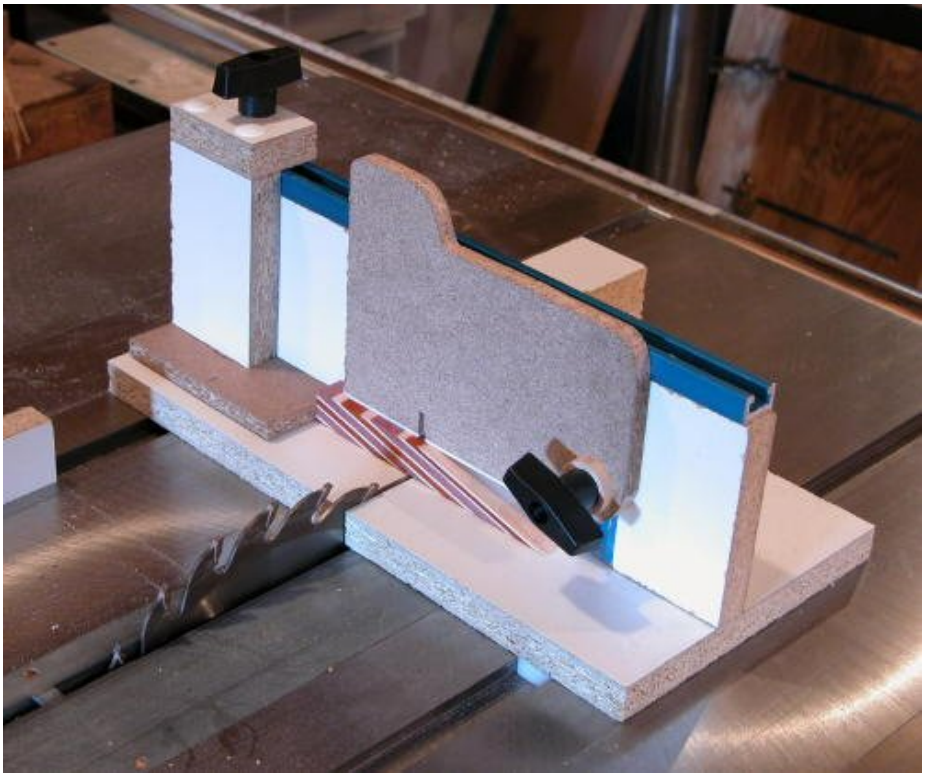
Pen Sled

by David Reed Smith



Introduction

Making your own pen center bands, or making segmented pens, can open up a lot of creative territory to explore. However cutting small parts on the table saw can put your fingers in harm's way. A band saw is safer, but doesn't cut as precisely or leave anywhere near a glue ready surface. This article describes a dedicated Pen Sled with a hold down that holds the stock securely, even for small segments, and keeps your fingers well away from the blade.

The body is just a small scale sled. But there are two additions that make it great to use on small pen parts. The hold-down pivots from an adjustable height. The Adjustable stop has a "foot" that doesn't interfere with the hold down.

Construction

Base

I have a considerable amount ¾" melamine lying about right now because of the "shelving incident", a major violation of the "measure twice, cut once" rule. So I used it to build this sled, but any stable sheet good would do as well. All the dimensions I used are arbitrary; please feel free to change almost anything as long as you leave the hold-down long enough to work and keep your hands away from the blade, and a long enough foot to get under the hold-down.

I started by cutting a 7” by 14” piece of melamine for the base. I laid it down on the table saw, centered on the blade, and marked about where the miter-gauge slots were. I cut two 7” pieces of 3/8 x ¾ UHMW for runners, then drilled and countersunk two holes for attaching them. You can use wood (or aluminum) but UHMW works nicer. I drew a line perpendicular to the back edge on the bottom of the base where I wanted it to ride in the miter-gauge slot. I attached one of the UHMW runners. Then I put a thin piece of cardboard (about 1/16”) in the other miter-gauge slot, and put the other runner on top of that. I put a couple of drops of CA glue on the UHMW runner, then set the sled down on it. This is an easy way to get the spacing right. I gave the glue a few minutes to cure, then screwed the runner to the base. Then I put the base on the saw and cut about two thirds of the way through the sled to give myself a line to mount the fence perpendicular to.

