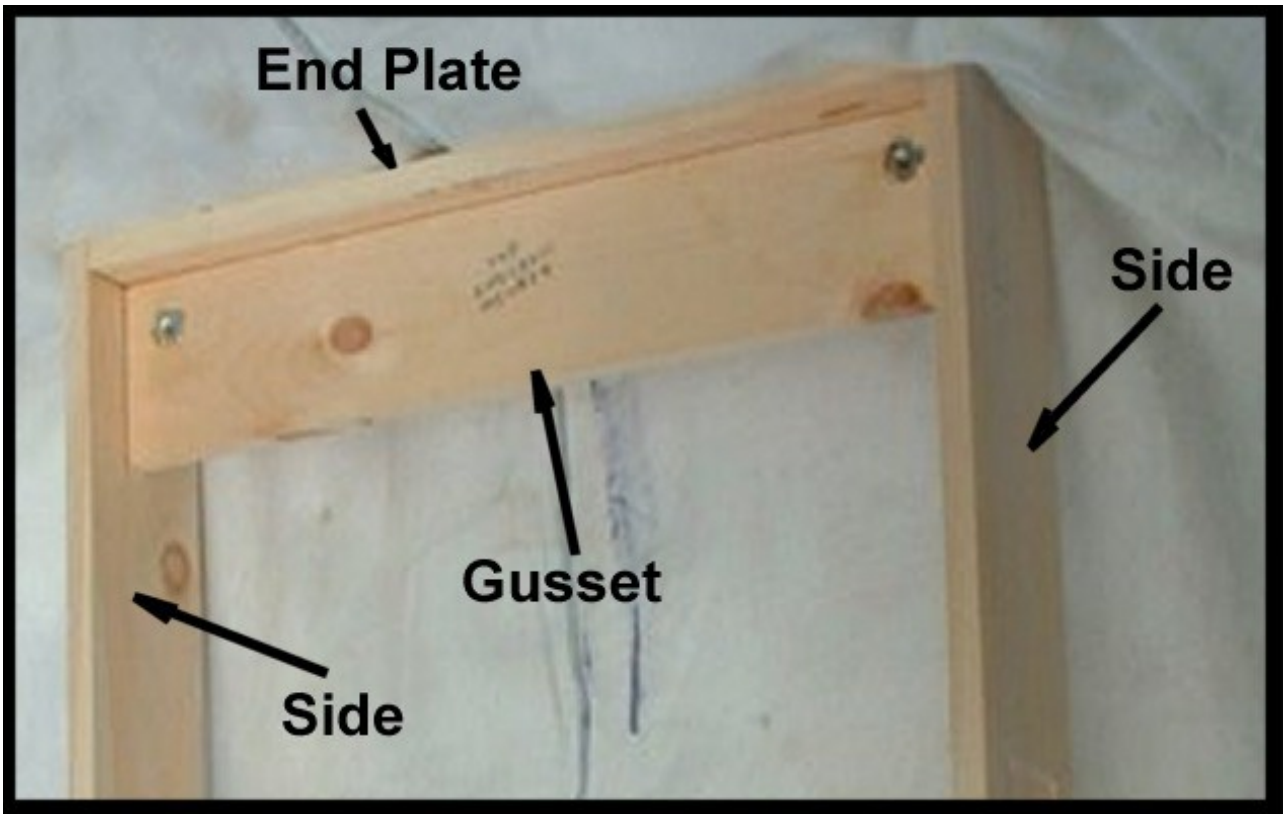
