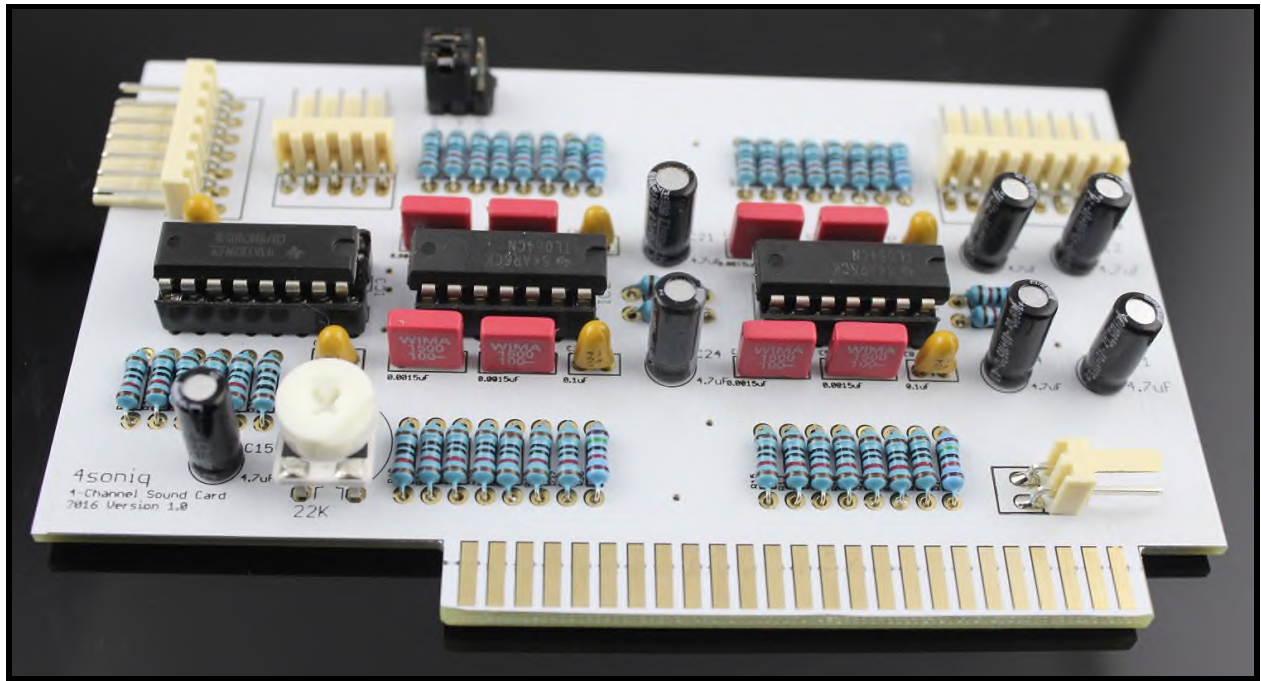


4soniq User Manual



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4soniq User Manual

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Introduction

Congratulations on your purchase of the Manila Gear 4soniq 4-Channel Sound Card for the Apple IIgs!

With this card, you now have the capability to record mono audio, and playback two to four channel audio. You can also playback eight channel audio by using two 4soniq cards together.

Checking System Requirements

You need to verify that your system meets the following requirements:

- Apple IIgs ROM 00, ROM 01, or ROM 3
- ProDOS 8 (to run the *4soniq Soundcheck* program and other software)
- Ability to transfer a disk image to a real Apple II (to run the *4soniq Soundcheck* program and other software)
- Four powered speakers (eight for 8-channel mode)

What's Included

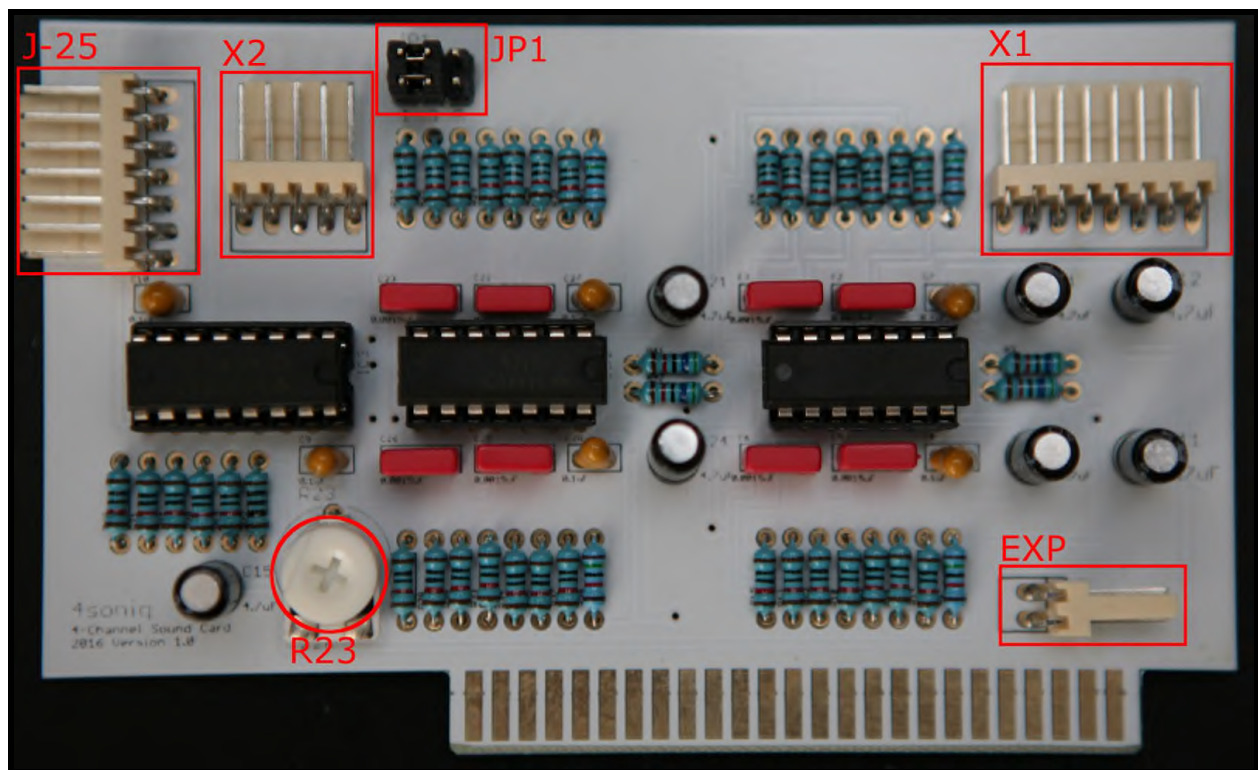
- 1x 4soniq 4-Channel Sound Card
- 1x J-25 Connector Cable
- 1x Backplate Cable Assembly
- 1x 4soniq-to-4soniq Connector Cable (optional)

1. Getting To Know Your 4soniq

This chapter helps you locate and identify the components of your sound card. The components of the sound card are divided into the following categories:

- Jacks, Plugs and Connectors
- Jumpers
- Input Control Knob

Figure 1.1. 4soniq Sound Card



- | | |
|------|--|
| X1 | Plug for the Backplate Cable Assembly connector |
| X2 | Plug for the 4soniq-to-4soniq Connector Cable |
| JP1 | Jumpers to select 4-channel or 8-channel mode |
| J-25 | Plug for the J-25 Connector Cable |
| EXP | Plug for external power |
| R23 | Input Control Knob for audio digitizer calibration |

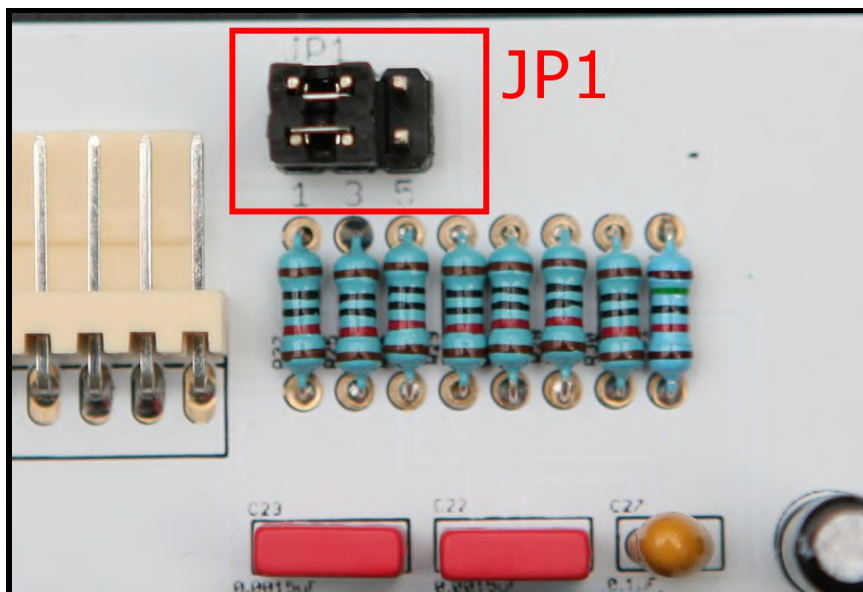
2. Installing the 4soniq

Installing the sound card in your system is simple. Please follow the instructions carefully.

