

Crosscut Sleds for Joinery

Quick to make and easy to store, these sleds are a must for every shop

BY MICHAEL PEKOVICH



DOVETAILS

A SLED FOR EVERY JOB

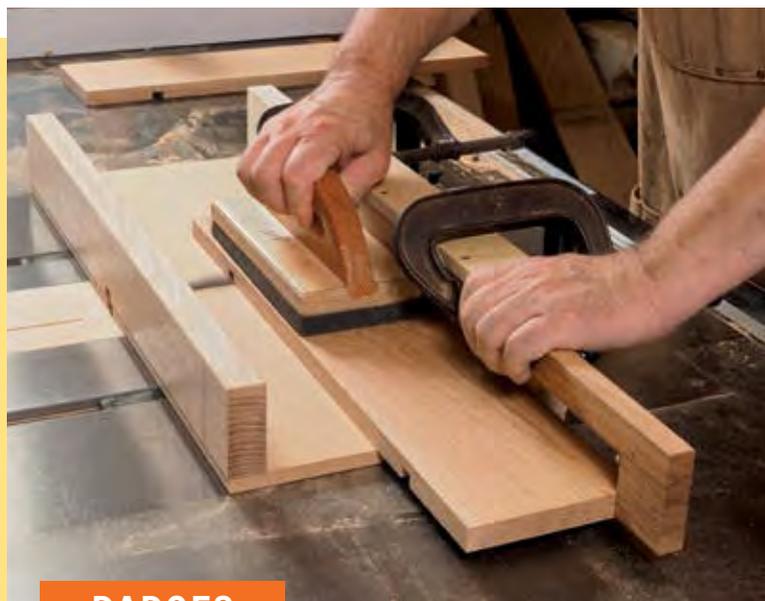
Put away your crosscut sled and turn your tablesaw into a precision joint-making machine with these single-task sleds. From dovetails to tenons and miters to box joints, these simple sleds combine to handle essential tablesaw joinery. Small and easy to make, they store out of the way until you need them.

I've always considered making a crosscut sled a big undertaking. I worked hard to get mine as accurate as possible and then I tried to hang onto it as long as I could. My current go-to sled has been around for a couple of years now and the surface and fence have been patched up a number of times due to the odd dado or miter that I needed to cut.

However, when I began to travel more to teach, I would often put together a quick sled from scraps and use a pair of miter gauges as runners. The miter gauges allowed me to fit the sled to saws with varying miter slot spacings, but they also did away with the fussy chore of mounting runners. Of course once I had them around the shop, I tended to use them quite a bit.

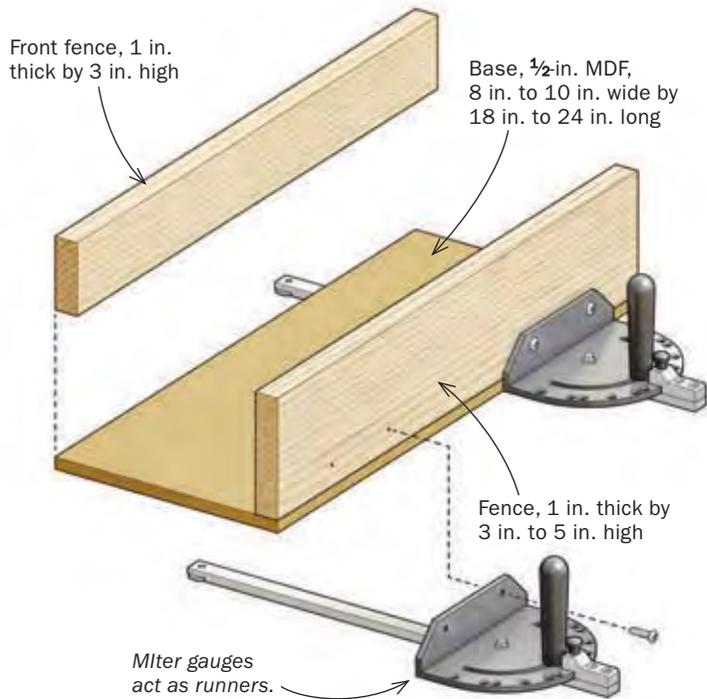
While my everyday sled is still great for crosscuts, I use the others for specific joinery jobs—such as cutting dados, miters, tenons, or dovetails—those that require a wider blade or one tilted at an angle. Luckily, these tasks don't require big sleds, so it's easy to keep a number of them stacked in a corner and ready to go when I need one.

Michael Pekovich is Fine Woodworking's editor and creative director.



