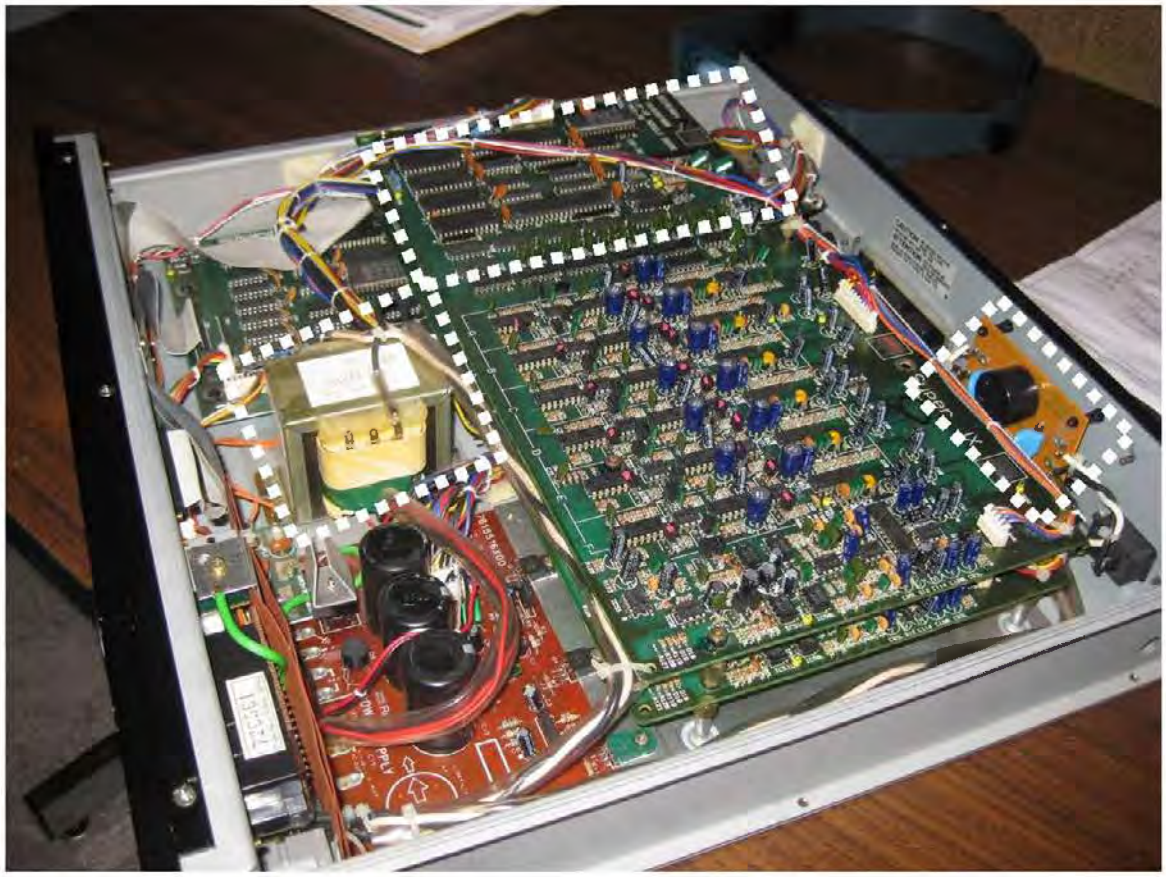
MKS-70 Hum Elimination Modification

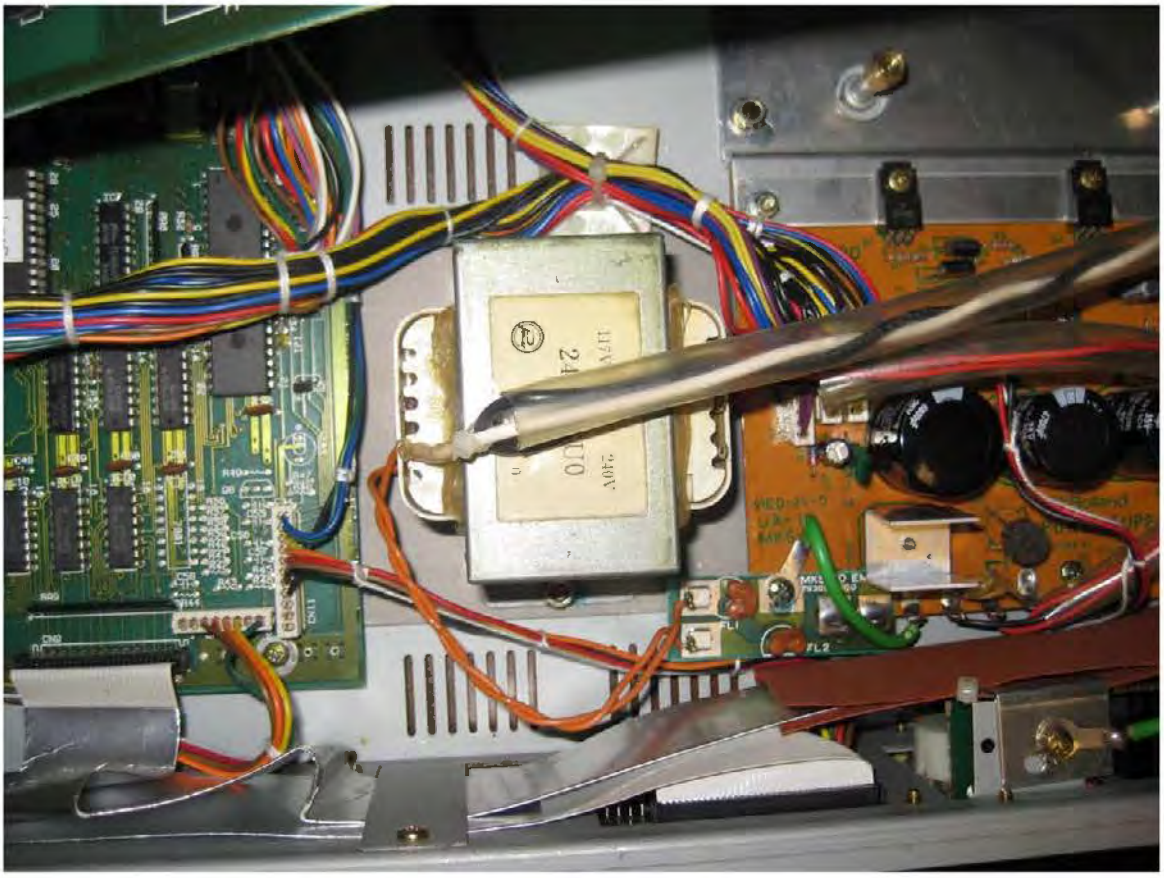
There are three main sources of noise inside the MKS-70. The worst offender is the transformer, then the processor area on the sound boards, and finally the AC line filter.

