

Metal-Working for Dummies, part 3. Top panel.

Wall of Sound.ca DIY all tube phono preamp project

Tools required:

Same as: Metal Working for Dummies, part 1.

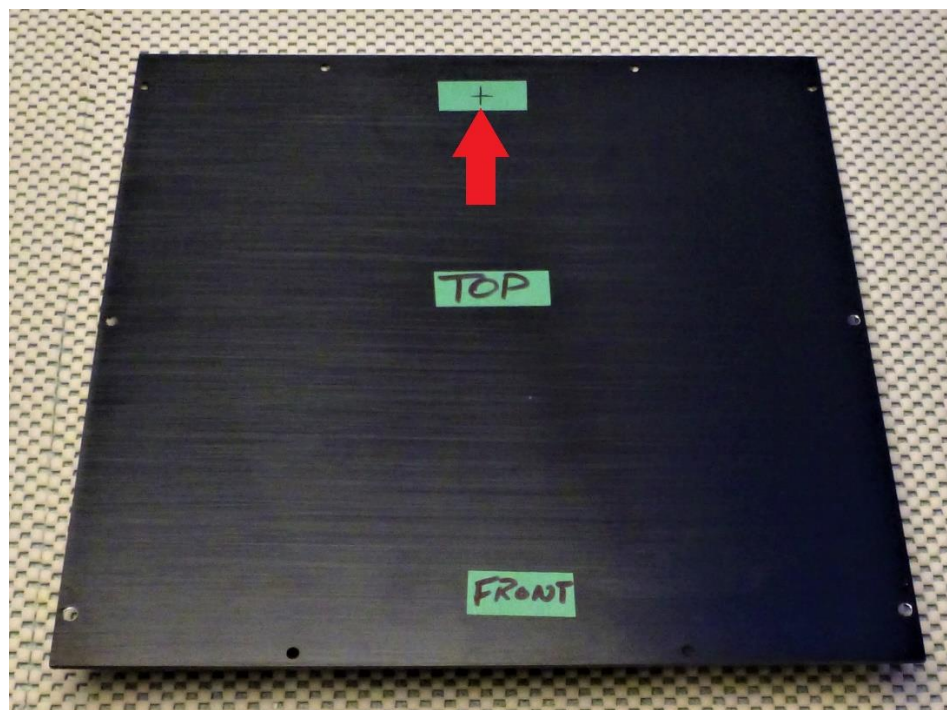
A sheet or two of 8½" x 11" graph paper

Layout:

To avoid scratching the outside surface place a piece of rubber or vinyl on your work bench. The mesh shelf liner sold in dollar stores works well for this.

Now that you've cut your teeth on the bottom panel the top is fairly easy. The positions of the holes are not that critical EXCEPT they need to look uniformly spaced. With the exception of one small grounding hole at the rear of the panel all of the holes are for ventilation.

