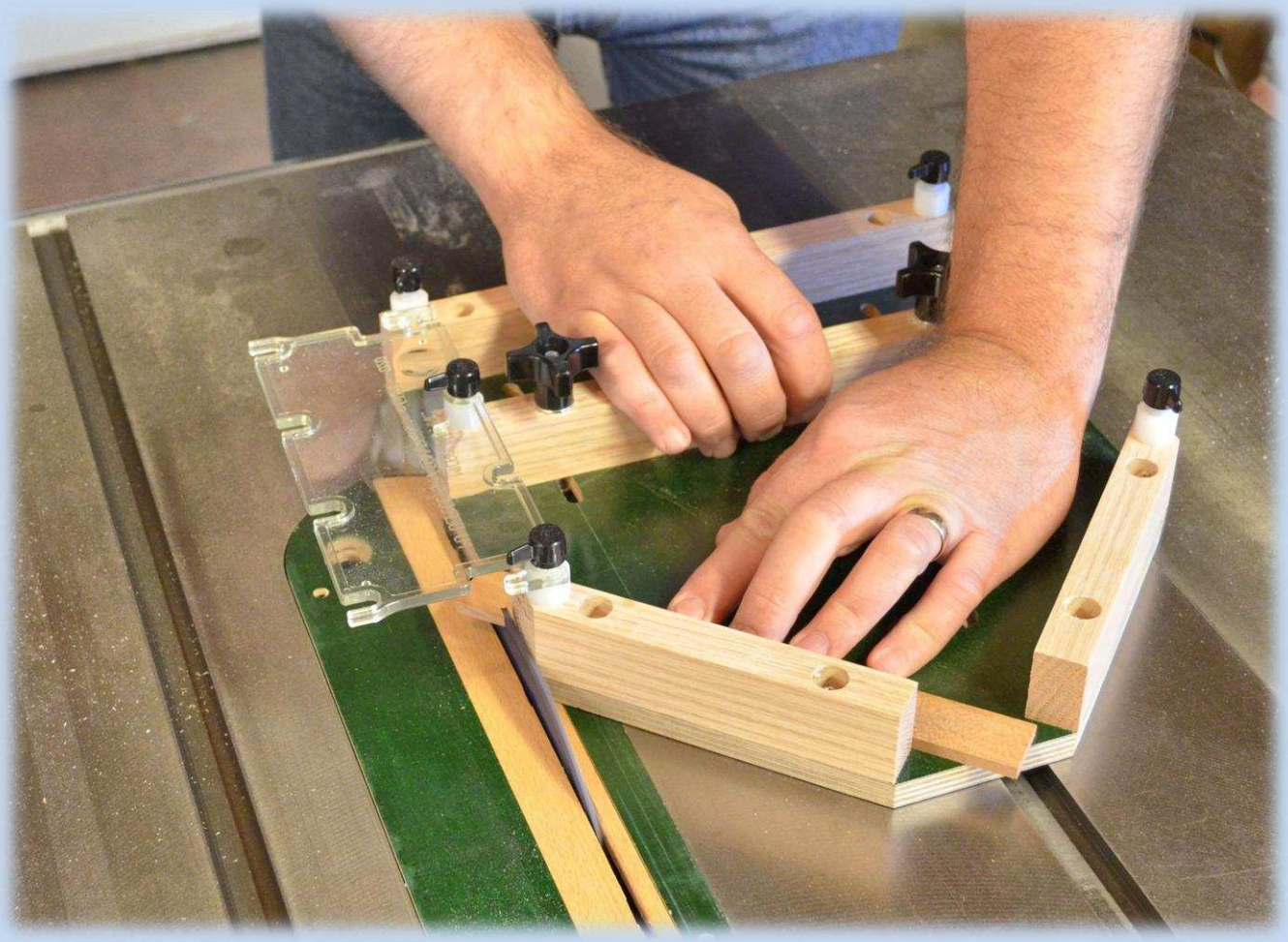
45/90 Degree Cutoff Jig

For the table saw



Plans for making a useful, accurate, and safe cut off jig for your table saw.

While a miter gauge can make perfect square and angle cuts, many projects require switching back and forth between angles which leads to a lot of set up time and the potential for errors and inconsistent cuts.

