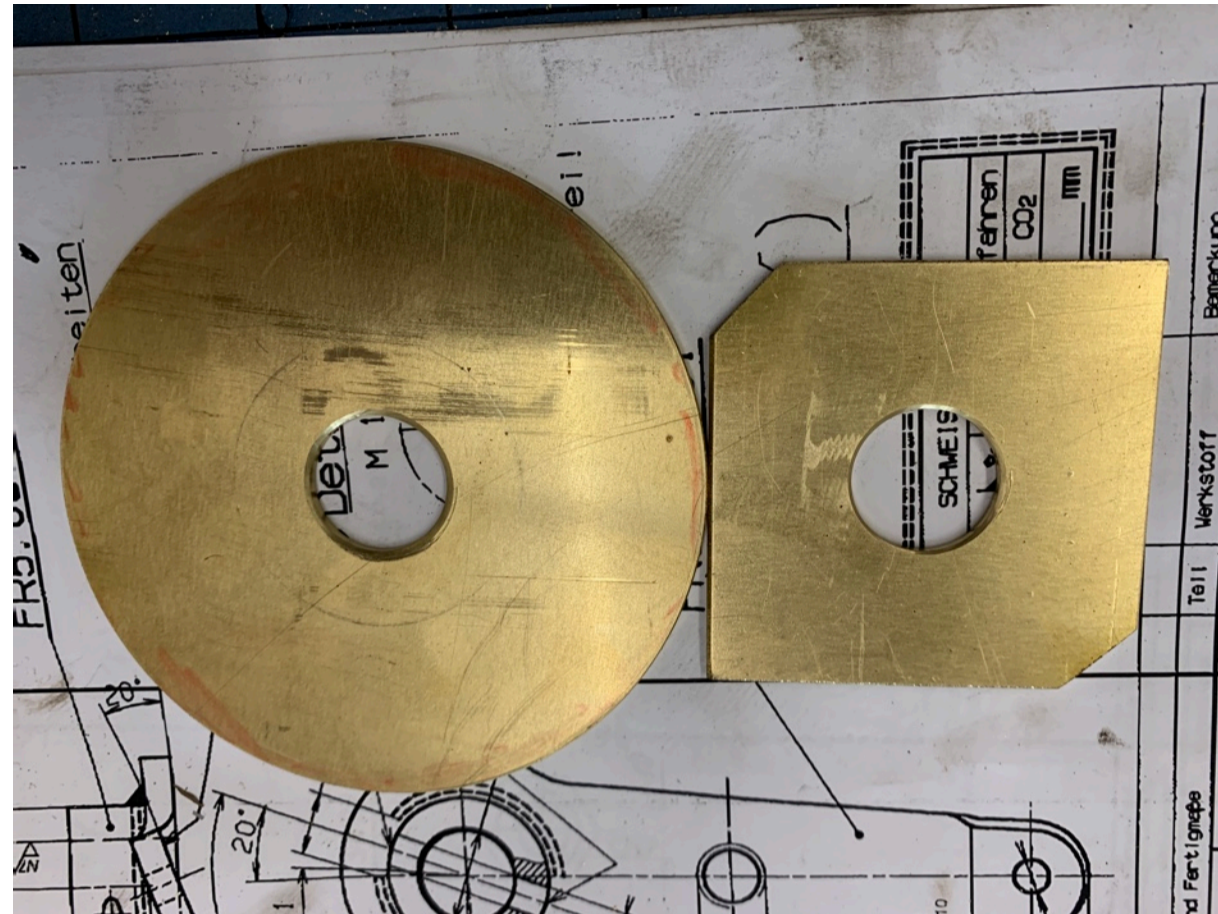


# Building the Patchfeed Plates





Hello

My name is Hans and i am from Austria. I am a HamRadio Operator since 2014. My daily Job is the work with Metall on big, heavy and expensive Machines.

The Dual Patchfeed is the Brainchild from Dr Mike Willis and UHF-Satcom. They did a great Job in designing this Feed and they also made it OpenSource so everyone can rebuild one for himself. Remco den Besten wrote a great Manual that describes the Feed in Detail. It is found here:

[https://uhf-satcom.com/blog/patch\\_antenna](https://uhf-satcom.com/blog/patch_antenna)

Today i am going to give you a Step by Step Instrucion in how to build the Plates for the Dual Patchfeed with the most common Tools available.

I have noticed that there is are a few Issues with getting on the Air on the new Geostationary Satellite. Alot of People are afraid of building the Feed themselves because the think they have little Skills and not the right Tools.