Step 2.1. Before installing the 4soniq in your Apple IIgs, make sure to switch your Apple IIgs main power switch to the OFF position.

Step 2.2. Make sure the JP1 jumpers on the 4soniq are setup for 4-channel mode. They should already be in this setting from the factory, but it is always good to double check.

Figure 2.1. JP1 Jumper Settings For 4 Channel Mode



Both jumpers must be on the **leftmost** two pins (1-3).

Step 2.3. Insert the 4soniq in any available slot on the Apple IIgs. There is no need to set the slot to “Your Card” setting in the Apple IIgs control panel.

Step 2.4. Plug one end of the J-25 Connector Cable to the J-25 Audio Expansion Port on the motherboard.

Figure 2.2. J-25 Connector Cable

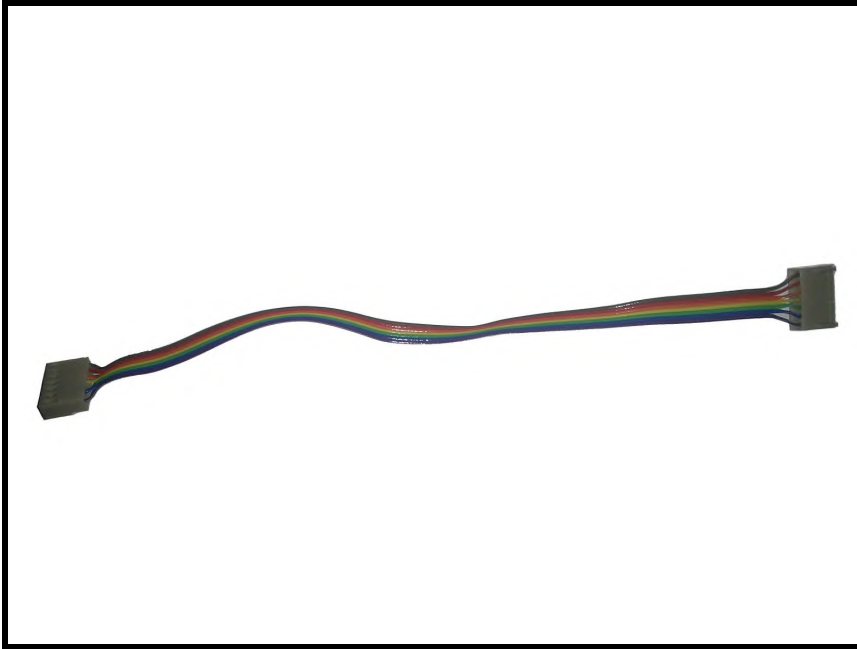


Figure 2.3. J-25 Audio Expansion Port

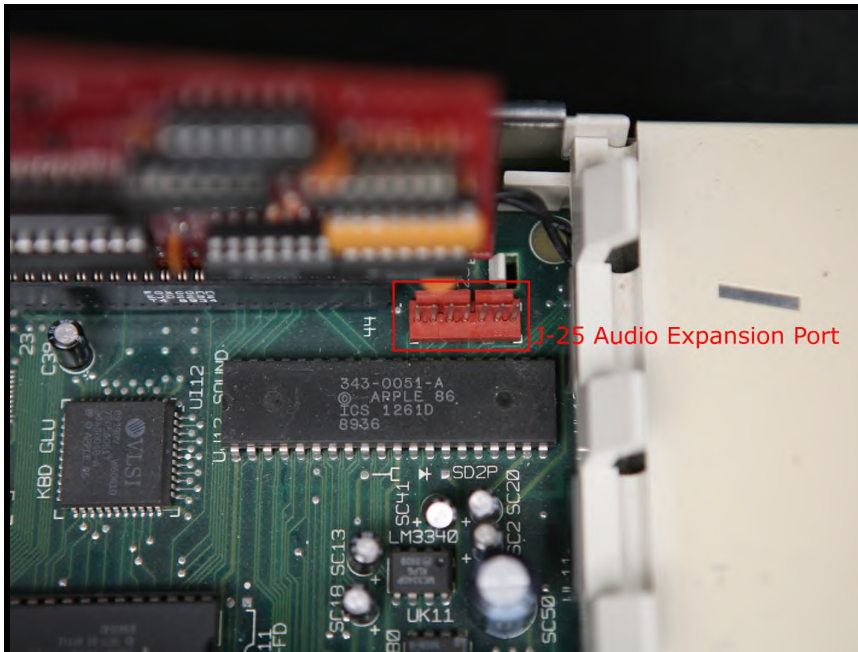


Figure 2.4. J-25 Connector Cable Going Into J-25 Audio Expansion Port

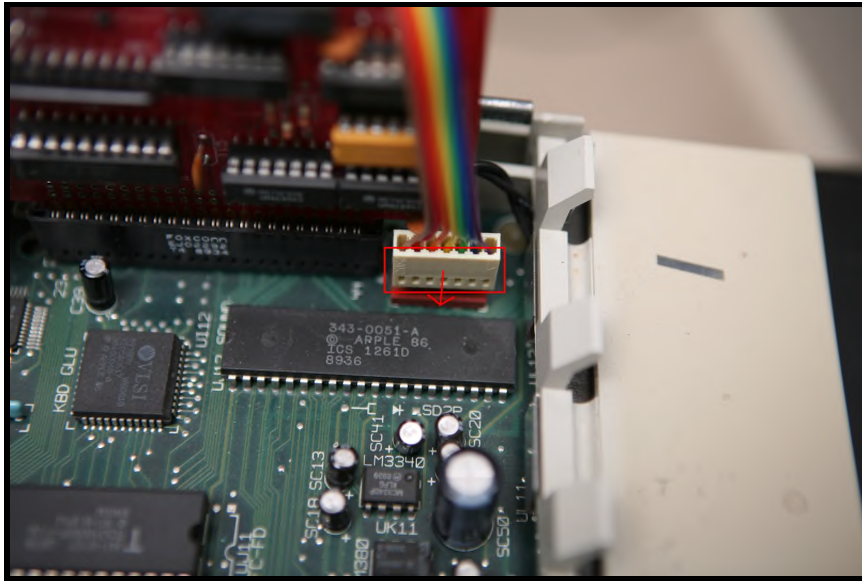
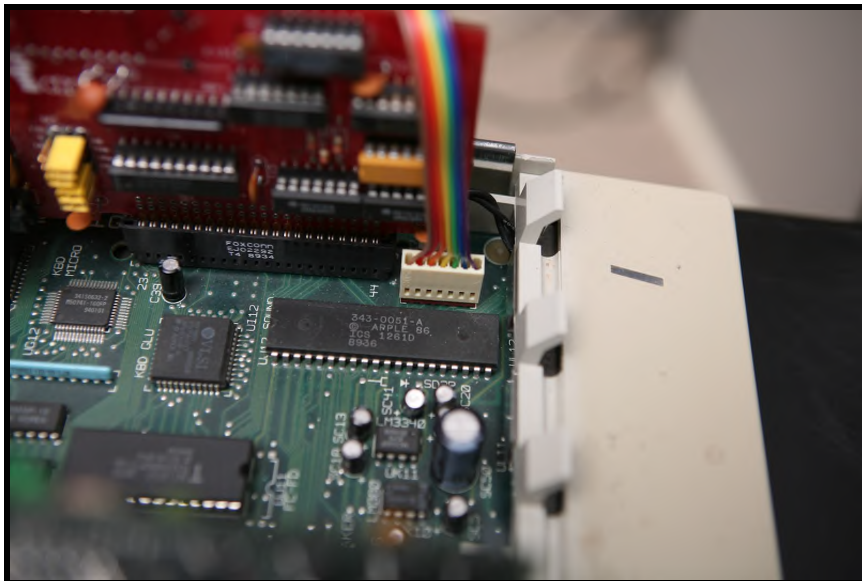


Figure 2.5. J-25 Connector Cable Installed On The Motherboard



Step 2.5. Plug the other end of the J-25 Connector Cable to the J-25 plug on the 4soniq.