Fence

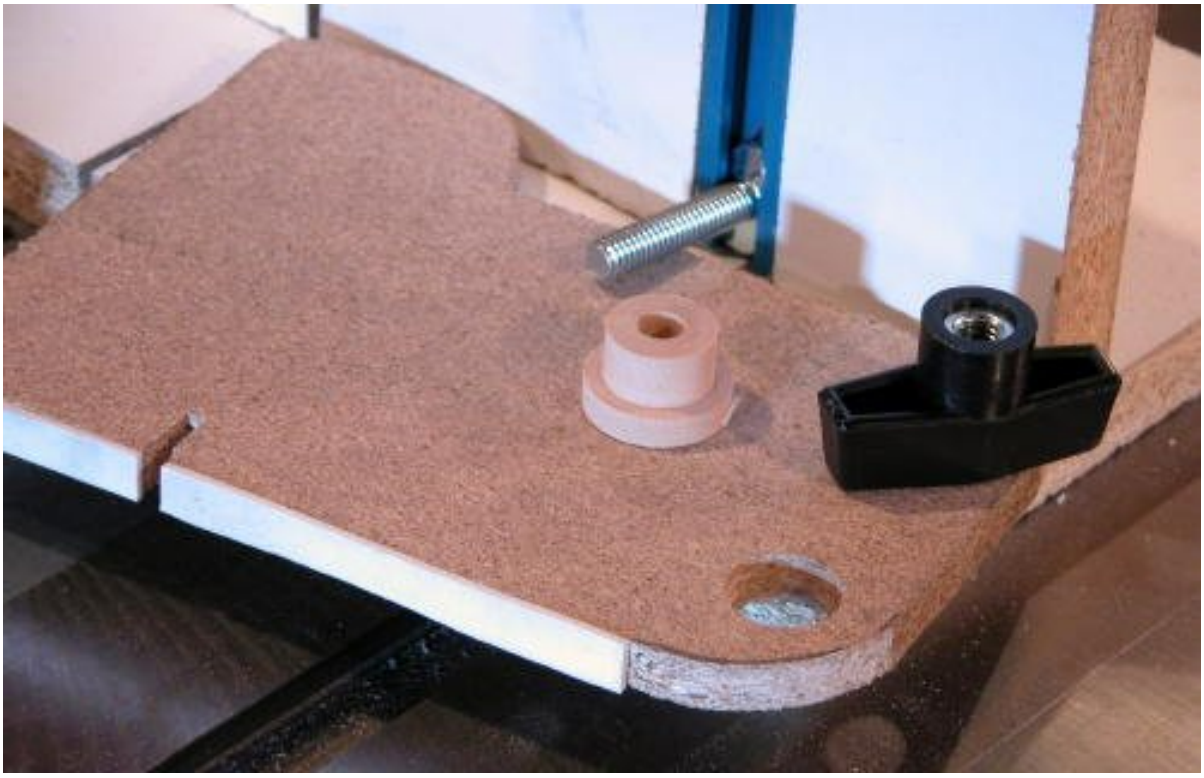
I started making the fence by cutting a 4 by 14 piece melamine. I cut a dado big enough for the aluminum track (¾” x ½”) 2 ¼ inches from the left hand end. Next I cut two pieces of track, one 4” long for the height adjustment, and one 14” long for the adjustable stop. I had to drill and countersink extra mounting holes. I used flat head machine screws and nuts to mount the height adjusting track, but I could just as easily have added a scrap of melamine to give some thickness for the threads to gain purchase. I used 1” wood screws to mount the track on top. You’ll be much happier with the results if you drill pilot holes for the screws.

To mount the fence I started by drawing a line perpendicular to the saw cut, 2 ¼ inches from the front edge. I put a T-bolt in the height adjustment track, lined the fence up with the line and temporarily clamped the fence to the base. Then I mounted one end of the fence with a screw (McFeeley’s has a really wonderful kit for joining sheet goods, I suggest you try it). I removed the clamps and checked to make sure the fence was perpendicular to the blade slot. After making any adjustments, I reclamped the free end and mounted it with another screw.

I added some blocks on the back to cover the saw blade. I just cut four blocks 2 inches by 4 inches, then glued them in place with a few drops of CA glue, clamped them temporarily, then screwed them in place from the bottom. The melamine is a trifle thicker than ¾ inch, just enough to jam into a miter slot. Keep a small piece to put in a miter slot to keep from exposing the blade on the back side.

Hold-down

I made the hold down from 3/8 inch particle board, about 7 by 5 inches. I drilled a ¾ inch hole centered ¾ inch from the left side and 1 inch from the bottom. Cut all but the rightmost two inches down an inch on top. Round the top and left bottom corners. Make sure when placing the hole that you don’t build a cam clamp that will keep you from cutting from long squares. I used the hold down to trace its thickness on some self-stick play foam, and then cut the strip out and stuck it to the bottom.



There are probably twenty ways to turn the hold-down bushing. I've made two, and made them both differently. However you make it is fine; but one of the ways I did it is to mount a piece of scrap maple in my collet chuck. I roughed it to round, then drilled a 5/16 inch through hole. I cut the end down to just under ¾ inch diameter, a little longer than 3/8 inch. I tested to make sure the hold-down could pivot on it, and that it was a little bit longer than the thickness of the hold-down. Then I cut it off, leaving a shoulder about ¼ inch long.

To mount the hold-down, put the bushing in the hole, with the shoulder on the front side. Thread through the 5/16 inch bolt and screw on the knob.

Adjustable Stop

To make the adjustable stop I first cut a piece of melamine 2 ½ inches wide as long as the height of the top of the track above the base minus the thickness of the particle board foot (~ 4 inches). I cut another piece of melamine 2 ½ inches wide by 1 ½ inches long for the top of the stop. I cut a foot of 3/8 inch particle board 2 inches wide by 4 ½ inches long. I screwed the foot to one end of the stop and the top to the other. Last I drilled a 5/16 inch hole lined up with the center of the fence track and mounted it to the fence with a T-bolt and knob.

Use

To use the Pen Sled, first set the Adjustable Stop for the length of cut. If you always use the same blade you'll be able to measure from the slot cut by it in the base. Set a piece of the stock you'll be cutting up against the fence, loosen the height adjustment knob, and set the hold-down against the stock. Then tighten the knob. The foam will automatically

adjust for any minor bumps and variations in stock size. Pivot the right side of the hold-down up and slide the stock into position. Then lower the hold-down, holding it in place by the tab. Advance the sled through the blade until the stock is cut, then return it to the original position. Pivot the hold-down up and remove the stock. Repeat and reset as needed.

Sources

Item	Source
¾” sheet goods	Any home improvement store
3/8” sheet goods	Any home improvement store
Knob and track set	Rockler # 24672, www.rockler.com
Connecting Screw Starter Set	McFeely’s # 7050-CSP-A, www.McFeelys.com
Self-Stick Play Foam	Wal-Mart craft section