

# 3D MODELING BY HAND

BY DAVID MCDONALD



Create contours with detail without touching a chisel!

**W**E DID A PROJECT *a while back* for The Custom House. *Because we were busy and had an incredibly tight timeline to work with we hired the services of Tan Seibert to help us meet these deadlines so we wouldn't go crazy. While we were working on the project Tan asked if it was the type of work that I would want to share with Sign Business readers.*

*I told Tan I usually like to find something within a project that readers will be interested in seeing, the process of solving a design problem or maybe the production steps — and asked if he thought there was something about this project that had a good focus.*

*Tan replied, "I think the way you created those rounded-over banners on both ends of this sign are a good hook."*

*So there you have it! — the way this article came to be (even though you didn't ask).*

— D M

## THE TECHNIQUE IS BORN

When I finished the design of the entry sign for *The Custom House* I envisioned the banners on both ends to be rolling from the background and over the bamboo in a natural fashion.

The problem I had to address was how to make this happen without doing a lot of hand carving, which would be very labor intensive and time consuming. Remember, not only was there a short deadline, it also wasn't in the budget, nor did it warrant hand sculpting with chisels and grinders.

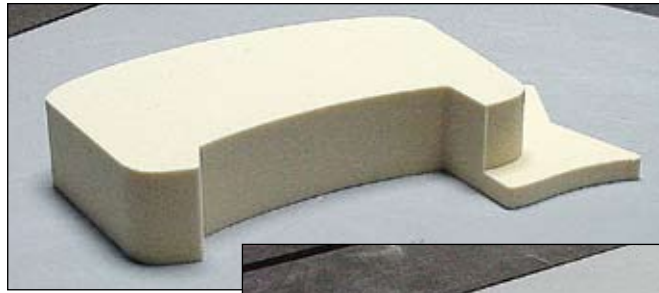
I figured the height needed for the banner to clear the bamboo and realized that I could get by with 2" thick material. The light bulb in my head started flashing and I came to the conclusion that I could create these banners the way I wanted in no time (well, a couple of hours) and we had everything I would need in the shop!

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The banners are cut out on the router table. A clean-out path is dedicated to the area where the banner folds around at a depth of 1 1/2".



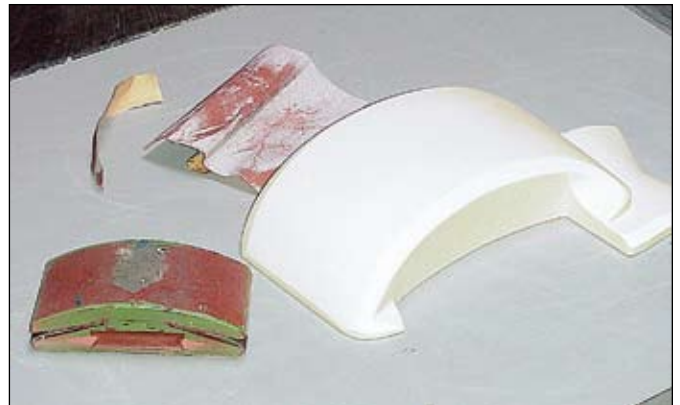
The raw blank as it came off the router. The thin area on the end that would normally be too weak is of no concern here because it will be applied to a backing for strength.



A pneumatic palm sander suited with 40-grit sandpaper makes quick work of forming the needed shape.



Using thin material is key when forming over a shape. Here I am cutting the letters and ribbing out of 1/4" Sign Foam. A round-over bit is used on the ribbing along with simple male cuts.



A block sander and 220-grit sandpaper finish the shape.

## THE IDEA IS REALIZED

My not-so-common sense told me that I could use the router table to cut the banner out of 15 lb., 2" Sign Foam. This could be hand sculpted with a pneumatic palm sander using 40-grit sandpaper — the kind that has little rocks glued to it — it makes quick work of forming HDU.

A vector file could also be created for the letters and border ribbing and be cut on the router table as well, using thin enough HDU that would bend around the contour. I could glue this to the surface with the help of a pattern and quick-setting cyanoacrylate glue.

I thought that when finished it would look as if it was hand sculpted as one piece and be very realistic and believable. If this would work, I would end up

with the result I was looking for yet keep the process within the budget allowed on this project.