Creating a dedicated sled for making 45 degree and 90 degree cuts on your table saw will save time and increase your shop productivity. And of course, since these plans come from Micro Jig, we have built in an added measure of safety through the ability to use our 'Deflector Connector' as a blade guard when using the jig.

The trick to getting really accurate cuts is precision in building the jig. If the jig is built well, there is no need to set up every cut made with it, saving time and adding accuracy to your work. Follow these instructions with care and you'll have another valuable addition to your shop.

This jig can be made with typical shop equipment including a table saw, router table and drill press. You WILL need an accurate square or triangle to set the 45 degree cleats. If you do not already own one, a plastic drafter's square from an office supply store is an inexpensive option that will be useful for all sorts of projects around the shop.

Materials

Since this is a jig you will keep and use for years, it should be made from quality materials. A phenolic faced plywood, 1/2" thick was chosen for the base, and 3/4" oak for the cleats.

The phenolic faced plywood is not always available locally, but any good quality 1/2" ply will be acceptable. Thicker ply can be used, but since the ply needs to be counter bored for the slots, 1/2"is the minimum.

The Base

The build begin by laying out the base. The dimensions included are for a Delta Unisaw. The base is slightly wider than needed since you want to trim the sides of the jig after assembly. This way the edge of the jig is exactly where the cut will be, which makes cutting to a mark on your part simple.

If you are building this jig for a different saw, double check the dimensions to insure that the edge of the base will reach the blade from either miter slot. Simply measure the distance between the slots and add 7/8". This will insure that both edges get trimmed just a bit.

The base for our Unisaw is 12" long and 10 3/4" wide. Mark 4 inches down from one top corner and four inches in, draw a diagonal line between the two marks, and cut the corner off forming a 45 degree angle. Do the same for the other top corner. These cuts should be 45 degrees, but do not have to be super accurate. A 12" chop box can make the cut, or you can use a bandsaw or a hand saw. Sand the sawn edge, an attractive jig is a joy to use.

Now the slots can be laid out. The short slots that run side to side are for the ZeroPlay Guide Bar that will ride in the saw's miter slot. The longer slots that run front to back are for the adjustable clamp bar.

Our preferred method for cutting the slots is to drill a 1/4” hole at each end of the slot and remove the waste at the router table. The router table fence is carefully positioned so that the bit meets the hole at the end of a slot. Lower the base onto the bit and cut along to the other slot hole. Do this in a couple of passes to keep from over stressing the cut.

Once the four 1/4" wide slots are completed, they both need to get a 1/2" counter-bored slot, but be careful here, the guide bar slots are counter-bored on the upper face of the jig, and the clamp bar slots are counter-bored on the lower face. This is done on the router table in the same manner as the 1/4" slots, but only 1/4" deep. The base is now ready for assembly and the cleats need to be made.

The Cleats

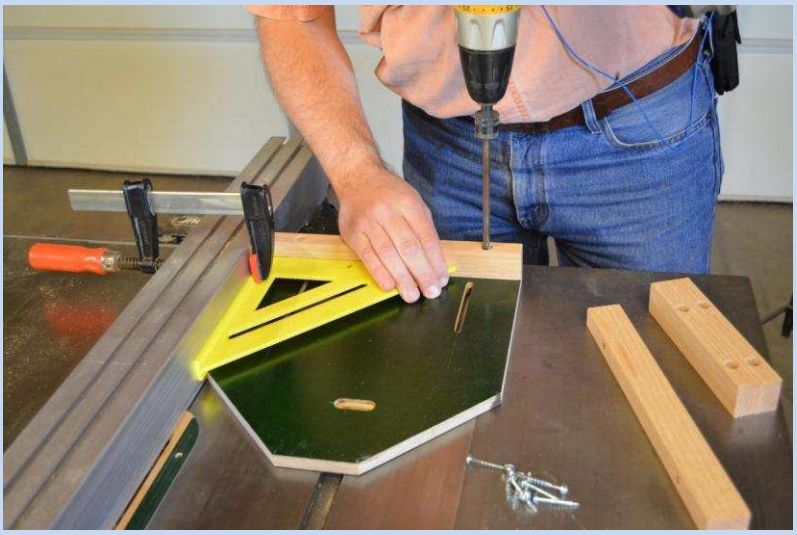
The cleats are best made from stable, well dried hardwood. The parts are small enough that you can use leftovers, but choose parts that are straight with no knots or wild grain. Plane your stock down to 3/4” thick and rip it to 1 1/2" wide. You’ll need two pieces at 10 3/4" and two more at 6 1/2" long.

