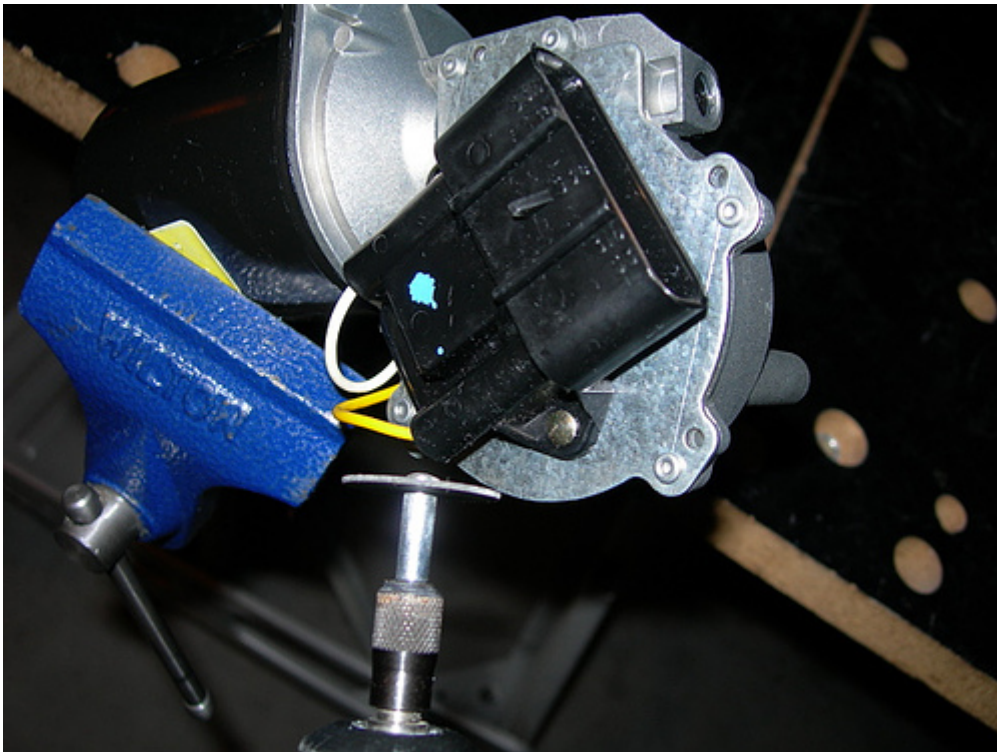


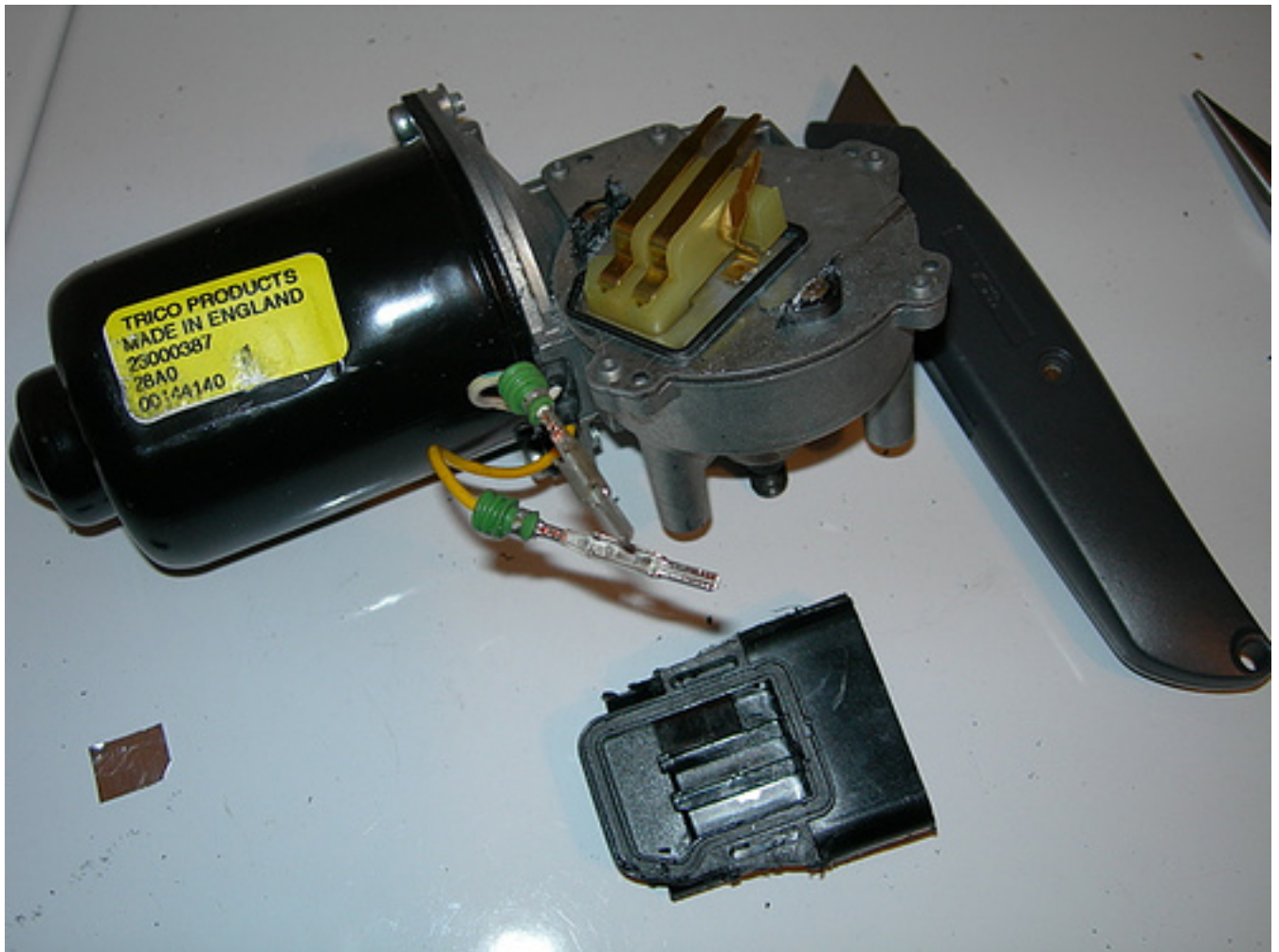
THURSDAY, FEBRUARY 01, 2007

## Hacked on Motors

After 19 months since I [acquired my Saturn wiper motors](#), I finally started working on them. I hacked on three of the motors tonight, and I have some spares that I'll eventually work on later.

The first thing that needs to go is the black plastic power connector. I placed the motor in a vise and used a hacksaw to saw at the plastic around the rivets until the housing came off.

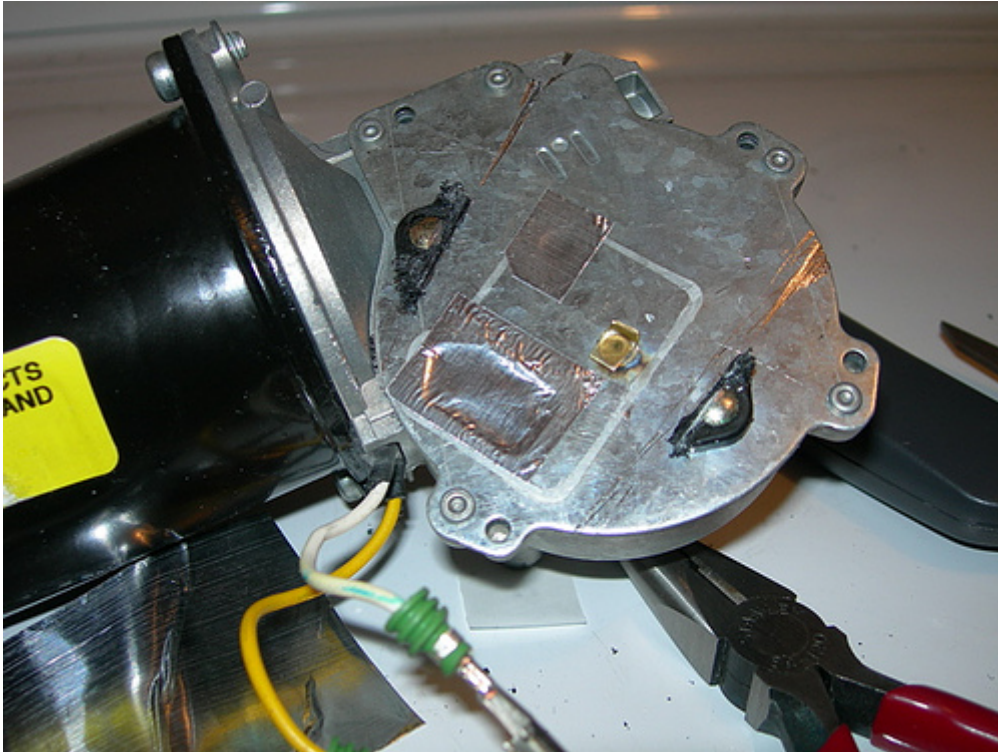




There is a yellowish plastic block underneath the power connector that contains metal leads into the motor. Two of the leads are connected to this block, and the whole assembly pulls out easily. A third metal lead has to be snapped off.



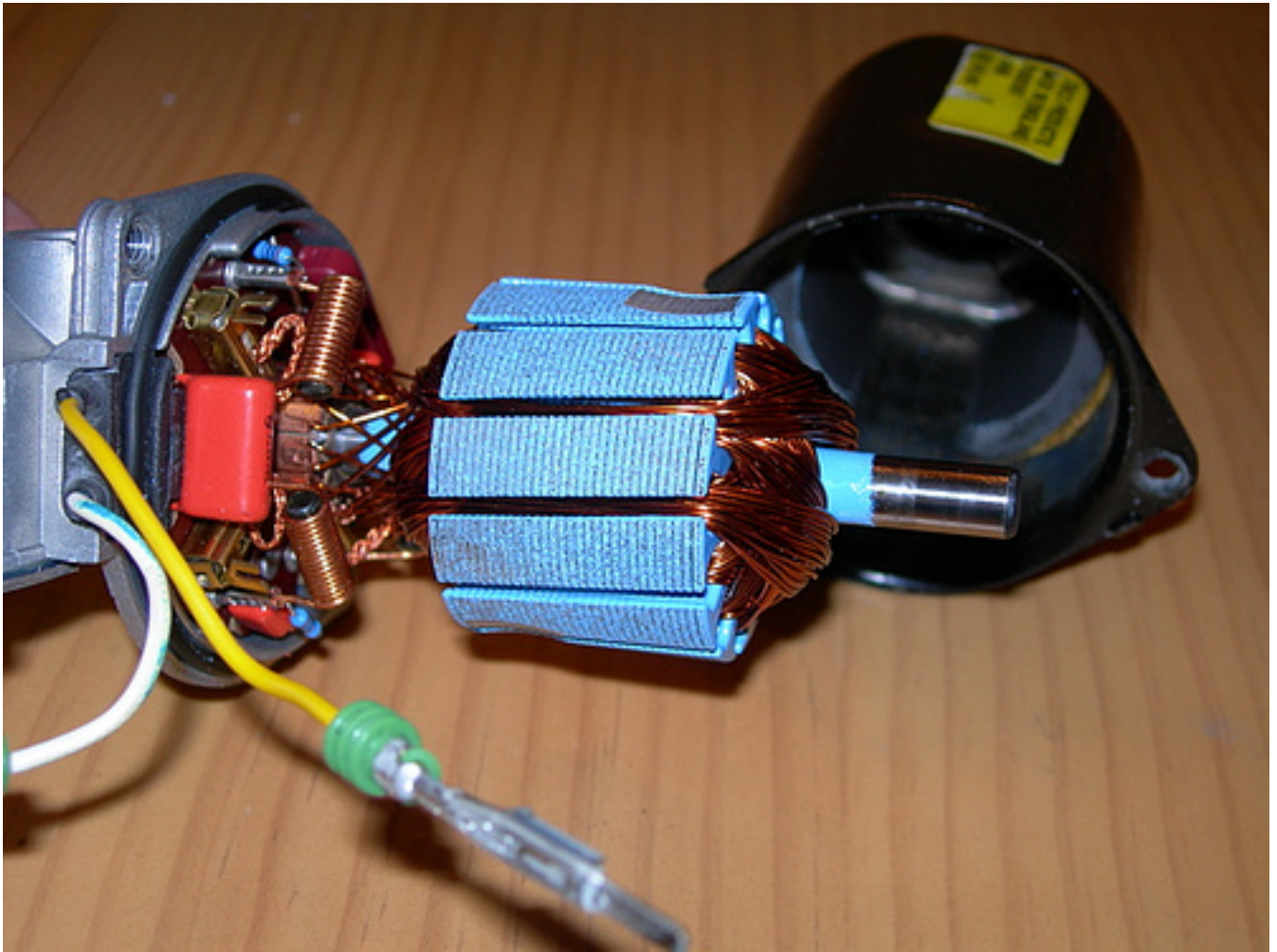
Once the leads have been removed, it's time to cover up the holes with a little foil tape.



Tonight, for the first, time, I applied power (12 volts) to the motors. They all appeared to be working properly, from what I could tell. I tried both forward and backward polarities.

I couldn't resist taking a peek inside one of the motors, since I will be modifying them soon using Alex Kung's 24v conversion tutorial.





*posted by Victor Franco at 9:32 PM* 0 COMMENTS

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SATURDAY, FEBRUARY 03, 2007

## **Cut and Glued Strips at Bottom of Curve for Outer Feet**

Last weekend Mike and I worked on the top end of the curve of the outer foot shells. This week we worked on the bottom of the curve.

We cut two strips of 1/4" styrene for each foot shell. One strip was 5/8" wide, the other 7/8" wide. They only need to be 1/2" wide, but we cut them wider so that we can glue them together and trim them as a pair. The reason for the extra 1/4" on one of the strips will be apparent in a moment.

I made the first 5/8" cut, and it turned out less than spectacular. Mike wisely decided to do the subsequent cuts.



Mike chopped the strips, which were about 4' long, down to size on the miter saw.





Next, we glued the two strips together.