Problem solved!

## EXECUTING THE THEORY

Vector files were created for the banners, letters and ribbing to be cut on the router table. On my original router files I designed the banners to be inlaid with a pretty tight tolerance between other elements to further enhance their believability.

After cutting on the router table the banners were in block form (flat) and needed to be rounded over to create the free flowing look. This was accomplished by using a pneumatic palm sander equipped with 40-grit sandpaper. All that

was needed was an arc that went from a slight edge return to the full 2" height.

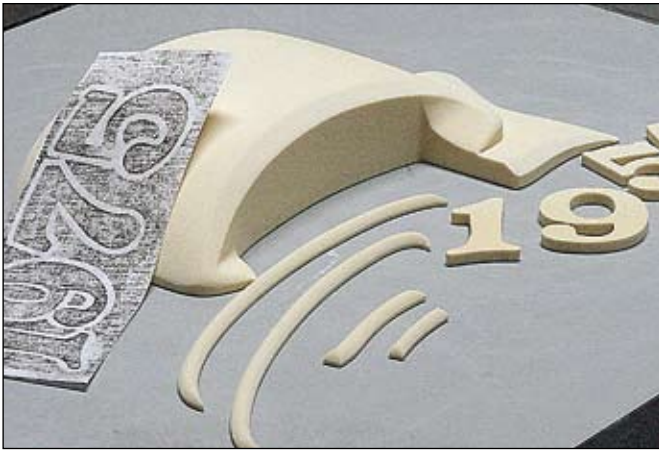
Once this was finished I softened the edges with a few quick passes. The folds in the banner were taken down using the edge of the sander and at this point I could finish the banners by merely sanding by hand until smooth.

The banner is very thin at the one end, but because it was designed to sit on a half-inch backing for support it will have plenty of strength.

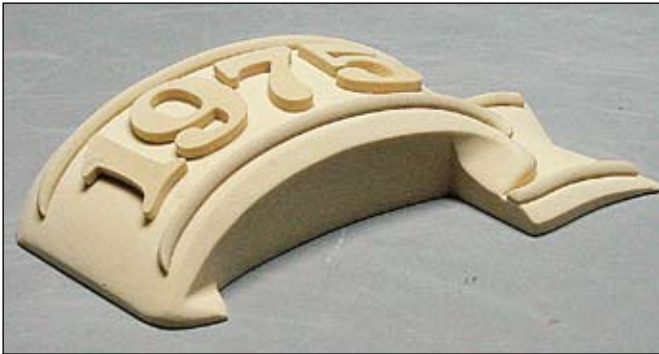
## DRESSING IT UP

Patterns were generated and positioned on the banners to ensure that the individual letters would end up where they belonged. Now all I had to do was attach the pieces to the rounded surface.

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A pattern is created to help with placement of the letters whereas the ribbing will simply follow the edge of the banner.



The finished extrusion can pass itself off as a casting or look like it was modeled using three-dimensional software.



The banners were primed and finished with acrylic paint. The ribbing was gilded with 23 1/2-karat gold leaf. Silicone is used to apply this permanent applique.



A close-up of the finished sign before installation shows the banner sitting within the elements rolling from the background and over the bamboo in a natural fashion as I had envisioned.



The cyanoacrylate glue and accelerator are shown here. Because of its watery consistency it's best to work your way across each piece slowly from one end to the other in a "tack weld" fashion.



I included this picture to illustrate the use of inlays that create the home for this banner. Notice how the bamboo border can now be formed to allow the banner to rise above into the foreground.

Cyanoacrylate is an instant drying glue when used with an accelerator and is a perfect solution with HDU when you need to work fast.

Normally I would apply the glue to one surface, accelerate the other, and press them together. But because the surface of the banners was rounded, I knew the glue would run and create a mess.

I had to position a letter, apply a drop of glue to the edge and accelerate to form a tack weld. Because the glue has a watery consistency, capillary action will draw it under the edge for a good bond.

Once tacked into position I could work my way across each letter very swiftly and with confidence (apply pressure, a drop of glue and accelerate).

## THE SKY'S THE LIMIT!

Once finished using this method the banners looked as if they were one extruded piece, as if they had been vacuum formed, cast or modeled with three-dimensional software.

