BUILT-UP MOLDINGS

It's not always necessary to invest in a large, expensive cutter to make moldings in the home shop. A few basic router bits and some planning do the trick.

By Ralph Bagnall

MOLDINGS ARE AN ESSENTIAL PART OF WOODWORKING. They provide visual interest, hide divisions and joints, and in some case even determine the style of a piece of furniture.

Professional shops often have many thousands of dollars tied up in router bits, shaper knives and molding cutters to produce a wide range of moldings. The typical home shop owner cannot hope to have such an array on hand, but the good news is that you don't really need to. A basic set of common router bits and a table saw can be used to create an almost unlimited number of complex molding designs. The secret is to maximize the cutters you already own and combine them to create the moldings you need. For this article, I used a basic set of inexpensive bits with a pretty simple shop-built router table. This is to stress the idea that even with a lightly equipped shop, you can create beautiful, complex moldings.

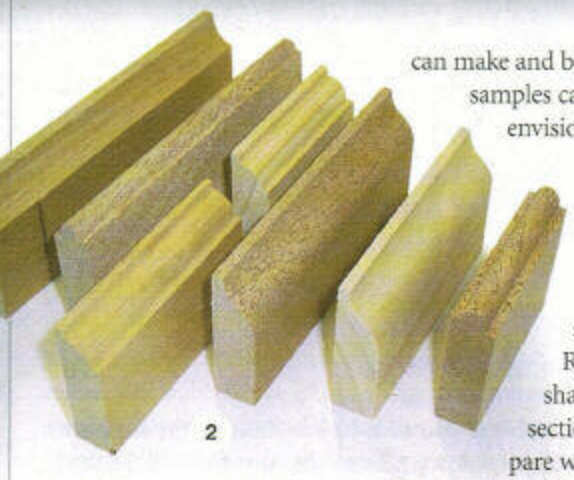
A careful look at crown molding profiles reveals a number of smaller profiles stacked along the bottom, then a larger cove, followed by another stack of small profiles on the top. Other large moldings may skip the central cove or substitute a reverse curve. By studying this arrangement and breaking it down into its basic components, you can see how highly complex profiles are created from simple shapes.

TAKE INVENTORY

The first step is to understand the tools available to you. Although most bits are designed to make a cut of a specific size and shape, almost any bit can be used to create more than one profile.

For example, a ¼"-radius roundover bit can be used to make a smooth curve when the lower cutting edge is set flush with the router base or table top (Fig. 1a). Adjust this height a little and you get a stepped roundover (Fig. 1b). Replace the bearing with a smaller one or remove the bearing and reset the router table fence and you get a stepped bead effect (Fig. 1c). You can get three usable profiles from one basic bit.

Since many profile cutters can produce a large number of different shapes, when teaching router techniques I encourage my students to save small pieces of the different profiles each bit



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can make and build a "library" of samples (Fig. 2). These samples can then be stacked together to help you envision new molding profiles.

By understanding how different bits can be used in tandem, you can not only create new profiles, but duplicate existing profiles. For example, I needed to re-create the complex newel cap shown in Fig. 3 for a home restoration. Rather than having a large and expensive shaper knife made to replicate this small section of molding, I made a template to compare with bits I had on hand. This enabled me to make the smaller pieces that could be stacked together to form the molding I needed (Figs. 4a & 4b).

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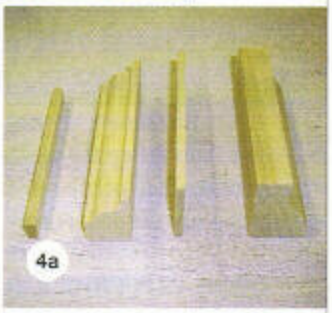

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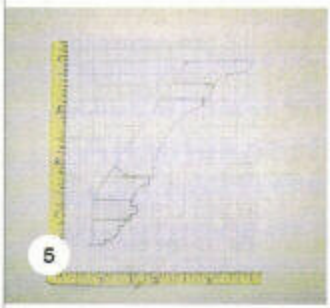
MAKE THE COMPONENTS

Now that you have the basic idea, let's go through the process step by step to create a sample crown molding.