Figure 2.6. J-25 Connector Cable Going Into J-25 Plug On The 4soniq

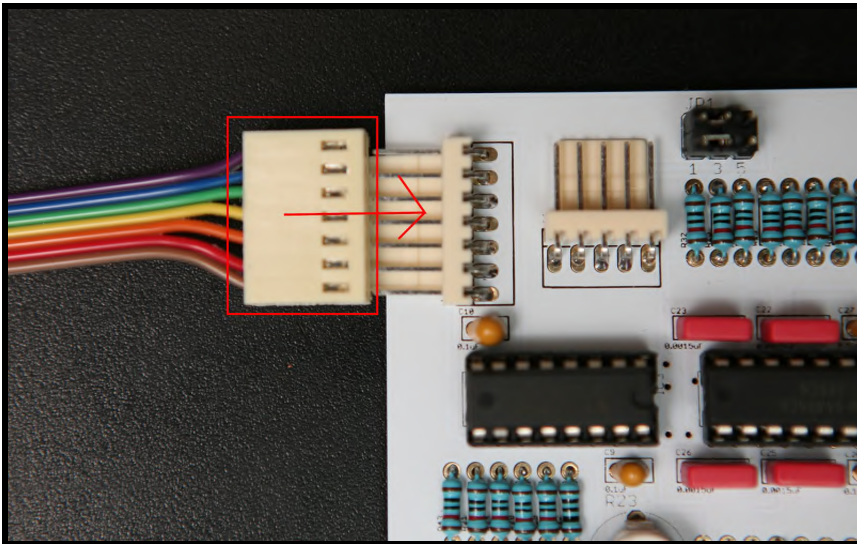
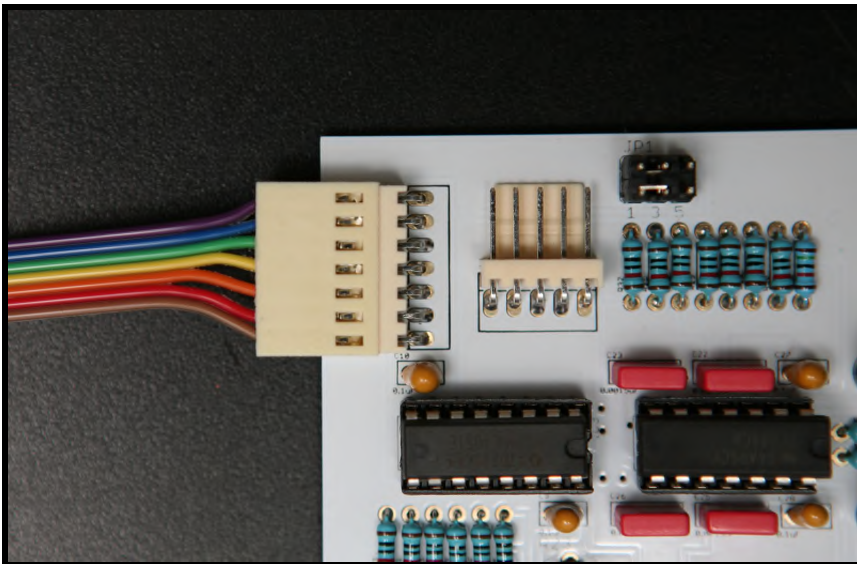


Figure 2.7. J-25 Connector Cable Installed On The 4soniq



Step 2.6. Plug the Backplate Cable Assembly connector to the X1 plug on the 4soniq.

Figure 2.8. Backplate Cable Assembly

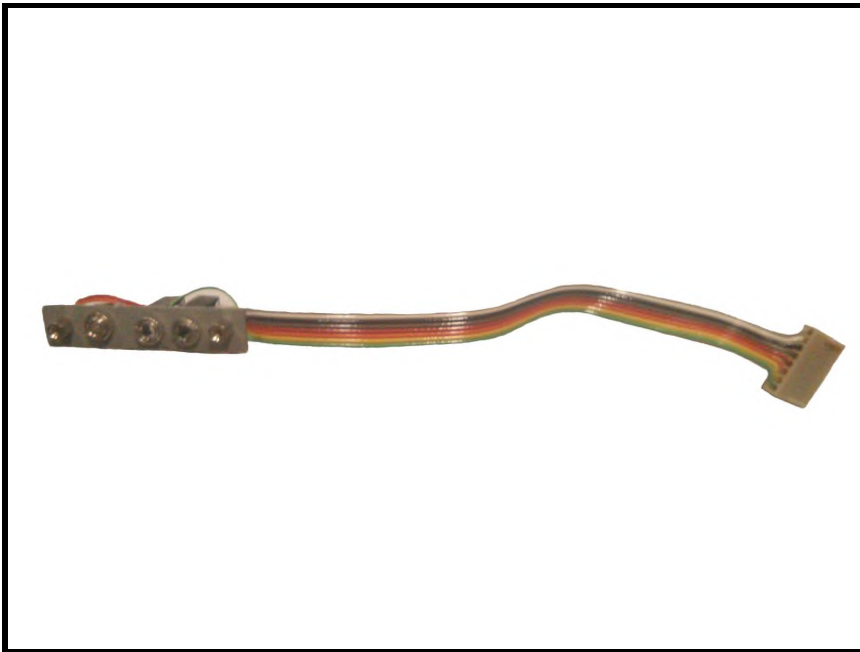


Figure 2.9. Backplate Cable Assembly Connector Going Into X1 Plug

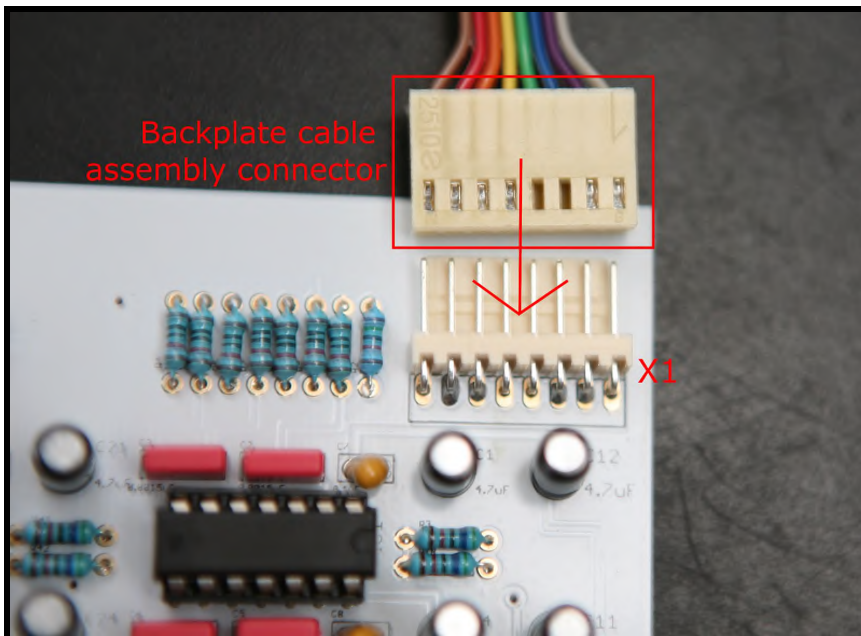
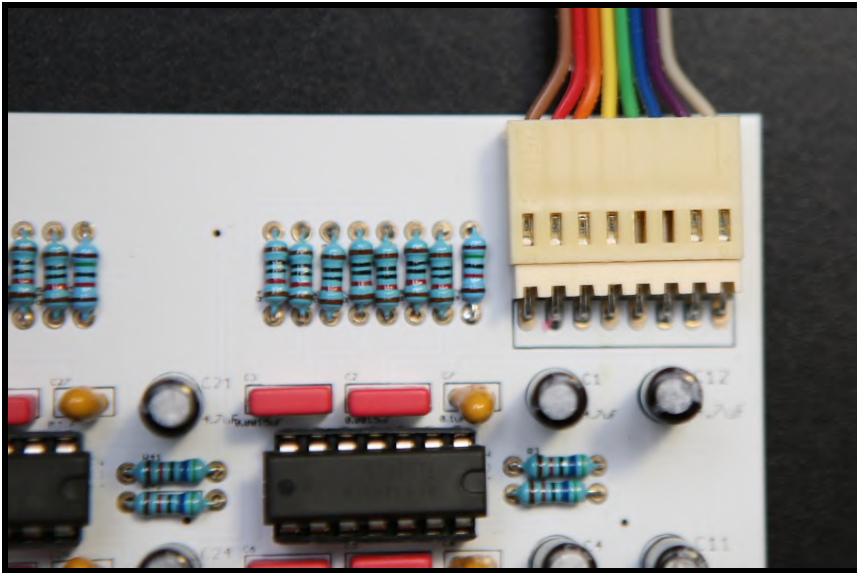
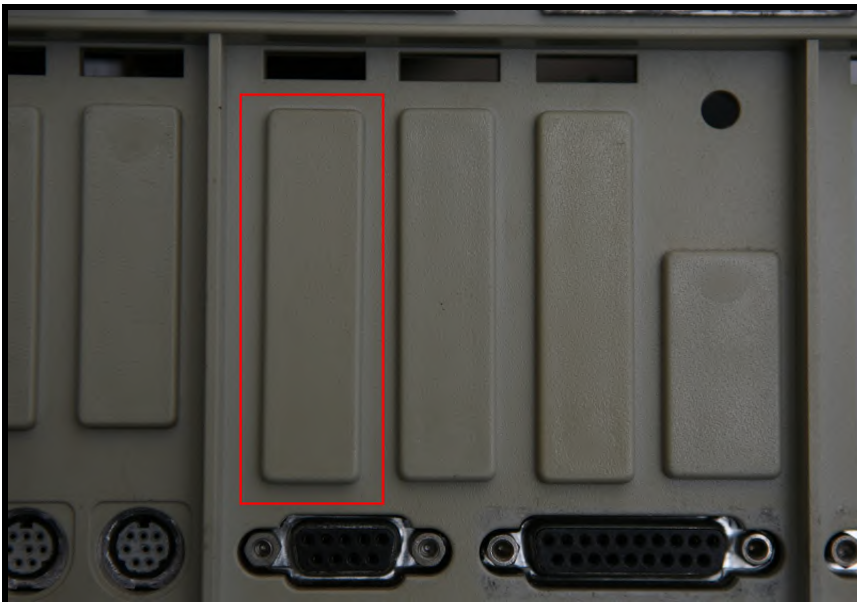


