

This is an extract of a build log by *Hubac's Historian* for the Soliel Royale on MSW:

I needed a good small-work project, so I have decided to tackle the low-relief Mer-Angels that flank the upper finishing of the quarter galleries. I'm carving these in 1/16" white styrene, and I will begin with the aft-most pair:



It's good to carve like-figures in tandem, for the sake of consistency. The forward pair require a little re-drafting, so that they don't interfere with my aft-most octagonal port.

On the Ships of Scale site, a few members have expressed interest in my carving process. I'm still up in the air about creating a YouTube account for posting video content. I thought, though, that these Mer-Angels were a good opportunity to discuss my approach and technique in depth. The major benefit of what I do is that it doesn't require a ton of specialized carving tools.

Continue, below, for parts one and two of this series

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I thought, perhaps, to demystify my carving process, that I would do short updates, as the carvings take shape.

The first thing, whether you are working from a pre-established ornamental plan, or drawing the ornaments yourself - you are going to want to make sure that the ornamentation is appropriately scaled and detailed in the appropriate style of the nation and time period you are working from. Ultimately, the quality of all relief carving boils down to the quality of the design and layout.

One aspect of model ship-building that begs for a good reference library is ship ornamentation. The single best book in my actual library, for this purpose, is Andy Peters's

book *Ship Decoration 1630-1740*. He covers each national style with sufficient depth to see the evolution of styles across this fairly long time period.

I also have numerous books filled with pictures of contemporary models and period portraits by respected artists. What really helps me out, though, is curating several very large databases of period ship imagery on Pinterest.

At the end of the day, the more you study the best examples of the shipcarvers' art, the more fluent you will become with their oeuvre, and the better equipped you will be to draw it. My operating philosophy is that The point at which I can see something clearly enough in my mind to draw it, is also the point at which it becomes possible for me to make it.

Because good carving is so time consuming, it is well-worth the extra time it takes to make extra copies of the ornamental plan so that you can edit directly to the plan, if you don't like the direction, or slope of a line, for example, or if you find specific aspects of an ornament to be exaggerated. Once satisfied with your edits, you can make fresh photocopies, and this becomes your new pattern.

Once I have a workable pattern, I paste it directly to my stock with a craft glue stick. It should be noted that almost everything I will say about carving these styrene ornaments applies equally to wood. The techniques involved in figure carving, though, are a little more involved.

The first objective for one of these low-relief ornaments is to separate the ornament from the bulk of the waste. I find it easiest to drill a series of closely spaced holes all around the carving with a micro bit. Afterwards, it's short work to connect the dots with a sharp utility knife.





The next step is to set in all of your lines. In large, full-size relief carving, one would use a V-tool and mallet to do this. For something this small, I use my #11 Exacto, which I keep razor sharp.

The difficulty, in this step, is that the design is full of many short radiuses, and pulling the blade through them can sometimes be quite difficult to stay on line.

Having watched engravers, on YouTube, I have discovered a trick that works quite well, enabling me to scribe even the finest curved lines.

Engravers use a swivel-vise to turn the work into the path of the graver, so that they only have to make minimal micro adjustments of direction, with their graver hand, while maintaining consistent pressure.

What I do is very similar, with the exception that my hand holding the work (on a firm flat surface) pulls and turns the work AWAY FROM the blade tip, which my blade hand is holding with even pressure. With this technique, it is only necessary to make the smallest adjustments to

blade direction, as you go. This all may sound difficult, but it becomes surprisingly easy with just a little practice.

Just as one would practice cutting-in lines on a scrap piece of wood, take a small scrap of your material and draw a series of curved lines, so that you can practice the technique. Try it both ways; pulling material through and away from the blade, as well as, pulling the blade through the material.

I think you will find that it is exceedingly difficult to pull the blade through the work (while holding the work stationary), and stay on-line. Almost invariably, the tension created by trying to control the large muscle groups in your blade arm, will cause you to lurch off track. In this scale, millimeters are everything, so even small distortions of line render the design illegible, once the paper is removed.

Initially, I like to keep the paper on, while I fair to my lines, around the perimeter. I might begin by using a small Dremel drum sander to take away as much excess as possible. Sometimes the paper begins to delaminate and you are better off removing it. You can, at this point, soak the carving in running water to remove the paper (fine with plastic, but you will want to have used spray adhesive and solvent removal for wood).

Once the paper is out of the way, I find it exceedingly helpful to darken (really darken) the whole surface in graphite. You want the pencil lead to get into your scribe lines. I then use my thumb to smudge the graphite into the lines. Doing so also lightens the field enough to see the lines more clearly.

Once that's settled, you work very carefully with a decent set of needle files to get as close to the lines as you can, all the way around the carving. Don't worry, just now, about the fine corners and crevasses you can't get to with the files. We'll tackle that in the next installment.