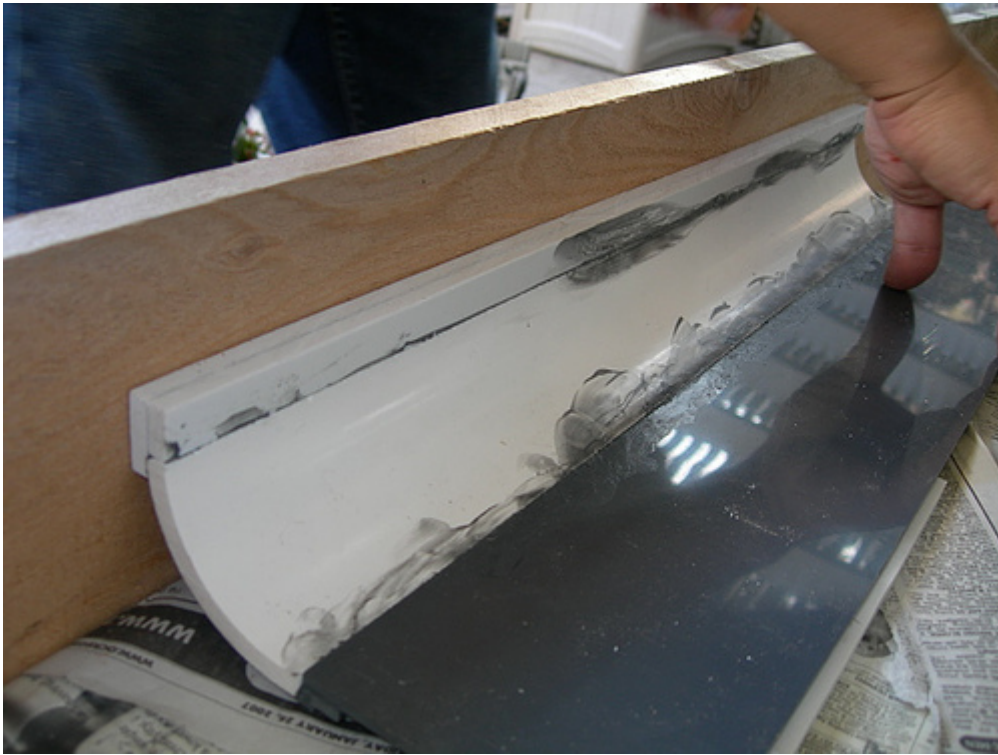


Once the PVC glue had dried and the two pieces were bonded, Mike cut the glued up pair down so that the piece that is visible to the outside world was 1/2" wide.





The end result is that we have a continuation of the curve at the bottom of the foot. The whole thing is rotated 90 degrees for glue up. The pieces will be trimmed to size, sanded and finished in due time. It may not look pretty now, but trust me, it will later.



*posted by Victor Franco at 7:41 PM* 0 COMMENTS

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SUNDAY, FEBRUARY 04, 2007

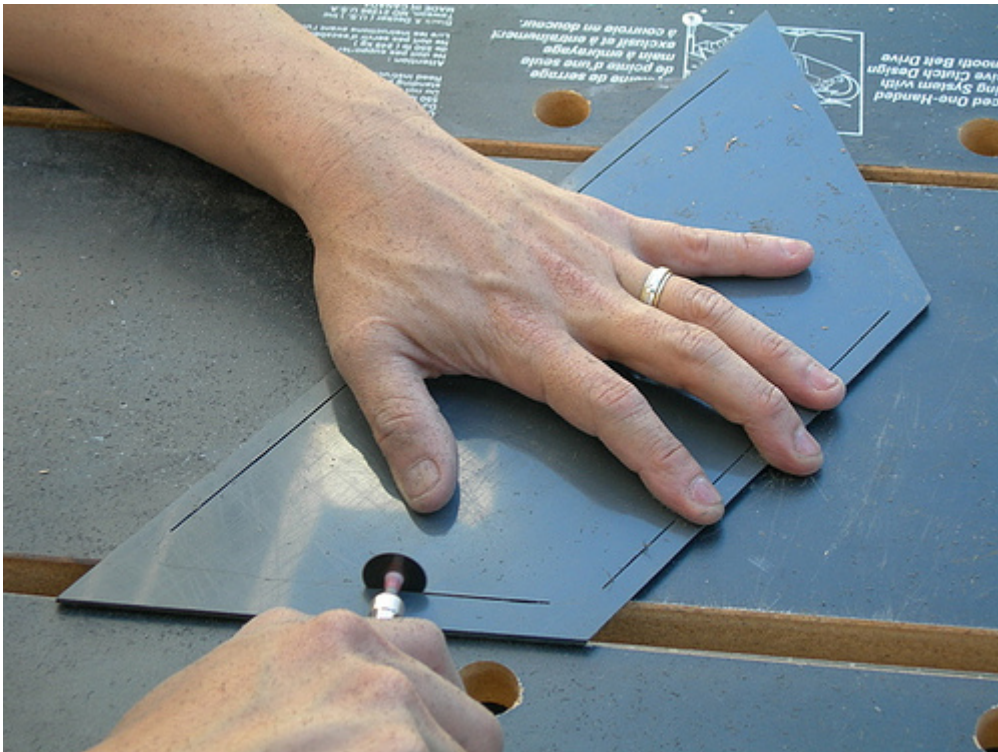
## Doors Cut for Outer Foot Shells

I have to admit, R2 building has been mostly a spectator sport for me when it comes to the foot shell build, and today was no exception. But it really is for the best. Also, keep in mind Mike is building himself a set of foot shells, so we're doing a pair of these.

Today Mike cut the doors for the outer feet. He started by removing one of the doors from his first R2, and tracing a line with a pin on the PVC.



Next, it was a matter of cutting along the lines. The straight parts of the doors were cut out with a Dremel and a mini saw blade attachment.



The curved corners were milled out by using a small drill bit on the Dremel.



Learning from experience, we used a thinner bit than the one used for the center foot shell. This allows us to sand the edges of the doors down so that the proper 1/8" gap can be made to size. On the center foot shells, we used a 1/8" bit, and that didn't leave much of a margin for error.



They turned out great!



I plan to glue up the top, front, back and one side (the side with the door) during the week. The next time Mike and I get together (and that could be a couple of weeks or more), we intend to trim the remaining oversized areas down, and then start gluing up the rest. The end is in sight! In the meantime, I need to get back to work on that drivetrain...

*posted by Victor Franco at 7:56 PM* 0 COMMENTS

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MONDAY, FEBRUARY 05, 2007

## Goofed Up Motor

If you're ever going in for surgery and you see me behind the mask, get off the table and run.

Tonight I attempted the 24 volt conversion on one of my Trico Saturn windshield wiper motors. Somehow, some way, I managed to render the motor dead. I don't know exactly what went wrong. This is why I bought spare motors, though. I guess I'll try again on another motor, I just hope I don't make the same mistake (or any new ones).

*posted by Victor Franco at 11:14 PM* 0 COMMENTS

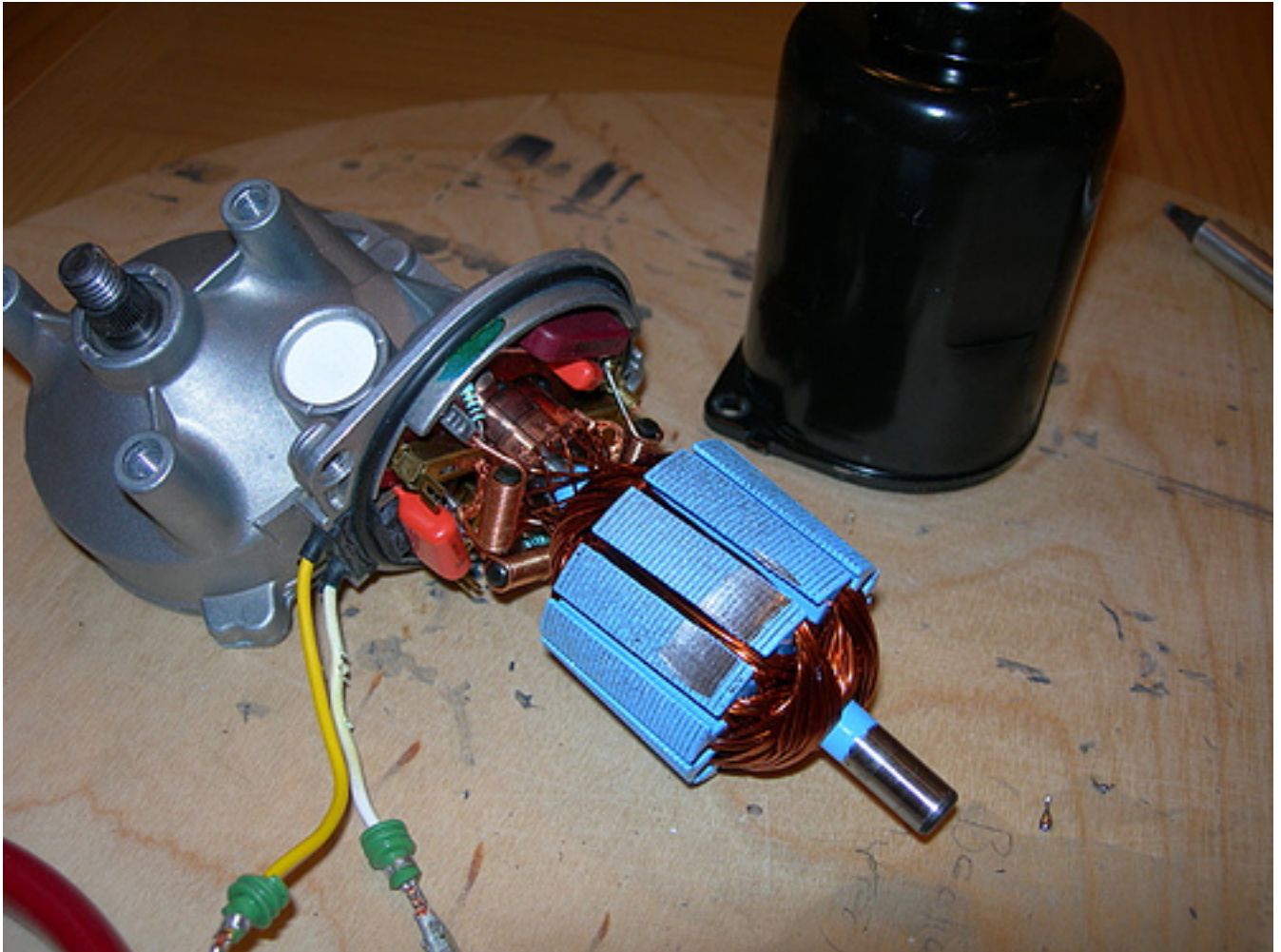
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TUESDAY, FEBRUARY 06, 2007

## Motor Conversion Success

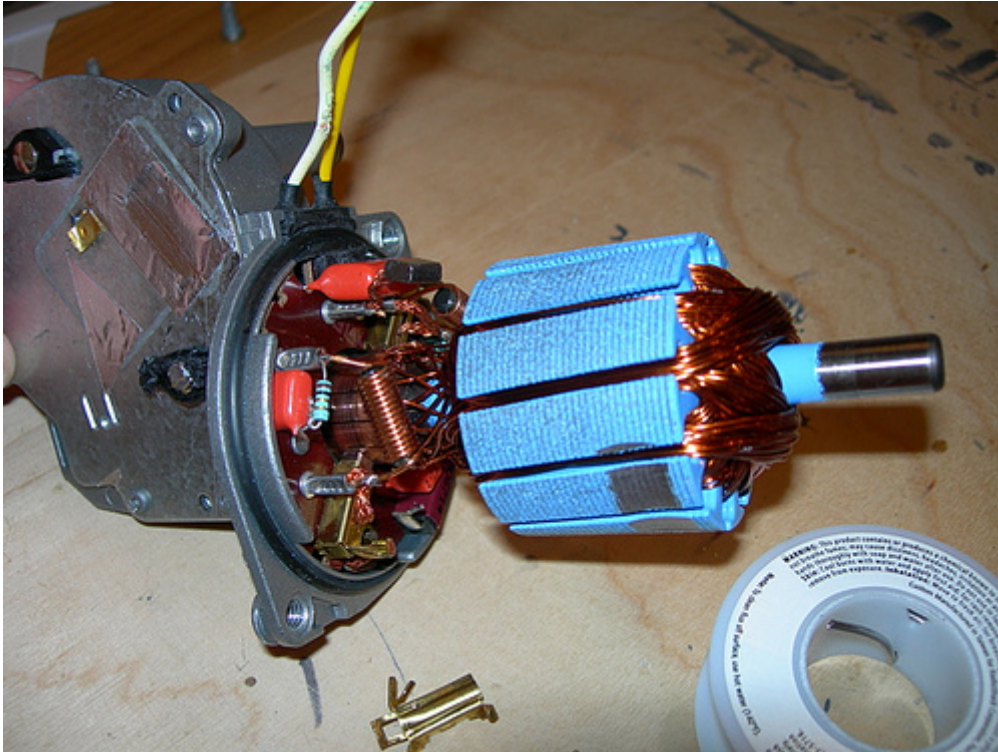
After last night's botched motor surgery, I was five-for-five in successfully executing Alex Kung's [Saturn wiper motor conversion tutorial](#). I was more careful tonight with the removal of various parts, and that paid off.

First, I removed the motor case, of course.