DADOES

Size the sled to the task



No runners needed. Glue and screw the fences to the base, making sure to keep the screws well clear of the blade area. Instead of adding runners, attach a pair of miter gauges to the rear fence.



For jobs where the stock is positioned vertically, such as dovetailing, tenoning, and cutting box joints, the depth of the sled can be minimal, but a higher fence will serve you well. Conversely, a sled for dadoes may need to be deeper depending on the width of your workpieces. The sled for mitered boxes is wider in order to support the offcut.

For the base, I use $\frac{1}{2}$ -in.-thick MDF or Baltic-birch plywood. A stable hardwood is nice for the fences, and I often glue up

scraps to make them. I glue and screw the fence to the base, keeping the fasteners clear of the cutting area.

For most of my joinery sleds, I screw the miter gauges directly to the fence. On my box-mitering sled they bolt to a T-track, which I'll explain later. Either way, if you check to make sure that the miter gauges are square to the blade, once you attach them to the sled, it should be square as well.



BOX JOINTS



TENONS



MITERED BOXES

Dado sled: Add stops for accuracy

For dados in large projects, I'd need a larger sled, or I might skip the tablesaw altogether and break out a router. But for smaller wall shelves and cabinets, this 10-in. by 24-in. sled with a 3-in.-high fence can handle the job just fine. Typically, I clamp a stop block along the fence and register the end of the workpiece against it when dadoing, but for stock that's longer

than the sled, I use a hook stop instead. A hook stop consists of a long arm with a stop screwed to one end. By clamping the arm to the crosscut sled fence I can set the stop beyond the length of the sled. To help keep the hook stop level, screw a cleat to the top edge of the arm. The cleat rests on the top of the fence and keeps the stop level when clamping.

A simple stop for repeatable cuts. A cleat screwed to the top of the stop rides along the fence and helps to keep the stop square when clamping. It also elevates the bottom of the stop off of the base of the sled, preventing sawdust from getting trapped between the stop and the workpiece.



Extend your reach with a hook stop. This stop is a great way to handle stock that's longer than the sled base. A cleat along the top keeps the hook stop level and makes positioning and clamping easier.



A tall fence for tenons



I typically use a tenoning jig or dado blade for single tenons where the tenon is parallel to the face of the part. But double tenons that are perpendicular to the face of the board can be trickier

to cut that way, and a dedicated crosscut sled can make the job much easier. The sled doesn't need to be very deep, but a tall fence will help you secure the work more easily. This sled is 9 in. deep by 18 in. wide with a 5-in.-tall fence. I clamp a tall stop to the fence for the edge of the stock to rest against. The stop is the same height as the fence and long enough to provide room for a pair of clamps.

To hold the workpiece in place, I use a notched hold-down made from MDF with a strip of sandpaper glued to the notch to keep the workpiece from shifting.



Hold it steady. A hold-down secures the part for accurate tenons. A notch in the hold-down helps to keep the part snug in place. Angle the face of the notch so that it is parallel to the stock when its opposite end is placed against the fence. Sandpaper glued to the notch adds extra insurance against shifting during the cut.



Support for long stock. A tall fence and stop make tenoning safe and easy. For tenons perpendicular to the face of a board, a sled can be a better choice than a tenoning jig.



A sliding fence for box joints



The key to accurate box joints is using an indexing pin that each successive kerf fits onto. The pin must be accurately positioned in relation to the blade, and you have to make small adjustments to dial in a perfect fit. The best way to do this is to glue the pin into a notch in a piece of MDF and clamp the MDF to the crosscut sled's fence. By loosening the clamps slightly and tapping the MDF one way or the other, you can quickly work toward a perfect fit. I use my tenoning sled for this job.

The pin must be the exact width of the kerf but this is easy to do. Cut a notch in the MDF using the same blade you'll use to cut the box joints, and trim a piece of stock to fit the notch. Cut a short length off one end and glue it into the notch. To position the auxiliary fence, place the remaining length of the pin stock against the blade and slide the fence over until the pin is snug against it. This should get you close, but you'll need to make a test joint to verify the placement. Make a series of fingers on the ends of a pair of boards by cutting a notch near the edge of the board, then slipping that notch onto the pin and repeating the cut. Any error in alignment will be multiplied by the number of fingers in the joint, so any minor adjustment will have a big effect on the fit. If the pins are too narrow, move the indexing pin away from the blade. If the pins are too wide, move the indexing pin toward the blade.