Once the parts are sized, they need to be drilled and counter bored at the drill press. 1/4" through holes with 1/2" counter bores are preferable so that they have room for adjusting after being attached to the jig.

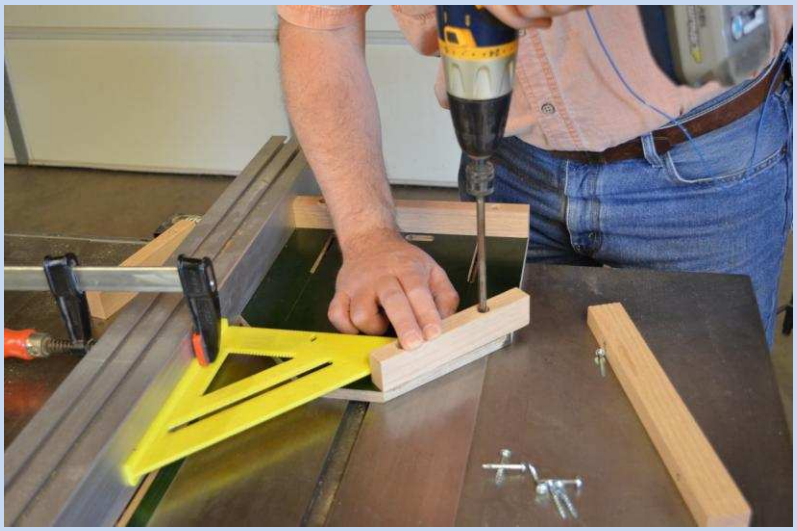
Note that only one of the 90 degree cleats gets counter bored and that the 45 degree cleat holes are not symmetrical. Be sure to drill and counter bore the cleats according to the plan.

Assembly

With your saw unplugged and the blade retracted, begin assembling the jig by setting the rip fence right to the "0" line of the blade.



Set the base against the fence and screw the 90 degree cleat flush to the back of the jig base. Secure the screw closest to the rip fence, and use a square to set the cleat while tightening the second screw. It is more important that the cleat be square to the fence than to the jig base.



The first 45 degree cleat is added in the same fashion, using your square to reference off the rip fence. Note that it will overhang the edge of the base to be trimmed off later.

Before securing the second 45 degree cleat, the guide bar needs to be added. The rip fence has not been moved, and the jig base remains in firm contact with it. The cross slots in the base allow for side to side adjustment of the bar, but it should not need adjusting once it is set so secure it well.

Of course, we recommend using our ZeroPlay Guide Bar for your jig, but you can use a shop-built bar as well.

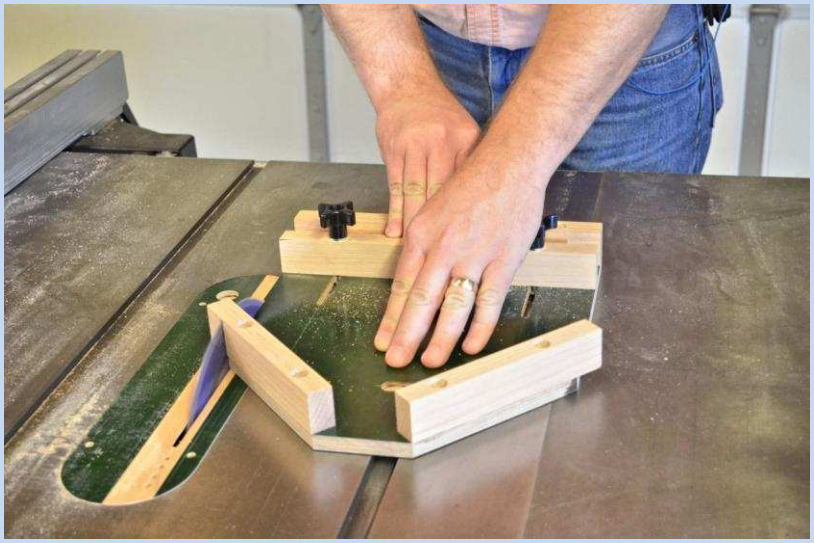
The second 45 degree cleat is NOT referenced off the rip fence, but rather off the other 45 degree cleat. It is very important to insure that these cleats form a true 90 degree angle. This will insure square corners even if the jig is slightly misaligned off the blade, the angles will be complimentary.