Using this method should solve many design problems for me in the future. It shouldn't be limited to the banners as in this project. I can foresee leaves and vines, embellishments of all types hugging the gentle contours of future signs I might design and I hope I have sparked a creative path so that you too might give it a try!

*Until next time, thanks for listening.* 

*David and Robin McDonald own and operate Avila Sign & Design, a custom sign shop in Grover Beach, Calif. They may be found on the Internet at [www.avilasigndesign.com](http://www.avilasigndesign.com).*



These letters will make great samples in the showroom. They illustrate some of the techniques we can produce in the shop that are unique and have a little "pizzazz"!

## MAKING LETTERS WITH



BY DAVID MCDONALD



Today's technology and materials allow us to create unique letters for added profits.

**I**N THE SIGN WORLD today there are plenty of resources a sign maker has available when the need for architectural letters is called out for or required. Most of the choices are of a canned variety (meaning that they usually don't offer much personality nor do they have any regard for the architecture where they are to be installed). Through these wholesaler/retailers a letter style can be selected and a given size depicted and delivery of this common order is realized.

A well-designed roman letter style can be mounted on just about any fascia and look good. This has always proved itself over and over through the years of sign making.

But what if you want to offer a mounted letter that has a little more pizzazz?

### THINKING OUTSIDE OF THE BOX

With the technology we have available today it is possible to spec-out just about whatever you can dream up and when it comes to letters the same is true. We have routers available to us that can perform all kinds of profiles to a letter; we have various materials available now, like plastics and wood products, urethanes and a multitude of metals that are available in sheet form.

Although the traditional roman letter on the fascia is a classic, today we can *think out of the box*, if you will, and put some of the technology and materials available today to work for us. As an example, on a recent project to achieve the look that I wanted I created a set of letters that utilized acrylic sheet, urethane and Corian in combination — all cut on the router. I believe because the letters were of a different and unique nature they were well received by the client and I was able to realize an excellent profit as well!

### SAMPLES, THE ULTIMATE SALES TOOL!

I decided to make some sample letters for two reasons. One is that when my wife Robin is out seeing customers she will usually take along the couple of letter samples that we have lying around the shop from previous jobs. Sure enough the customer always wants us to make the same letters for them as well. I thought it was high time to make some samples based on ideas I have had but never found time to produce, figuring that if the client can see it they will buy it! The second reason was that I thought it would make for a good illustration for the readers of *Sign Business*.

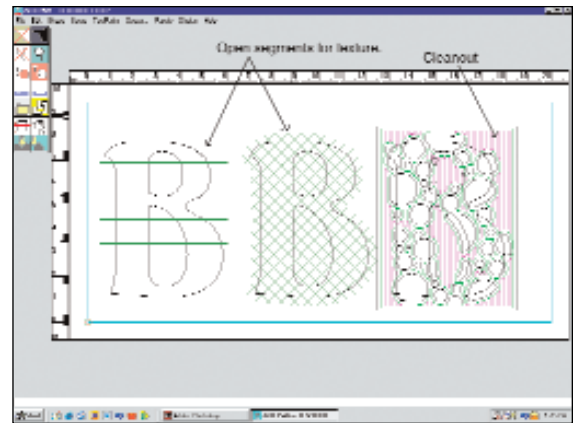
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Here is the finished rosette. I could have printed it darker for better contrast?



Using 15-lb. Sign Foam each "B" is cut out and receives a different edge profile. Using the inlay feature, four of the letters are assigned a cleanout path to remove the material.



The inlay textures were routed using the technique illustrated in this screen capture. The open segments allow the router to make the textures possible.



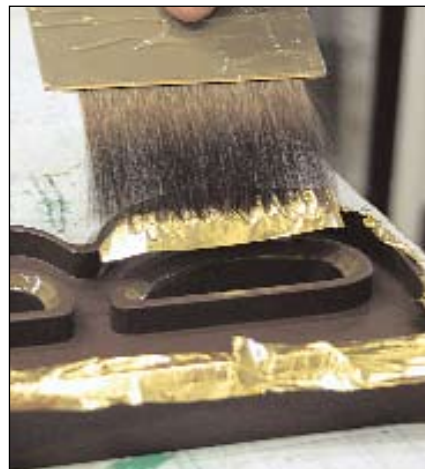
I included a box around the circles so as to run the clean-out necessary to create this style of texture or pattern.



