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Make your own long-grain shooting board

Aaron Moore shows you how to make a long-grain shooting board for your workshop



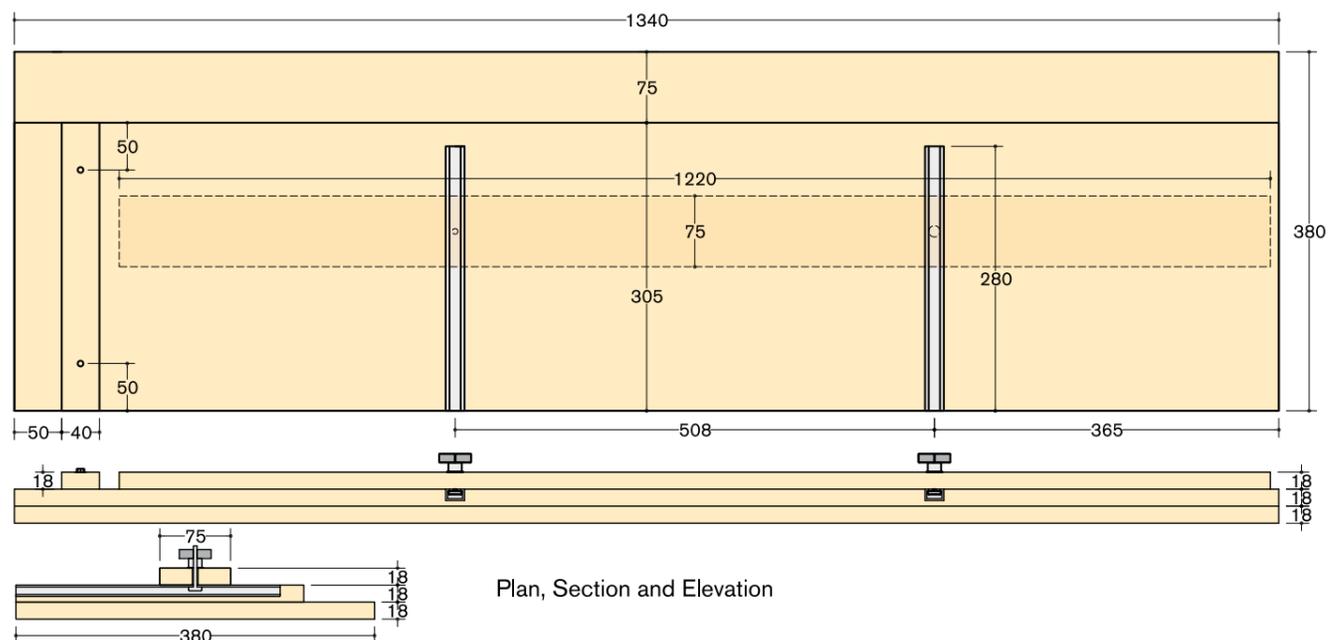
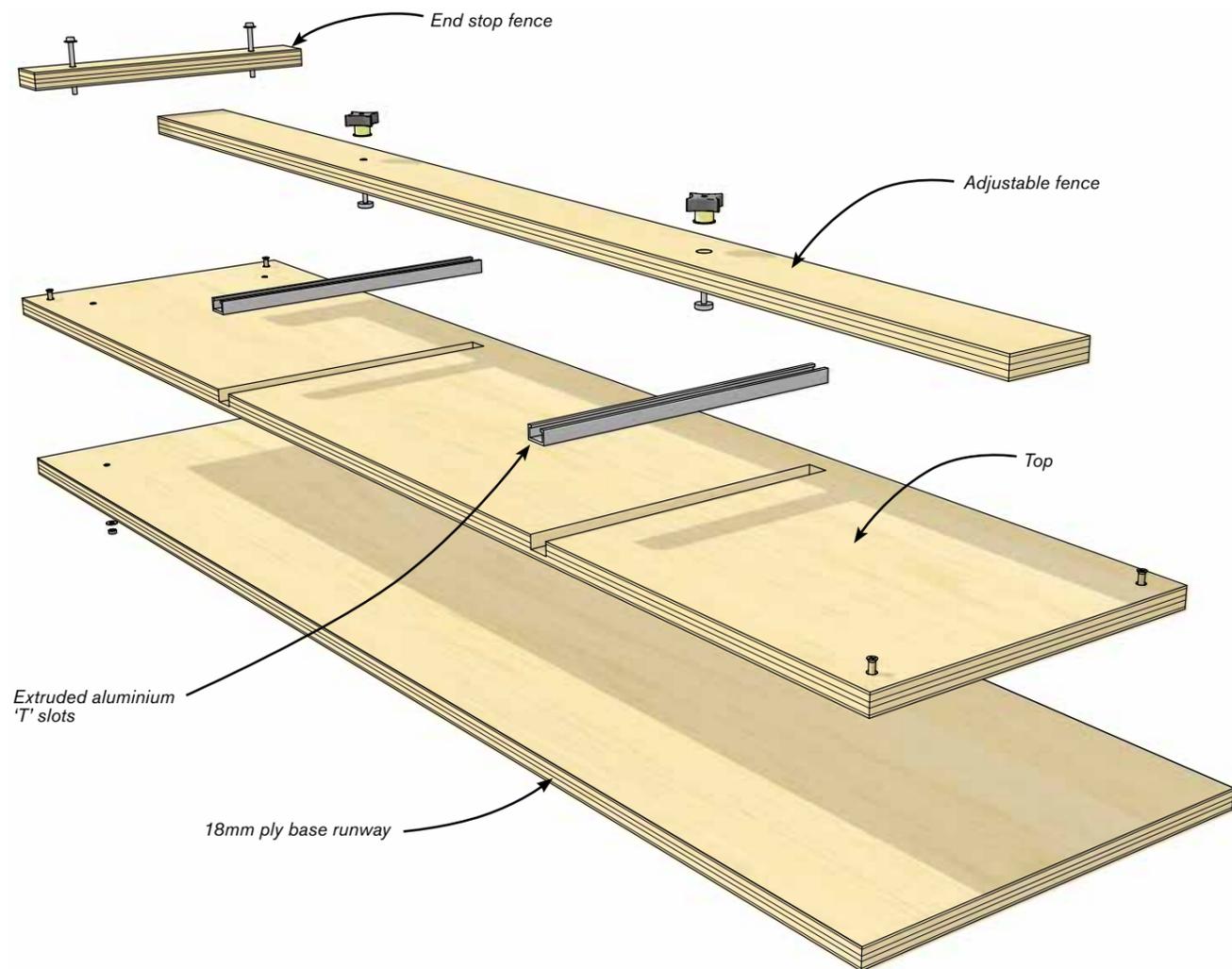
PHOTOGRAPHS BY AARON MOORE

