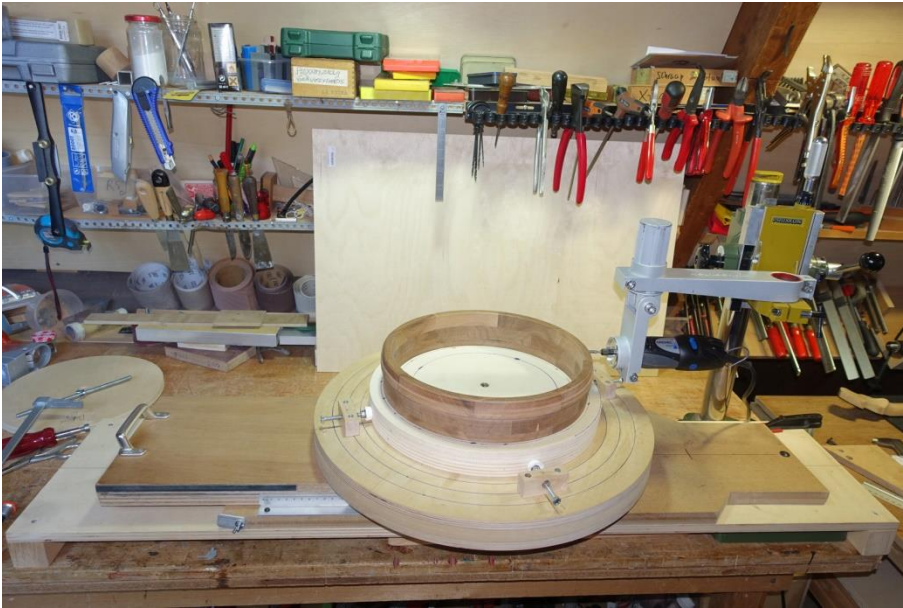


## Rim Shaping Jig / Poor Man's Lathe 2

### An improved version



#### 1. Purpose

Shaping a simple and complicated banjo rim without a lathe.

With this jig you can not only shape a simple, straight banjo rim, but also a complicated, profiled rim, like bluegrass rim or a rim with a bracket band.

The jig is devised for a Dremel or a router/milling motor with a 43mm collar. It can also be used with a Foredom.

#### 2. Why not a lathe?

A lathe is big, heavy and expensive, certainly with the tools. It's also rather dangerous. For me, a lathe is out of the question: I simply don't have enough space.

#### 3. Tools used

a. Basic tools



This is all you really need:

- Proxxon mill/drill stand BFB 2000 for standard drills with 43mm spindle neck
- Drill clamp
- Dremel with router bits, and adapter for 43mm drill stand
- Standard drill, 43mm neck, with sanding drums

b. Other tools you can use



(1) A clamp with a longer reach and more flexibility:



Parts of this "Neutechnik" drill clamp can be used in combination with the drill stand. A piece of the red steel tube is sawn off and clamped in drill stand with an adapter made of a piece of aluminum, easily made for this purpose.

(2) Other, more powerful routers:



From left to right: the Proxxon BFW 40/E, the Kress FME 800 and the Freedom Power Tool. The Proxxon and the Kress fit directly in the 43mm drill stand and clamps, the Freedom can be fitted with the Dremel adapter in combination with the StewMac Freedom Handpiece.



#### 4. Parts of the jig, assembling

##### a. Portable drill/router stand

Place the drill stand on the workbench:



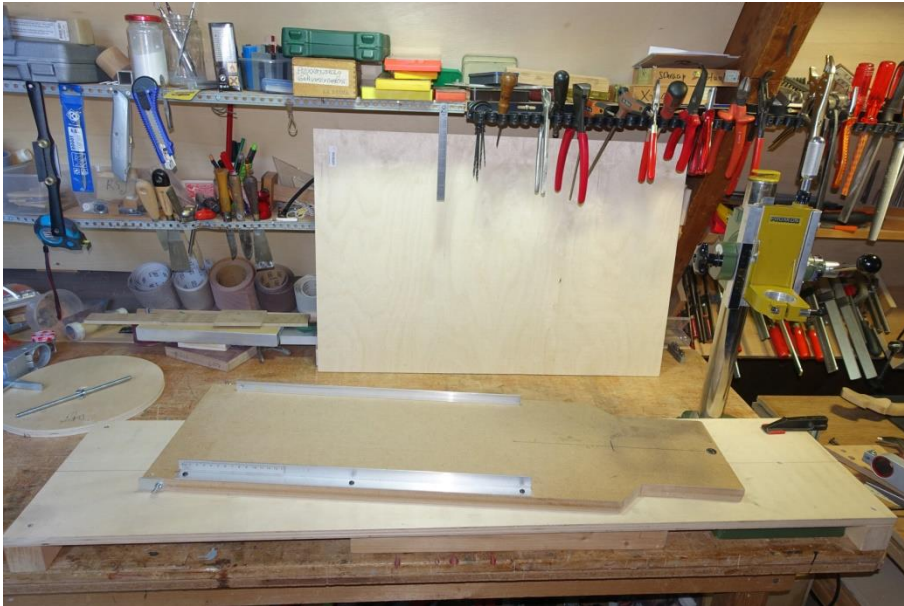
##### b. Base

Place the "base" over the drill stand. This base is made of plywood with a piece of softwood (same height as the drill stand) at both ends. It should fit just over the base of the drill stand. Clamp this part of the jig to the workbench. The drill stand should now also be clamped sturdily to the workbench.



##### c. Slider(s)

Then lowest part of the "slider" is a piece of plywood or MDF just as wide as the base. It's attached with a pin to the base so that the slider can pivot sideways on the base.



This lowest part of the slider has on both sides an aluminum L-shaped profile.

The second, upper part of the slider just fits between those L-shaped profiles, so that this part of the jig can move forward and backward.  
See next page.



On the upper part of the slider are four pins (hardly visible on this photographs). These pins are for stabilizing the "Lazy Susan"

#### *d. Turntable*

The round turntable is rather wide and heavy (diameter 49 cm: thickness 4 cm), made of plywood and/or MDF. *It should be rather heavy for better stability.*

Exactly centered a "Lazy Susan" with ball bearing is screwed to the underside of the turntable.





The Lazy Suzan is placed on the four pins on the slider.

The turntable should now be stable and turn easily.



On the turntable are screwed four homemade clamps, small pieces of hardwood with threaded inserts, a bolt for clamping and a piece of plastic or rubber to prevent damage to the disc, see next section.

*e. Mounting disc*

The final part of the jig is the "mounting disc" for attaching and centering the rim.



## 5. Working with the jig

### a. Taping and centering the rim

First, the drill clamp is attached to drill stand.  
Then the Dremel with adapter is attached to the drill clamp.

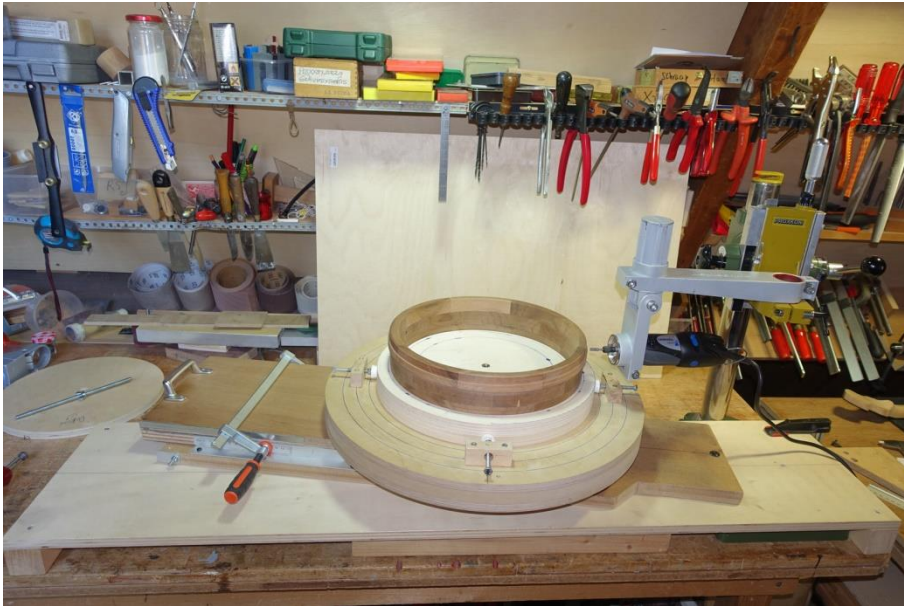


Next, the rim is attached to the disc with removable double sided tape.  
Last, the rim is exactly centered with the bolts in the clamps on the turntable, so that the distance between the tip of the router bit and the outside of the rim is equalized.

