POLYPHONIC AFTERTOUCH SYSTEM
FOR RHODES CHROMA
Installation Manual

Introduction

Thank you for purchasing a Rhodes Chroma Aftertouch System. This product adds polyphonic aftertouch functionality to any Rhodes Chroma. Our aftertouch system uses high quality force-sensing-resistors that were designed for human touch applications, making them ideal for use in aftertouch systems. Each key's aftertouch sensitivity can be adjusted, allowing for uniform response across the Chroma's keyboard, which can require as much or as little pressure as your tastes require.

The original aftertouch system for the Chroma required that the sensors be mounted to that back rail, which due to the mechanics of the Chroma keyboard, required more force than should have been necessary to engage aftertouch. We noticed that the Chroma keyboard has the same style of keys as the Prophet T8 and Synclaviers, which both have fully adjustable, great feeling polyphonic aftertouch. The sensors in these two synths were located under the keys, which gives a significant mechanical advantage. (Requires less force to activate aftertouch) We decided to adapt the circuitry and mechanics from these synths into a system for the Chroma. We were able to take advantage of the Chroma's keyboard mechanics to make our aftertouch system feel great.

This kit is easy to moderate in terms of difficulty, and can be installed in about 3 hours. We hope you enjoy our product.

Kit Contents

- Aftertouch Sensor PCB (2)
- Foam Balance Rail Punchings (70)
- 3/8" #4 wood screws (80)
- 14-Pin DIP Connector Cable (1)
- Nylon Cable Tie (2)
- 12-Pin 1" FFC Connector (1)

Tools Required For Installation

- Phillips Head Screwdriver
- Awl, Center Punch, or other tool for starting screw holes
- Soldering Iron
- Solder
- Ruler
- Pencil

Installation

To begin the installation process, start by removing the lid and the 4 screws that hold the front panel in place. Flip the lid up to allow access to the keys. Remove all of the keys and set aside.

Clean any dust and debris from the keybed.

You will see two sets of guide pins, each with a different type of felt ring (Fig. 1). The thick, green piano felts are the front rail punchings, and the thin felts are the balance rail punchings. Remove the felt balance rail punchings, being careful to leave any paper punchings (used for key leveling) behind (Fig. 2 & 3). Replace the felt punchings with the punchings contained in the aftertouch kit (Fig. 4).

