300 DOME TUTORIAL

INTRO

What Comes with a Dome:

- One Laser Cut Outer Dome
- One Solid Inner Dome
- One HDPE Internal Ring
- One Angled Aluminum Ring
- Mounting Hardware

For More about what comes with a dome, visit:
http://gallery2.astromechbuilder.com/main.php/v/darenmurrer/videos/

In order to prep the metal, we first look at the inner dome. On the inside, there could be some black grease leftover from spinning. Just use a rag and wipe this out. Cleaning now will keep a lot of nasty aluminum grease off of your hands in the future.

The next step is to remove the leftover pieces of aluminum. These thin pieces of scrap aluminum are sometimes still hanging in the gaps between panels. Flip the outer dome upside down on a soft surface and find a dull chisel or punch. I used my small chisel to apply steady pressure on these thin pieces and pushed from the inside out. Push on the corners of the strip first, and then apply light pressure to the middle.

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Panels

To remove the panels, you will need a few tools.
-Small Saw Blade
-WD-40
-Side Cutters (optional)

First, go around the dome and label all of the panels that will be removed. Just grab the nearest sharpie and label the panels on the inside. By doing this, you will have a reference in the future as to where the panels will be reattached.

The easiest way for me to remove the panels was to first use the side cutting pliers and take a small bite out of the tab. This allowed me to spray a little wd-40 on the saw blade and then use that to finish cutting through. On the pie panels, I found that if you cut the bottom right tab first, the other two could just be twisted off if you have used the side cutting pliers on them. Be careful as you go around not to force the blade or hold it too tightly. Just keep adjusting your angle until you find a place where the saw blade moves easily. If the blade is catching or you are having a lot of trouble, try a little wd-40 and keep adjusting the angle.

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Bottom Rings

On the very bottom of the outer dome, two rings have been etched out. The very bottom one is scrap. Simply remove it like a panel and throw it away. The larger ring above it gets detached and painted to match the panels. It will eventually cover up the screws that hold the plastic ring to the inner dome. It will be glued on later.

Cutting the Inner Dome

The next step is cutting the inner dome. First, you must trace the lines that need to be cut. To do this place the outer dome on the inner and check your spacing.

Simply turn the dome and make sure this is even all the way around. You want to find the optimal position where the two domes rest most perfectly against each other. Once that is done, sharpen your pencil and prepare to trace.

First, trace the top circle. Trace the HP's and other details like logics and PSIs. Next, trace any panels that you will want to open and close. This might include the pie panels on top and and panels you want to open on the side. Make sure that you create a lip for the panel to rest on.

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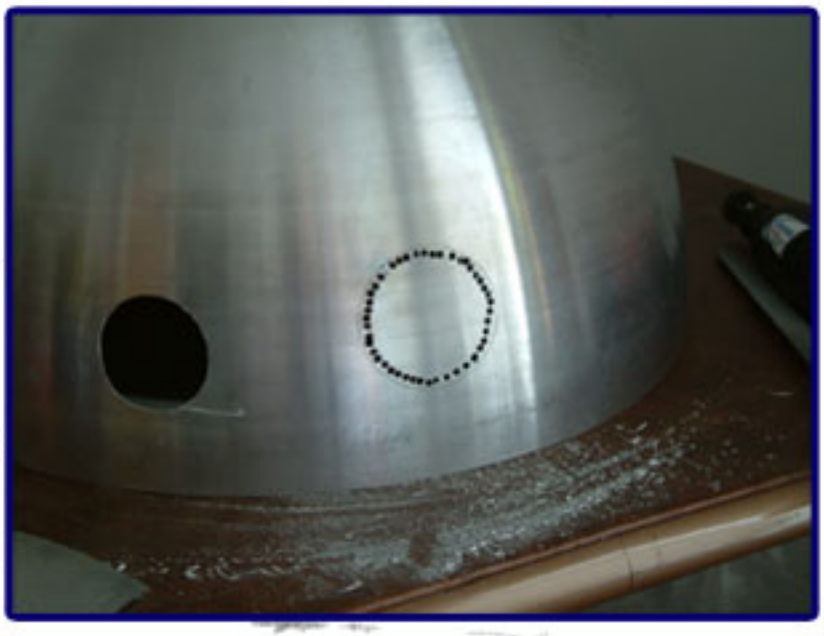
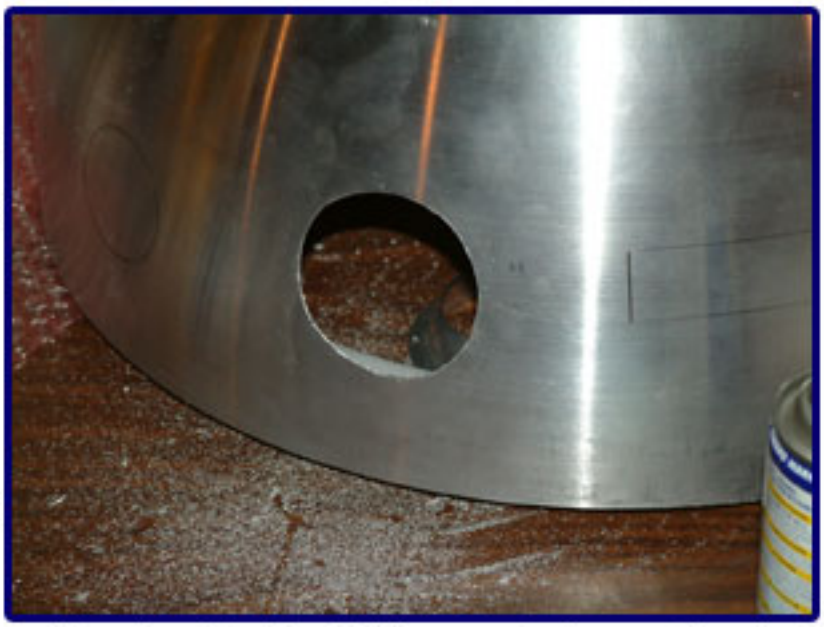
Cutting the Inner Dome