Like most hand tool woodworkers, I've been a long-time fan of end grain shooting boards. These simple devices square up the ends of a board relative to a reference face and edge, prevent blow-out at the end of the cut and enable precise control over the final length of a board. It's been my experience, however, that long-grain shooting boards are far less popular

and, in my opinion, far less useful. After all, there is no risk of blow-out when planing long grain and while it is possible to shoot straight and square edges on a long-grain board there is no guarantee that those opposing edges are parallel to each other. It is often preferable to simply throw the board in a vice and plane down to a gauge line. Then I started making winding sticks

in quantity for my hand tool business and it challenged my edge planing needs. I began to evaluate how I could plane edges more accurately and efficiently, which led to the construction of a – rather large – long-grain shooting board, which I will show you how to make here. It only takes a few hours to build and I have found it to be extremely useful in my tool and furniture making alike.

In detail



Primary uses



Use a square to set the fence to the desired final width



After shooting, all four boards are the exact same width. Perfect for drawers, boxes and so much more

The primary feature that makes this shooter so useful is the fence. With the fence removed you have a standard long-grain shooting board and it can be used as such, but set the fence to position and exact widths, tapers or even subtle bevels can be created with ease. Better still, each piece that gets shot will be an identical match and that's without spending all kinds of time drawing the same layout lines over and over again on every board.