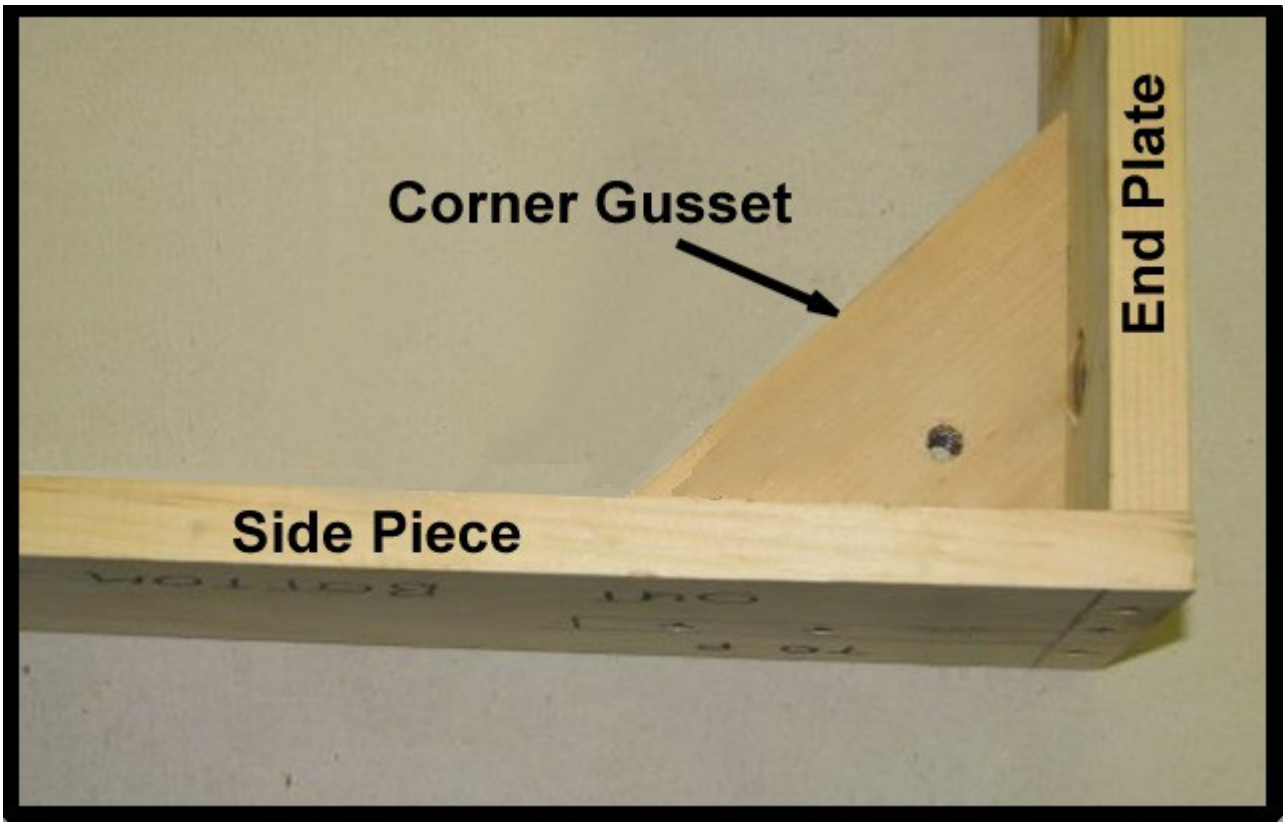
Triangular Corner Gussets