Add an indexing pin. Cut a notch in the sliding fence and size a strip of wood to fit it. Cut off an end and glue it into the notch by adding a drop of cyanoacrylate (CA) glue. The height of the pin should be lower than the box-joint notches you'll be cutting so that the parts sit flat on the sled base.



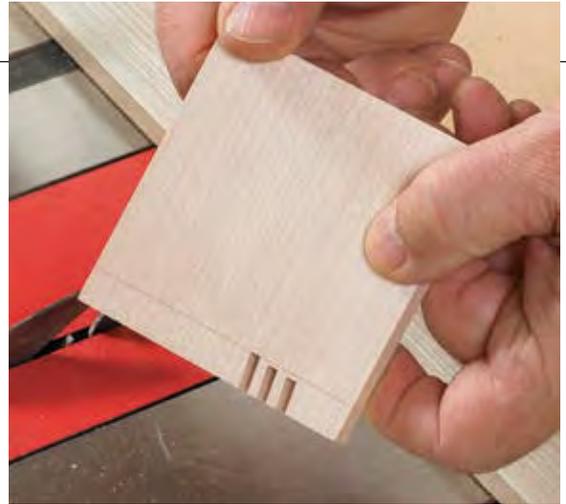
Position the fence. Use the extra length of pin stock to set the distance from the pin to the blade. Start with the stock against the pin for the first cut. Then position the notch over the pin for the remaining cuts.



Dovetails on the tablesaw

When dovetailing a lot of parts, I speed the process by cutting the tails at the tablesaw using a blade ground especially for the job and a small 8-in. by 18-in. crosscut sled equipped with a 5-in.-high fence. On my blade, each tooth is ground 8° in the same direction so that when I tilt the blade to that same angle, the teeth will cut a flat-bottomed groove with angled side walls.

The boards stand on end, so the tall fence helps to keep them steady during the cut. To dial in the height of the blade, scribe a shoulder line on a piece of scrap. Starting with the blade lower than the shoulder, make test cuts, raising the blade between each one until it just hits the line. Rather than marking the tails on every board, I'll mark centerlines for the pin sockets on just one board. Slide the board over until one of the marks is centered on the kerf in the sled, and make a mark on the sled base at the edge of the workpiece. Repeat the process for the remaining sockets. The end marks on the sled provide a road map for cutting the rest of the parts.



Sneak up on the line. Scribe a shoulder line on a test piece, tilt the blade to the correct angle, and slowly raise the blade until it hits the mark.

Layout is quick.

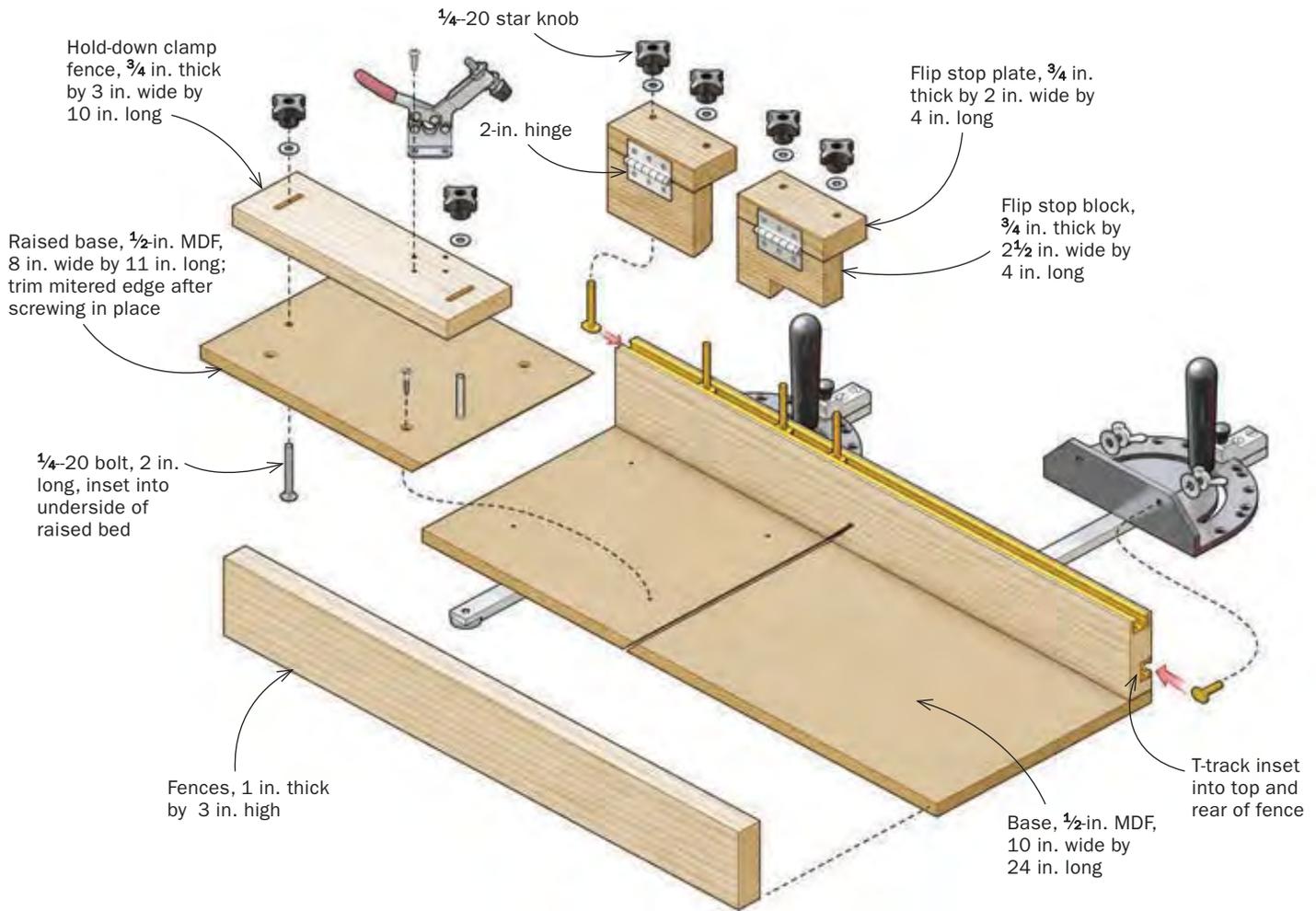
Rather than drawing all of the tails, all you need is a mark at the center of the pin socket. To cut the tails, align each mark with the center of the blade kerf in the sled and make a cut.



