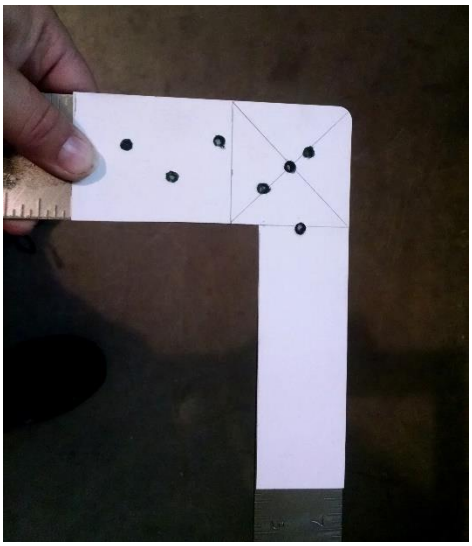
Making weave poles with steel framing squares

Need:
12 steel framing squares (thicker steel is better)
12 steel joining brackets (8" 12ga heavy duty strap)
12 PVC slip plugs ¾"
12 PVC slip connectors ¾"
Box of 100 #8 round head bolts (½" long) and nuts
12 #8 round head bolts 1" long
12 washers ¼"
12 washers #8
2-3 titanium drill bits 11/64
4 PVC pipes ¾" x 10'- cut to 40" sections
Hacksaw
Screwdriver
Needle nose pliers
(optional) Table top drill press
(optional) Non-skid tape (for center bar of the finished piece)

NOTE: These will only work outside, on dirt or grass, due to the ends of the bolts sticking through to the underside which could rip or puncture indoor flooring. If you used 'post screws' of the proper length, then these would likely work inside. Might need to tape over the straps.



I made a template, but found it didn't help as much as I thought it would for the holes in the connecting strap. It wasn't precise enough. But it did help to place the holes for the pole bases. I drilled 2 holes, one at the X for straight poles and the one (at the lowest point on this template) that is on the narrow "foot" of the framing square to create slightly off set poles. If you want to create channel weaves, you can make more holes along each foot. You'll want to drill all those holes now rather than later!

Drill the holes for each pole at the marks you made through the template.

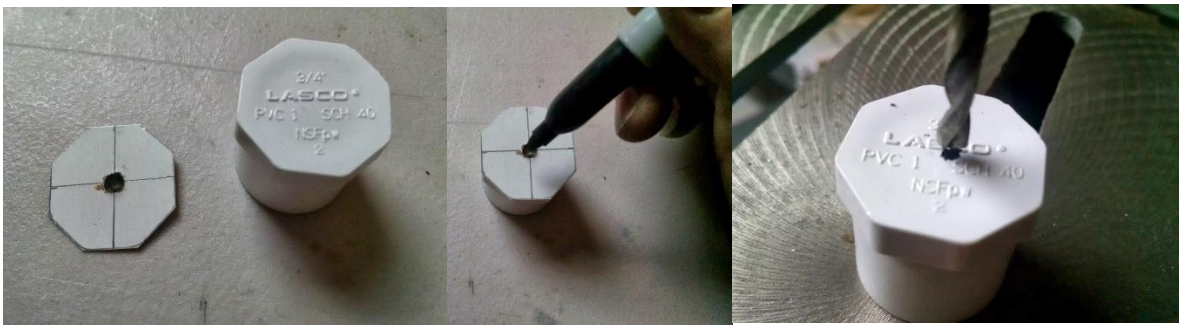
NOTE: I used $7 framing squares, but the end result is MUCH more flexible than I thought it would be. If I pick up the set of 6 poles in the center, I can lift it above my knees before the ends come off the ground and it looks like a rainbow shape. This doesn't affect their performance, but if you want a stiffer base, the thicker steel in the more expensive framing squares may be less bendy (this theory hasn't been tested).

When you drill through the metal, it tends to leave sharp bits on the underside. I ripped these off with a pair of needle nose plyers. If you have a round file that is small enough, you might be able to make the holes smoother, but since it is covered by a screw head or a nut, I just wanted to get the big chunks off.

I put a mark at the halfway point of the brackets/straps and then held half of the strap in place to drill the holes for the screws. A clamp would likely be better, but I didn't want the have to keep tightening and untightening and positioning one on the base plate of the drill press for all the holes I needed to drill. I held it by hand to drill one hole, then put in the bolt and made it as tight as I could to hold the strap in place for the rest of the holes to be drilled. You'll want the strap as straight as possible.

Bottom of the bolt goes into the hole toward the strap.

Next I made a template to find the center of the plugs, used it to mark all the plugs, and drilled a hole in the center of each.



Once the strap is fully attached, flip the framing square over and drill through the strap using the hole you drilled for the pole as your guide.

Making sure you get the screws in the correct direction is important. You don't want to attach the plugs just yet, but here is how it should look when you're ready to attach them:

When you attach the plugs later (after you have attached each square together with others) you'll want to use the 1" long screws. Shorter screws would work, but I found it easier to set the washers and start the nut with the longer screw. And holding the nut with the needle nose pliers while turning the screw head with a screwdriver till it was tight worked best. I used 2 different size washers because I couldn't find one that was the larger diameter with a small (#8) sized hole in the center. The larger washer helps distribute the force and hopefully helps prevent the base from snapping off with a fast dog.

Once you have a strap attached and all the holes drilled for your poles in each framing square, you're ready to attach them together. Because of how flexible the squares are, I found I had to use a lot of support as I attached them to each other. I stacked up boxes and knee pads I had around to get them supported at the height of the drill press base. Then positioned the next framing square so it was aligned with the previous and held it in place as I drilled the first hole. I put the bolt in that hole and tightened it to hold everything in place for the next holes to be drilled. Repeat 12 times, moving the drill press as needed.

I made 2 sets of 6, then finished the final connection once I had them in place in my yard.

Then you're ready to carefully flip them over to attach the PVC plugs as described above. Once the plugs are securely attached, fit the PVC connectors over them. It is the connector that will hold the poles. You might need a hammer to be sure the connectors and poles are fully attached.

In order to get proper pole placement (for 24" spacing) you'll need 12 framing squares. But the last one doesn't need to be 24" long. So if you don't want a lot of extra length after the last pole, you'll want to cut it off before you attach it to the others. A vice and hacksaw work, or you could use a rotary cutter (just make sure nothing flammable is close by to get hit with sparks).

Finished sets, showing trimmed end on the bottom left and strap on the bottom right ready to be attached at the top of the left set.

Quick clip of the poles in use by my fast, 60 lb Lab: https://vimeo.com/286458136