output level of sinewave test is very loud!.

MIDI

The MIDI test performs a loop-back of the serial port by sending a 23-byte pattern over the external MIDI link. This test requires a MIDI loop (a MIDI cable that connects two MIDI jacks). The test will fail if a MIDI cable is not connected between two MIDI jacks. Be sure to run this test with MIDI cables connected as follows:

Note: Be sure to use a known working MIDI cable!

Connect a MIDI cable to the MIDI In and MIDI out jacks and run the test.

A failure of this test could be caused by failure of the serial port, other MIDI circuitry, or a problem on the Amp Board or the Engine Board.

NVRAM

The NVRAM(rM2) test performs part of the SRAM back up by built in lithium coincell battery. Test starts with write test pattern to NVRAM area and after power cycle, read pattern again.

A failure of this test could be caused by low battery voltage or problem of battery-back related circuit.

Chapter 4
Troubleshooting
Introduction

Cables, Connectors

Cable Routing

In some cases, tape secures cable connections or fastens cables to the bottom enclosure. Always peel back the tape from one side when disconnecting cables so that the tape remains properly positioned.

Surface-Mount Devices

The removal and replacement of surface-mount devices requires training and the proper equipment. If you do not have the training or equipment to remove or replace surface-mount devices, contact the service department to order a board replacement. International service technicians should contact their appropriate Young Chang Distributor.

Boot Block

Use the Mark Pro 2i's Boot Loader to enter Diagnostics or perform a Hard Reset to the unit. You can also install operating system updates and ROM objects into Flash ROM.

Entering the Boot Block

Apply power to the unit. When the [8.8.8.] message appears in the display, quickly press and release the **Global** button. The segment display the main menu of the Boot Loader and the first available option. Use the **+/Yes** or **-/No** button to advance to the next option. The menu options are as follows;

Install Engine $\boxed{\quad \mathtt{o.o.S.} \quad}$

— Installs new operating system software upgrades.

Update Boot block $\boxed{\quad \mathtt{u.b.t.} \quad}$

— Installs boot block updates.

Run Diagnostics $\boxed{\quad \mathtt{d.i.g.} \quad}$

— Enters the diagnostic test menu. For a complete list of tests
and the procedure to execute the diagnostic tests.

Run Engine $\boxed{\quad \mathtt{E.n.g.} \quad}$

— Exits the boot block and returns the unit to normal operation.

Hard RESET $\boxed{\quad \mathtt{r.S.t.} \quad}$
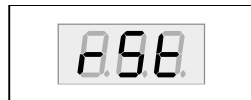
— Clears the memory to factory default settings.

Resets

Hard Reset

There are two ways to perform a Hard Reset to the Mark PRO 2i.

Press the **Global** button and press the **Reset** button segment displays following screen and press

+/Yes button   segment displays
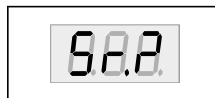
an message. Press the **+/YES** button again segment finally displays

to continue.

Software Updates

A computer with a MIDI interface and sequencer is necessary to transfer software to your Mark Pro 2i units MIDI Sysex.

File Formats

Software upgrades are stored as standard MIDI files. Filenames are in the format MP2VV.MID, where X is the software block and VVV is the version number (V.VV). The following lists the possible values for X. Never install files with names that don't conform to this format; it won't work.

bk—boot block for keyboard models
k—operating system software for keyboard models.

Installing the Operating System or Setups

⚠ **Warning**: This procedure requires performing a hard reset. All user programs and setups will be erased. Before continuing, be sure to save all user programs and setups.

1. Connect a MIDI cable from the MIDI Out port of the computer interface or sequencer to the MIDI In port on the Mark pro 2i.

2. Open the first .MID file using the sequencer program.

3. Turn on the Mark Pro 2i and follow the procedure to enter the Boot Block.

$$\boxed{\textit{uoS}}$$

4. Press the **Enter** button to select **"uOS"**

5. The segment shows "uOS". Start playing the MIDI file from the sequencer.
While a file is loading, the bottom line of the display shows the progress. If the display continues to show after starting the sequencer, stop and restart the sequence.

$$\boxed{\textit{uoS}} \qquad . \ . \ .$$

$$\boxed{\textit{ot}}$$

6. After the file is loaded, the display will show "oK".

7. If you have additional files to load, open the file from the sequencer and begin playing it.

8. Press the **Cancel** button twice to return to the main menu. Scroll to Hard Reset and select.

Installing a New Boot Block

⚠️ **Warning**: This procedure performs a hard reset. All user programs and setups will be erased. Before continuing, be sure to save all user programs and setups.
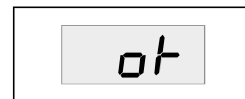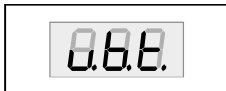
1. Connect a MIDI cable from the MIDI Out port of the computer interface or sequencer to the MIDI In port on the Mark Pro 2i.

2. Using the sequencer program, open the first **.MIDI** file.

3. Turn on the Mark Pro 2i and follow the procedure to enter the Boot Block.

4. Press the Enter button to select .

$$\boxed{U.b.b.}$$
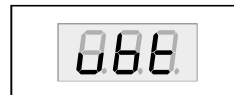
6. The segment shows $\boxed{U.b.b.}$. Start playing the MIDI file from the sequencer. While a file is loading, the bottom line of the display shows the progress. If the display

continues to show $\boxed{U.b.b.}$ after starting the sequencer, stop and restart the sequence.

7. After the file is loaded, the unit will reset.

Replacing the Battery

The Mark Pro 2i uses a flat three volt Lithium coincell battery. When the battery voltage runs low, the unit boots up with a low battery message.

✎ **Note**: The battery voltage can be checked at anytime using the Scanner Diagnostics.

Accessing the Battery

1.   Place the Mark Pro 2i upside down on a flat protected surface.

2.   Remove top assembly and set it safely aside.

Removing the Battery

The battery (CR2032) in the Mark Pro 2i is mounted into a holder on the Engine Board and is accessible when the access panel is removed.

1.   Insert a flat plastic tool (plastic knife, pen cap, etc.) into one of the openings between the battery and the holder to lift the battery.
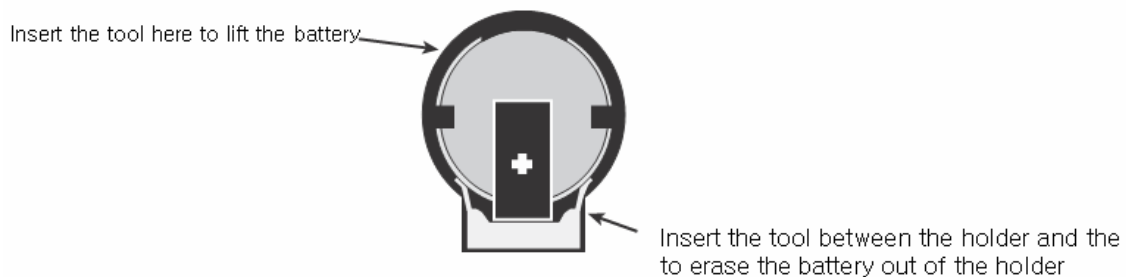
Figure 4-1   Battery and Holder

2.   Ease the battery out of the holder. If necessary, insert the plastic tool at the bottom of the holder (closest to the Engine Board) to remove the battery.

Installing the Battery

1.   Position the battery over the holder so that the positive terminal is pointing to the Engine Board.

2.   Slide the battery into the holder and apply slight pressure until it snaps into place.

3.   Install the seven screws to secure the top assembly.

Mark Pro 2i Scanner test

The Scanner Tests for the Mark Pro 2i include separate tests for the front panel buttons and LEDs, the keyboard, and the pedals.