Complete the tails. The first pass will cut half of the tail sides. To cut the remaining sides, rotate the stock and align each kerf in the stock with the kerf in the sled.



A dedicated sled for mitered boxes



A mitered box is a simple thing to make, yet a lot can go wrong if you don't take the time to set up properly. I've fine-tuned my approach over years of teaching, and I have an efficient and accurate way to go about it. At the heart is my miter sled. It secures the stock safely and has a pair of stops that allow me to cut all four sides of a rectangular box without changing the setup. Building it required just a handful of inexpensive hardware.

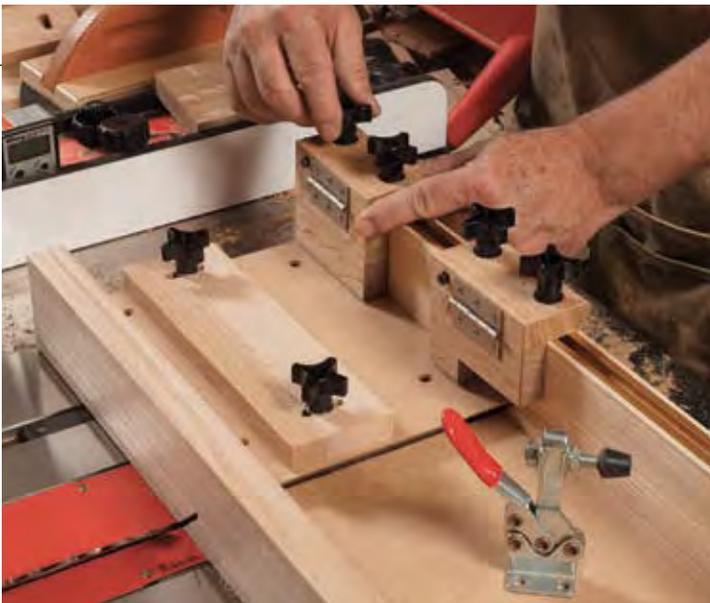
The sled doesn't have to be very deep, but it should be wide enough to support the stock through the cut. I bolt the miter gauges to a T-track in the back of the fence instead of screwing them in place, which allows me to slide the fence sideways for a fresh zero-clearance cut after the kerf has been widened with use. This helps minimize chipout when mitering the box parts. There's also a T-track along the top of the fence that makes adjusting the stops easy. To mount the T-track, run continuous grooves along the top edge and back of the fence. Inset a full-length piece of T-track on the top, but on the back use a pair of shorter tracks, staying clear of the blade area.