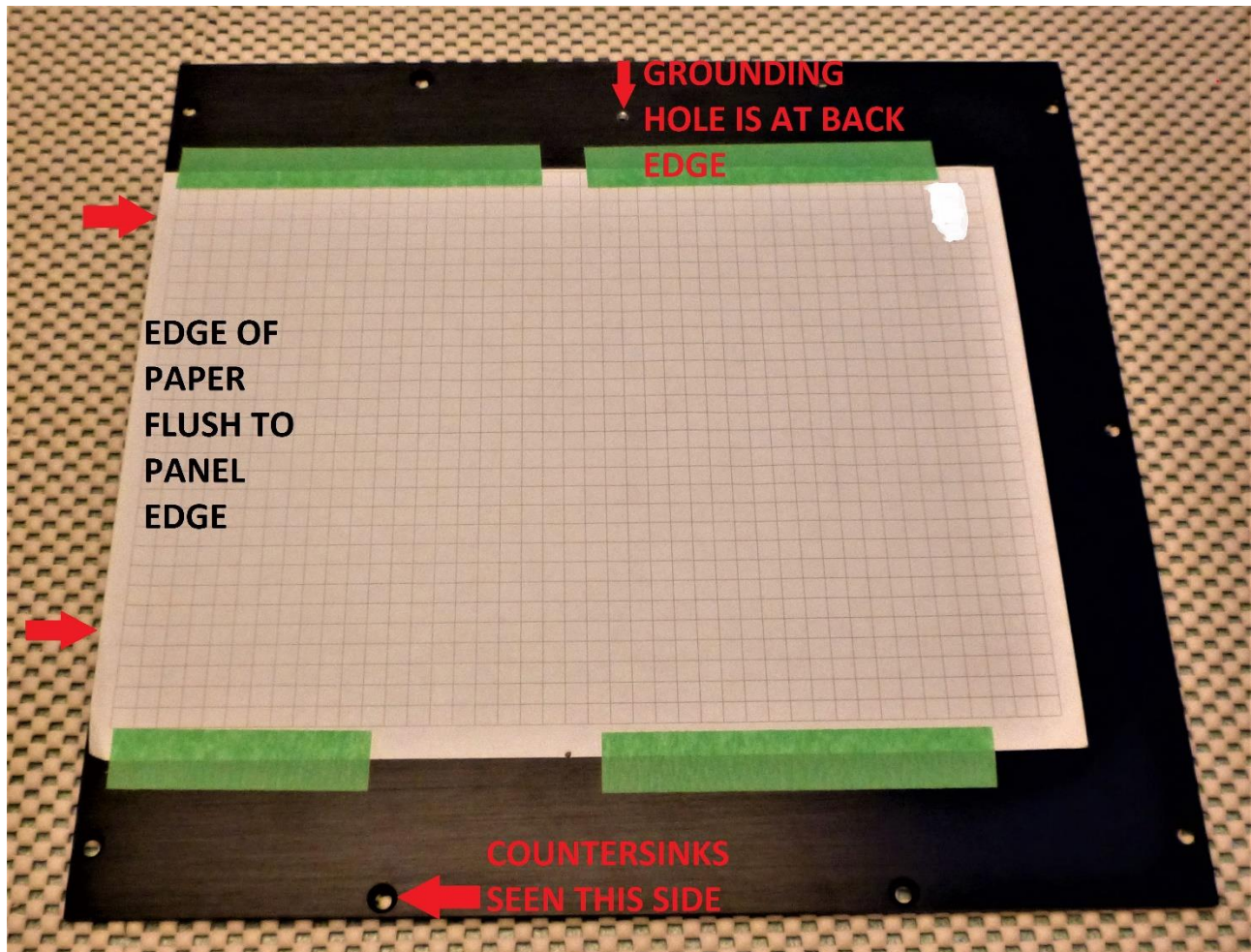
First drill the grounding hole. This will help orientate the panel for us. Flip the panel so that the inside surface is facing up. Measure along the back edge and mark the centre to within 1/8" (3mm). Measure in from the back edge 1" (25mm) and centre punch. Centre drill, drill a 1/8" (3.2mm) hole and deburr.



Place the top panel to your bench with the outside (side with countersinks facing up) and the just-drilled hole farthest from you.

Remember graph paper, or if you are much younger than I, maybe not. Anyway, get your hands on some graph paper. It will make layout of the holes much easier.

Tape a piece of graph paper to the top as shown below ensuring its edge is flush with the edge of the panel.