Let me tell you: You dont need much to build this Feed. This is a nice weekend Project and can be done by EVERYONE no matter if you are a Master in Metallworking or a Accountant.

Take your Time, Dont get nervous or stressed and just do it...

The Tools needed for this Project should be in every home. If you havent got them buy some.

The only Powertool really needed is a Powerdrill, but i would highly recommend to get an Anglegrinder. They are cheap and you will be alot faster...

I assume that everyone who has access to more Hightech Machinery does already know in how to use them. In this Guide we will only use Basic Tools...

Now let do this...



# Disclaimer and Safety

In this Guide i describe how i would build the Plates. If you have other Ideas and Methods that are more effective or accurate please let me know, but don't yell at me saying „this is sh%%, why didnt you use this and do that instead...” A lot of ways lead to Rome...

Everyone is capable of making these Plates with basic tools that should be in every home Workshop. No special knowledge is needed. BUT be adviced that working with Metall and Fire always can hurt you and your Belongings. Be aware that some Tools and Materials used in this Manual can be Dangerous for your health and Safety.

- Don't touch hot Parts, even if they don't look hot.
- Don't touch not deburred Edges of Metallparts.
- Don't set something on Fire when working with Anglegrinders.

I, nor the Designers of this Feed are responsible for any Damage you do to yourself, your Belongings, Others or any technical Equipment you connect to this Feed

A word of Advice before we start the Action: Take yourself as much time as you need to build this Feed. The key in a good working Antenna is Accuracy. Have your tools prepared and in good usable Condition.

Quote: „Slow is Smooth and Smooth is Fast.“ Phil Dunphy



# Tools and Parts needed:

- The Material For the Plates: Brass or Copper 1-3mm thick. Either they cut your the Parts to Dimension (not smaller than 107 x 107 and 68 x 68) or you cut them yourself. Make them a bit bigger so you have some Margin...
- A Coppertube Outerdiameter 22mm Lengh 120mm
- A Powerdrill
- A Flatfile
- A 90° Angle
- A Centerpunch
- A Powerdrill
- A Stepdrill up to 22mm
- A Ruler or a Streight Piece of Metall
- A Marker (one with a thin Tip and a broader one...)
- A Caliper (Preferable one where you can lock the Slider)
- !!!SafetyGoggles and other personal Protection Gear!!!
- Nice to have: a Angleginder with a Cutting and a Grinding Wheel
- Nice to have: a Vice



# Let's begin:

Take the 2 Plates and make sure that they are at least 1 mm bigger than the Final Plates are. Its better when they are 2-3mm bigger.

The finished Plates will be 105mm in Diameter and 65.5mm square so do some Math and then we will get this Party going...

Now the first Step is to bring the smaler Plate to Dimensions and to the right Angle. Please ignore the big fat Hole in the Plate, this Will be done later because its easier this way.

First we have to find a 90° angle on one corner of the Plate. If there is none we will make one... Dont worry =)

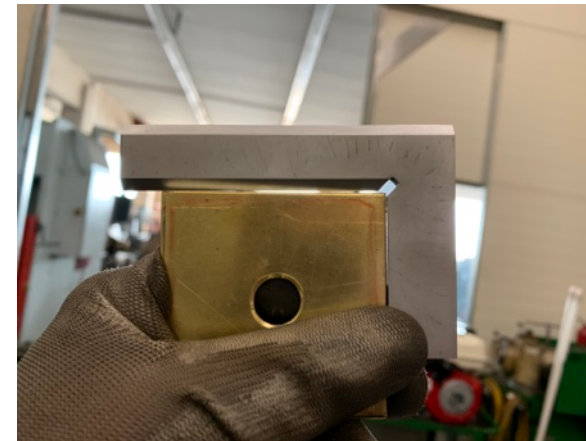
Use your 90° Angle and put one side flat onto one Side. Then slide the Angle down so that it touches a Point on the second Side of the Plate. If you hold the Plate against the Light youll see a Gap. If the Gap is bigger on one Side than on the other Side the Angle is not exact 90° use a File and file on the Side where the Gap is smaller.

Check again with the Angle and do this process as long until the Gap is the same on the complete Lenght of the Side. Mark this Angle with the Marker. This is our first Angle...

Now rotate the Plate and put the Angle on one filed Side and on one not filed side. Check again for the Gap and file until the angle is 90°

When this is done you can measure the width with the Caliper.