Important Note: I tried to do some alternative wire routings by swapping around the sound module board locations to prevent from having to cut wire bundle lacings, but I just couldn't get it to work. Because of this, SOME OF THE PHOTOS SHOWN HAVE WIRE CONNECTORS IN THE WRONG LOCATIONS! The correct locations are clearly called out in the reassembly photos at the end of the article, but don't use random photos for reference as the wire connector locations may be "backward". Sorry.



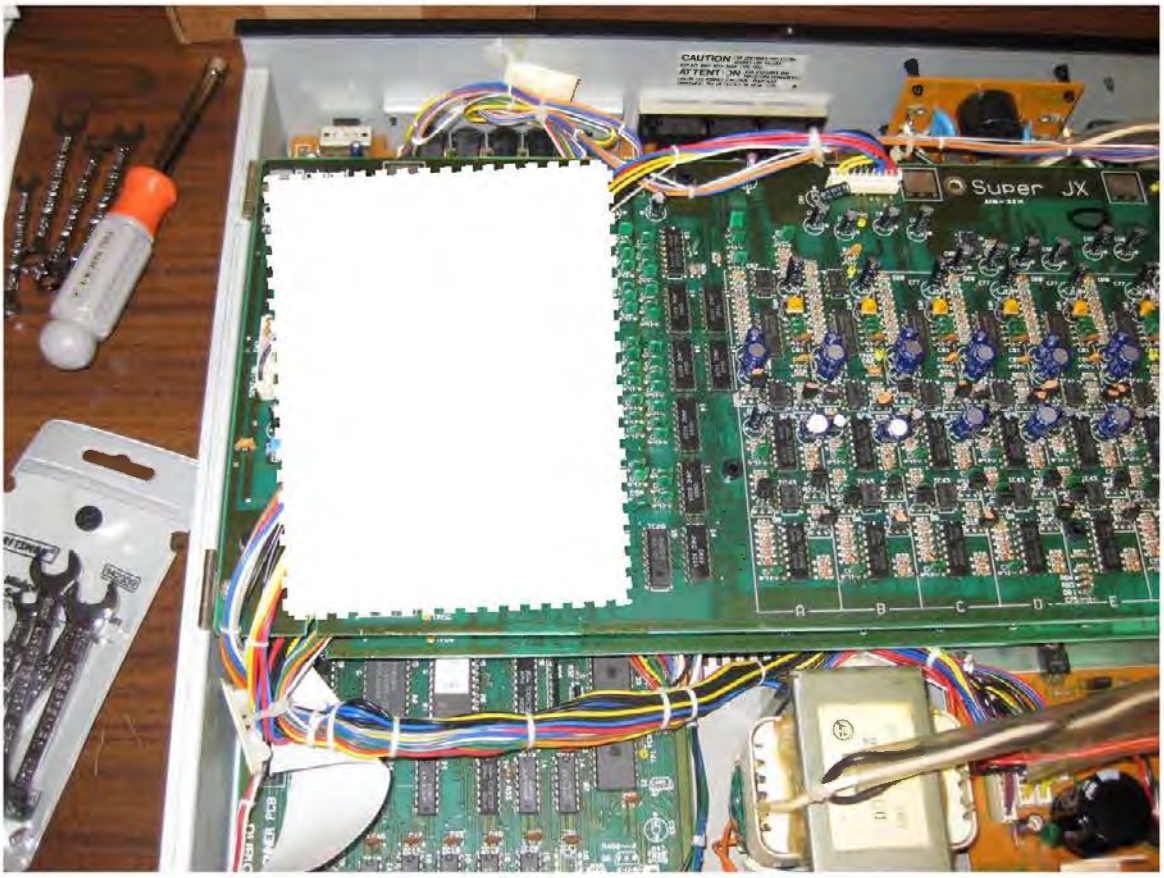
#1 The Transformer - The main power lead bundles coming off the power supply board runs right next to the mains transformer. You wouldn't think a bit of 60-cycle imposed on the DC power going to the boards would be a problem, but it is.

In the above photo, you can see the sound boards themselves are pretty close to the transformer, and they do actually pick up a bit of 60-cycle hum directly. However, it's far and away the routing of the power bundle next to the transformer causing the audible 60-cycle hum.