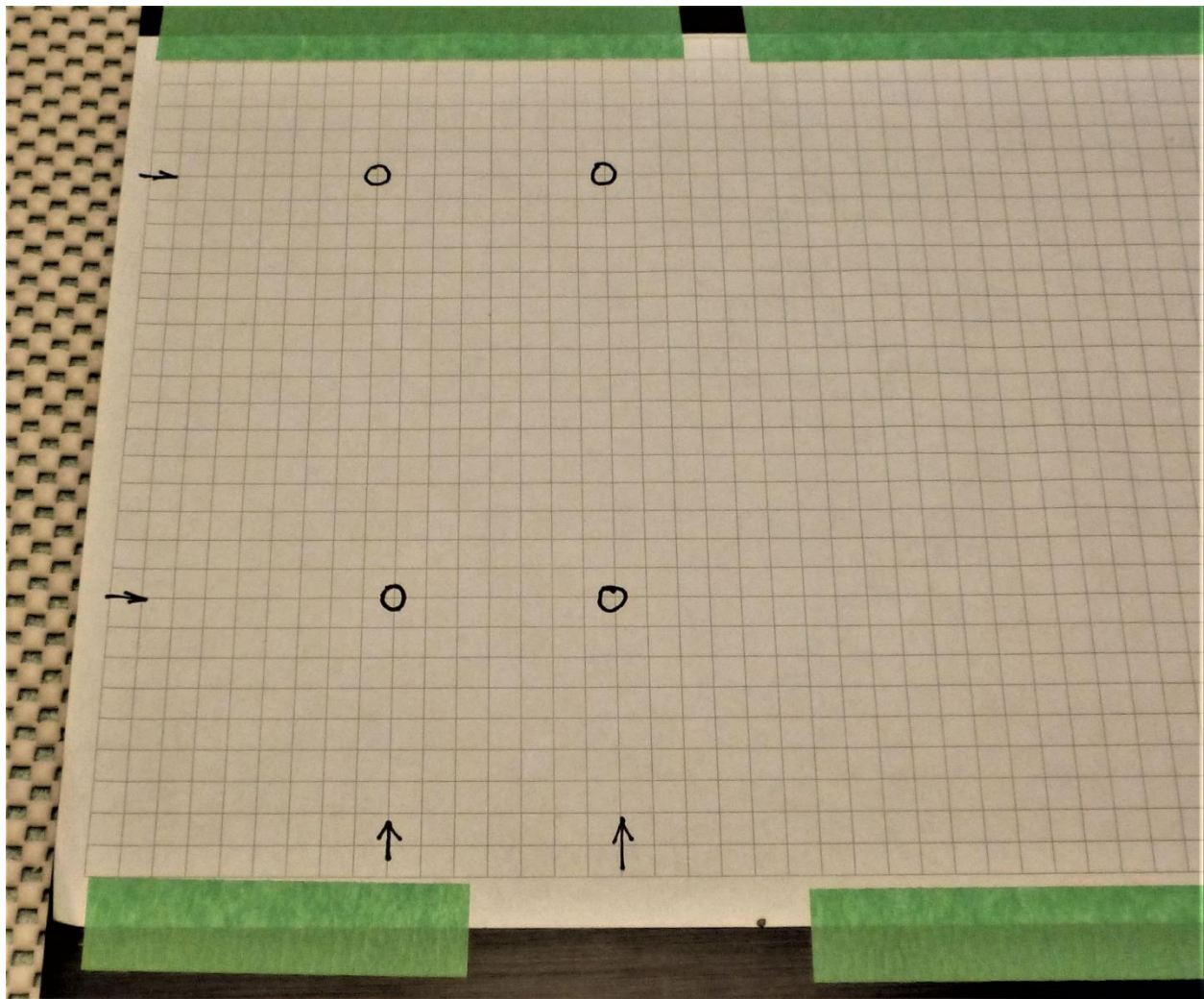
Measure over $2\frac{1}{2}$ " (63mm) from the left-hand edge and put a mark on the line nearest.

Measure over $4\frac{3}{8}$ " (111mm) from the left-hand edge and put a mark on the line nearest.