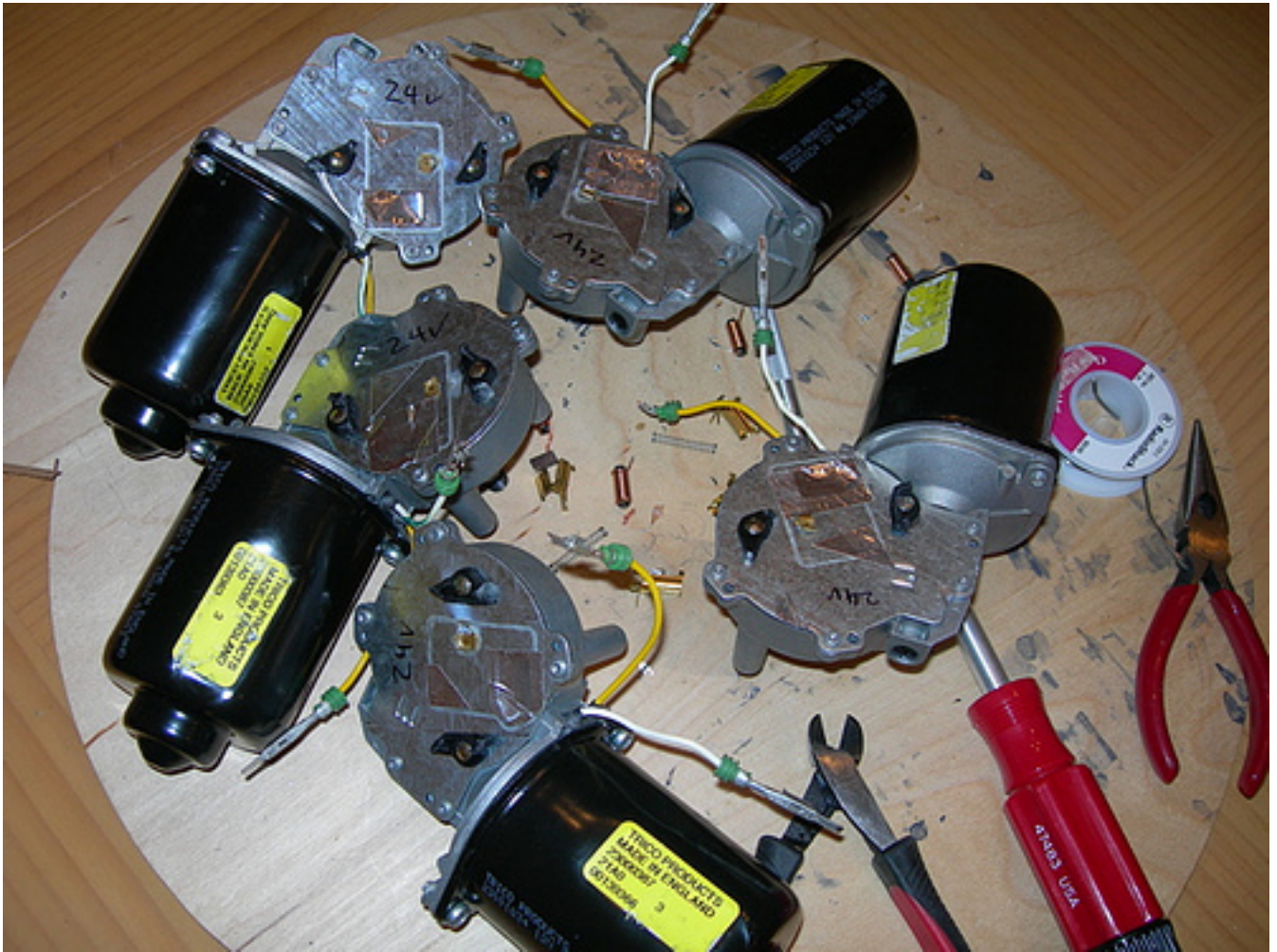


Then, it's a matter of removing one coil, snipping one end of another coil and swiveling it around to where one of the ends of the removed coil used to be. Just solder the ends together, and the conversion is done. It's almost impossible to see the soldered joint, but it's there on the lower leg of the coil. There are a few odds and ends that get pulled out and completely thrown away, hence the blank spot or two.





I managed successfully to convert five out of six motors total. I still have a few more spare motors beyond the six I worked on during these last two nights, but I think I have enough motors ready for action for the moment.



*posted by Victor Franco at 10:47 PM* 0 COMMENTS

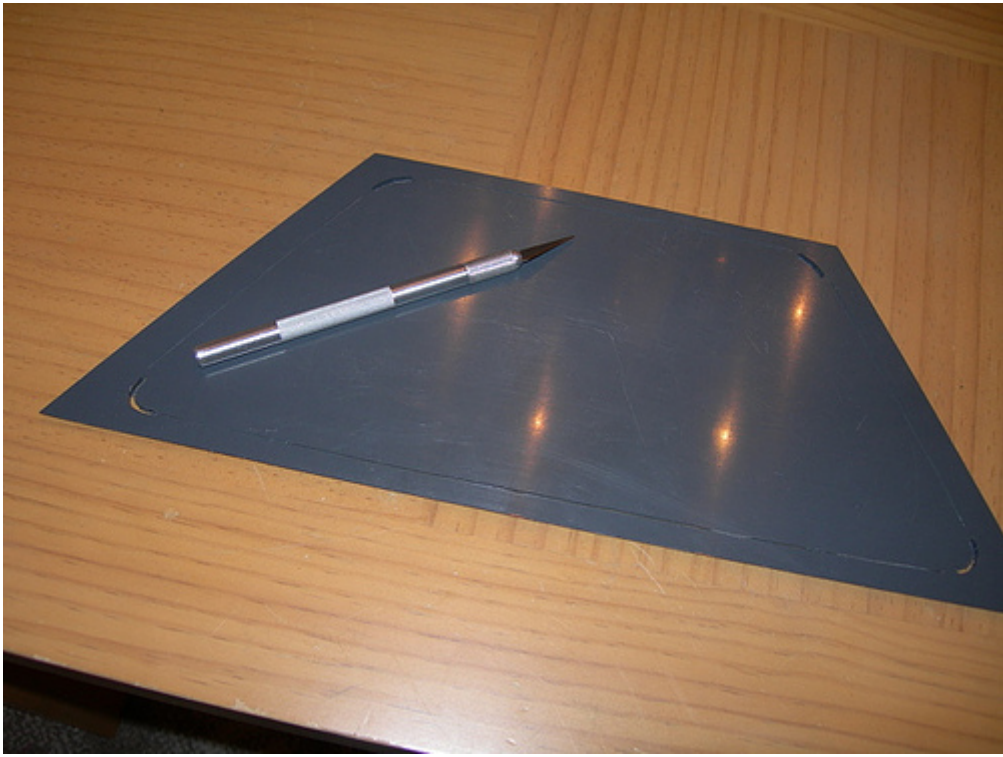
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THURSDAY, FEBRUARY 08, 2007

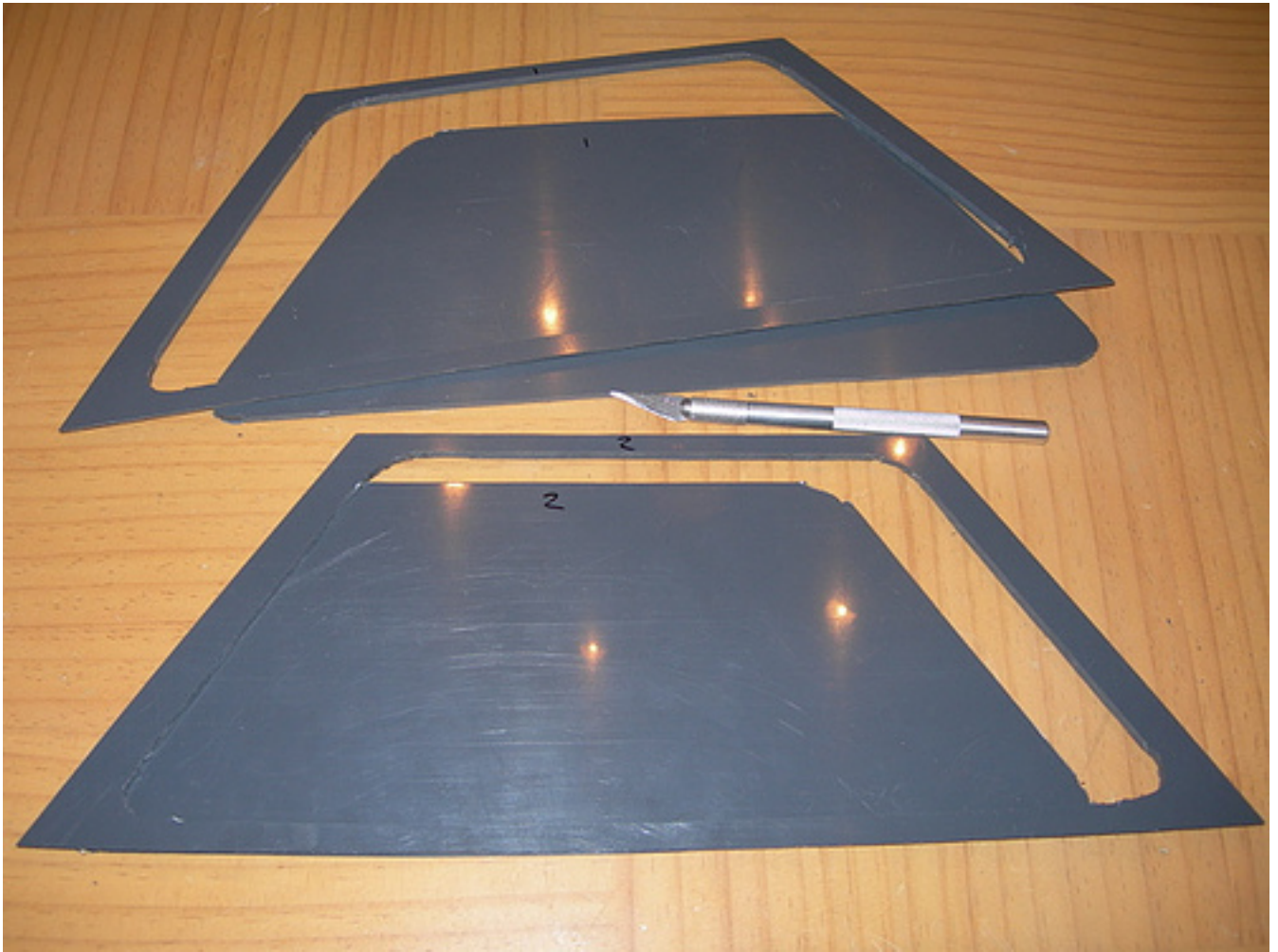
## **Cut out Outer Foot Doors, Cleaned & Prepped Aluminum**

Tonight I got around to doing some minor work for the feet.

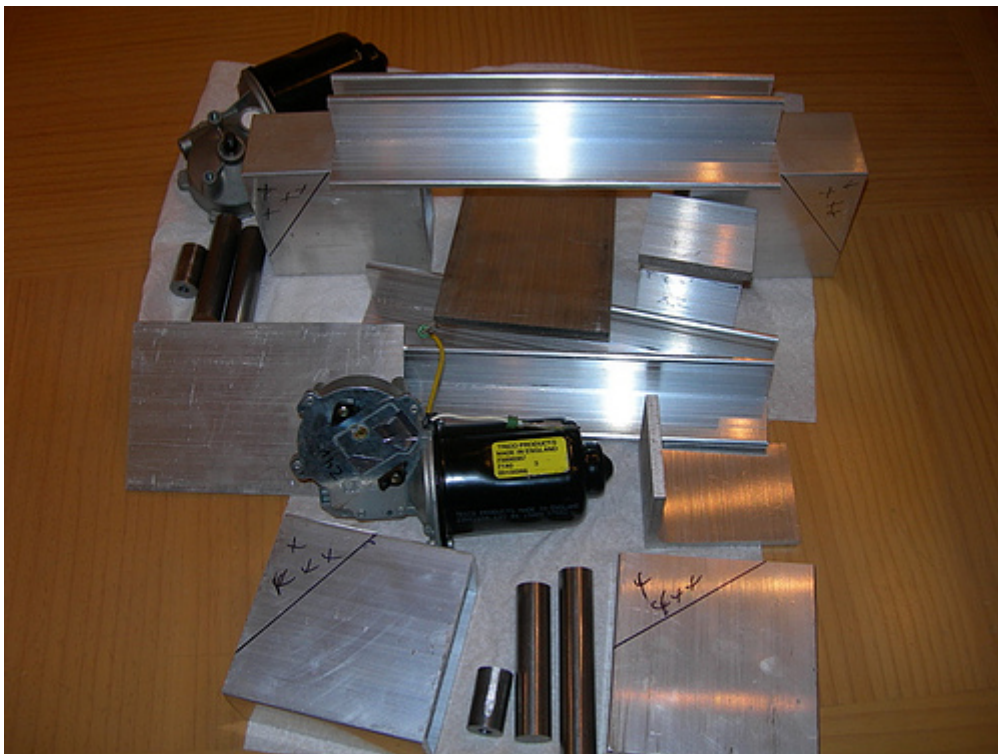
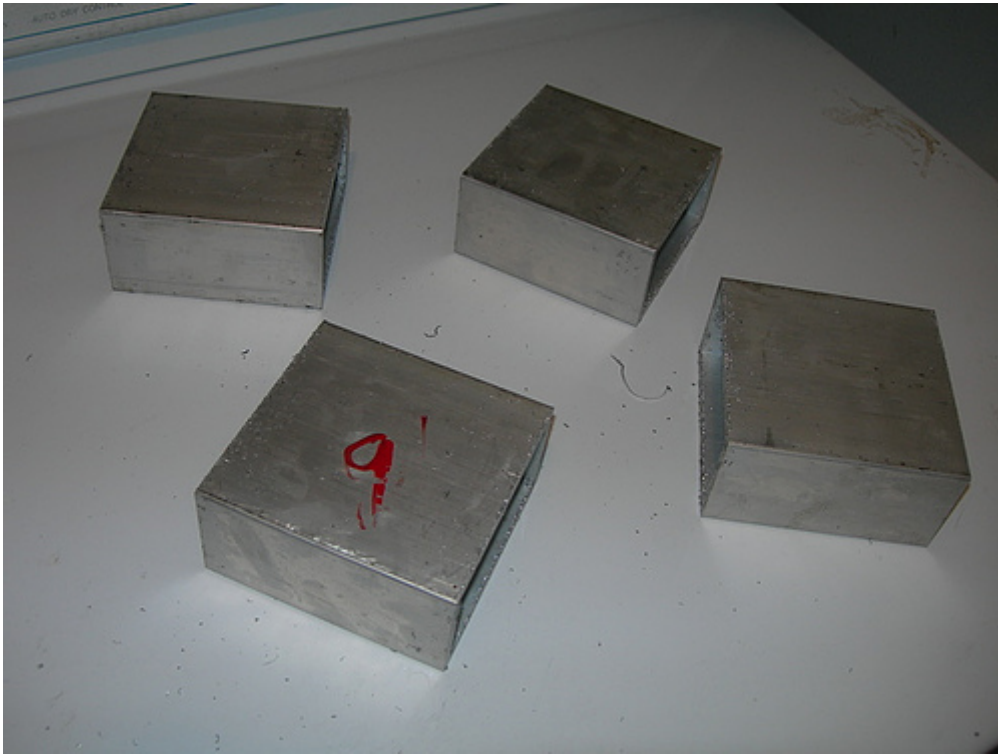
First I used an Xacto knife to cut the tabs that were holding the doors in on the outer foot shell sides.