To enter the Scanner Tests, first turn on the Mark Pro 2i. Once the Mark Pro 2i is on and ready to play, simultaneously hold down the Effect, **Transpose +** and **Transpose -** buttons. All front panel LEDs will flash and the segment will display the following:

Figure 4-2   Segment example, Mark Pro 2i scanner tests

"SP2", "SCn", then "vX.Y" are displayed briefly in sequence vX.Y means version of the scanner installed the unit.

"bAt" means "Battery" and the voltage is X.Y volts. Normal battery voltage is around 3.0 volts where 3.2v is typical for a new battery and less than 2.8 means the battery is nearing the end of its life and has only a few months left. At 2.2 volts, warning will begin. A completely dead oe missing battery may not read exactly 0.0v but will certainly read less than 1.0v.

Last is a display of which option diodes have been installed. First "jPr" is displayed briefly then 4 vertical lines will show briefly. Each line represents an option diode from Opt1(leftmost) to Opt4(rightmost) A long line(2 segments long) mans the corresponding diode is installed while a short line(1 segment) is not installed. Option settings normally tell the scanner software the keyboard length and weight and should match the actual unit.

Front Panel Buttons

When a button is pressed, its LED(if any) turns on and its matrix address is shown in the display. Each press of Knob Mode will right the next Knob Mode LED in a top down sequences. Rhythm and Program button has two color led, each button press, RED and GREEN LEDs turns on alternatively.

Keyboard

When a keyboard key is pressed, the key's musical pitch should be shown in the display. The first character should be the note name .The second character should be blank for white keys or a "high o(sharp sign) for black keys. The third character should be the octave number from 0 to 8. Thus Middle C will be shown as "C 4"

Besides the key name, the 3 decimal points in the display reveal important information about the rubber switches under the key being pressed. When the key is pressed partially, the left decimal point will indicate that the first rubber switch and made contact. When the key is pressed further, the middle decimal point indicates that the key is pressed further, the middle decimal points indicates that the second rubber switch has also made contact. Thus when a key is pressed slowly, the following sequence should be observed exactly 0.

Blank Display -> Correct Key name and left decimal point -> Correctly Key name and left and center decimal points

If the correct key name and only the center decimal point lights, then there is a defect associated with the first switch. If all 3 decimal points light, then either more than one key is processing at once or there is a short circuit in the connecting or on the connector.

Switch Pedals

If a single switch pedal is plugged into the SW jack, operating it should case a response in the display. For Kurzweil pedals , pressing the pedal should cause "S1C" to be displayed while releasing it should cause "S1o" to be displayed. Other vender's pedals may cause the opposite response. If a dual pedal is plugged in, then the Sustain (right) pedal should display as described above. The Soft pedal(left) should cause "S2C" and "S2o" to display. As with the buttons , the display should respond immediately and without flickering if pedal working properly.

Power Problems
Dead

1.   Before opening the unit, verify the following:

- The AC outlet is supplying power.
- The power jack is properly connected to the unit.

2. Check the power switch, power jack and AC adapter.

3. Refer to the Interconnect Diagram. Check all related connections.

4. Refer to the Amp Board schematics and check all supply voltages.

Audio Problems

No Audio

1. Refer to the Interconnect Diagram.

2. Check the standard wire from J9 on the Engine Board to J15 on the Amp Board.

3. Check the solder connections at the connectors.

4. Refer to the Engine Board schematics and check the signal activity on the DAC, U28.

6. Trace the signal path.

Front Panel Problems

Buttons, Knobs or Controllers not working

1. Run the Scanner Tests.

2. Refer to the Interconnect Diagram.

3. Check all related cables.

4.   Disconnect and reseat the cables.

5.   Check the solder connections at the connectors.

6.   Check front panel ribbon cable(s).

7.   Refer to the Scanner Board schematics and check U12, IC Scanner 38869, for signal activity.

Keyboard Problems

Dead Keyboard

1.   Check the flat ribbon cables connecting the keyboard Bass and Treble Contact Boards to the Scanner Board, locations J2 and J3. Be certain that the cables are not loose or damaged.

2.   Disconnect and reseat the cables.

3.   Refer to the Scanner Board schematics.

4.   Check U12, IC Scanner 38869 on the Scanner Board for keyboard signals.

5.   Trace signal path.

.   Find and replace bad component(s) or order a board replacement. Dead Note(s)

One or More in a Section

1.   Remove related contact board.

2.   Check contact strip for dirt, damage or wearing. Clean dirty contacts with denatured alcohol. Replace damaged or worn contact strip.

3.   Install contact strip.

4.   If section is still dead, remove strip and check contact board for shorts, cold solder joints,

etc.

5.   Find and replace bad component(s) or order replacement board.

Mechanical Noise

Check keyboard for broken key weights, support brackets, or ripped contacts.

Chapter 5
Parts Lists

Introduction

The parts lists included in this chapter cover all models of the Mark Pro 2i. Some printed circuit boards and assemblies are used in more than one model. Therefore, the parts lists on the following pages are listed under these headings:

The following two tables list the printed circuit boards and assemblies by model.

Mark Pro 2i Printed Circuit Boards and Assemblies

Engine Board

Part Number	Part Name	Description	Q'ty	Reference
N052901610	CAP ELECT GP	10uF 16V 20% SZB SMT	4	C1,C200,C202,C208
N052007825	CAP CER X7R	0.1UF 50V 10% X7R 0603	74	C2~4,C8~11,C12~14,C19,C20,C51,C55,C 56,C60,C62,C65,C67,C68,C71,C73,C129,C 130,C132~163,C165~168,C170,C172~183 ,C206
N051007810	CAP CER	1000PF 50V 10% X7R 0603	6	C5,C59,C64,C70,C75,C128
N052007809	CAP CER NPO	100pF 50V 5% NPO 0603	1	C6
N052901622	CAP ELC GP	220UF 10V 20% SZE SMT	2	C17,C209
N052007814	CAP CER NPO	15pF 50V 5% 0603	1	C32
N052007833	CAP CER NPO	33pF 50V 5% NPO 0603	2	C33,C34
N052007827	CAP CER NPO	270PF 50V 5% NPO 0603	8	C58,C61,C63,C66,C69,C72,C74,C76
N052901011	CAP ELECT GP	22uF 10V 20% SZC SMT	1	C164
NEW	CAP CER NPO	22pF 50V 5% 0603	2	C169,C171
N052901601	CAP ELECT GP	100uF 16V 20% SZC ZMT	2	C201,C204
NEW	CAP CER X7R	0.01UF 50V 10% 0603	1	C207
N253000712	DIODE SHTKY SIG 5NS LO-C S	BAS40 SOT-23	2	D2,D11
N053000802	DIODE SWITCH	1N4148 SMT DL-35	2	D6,D8
N053000703	DIODE RECT GP SMT 1A S1A S	1N4001 1206	1	D7
N041030150	HEADER DUAL 0.1"SQR 50POS	DIGIKEY S2012-50-ND	1	J1
N041030003	CON HDR SIP 0.1" SQR PIN JMPR	3P	2	J2,J14
N041034010	HEADER .098"SP 10P	10P	1	J4
N041034008	HEADER .098"SP 8P	(22-03-5085)	1	J6