Making a Shaker-style end table

Take a classic Shaker-style end table, for example, with a single drawer and four legs each tapered on two faces. The drawer would typically require a front and two sides

that all need to be the same width for the drawer to function properly. The back panel is generally narrower than the sides and front panel so the drawer bottom can slide in below it. This can also be made to a consistent width without moving the fence by placing a spacer between the fence and back panel. This critical width dimension would often be laid out with a marking gauge – probably cut into both faces – on all four boards with the back panel requiring its own gauge setting as its width is unique. Each board would then be clamped in a vice and the edge would be worked to the gauge line with a hand plane. This takes a little time and skill to ensure the final edge is straight, square to the face and parallel to the opposite edge. With the shooting board

this critical work is fast, incredibly accurate and virtually foolproof. After shooting one edge straight – this is now your reference edge – set the fence to the desired width, place the reference edge against the fence and shoot the opposite edge until the plane stops cutting. You need to repeat this for all four boards. There is no layout required – just use a spacer for the back panel – and the result is perfectly matched drawer components ready for dovetailing.

The tapered legs are handled in a similar fashion. Rather than laying out all eight tapers and planing down to the lines by eye, simply set the distance and angle on the fence and start shooting. Again, the result will be identical parts requiring minimal layout and completed in less time.



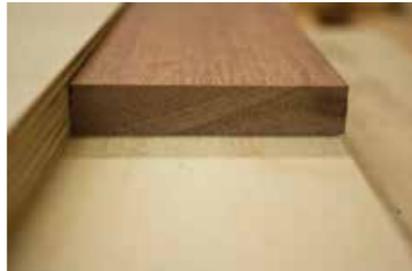
Shooting matched tapers is no problem with the fence set at an angle

Multi-functional tool

As a side note, long-grain shooting boards are also nice for handling thin stock where balancing a plane on the narrow edge is difficult. They can also help with non-square stock where clamping the work between the square jaws of the vice may be impossible. Before getting into the details of how to construct a shooting board I should point out that most woodworkers won't need

something as large as the version I made. I get requests for custom tools and I wanted to be prepared to make something longer than usual – like a 1.2m pair of winding sticks. Most would be fine with a shooting board that can handle work up to 1m long, but it will vary from person to person so decide on a size that fits your work and scale the design accordingly.

Making the shooting board



Before shooting, any extra material to be removed will overhang the shooting board



When starting out there will be a gap between the shooting board and the plane. The smaller the gap gets, the closer you are to being finished

The board is made primarily of 18mm-thick plywood, which stays flat and is reasonably priced. However, don't buy too cheap – use a quality, furniture-grade plywood and with a little care the board will last a lifetime. The body of any shooting board should be made from gluing two sheets of plywood together, doubling the thickness.

Before gluing the sheets together, make sure the upper sheet has a perfectly straight edge as that is what the plane will register against in use. If that registration edge is arched the shooting board will never create a straight edge. The lower sheet is 75mm wider than the upper sheet and this extra width provides a runway for the hand plane to ride on during use. There are single sheet shooting board designs where the plane simply rides on the surface of the workbench, but the benefits of a two-sheet design are worth the increased cost, in my opinion.

The board is stiffer with two sheets, the runway can be waxed to reduce friction, which is a major benefit for those who have never compared a waxed board to an un-waxed board or bench, and because we will be inserting aluminium rails in the upper sheet to guide the fence adding a lower sheet really isn't an option for this design. When gluing the sheets together, you may want to drive in a few nails or screws to help hold everything tight while the glue dries, especially towards the middle where clamps won't reach.

With the upper and lower sheets together, the hard stop can be added to the end of the board. I'm right-handed so my stop is at the left, if you're left handed you will want to flip the design. Again, 18mm plywood works great and it should be glued in place, but I also drove in some 6mm lag screws to hold things together while the glue dried and



When the plane bottoms out on the shooting board and stops cutting, you're done

Making the shooting board – cont'd

provide a mechanical hold should the glue ever fail. I recommend leaving 50-75mm from the front of the hard stop to the end of the board. This gives a little extra room to slow the plane down after each cut without it falling off the end of the runway.