Then, I finally got around to unwrapping the aluminum that arrived from DiscountSteel.com last week. I filed down and cleaned the various aluminum parts, in preparation for cutting on Saturday.



posted by Victor Franco at 11:03 PM 0 COMMENTS

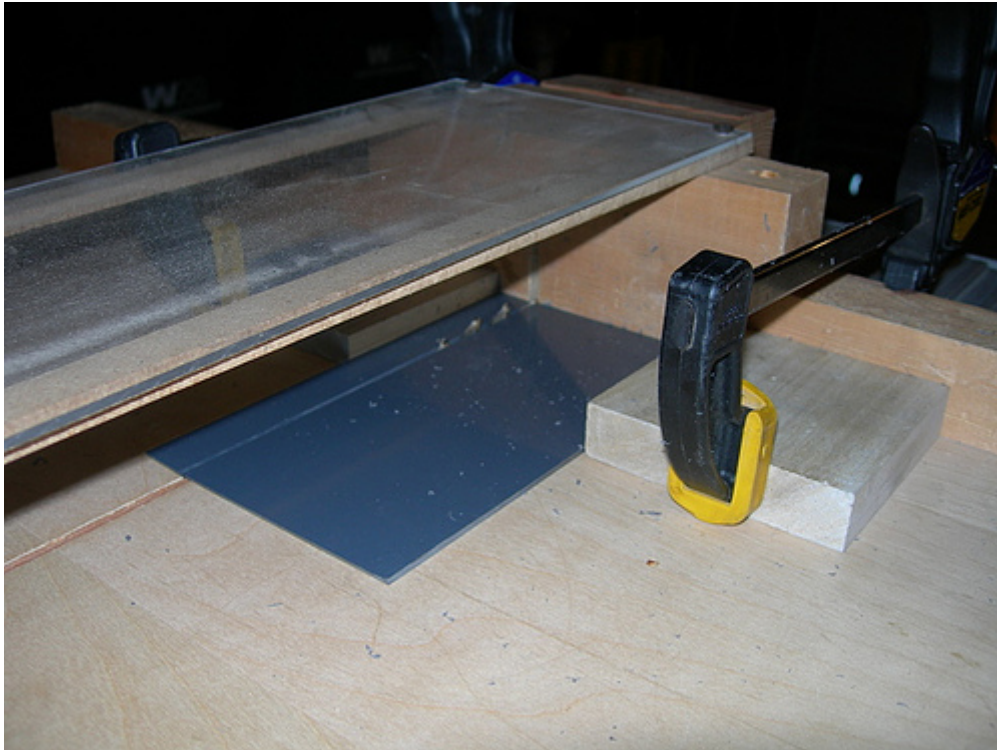
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FRIDAY, FEBRUARY 09, 2007

## Trimmed Top Pieces for Outer Feet

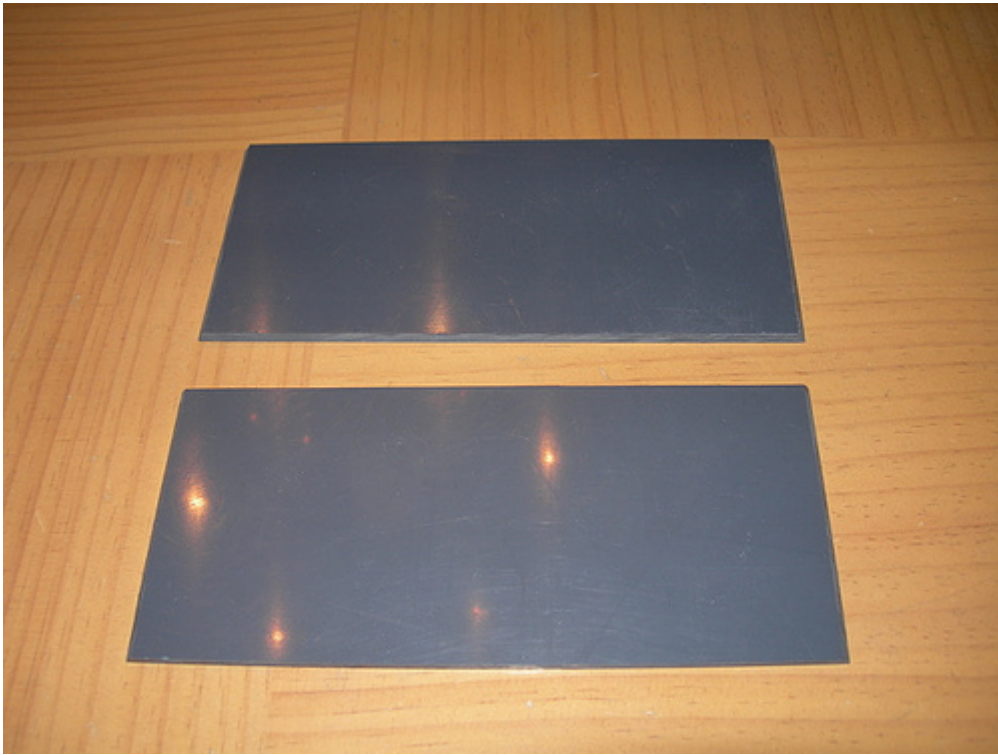
Tonight I trimmed the top pieces for the outer foot shells to be just about 3.5" wide. I cut them slightly less wide because there will be an overlap with each of the side pieces, that will bring the total width at the top to 3.5".

This was a pretty simple cut. Just anchor the PVC piece in the table saw sled and feed the material. For once there weren't any crazy miter angles; just a straight, 90 degree cut.



With these two top pieces trimmed to size, I can start gluing up three of the sides to them this weekend.





*posted by Victor Franco at 11:12 PM* 0 COMMENTS

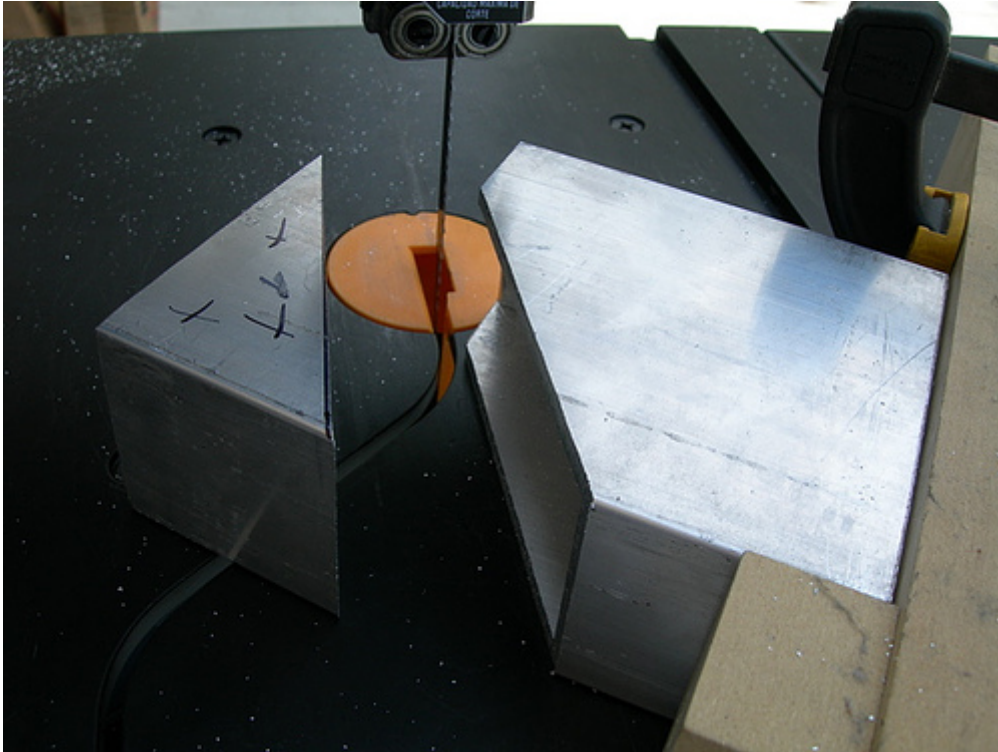
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SATURDAY, FEBRUARY 10, 2007

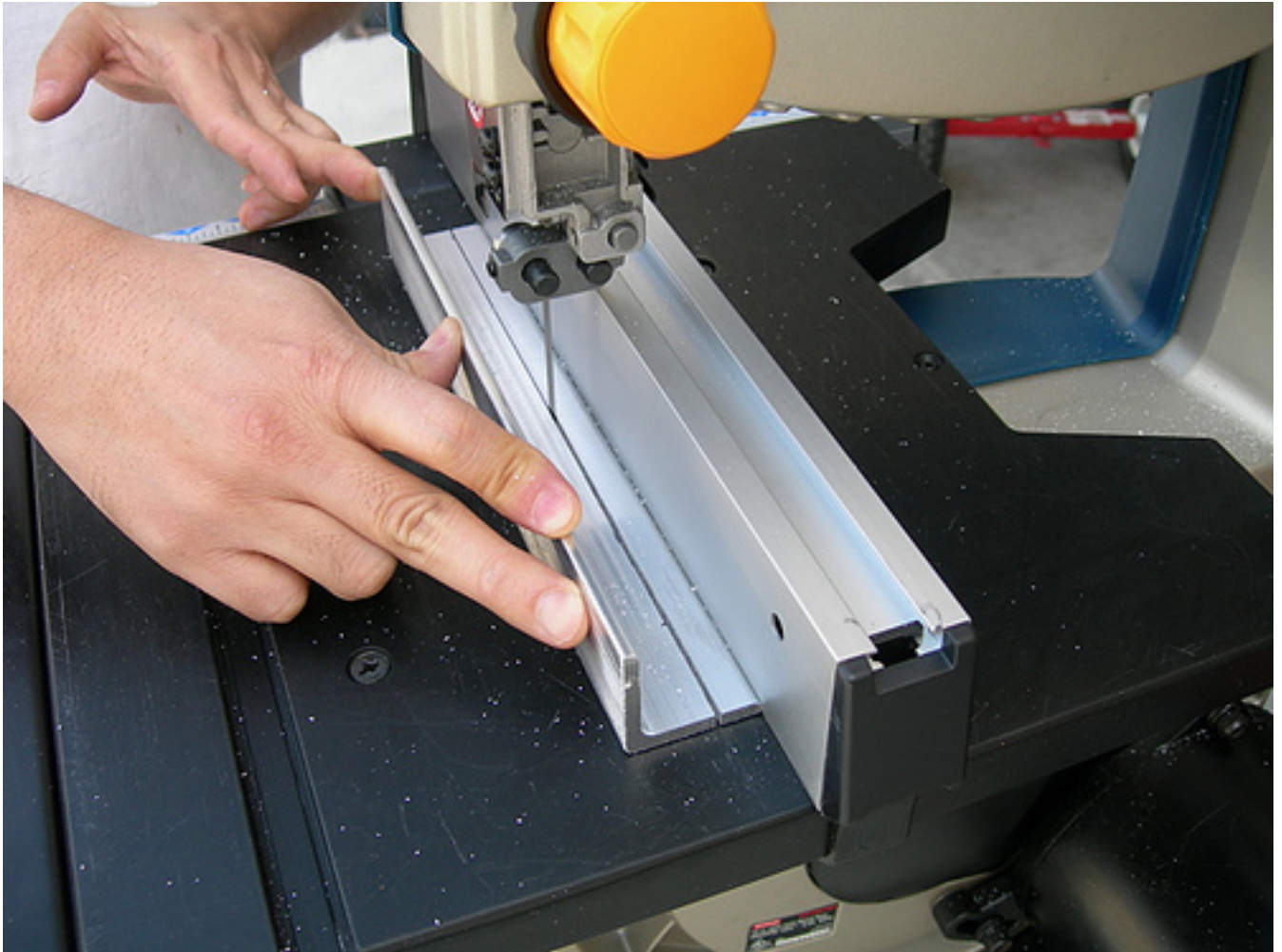
## **More Drivetrain Cuts, Started Gluing Outer Foot Shells**

Today was fairly productive, I had a chance to work on a couple of areas on the feet.

The first order of business was to drop by Kelvin's, and use his band saw yet again. I needed to chop the corners off the square pieces that will house the wheels.

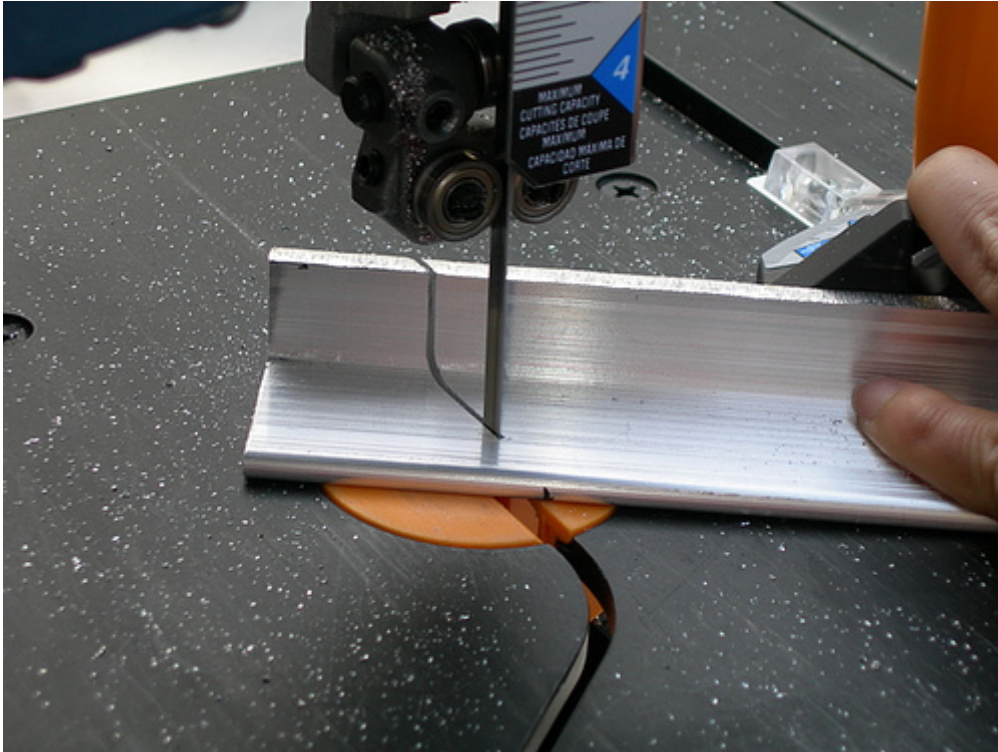


The L channel also needed to be trimmed. One pair is 1.500"x1.000", the other is 1.500"x1.188", per the H&A blueprints.