When setting the cleats you can see why the holes for the screws are slightly oversized. This allows for easy adjustment of the cleats. Pocket hole screws are perfect for this jig, they allow room for adjustments and the washer heads will hold the cleats securely once tightened.

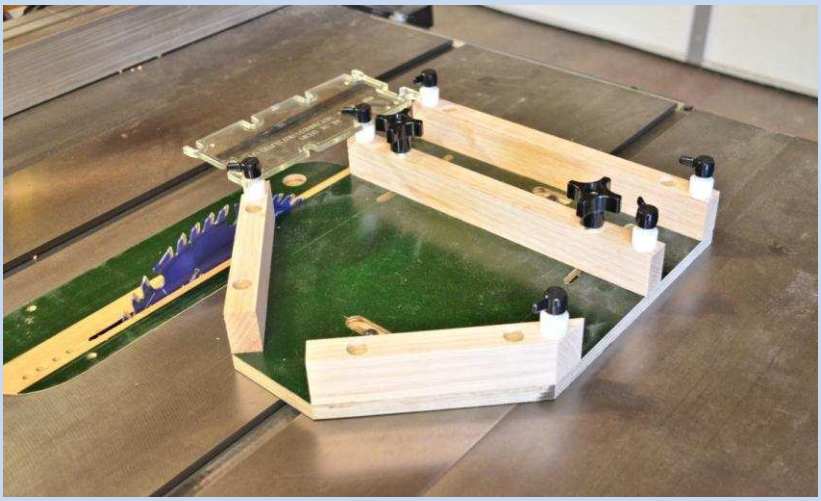
The clamping cleat is set in place over the two remaining slots in the base, and a pair of T-head bolts run up through the base and the holes in the cleats. Clamping knobs or wing nuts allow it to adjust for different widths of stock.

Trimming

The jig is now largely assembled and can be trimmed to final width. Make sure that the clamping cleat is set square and secured, then run the entire jig through the saw trimming the base and the cleats flush with the blade. Set the jig into the other miter slot and trim the opposite side as well.