Once tracing is done, its time to cut into the inner dome. An easy way to cut out the holes and panels is to drill lots of tiny holes around the inside perimeter of the lines you have drawn. Make enough little holes that the panel can be removed. Once you do that, use a half round file and start finishing what is left. You will want to file at least to the line, but possibly more. You can get as detailed as you want, but know that you will be filing off a significant amount of material at this point. You will want to use a mask for this or else you'll be breathing a lot of aluminum.

Some people will want to use a dremel to cut these holes out. If you are comfortable with that technique, its an option. It is faster than drilling, but could leave more room for errror.





A mix of both drilling and dremeling is very effective. Both will require lots of file work.

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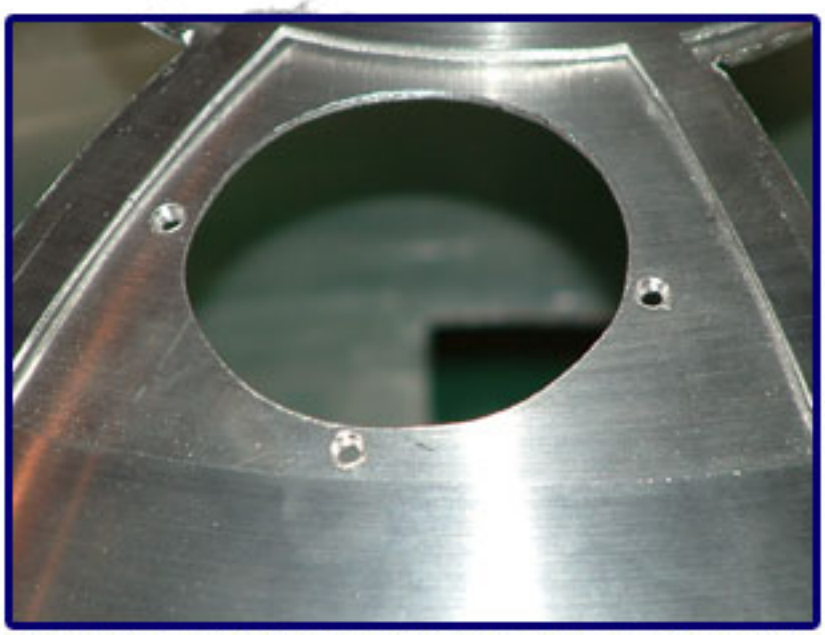
Installing the Details

Once you have finished cutting and finishing all of those panels, its time to mount the holoprojectors and other details. To do this, grab your drill, countersinking bits and some hardware. I went to Lowes Hardware Store and picked up some **4-40 x 3/4 flat machine screws**. These are found in the drawers and come in packs of 5. You will need three for each HP. Don't forget to get the **4-40 hex nuts** to go with them.