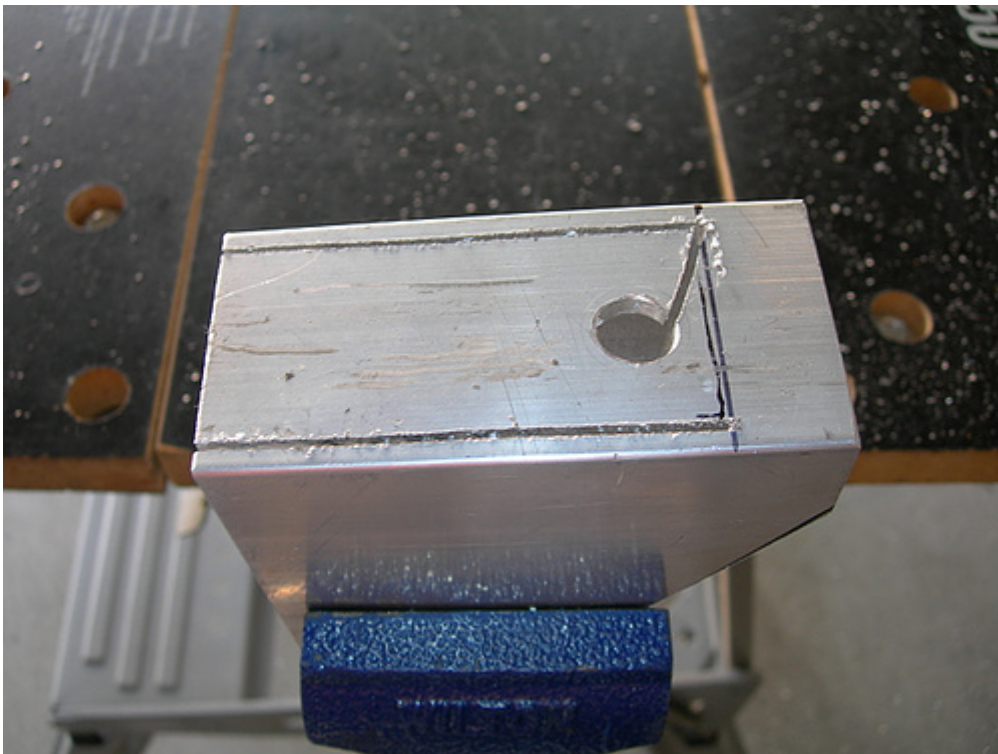


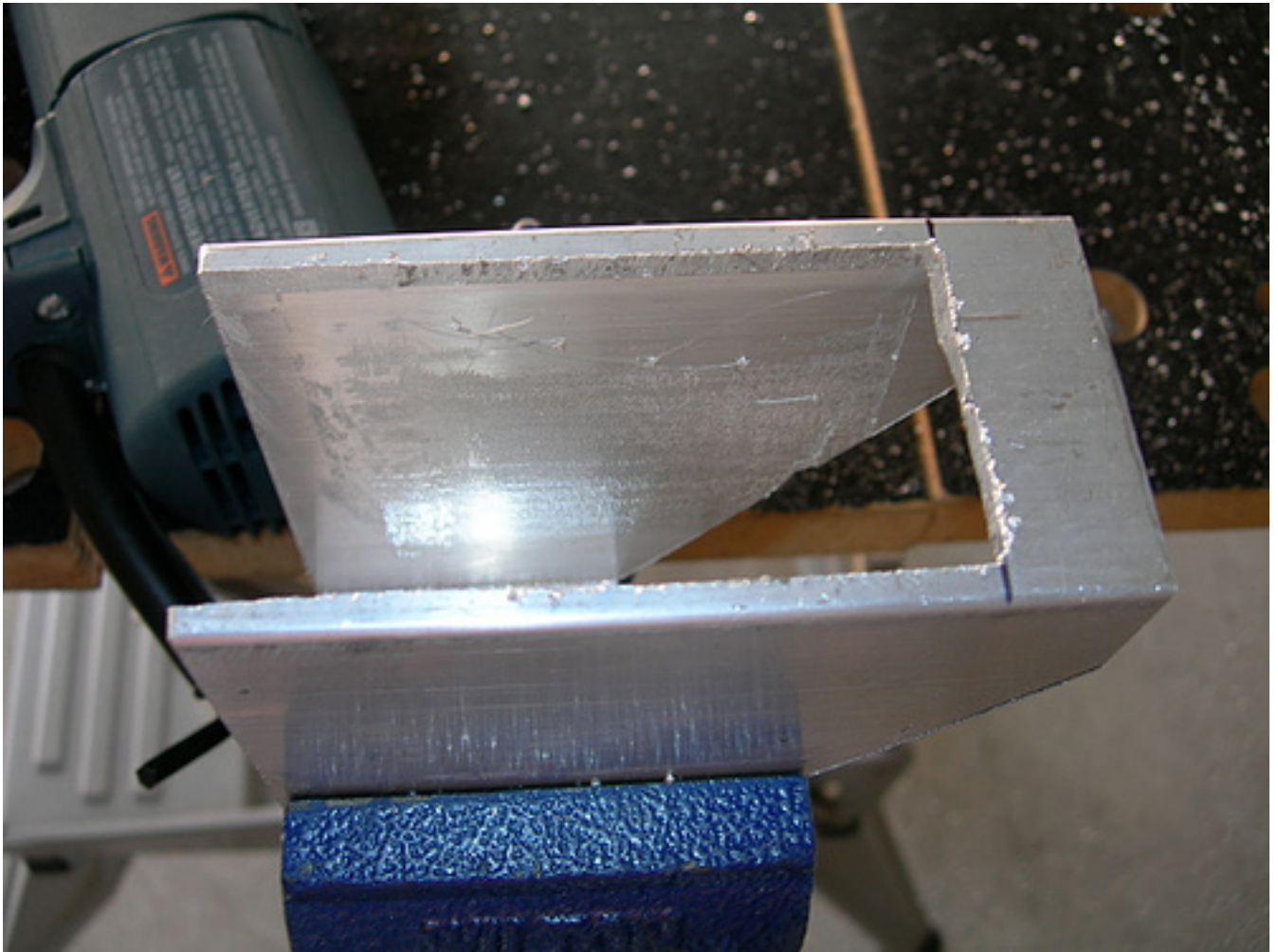
A 55 degree angle is cut on the L channel as well.





Back at home, I used a jigsaw to open up the area where the wheel will go.





After all those cuts, I cleaned everything up with a file.

Turning to the outer foot shells, I started gluing up three of the sides, and the top.



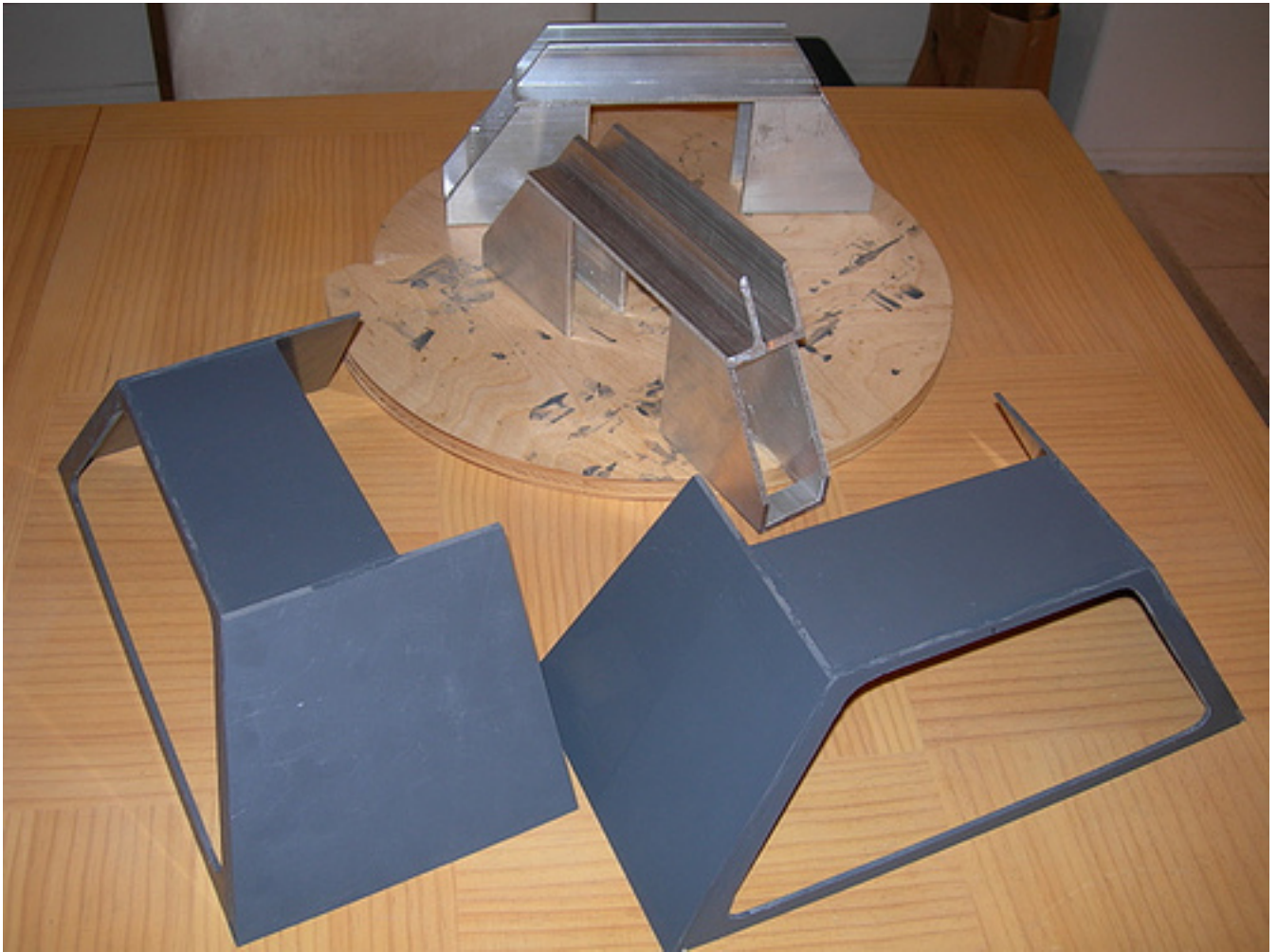






The overhang on the front and back sides will be trimmed, probably the next time I visit with Mike.

All in all, a reasonably productive day. I still need to drill a lot of holes for screws on the drivetrain, but first I need to order and receive the screws, nuts, chain, etc. from McMaster-Carr.



*posted by Victor Franco at 10:01 PM* 2 COMMENTS

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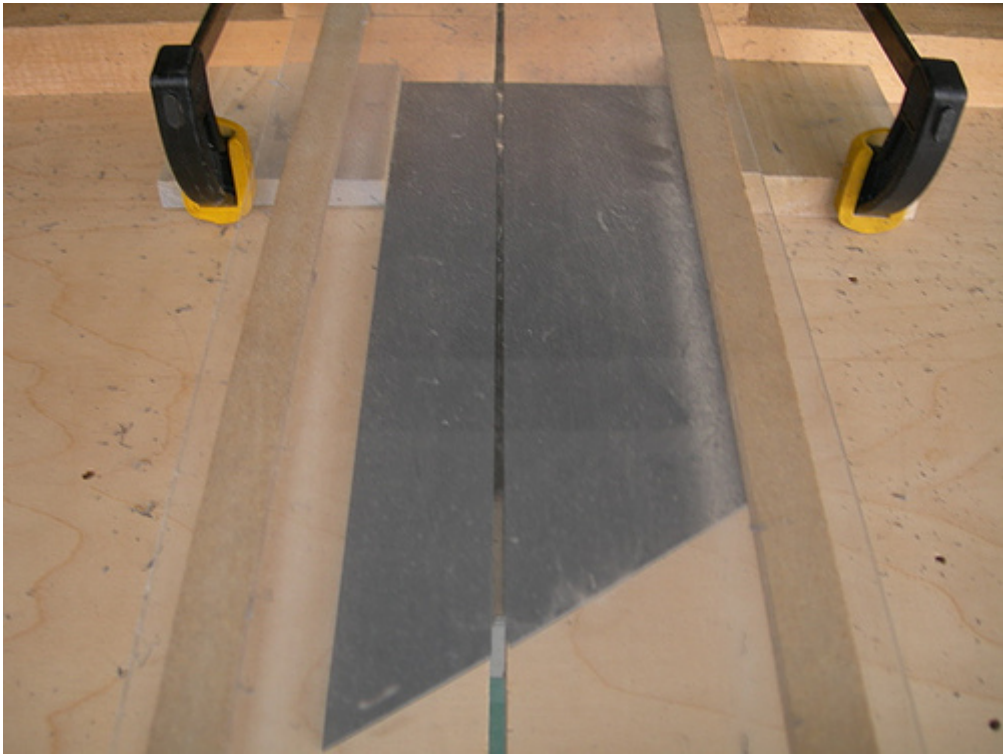
SUNDAY, FEBRUARY 11, 2007