### b. Preparing for routing

1. Put the drill stand in the "routing mode" to be able to adjust the height of the router in small steps.
2. Set the height of the router.
3. Move the slider forward until the tip of the router bit just touches the rim.
4. Then, move the slider sideways, so that there is some distance between the bit and the rim.
5. Next, move the slider forward, just as much as the depth of the cut you want to make (not too deep, easy does it!).
6. Clamp the two parts of the slider together with a glue clamp; the slider should now not be able to move forward or backward.
7. Put one of the stops on the slider down, in this example the invisible stop at the other side: when moving the slider parallel to the base, the slider should not be able to move further.





*c. Routing*

- 1. Turn on the router (Dremel in this example).**
- 2. Move the slider rather slowly parallel to the base with your left hand, while with your right hand turning the turntable in the right direction (depending on your preference for push cutting or climb cutting).**
- 3. Turn easily and regularly, not too fast.**

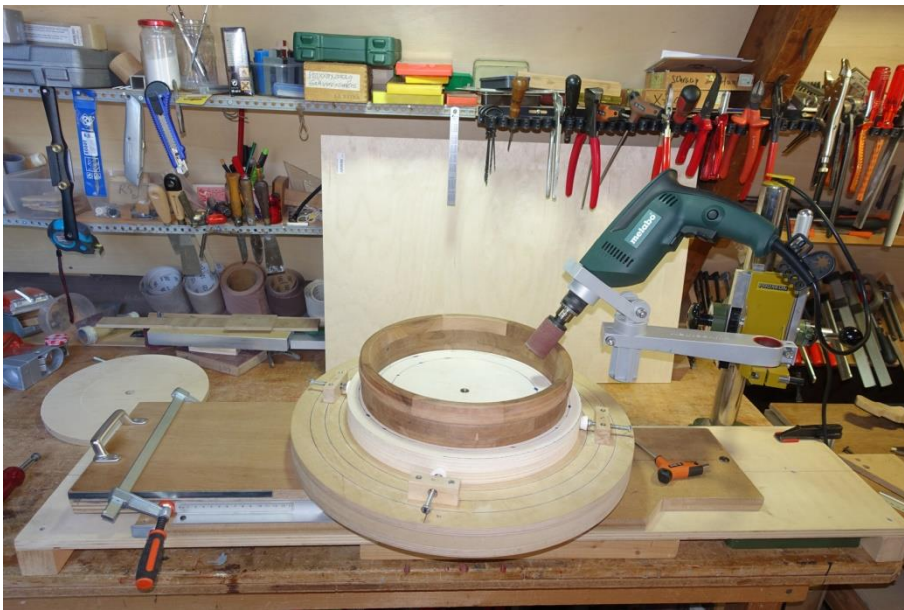


Adjust the height and the depth and repeat this procedure as often as necessary.

When you can't go deeper, turn the rim upside down and tape it to the disc again. But be very careful now to center the rim exactly!