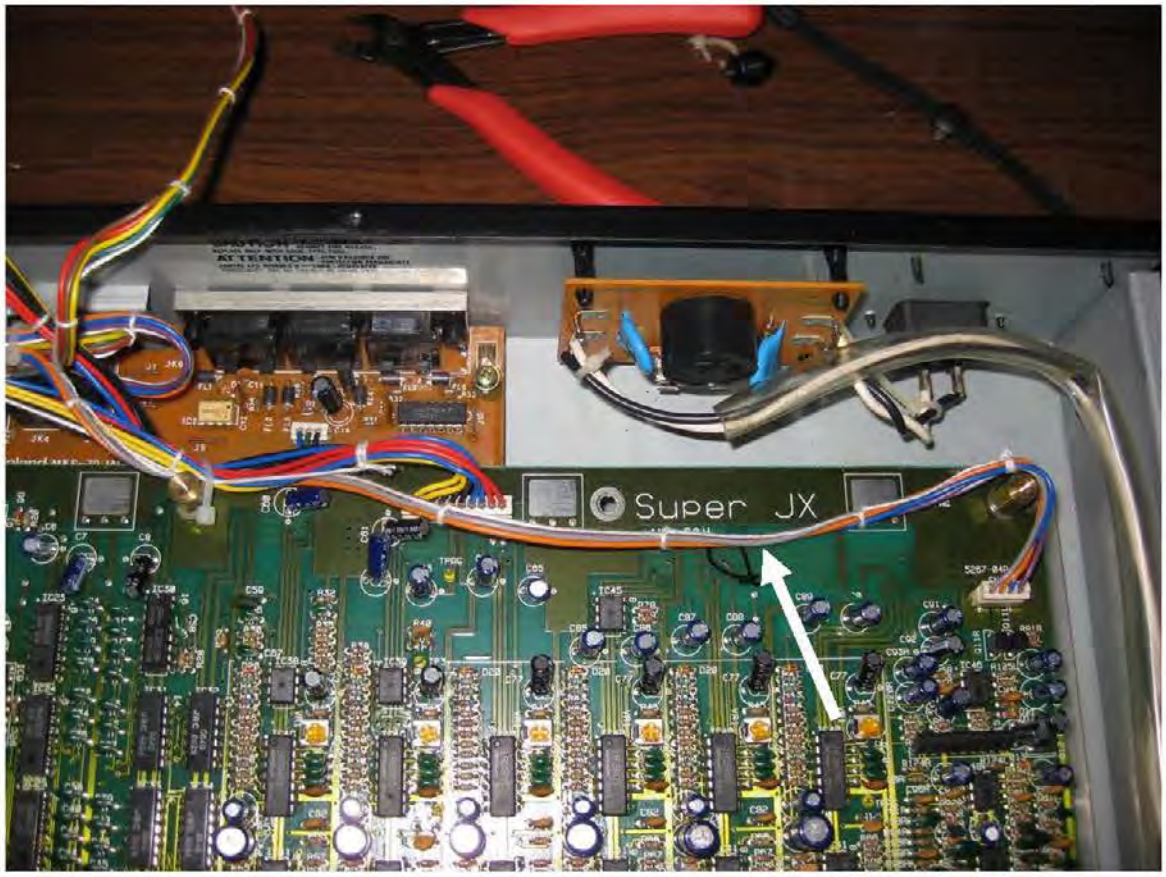


#2 Digital Noise - If you clear up the 60-cycle hum and put it back together, the outputs are now quiet enough to hear there's some substantial digital noise being generated as well. This is coming off the sound module boards from the area shown below. The power wires are running right across the processor section, compounding the noise problem.

The noisy processor zone is shown below. You want to keep all wires away from the chips in the shaded area. Route wires so they are to the right of the green capacitor array adjacent to the shaded area and you won't have any noise. The chips just to the right of the green capacitor array are fine; you can lay wires right on top of these without ill effects, but anything to the left is very bad.



#3 AC Filter Board - This wiring gap as shown below from the factory isn't too bad, but the unshielded wires running from the sound module audio output connector to the jack board do run right next to the filter. As shown is fine, but if when putting things back together if you accidentally get the audio wires close to the filter, you'll pick up 60-cycle hum.