## Cut Side Details & Strips for Outer Feet

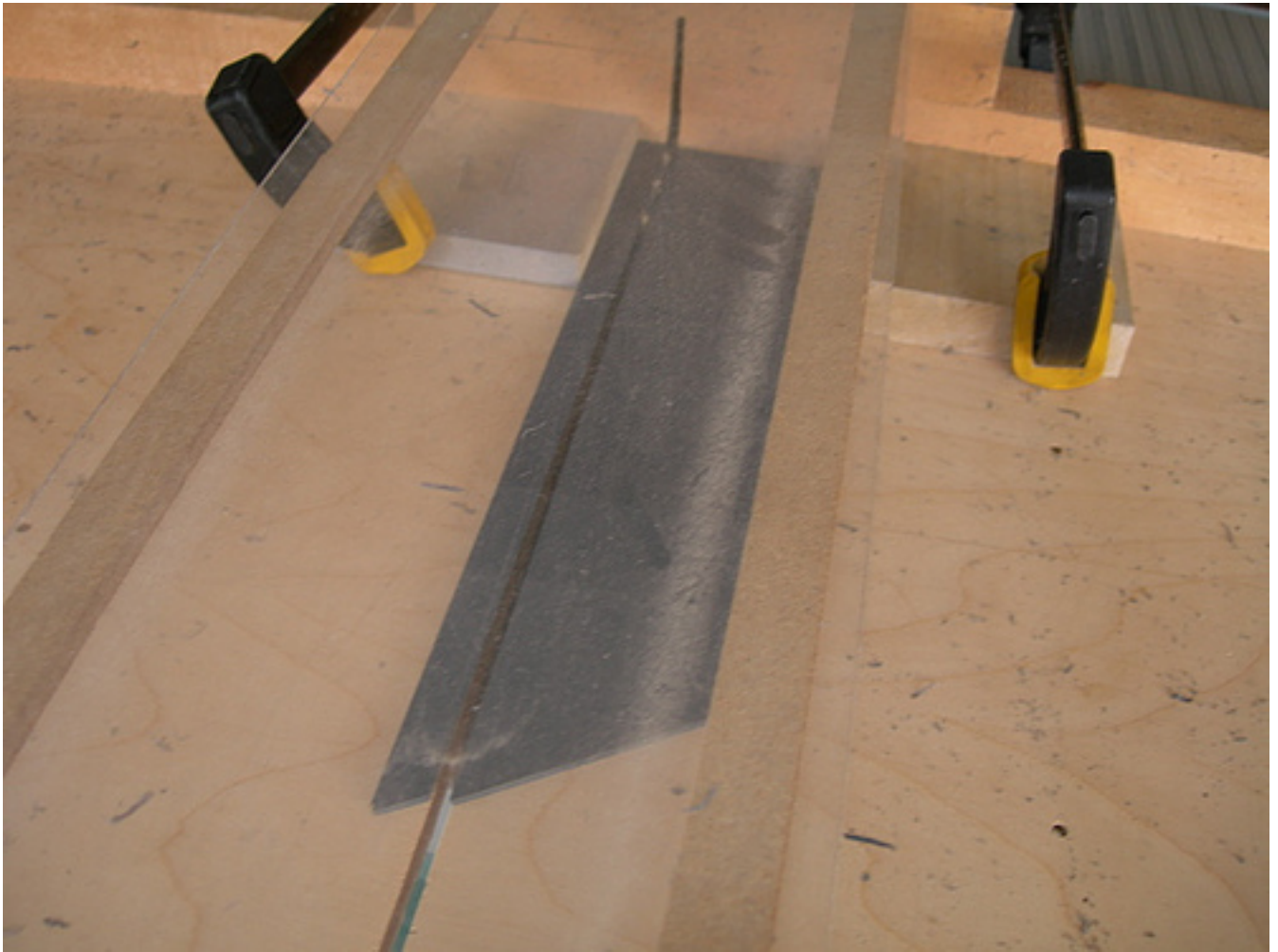
Before I forget to mention it, blogger.com allows users to search its blogs. You can look up something like "wedges" and find any page that might be dealing with the ankle wedges. Now, back to our regularly scheduled blog entry.

For the first time in a while, I was able to work on a very easy part of the build, the details and strips that adorn the doors of the outer feet. Like the rest of the foot shells, these are made from 1/8" thick PVC.

I cut some PVC scrap that I had sitting around for these parts. First I cut a strip for the width of the side detail, and then another for the side strip.







Next I cut the required angles with the a miter saw.



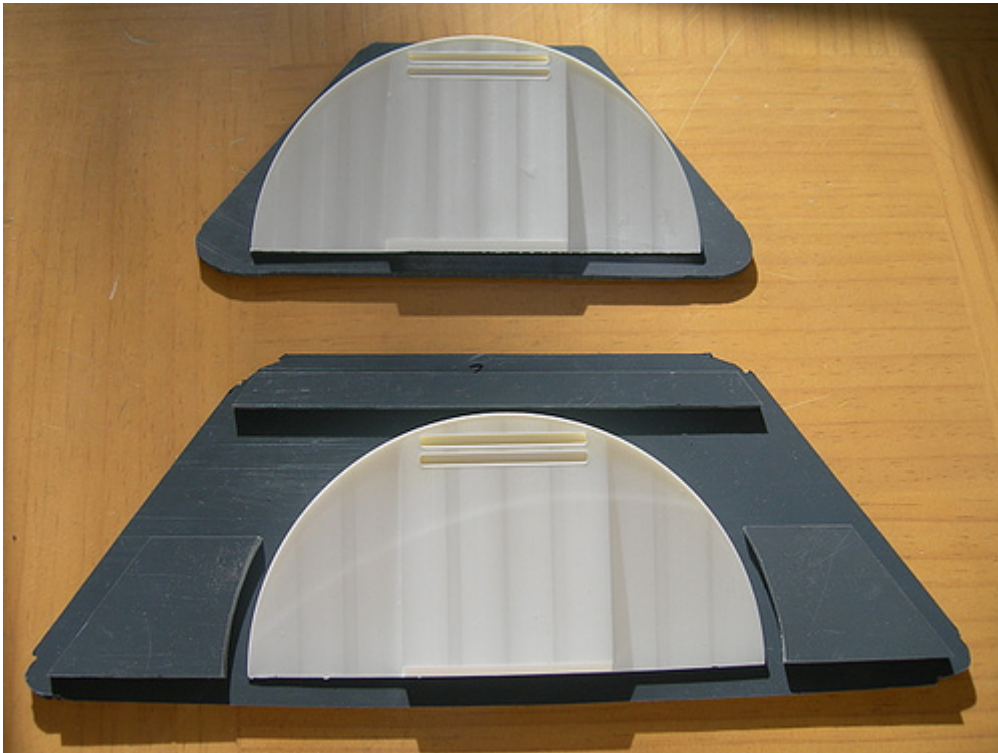


At this point, the side strips are done, but the side details have a curve that needs to be cut from one side. I started the curve with the Dremel using the cutoff wheel attachment, and I finished it with the drum sander attachment.





As mentioned above, these parts go on the outer doors, along with the half-moons. I still need to trim the door edges. I should have done that today, but I forgot(!). The center door looks like a baby door when compared to the outer door.



*posted by Victor Franco at 10:32 PM* 0 COMMENTS

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TUESDAY, FEBRUARY 13, 2007

## More Drivetrain Parts Arrive, Started Sanding Doors for Outer Feet

My order from McMaster-Carr arrived today. This pretty much rounds out the remaining parts I need for the drivetrain. For some strange reason, two of the 11-tooth gears are being shipped from Chicago, while the other four were part of today's shipment. Must be an inventory issue or something.

The screws and nuts only come in bulk packages, but they are relatively inexpensive, compared to the gears and chain at least.



I started sanding down the edges of the doors that go on the outer foot shells tonight.





There's supposed to be a 1/8" gap between the door and the foot shell. I'm just about there with the first door, I probably need to sand a bit more.



This is almost as glamorous as when I [sanded the resin eye](#).

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*posted by Victor Franco at 10:53 PM* 0 COMMENTS

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WEDNESDAY, FEBRUARY 14, 2007

## Started Sanding Second Outer Foot Shell Door

My two other gears from McMaster-Carr arrived today. I still think it's weird that they shipped separately, but what do I know?

More exciting sanding of foot shell doors tonight. It looks unsurprisingly similar to last night's effort. I'm sure I'll have to do a little finish-sanding on these doors still, but it's a start.



*posted by Victor Franco at 11:02 PM* 0 COMMENTS

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FRIDAY, FEBRUARY 16, 2007



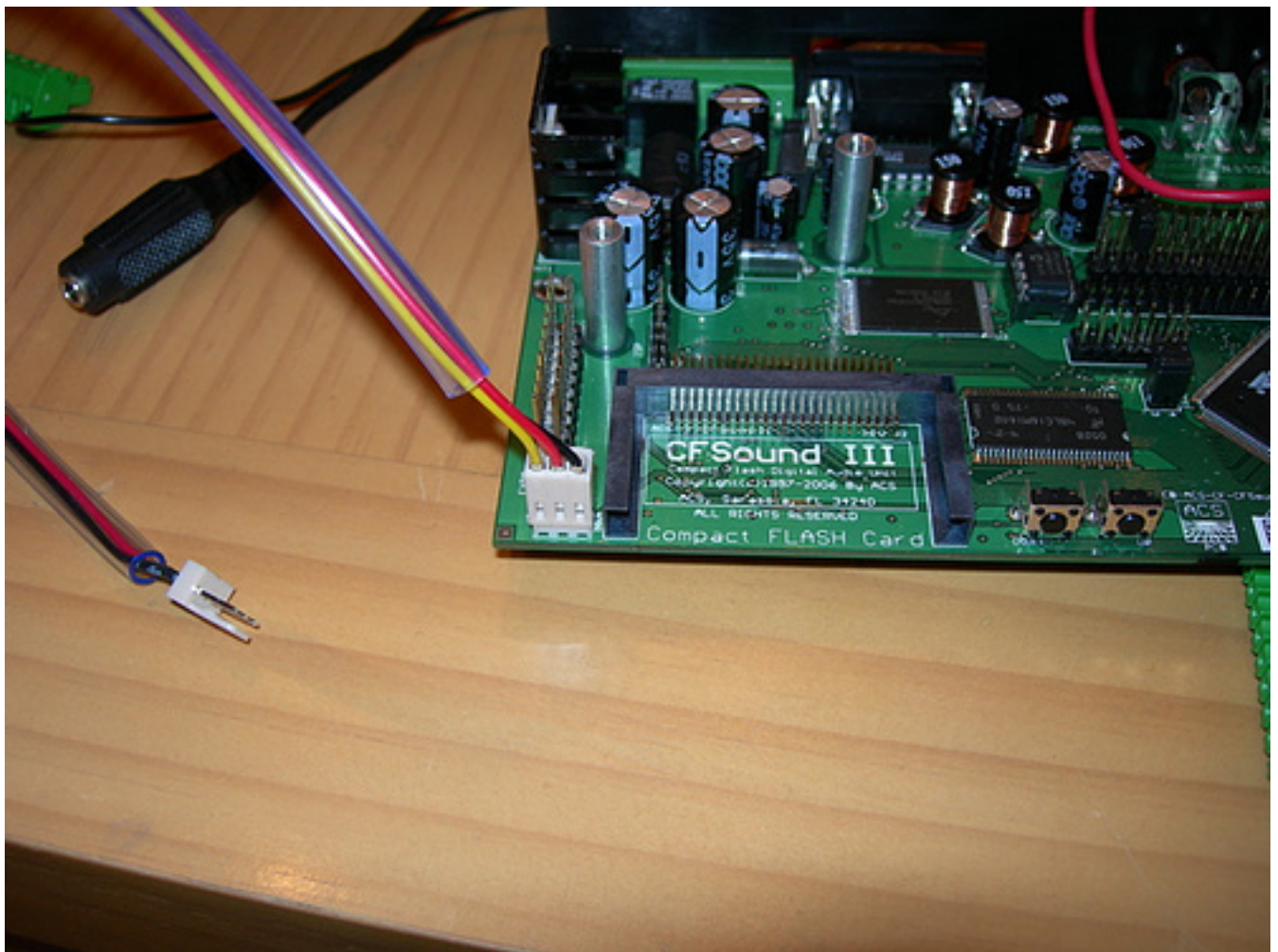
## Added Volume Control

Tonight I decided to add a volume control to my CFSound III system.

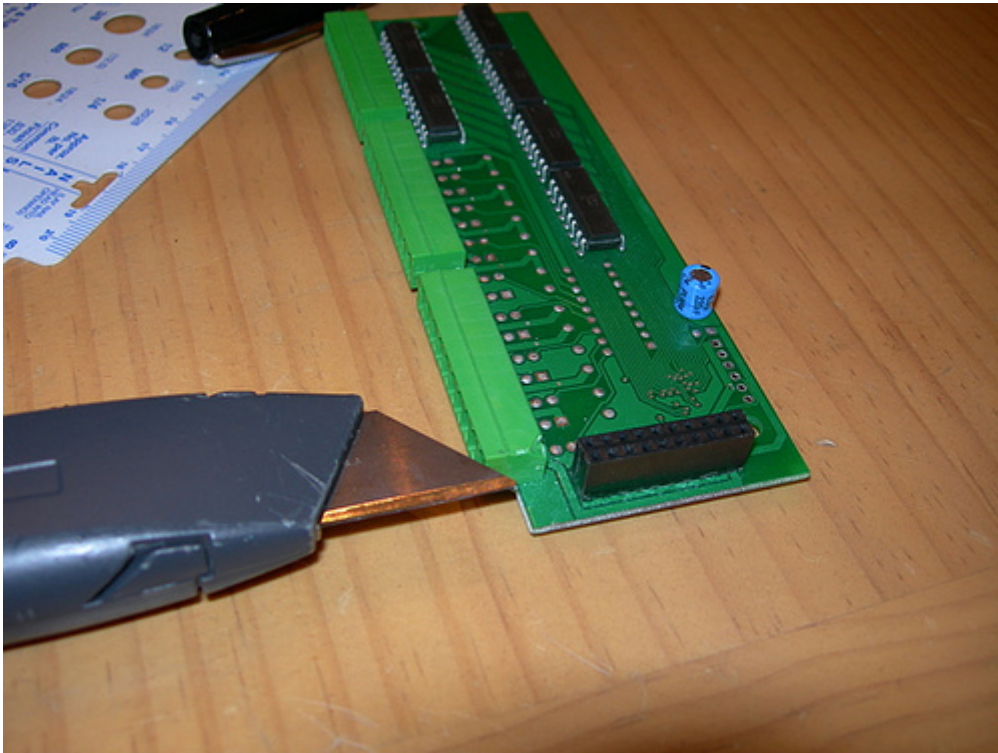
Unlike the CFSound II, the CFSound III has no volume knob. Instead, there are two physical push buttons for volume-up and volume-down. These aren't too useful when the sound system is buttoned up inside R2.

Fortunately, there is a three-pin header on the board that can also be used to control the volume. One of the outer pins is volume-up, the other is volume-down. When ground is jumpered between an outside pin and the middle pin, the volume adjusts accordingly.