<u>What's A Gusset?</u>

While it's commonly heard of in carpentry work and on construction, we're going to introduce a term that's not in the common vernacular. The term is "gusset". A gusset is simply a piece of material that's used to strengthen and join two other pieces of material together. In module construction, there are generally two types of gussets. One type goes from one side to the other at each end of the module frame.



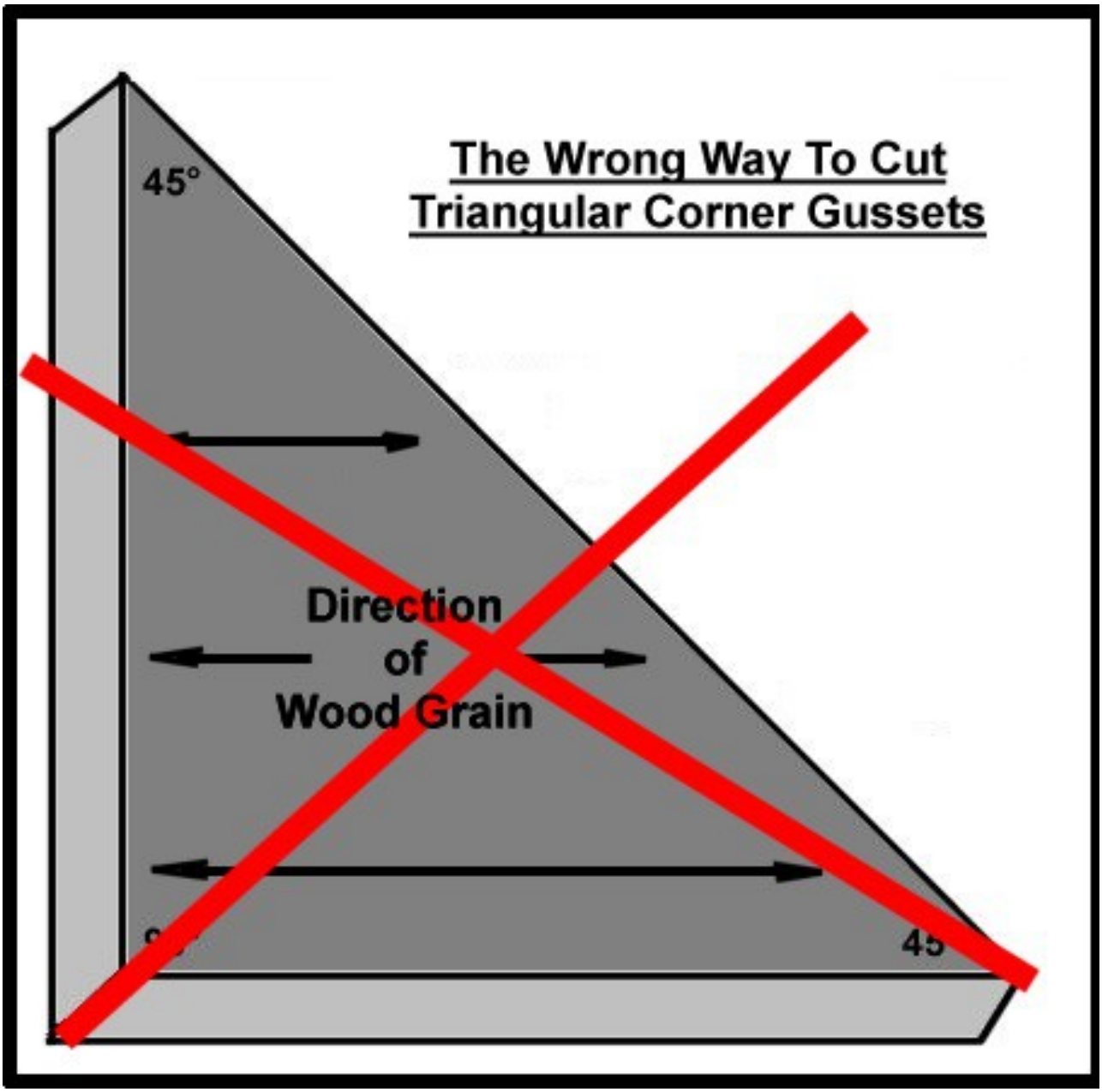
And the other is a triangular piece of wood. If you use 2" Styrofoam and you have gussets that go from one side of the module to the other as in the photo above, you'll find there isn't much space to clamp your module to the next one. In order to give us some extra space for clamping, we use a "triangular gusset" on each corner of the module frame.



Regardless of which type of gusset is used - straight or triangular - the purpose of the gusset is to strengthen and join the end plates to the side pieces of the module frame. In our case, we're going to use triangular gussets in our module construction.