N041034005	HEADER .098"SP 5P	(22-03-5055)	1	J9
N041034004	HEADER 0.098"SP 4P(22-03-5045)	YDP2000N	1	J10
N035040201	BATTERY HOLLDER TOSHIBA	(BV-32) PC-88	1	J13
N041030002	HEADER .1"SP SGL ROW 2P	(22-03-2021)	1	J16
N055001505	IND FE BD 2.5-TURN SMT		2	L3,L15
N055001509	IND FE BD SMT	500mA 600 OHM @ 100MHz 0805	3	L13,L14,L16
N054000102	TRANSISTOR	MMBT3904 SOT-23	1	Q1
N054010101	TRANSISTOR PNP	KSA931 TO-92L	1	Q2
N054000802	TRANSISTOR	MMBT2222L SOT-23	1	Q3
N051100010	RES NET QUAD ISO	10KΩ5% 1/16W 3.2mmX1.6mm	4	RN1,RN2,RN3,RN4
N051102103	RELAY, 5V DPDT	(G6H-2-DC5)	2	RY1,RY2
N051064130	RES CF	1.3KΩ 5% 1/16W 0603	1	R1
N051064220	RES TF	2.2KΩ 5% 1/16W 0603	2	R2,R7
N051064100	RES CF	1KΩ 5% 1/16W 0603	3	R3,R30,R54
N052064015	RES TF	1.5Kohm 5% 1/16W 0603	2	R4,R87
N051064470	RES TF	4.7 kΩ 5% 1/16W 0603	3	R5,R80,R85
NEW	RES TF	10KΩ 5% 1/16W 0603	19	R9,R12,R13,R14,R18,R55,R69,R70,R72,R73,R74,R75,R78,R104,R105,R106,R107,R108,R109
N051064010	RES TF	100ohm 5% 1/16W 0603	2	R19,R32
N051064022	RES TF	220Ω 5% 1/16W 0603	1	R22
NEW	RES TF	330Ω 5% 1/16W 0603	2	R24,R91
N051064109	RES CF	1.0MΩ 5% 1/16W 0603	1	R27
N051064820	RES TF	820 OHM 5% 1/16W 0603	1	R29
NEW	RES TF	10.7K OHM 1% 1/16W 0603	8	R35,R40,R41,R46,R47,R53,R56,R61

NEW	RES TF	4.75K OHM 1% 1/16W 0603	17	R36,R37,R38,R39,R42,R43,R44,R45,R48,R49,R50,R51,R52,R57,R58,R59,R60
N051064004	RES TF	47Ω 5% 1/16W 0603	1	R68
NEW	RES TF	18ohm 1% 1/16W 0603	2	R81,R82
N051064109	RES CF	1.0MΩ 5% 1/16W 0603	3	R83,R84,R86
NEW	RES TF	620ohm 5% 1/16W 0603	1	R110
NEW	RES TF	120ohm 5% 1/16W 0603	2	R111,R112
NEW	RES CF	196OHM 5% 1/16w 0603	1	R113
NEW	RES CF	52ohm 5% 1/16W 0603	1	R114
N055004301	EMI FILTER,DUAL	EXC-EMT470BT	1	T2
N262001301	IC MC 68331CPV25	MOTOROLA	1	U1
N062100410	IC MEM SRAM 256kX16 55nS	TSOP44-400 LOW PWR	1	U3
N262005532	IC FLASH MEMORY	AM29F160D	1	U4
NEW	IC LOGIC	74LCX139 TSSOP16	1	U9
NEW	IC MEM DDR SDRAM 2Mx16x4	MT46V8M16TG(MICRON)	1	U11
N061007143	IC LOGIC	IC DIG 74LCX162245 16-Bit BUS XCEIVER	2	U12,U13
N061007142	IC LOGIC	IC DIG 74LCX2245 8-Bit BUS XCEIVER	1	U15
N061000910	IC LOGIC	NC7SU04 UNBUF INV SoP23-5	2	U22,U24
N062004905	IC IF UART ST16C550 W/FIFO	PLCC44P	1	U23
N062005704	IC GAL 16V8A-15QJ	SMT,PLCC20	1	U26
N064003511	OPAMP	IC ANA OPAMP NJM4580 DL BIP LO-NOIS SOP8-160	2	U27,U30
N062004923	DAC	IC IF DAC AK4382VF DL 24B DS +5VS VSOP16	1	U28
N064003502	IC LINEAR +5V	LM78M05 500mA TO-220	1	U29

N061007144	IC LOGIC	74VHC14 SOP14-150	1	U38
N061011008	IC LOGIC	74AC08 SOP14-150	1	U39
NEW	IC ASIC MARA	FBGA388	1	U46
N083071801	IC MASKROM OKI MR27V128000J	SP2, 830178-001	1	U47
NEW	IC USB FUNCTION GENERAL PURPOSE		1	U48
NEW	IC REG ADJ	LM1117SX-ADJ TO-263	2	U55,U56
NEW	IC REG 2.5V FIXED	LP2992IM5-2.5	1	U57
N059010062	XTL 24.576MHZ +/-50PPM FND	18PF SMT 아부라콘(A245K9Y)	1	X2
N059010080	XTAL 6.0MHz FND PAR	50ppm SMT HC49	1	X4
N035040105	BATTERY COINCELL 3V 195mah	CR2032, TOSHIBA	1	@J13
N041010302	JUMPER CAP	J2	1	J2

Scanner Board

Part Number	Part Name	Description	Q'ty	Reference
N052007402	CAP CER X7R	1000PF X7R 10% 0603	4	C8,C24,C25,C26
N052007503	CAP CER X7R	0.1UF 50V 10% 0603	8	C4,C7,C9,C10,C11,C12,C14,C16
N052007033	CAP CER NPO	33pF 50V 5% NPO 0603	2	C5,C6
N053000802	DIODE SWITCH	1N4148 SMT DL-35	1	D5
N041031220	HEADER .1"SP DUAL ROW 20P	(057-020-153)	3	J2,J3,J4
N041034010	HEADER .098"SP 10P	(22-03-5105)	1	J6
N041034004	HEADER .098"SP 4P	(22-03-5045)	1	J9
N041034006	HEADER .098"SP 6P	(22-03-5065)	1	J12
N055001505	IND FE BD 2.5-TURN SMT		1	L1
N051100010	RES NET QUAD ISO	10KΩ5% 1/16W 3.2mmX1.6mm	6	RN1,RN2,RN4,RN9,RN10,RN14
N051100011	RES NET QUAD ISO	100Ω5% 1/16W 3.2mmX1.6mm	8	RN3,RN5,RN6,RN7,RN8,RN11, RN12,RN13
N051101790	RES CF	1.0MΩ 5% 1/16W 0603	3	R1,R10,R99
N051101757	RES CF	10KΩ 5% 1/16W 0603	28	R2,R3,R4,R5,R6,R7,R8,R11,R12,R13,R17,R18,R20,R21,R22,R24,R26,R27,R28,R29,R30,R38,R40,R43,R46,R48,R52,R53
N015101714	RES CF	110Ω 5% 1/16W 0603	5	R14,R15,R42,R45,R47
N051101705	RES CF	4.7KΩ 5% 1/16W 0603	1	R35
N051101747	RES CF	4.7MΩ 5% 1/16W 0603	1	R36
N061014003	IC LOGIC	MC74HC541DW SOP-20	1	U2
N262100701	IC M38869 FFAGP	FLASH MEMORY	1	U12
N059010081	XTL 6.144MHZ +/-50PPM	PAR 18PF SMT	1	Y1