File until the Measurement is 65.5mm and check for the Angle between filing...



When you have one Measurement correct between 2 Edges continue with the last Edge.

Check Angle, File, Check Measurement, File,... You got this...

Make Sure that you file in a 90° angle between the File and the Surface of the Plate. A Vice is very Helpfull. When finished we should have 4 90° Angles and the Plate should have 65.5 x 65.5mm. There is a bit of a Tolerance, but try to work accurate...



Use your Ruler and a thin Marker and mark the Center of the Plates. Its best when you put the Ruler diagonally over the Edges of the Plate and draw a small line in the Center. Do this also over the other two Edges.

You should end up with an X in the Middle of your Plates.

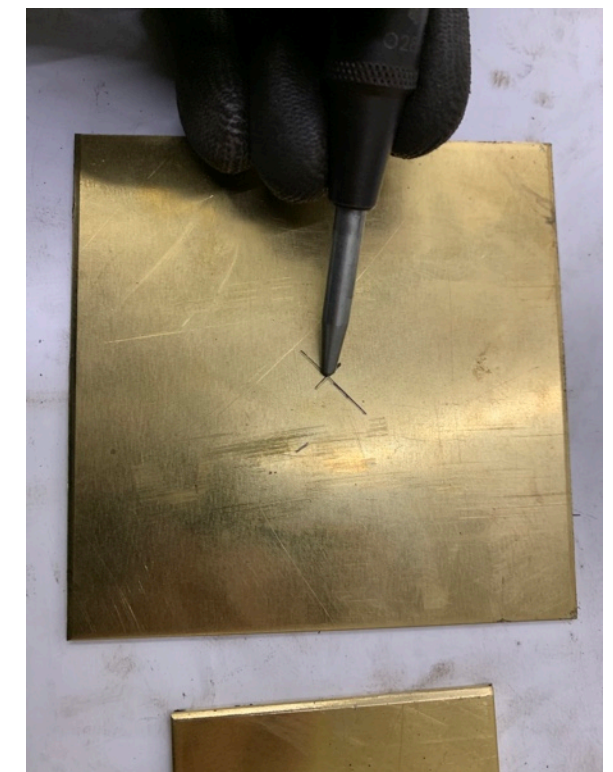
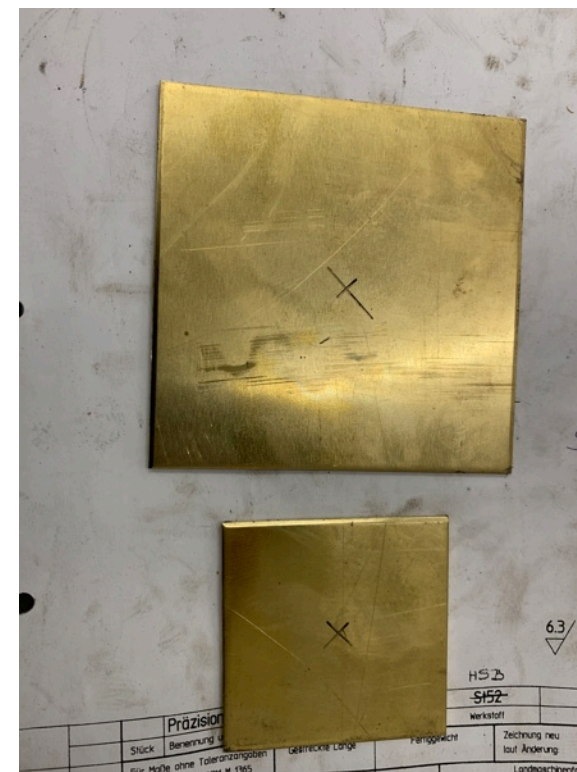
Take a Centerpunch and make a Mark in the Middle of the X.

A good Technique is that you hold the Punch in an angle at first (see Picture), so you can see the Tip and align it. Then hold the Punch upright and hit it with the Hammer but gently at first. You can check now if you have hit the desired Spot.

If you missed, give it another try on the right Position. Do this as often as you need to finally hit the right point. ;)

When you have created a small Mark you can put the Centerpunch in that Mark and hit it harder so that you get a nice Dip in the Plate.

Quote: „Good centered is half drilled...“ Aaron Whifflingpin





Take your Caliper and set it to the Radius of the Refelctor Plate. (52.5mm) Lock the Slider of the Caliper.