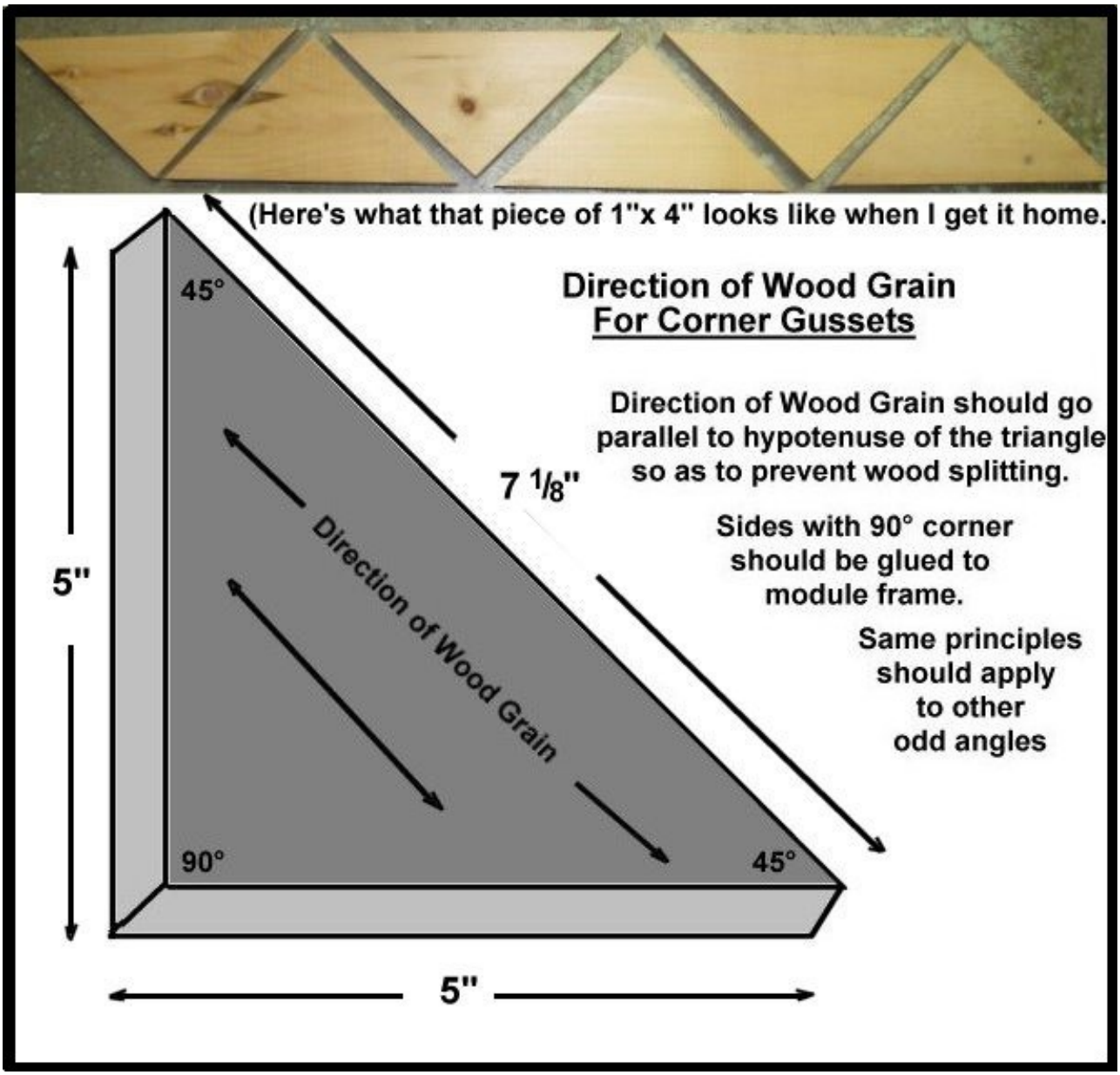
Cutting Triangular Gussets

I've had to replace a few triangular gussets on modules because they cracked along the grain. The 45 degree cut is made the wrong way with the result that the gusset cracks in very short order and has to be replaced because it won't hold the leg in place.



Whenever I get the saw service to cut the triangular gussets, I get them to chop the wood the right way. Using a piece of 1"x 4" knotty pine, they set their chop saw to 45 degrees and make the first cut. This piece gets discarded because, if I use this piece, I'll end up with a cracked gusset. From here, they repeatedly flip the wood over and chop off 45 degree triangular gussets.

There's the added advantage that the dimensions of my gusset increases. It goes from 3 1\2" on each 90 degree side to 5" and from 5" to 7 1/8" on the hypotenuse side. This gives me a good surface to install the T-nuts for the legs. (If you're still having problems visualizing what we're talking about, the photo below will help you out.)