I connected a three-pin cable (like the kind used for a computer fan) to the three-pin connector on the CFSound III board. I had to trim the beige plastic on the connector down a bit, in order for the Contact Sense 24 card that sits above the connector to fit properly. I also had to trim about 1mm off one corner of a green connector on the Contact Sense 24.



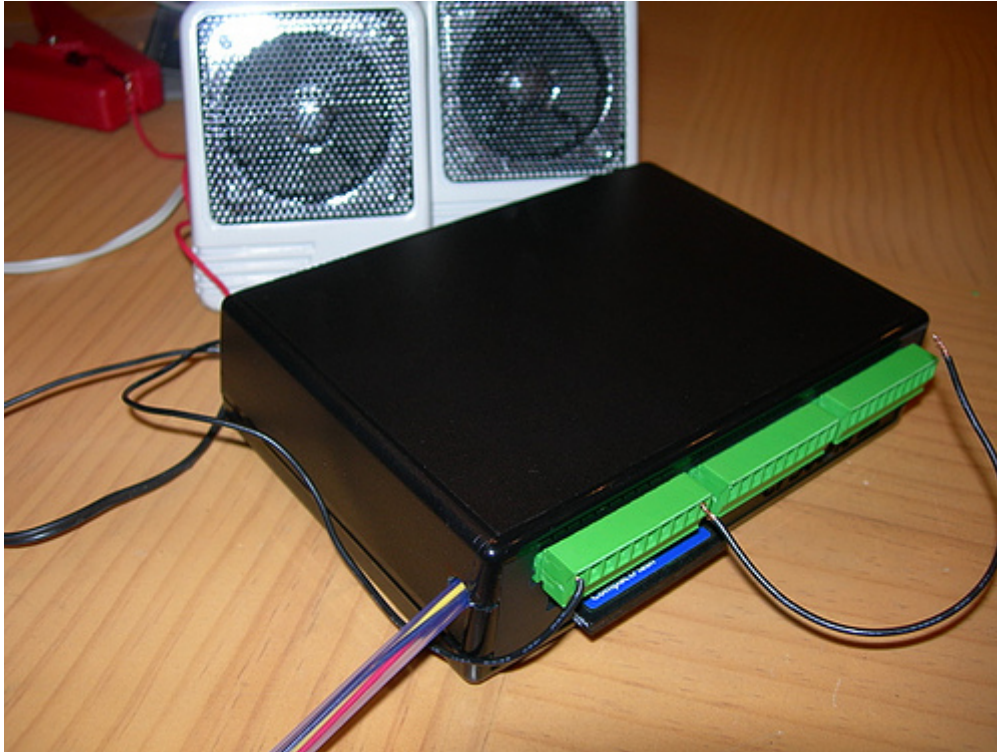




I drilled a 1/4" hole in the side of the box for the cable to fit through. After drilling the hole, I cut a small slot for the wires to slide through as well.



It works! Once I get my remote control system (which I'm *still* waiting for), I'll connect the wires so that I can control the volume via the remote.



*posted by Victor Franco at 10:25 PM* 1 COMMENTS

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SATURDAY, FEBRUARY 17, 2007

## More Foot Shell Work at Mike's

Today was a pretty exciting day, things are starting to come together for the foot shells.

Mike showed me the current state of his outer foot shells. He has trimmed the curved sides and glued them in place.



The first item of business for my foot shells was to trim the curved sides to size. This was an iterative process; trim, fit, trim, fit. Mike cut them perfectly to size.





Next up was cutting the bottom strips to size for center foot shell. These are simple 45 degree cuts with no beveled edge (yea!).





I made a practice cut, as I plan to cut the bottom strips for the outer feet during this three-day weekend.





Mike cut these perfectly too, ready for sanding and gluing.



Mike trimmed down the overhang of some of the edges on the outer foot shells with the Dremel cutoff wheel, followed by the drum sander, to wrap up the day.



I hope to glue up and trim the rest of my outer foot shells too here at home during this weekend. I can feel the momentum starting to build again, it's a good feeling.  
*posted by Victor Franco at 11:50 PM* [0 COMMENTS](#)

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SUNDAY, FEBRUARY 18, 2007

## Foot Shell Gluing, Lower Strips Prepped

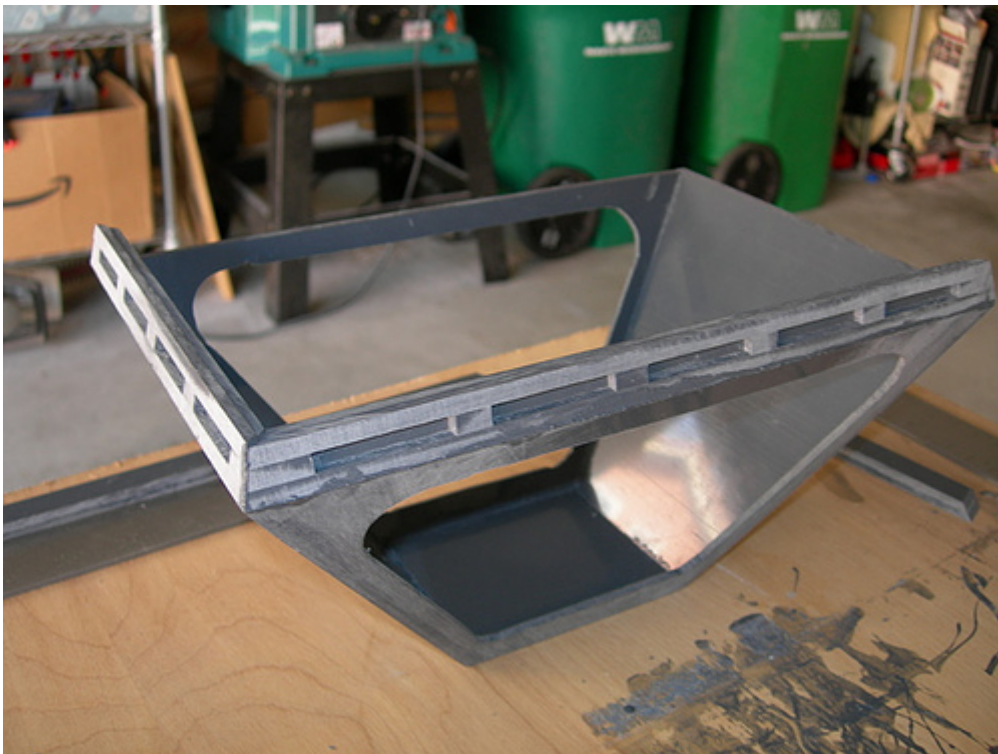
Today I glued up some of the cuts from yesterday.

First I glued in the curved sides of the outer foot shells. These were actually glued in right-side up, but after the PVC glue had dried, I turned the foot shells over and oozed some more PVC glue on the seams from the inside, for further reinforcement.





Next, I glued down the bottom strips on the center foot.

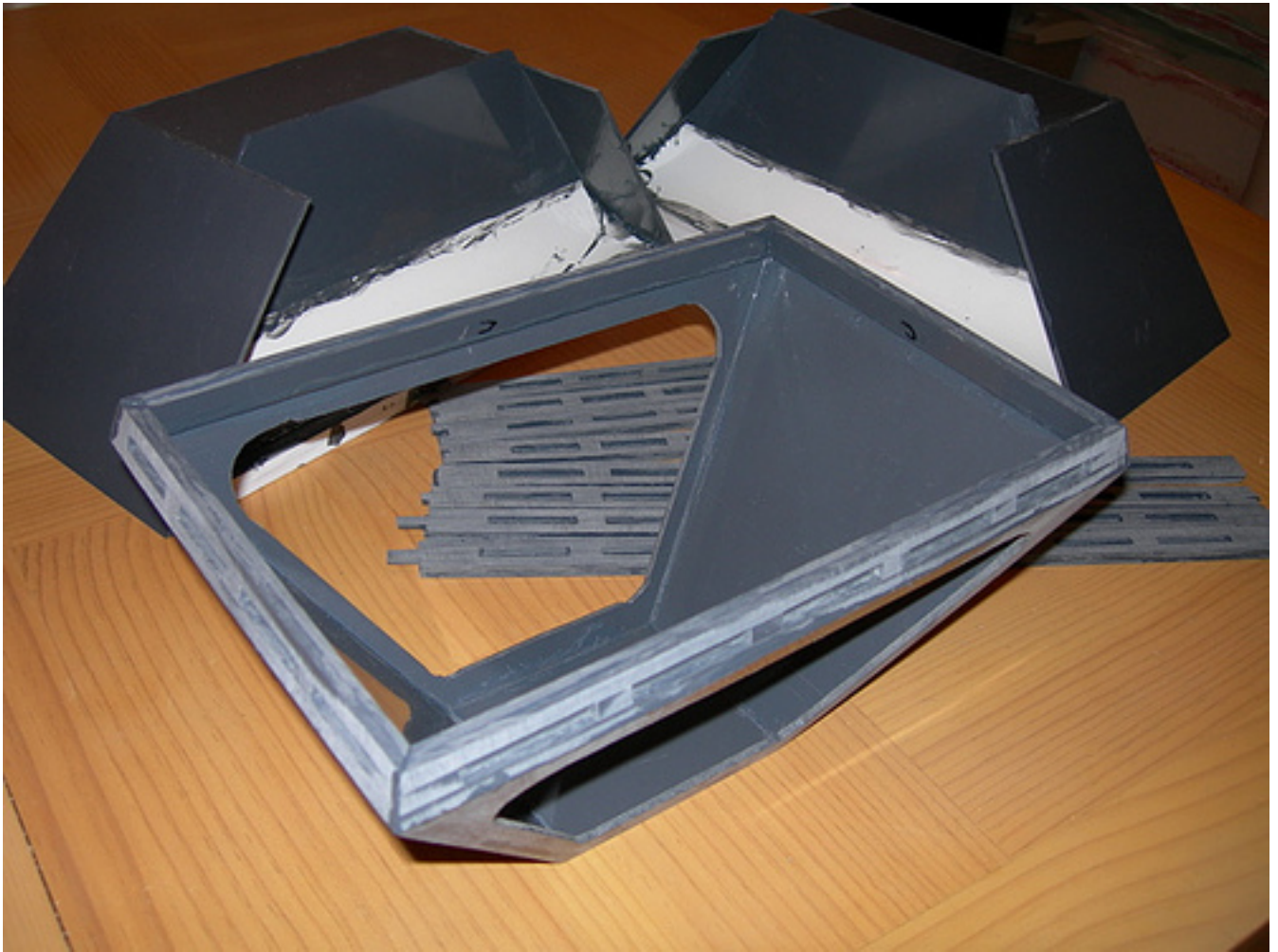


Last up was sanding smooth the outer faces of the bottom strips for the outer feet. I also cleaned up the little "windows" in the strips as much as I could. This

actually took longer than all the gluing combined.



Tomorrow I plan to trim the bottom strips for the outer foot shells to size. I also plan to trim off the overhang on the outer feet. After that, I should be able to glue the bottom strips onto them. Then those outer foot shells will really start to look real!



*posted by Victor Franco at 11:48 PM* 0 COMMENTS

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MONDAY, FEBRUARY 19, 2007

## **Dremeled & Sanded Outer Foot Shells, Started Trimming Bottom Strips**

I love three-day weekends! (Who doesn't??) Today afforded me a chance to make a mess in the garage.

I pretty much picked up where I left off yesterday with the outer feet. The PVC glue had dried overnight, so I used the Dremel with the cutoff wheel to hack down most of the overhang on the edges of the outer feet. Then I used the Dremel drum sander to bring the overhang to a minimal distance so that I can sand off the rest by hand.





After the trimming, I sanded the top side of one of the outer foot shells nice and flat. I also sanded the flat edges on the bottom of the curved side on both foot shells, so that I could be sure that the lengths of the bottom strips could be measured accurately.



Recall that the bottom strips were cut too long intentionally, and now is the time to cut them to the correct length.

As Mike showed me on Saturday, the idea is to locate the midpoint of a bottom strip, and the midpoint of the corresponding edge of the foot shell. These two points will line up when the strip is glued to the foot. Once the centers are lined up, I then used a razor blade to lightly mark only the left edge on the bottom strip to trim. (The strips were trimmed upside-down, so the cut itself appears on the right.)

The top and bottom edges of the bottom strips have a 12 degree beveled edge, so I used a strip of wood that Mike cut on Saturday that also had the 12 degree tilt, to rest the PVC strip on. This helps to prevent the PVC from chipping as the cut is being made. I trimmed the strip down at a 45 degree angle a little at a time, until I hit my mark.





With the left sides trimmed, later I can again match the bottom strip to the corresponding foot shell edge, and make another notch for the right end, and trim. This time, I should have a match at both the left and center points on both the bottom strips and the foot shell edges, but the important thing is to align the left edges before marking the right edge. This ensures the correct length. (I ran out of daylight, otherwise I would have done it today.)

There's still a fair amount of work left on these foot shells, but they are definitely taking shape.





*posted by Victor Franco at 9:18 PM* 0 COMMENTS

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TUESDAY, FEBRUARY 20, 2007

## Outer Foot Shell Sanding

Tonight I worked on sanding the edges of one of the outer foot shells smooth.

I found some PVC pipe that's almost 3" outer diameter. It's more like 3.25", so I can't use it to perfectly sand smooth the curve of the feet, but I can get close.



I need to keep in mind that I'm going to be cutting a fairly large chunk of material out of the foot shell, because the drivetrain isn't going to fit completely inside the foot shell. It will actually enter into the battery box, so those will get cut too. There's no sense in finishing certain sections of the foot shells to perfection because of this.

After a few hours of sanding, I have one of the foot shells just about ready for filling (with Bondo, probably) and then... another round of sanding. There's a lot of sanding in my future.



This is going to get tedious over the next few days, but R2 refuses to build himself.