Figure 2.10. Backplate Cable Assembly Connector Installed



Step 2.7. Choose an empty plastic plate (a.k.a. “backplate”) covering the large opening at the back of your Apple IIcs. In [Figure 2.11] we’ve selected the leftmost one just above the Joystick Port.

Figure 2.11. Plastic Plate Covering The Large Opening (a.k.a. “Backplate”)



Step 2.8. Carefully turn the backplate locking clip 90 degrees counter clockwise [Figure 2.12] and the backplate cover should come off [Figure 2.13].

Figure 2.12. Backplate Locking Clip (View From Inside The Apple IIgs)

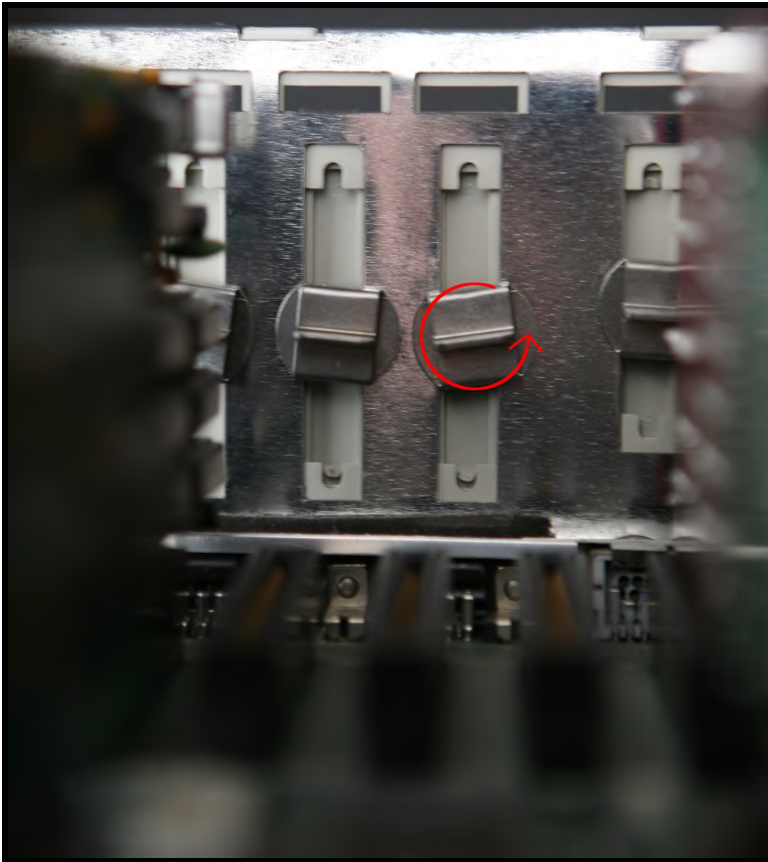


Figure 2.13. Backplate Cover Off



Step 2.9. Completely remove the top screw and loosen the bottom screw from the 4soniq Backplate Cable Assembly's backplate. The bottom screw is the one next to the jack that is located further away from the middle jack on the backplate. Insert the bottom side of the backplate with the loosened screw into the matching bottom screw hole on the Apple IIgs chassis.

Figure 2.14. Inserting One Side Of The 4soniq Backplate



Step 2.10. Push the rest of the backplate into place, flush against the back of the Apple IIgs chassis. Insert the top screw through the top hole, and tighten both screws. Just make it hand tight; there is no need to use a tool.

Figure 2.15. Tighten Both Screws

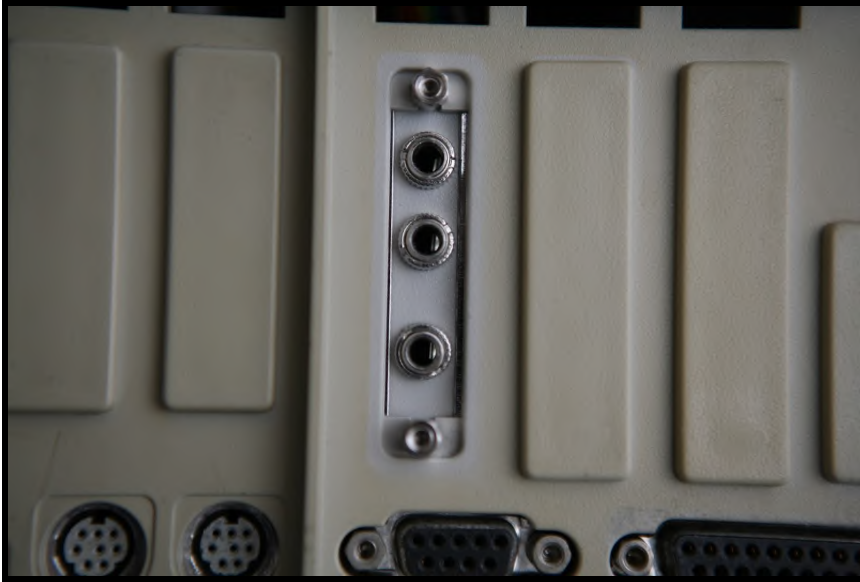


Figure 2.16. 4soniq Backplate Installed



Step 2.11. Plug the stereo jack of your Front speakers (front left = FL and front right = FR) into the top jack, and the stereo jack of your Surround speakers (surround left = SL and surround right = SR) into the middle jack.

Figure 2.17. Backplate Connections



Step 2.12. Switch on your Apple IIgs and you are all set!

You may want to run the *4soniq Sound Check Program* to confirm that everything was setup correctly. Refer to [Appendix B] for information on where to get the software.

3. Recording Sound

You can record monophonic audio using the 4soniq's Line IN jack.

WARNING: The Line IN jack can take a maximum signal of -1.25 to +1.25 Volts peak-to-peak. Please take care you do not exceed this voltage. Doing so may cause irreparable damage to both the 4soniq and your Apple IIgs.

Step 1. Switch off the main power switch to your Apple IIgs.

Step 2. Set your sound source (e.g. iPhone or Sony Walkman) volume to the lowest setting.

Step 3. Plug the output jack of your playback device in the Line IN jack of the 4soniq. This is the jack that is at the bottom of the 4soniq Backplate.

Figure 3.1. Line IN Jack



Step 4. Power up the Apple IIgs and run your favorite audio recording software (e.g. *AudioZap* or *HyperStudio3's SoundShop*). See [Appendix B] for information on where to get the software.

Step 5. Play your music and start recording. If the input volume level is too low, you can adjust your sound source volume a little higher and try again.

Step 6. If you experience sound clipping on your recording, lower the volume on your sound source, or check your digitizer calibration [Chapter 4. *Calibrating the 4soniq Digitizer*].