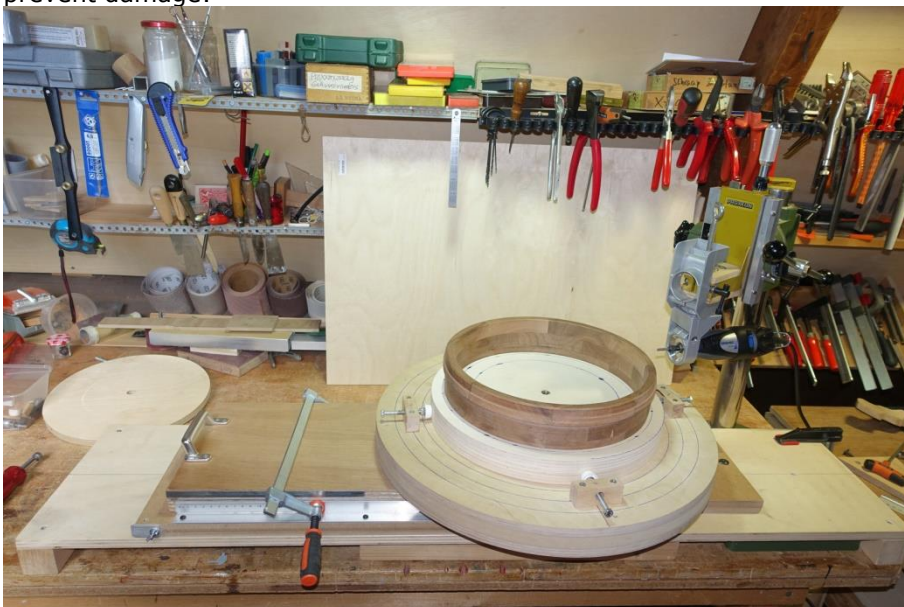
*d. Sanding*

Sanding is of course also possible.  
The same procedures should be followed.



*e. A simpler and cheaper drill clamp*

In the example above parts of the "Neutechnik" drill clamp are used. But a simpler, cheaper, more commonly available drill clamp also works. This clamp is clamped to the drill stand with pieces of plywood to prevent damage:

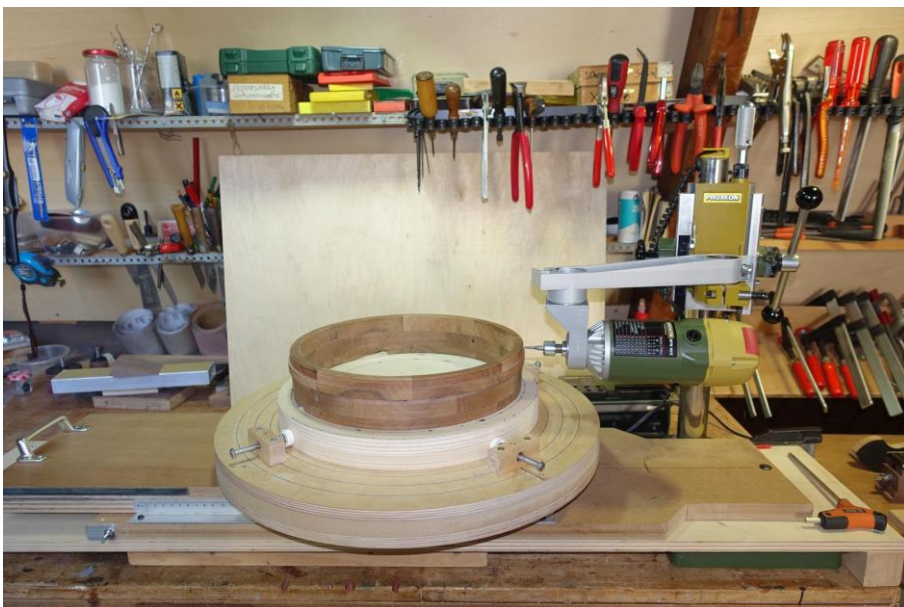
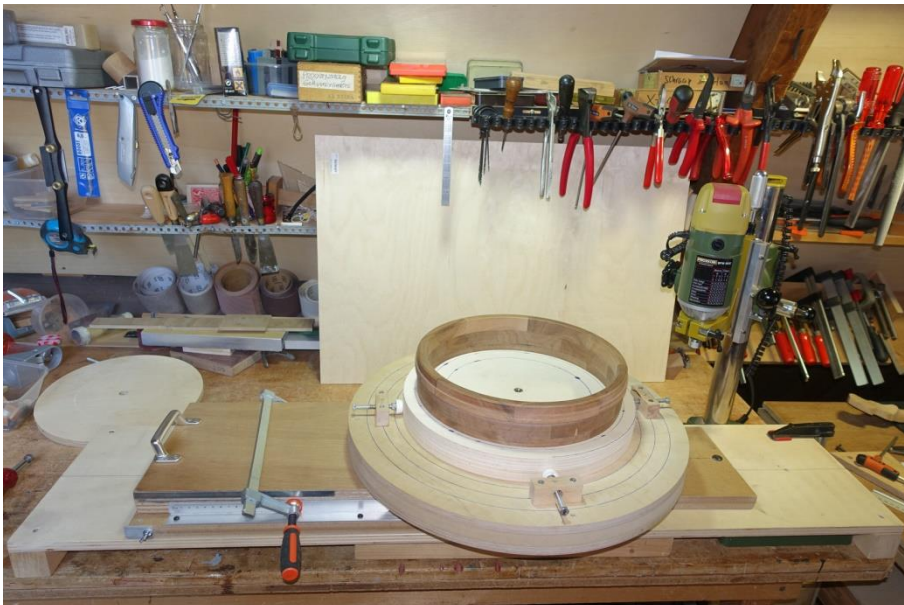