Audio Board

Part Number	Part Name	Description	Q'ty	Reference
	CAP CER X7R	1uF 50V 10% 0603	1	C43
N052007503	CAP CER X7R	0.1uF 50V 10% 0603	13	C1,C3,C4,C6,C8,C41,C47,C48,C49,C50,C51,C52,C53
	CAP ELEC	1000uF 10V 20% 35D 51mmH	1	
N052002401	CAP ELECT	100uF 16V 20% 0.138"SP	3	C2,C7,C9
N052003506	CAP POLY	0.01uF 50V 5% RAD	2	C9,C12
N052003505	CAP POLY	0.0047uF 50V 5% 0.2"SP	1	C10
	CAP ELECT	2200uF 25V 20% RAD	2	C5,C10
N052080052	CAP CER NPO	470pF 50V 5% 0603	2	C13,C18
N052007004	CAP CER NPO	1000pF 50V 5% 0603	9	C12,C15,C16,C17,C37,C38,C39,C40,C42
	CAP ELEC BP	6.8uF/50V BIPOLAR	2	C28,C32
N052010022	CAP POLY	0.22uF 50V ECQ-V1H224J	2	C11,C14
N052003709	CAP POLY	0.1uF 50V 5% 0.2SP	6	C19,C21,C22,C23,C34,C35
	CAP ELEC	47UF 16V 20%	2	C45,C46
N052001701	CAP ELECT	1uF 25V 20%	2	C30,C36
N053010502	DIODE SHOTTKY	5817(SS12) SMT 1A 20V	1	D4
N053000802	DIODE SWITCH	IN4148 SMT DL-35	2	D2,D3
	HEADER .156"SP 5P	HEADER	1	J1
N041025302	HEADER 0.156"SP 2P	HEADER	4	J5,J6,J7,J8
N041021711	CONN QUAD RCA	(SH-R16412)	1	J2
N041034008	HEADER .098"SP 8P	(22-03-5085)	1	J11
N041033310	CONN USB FEMALE	TYPE-B RECEPTICLE	1	J14
N041034004	HEADER 0.098"SP 4P	(22-03-5045)	1	J13
N041034005	HEADER 0.098"SP 5P	(22-03-5055)	1	J3
N041034006	HEADER 0.098"SP 6P	(22-03-5065)	1	J4
N041034007	HEADER 0.098"SP 7P	(22-03-5075)	1	J12
	MIDI JACK		2	J9,J10
N054000802	TRANSISTOR	MMBT2222 SOT-23	7	Q1,Q2,Q3,Q4,Q5,Q9,Q10
N054002906	TRANSISTOR	MMBT2907 SOT-23	3	Q6,Q7,Q8
	RES CF	10K OHM 5% 1/16W 0603	4	R271,R28,R53,R54
	RES CF	1.8K OHM 5% 1/16W 0603	1	R52

	RES CF	560 OHM 5% 1/16W 0603	2	R34,R35
	RES CF	150K OHM 5% 1/16W 0603	1	R55
	RES TF	4.3K OHM 1% 1/16W 0603	2	R19,R22
	RES MF	17.8K OHM 1% 1/16W 0603	2	R5,R10
	RES MF	15.8K OHM 1% 1/16W 0603	2	R4,R13
	RES TF	18K OHM 5% 1/16W 0603	2	R32,R33
	RES TF	1.2K OHM 5% 1/16W 0603	2	R15,R16
	RES TF	49.9K OHM 1% 1/8W 0603	2	R7,R12
	RES TF	68K OHM 5% 1/16W 0603	2	R17,R18
	RES TF	110 OHM 5% 1/16W 0603	2	R41,R43
	RES TF	220 OHM 5% 1/16W 0603	3	R24,R25,R39
	RES TF	270 OHM 5% 1/16W 0603	1	R45
	RES CF	4.7 OHM 5% 1/4W 1206	2	R36,R37
	RES CF	1K OHM 5% 1/16W 0603	4	R6,R8,R9,R11
	RES CF	56 OHM 5% 1/16W 0603	4	R38,R40,R42,R44
	RES CF	4.7K OHM 5% 1/16W 0603	4	R20,R21,R23,R26
N051101724	RES CF	470 OHM 5% 1/16W 0603	2	R49,R50
N051120056	RES CF	5.6K OHM 5% 1/16W 0603	2	R51,R46
N051101790	RES CF	1.0M OHM 5% 1/16W 0603	1	R48
N051101734	RES TF	1.5K OHM 5% 1/16W 0603	1	R47
N061010302	IC LOGIC	74HCU04 SOP14	1	U9
	IC PC410	PC410-SOP6	1	U8
	IC ANA POWER AMP	20W+20W DUAL BRIDGE AMPLIFIER	1	U14
N064003511	IC ANA OPAMP DL BIP LO-NOIS	NJM4580E SOP8-160	1	TDA7265
	IC LINEAR +12V	7812 1A TO-220	1	U2
	IC LINEAR -12V	KTA7912 1A TO-220	1	U1

Front Board

Part No	Part Name	Description	Q'ty	Reference
N052002422	CAP ELECT ECE-BOJU471	470UF 6.3V 3.5mmSP 0.11mm	2	C1,C2
N052007503	CAP CER X7R	0.1UF 50V 10% 1206	3	C3,C4,C5
	LED DISPLAY	3 X 7 SND630ASR(Common Cathod)	1	DS1
N045010902	LED SMT RED/GREEN WATER CLEAR	KINGBRIGHT AA2734SRSGC	2	D1,D17
N045010111	LED T1 RED HIGH EFF	PC1SE	1	D2
N045010901	LED SMT RED WATER CLEAR 120 degree view 1206	KINGBRIGHT APTD3216SRCPRV	31	D3~D5,D8~D16,D18 ~D36
N041031220	HEADER .1"SP DUAL ROW 20P	(057-020-153)	1	J1
N041030326	HEADER .1"SP DUAL ROW 26P	(057-026-153)	1	J4
N041030326	HEADER .1"SP DUAL ROW 26P	(057-026-153)	1	J5
N041034056	**HEADER .098"SP 5P**	**(22-03-5055)**	**2**	**J2, JX**
N054002906	TRANSISTOR PNP	MMBT2907L SOT23	10	Q1~Q10
N054000802	TRANSISTOR	MMBT2222 SOT-23	8	Q11~Q18
N051064033	RES TF	33Ω 5% 1/16W 0603	8	R1,R4,R8,R11,R15,R17,R18,R32
NEW	RES CF	10K Ohm 5% 1/16W 0603	18	R2,R3,R5~R10,R12~R14,R19~R26
N051005011	RES CF	4.7Ohm 5% 1/8W	1	R16
N043003703	TACT SWITCH(160gf, BLUE/GRAY)	SAMWON TSM155JK	36	SW1~SW36
N061000302	IC LOGIC SOP16	74LS145	1	U1
N061020502	IC LOGIC OCTAL LATCH SOIC 20	74HC373A	1	U2
N061014003	IC LOGIC SOP20	MC74HC541DW	1	U3
N051101421	RES POT	10K LIN H15xL9.8xW12.5 V09H20F(백조전자)	1	