The inlays are fitted to the corresponding letter. I used an inlay tolerance of .012 for this run and after primer and paint it was a tight squeeze.



Wunda size is used on the waffle texture prior to gilding with copper leaf. Here you see the copper after rubbing down with a foam brush.



Quick oil size is applied to the beveled edge profile of this letter. Here you see me using the gilders tip to lay the 23-karat gold leaf.



After priming, all of the letters were sprayed with acrylic paint. To create the speckled finish this letter was later sprayed with a light green and black mist. The engraved areas were then filled with epoxy resin. When cured the design was brushed with oil size and gilded with 23-karat gold leaf. Two copper bee-bees were glued into the center holes.

My intention here is to show you how, with a little pre-thought, you can create just about any texture imaginable with the use of a router table and various materials and do it with relative ease and speed. Of course if you don't have a table in house you could send your files to a wholesaler who would be glad to cut them for you. We have had sign makers send us files with just the basic letters along with the request to produce a texture as required. So if you're not equipped with a router you can still design and have your files cut to your specifications. It is always nice to have samples to show the client. It leaves less to their imagination.

#### GIVE ME A "B"

For this illustration I chose to cut five capital letter B's and to give each letter a unique texture or look, using simple techniques with the help of the Gerber router. Each letter will be assigned a different edge profile as well as a center texture. I will use sheet acrylic, Sign Foam, Sintra PVC (poly vinyl chloride), osmalto (smalt), gold leaf, aluminum leaf, copper leaf, epoxy resin and vinyl printed with the EDGE. Some letters might have a backing plate of acrylic to act as an outline or may have a contrasting foundation to which the letter might be installed.

One letter will be a simple prismatic letter backed with a cutout shape that is printed with a Victorian style rosette. This letter could be best served up as a short word like "boutique" rather than as a string of text where the legibility might be hindered. The letter that has the design cut onto the face could be simply painted with a contrasting color, but for this sample I elected to fill it with resin to later be gilded with 23-karat gold leaf.

We do a lot of dimensional signs incorporating glass smalts, although for the most part the application is done to the sign background. For one of the samples I chose to do a blended smalt technique to the center of a letter.

#### TEXTURES OF ALL KINDS

To cut designs into the face of a letter like the one with the copper bee-bees is a no-brainer. All you have to do is create a design that will allow a router bit to fit within and apply the design to the face of

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The profile for this letter was sized and gilded with aluminum leaf after which a transparent glaze was applied for a bright red outline.



The PVC (polyvinyl chloride) letter is routed with a prismatic profile and attached to an acrylic back. I printed a rosette on the Gerber EDGE and applied it to the acrylic. A letter this ornate would be best used as a short word such as "Boutique".



A simple letter employing a blended glass small center. First I paint in the matching colors and stipple them together to create the blend. The glass is sprinkled into the wet paint, carefully overlapping the colors.



(Above) A close-up of the router bits used to shape the textures. I placed each bit on to the texture that they created.



(Left) All of the "B"s are complete and ready to be assembled. It was at this point that I noticed that I neglected to mention the blue center. It was sprayed with a soft blend and then the raised circles were painted a darker shade. That one is monochromatic.

each letter. Send the letters to the router software, generate the router paths and cut the letters with the designs.

The textures for the centers could, in theory, be executed in the same fashion but because of the nature of the way a router bit cuts, the texture will not have a clean edge and therefore not be as eye appealing or believable. Instead, what I prefer to do is cut the letter and the center texture as two separate elements. The texture is treated as an inlay. There are two distinct advantages to this approach. The first is that the texture becomes optically trapped, meaning that the texture appears to stop at the edge of the letter where it should. The second reason is the ease at which you can paint and finish the center when it is separated from the letter.

As you can see, letters can be dressed up to add pizzazz to an otherwise traditional or standard typeface. The next time architectural letters are required for a project I hope that you can see clear to use your imagination to possibly offer your client some choices that just might set you apart from the rest!

*Until next time, thanks for listening.*

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