With this simple clamp sanding is also possible.



*f. With a better and more powerful router*





## 6. Costs / availability

### a. Basic tools, all you really need:

(1) Proxxon mill/drill stand BFB 2000 for standard drills with 43mm spindle neck  
Readily available in Europe for about €160. UK: about 156 English pounds:

[http://www.amazon.co.uk/Proxxon-20000-2000-Milling-Drilling/dp/B001UH3SAQ/ref=sr\\_1\\_1?s=diy&ie=UTF8&qid=1442928234&sr=1-1&keywords=proxxon+bf+2000](http://www.amazon.co.uk/Proxxon-20000-2000-Milling-Drilling/dp/B001UH3SAQ/ref=sr_1_1?s=diy&ie=UTF8&qid=1442928234&sr=1-1&keywords=proxxon+bf+2000)

Message from the US Proxxon dealer:

"The BFB 2000 is not readily available in the US. It would be a special order item from Germany that requires payment up front and a lead time of 10-16 weeks. It is \$279.83 plus shipping from our distribution center here in NC." Here:

<http://shop.prox-tech.com/?gclid=Cj0KEQjwm4mwBRCni-ivmePYivkBEiQAdGkklvecC0E4NOU33MJ-ew8RSzkl4B8wftNG1ZgTxWIO9fkaAtsD8P8HAQ>

This is not cheap, but if you have little space, no good drill press, you want an extra drill press, or *you need a lathe, but you don't want one*, you should consider it. It's a very versatile, well-made tool. You can combine it with the excellent Proxxon router or a Kress router. With a good powerful hand drill that fits you can also use a "safe-T-planer". It's sturdy, very stable.

(2) Drill clamp

A rather simple drill clamp: About 15 UK pounds:

[http://www.amazon.co.uk/Wolcraft-B4800-Universal-Drill-Clamp/dp/B0001P19QI/ref=sr\\_1\\_1?s=diy&ie=UTF8&qid=1442947616&sr=1-1&keywords=drill+clamp](http://www.amazon.co.uk/Wolcraft-B4800-Universal-Drill-Clamp/dp/B0001P19QI/ref=sr_1_1?s=diy&ie=UTF8&qid=1442947616&sr=1-1&keywords=drill+clamp)

And there is a more sophisticated clamp from Neutechnik for €45:

<http://www.amazon.de/exec/obidos/tg/detail/offer-listing/-/B001W2SX4U/new>

It's a well-made, useful tool, but you don't really need that.

(3) Dremel with router bits.

You have one or you know what it costs.

(4) Dremel adapter for 43mm drill stand

About 10 UK pounds + shipping. Here is one:

<http://stoneycnc.com/en/stepcraft-/accessories/mounting-adaptors-/22>

(5) Standard drill, 43mm neck

About \$100. Shouldn't be hard to find, even in the US.

(6) Sanding drums

You probably have those things.

(7) Lazy Susan

About \$6.