Head Phone Board

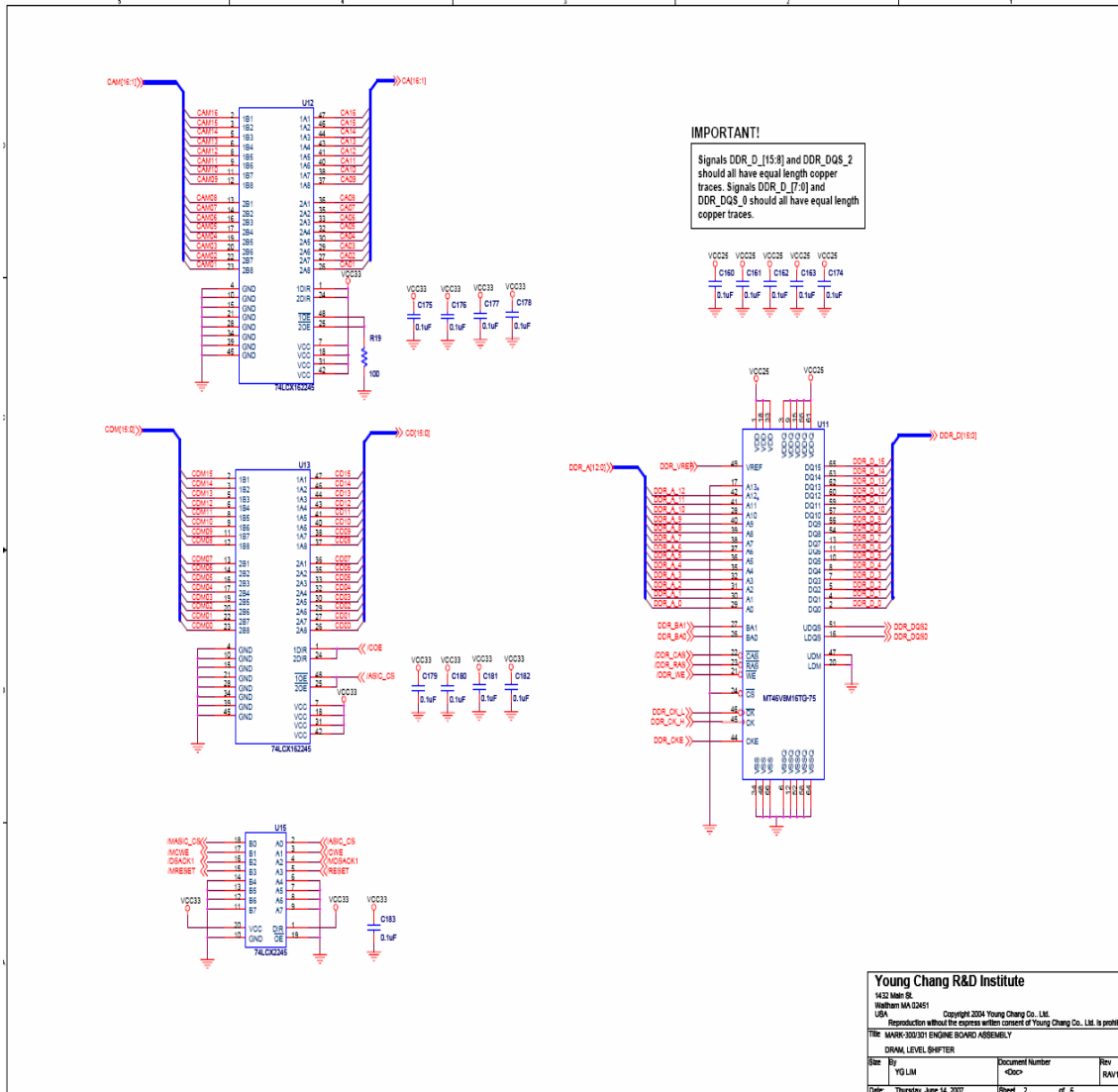| Part Number	Part Name	Description	Q'ty	Reference
N041021007	HEADPHONE JACK	MARK-XXX	2	
N052001204	CAP CERMONO Z5U	.1UF 50V 20% .3AX	2	
N041034005	HEADER	0.098SP 5P	1	

