Shooting Board
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A shooting board is a woodworking jig that is used to guide a hand plane. It is used to trim and true (square up) the end or edge of a board. It would typically be configured as a bench hook on a workbench, although there are other ways to fix it in place.

In my shop, a shooting board is essential for trimming and trueing endgrain. When I had a table saw, it was set up very accurately and stably. I seldom needed a shooting board except for tweaking 45° miters. Now that I make crosscuts by hand or with a compound miter saw, a shooting board is essential.

It is often unwieldy to use a shooting board to joint the long edge of a plank. I find other ways to do that, e.g., a Veritas Jointer Fence® attached to a plane.

The Basic Shooting Board

The basic design of a shooting board comprises a fence and a runner or track to guide the plane. One style of shooting board is shown in Figure 1. This is a bench hook style. It has a cleat in front that hooks over the edge of the workbench and that can be clamped in a face vise. This shooting board has the runner on the right side. It could be on the left, if desired.

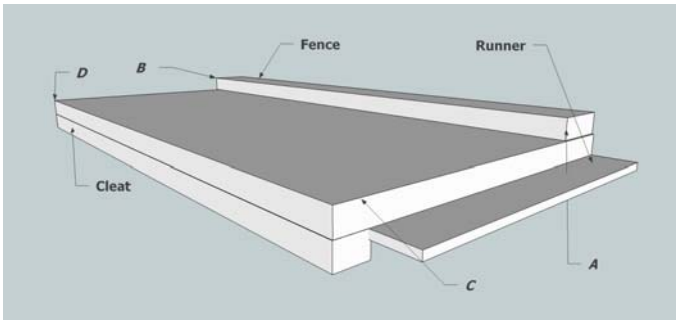

Figure 1. Bench Hook Style of Shooting Board

Materials It may be made of any stable lumber, often scrap pieces. Preferably the fence and cleats are made of solid hardwood and the base is ½"-¾" Baltic Birch. Plane what will be the right edge of the base and what will be the front of the fence as straight and square as possible. Chamfer what will be the right rear corner of the fence. (You can do this later if desired.)

The runner could be ¼" melamine coated MDF. Melamine is slippery, especially with a thin coat of paste wax on it. You could use UHMW plastic as well. Using ¼" thick stock for the runner presumes that the workbench top is flat. If there is any doubt about that, use ¾" thick stock, e.g., a piece of countertop. The cleat and fence should be glued and screwed to the base.

Dimensions The dimensions should suit the work you plan to do with it. For trimming end grain on crosscut pieces like rails and stiles, 12" long by 10" would be about right, with the cleat and the fence about ¾" thick by 1" wide. (A thicker cleat may hook the bench more securely.)

One issue that is easily overlooked until you start using a bench hook style of shooting board is the rear clearance and the distance from the mouth of the plane to the toe. You need enough space to aggressively finish a cut without having the toe of the plane slam into the wall (if any) behind the shooting board. That, in turn, along with the width of your bench, determines the maximum width of the shooting board. That, in turn, determines the maximum board width that you can shoot.

Setting the Fence The fence should be 90.0° relative to the right end of the base. The angle of the fence will determine the accuracy of the shooting board, so it is worth the trouble to get it right. There are many ways to get an accurate 90° angle. The quickest is just to use a try square, i.e., follow steps 1, 2, 8 and 10 below. I recommend all ten steps, however, where you would construct an imaginary rectangle with corners "A" - "D" and adjust the fence until the diagonals are equal. (See Figure 1.)
(1) Begin by screwing the fence to the base exactly where you want it to be at the right (runner) side. The end should be flush with the right side of the base. Tighten the screw snugly but not tight.
(2) Use a try square, held against the right side of the base and the front of the fence, to initially set the angle of the fence. Clamp the fence in place.
(3) Let point "A" be the right front corner of the fence, flush with the right edge of the base. (See Figure 1.)
(4) Mark point "B" a convenient distance along the front edge of the fence from the right edge of the base, e.g., 12" This is distance AB.
(5) Mark point "C" a convenient distance down the right side of the base, say 10". This is distance AC.
(6) Mark point "D" exactly distance AB along the front of the base and distance AC from the fence.
(7) Loosen the clamp slightly and tap (rotate) the fence until the diagonals are equal, i.e., when distance AD equals distance BC. Re-tighten the clamp.
(8) Mark the position of the fence on the base at points A and B. Drill a pilot hole for a screw at the left end of the fence.
(9) Check the diagonals again.
(10) Release the clamp. Unscrew the fence at point "A". Apply adhesive, and screw the fence in place in at least two points using the existing pilot holes.

