

## Angle Plate

I wanted a small angle plate. On the web I found several angle plates on offer, but they were a bit expensive. I had a piece of 60mm angle iron in my pile of scrap and decided to try to make a pair of angle plates since the piece was long enough. I wanted webbed angle plates and decided to silver solder some pieces of steel to the ends of each angle plate.



## Materials

I used a 160mm long piece of 60mm angle iron, and two pieces of 8 x 15mm steel a little over 150mm long and a piece of 4mm diameter steel rod. The angle iron was clamped to the milling table and a light cut taken on the top to get it parallel to the bottom.

## Support webs

The webs were made from a piece of 8x15mm steel. I first cut each piece in two, drilled two 4.2mm holes through both. The holes in one piece was tapped M5, in the other the holes were opened up to 5mm. I screwed two webs together and milled all sides. I used a protractor and clamped them to the milling table at 45° with brass shims under the work. I could then mill both ends to 45° by using the longitudinal and cross feed screws.

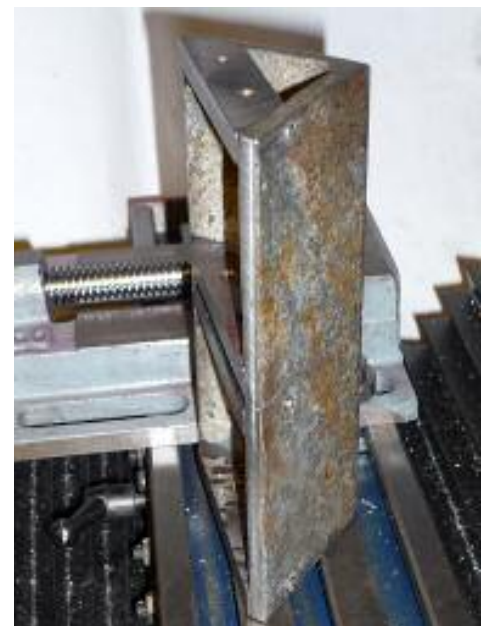
I milled a small part of the inside of the angle iron where the webs will make contact. This will give a clean surface when silver soldering.

To make sure that the support webs stay in place while silver soldering I decided to drill 2.5mm holes through the corners of the angle iron and into the webs. The parts of the holes in the webs were tapped M3, and the holes in the angle irons opened to 3mm and countersunk. I used a small C clamp to clamp the webs in place while drilling.



I chucked a piece of 4mm diameter mild steel and turned it down to 3mm for a length of 10mm. Most of that was threaded M3 with a die held in a tailstock die holder. The other end was turned to fit the countersunk hole in the angle iron. The heads were made a little longer than necessary; the protruding parts will be milled away afterwards.

I applied soldering flux to the angle iron and web pieces and used the home made screws to hold the parts together before soldering (right picture).



### Drilling and milling the soldered parts

After soldering I mounted the angle iron in a vice. I used two small machinists jacks to assist in the clamping (they are barely visible in the picture to the right). I drilled a couple of 6mm holes so the angle plate could be clamped to a square cast iron block for milling.

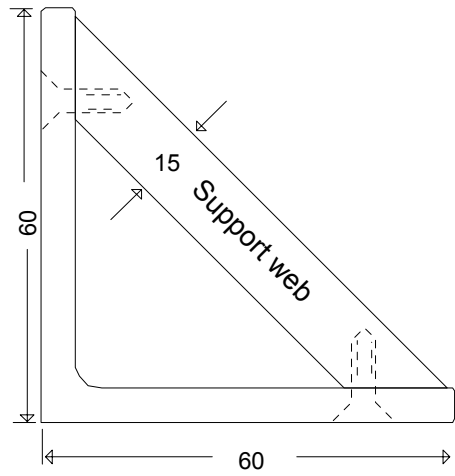


The square cast iron block was clamped to the milling table and a dial indicator used to set it parallel to the longitudinal movement of the milling table.

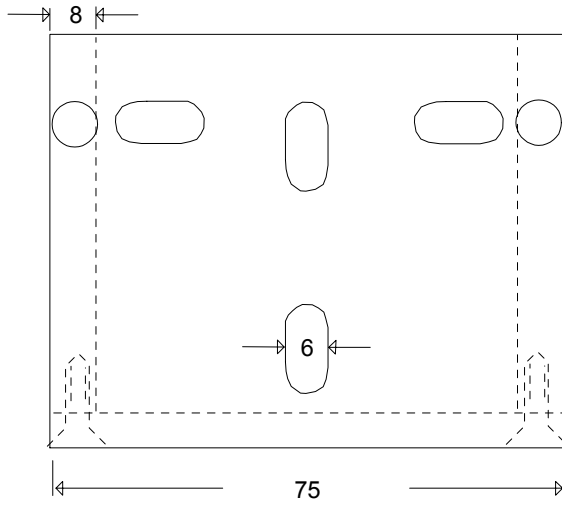
Here is a picture of the angle plate clamped to the cast iron block. The top face has been milled and one of the sides is being milled. The long angle iron was then cut in two with a hacksaw to give a pair of angle plates. The bottom picture shows how I milled the hack sawed ends.



The angle plates were heated and dipped in oil to give some rust protection.



Side view



Front view

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Angle Plates						