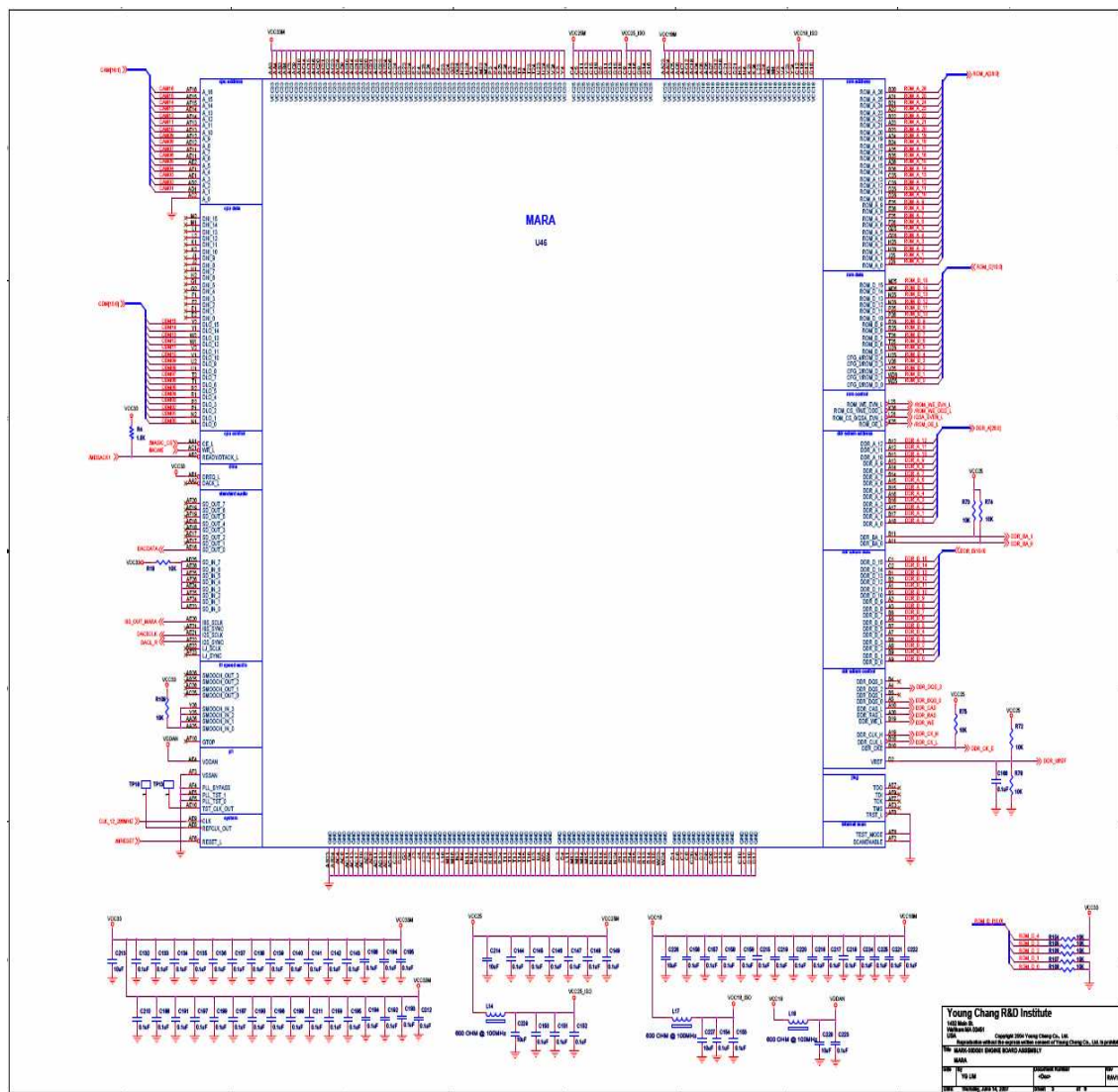# Chapter 6
Schematics
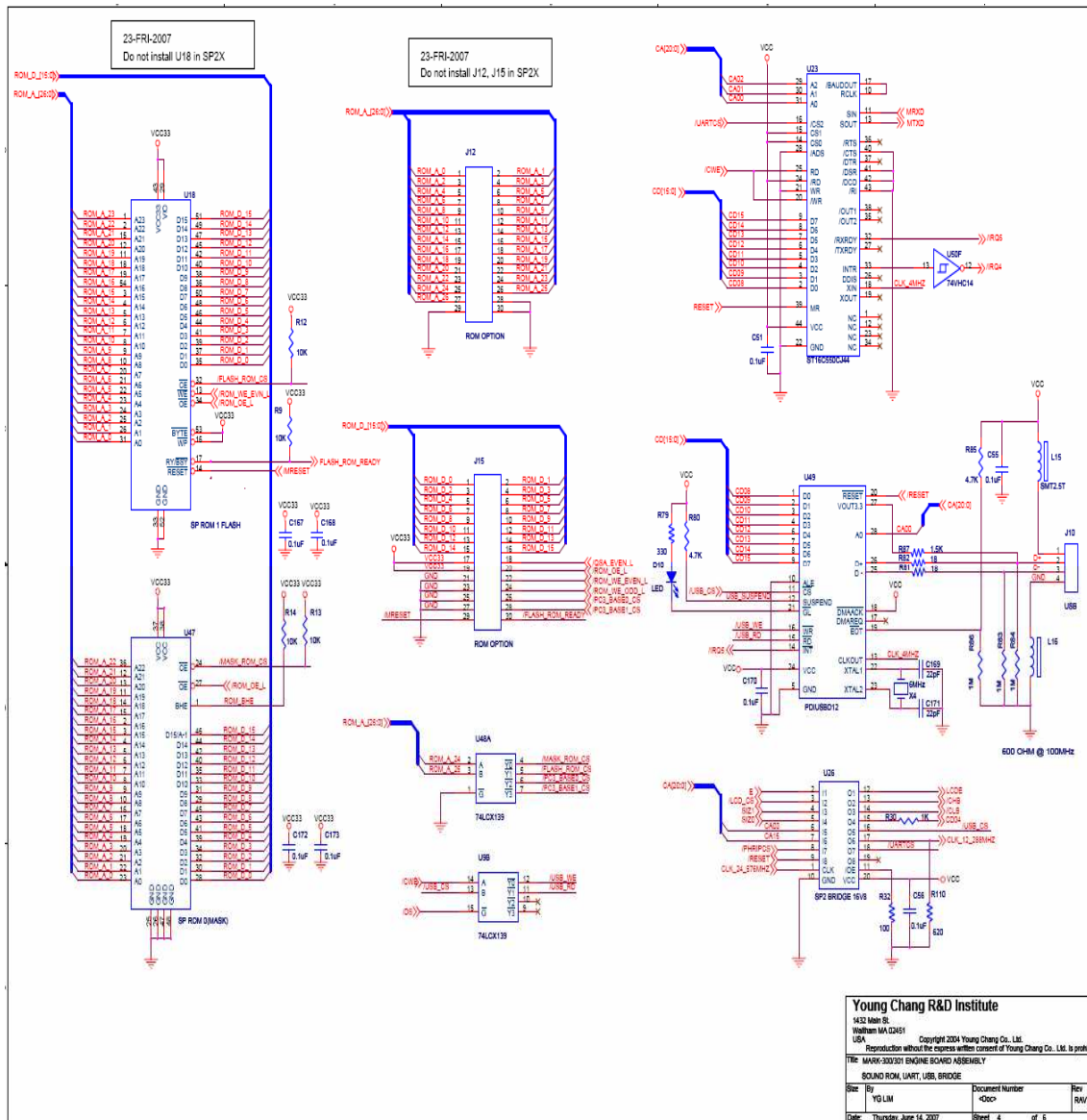
Engine Board Micro Processor(68331) Interface
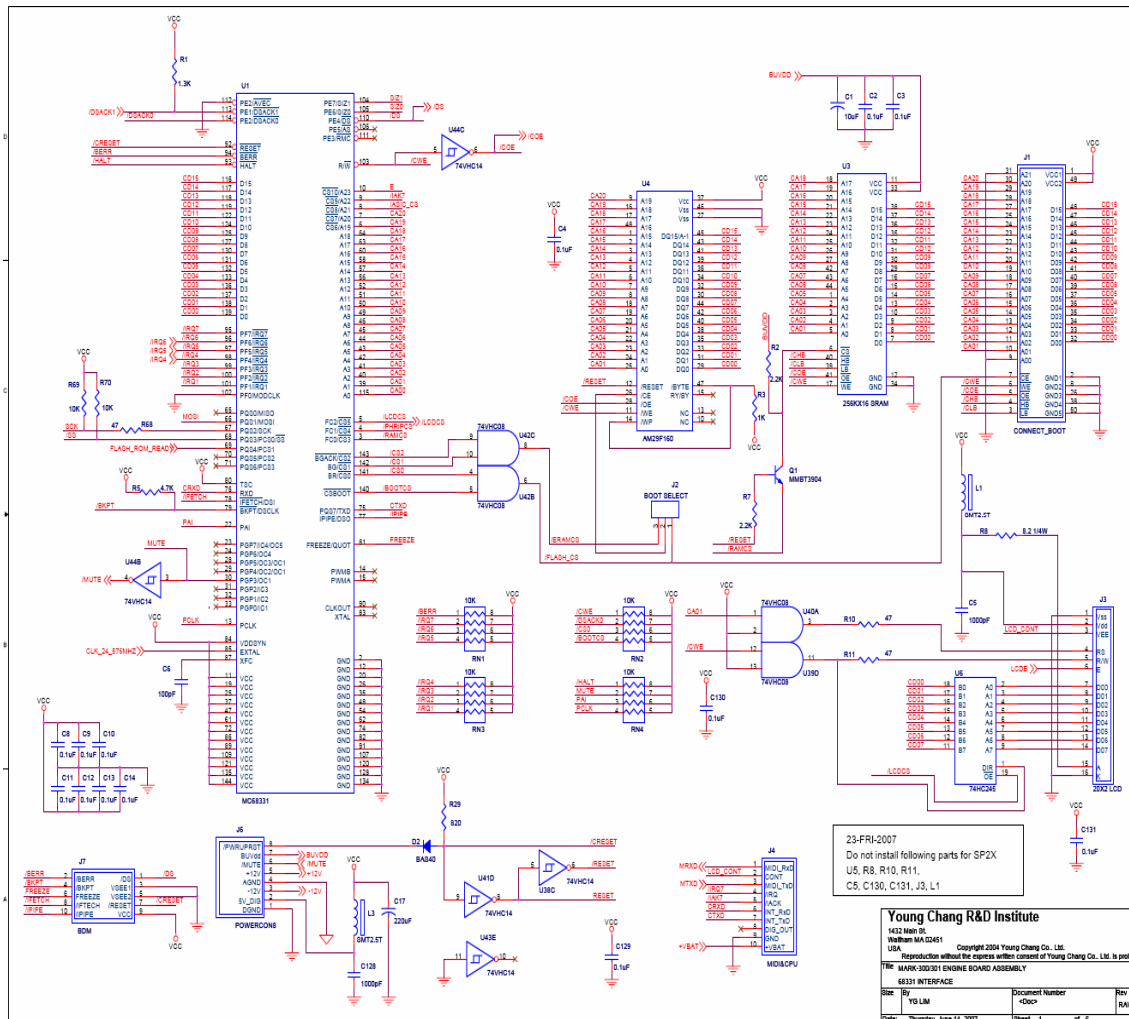
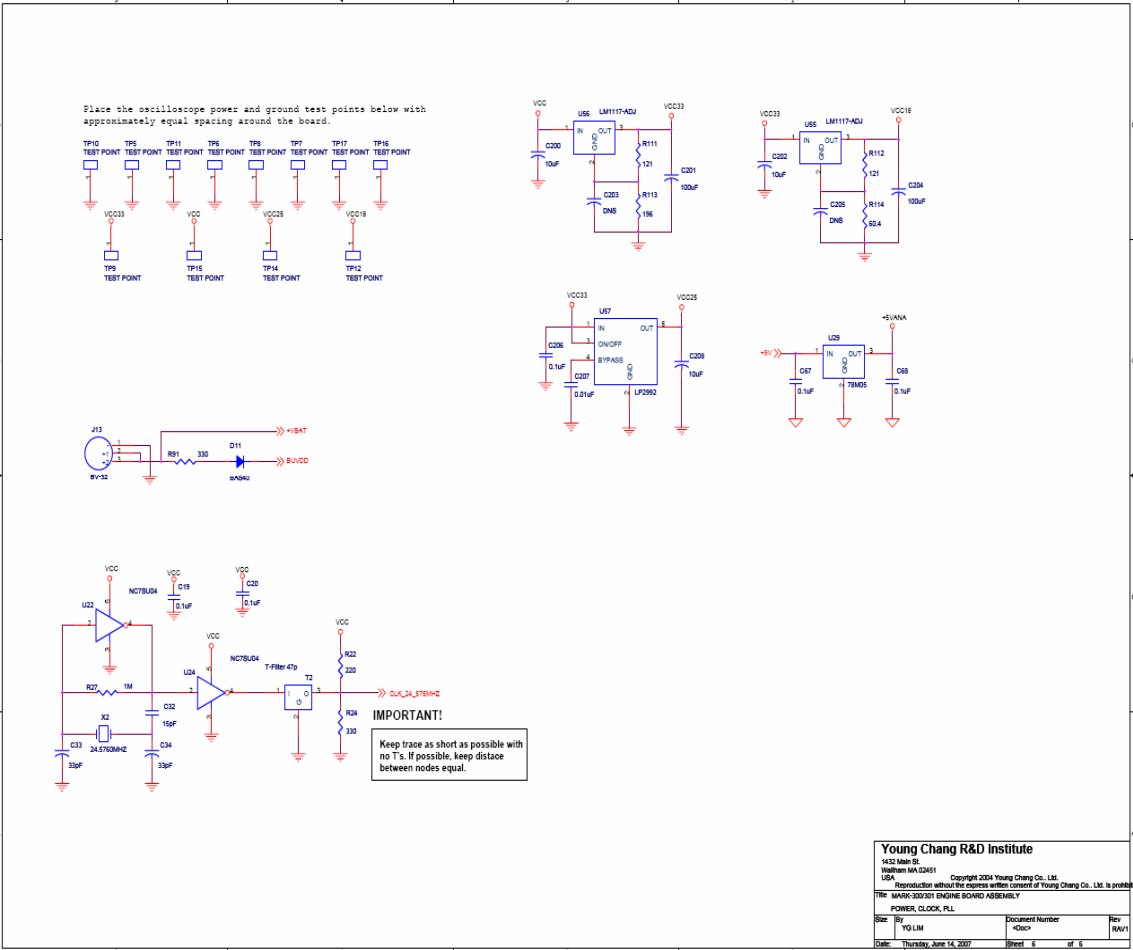## Engine Board DRAM, LEVEL, SHIFTER