Running-In The base of the shooting plane will run in the corner formed by the runner and the right side of the jig base. The first few passes of the plane will remove wood from the jig until the plane is "run in." Take light passes during this running-in operation. The base of the plane will hold the plane iron away from the base of the jig, so that it will not continually remove wood. The shooting board is now ready to use.

Shooting Plane

Any well set up plane will serve as a shooting plane. Or, a specialized sanding block can be used, as described below. A very sharp, low angle plane is preferable to a standard bed for cutting endgrain cleanly. So, a low-angle block plane or low-angle jack plane can be used. The heavier plane will provide more momentum to get through a cut.

If you have much shooting work to do, the position of the tote on a conventional plane becomes very uncomfortable. Many people will put an accessory tote on a conventional plane (a "hot dog") to make it more comfortable to push when it is on its side. (Figure 2) This makes a bench plane into a reasonably useful and less expensive alternative to a specialized shooting plane. The hot dog can be fastened to the body of the plane using the screw holes that are already in place for the original tote and/or knob. That way, you do not need to drill and tap new holes in the plane body. A heavy block of wood for a hot dog would increase the mass and might make a low angle block plane more useful for shooting.

Figure 2. "Hot Dog" accessory Tote for Shooting Attached to a Stanley #4 Bench Plane

The "elite" level is occupied by dedicated shooting planes. These are usually low-angle bevel-up planes with a right-angle sole and a tote that can be held easily when the plane is on its side. They have enough mass (5-7 lb) to cut with authority. They are very expensive for such a specialized plane, but they are a joy to use compared to the alternatives.

To make a sanding block for use with a shooting board, simply leave a gap of bare wood along one edge of the sanding block. The sanding block should be thick enough not to tilt easily and be perfectly square along the running edge. Then, when you run the block along the runner, the bare wood will prevent the sandpaper from cutting too deeply into the base of the shooting board, just as the base of a plane does.

Accessories and Modifications

Ramped Board A shooting board with a flat runner, like the one shown in Figure 1, tends to use only the lower part of the iron, which dulls more quickly. The runner on a ramped shooting board is tapered from front to back. This distributes the cutting action over more of the edge. All other dimensions being the same, a ramped cutting board needs a wider plane iron to plane thicker work.

Steel Track Back in its glory days, Stanley offered a steel chute board (#52). This was equipped with a hold down, an adjustable miter fence, and a track to hold their #51 chute plane. According to Patrick Leach (Patrick's Blood and Gore)[1] these worked very well. These are collectors' items now (i.e., very expensive), but both Veritas and Lie-Nielsen offer modern versions. They hold the plane in position laterally as it slides forward and back.

Miter Fence and Donkey Ear Of course, the fence does not need to be 90° relative to the right side of the base. To trim 45° miters. I preferred to cut an accessory fence with an exact 45°

angle, which I fit next to the permanant fence and bolt in place for trimming miters. Other angles are possible as well for making polygons. (It occurs to me, based on the Stanley #52 chute board, that you could make a shooting board with an adjustable miter gauge intended for a table saw or band saw.

Likewise, for planing 45°bevels, you can make a ramp to hold the workpiece at the desired angle and square to the base. These can hold the work above the shooting board, as shown in Figure 3, or below the shooting board, hanging off the edge of the bench. The latter configuration is what gave rise to the name *donkey's ear*. These must be square in two dimensions and are tricky to get right the first time. Therefore, they are likely to need some means of adjustment with shims or screws.

I bevel long grain with a specialized fence-guided plane or on a router table with a specialized bit.

Figure 3. Donkey Ear on Shooting Board

Orientation to Bench The cleat shown in Figure 1 can be located anywhere you like, or omitted entirely. For example, it can be located nearer to the midline of the board to give more clearance to the rear. It would be clamped in a face vise and the back of the board would need to be clamped or bolted down. It could be turned 90° so that it is parallel to the runner. That would be done for shooting long grain on longer boards.

Reference

1.http://www.supertool.com/StanleyBG/stan7.htm