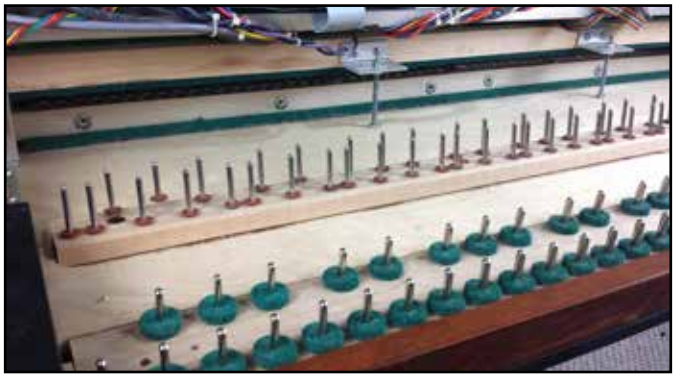

Figure 1 - Front and Back Rail Guide Pins and Punchings

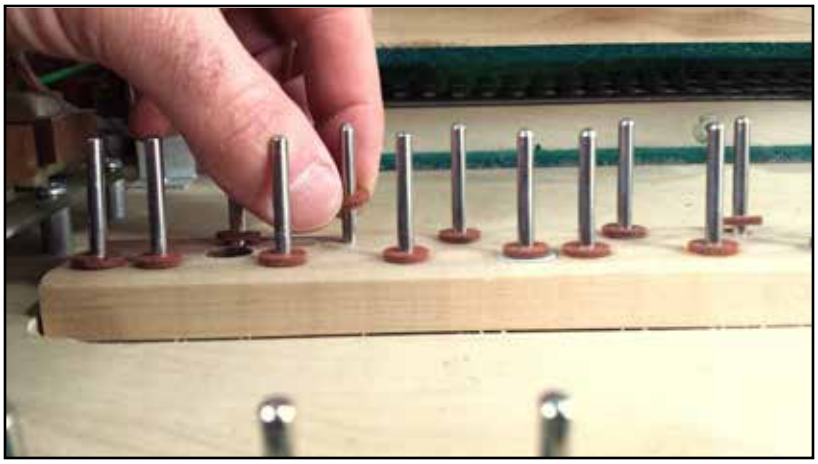

Figure 2 - Removing Balance Rail Felts

Figure 3 - Paper Spacers Remaining

Figure 4 - NEA Quick-Recovery Foam Punchings

The aftertouch kit contains two PCBs (Fig. 5 & 6). One PCB has a 14-pin DIP cable connected to it. This is the Lower Sensor Board (Placed beneath the lowest 32 notes on the Chroma keyboard). The Lower Sensor Board must be connected to the Upper Sensor Board using the 12-pin 1" FFC connector. J2 on the Lower Sensor Board should be connected to J1 on the Upper Sensor Board. Solder the FFC connector on the bottom side of the PCBs (Fig. 7). Fold the cable as shown in Figure 8.

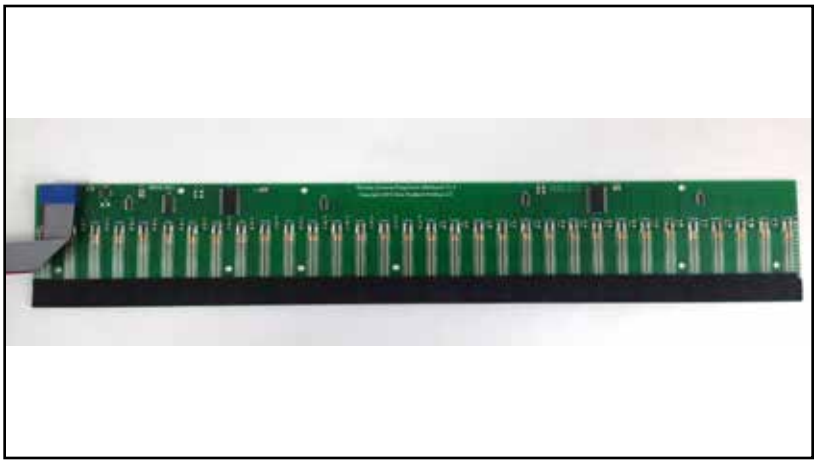

Figure 5 - Lower Sensor PCB With 14P DIP Connector Cable (Note that trim-pot is only populated on Lower Sensor PCB)