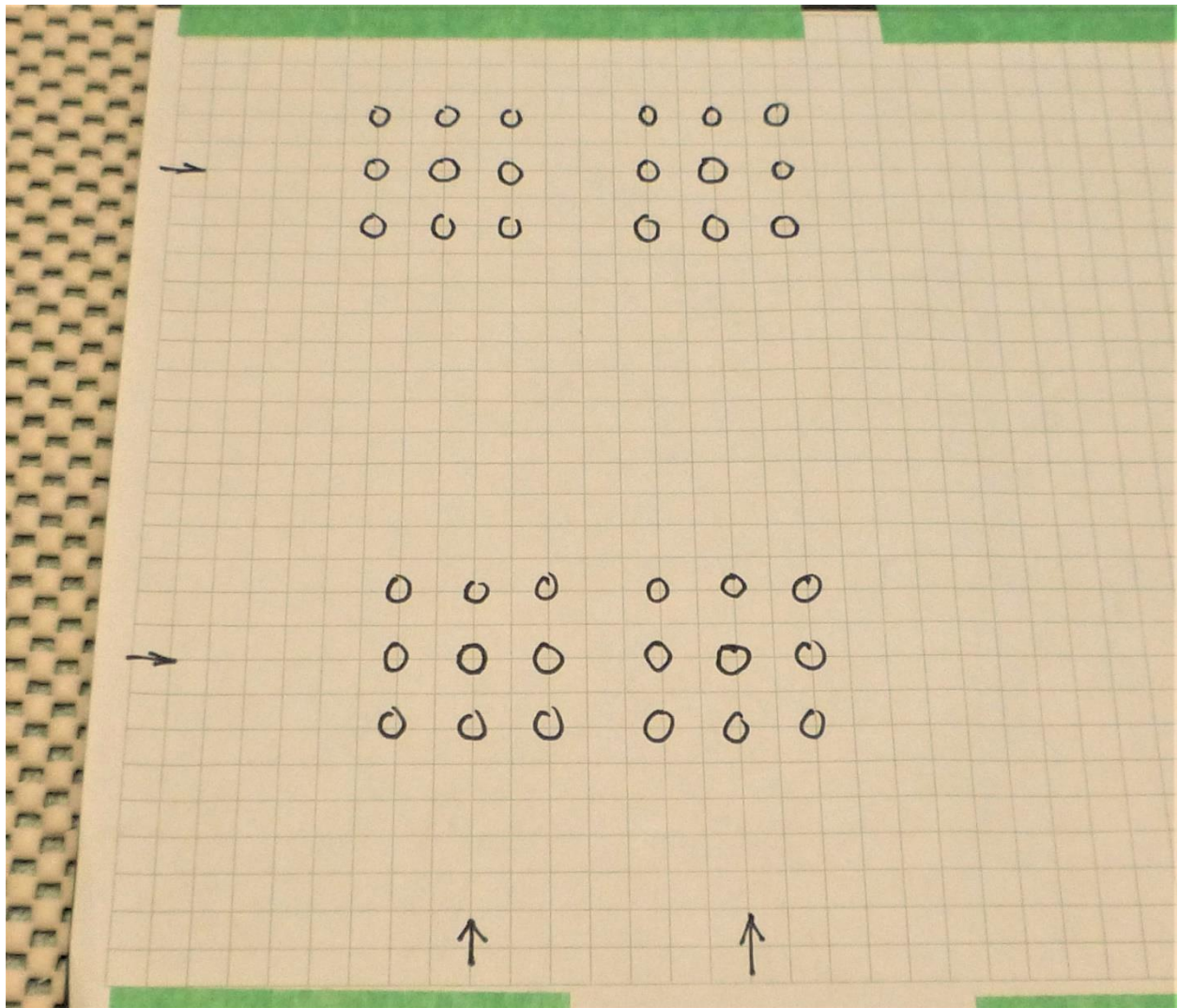
Measure up $4\frac{3}{8}$ " (111mm) from the front edge and put a mark on the line nearest.

Measure up $8\frac{1}{4}$ " (209mm) from the front edge and put a mark on the line nearest.

At the intersections of these lines draw four circles.