4. Calibrating The 4soniq Digitizer

Every 4soniq is pre-calibrated at the factory to have a zero DC offset in the input channel.

Because sound is analog (AC), signals typically swing equally to both the positive and negative side. If the 4soniq is out of calibration, one side of the signal can get “chopped off”. This would manifest itself in the digitized signal as distortion.

Follow these steps in case you need to change this calibration, or if you just want to verify that your 4soniq is properly calibrated.

Step 4.1. Follow the instructions for installing the 4soniq in [*Chapter 2. Installing the 4soniq*]. For purposes of this calibration, choose a slot where the next 2 right slots are unoccupied. It will allow easier access to the Input Control Knob [*Figure 4.3*].

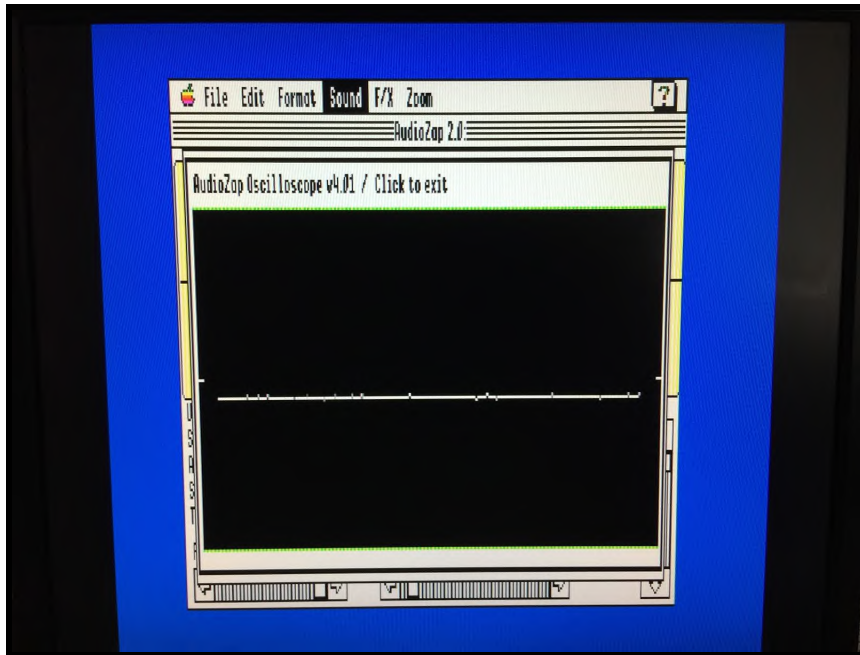
Step 4.2. Plug the output jack of your playback device (e.g. iPhone or Sony Walkman) in the Line IN jack of the 4soniq. This is the jack that is at the bottom of the backplate.

Figure 4.1. Line IN Jack



Step 4.3. Run the AudioZap utility (see *Appendix B* for where you can get the software) and place it in Oscilloscope mode. You may see the input signal is not exactly in the center position.

Figure 4.2. AudioZap Oscilloscope Showing Non-Centered Input



Step 4.4. Using a small plastic screwdriver, adjust the Input Control Knob (R23 as shown in [Figure 4.3]) on the 4soniq in small increments, until the line on the Oscilloscope is centered as shown in [Figure 4.4]. If you find it difficult to reach and turn the knob, you may have to power down the computer, and move the card one more slot to the left, and try again until you can easily access the knob.

Figure 4.3. Input Control Knob (R23)

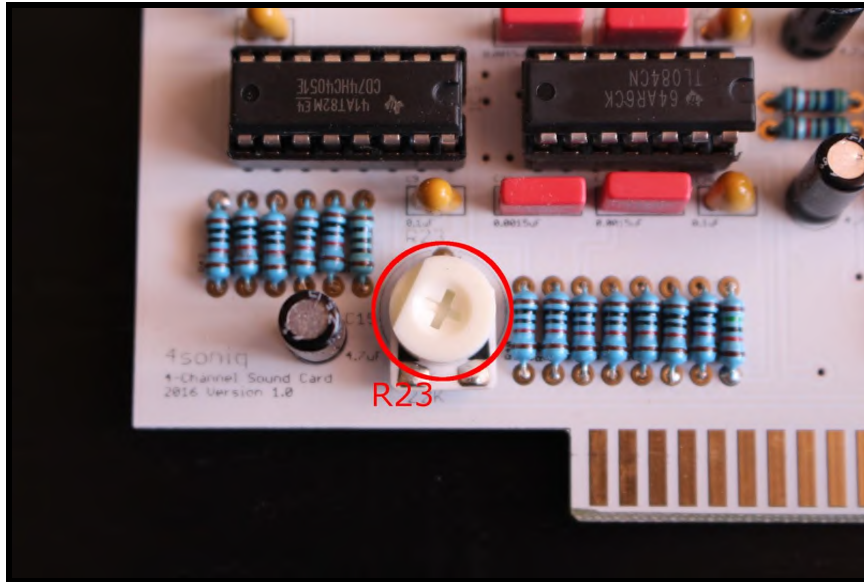
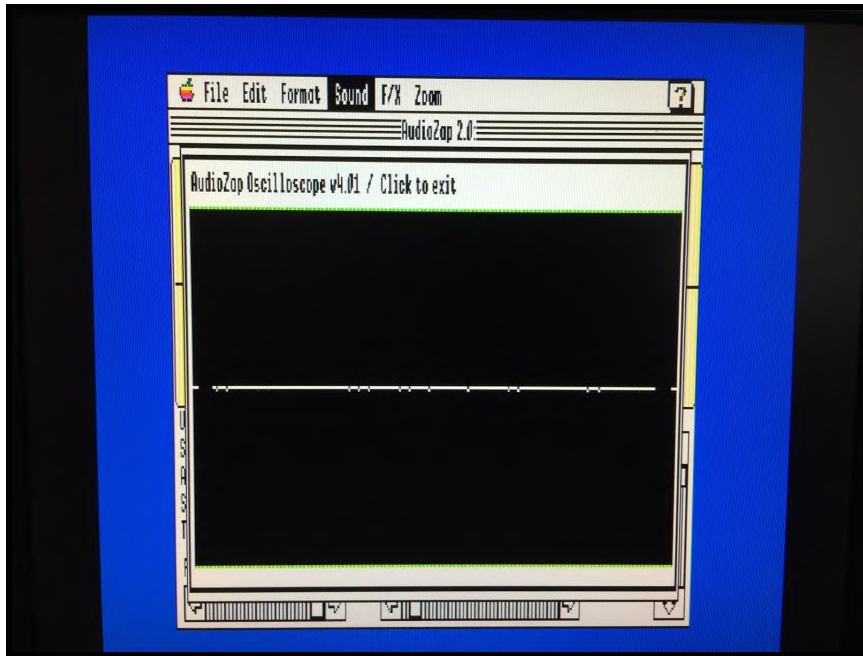


Figure 4.4. AudioZap Oscilloscope Showing Centered Input



Step 4.5. You are done!

5. Setting Up Two 4soniqs For 8 Channel Mode

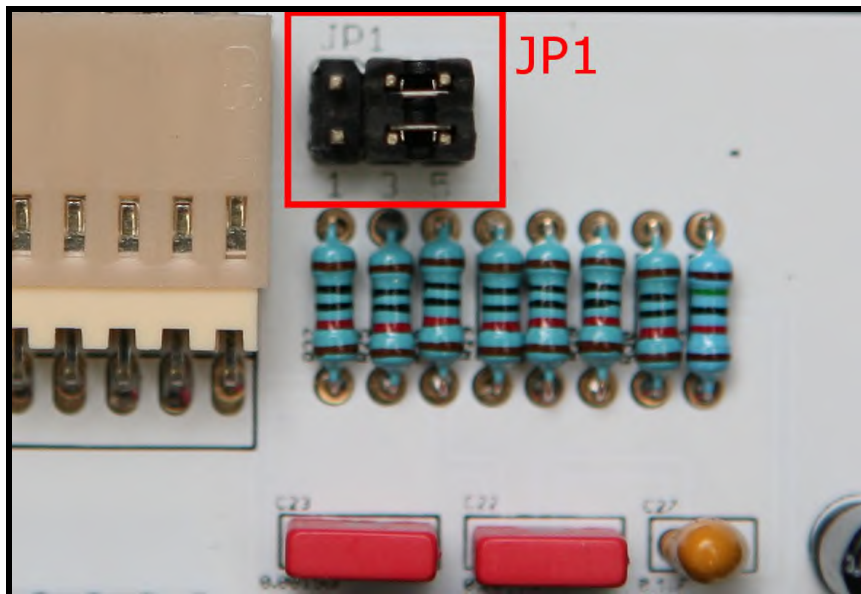
If you have two 4soniqs, you can use them together to get 8 channel sound.