*posted by Victor Franco at 10:15 PM* 0 COMMENTS

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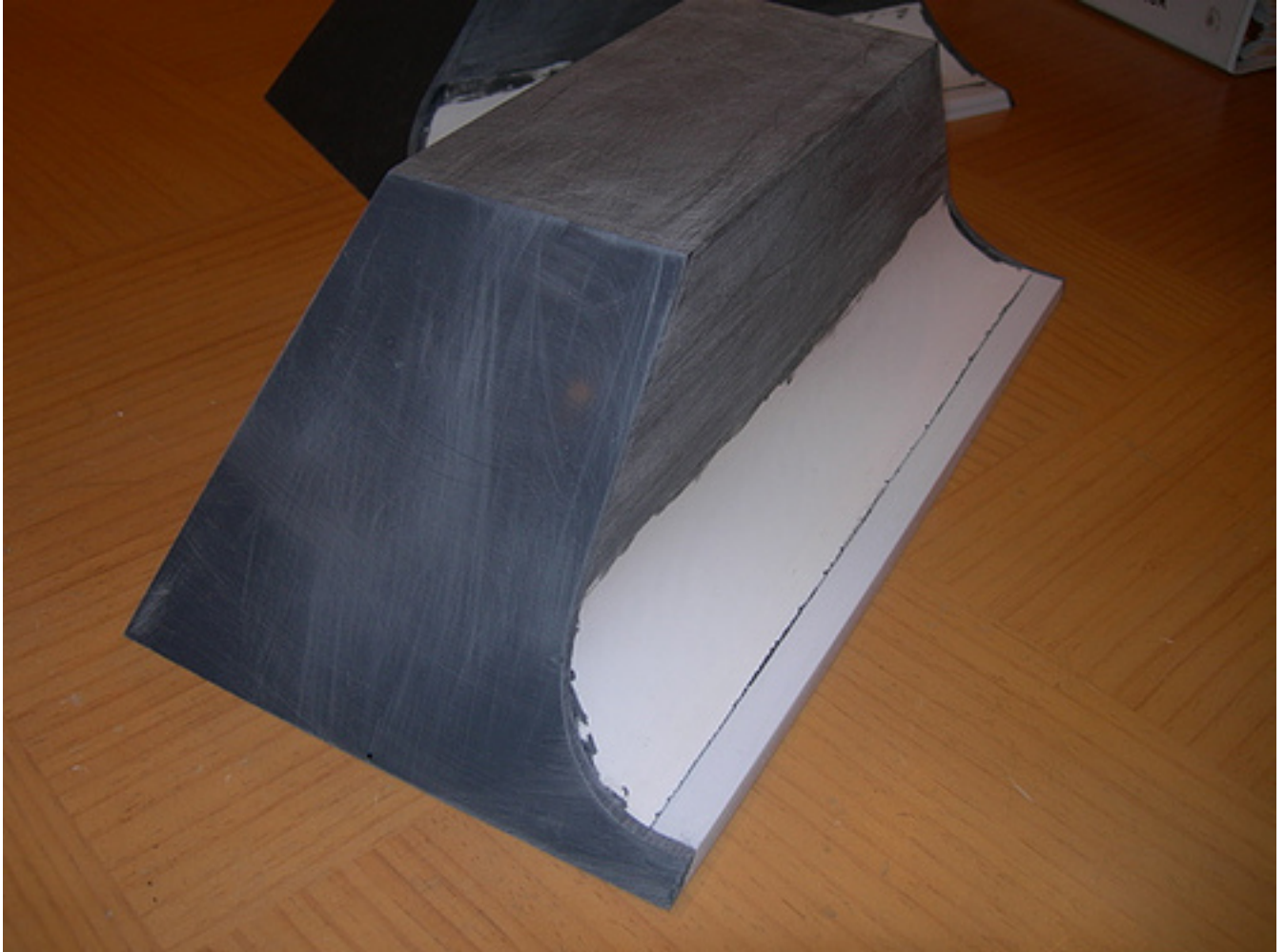
WEDNESDAY, FEBRUARY 21, 2007

## Sanded Second Outer Foot Shell

More of the same from yesterday. A few hours of sanding the other outer foot shell.

This time I used one of Craig's battery boxes to sand the curved area. The profile is a better match than the pipe I used yesterday, but it's harder to use. I actually moved the foot back and forth against the sandpaper on the stationary battery box.





I probably have a little bit more light sanding to do, but it's almost ready for filling here and there.

*posted by Victor Franco at 10:28 PM* 0 COMMENTS

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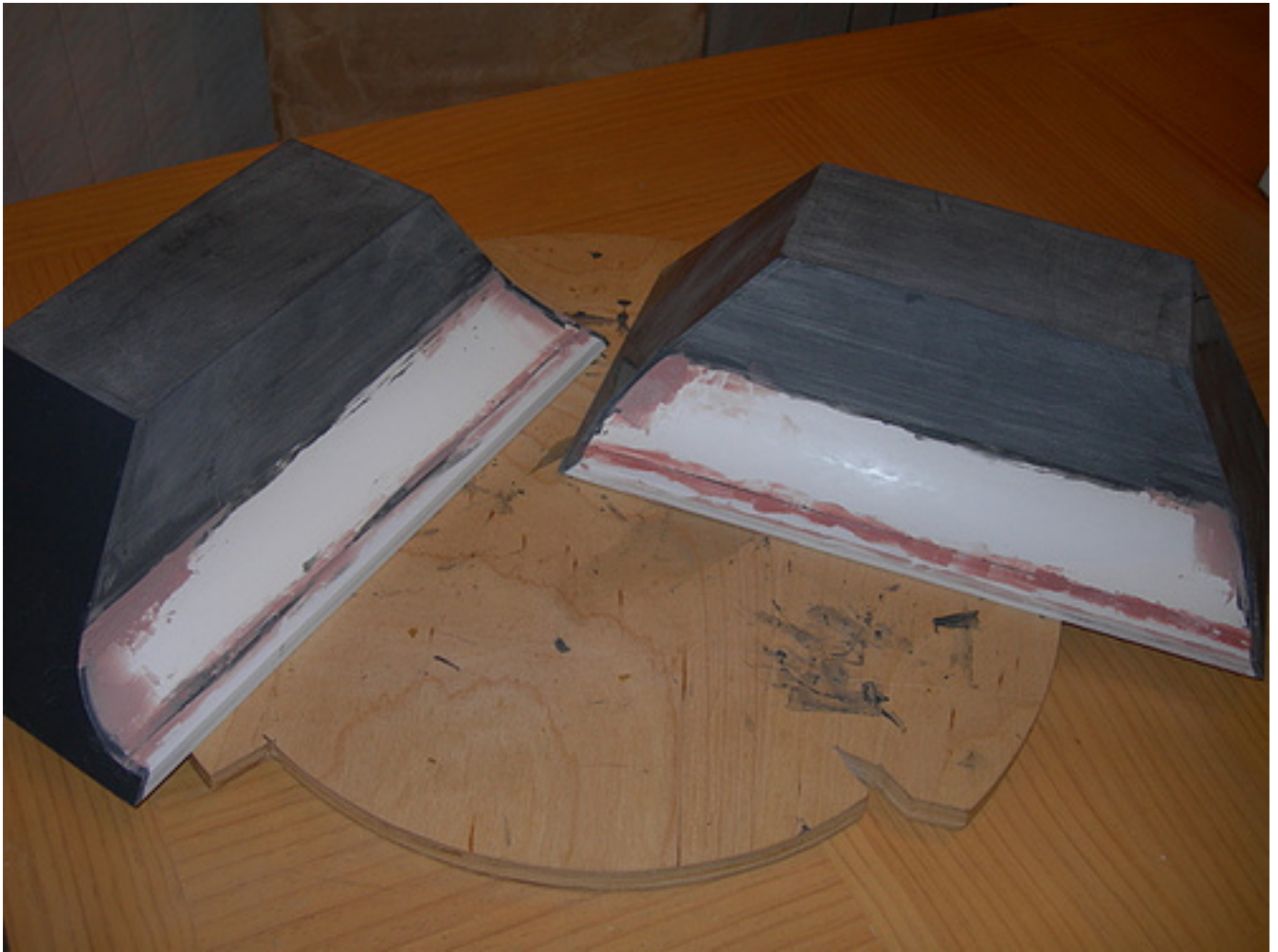
THURSDAY, FEBRUARY 22, 2007

## Fun with Bondo

Tonight I got reacquainted with my good friend Bondo. Bondo and I first met on [July 16th of last year](#), and we've been buddies ever since. Evidently it's the fumes.



The main areas that needed work were where the curve meets the front/back sides, and where the curve meets the flat part above the curve. A couple of seams also got some attention. Tomorrow I'll sand, hit it with some primer to find the discontinuities, and repeat as necessary.



*posted by Victor Franco at 10:50 PM* 0 COMMENTS

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SATURDAY, FEBRUARY 24, 2007

## More Outer Foot Shell Finishing

After spending around five hours in the R2 Builders chat last night, I got back to work on the outer foot shells.

I sanded down the Bondo that I applied Thursday night, again by using sand paper wrapped around the battery box, and running the curved part of the foot shell back and forth.





With so many different colors to look at (gray and white for the PVC, pink for the Bondo), I used some gray primer to help find the remaining flaws.



Things actually look better than I thought they would, but I still have a little more filling and sanding to do. I'm ignoring the middle area where the curve and flat part above the curve meet, since that is going to get cut out for the drive train to fit into the battery boxes.

*posted by Victor Franco at 9:31 PM* 0 COMMENTS

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SUNDAY, FEBRUARY 25, 2007

## Finished Cutting Bottom Strips for Outer Feet, More Finishing Work

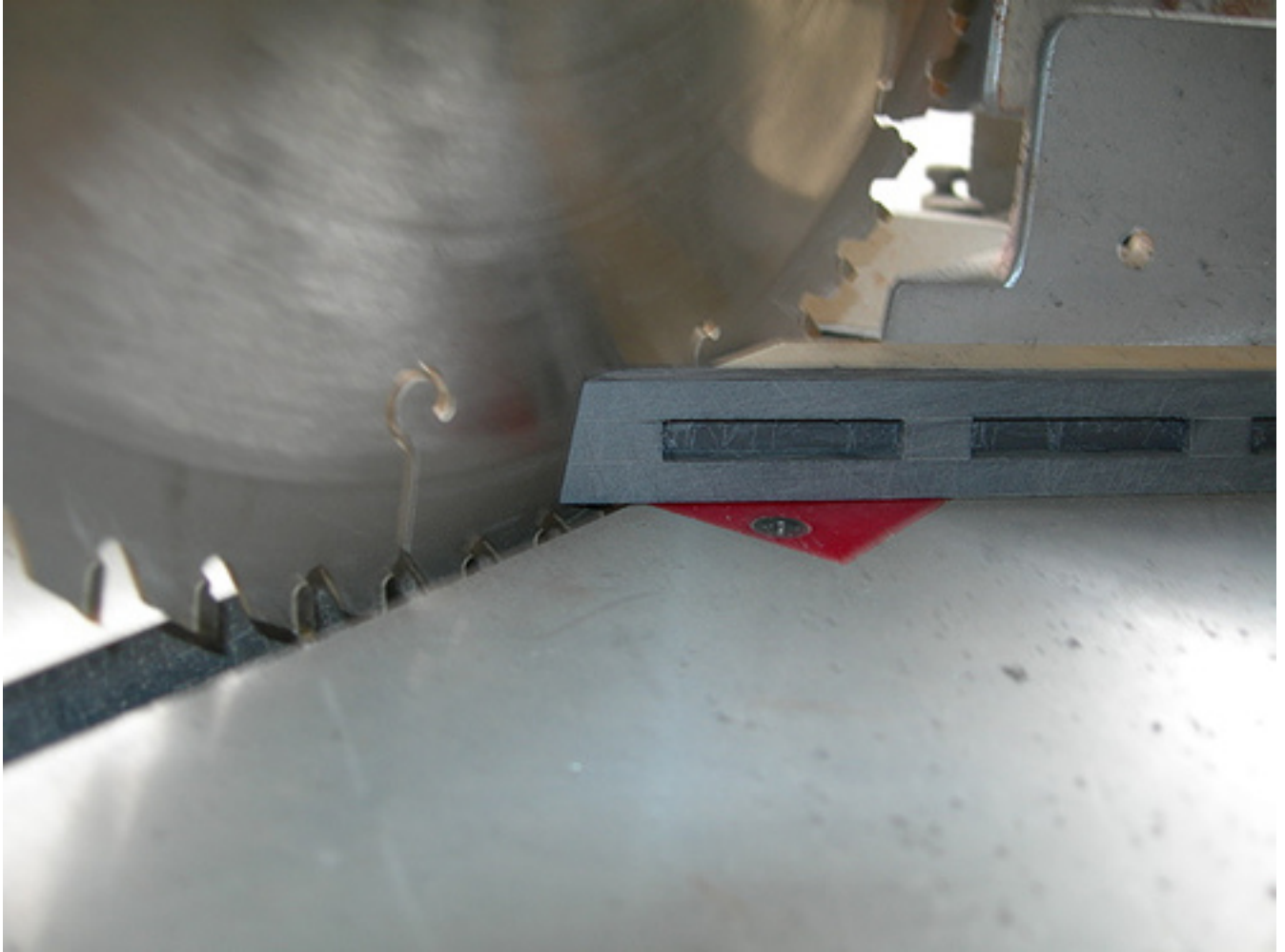
Today I completed cutting the strips that go on the bottoms of the outer feet.

I started by making a mark with a razor blade on the strip.



As I did this past Monday, I trimmed the strip down on the miter saw at a 45 degree angle.





Things are looking pretty good. I won't glue these on just yet though...



... because I'm still working on finishing up the rest of the foot shells first. I did some light filling and sanding again today, more primer, and hopefully one more round and I'll be done.



*posted by Victor Franco at 10:25 PM* 0 COMMENTS

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MONDAY, FEBRUARY 26, 2007

## More of the Same

Just a few minutes of light sanding on the outer foot shells tonight.

I told you this would get tedious.

*posted by Victor Franco at 10:43 PM* 0 COMMENTS

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WEDNESDAY, FEBRUARY 28, 2007

## Aluminum Under Shoulder Details, Meet at Mike's

Ryan's excellent aluminum under shoulder details arrived today. Right now I have Keith's resin parts installed, and they do look very good, but I've wanted this part in aluminum for quite some time. I'm not exactly sure when I will install them however, as I'm driven to get the feet done before I start revisiting other areas on the droid.





Roy Powers, Mike Granek and I had a very impromptu meeting at Mike's tonight. I also had Mike review my current foot shell progress. With just a bit more work, they will get the Senna Seal of Approval™. They should, Mike did most of the work.



Yes, this my way of saying that I got nothing productive done today on my droid.  
*posted by Victor Franco at 10:25 PM* [0 COMMENTS](#)

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