Make a square pattern of 8 more circles about $\frac{1}{2}$ " (13mm) in each direction from each of the four initial circles.

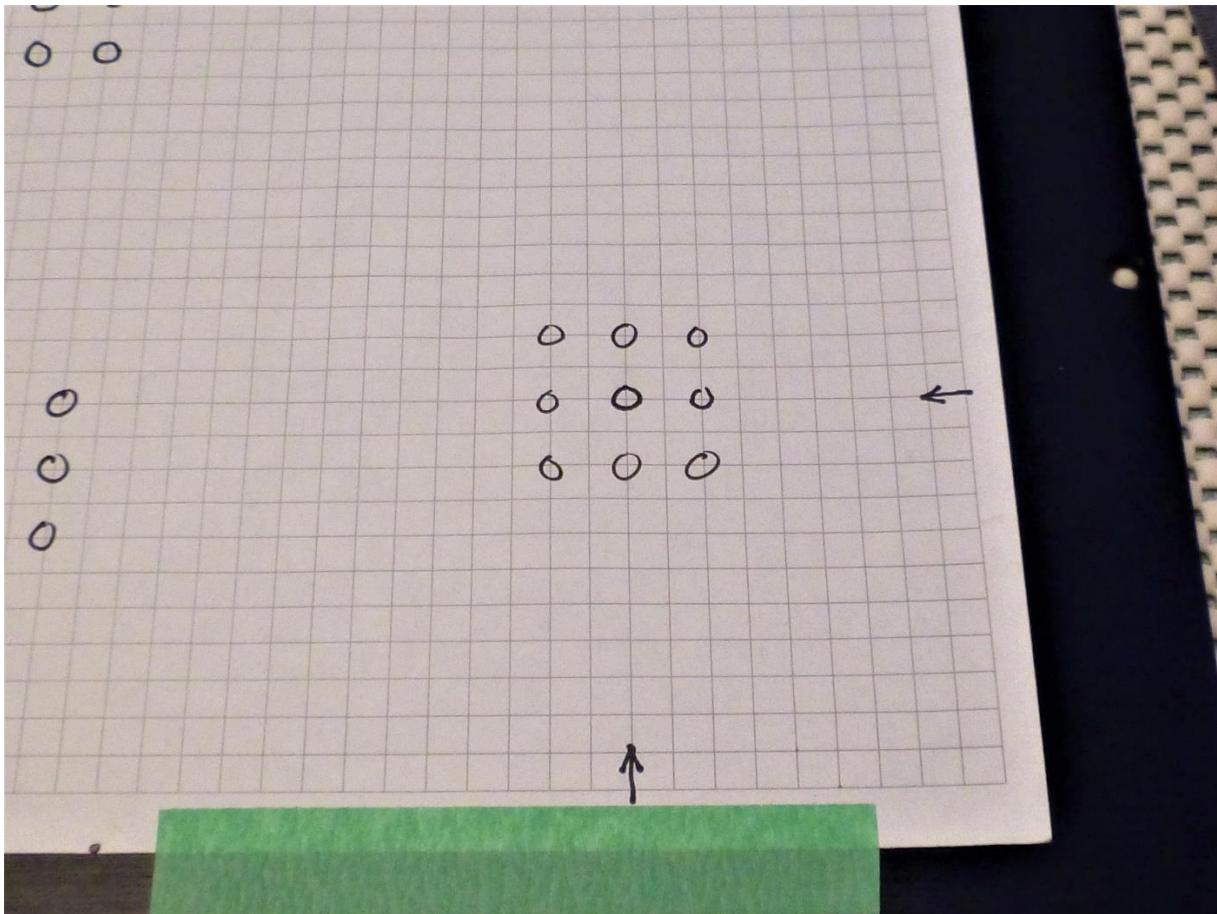


Measure over $3 \frac{5}{8}$ " (92mm) from the right-hand edge and put a mark on the line nearest.