Install the first 4soniq in your Apple IIGs using the procedure described in [*Chapter 2: Installing the 4soniq*], before proceeding to this chapter.

Step 5.1. Ensure the Apple IIGs main power switch is in the OFF position.

Step 5.2. Set the JP1 jumpers on the first 4soniq to 8-channel mode.

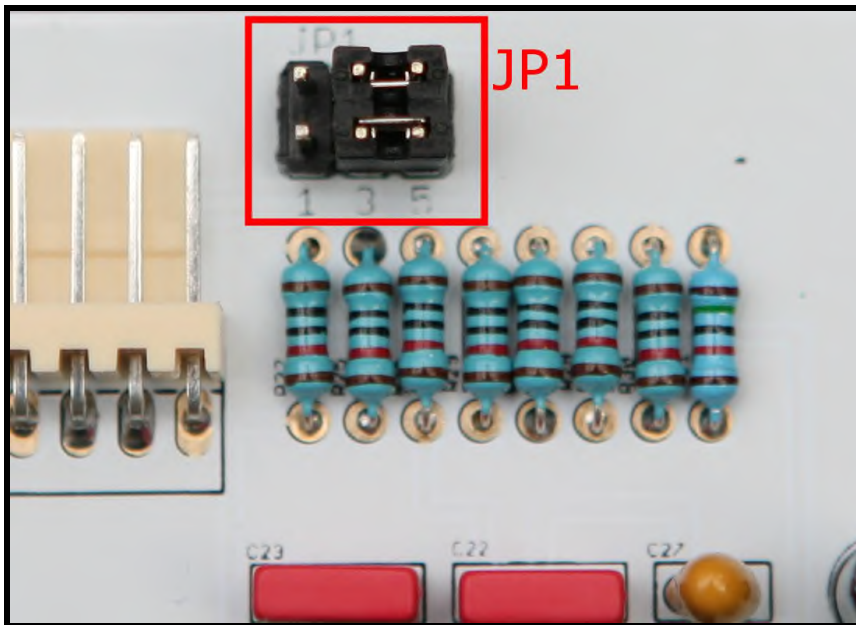
Figure 5.1. JP1 Jumper Settings On The First 4soniq For 8 Channel Mode



Both jumpers must be on the **rightmost** two pins.

Step 5.3. Set the JP1 jumpers on the second 4soniq to 8-channel mode.

Figure 5.2. JP1 Jumper Settings On The Second 4soniq For 8 Channel Mode



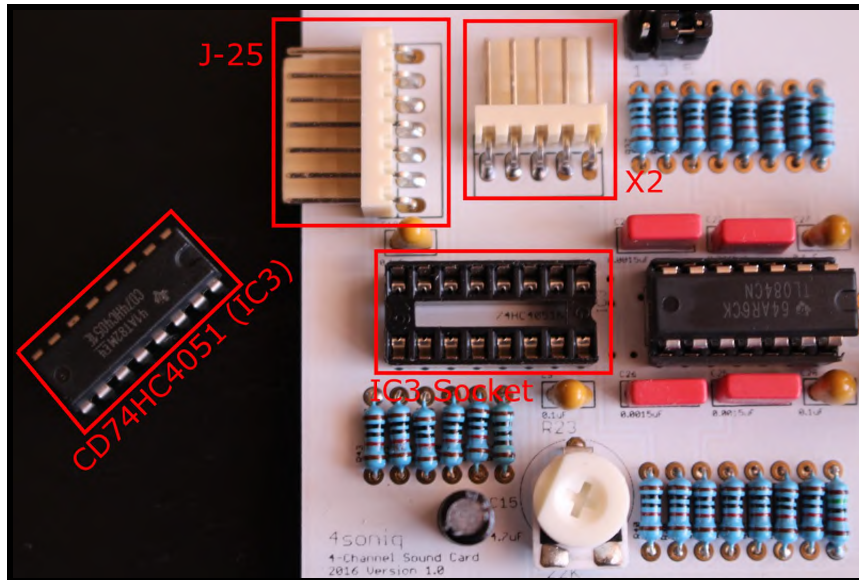
Both jumpers must be on the **rightmost** two pins.

Step 5.4. Make sure there is no cable connected to the J-25 plug on the second 4soniq.

Step 5.5. Make sure there is no cable connected to the X2 plug on the second 4soniq.

Step 5.6. Gently remove IC3 “CD74HC4051” from its socket on the second 4soniq. Store it in a safe place, such as one of the anti-static bags that the 4soniq card came in. A good place to store this bag to avoid misplacing it is the space under the Apple IIgs power supply.

Figure 5.3. Chip CD74HC4051 Removed From Socket IC3



Step 5.7. Insert the DIP plug of the 4soniq-to-4soniq Connector Cable, into the IC3 socket on the second 4soniq. The DIP plug should have the cable wires coming out at the top edge of the card.

Figure 5.4. 4soniq-to-4soniq Connector Cable

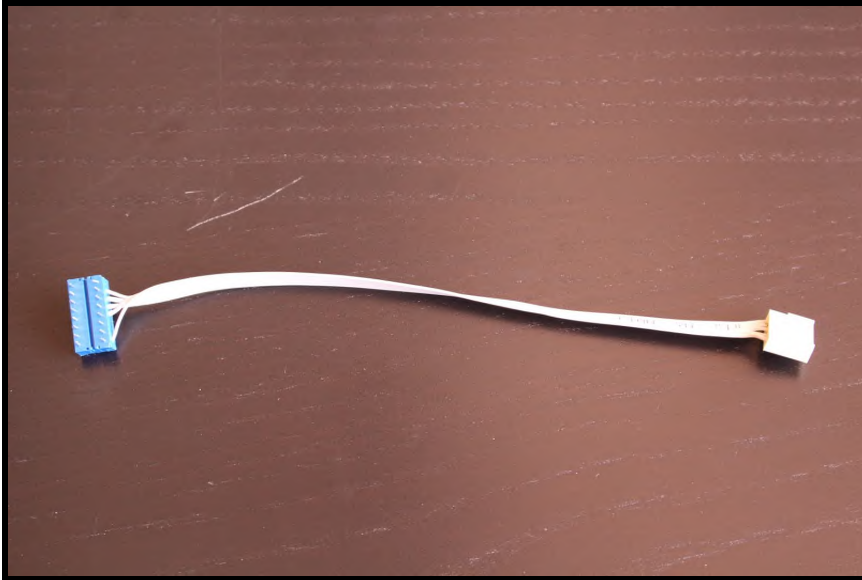


Figure 5.5. DIP Plug (this end goes to the IC3 socket on the second 4soniq)



Figure 5.6. X2 Connector (this end goes to the X2 jack on the first 4soniq)

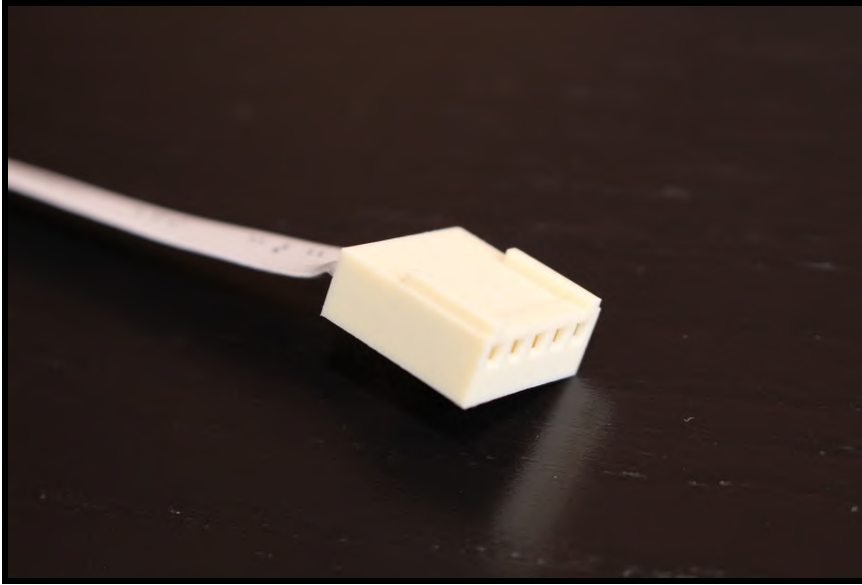
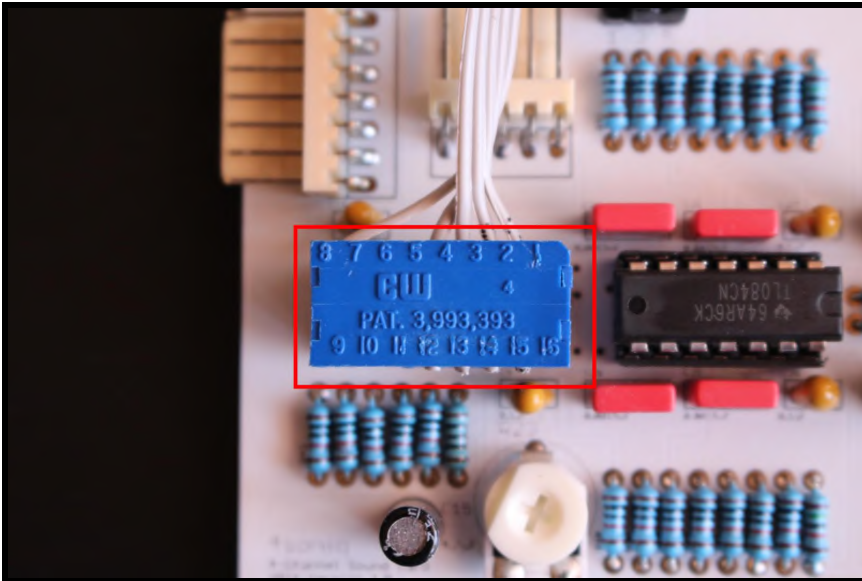