Sliding sled. Twin miter gauges bolt to T-tracks inset into the rear of the fence. This allows the sled to be adjusted side to side in order to create a fresh zero-clearance kerf to prevent chipout.



A raised bed. An important feature of the sled is a raised base to one side of the blade. Screw down a piece of ply or MDF that overlaps the kerf, then trim it flush.



Adjustable stops and hold down. A pair of hinged stops attach to the T-track on top of the fence with bolts and star knobs, and allow you to cut box sides of different lengths. The hold-down clamp is screwed to a slotted fence that is bolted to the base.

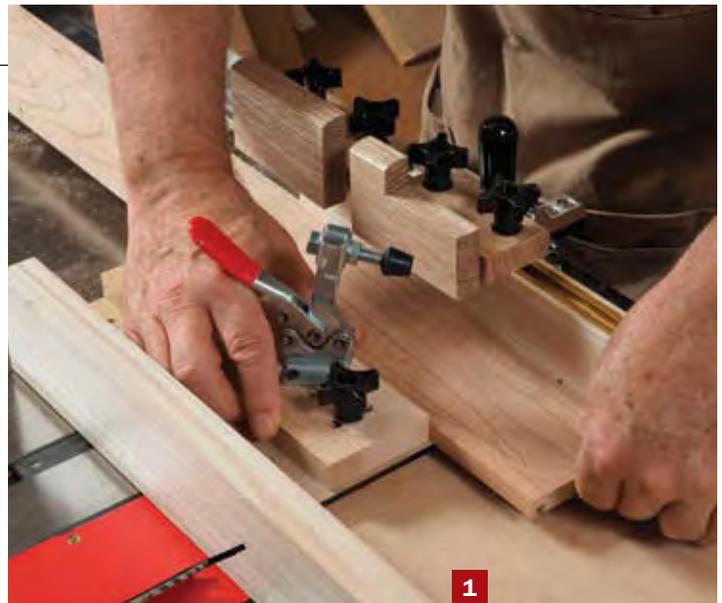
An important feature of the sled is its split-level base: I screw a piece of MDF to one side of the base to elevate it above the other. This allows the offcut to drop away from the blade when cutting a miter instead of being trapped beneath it. My saw tilts left, so I mount the piece of MDF to the right of the blade.

Once the sled is mounted to the miter gauges, tilt the blade to 45°, raise it slightly above the base, and make a cut. Next mount the raised base, which should be sized to cover half the sled base and extend slightly beyond the kerf. Before screwing it in place, drill holes for the bolts that secure the clamping fence, counterboring them on the underside to recess the bolt heads. Next raise the blade to trim the raised base flush with the kerf.

Each of the stop blocks consists of two blocks of wood that are hinged together. The top piece is drilled for bolts that mount to the T-track. The swinging portion of the stop is beveled on the bottom inside corner to allow clearance when lifting it.

I add a hold-down clamp to secure the parts and keep fingers away from the blade. The clamp is screwed to the adjustable fence that is bolted to the raised base through slotted holes. This lets the sled accept stock of varying widths. To set the fence, slide the fence snug to the workpiece and tighten the star knobs.

To make a mitered box, start with a length of stock that can yield all four sides. Lift both stops and slide the stock in place with one end just past the kerf in the fence. Snug up the clamp fence, tighten the hold down, and miter the end. Rotate the stock, lifting the near stop to allow the newly cut miter to contact the far stop, and make a cut. Rotate the offcut stock, trim a clean miter on the end and repeat, alternating between the near and far stops.



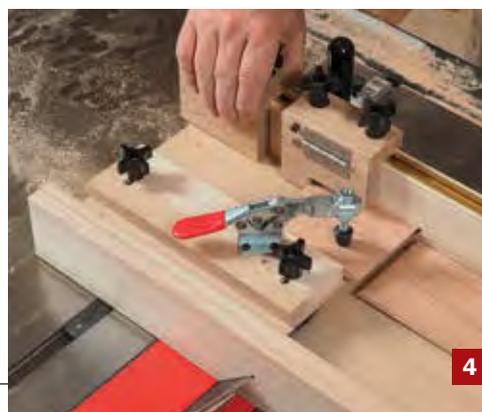
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A quick, accurate mitered box. Start with stock long enough to yield all four sides of the box. Slide it in place and adjust the hold-down fence snug to it to prevent the box parts from pivoting during the cut (1). Clamp the stock down and cut a miter on one end (2). Then rotate the stock and place the mitered end against the far stop to complete the box side (3). Repeat the process using the near stop to cut a short end of the box (4). Alternating between long and short pieces will result in continuous grain on all sides of the box.