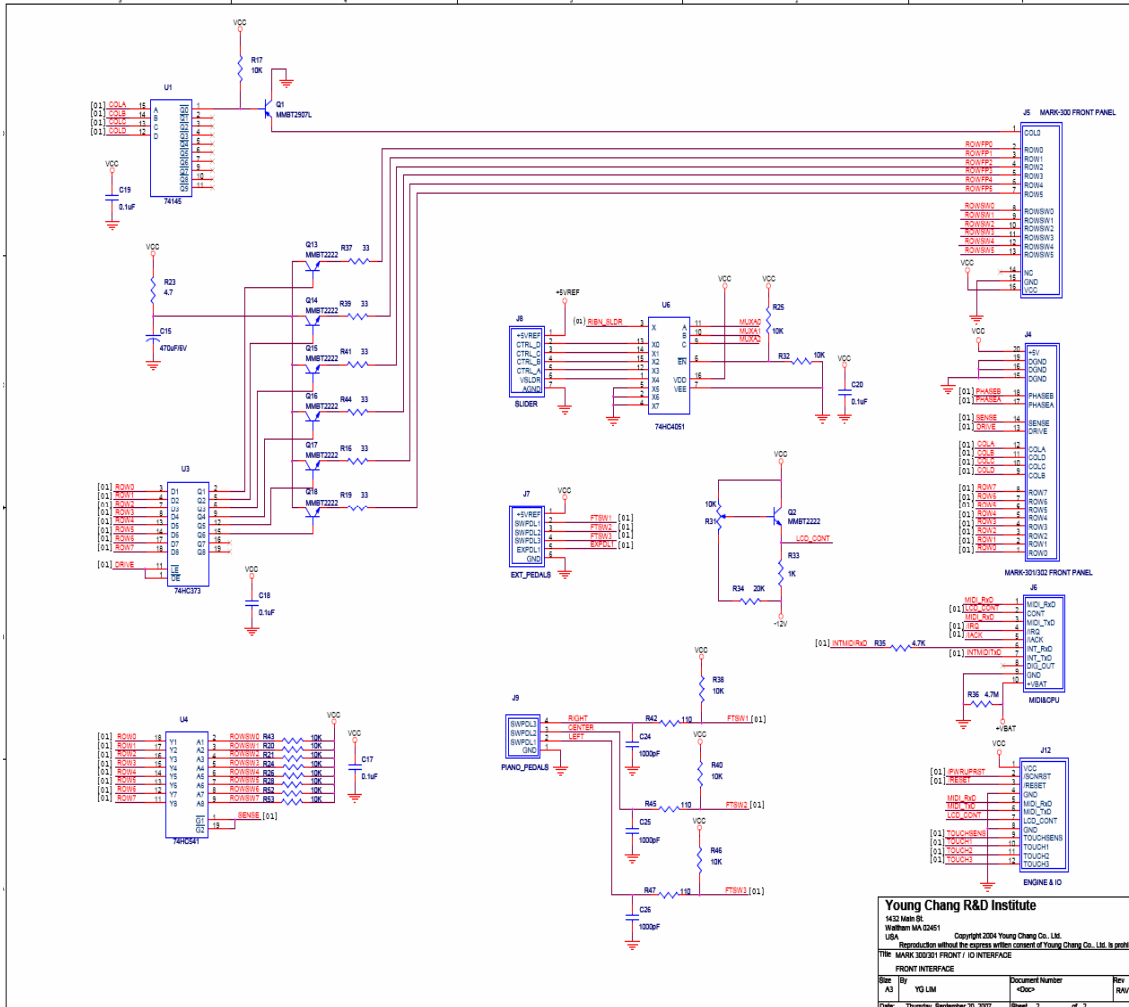## Engine Board MARA

Engine Board Sound ROM, UART, USB, BRIDGE

Engine Board POWER, CLOCK, PLL

Scanner Board 38869 Interface
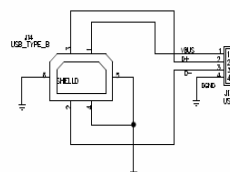
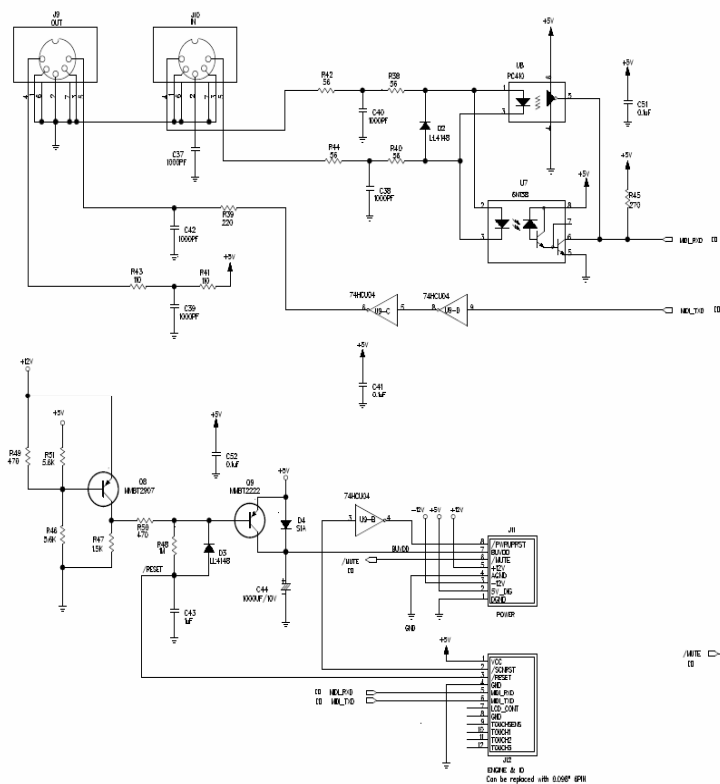## Scanner Board Front Interface