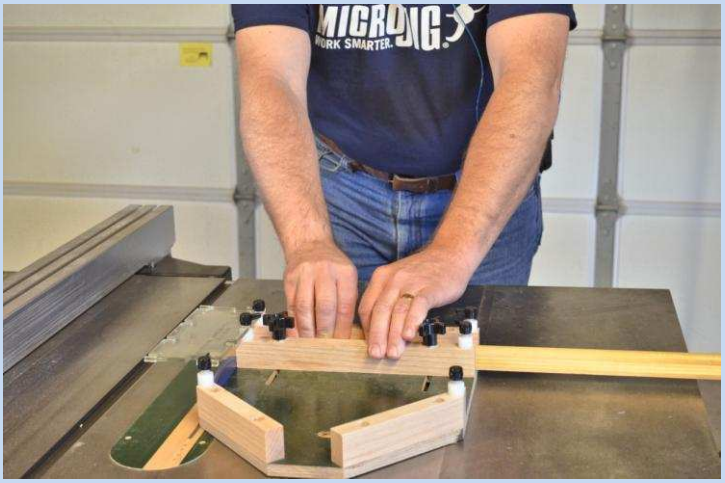


Final Details



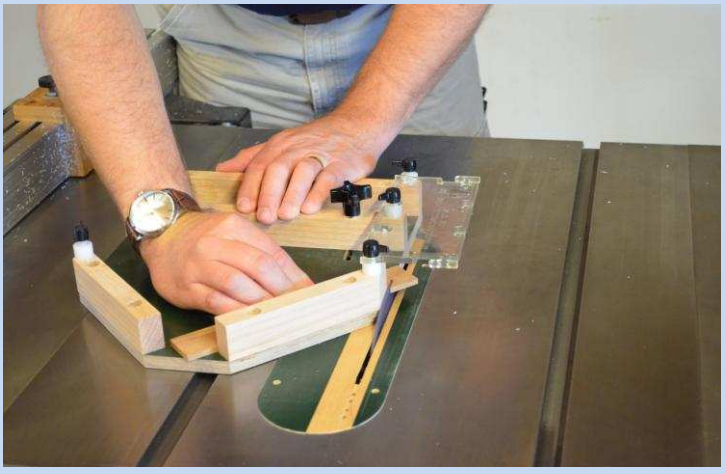
The last bits added are the stand-offs for adding a shield. 1/4-20 holes were drilled and tapped into the outer ends of all the cleats. Nylon spacers and 1/4-20 bolts are used to hold the Deflector Connector during cuts. Note in the photos below how the clamping bar can be adjusted to allow the Deflector Connector to be mounted where needed for any specific cut. It can quickly be moved since the clamping knobs only need to be loosened and not removed to reset the guard.

Using the Jig



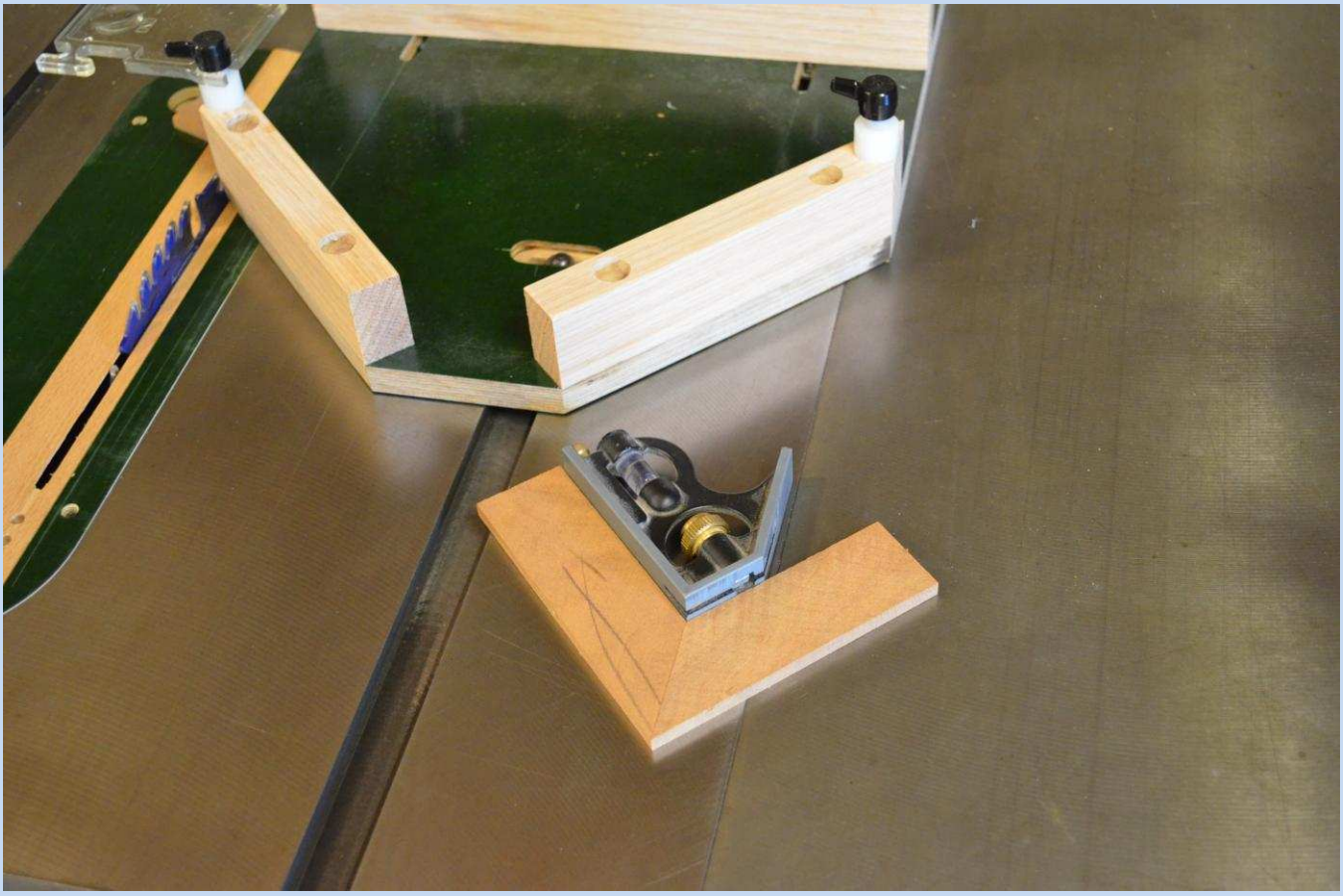
This jig works from either miter slot for making 45 and 90 degree cuts. Since it has been trimmed to be flush to the cut line, a part can be marked and cut very accurately by simply lining up the mark with the edge of a cleat.