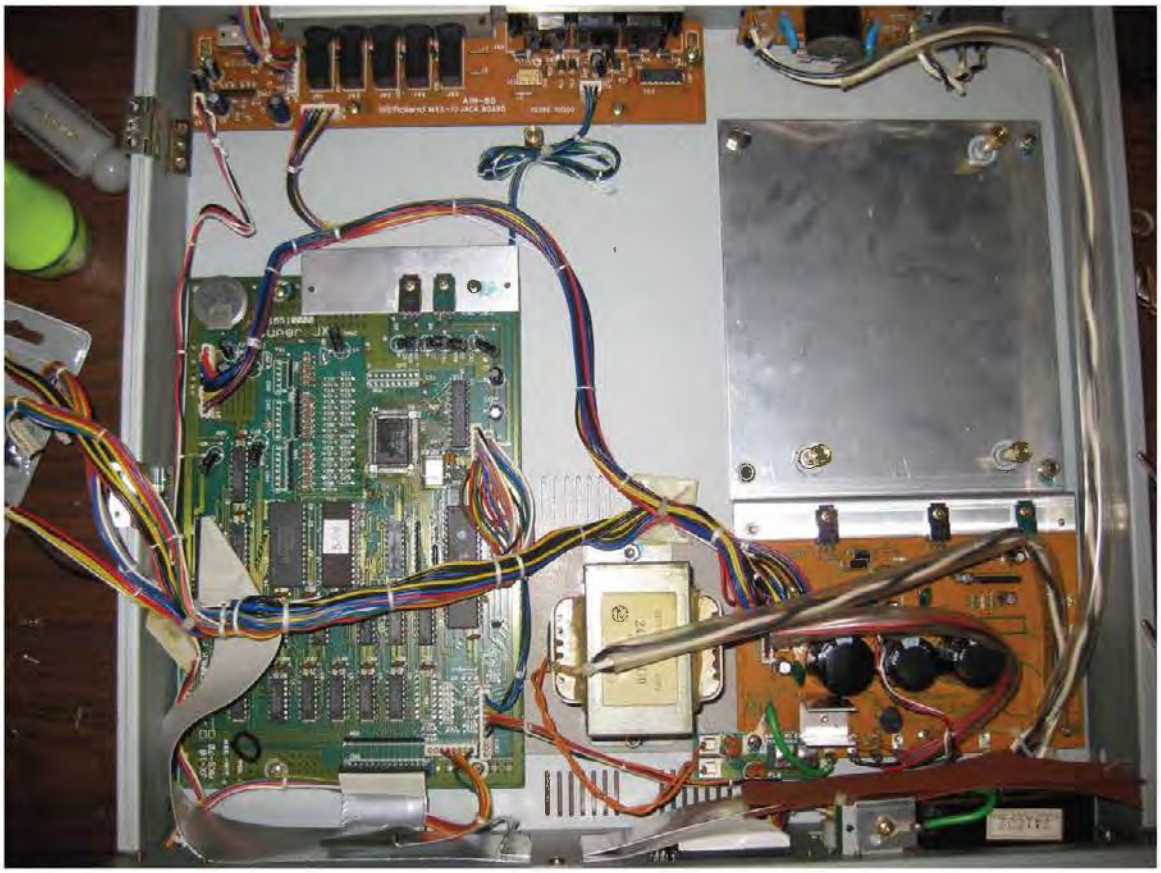


Connector Locations - To educate one in what is to follow, below are the functions of the three wire bundles going to the Super JX sound module board connectors.

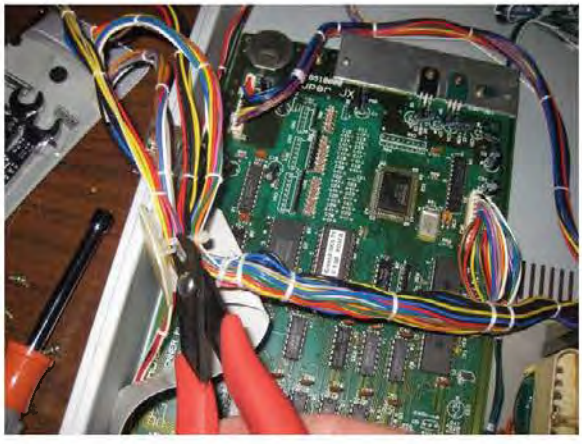
1: Processor Left
2: DC Power Middle
3: Audio Right

Modification - I hate to perform modifications to synths that can't be "undone", but there was just no way around it; you have to clip the original wire bundle lacings to reroute the wires.

First, remove both sound module boards to completely expose the wiring.

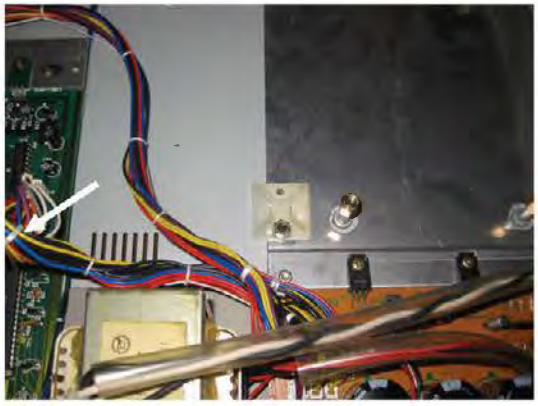


Clip the cable ties securing the power supply wire bundles to the stick-on ty-wrap mounts in the two locations shown. On my synth, the double-sided foam tape on the mounts had popped free from age. If yours are still attached, gently remove the mount nearest the transformer after clipping the wires free as shown in the left photo.

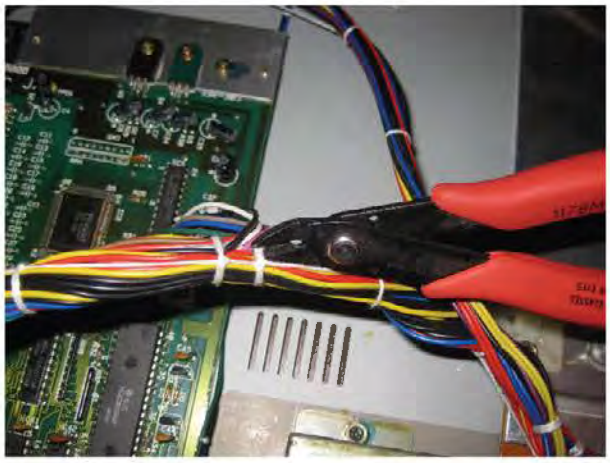


If still attached, remove the old double-sided foam tape backing off the mount nearest the transformer and leave it off. Replace the tape on the other one with new if required.