Measure up $4 \frac{7}{8}$ " (124mm) from the front edge and put a mark on the line nearest.

At the intersections of these lines draw a circle.

Make a square pattern of 8 more circles about $\frac{1}{2}$ " (13mm) in each direction from the initial circle.



Optional inspirational musical accompaniment: We'll be doing a lot of hammering soon so if you wish play the Anvil Chorus.....

Now comes the tricky bit, but you've had lots of practice on the bottom plate. Just take your time. Centre punch exactly on the intersecting lines in each of the 45 circles.

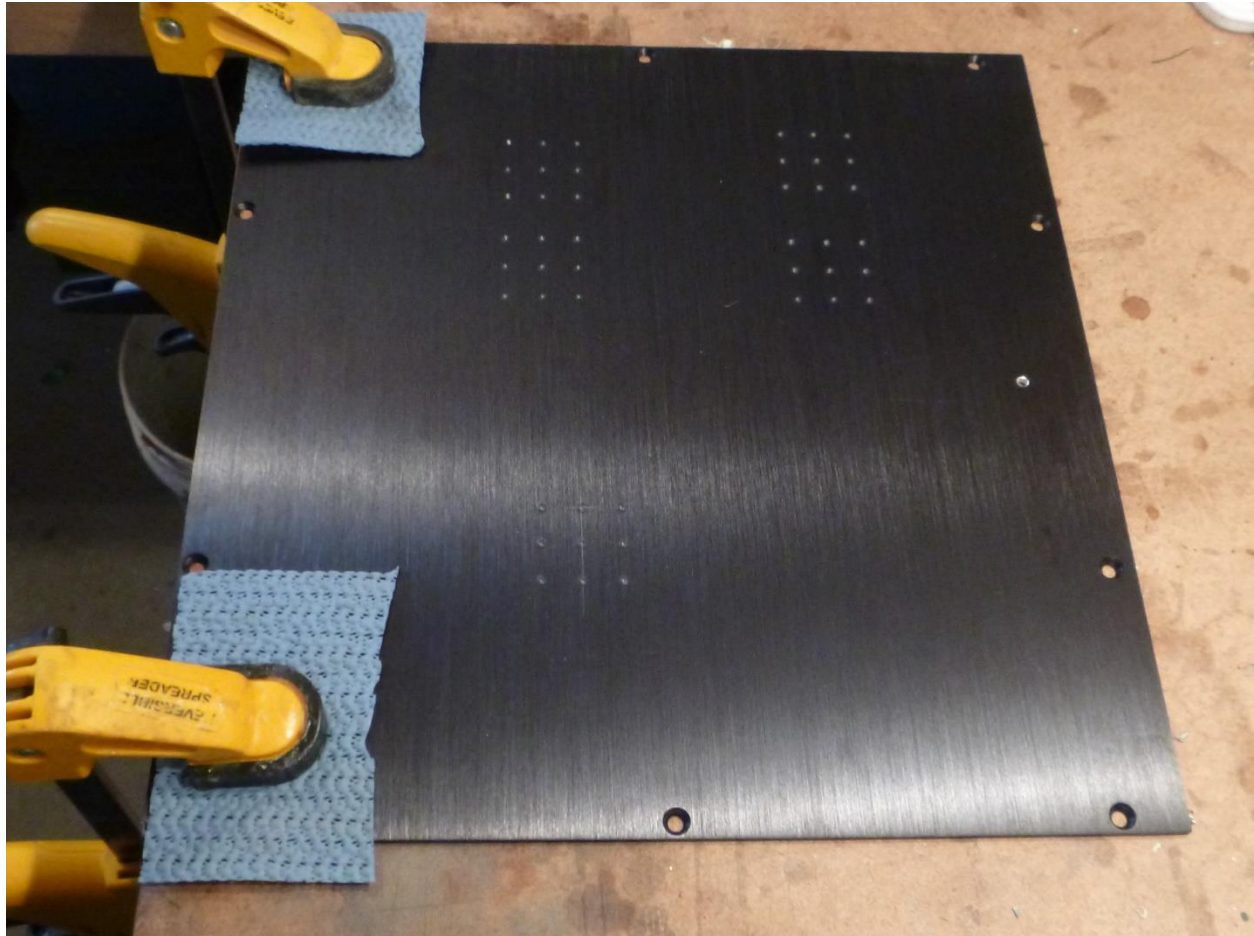
I find if I touch the point of the centre punch lightly on the paper then pull it away I will be able to see if I'm on the exact intersection of the lines. If I'm not on the exact intersection I can try again until I'm in the right place before I tap the punch with the hammer.