Above: The panel has been removed, a hole cut and sanded, and three holes have been drilled and countersunk to hold the Holoporjector on.

The next thing is to grab the ring from a holoprojector. If you have some of the newer aluminum HPs, they have holes pre-drilled for the screws. If not, you will have to drill a few yourself. Really, you only need three holes.

Take the ring and place it through the hole for the HP you made on the inner dome. Use a pencil or marker and mark the three holes you plan to drill. Then, remove the ring and drill a small guide hole through from the inside. Once that is done, take a countersinking bit and drill countersinks on the outside of the inner dome. This will allow the screws to sit flush on the inner dome and be covered up when you put the outer dome back on.

Continue this process for mounting all of the logic ports.

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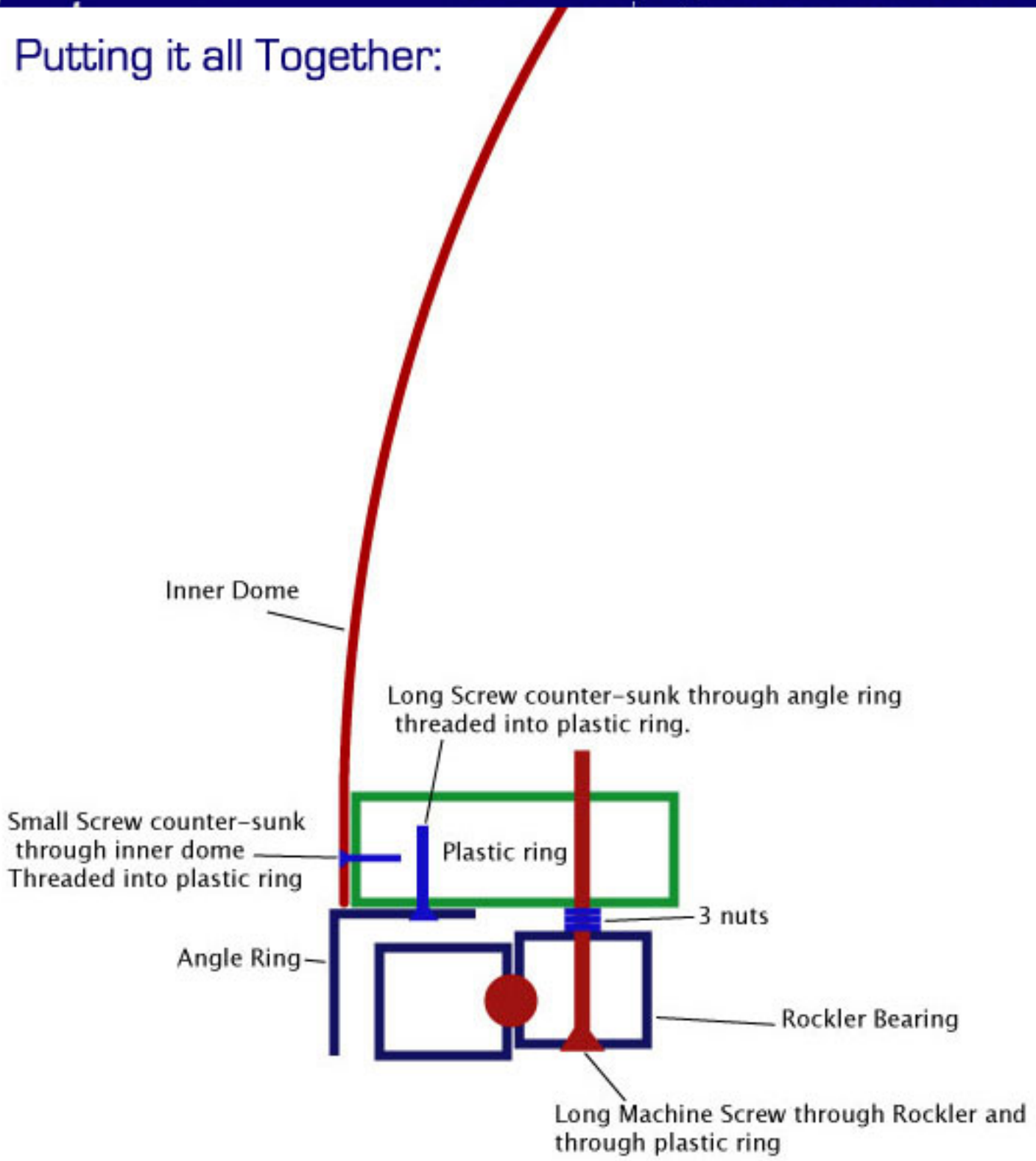
Putting it all Together:



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1. Place the lazy susan bearing on a flat surface with the long machine screws sticking up through the pre-drilled holes with three nuts holding the screw in place.
2. Flip the aluminum angle ring upside down. Drill and countersink about four holes on the inside of the ring so that they will stick up into the plastic ring.
3. Lay the HDPE plastic ring underneath the upside-down angle ring. Check your spacing all the way around and then drill screws through the newly countersunk holes.
4. Flip the HDPE ring/aluminum angle ring and place it on top of the lazy susan bearing with the screws going through the pre-drilled holes in the HDPE ring.
5. There should be even spacing all the way around, so then place the inner dome on top of the plastic ring.
6. Counter-sink about four holes into the inner dome at on different sides of the dome. Thread the small screws into the plastic rings through these holes.
7. To cover these holes, you will glue the blue aluminum ring that you detached ealier back onto the base of the inner dome. Be sure that it is already painted when you attach it.

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Reinstall the Panels

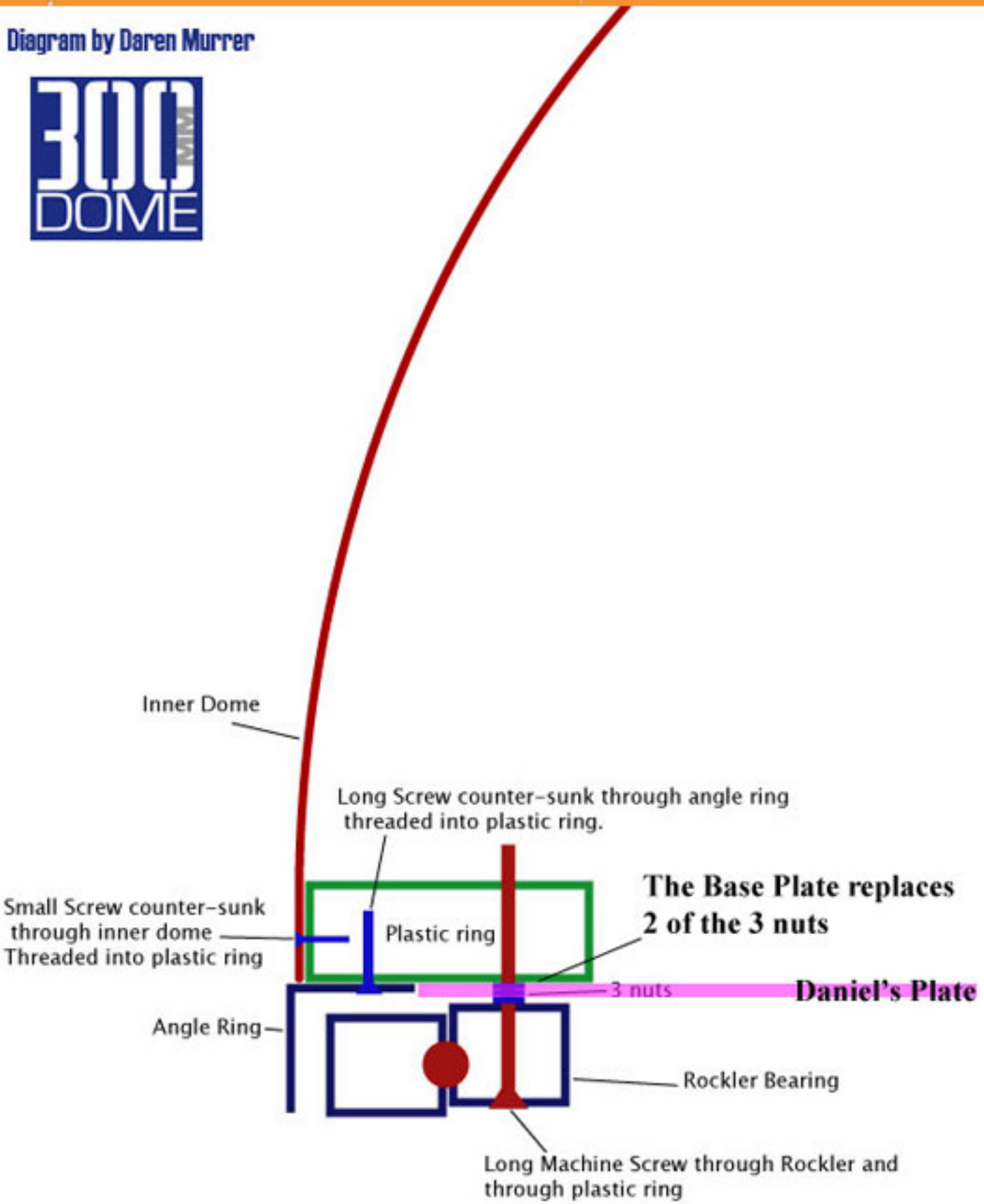
Remember, you will want to **attach the blue ring before you glue any other panel or the dome.** Then, you can permanently bond the inner and outer domes. Using any adhesive you like most, glue the inner dome to the outer dome. Be sure that all of the holes match up and that all of your hardware for the HP's and logics are countersunk and sitting in the holes. Remember to test everything and take your time for this step. You don't want to permanently bond the two domes togther and forget something.