Now put one Point of the Caliper into the Dip we Made and the other Point onto the Plate. Slide the Caliper all around the Plate scratch a Circle into the Plate.

After you have done this check the Diameter of the Caliper. It should be around 105mm. If its a bit Smaller its ok, it is better to see the Scratch later when we Grind it round. If the Diameter is too Big, Set the Caliper for a bit less than our last Setting and slide it around again...

You can Paint the Area where the Scratch will be with a bigger Marker, so you can see the Scratch better...



Use the Powerdrill with a Stepdrill for the Centerhole.

Put the Plates into a Vice or Try to hold it very tight and Drill the Centerhole where we made the Dip.

Use the high Speed of the Drill when the Hole is still small and go down With the speed when the Hole gets bigger.

Drill as streight as possible until you reach a Diameter of 22mm.

Use a Countersink or the Stepdrill to deburr the Holes on both Si-  
des.





I got my Pictures mixed up a bit there so dont worry that your bigger Plate has a Hole in the middle and the one on the Picture doesnt. Your doing great ;)

Take the bigger Reflectorplate.

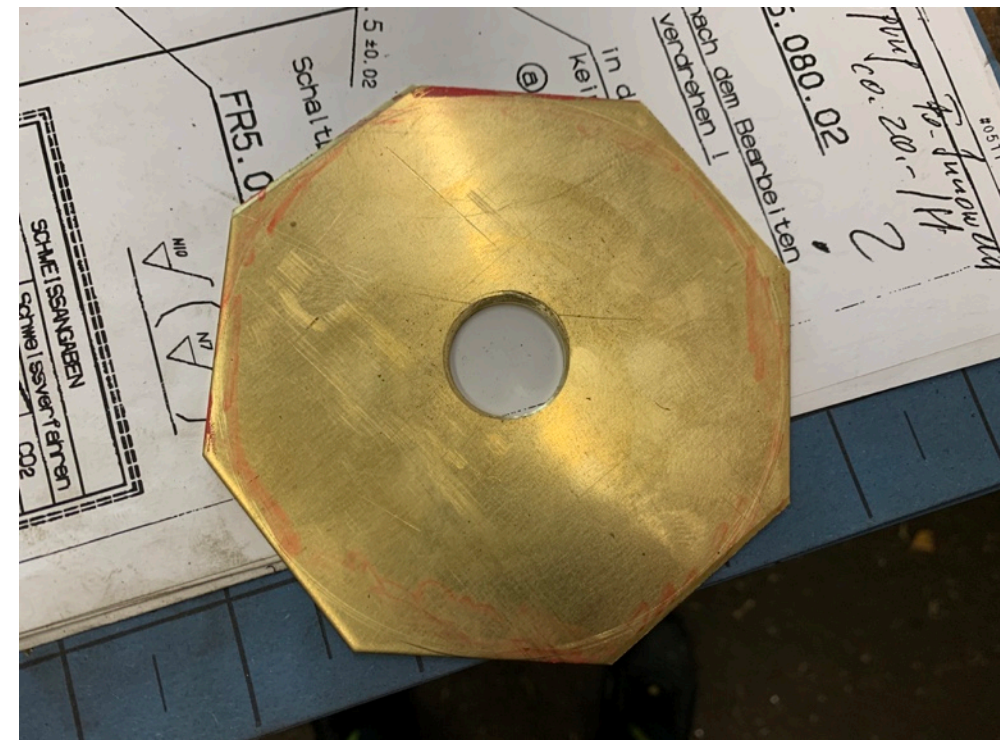
Draw 4 Lines on the edges that are a bit away from the round mark we made. We will just cut the corners so we have to grind less.

Use your Anglegrinder or a Handsaw to cut away the Edges. Make sure you dont cut too much into the Plate, We dont want to get inside our marked Circle...

The Plate should now look like the one on the last Picture.

You can also cut away the 8 remaining corners... Just make sure you dont cut into the Circle...

Now give yourself a rest... You did a great Job till now. Get something to Drink and to Eat and admire the job you did thus far... =)



(See Appendix 1 for an alternative Method)



Now we will make the Reflector Plate round.

Take your Anglegrinder with a Grindingwheel or the file and begin to grind Away from the remaining Edges. Grind thus far that you are away a bit from the round Scratch. do this on all Sides until the Plate is round.

Take a look from time to time and check with the Eye where the Plate is not round. Youll fast notice where you need to grind further.

When the Plate appears round, take the Caliper and measure the Diameter on different Points. Mark those Points who need more grinding and try to make the Plate as Round as Possible.