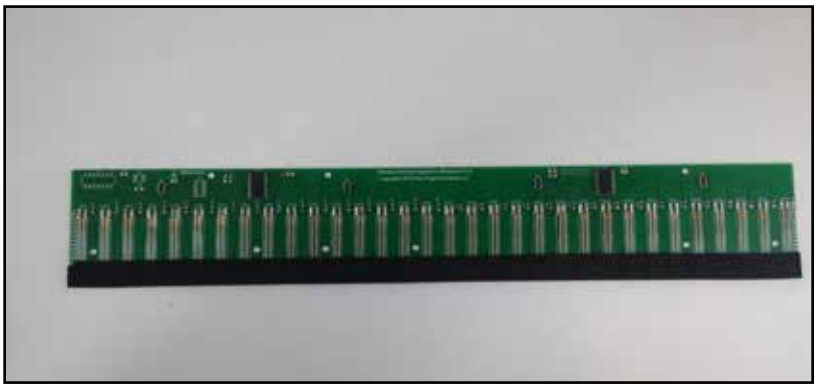

Figure 6 - Upper Sensor Board

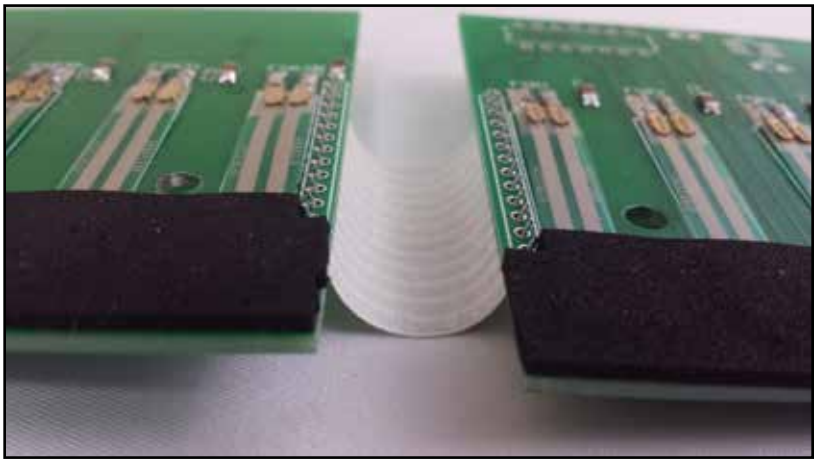

Figure 7 - Soldering FFC Connector

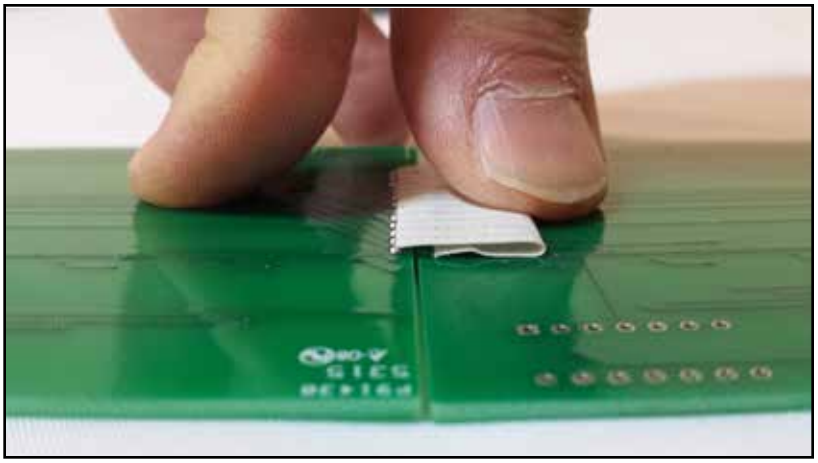

Figure 8 - Proper Folding of FFC Cable

Place the aftertouch assembly onto the base of the keybed as shown in Figure 9. Do not screw the assembly into place yet. The assembly should be oriented so that the sensors are closest to the front rail, and the back edge of the PCBs is flush with the balance rail. Fold the DIP connector cable as shown in Figure 10, and be sure to secure the cable so that it will not be in the way of anything such as other keys or the lid. Plug the 14-pin DIP cable into J22 on the Chroma I/O Board. Take note of the pin numbering on the DIP connector (Fig. 11). Pin 1 on the J22 on the Chroma is indicated with a small dot. Be sure that you orient the connector correctly.

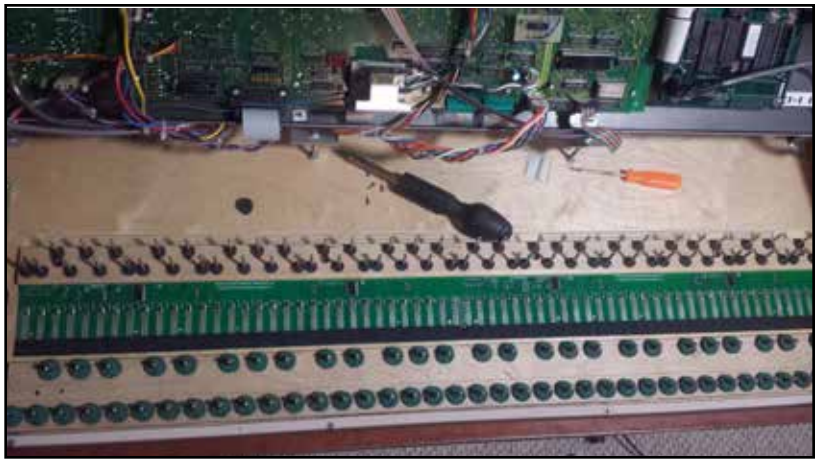

Figure 9 - Test Fit of Aftertouch Assembly

Figure 10 - 14 Pin DIP Cable Placement (Best to fold and run ribbon underneath bender chassis. Tape ribbon down to keep flat)