Once all of the details have been installed, its time to replace the colored panels. First, you need to paint them in the color your droid will be. Take the painted panels and attach them with the adhesive you are most comfortable with. Some like silicone, others JB weld, others Super 77. Whatever you like should do the trick.

Just make sure that the panels are clean and you have plenty of clamps to hold them in place while they adhere.

Daren's R2-D2 at Celebration IV, Los Angeles 2007

Diagram by Daren Murrer

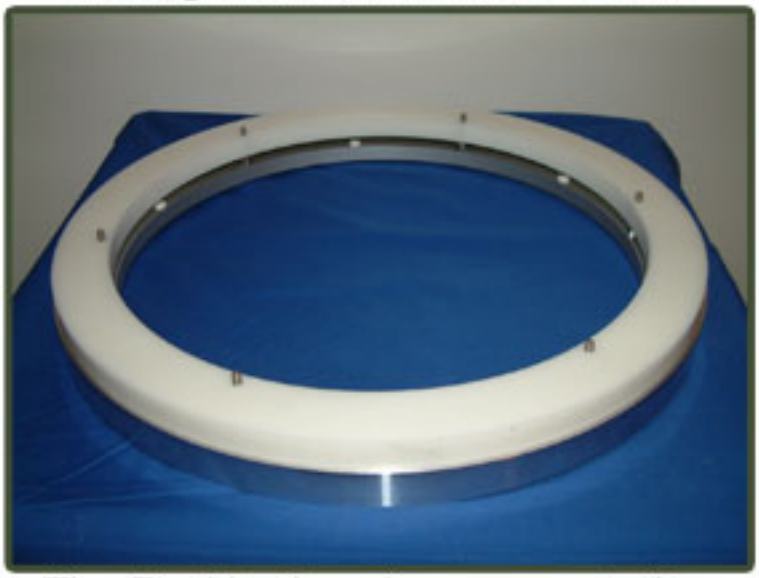


EXTRAS

At the Laser Cutter

Drilling Holes in the Inner Dome

Half Round File on the Inner Dome



The Rockler bearing connected to the aluminum ring with plastic ring on top

HINTS AND TIPS

Remeber to be safe. Wear eye protection, masks, etc. You will need those fingers to control your droid.

Check out Jerry Greene's tutorial on finishing the R&J dome. It can be found in the tutorials section of Astromech.net There is considerable overlap on how to finish both of these domes. Much of what he says in his tutorial also applies for your dome.

Take your time and pace yourself.

The fewer holes you cut in the inner dome, the stronger it will be.

Do your research. Read builders' blogs and the forums to see how others approach things. There is no "right" way to build a droid.

Before you bond the domes together, make sure everything is in place to mount all of the HPs and Logics. Double check that you have nothing else to cut on the inner dome before you bond the two domes together.

Boms Away is a great polish for aluminum. You can buy it at bikecleaner.com

If you have any questions or concerns, please don't hesitate to email me at **cole.horton@gmail.com** or check my blog found at **www.HoosierTrooper.com**

Cole