First the height and depth of the molding need to be determined. These measurements can vary widely, and are mostly determined by our project needs. I chose a crown 3½" tall and 3¼" wide, and sketched out a concept using the shapes I know are in my bit box (Fig. 5). Now I can dig into my "library" of samples and find profiles that closely match the sketch.



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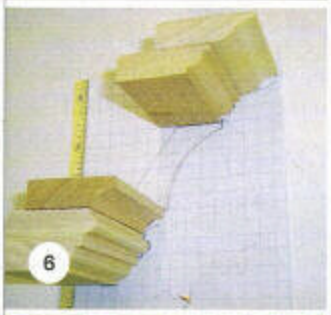
Here I've lined up the samples for the stack on top of the sketch (Fig. 6). I started with a stepped bead profile, followed by a true bead on top of it. A small cove transitions to the larger cove in the center. This is the time to make any changes from the sketch. Note that the original sketch shows a step between the first two profiles, but the stack shows the two aligned. Seeing the molding built up from the samples often leads to changes from the original concept.



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Next, I prefer to skip the cove section and create the top stack of parts. I prefer to cut coves on the table saw. As I'll explain, table saw coves can be made to a wide variety of sizes and radii. This versatility allows me to figure out the cove last so that it spans the gap between the top and bottom stacks, resulting in the desired size molding.

The top stack is a repeat of the beaded profile, capped with a reverse curve. Repeating elements on a complex molding is common and desirable. Also, if there were other moldings or profiles on our sample bookcase, having elements from those in the crown unifies the project.

Now that the stacks have been determined, prepare your stock and mill the pieces as individual moldings. Obviously, you'll need to prepare the same length of each piece in the stack. Be sure to leave your stock wide; the profiles will be ripped to the proper width and angle later. Use your original samples when setting up the router to ensure the same results, as in Fig. 7. I'm using a very basic bench top router table and a 1¼-hp router to demonstrate that these complex moldings can be created with common tools. For safety and accuracy, I've added a hold-down to keep the fairly small stock tight against the table.

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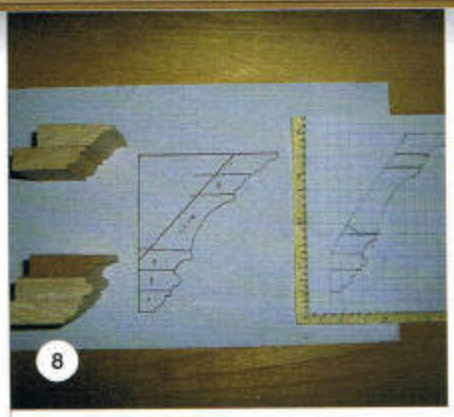
Properly set up, these moldings should require little if any sanding after milling. When done, set these parts aside until you're ready to assemble them.

Referring back to my sketch, I can now decide on the depth and the overall width of the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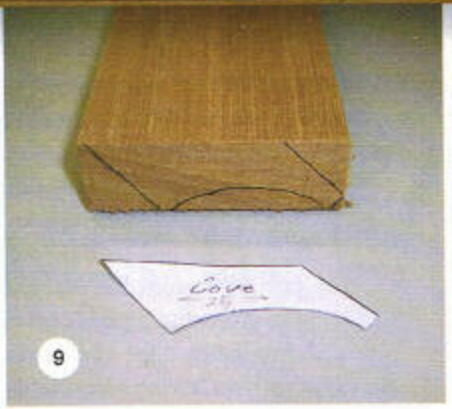

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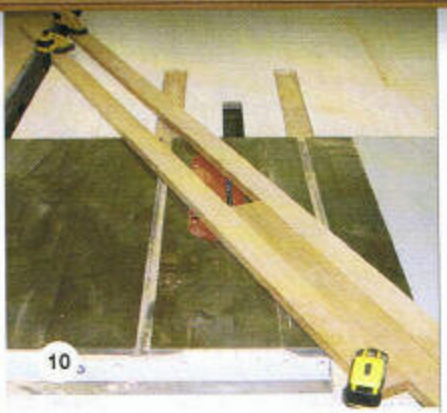
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cove, and set up the table saw. Fig. 8 shows a final tracing of the desired molding, and added a line showing the angle cuts needed on all of the moldings and how wide each should end up. Now it's possible to measure the cove and mill the stock to the size needed. Finally, I'll cut out the cove part of the drawing and trace it onto the end of the cove stock (Fig. 9).