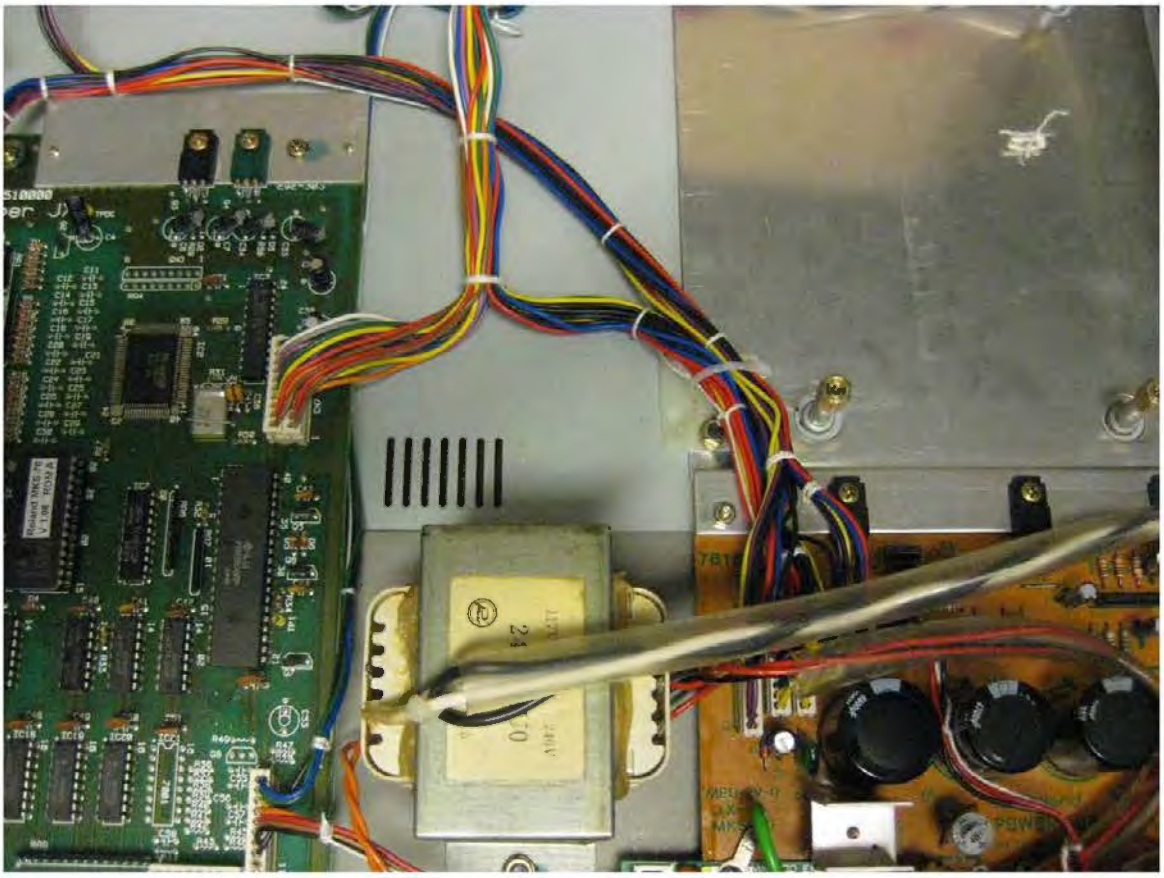
Now remove the nut from the lower left heat sink attach point and install the mount without tape as shown in the photo on the right below.



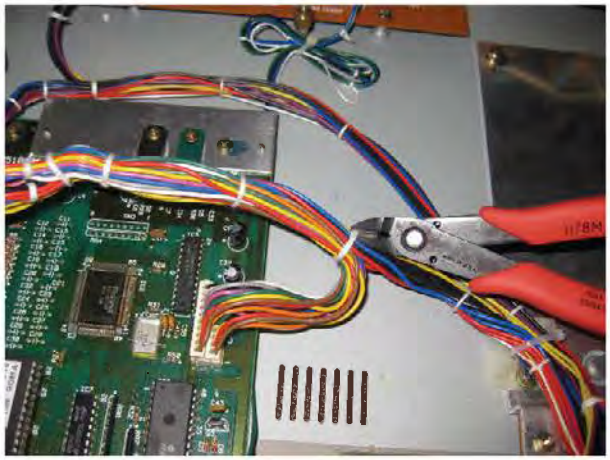
Clip the wire bundle string in the location shown below, liberating the bundle. See the arrow in the above right photo for clarification.

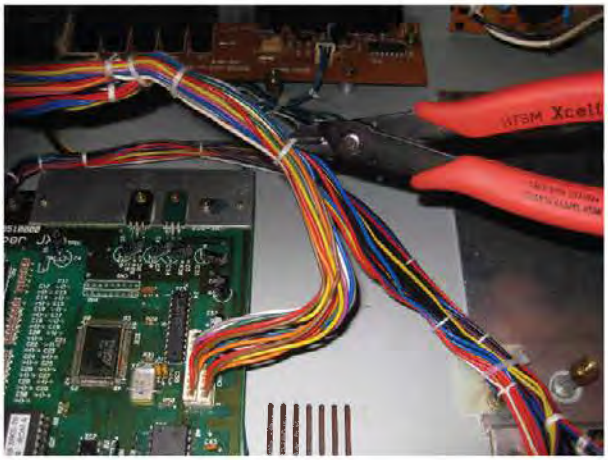


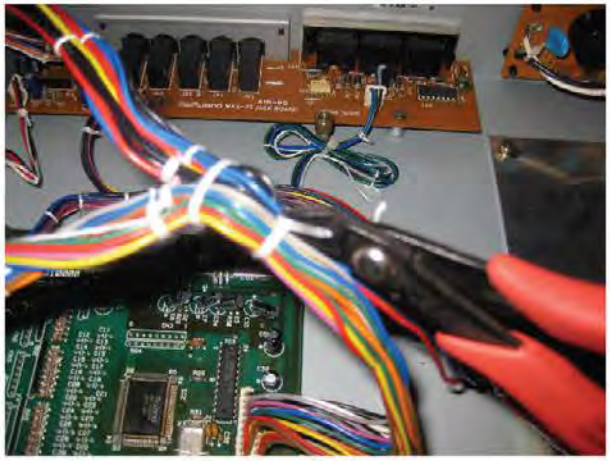
Now ty-wrap the bundle to the heat sink mount into position as shown below. A sound module board is going over this bundle at the ty-wrap location, so mount the wires so they are side-by-side rather than on top of each other. Rotate the ty-wrap so the locking nub to the side as well to keep it away from the sound module board. Gently push all the wires as far away from the transformer as possible.