This will be one of the most visible parts of the project. You'll want to get it right to avoid grief from your significant other and/or your audiophile buddies.

Peel off the graph paper and inspect the centre punched marks. You'll be using the larger of the two centre drills so if you wish to enlarge the centre punch marks by giving them another wack with the centre punch go right ahead. (Cue the Anvil Chorus again.)

Clamp the panel to your work bench using small pieces of soft material between the clamps and the panel to prevent scratches. As you will be working on the external surface to the top panel be careful to avoid damage.

Using a little alcohol to cool the drill bit, if you wish, centre drill the 45 marked positions.

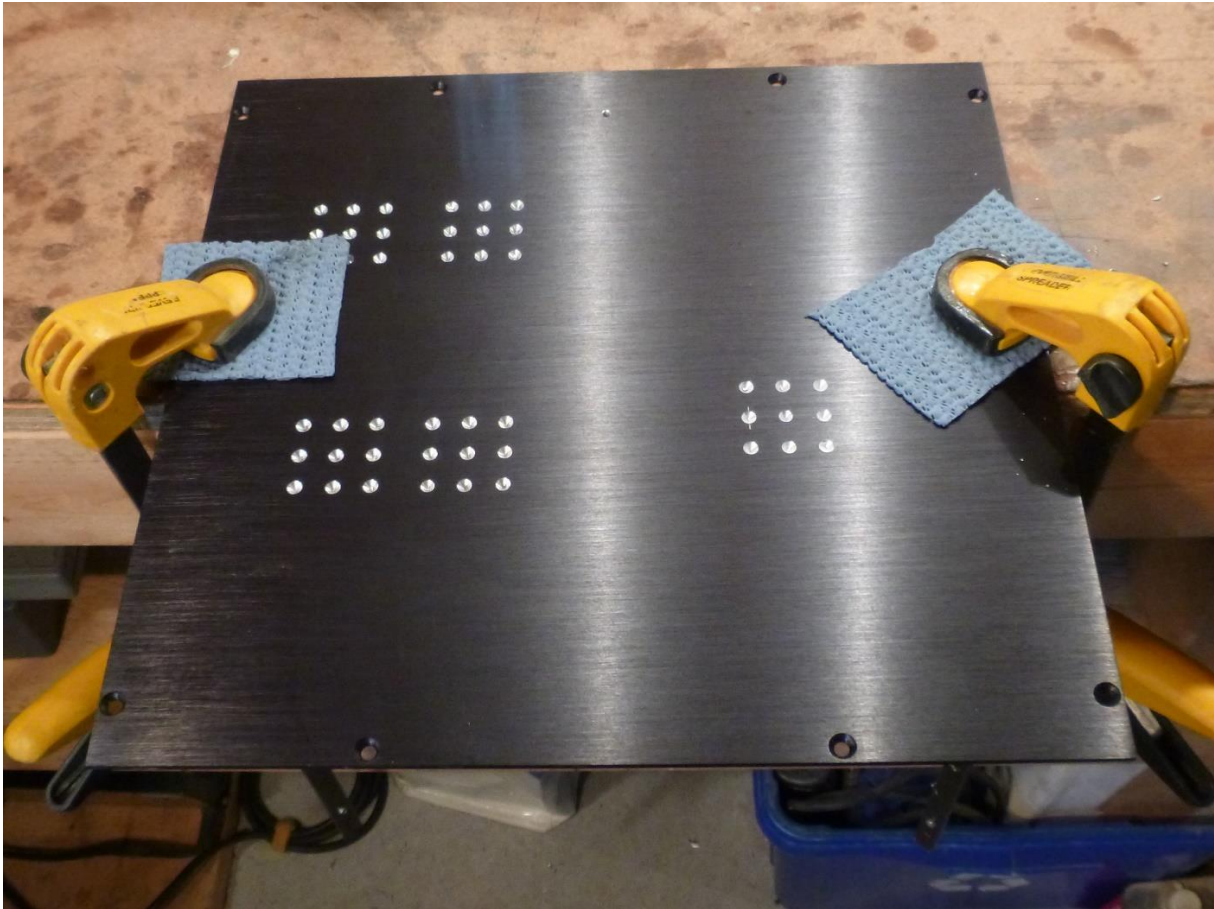


If a centre punch mark isn't quite in the right position it can be "pushed" a bit as shown in, *Metal-Working for Dummies*, part 1.

Remove the graph paper.

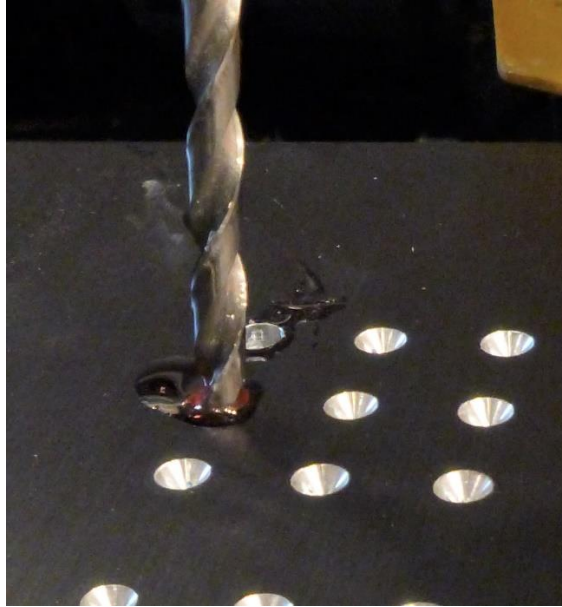
With the centre drill stationary set its point in the centre punched divot. Start the drill turning slowly to ensure it doesn't wander. Allow the angled part of the centre drill to "bite" into the top panel. This will give the drill in the next step a better start.