COVE CUTTING

You can buy router bits to make coves, but each bit produces only one size of cove. Learning to cove cut on the table saw is an effective way to create a wide range of cove moldings, and is simply a matter of running the stock at an angle to the blade, taking very shallow cuts until the desired depth is reached.

Start with an auxiliary fence clamped to the table to guide the part. The closer the fence is set parallel with the blade, the narrower the cove. Angling the fence farther away from parallel creates a wider cove. A little experimentation will reveal the best angle for the cove you desire.

Cove cutting on the table saw looks scary, but done correctly it's quite safe and a very useful technique to master. Some people like to set the auxiliary fence in front of the blade because the cutting action will tend to keep the part against the fence. Others prefer to set the fence beyond the blade since the feed pressure will drive the part back toward the rear of the saw. I solve this dilemma by setting up a pair of auxiliary fences. By having guides on both sides of the part, I'm confident in both the safety and accuracy of the cut (Fig. 10).

At first, finding the correct angle for the cove you want is a matter of trial and error, but with experience, you'll be able to get close right from the start. Unplug the saw and raise the blade to the final height of the cove. Now you can sight across the blade and along the part to get the approximate angle. Drop the blade below the table and clamp the fences along the angle using the part to set the spacing between the two fences. Be careful to make sure that the blade will not contact the fences.

Raise the blade about 1/32" above the table and feed the part across it from front to back. Use push sticks or pads to keep fingers out of harm's way, and feed slowly to minimize saw marks that will need to be sanded out later. A square-top grind on the saw blade helps too. Make as many passes as needed to reach your layout lines, taking no more than 1/32" depth of cut each time (Fig. 11).


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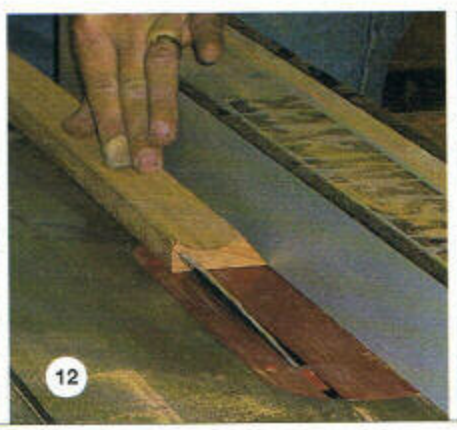
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Now that the cove is cut, its edges need to be cut to set it to the proper angle. Note that on my setup, the two ends have parallel angled cuts with a third at 90 degrees to a major cut. I set the table saw to the proper angle (50 degrees in this design) and cut the two major angles (Fig. 12).

The third angle ends at the cove and is quite small. To ensure a safe and accurate cut, I took the stock down on the jointer. Keeping the major angled face against the jointer's fence ensures a 90-degree angle between the two faces. While the 50-degree angle is still set on the table saw, I cut the profiles to the widths determined in my final sketch. The back edges are cut at the same angle used for the cove edges.

STACK 'EM UP

With all the parts complete, assemble the molding. Usually, I like to work from the center out, using glue, brads and lots of clamps (Fig. 13). With a bit of planning, each layer of the stack hides the brad holes from the next. I use a glue roller to spread a light, even coat of glue. This helps minimize squeeze-out and the cleanup it requires. Whenever possible I hammer brads into the parts, keeping the heads out so they can be removed after the glue dries.

After the glue has dried, if sanding is needed I prefer to use a flap sander mounted in my electric drill. Use 120-grit or finer and take light passes. Sharp corners and details look more professional.

It took some preparation and work, but the results are well worth the savings over buying expensive cutters. A stand-alone molding like this one can be set up and run fairly quickly once you know the steps. If I needed to match an existing profile, I would likely have to tweak the router setup quite a bit to match it, but again the results can be well worth the effort. The key to easing the process is to have the "library" of samples, allowing you to quickly choose the right profiles and setups.

Ralph Bagnall has been woodworking professionally for 20 years. Bagnall builds reproduction furniture in his home shop, and has been teaching and writing for the past several years. He has recently relocated from New Hampshire to the island of St. Croix, Virgin Islands, to pursue his woodworking in tropical sunshine.