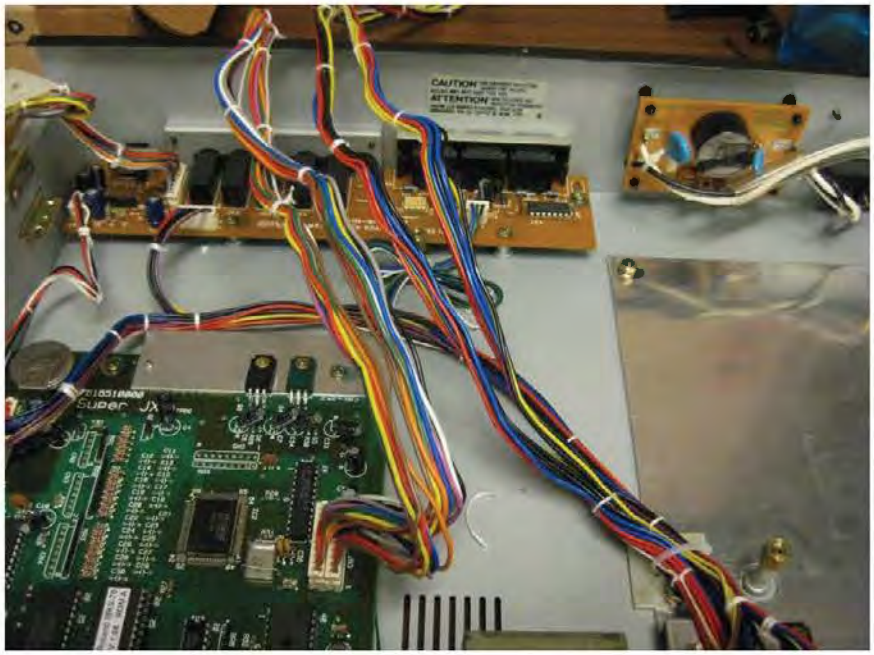
Now clip the lacings for the Assigner board and Power Supply wire bundles in the four places shown below.



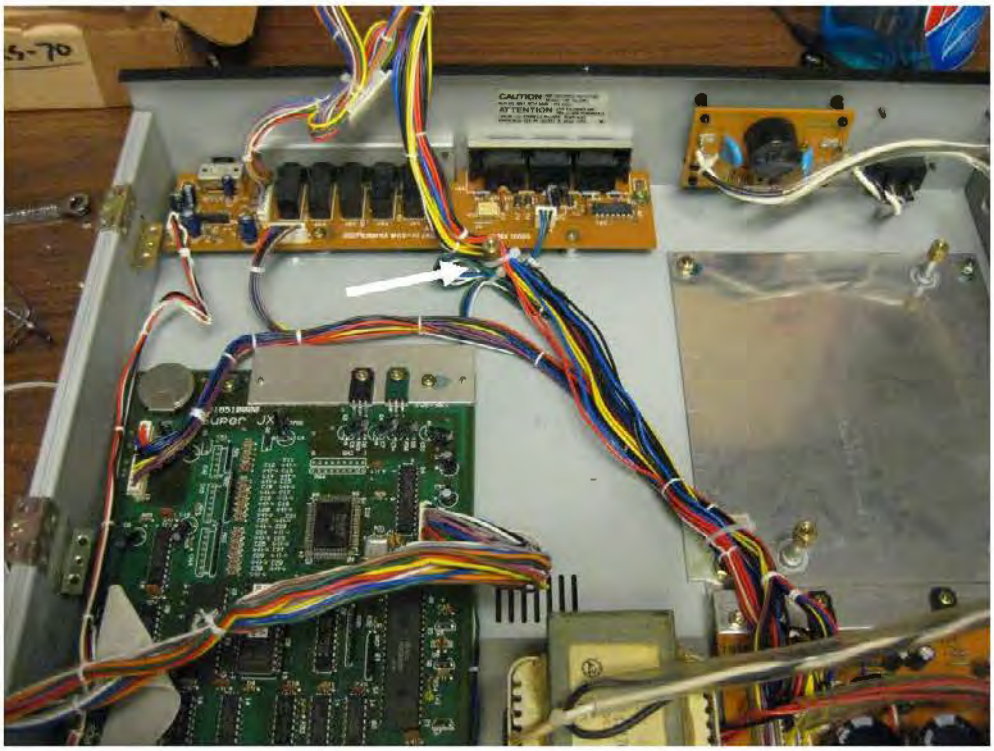




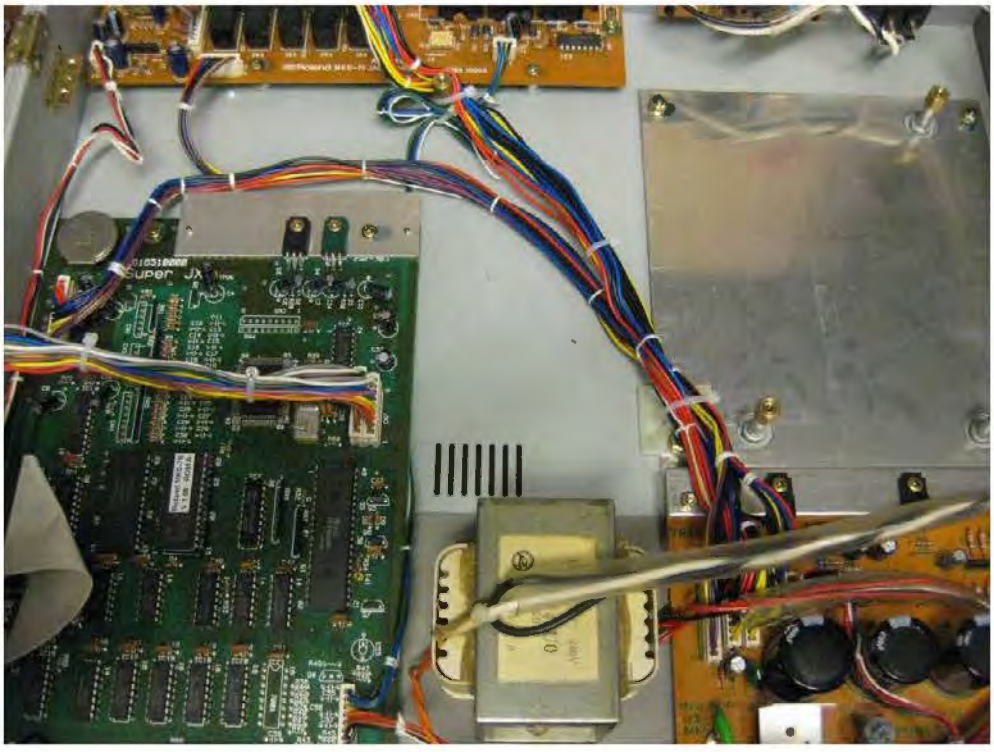
It should look like this when you're finished.