In this second installment, I'll discuss the initial planning and approach that goes into modeling the carving, while introducing the tools that I use the most, and discussing the techniques that have given me good results.

At the stage pictured, below, I've invested about four hours cleaning to my outlines on each carving. I've used the smallest diameter drill bit I have - roughly 1/64" - to get in-between the head, wings and arms. Doing so, even to this minimal degree will greatly ease the cutting-in later. The carving blanks have good symmetry. I made one small drilling error in the bell-flower garland, near the hand, on the left blank. In the end, this small mistake won't be noticeable, and certainly it does not necessitate a redo of the blank.



Below are the primary tools that I used, today, to begin carving the tail. With the exception of a few Dremel burrs that I use to do some of the initial wasting, most of the cutting-in and sculpting I do happens with my EXACTO (for deepening lines of demarcation), and my hooked BEEBE knife for paring, digging and scraping.

This hooked knife, in particular, is invaluable throughout the sculpting process because its versatility enables you to achieve fine results without an arsenal of carving tools.

The occasional drill bit also comes in handy when you need to define a small radius within the work - as, here, along the flowing hem of the figure's blousy skirt.



So - even though, at this point, I have made a number of similar sculptures for this project, every carving is unique and demands that you think your approach through before you begin.

While not a fully rounded figure, this carving is, nonetheless, fairly involved, with the area around the head and wings providing the greatest challenge.

Personally, I like to begin a carving in an area that is a little less daunting until I find my confidence, again, and the resulting momentum allows me to work through the carving by increasing degrees of difficulty.

In this instance, I have decided that the tail is the best starting point because, while contoured, it is a shape that I fully understand, right now. Unfortunately, the line of demarcation, here, is the blousy skirt that has a somewhat involved hemline that one must clearly define, first.

Bear in mind that the blank, in this case, starts out as 1/16" thick. As a general rule, I will reduce to 1/2 thickness along lines of demarcation, in order to convey a sense of depth. In this case, that means that the skirt steps down, roughly, 1/32" to the tail.

In order to begin cutting in this line of demarcation (on the tail side of the line) I like to take the smallest round burr I have and run it in the Dremel at the next to lowest speed; because this is plastic, you don't want to generate too much heat, thus making a molten mess of your waste.

The absolute key to "relief" carving is to relieve an area for the waste to pare away easily, without having to apply too much pressure on the blade. To facilitate this, I run my Dremel burr along the line, but not on it. You want to get to within 1/32", or so, of your line so that you can gently pare to the line with your knives. For the most part, I like to use my EXACTO to pare to lines, and the BEEBE to pare and scrape the surface down smoothly.

Although it isn't so evident in the picture below, I'm plunging the tail lower at the sides, than in the middle because, ultimately, I want the tail to take on a domed appearance. In the finished carving, it is this very slight rounding of a surface that creates the play of light and shadow that gives the carving a sense of depth.



The other thing to be aware of is that, as you sculpt down through some of your reference lines, you will occasionally need to pencil-in a few guidelines as a reminder of where you are going. In the example below, I've penciled-in a crease line that ever so slightly favors one side of the tail, towards the top, but centers at the bottom, where it meets the foliate flipper.

I have found that, sometimes, working just off-center enhances the dynamic “movement” of a carving. Also - however subtle they may be, hard crease lines define shadow and light in a way that benefits the finished carving. Developing a sense for this is simply in the doing of it, but it is useful to at least be aware of that, as you begin sculpting.



Another design trick for creating a greater sense of movement and vitality is to create undulations or “waves” of varying depth. Some examples of where I have previously done this on this model are the motto banner and the rudder dolphin’s tail.

Initially, it’s just a simple matter of using a Dremel side cutting, straight burr to create these waves:



Note that the angle at which you introduce these undulations matters; it can either affirm natural movement or run contrary to our intuitive expectations of how tails behave.



Once that's established, you can begin really contouring the tail. Usually, I'll begin a rough paring with the BEEBE. Then, I'll smooth the surface and try to define my crease with the triangular And round needle files - so far as I can without cutting into adjacent sections of the work. Finally, I will scrape micro-facets with the BEEBE - particularly around the perimeter. This helps me achieve the soft rounding.



The foliate tail “flipper” represents a small increase in degree of difficulty. Before I begin sculpting the leafy tail fronds, I want to achieve a sloping taper from the head of the flipper to its tip. This is easily achieved with an emory board.

Next, I want to introduce a similar sense of movement with waving undulations, just as we did before with the tail body:



Sculpting of the flipper fronds, themselves, begins by re-scoring the outline of each frond with your EXACTO blade. I like to “draw” a very light line with the blade, on the first pass. Then, I’ll make a few deeper, scoring cuts along this line.