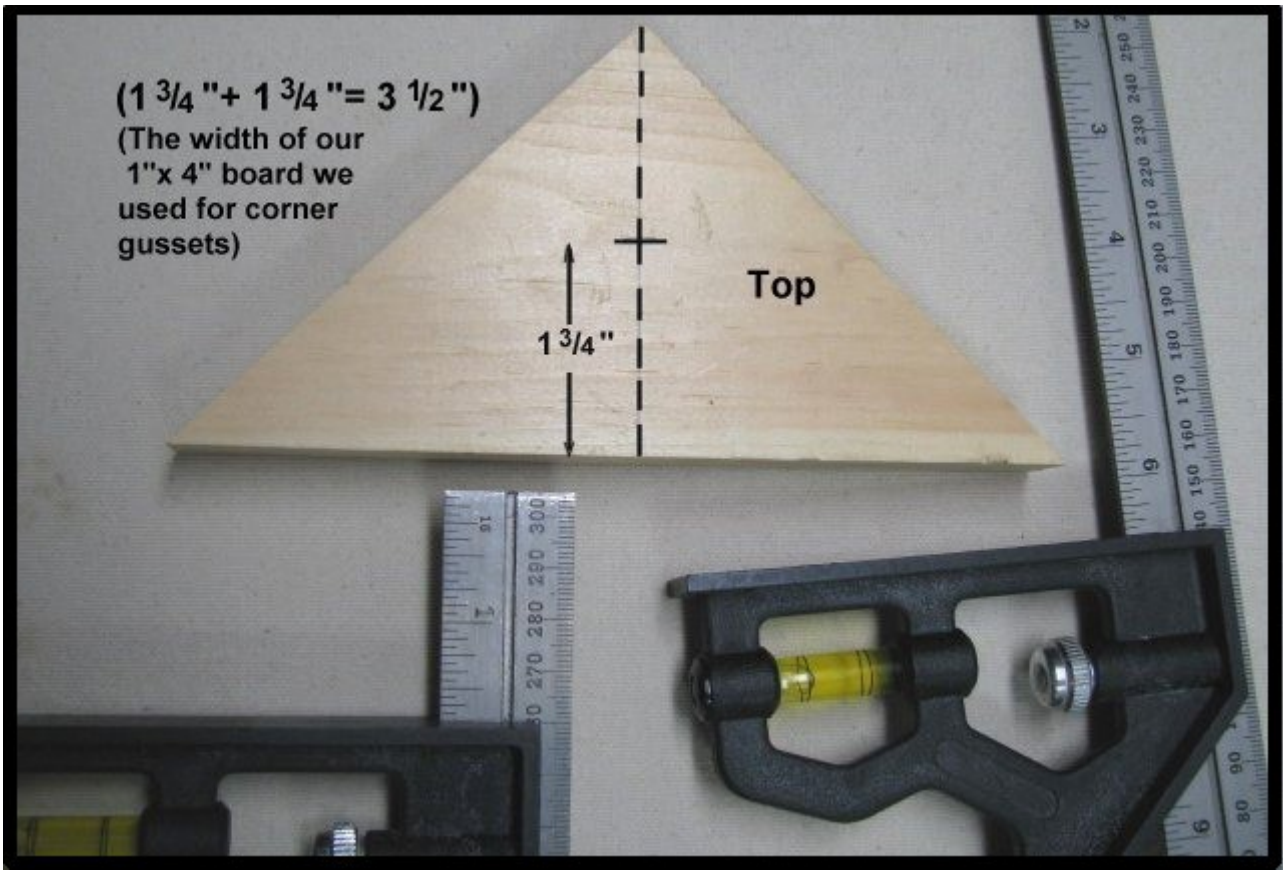


Locating The Holes For The T-nuts

Now that we have our gussets cut, we're ready to first locate the holes for the T-nuts. The T-nuts are used to install the module legs into the bottom of the module. (Don't buy the wood for the legs, yet. We're not ready for that step yet.) The measurements shown below will ensure that the legs will clear the side of the module frame when we turn the legs into the T-nuts.

Using a T-square, draw a vertical line from the top of the gusset (the 90 degree angle) to the bottom as shown in the photo below. Repeat this process for the other 3 gussets. Next, set the T-square to 1 3/4" (half the width of our 1"x 4" board we had cut for corner gussets) and mark all 4 gussets with a short horizontal line. We should have 4 corner gussets marked up as shown below.