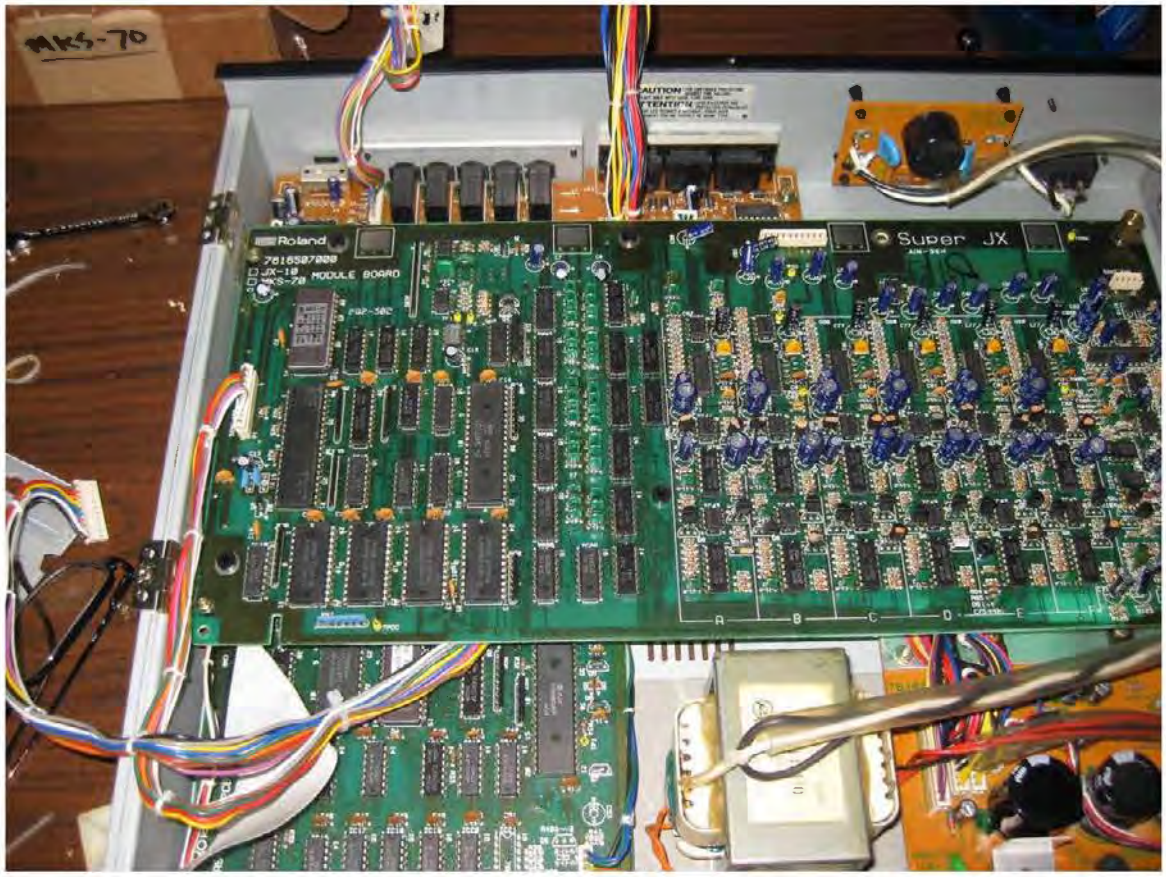
Gently ty-wrap the power supply wire bundle to the middle-rear sound board mount near the jack board so it looks like the photo below. Keep the wire bundles low to clear the sound board.



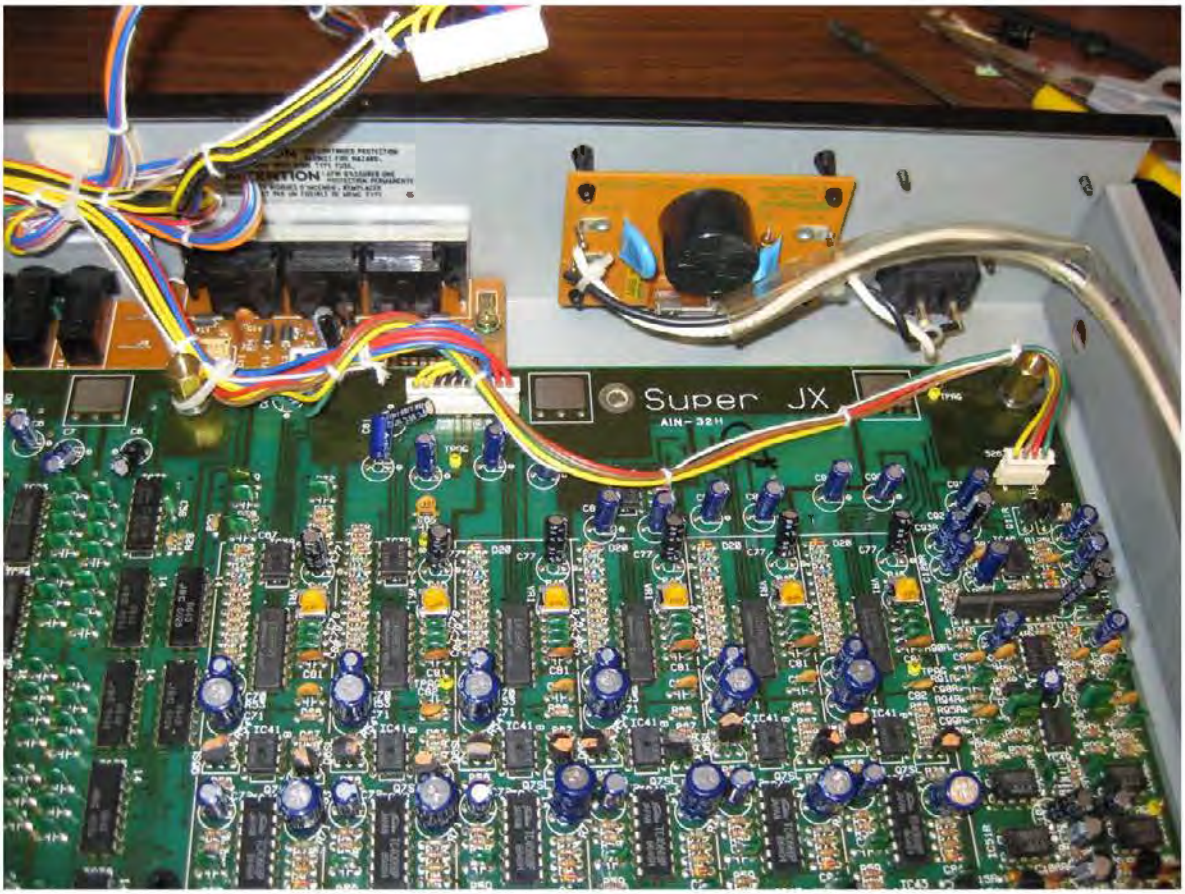
Carefully bend all the Assigner board connector wires over to the left. This wire bundle goes under the sound module board as well, so make sure it's as low as it can go. Add a few ty-wraps to the two wire bundles to secure the wiring.