Figure 5.7. 4soniq-to-4soniq Connector Cable DIP Plug Installed on IC3 Socket of Second 4soniq



Step 5.8. Connect the other end of the 4soniq-to-4soniq Connector Cable, to the X2 jack of the first 4soniq.

Figure 5.8. Insert 4soniq-to-4soniq Connector Cable Into X2 Jack Of First 4soniq

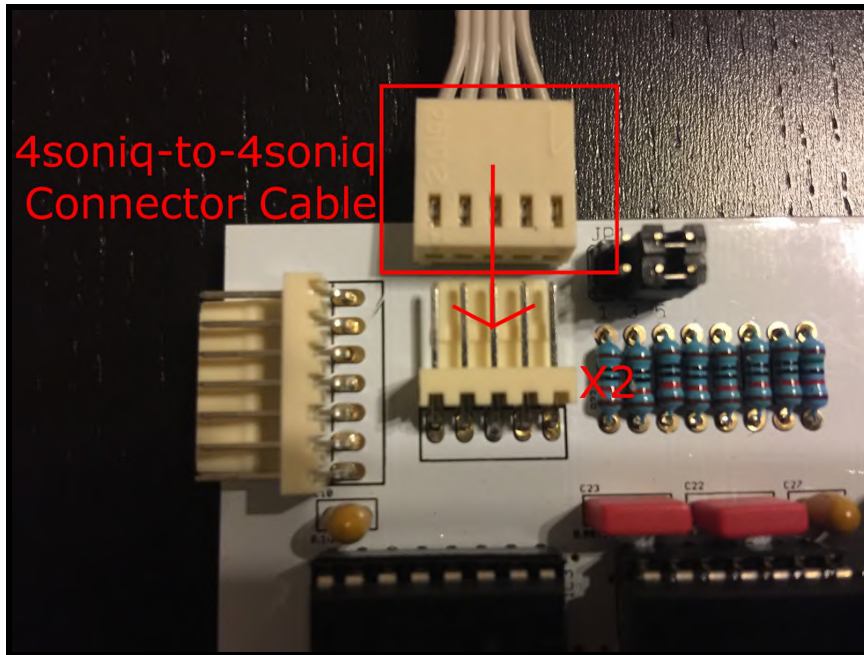
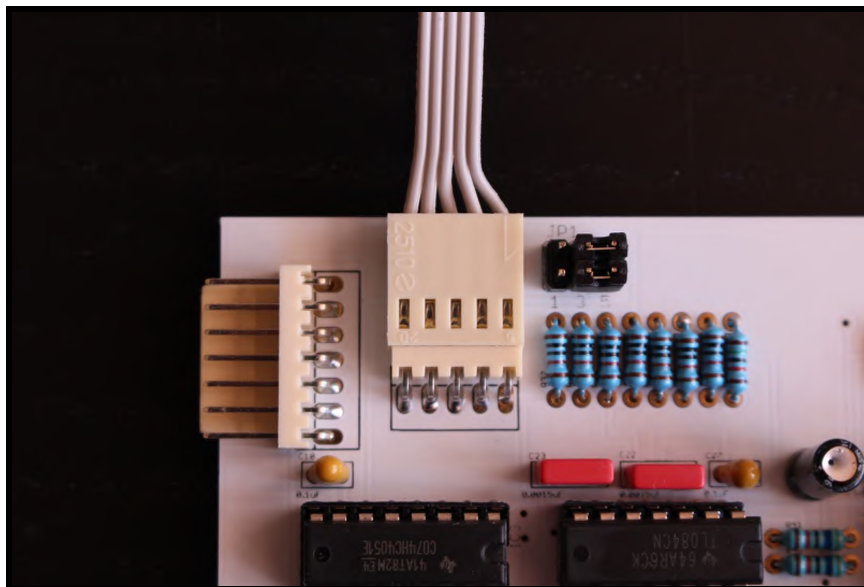


Figure 5.9. 4soniq-to-4soniq Connector Cable Installed On First 4soniq



Step 5.9. Install the second 4soniq into an available slot on the Apple IIgs.

Step 5.10. Plug the second Backplate Cable Assembly connector to the X1 plug on the second 4soniq, and install the second backplate on one of the free slots in the back of the Apple IIgs.

Figure 5.10. Second Backplate Cable Assembly

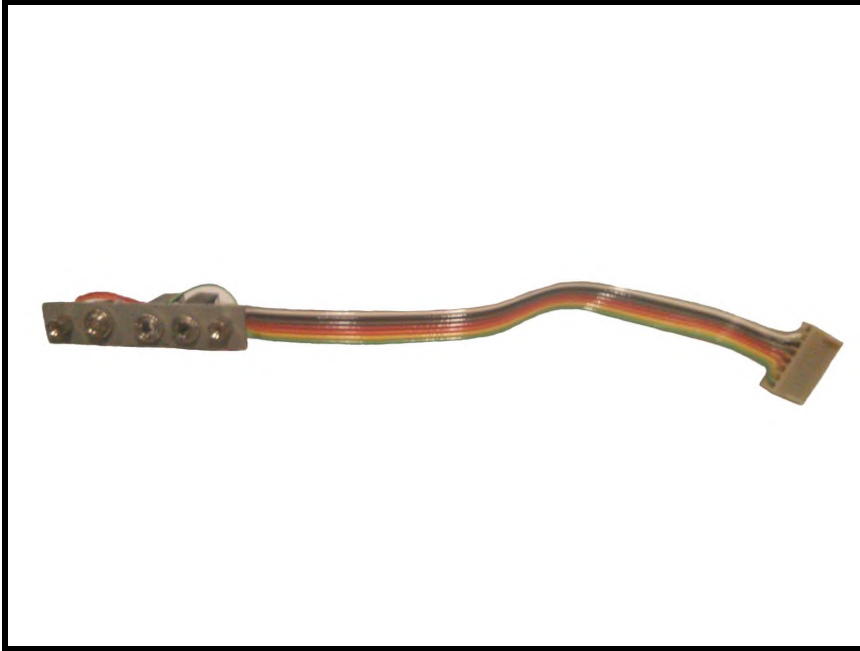
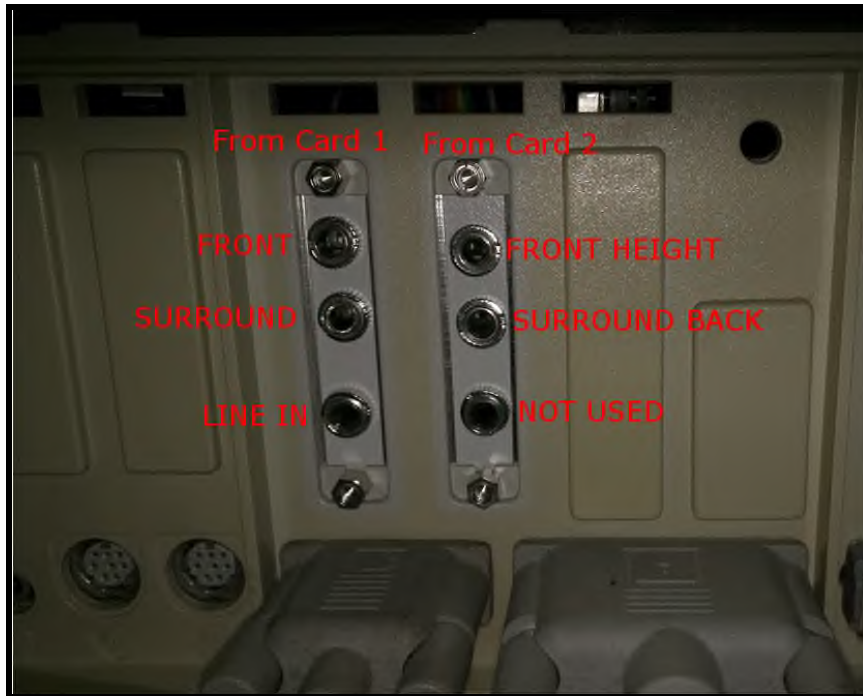


Figure 5.11. Second Backplate Installed



Step 5.11. Plug the stereo jack of your Front Height speakers (front height left = FHL and front height right = FHR) into the top jack of the second backplate. Plug the stereo jack of your Surround Back speakers (surround back left = SBL and surround back right = SBR) speakers into the middle jack of the second backplate.