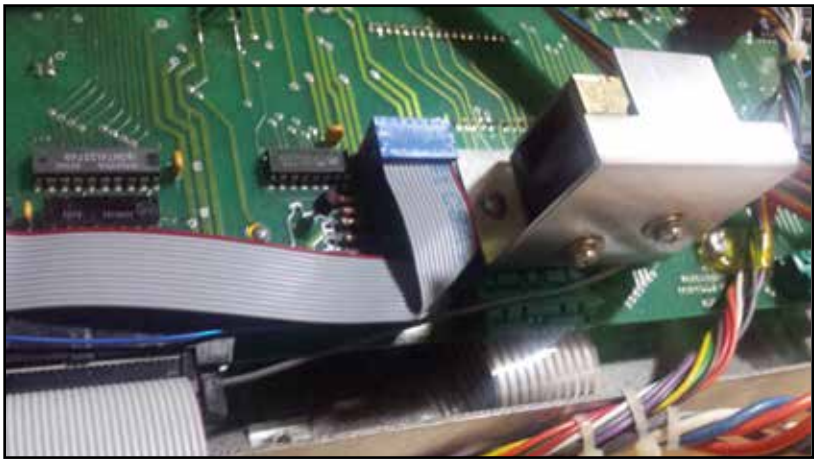
Figure 11 - 14 Pin DIP Cable Plugged Into Chroma I/O PCB J22 (Note pin number markings on PCB and Header)

Turn on the Chroma and press SET SPLIT-35 to enable polyphonic aftertouch. Edit a sound so that pressure is routed to pitch, resulting in a pitch bend when aftertouch is applied to a note. Place a key back into the keybed as shown. Press the key and use your finger to press on the aftertouch sensor associated with that note. (Remember that the assembly is not screwed down yet, so you can just slide the pcb to the side and access the sensor you want to test.) Verify that aftertouch is working. Adjust the SENS ADJ on the Lower Sensor Board if needed. (This is a global sensitivity adjust and affects all keys.)
Place one black key on each octave back into the keybed (Fig. 12). We need to align the assembly so that the keys line up with the sensors. Use black keys to do this. Be sure that the back edge of the PCBs are flush with the balance rail, and be sure that the sharps are directly centered over the sensor strips (Fig. 13). When you are happy with the alignment, use an awl or center punch to mark the holes as shown in Figure 14 (only the 6 holes closest to the sensors need to be marked). Use 12 #4 screws to secure the aftertouch assembly to the keybed (Fig 15).