Front Board Left
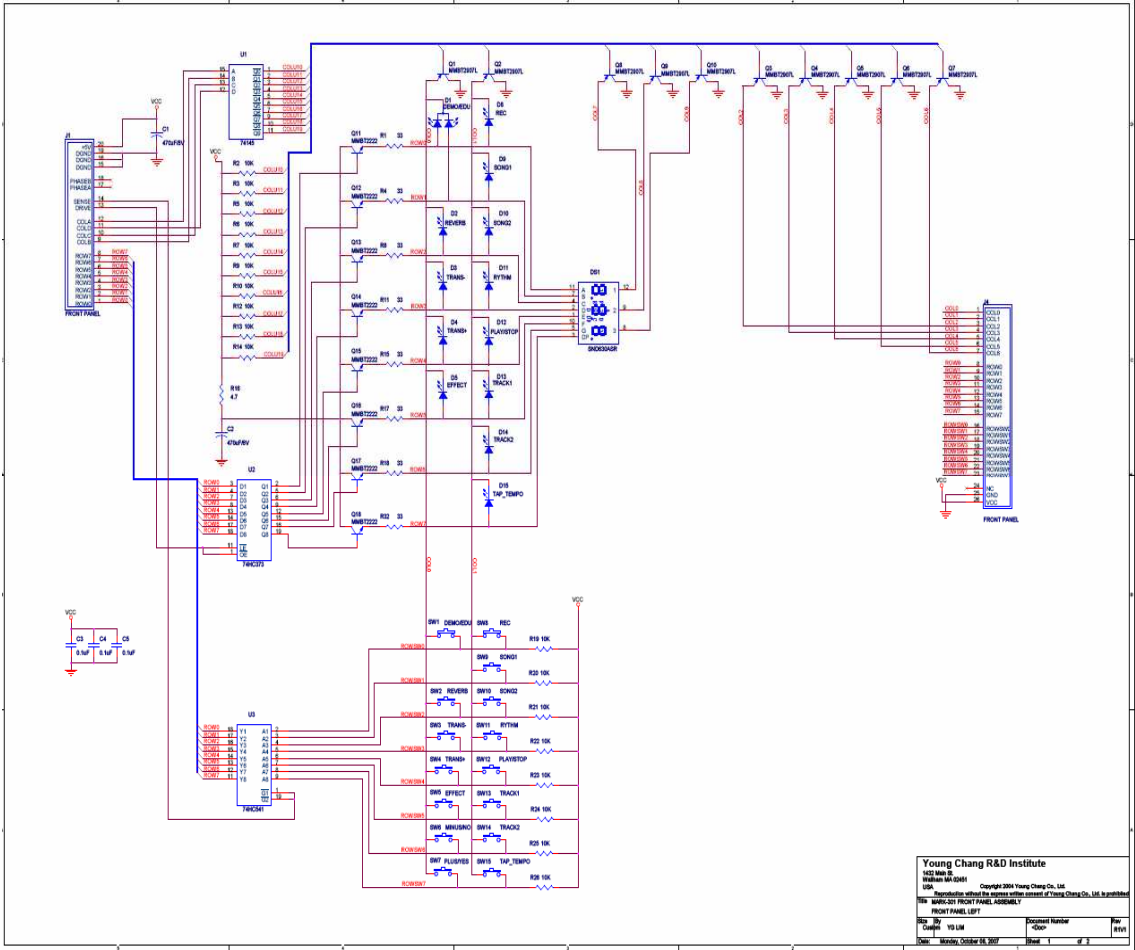
Front Board Right
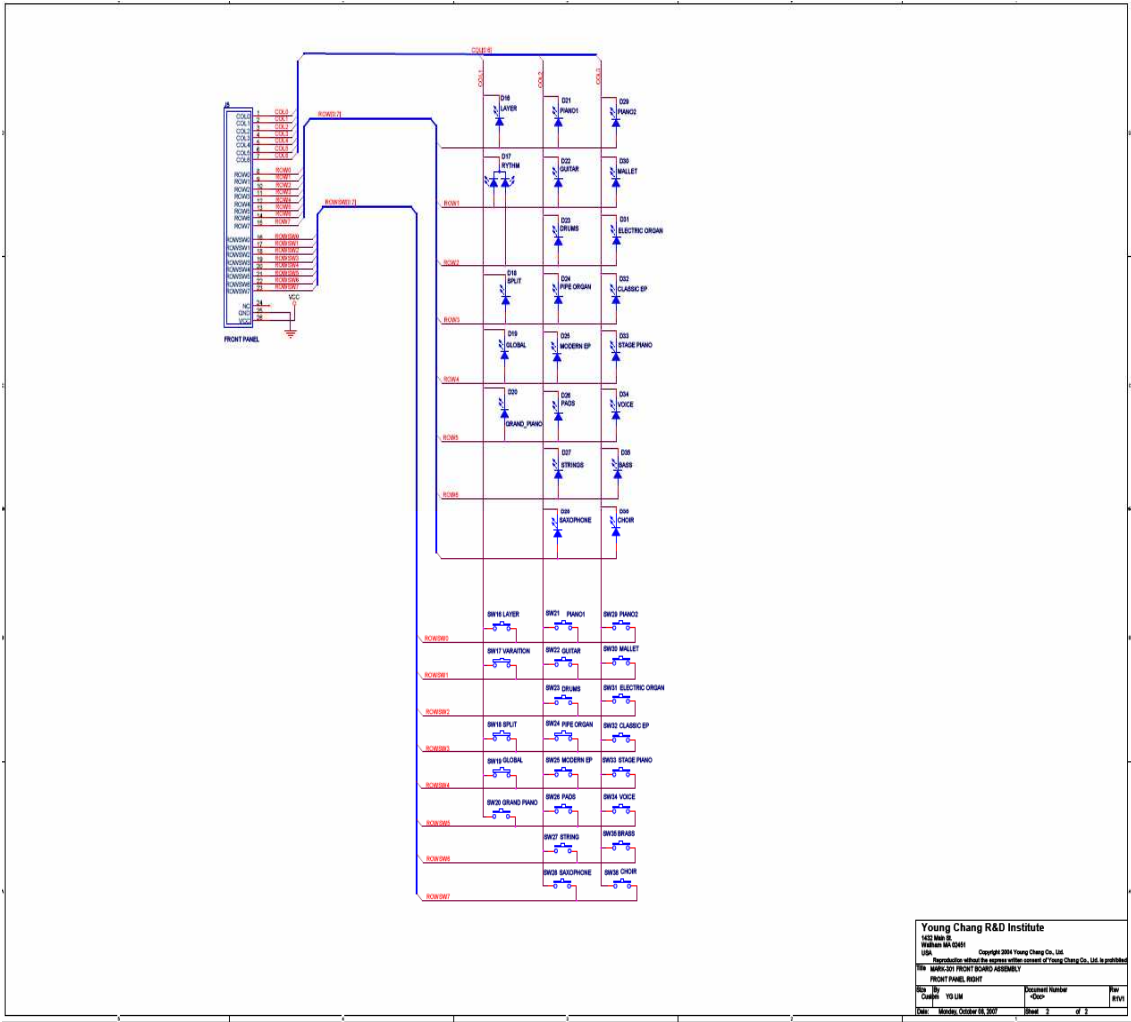
Amp Board Engine IO, MIDI IN & OUT
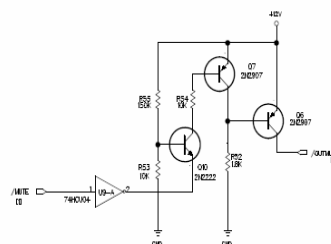
Amp Board Speaker, Line IN & OUT, Headphone