It does not matter which side of the 90 degree cleat is used, but 45 degree cuts for a miter joint should be made using both sides of the jig. This way, as long as the two cleats are at 90 degrees to each other, your miters will always form a perfect right angle even if the cleats are not perfectly 45 degrees to the blade.



The jig allows you to make very accurate cuts safely since your hands are never in line with the blade and the Deflector Connector keeps chips and off-cuts from flying at you.

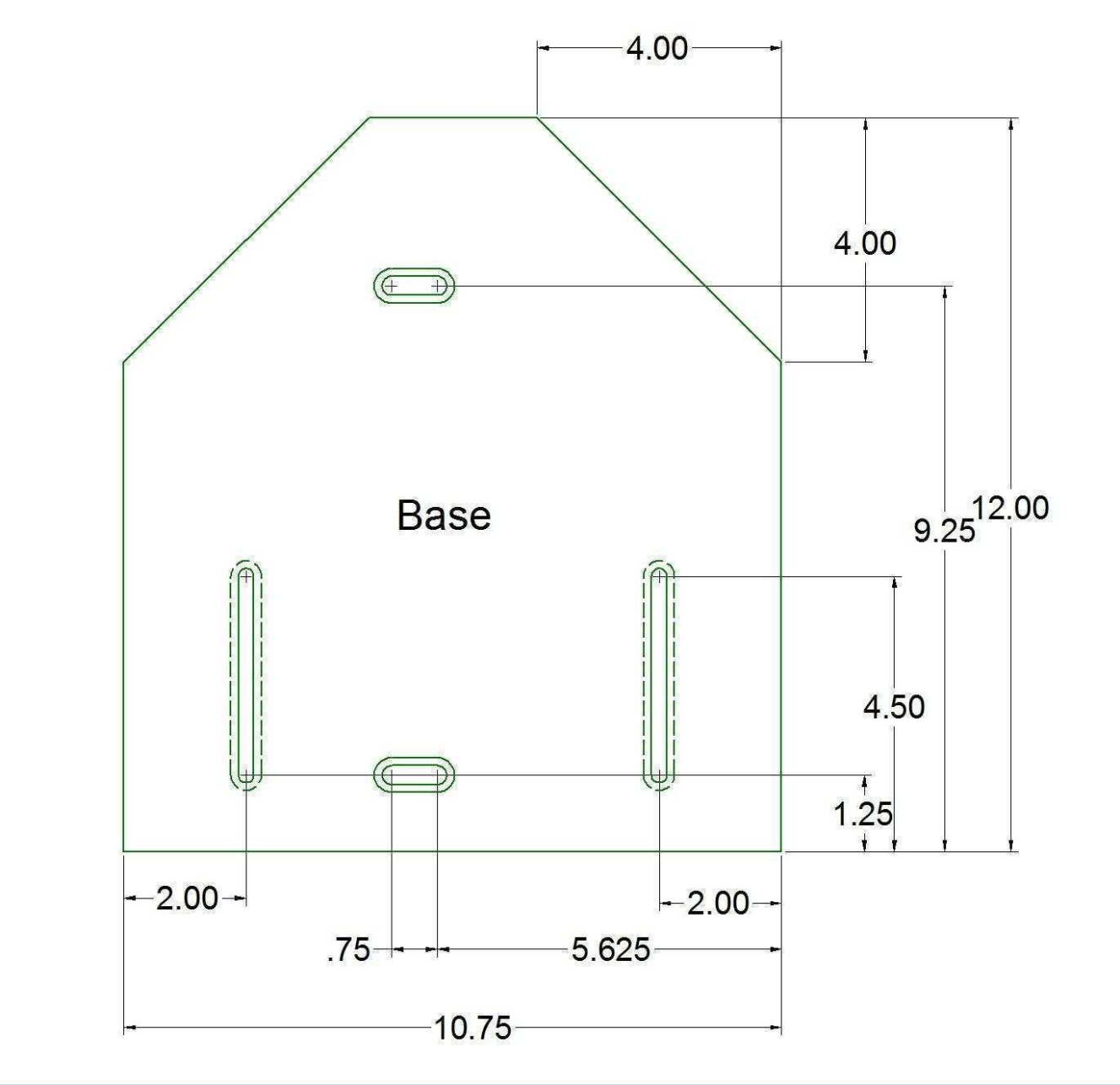
Ralph Bagnall-
ConsultingWoodworker.com
May, 2013