Finally, I’ll flip the blade and drag it through my score cut, with the spine of the blade leading the direction of the cut. In this fashion, the blade tip essentially engraves a successively deeper line into the plastic. As described, this same technique works essentially the same way on wood - particularly, across the grain. The more parallel your cut runs with wood grain, the more you will have to alternate your direction of cut

Any time I’m trying to sculpt something small and leafy like this, I basically try to scrape two facets along a centerline, for each frond. Mainly, I use the BEEBE for this.

I also like, where appropriate, to introduce concave hollows around round openings. There's a small shallow gouge that I use for this, but I didn't have that with me today. I'll be discussing that more in the next installment.



Basically, these few techniques will enable you to methodically work your way through any carving. I probably won't do detailed updates of every step in the process, but I likely will discuss the bell-flower garland, as well as the head and wings, in some depth.

Alright, so it took me a moment to finish the tail on the port side figure, and then work the starboard side to the same point. The tails differ in small ways, but working the carvings in tandem helps ensure a degree of consistency from one side to the other. It is also helpful and faster, carving the second piece because all of the process you just worked through for the problems of that section are still fresh in your mind.



The next section I concerned myself with is the flowing, billowy skirt, up to the lower edge of the bellflower garland.

The process begins the same way, by cutting in the next line of demarcation, which is the bottom edge of the garland.

In order to achieve this cutting-in, I begin with my smallest round Dremel burr, as before. This time, though, the particular shape of the bellflower lends itself well to stab-in cuts with my small, shallow sweep gouge:



This single tool is incredibly versatile for small work, such as this. I can creep up to a line with a series of stabbing cuts, and the thumbnail edge allows me to roll into tight corners. I also use this tool for both concave and convex modeling, with either paring cuts or a scraping action. Next to the hooked BEEBE, this is the knife that I use the most.

So after cleaning around the bellflower, this is what we have:



I've smoothed over and slightly rounded over the surface of the skirt by paring and scraping with the Beebe, but really, I've only removed enough material to ease the transition into the line of demarcation, which is the bellflower.

In the next picture, you can see that I completed the skirt modeling, to the right, but I've marked in the reference lines on the left skirt, to remind me how the folds and hollows need to be cut in:



This process begins by using the smallest veiner I have to begin cutting-in the troughs of the hollows as far up as I can, before the tool interferes with the garland. Here is my veiner:



If my small gouge is an 1/8", across the sweep, this veiner cuts a 1/16" line.

Once I have the basic direction of the trough cut-in with the veiner, I use my smallest ball-burr to deepen the troughs, and extend them up to the garland. These are just very light, controlled passes in the Dremel, on the lowest setting, until you are satisfied with the depth and overall shape of the trough. Oddly, I find this near-finish use of the Dremel much more difficult to control than using knives.

The next to last step is to smooth the transition from trough into fold by using the gouge to scrape smooth micro-facets until you have a smooth natural-looking fold. I also like to use the edge of the BEEBE knife to take skewed, paring scrapes to further deepen the trough and smooth into the folds - especially near the garland, where the tip of the BEEBE can ride right along the line of demarcation.

As Druxey noted, this final finishing of the modeling is best achieved in a raking light, so that you can best gauge the depth of your modeling and the smoothness of your transitions.

The final step, on this particular carving exercise, was to undercut the hem of the skirt, just beneath the largest folds, and to both sides of the tail. This is achieved quite easily by scraping the tip of the BEEBE into the highest portion of the raised-fold edge. You won't have to work this very deep or hard, in order to achieve the desired effect.



When the carvings are complete, I'll use a stiff-bristle toothbrush to break away any remaining fuzzies.

For the next section, I am focused on the hips and abdomen, bordered by the breastbone and garland. It's a small area, but surprisingly complex for conveying a sense of anatomy.

The main thing to keep in mind is that this area gets divided into three levels of relief; the hips are the lowest level, while just slightly more proud is the lower abdomen, and topping all is the upper abdomen, which gets cut back rather sharply to create what will be the overhang of her breasts.

The process involves all the same steps and techniques that have been described previously. If anything, most of what is happening here is a scraping to form with the



hooked BEEBE.

This photo montage shows something of the progression. I thought I had taken a few more pictures, nevertheless, here is what I have:



Here, the upper abdominals are scribed in with a bit of a hard line. A few scrapes later, though, and they soften up appropriately:



I keep forgetting to mention that I deliberately mount my carving blanks to the waffled side of my masonite tile. I do this because the grip of the double-stick tape is aggressive, And it needs to be for holding the work securely while you carve. However, the waffled surface reduces the gripping power of the tape enough to make extracting the carvings easy enough, without breaking them.

Of the remaining elements to carve, the wings are set the furthest back. I decided that now was the best time to create a clean separation between the head and wings.