Make sure that you file in a 90° angle between the filed Side and the Surface...

When you are finished the Plate should be 105mm in Diameter. Use the File to deburr all sharp Edges of both Plates.

(See Appendix 1 for an alternative Method)





We are almost finished now.

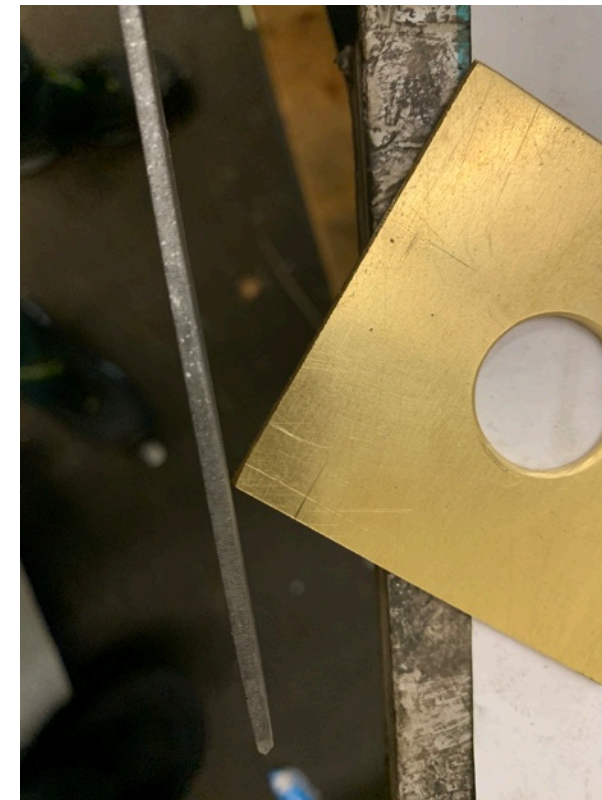
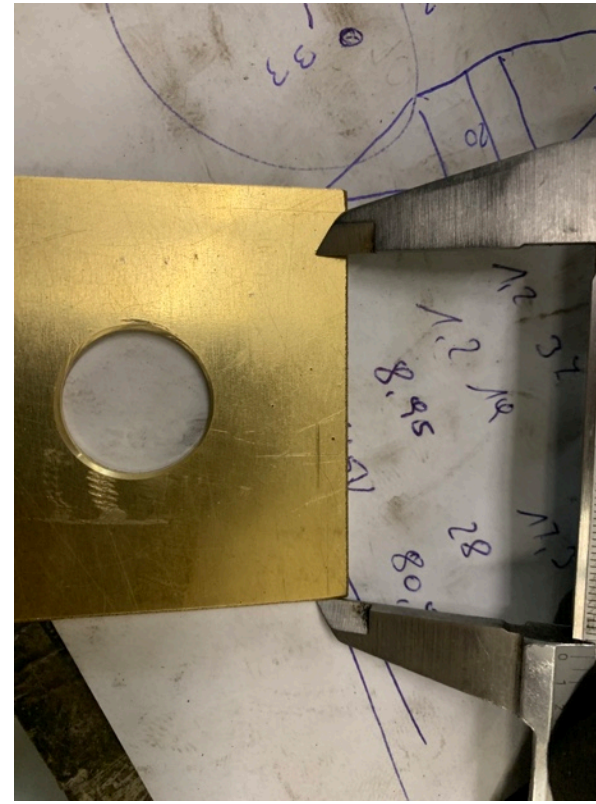
Take your Caliper and set the Slider to 55.3mm. Lock the Slider and hook it to one edge. Now Slide the other side of the Caliper on the Plate to create a Scratch 55.3mm away from the hooked in Side. Also do this on the other side of the Plate.

You should now have 2 Scratches on one Corner of the Plate. (See Picture).

Also create the Scratches on the diagonally opposite Side of the plate.

Now take your File or the Anglegrinder and grind away the Corners until you come to the Point where the Mark touches the Edge.

Also deburr the new Edges we created.



Congratulations!

You made the Plates for the DualPatchfeed.

