

The Well Tempered Drill Press

by David P. Andersen



**"I don't need a drill press...
I can do everything with a cordless drill."**

Yes, and one can build furniture with a chain saw. The difference is precision. A drill press holds the cutting tool at a precise position, angle and depth.

The small-to-medium size benchtop drill press is ideal for model work. Choose one with at least 3 inches of clearance and a 1/2" chuck. Electronically variable speed is nice, but almost all model work can and should be done at a low speed, so speed adjustment with a belt and pulley shift is okay. A good example of a modeler's drill press is the Sears Craftsman 8-inch drill press. Modeling work is light duty. With oiling before each project, a quality drill press will last a lifetime.

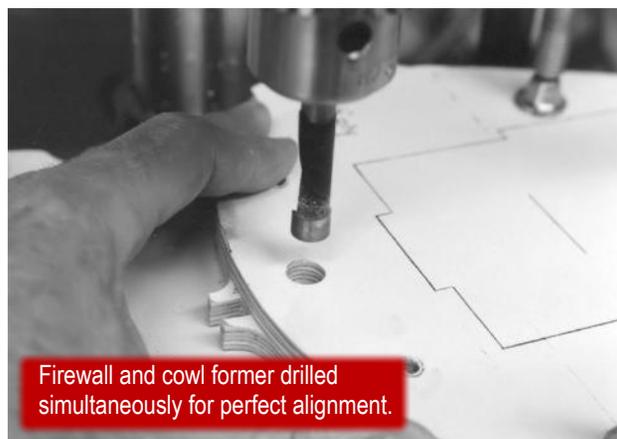
When shopping for a drill press, administer this test to each candidate. Close the jaws of the chuck and lower the chuck all the way down. Grab the jaws of the chuck and wiggle them back and forth, side to side and around in a circle. There should be no play. If there is, the play will cause uneven holes and inaccurate cutting. You will be surprised to find that there is little relationship between the slop in the chuck and the price of the drill press. Choose the model with the least amount of play.



Most drill presses have a depth gage and adjustable stops. These tend to be inaccurate and difficult to use. Instead, wrap a piece of masking tape around the drill to indicate the desired depth of cut. A wheel collar works well too.

To position a hole precisely, drill a small pilot hole first. Lower the larger drill bit into the pilot hole and center it by feel in the pilot hole before turning on the motor.

When cutting deep holes, allow the waste material to exit the hole by backing the drill out of the hole occasionally. This speeds cutting and prevents binding.

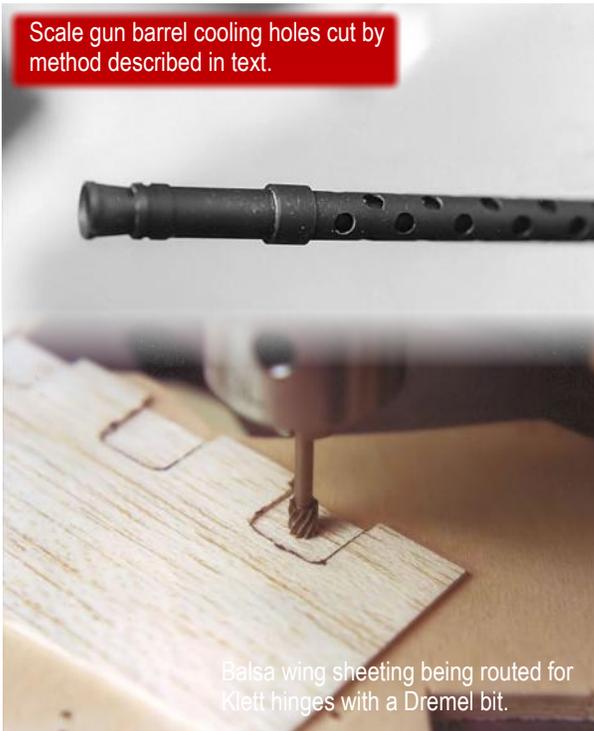


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Scale gun barrel cooling holes cut by method described in text.



Balsa wing sheeting being routed for Klett hinges with a Dremel bit.

Cutting oil can be used when drilling metal. It cools the drill and prevents galling (material sticking in the grooves of the drill). Aluminum tends to gall especially easily. For model work, any light motor oil will serve as cutting oil.