Figure 12 - Alignment of Sensors With Keys

Figure 13 - Alignment of Aftertouch Assembly With Balance Rail

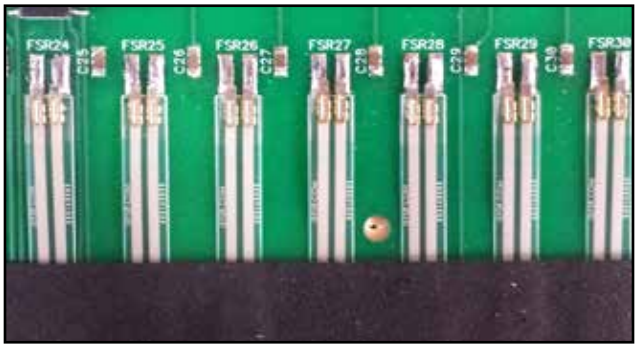

Figure 14 - Marking Screw Holes With Awl

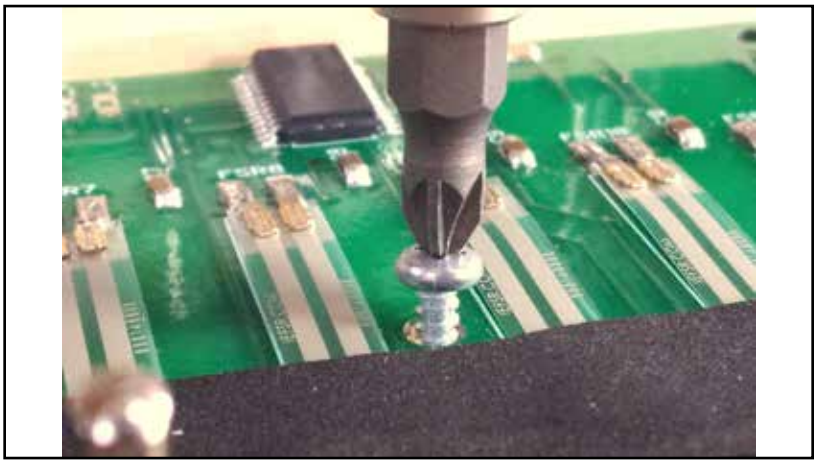

Figure 15 - Screwing Aftertouch Assembly Into Place

Note that now the active portion of the sensors is located directly underneath keys at the same point on all of the black keys (Fig. 16). This is typically 1.5” from the key front (Fig 17 & 18), but can vary slightly, so measure this distance on your keyboard to make sure it’s the same. Mark the black keys as shown in Figure 19. Use an awl to mark the center point of the key, then screw a #4 screw into the key. Be sure to drive the screw all the way up to its head as shown in fig 18.