The final step for making the body of the board is to add the aluminium T-track that will guide the fence. You will need to purchase the T-track as well as the corresponding T-bolts and knobs, which are readily available at most woodworking stores or online. Cut two lengths to size using a hacksaw and smooth the ends with a file. The rails I made are 280mm long, but your board may be narrower so size them appropriately. The important detail is to cut a stopped groove leaving about 25mm of material at the registration edge intact. Cutting all the way through can lead to stub points that the plane may hit during use and if the rails are mounted flush with the registration edge... well, get ready to sharpen a damaged plane iron. To create the stopped groove I simply clamped a straightedge to the board, ran a palm router

against it and squared up the end with a chisel. Once the material is removed, screw down T-track and you're now ready to make the fence.

The fence

The fence is about as simple as it gets – a long rectangle with two holes. Because of the length of the fence, I wanted something fairly wide – 75mm – so it wouldn't deflect under the pressure of planing. When adding the holes for the T-bolts to pass through, leave at least one hole oversized so the fence can rotate – for tapered cuts – without binding. All that remains is to add some finish – I used three coats of wipe-on polyurethane. When the finish dries, don't sand or polish the top surface of the board or the underside of the fence. These two surfaces touch when the fence is locked down and leaving them a little rough ensures the fence won't slip during use.

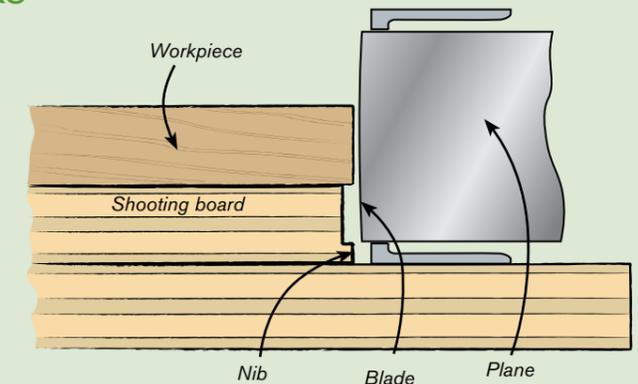
Almost there

After the finish you've applied has dried, you need to wax the runway, assemble the

fence to the board with the T-bolts and then, it's time to start shooting. Simply place the fence in the desired location and set the work down with the reference edge against the fence. The edge to be shot will overhang the registration edge of the shooting board. This is a little different from a traditional shooting board where the plane is always riding against the registration edge and the work is fed into it. In fact, many woodworkers add an outer guide to their board's runway to trap the plane in a chute – hence the name. This is not possible with a fenced shooting board because the plane will bind between the outer guide and the wood overhanging the registration edge. This is also why the runway is 75mm wide even though most planes only require around 50mm. The extra width allows the plane to start some distance away from the registration edge and plane down to meet it. Once the plane bottoms out against the shooting board it will stop cutting, so when material is no longer being removed anywhere along the edge, you're done.

How a shooting board works

If you're new to shooting boards, the first question most people have is: "What stops the plane from wasting away the board itself?" Well, if you're using a rabbet plane – where the blade is equal to the width of the plane's sole – you would chew up the shooting board. If, however, you are using a common bench plane on its side or a dedicated shooting plane like the No.51, then the blade does not pass through the full width of the body. So while the upper portion of the shooting board will lose a few shavings the first time you use it, the lower portion of the board is untouched by the plane iron and this material will soon bottom out against the body of the plane. The wood that gets placed on top of the shooting board, however, only sees the blade and can be planed as many times as necessary to achieve the desired result.



Shooting subtle bevels

Most bevels that get added to a board are decorative and typically range from 30-60 degrees. At times, however, very subtle bevels are required. Take a pair of tapered winding sticks, for example. Leaving one face square to the base edge makes them more likely to tip over in that direction, but clamping the tapered body in a vice to correct the base angle is no picnic. A fenced shooting board again makes this operation absurdly simple. Set the fence, then shim the board's face as required and start shooting. Using the same shim yields repeatable angles every time and creating the bevel takes only a few seconds. *F&C*



Shooting the bevel