Figure 5.12. Backplate Connections



Step 5.12. Switch on your Apple IIs and you are all set!

You may want to run the *4soniq Sound Check Program* to confirm that everything was setup correctly. See [Appendix B] for information on where to get the software.

6. How To Use The 4soniq In Slotless Mode

The 4soniq can be used without taking up a slot in the Apple IIgs. To do this you will need to supply the card with power. This is possible by using the EXP plug on the 4soniq.

WARNING: Read this chapter only if you are an advanced user who knows how to use pin assignments and make electrical connections. You should also be familiar with your system's motherboard and know where to find your system's power supply points.

Figure 6.1. EXP Plug



Power Requirements

- The top pin as shown in [Figure 6.1] must receive +5V
- The bottom pin as shown in [Figure 6.1] must receive -5V

Power Source Options

- Apple IIgs video out jack + 78L05
- Apple IIgs power supply jack
- If you have two 4soniqs, you can keep one 4soniq in a slot, and use the other 4soniq in slotless mode, by connecting the two EXP plugs together.
- For more advanced power supply options, contact us. See [Appendix E] for our contact information.

Other Considerations

- You will potentially need a longer J25-to-J25 Cable if you are planning to locate the 4soniq outside of the Apple IIgs case. You can try to make these yourself or contact us to place a special order. See [Appendix E] for our contact information.
- You will want to make sure the card is in a proper enclosure that ensures all the component pins and the gold fingers on the edge of the card are protected from getting shorted out.

A. General Specifications

Digital Wave Synthesizer using the Ensoniq 5503 Digital Oscillator Chip

- 8-bit audio resolution
- 32 oscillator channels (15 voices when paired)
- Support for eight independent stereo speaker channels

Quadraphonic audio playback capability

- Plays back all kinds of digitized sounds such as speech, music and special effects
- Two 3.5mm stereo Line OUT jacks (total of 4 channels per card)
- Maximum analog output = -5 to +5 Volts peak-to-peak

Mono audio record capability

- Digitizes and records any kind of sound
- One 3.5mm mono Line IN jack
- Maximum A/D converter input = -1.25 to +1.25 Volts peak-to-peak

B. Software

4soniq Sound Check Program

You can download the *4soniq Sound Check Program* and other 4soniq related software from the Manila Gear website:

<https://manilagear.com/downloads/>

AudioZap 2.0

AudioZap is available from the Audio and Utilities hard disk image from the What Is The IIGs website:

<http://www.whatisthe2gs.apple2.org.za/>

NinjaTracker

NinjaTracker is a SoundSmith based music player, available from the NinjaForce website:

<http://ninjaforce.com/html/products.html#NinjaTracker>

A version of *NinjaTracker* that supports the 4soniq is available on the Manila Gear website:

<https://manilagear.com/downloads/>

Kaboom! v1.03

Kaboom! is the only action game for the Apple IIGs where up to four players can play simultaneously. It supports 4soniq 4-channel sound.

http://ninjaforce.com/html/products_kaboom.html

SoundSmith v2.0b

SoundSmith v2.0b supports 8-channel sound. It is available from the Brutal Deluxe website:

<http://www.brutaldeluxe.fr/products/apple2gs/soundsmith/>

SoundShop

SoundShop is available from the Audio and Utilities hard disk image from the What Is The IIGs website:

<http://www.whatisthe2gs.apple2.org.za/>

C. Programming

If you are interested in writing programs for the 4soniq, make sure to read the *4soniq Programmer's Guide*. It includes a good overview of Ensoniq 5503 DOC programming basics, complete with code examples for BASIC, Assembly, and Toolset programming.

Get your copy of the *4soniq Programmer's Guide* from the Manila Gear website:

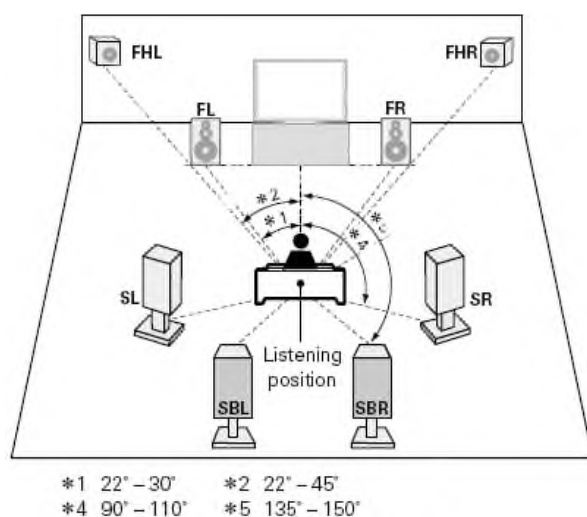
<https://manilagear.com/downloads/>

D. Frequently Asked Questions

How should I arrange my speakers?

A single 4soniq should be connected to FL, FR, SL and SR respectively. If you have a second 4soniq, it should be connected to FHL, FHR, SBL, and SBR.

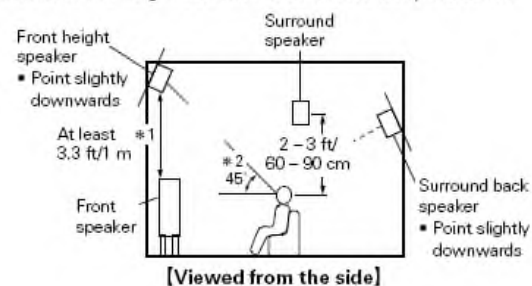
You can choose to arrange your speakers according to the layout illustrated below:



[Speaker abbreviations]

FL Front speaker (L)	SBL Surround back speaker (L)
FR Front speaker (R)	SBR Surround back speaker (R)
SL Surround speaker (L)	FHL Front height speaker (L)
SR Surround speaker (R)	FHR Front height speaker (R)

Use the illustration below as a guide for how high each speaker should be installed. The height does not need to be exactly the same.



Can I use my 4soniq as a stereo card?

Yes. You can attach your stereo speakers to FL and FR. Software written to use only two channels of the Ensoniq 5503 DOC chip should work perfectly fine. However, in this configuration, software written for four or more channels may sound incorrect and may not operate properly.

Why is the input just mono, and not stereo?

The ability of the 4soniq to record monophonic audio takes advantage of the Ensoniq 5503 DOC chip that is already installed in your Apple IIgs. Recording stereophonic audio would require additional components, the use of the slot for more than just power, and specialized software, all of which would add significant cost to the unit.

If there is enough interest we might explore creating a stereo input model. If you'd like to be added to the interest list, you can let us know using our website's Contact Us form, or simply send us an email at info@manilagear.com.

Why did you use a special cable and require users to extract an IC for 8 channel mode?

We could have designed the card so that the 2nd card just uses the same cable that goes to the IIGs motherboard (J-25 Connector Cable), to a plug on the 1st card with no need to remove an IC. This would have required 2 or 3 additional chips on the card, and would have increased the price for "4 channel only" users. This would also have allowed connecting the wrong cable into the wrong jack.

Why are the plugs on the board at right angles to the card itself?

This is so that there is no adjacent slot interference. Many IIGs's are already full with cards, so we wanted to make sure plugging in the 4soniq doesn't block the use of the next higher slot because of jacks or connectors sticking out.

E. Technical Support

When you contact us, please provide the following information:

- Version number of your 4soniq (printed on the front of your card)
- Error message on the screen and how it came about

Contact us at:

Manila Gear LLC

Mountain View, CA 94043

<https://www.manilagear.com>

Email: info@manilagear.com

Facebook: <https://www.facebook.com/manilagear>