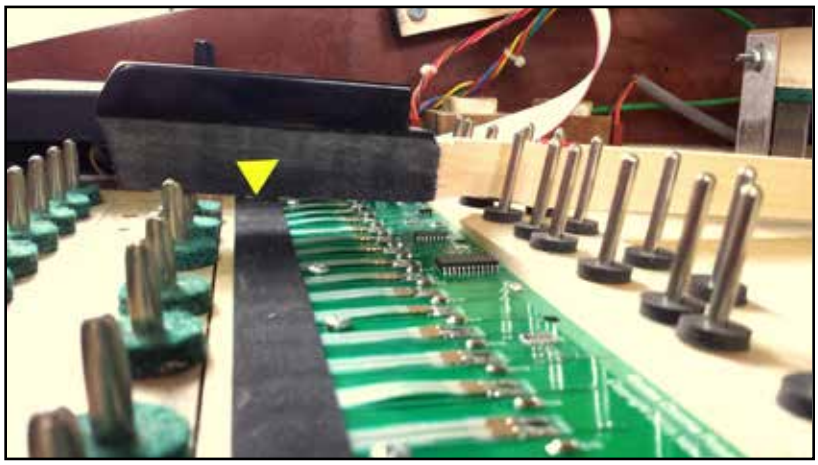

Figure 16 - Location of Sensor & Key Contact Point

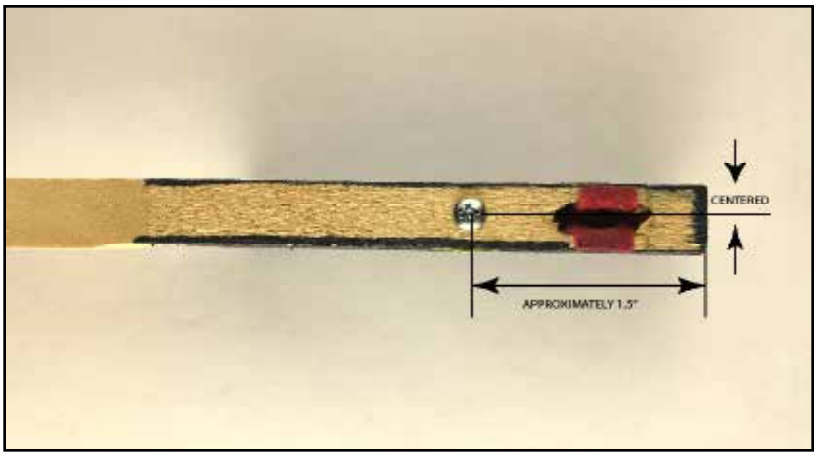

Figure 17 - Correct Location of Screw on a Sharp Key

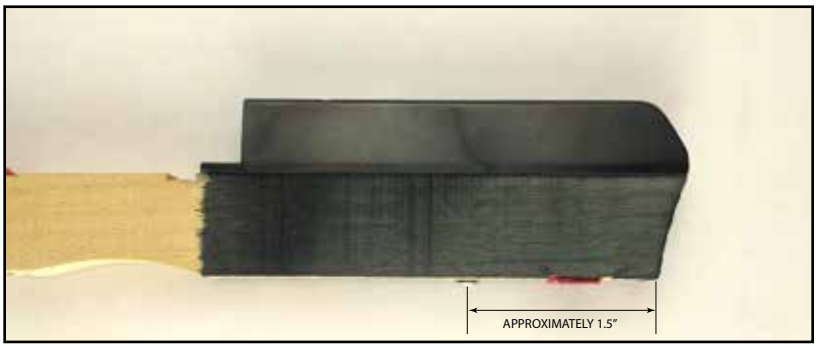

Figure 18 - Correct Location of Screw on a Sharp Key

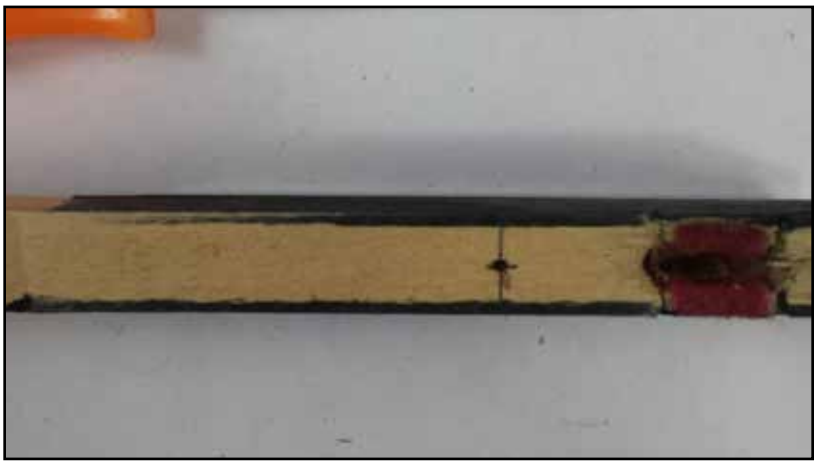
Figure 19 - Example of Starter Hole Marked With Awl

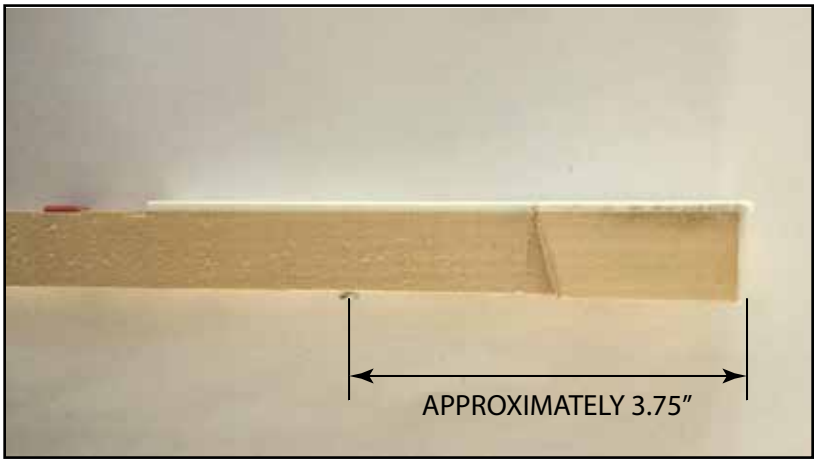

Figure 20 - White Key Screw Location (Side View)

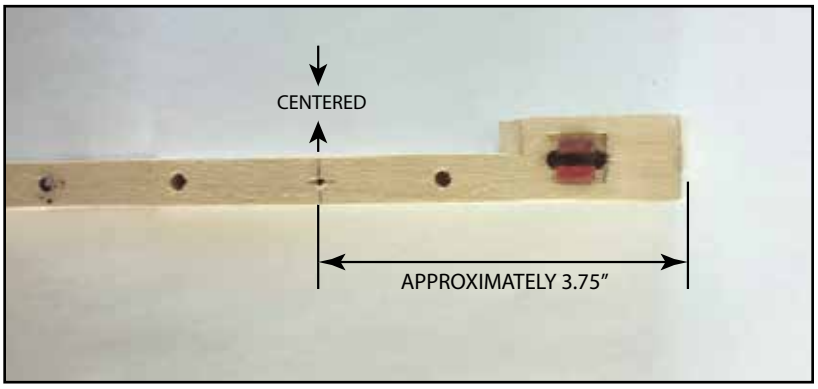

Figure 21 - White Key Screw Locarion (Bottom View)