Keep a scrap sheet of plywood on the table of the drill press to serve as a backing. It prevents splintering when the drill exits the back side of the piece. The result will be a sharper edge.

Cutting soft balsa requires special care. Balsa tends to be torn rather than cut by an ordinary twist drill. Here are some tricks to cut clean holes in balsa.

- 1.) Drill a pilot hole and enlarge it to the desired size with a round file. Better yet...
- 2.) Sharpen the inside edge of a brass tube with an X-Acto blade. Chuck the tube in the drill press and cut slowly. A backing plate of ply must be used. Push until the backing plate is felt. There will be a plug of balsa inside the tube that must be cleared out after each hole is drilled. Better yet...

- 3.) Use a Forstner bit. It is a tube-like drill that cuts a clean edge, but it does not cut very fast. Raise the drill every 1/8-inch or so to allow the waste to clear.

Sometimes, holes in two pieces of wood must be exactly aligned, such as screw holes in a cowl former and the firewall. Align and clamp the two pieces together before assembly and drill both holes simultaneously.

A drill press can be used as a router. Chuck a standard router bit or a Dremel router bit in the drill press. Adjust the height of the table so that the bit is at the desired depth when the chuck is fully raised. Try it on scrap material and adjust either the height of the table or the position of the bit in the chuck until the depth is perfect. About 1/32" is just right for recessing Klett hinges.



Drum sander cleans up the edges of a wing rib.

A drill press can be used as a sanding machine. Chuck a drum sander in the drill press. Use a backing plate that has a hole larger than the diameter of the drum sander. Cut a part slightly oversized on your scroll saw, then sand to exact shape with the drum sander. The patterns printed in many plans tend to have wide lines so that they will print well when reduced to magazine page size. To be precise, sand away half of the line. A disk sander works better, but a drill press can sand concave curves.



Forstner bit cuts a clean hole in balsa.

A drill press can be used as a tap wrench. To tap thin metal (tricky to do by hand), clamp the work to the table and drill a pilot hole. Then chuck the tap. With the motor off and no backing plate, lower the tap with one hand. Hold steady but gentle pressure while turning the tap with the other hand.

A drill press can be used as a small lathe. Screw a nut and bolt or wood screw into the work to be turned. Cut off the head and chuck the shaft in the drill press. Rest a chisel on a block of wood and cut like a vertical lathe. Smooth the result with sandpaper.

When cutting holes in plastic, cut slowly, lifting the drill frequently so that the plastic remains cool. A sharp drill is required so that it cuts, not scrapes.

Drill bits tend to wander when starting a hole in metal. To prevent this and to center the hole perfectly, punch an indentation in the metal with a sharp awl or sharpened nail. The drill will then start at the indentation.

To drill a series of holes in a straight line or following a curved line, clamp a ruler or other backstop to the drill press table. Hold the work against the back stop while drilling. The holes will then be all the same distance from the edge of the work.



Drilling holes in tubing requires a special procedure. The tube must be clamped so that it will not roll. There are special clamps for this purpose or you can make your own. To hold without squeezing, cut the head off a hex-head bolt, leaving a little bit of shaft, and glue it into one end of the tube. This will keep the tube from rolling. Make a jig of two parallel strips of wood separated by the diameter of the tube, clamped to the drill press table. Place the tube in the jig. Cut off the bolt head when done.



Without a pilot hole, the point of the drill bit will try to roll off the tube. First, file a tiny flat spot on the tube. Then drill a small pilot hole. A Dremel pointed burring bit is excellent for this purpose; it may not even need the flat spot. Move the jig as needed to center the pilot hole. Now drill the final hole. De-burr with an X-Acto blade or a file. You can make a scale gun barrel with its rows of cooling holes with this method-slide the tube in the jig and rotate to the next face of the bolt head to drill uniform rows of holes.

Enlarging wooden prop holes with ordinary drill bits is not recommended unless the prop can be firmly centered and clamped in place. Free-hand cutting tends to wander the hole off center, resulting in a prop that cannot be balanced. It is better to use a reamer.

Industrial applications use laser drill presses. When set to low intensity, a light spot shows where the hole will be centered. And they cut sharp edges even in very soft materials. They can even cut square holes and double as a scroll saw. Someday we modelers will have them too. Won't that be fun!

References:

The Art of the Scroll Saw, R/C Modeler, August 2002

Arado 96B construction article, R/C Modeler, May & June, 2002

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