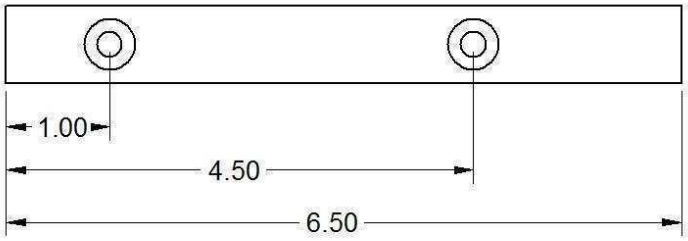
Cutlist

- **Base** **10 3/4" x 12” x 1/2" (sized for Delta Unisaw)**
- **90 Degree Cleat** **10 3/4" x 1 1/2" x 3/4"**
- **Clamping Cleat** **10 3/4" x 1 1/2" x 3/4"**
- **45 Degree Cleats** **6 1/2" x 1 1/2” x 3/4" (2 needed)**

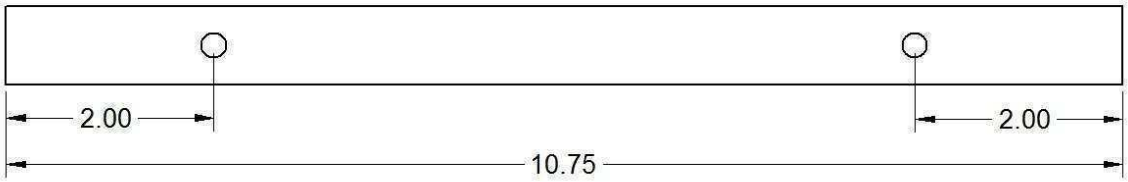
ZeroPlay Guide Bars, the Deflector Connector, phenolic faced plywood and T-bolts can be found at Rockler, Woodcraft and other online retailers who carry Micro Jig products. Nylon Spacers are available from the hardware aisle of most hardware stores and home centers.


4.00
4.00
Base
12.00
9.25
4.50
1.25
2.00
2.00
.75
5.625
10.75

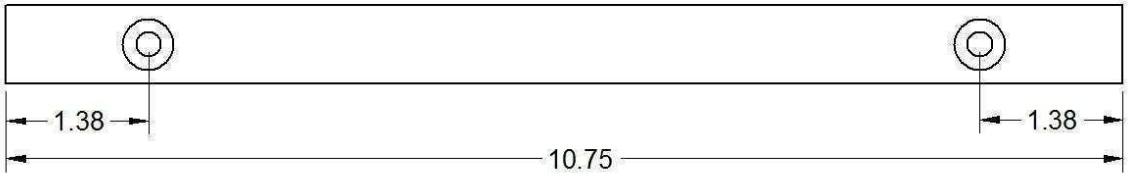
45 Degree Cleat (2 Needed)



Clamping Cleat (no counter bore)



90 Degree Cleat



Cleat Bore Diagram