If you have a friend, neighbour, relative or work colleague with a drill press now would be a good time to take them a large coffee and an even bigger donut. These holes can be drilled by hand but a drill press makes it easier. If you have access to a drill press layout the front and rear panels as well, see Metal-Working for Dummies part 4, so you can drill all of these for the price of one coffee and donut. However, if you are careful a two-speed, variable speed drill like the DeWalt shown in part one works well.



If using a hand-held drill, it's near-essential to clamp the panel to your work bench as the larger drills tend to "grab" when drilling. Put a piece of rubber between the clamp and the panel to protect from damage.

Put a 13/64" or 5.1mm bit in the chuck or the drill. Put a few drops of alcohol in the centre drilled mark to help cool and lubricate the drill bit. If you wish, automatic transmission fluid (ATF) performs well when drilling aluminum. It does however make a bit of a mess that requires solvent, often acetone, to clean up.



With the drill bit not turning place it in the centre-drilled recess. Start the drill turning slowing then increase speed once it has started to "bite" into the panel.

Perform the next task carefully for a better-looking finish: when deburring the holes attempting to get the chamfer or beveled edge made by the countersink bit the same size on each hole, especially on the top (external) side of the plate.



Set the plate aside and proceed to, **Metal-Working for Dummies, part 4**. This will detail the layout of the holes in the front, back and side panels.