Replace the lower (ROM B) sound module board and connect the processor wire bundle to the left side of the board. The correct bundle connector for the lower board has no wire in Position 10.



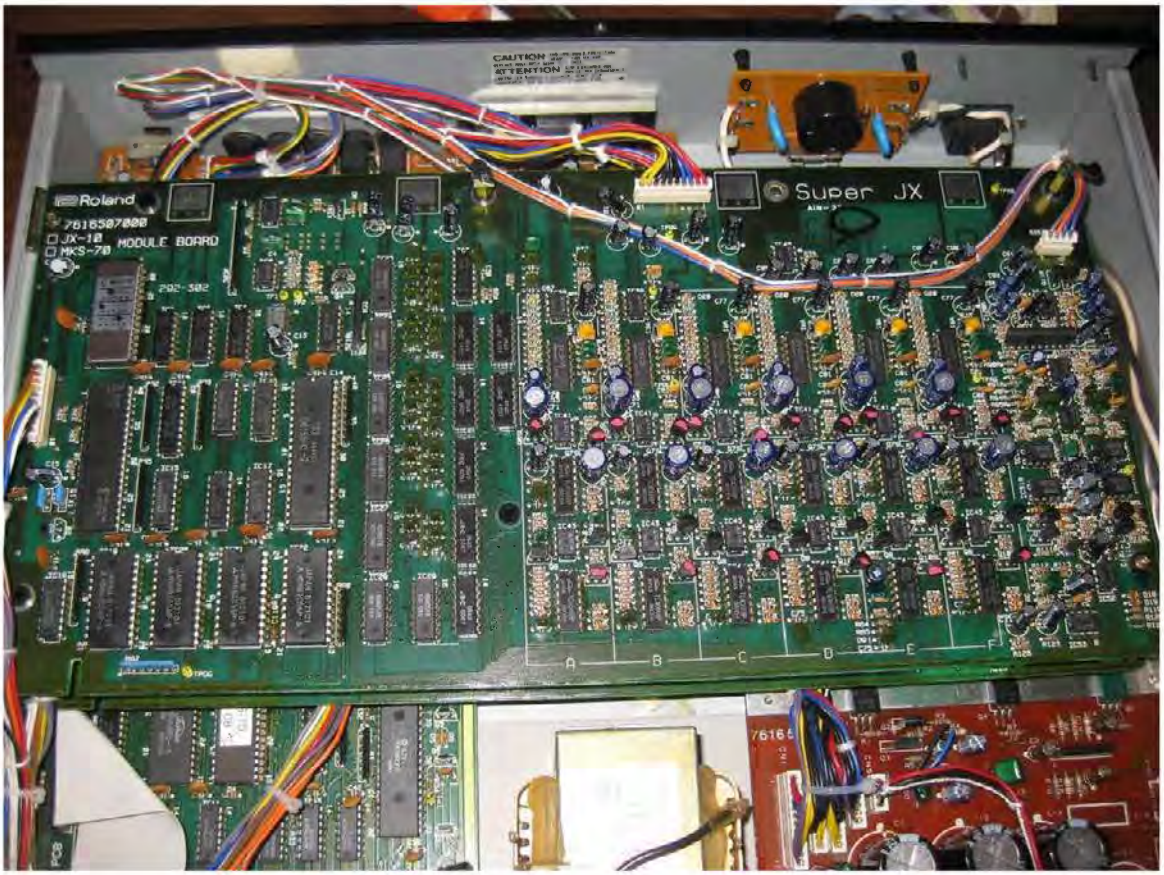
Install one of the power supply connectors to the middle of the board (either connector, they're the same) and also the audio connector for the lower module board. Note the color code for the audio connector on the lower board. Keep the audio wires away from the filter board, and ty-wrap the wires to the two posts.



Install the upper sound module board (Rom C) and wire similarly. Again, the choice of power connector in the center doesn't matter, but be sure you now have a black wire in Position 10 on the processor wire bundle and the correct color code for the audio wire bundle as shown below.

I was probably over-zealous in keeping the audio wire away from the filter, but the location routing in between the capacitors on the sound module board doesn't hurt either.

Note the black and white AC supply wire to the transformer that was tied to the bottom right-hand portion of the sound module boards (can be seen in the first photo in this article) has been rerouted away from the sound boards as well. It didn't seem to make any difference when located adjacent to or away from the boards however, so the original position is fine as well.



Finally, stick the other ty-wrap mount into position and snug things up. It’s now ready to go, no more hum!