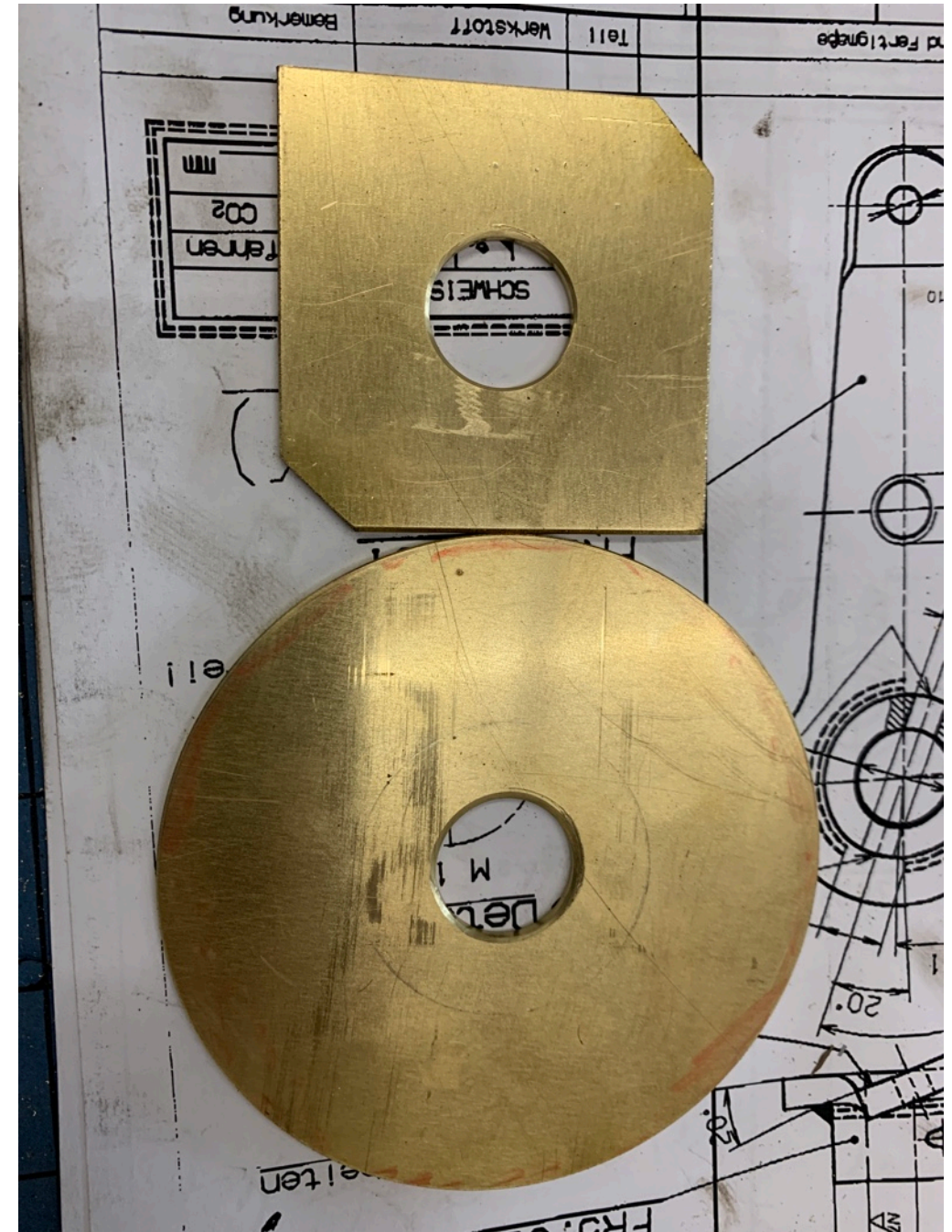
Now you can follow my other Guide in howto assemble the Feed.

<http://www.oe8hsr.at/blog/wp-content/uploads/Manuals/PatchFeedAssembly.pdf>

If you have any Ideas to make this Guide better or anything else write me a mail to [oe8hsr@oe8hsr.at](mailto:oe8hsr@oe8hsr.at)

Good Luck,

Hans





# Appendix 1:

DL6KBG wrote me a Message for a very interesting Approach on how to get the Reflector round.

He made a wooden Base and mounted a DremelTool with a Cutwheel on it. I assume that he just used 2 Angles on each side to hold the Dremel.

Then he drilled a small Hole in the center of the square Reflector plate and then screwed the Reflectorplate onto his Base.

He then set the Dremel on the right Distance on the Reflectorplate and switched it on. By slowly turning the plate you get a perfectly round Reflectorplate.

Be advised that you have to mount the Plate and the Dremel strong so it doesn't get loose. No one wants a switched on flying Dremel in their Workshop ;)

Also make sure you wear your Safetygoggles and gloves...

Noce Job!