Certainly, drilling into these areas with the smallest bits I have makes it easier to clear the waste. Initially, I use the heel of my EXACTO blade to drag backwards and connect the drill holes.

There are no substitutes, here, for care and patience. Eventually, you will dig a channel deep and wide enough to come in with the tip of your hooked knife to make forward-pushing, shaving cuts until you get to the lines.



From there, it's a process of reducing the wing thickness to slightly less than half the blank thickness, closest to the body. Doing so, enabled me to model a rising, folding shape to the wing surface.

From there, I used my veiner to cut two small coves, and I finished by cutting-in a line that demarcates the leading edge of the wing. This last is achieved, first with scoring cuts of the EXACTO, and then finished with dragging scrapes of the EXACTO heal.



It should be noted that in a few places, my drill bits wandered a little into the design. At this stage where all the other waste is removed, and the element is modeled, one can then pare away any remaining traces of the wasting process, so long as doing so doesn't result in jagged lines or unbalanced looking elements.

Finally, it was a simple matter of repeating the process on the other side of the head. As most of the wing is hidden by the arm, the process was greatly simplified.



Just a quick montage of the garland. So far, I have found this to be one of the most enjoyable segments of the carving. Bellflowers look difficult to do, but you really only need the EXACTO and the hooked knife. The whole process is digging-in, paring and scraping as described, before.

Once the outlines of the flowers were really clear (digging-in and paring cuts with the BEEBE), I'd begin by parting the bell-bottom of each flower with a flaring bevel. Then, it's a simple matter of scraping the outer bevel all around the bell-curve. What you are aiming for is to pare the points down closer to the ground, while leaving the top of each bell as the high point:



At the outset, I was a little bothered by the separation between bell flowers. As the modeling progressed, however, this seemed less glaring. In the end, because everything is so small, it becomes more an impression of the form:



At this point - where the bellflowers separate from the body, it is necessary to taper-down the remaining garland so that the hand and arm finish as higher elements:



Once you have reduced the thickness of the remaining garland, here, it becomes much easier to dig-in (with the EXACTO and the tip of the BEEBE), and define the remaining bells, which become very small:



A little bit of pencil sketching helps you to define these shapes.







Having solved these problems, the starboard side is proceeding much more swiftly.

The chest and arms:









The forearm and hand were tricky. I had to do some delicate re-shaping of the forearm because the way I cut it in, initially, looked a little squiggly. As for the hand, there's at least the suggestion of a thumb and clenched fingers. At this scale, that's plenty good enough.

The other arm is ill-defined, but the conceit is that most of the arm is tucked behind the crown ornament.

Finally - the head!

In observing Druxey's excellent carved works for his Speedwell project, these past few days, it dawned on me that definition of the brow and position of the nose were the key determinants for getting started.

I began by digging down around the hairline, first with score cuts of the EXACTO, followed by pairing slices of the BEEBE. The idea is to approach at a steep enough angle that you creep towards the previously scribed brow line. Keep in mind that this head is just about the size of a pencil eraser head:



Once the hairline had been cut deeply enough, and I was satisfied with the rough slope of the forehead, I cut to the line beneath the left brow and down the nose line, setting it in relief. Again, in-between light scoring cuts, I use the BEEBE - this time with a scraping motion - to clear waste and to begin contouring the face around the eye socket.

It bears mentioning that I never intended to represent the roundness of the eye, itself.



I then cut beneath the right brow, scraped waste and began contouring the cheek area with scraping cuts.

At this stage, I started to worry that I was sculpting the MerAngel of Death, and that maybe I should have her holding a scythe, because her facial features began to seem skeletal.

When the carving becomes discouraging, like this, the best thing to do is take a breath and evaluate.

After leaving it for an hour, I came back and determined that now was a good time to rough in the mouth because its presence would cue me toward how and where to shape the cheeks and chin:



As I've drawn it, the mouth is just a soft diamond shape. It is achieved with four angled, stab cuts of the EXACTO, that converge at the bottom of the cut. I, then, use the heel of the EXACTO to dig out the waste and extend the corners of the mouth.

Although, in the above picture, you can see that I also began to contour the nose, I think it is evident that the simple addition of the mouth animates the face.

From there, it was a simple, but deliberative process of defining recesses and hollows around the cheeks and chin until the face appeared more cherubic than Skellator.

There does come a point, though, where one has to stop before they risk un-doing all that they worked so hard to arrive at. I found that point, and so I shifted my focus to shaping the coif: defined parts of the hair, rounds and hollows. it doesn't take much to suggest the movement and shape of hair.

The completed figure:



I'm not 100% satisfied with the nose, but I have at least five more faces, like this, to carve for the ship, so I think I will get better at it, as I go.