Now place the key into the keybed and play that note. Apply aftertouch pressure. Notice that the screw under the key comes into contact with the protective foam strip over the aftertouch sensor. Adjust the height of the #4 screw so that it only comes into contact with the aftertouch sensor when aftertouch is engaged. If it comes into contact with the sensor too early in the keystroke, aftertouch will engage too early, and will engage when playing notes at high velocities. Both of these are undesireable. If the screw comes into contact with the foam too late in the keystroke, then too much pressure will be required to engage aftertouch. The height of the screw determines the point in the keystroke that the aftertouch starts. You want this to be the same on every note. Adjust this on every black key.
Now place a white key into the keybed. Find the correct distance for the location of the screw for the white keys, about 3.75” from key front (Fig. 20 & 21) Apply the #4 screws to the white keys as shown in Figure 20. Repeat the aftertouch calibration procedure described in the previous step.

Figure 22 - Black Key at Rest

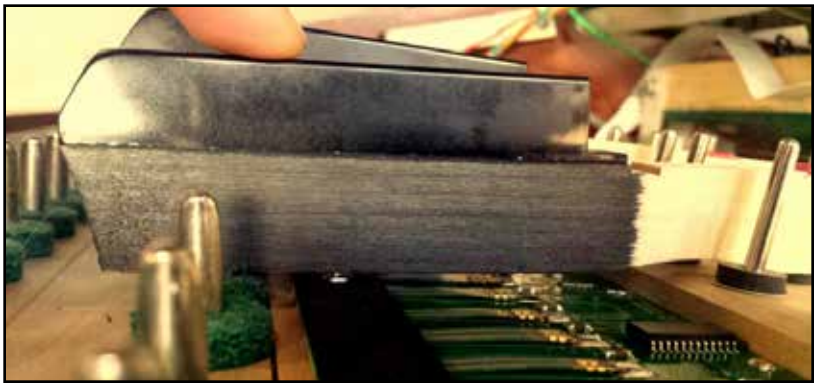

Figure 23 - Black Key Depressed (No Aftertouch Engaged)

Figure 24 - Black Key Depressed (Aftertouch Engaged)

Figure 25 - Key Travel During Normal Key Stroke (Note how close screw comes to the sensor foam without actually touching it.)

Figure 26 - Back of Key Hitting Back Rail Felt During Keystroke

Figure 27 - Back of Key Pressing on Back Rail When Aftertouch is Engaged

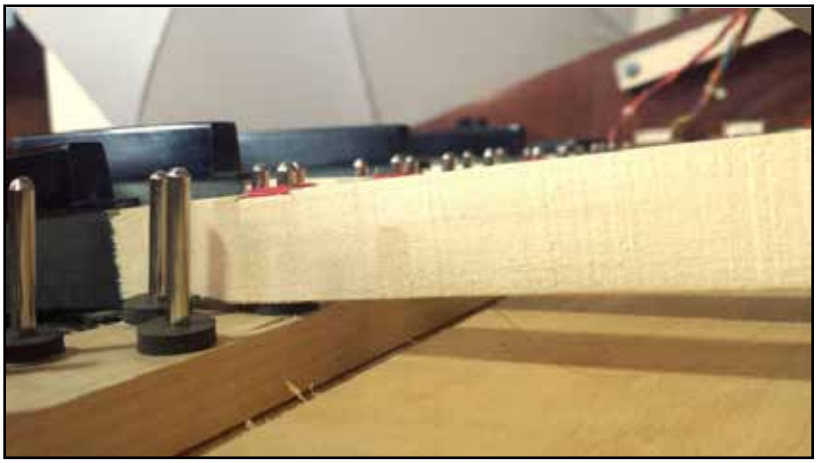

Figure 28 - Compression of Balance Rail Foam Punchings When Aftertouch is Engaged.
(This is what allows the screw to come down on the sensors in a controlled way, which makes the aftertouch response feel good under the fingers.)

Test all keys to be sure that the pressure response is even from note to note.

If you would like more “squish” to the feel of your aftertouch, we also have custom foam front rail punchings that replace the green felt front rail punchings. The Prophet T8 and Synclavier both used foam punchings on the front and balance rails. It is a matter of taste. The foam punchings have the added benefit of making the action quieter. If you need a set of foam front rail punchings for the Chroma, they can be purchased separately on our website.

When you feel that the aftertouch response is uniform across the keyboard and the sensitivity is to your liking, you are ready to close the lid and play the Chroma.

Please contact us with any questions regarding this product.