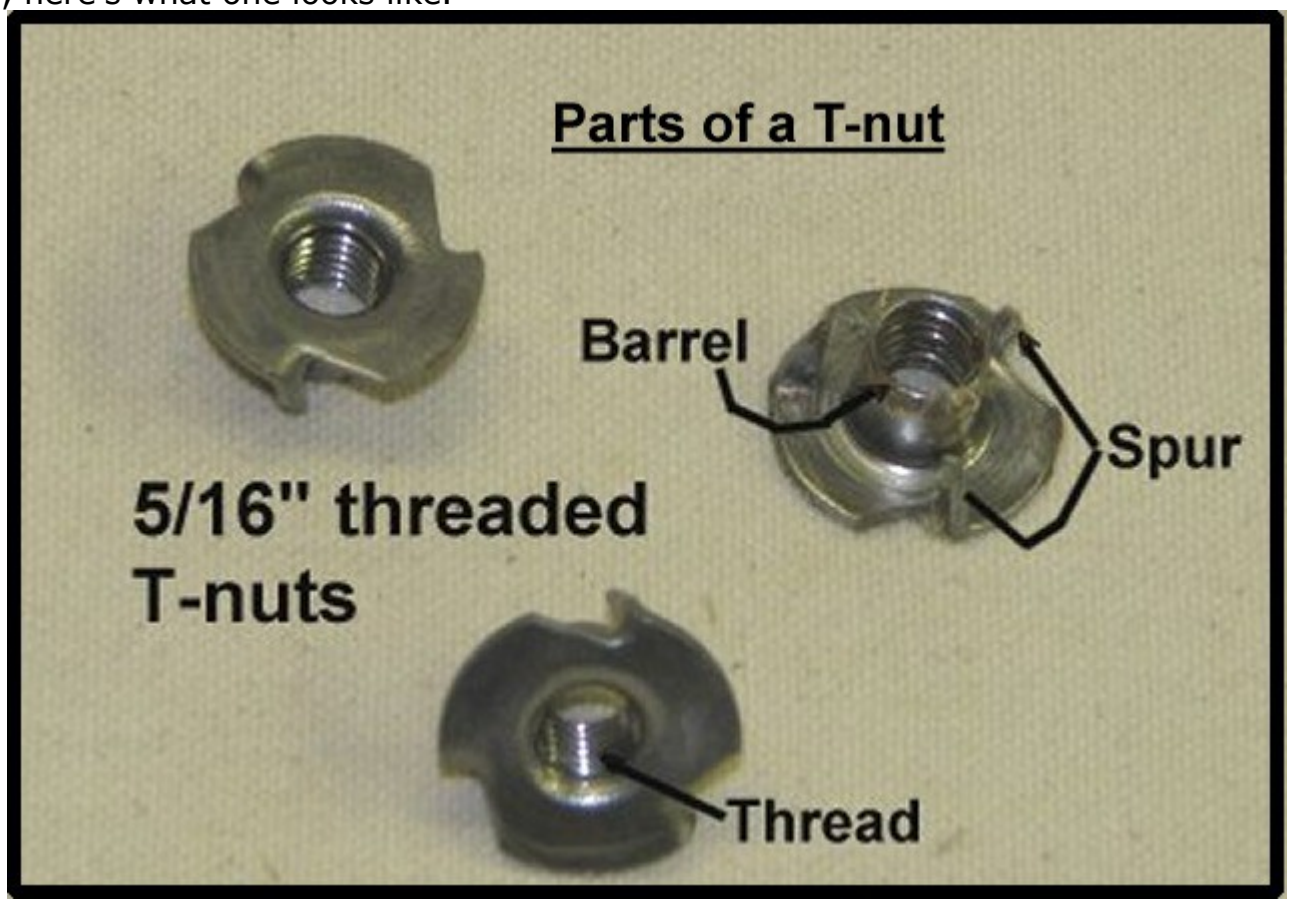
Mark the side with the pencil markings as "Top" and the other side as "Bottom"!!
It will save you lots of grief later on. (Voice of experience talking here. Ever tried to remove a gusset that's been glued on upside-down? You have to jump on it with all of your weight!)



Simple, eh!?

Drilling Holes For The T-nuts

As mentioned above, the legs will be inserted into T-nuts. In case you haven't seen a T-nut before, here's what one looks like.



So let's drill the holes. Remember to clamp the wood down before you drill the holes -

there's quite a bit of torque in a power drill.

Step 1) - We first drill a 1/8" pilot hole in each of the 4 gussets. This will make sure that subsequent drilling operations line up.

Step 2) - Since the Styrofoam sits on top of the gussets, we need to counter-sink the "**Top**" of the hole by 1/8" so that the head of the T-nut will be below the surface of the gusset. (Remember that we marked the gussets as to "**Top**" and "**Bottom**".) Otherwise, our Styrofoam will be sticking about 1/8" above the top of the module. To do this, we can use either a 1" Forstner bit or a 1" spade bit. I prefer to use a Forstner bit as it leaves a nice flat surface. Clamp the gusset before you start to drill! Be careful when applying pressure to your drill. It's very easy to drill right through the wood when the bit starts to bite! As you finish each hole, lay the head of the T-nut into the cut and make sure you can't see any of the head when you scan across the surface.

Step 3) - Next, clamp the gusset on top of a scrap piece of wood. This is to reduce splintering when the drill bit breaks through the other side. Now, drill a 3/8" hole right through the wood so that the barrel of the T-nut will fit into the hole. Test fit each hole by pressing the barrel of the T-nut into the hole. You should have a nice tight fit.

Step 4 - If you didn't do it before, mark each piece as **"Top"** as shown below and **"Bottom"**. It'll save you lotsa headaches later on. (Since I've repeated this step twice, it MUST be IMPORTANT!)

And that's all there is to it. The photo below shows each of the above steps.