[http://www.amazon.com/Shepherd-Hardware-9548-Turntable-Capacity/dp/B002TIPWNQ/ref=sr\\_1\\_1?s=hi&ie=UTF8&qid=1442950131&sr=1-1&keywords=lazy+susan+turntable](http://www.amazon.com/Shepherd-Hardware-9548-Turntable-Capacity/dp/B002TIPWNQ/ref=sr_1_1?s=hi&ie=UTF8&qid=1442950131&sr=1-1&keywords=lazy+susan+turntable)

[http://www.amazon.com/Shepherd-Hardware-9548-Turntable-Capacity/dp/B002TIPWNQ/ref=sr\\_1\\_1?s=hi&ie=UTF8&qid=1442950131&sr=1-1&keywords=lazy+susan+turntable](http://www.amazon.com/Shepherd-Hardware-9548-Turntable-Capacity/dp/B002TIPWNQ/ref=sr_1_1?s=hi&ie=UTF8&qid=1442950131&sr=1-1&keywords=lazy+susan+turntable)

(8) Double sided tape

Ordinary light duty carpet tape should work. But this is much better:

[http://www.amazon.co.uk/tesa-Universal-Double-Sided-Removable/dp/B0072HK9J6/ref=pd\\_sim\\_60\\_3?ie=UTF8&refRID=0CYR8SNW8ZFZNVMPFPXT&dpID=51%2BDqEKUXWL&dpSrc=sims&preST= AC UL160 SR160%2C160](http://www.amazon.co.uk/tesa-Universal-Double-Sided-Removable/dp/B0072HK9J6/ref=pd_sim_60_3?ie=UTF8&refRID=0CYR8SNW8ZFZNVMPFPXT&dpID=51%2BDqEKUXWL&dpSrc=sims&preST= AC UL160 SR160%2C160)



(9) Some plywood and hardware  
Your guess is as good as mine. It's not much.

**For better results a bigger and better router can be used:**

⇒ **Proxxon BFW 40/E, 155 UK pounds:**

[http://www.amazon.co.uk/Proxxon-Micromot-Mill-Drill-System/dp/B000PJ6KZU/ref=pd\\_rhf\\_se\\_s\\_cp\\_4?ie=UTF8&refRID=1ZK5KFWYHNTZS2EQ9F3](http://www.amazon.co.uk/Proxxon-Micromot-Mill-Drill-System/dp/B000PJ6KZU/ref=pd_rhf_se_s_cp_4?ie=UTF8&refRID=1ZK5KFWYHNTZS2EQ9F3)

However, this router is not available in the US, and there is no 110 volt version.

⇒ **Or this alternative, also with a 43mm clamping collar: the Kress FME 800 router motor:**

<https://damencnc.com/en/tools/kress/kress-milling-motor/42>

This motor has a 110V USA version and can be ordered from the USA (€167 incl. shipping). So it's also cheaper than the Proxxon. And it is smaller and lighter.



⇒ **Or the Foredom Power Tool(\$272):**

[http://www.stewmac.com/Luthier\\_Tools/Types\\_of\\_Tools/Routers\\_and\\_Bits/Routers/Foredom\\_Power\\_Tool.html](http://www.stewmac.com/Luthier_Tools/Types_of_Tools/Routers_and_Bits/Routers/Foredom_Power_Tool.html)

In combination with the Foredom Handpiece (\$75):

[http://www.stewmac.com/Luthier\\_Tools/Types\\_of\\_Tools/Routers\\_and\\_Bits/Foredom\\_Handpiece.html](http://www.stewmac.com/Luthier_Tools/Types_of_Tools/Routers_and_Bits/Foredom_Handpiece.html)

This handpiece can be fitted in the Dremel adapter that fits in the drill stand and the drill clamps.

## 7. And, does it work?

This whole unit works surprisingly well, considering its low costs and simplicity. But it isn't fast.

For routing, the results depend of course upon the quality of the router and the router bits. The Dremel is not a good router, it just works. You should proceed carefully, with very light passes. I got a good, clean result with the far better and heavier Proxxon router. For better operation with this machine I used the Neutechnik drill clamp, which has more reach. I don't own the Kress router, and I couldn't test it. But it should work far better than the Dremel, *it can be used in the US*. It's also cheaper than the Proxxon BFW 40/E. The Foredom is not tested either.

No matter how big and powerful the router is, heavy routing with this fixture, with big bits or deep passes is not advisable! The stability of the workpiece depends upon the weight of the turntable. Even with a big and heavy turntable this unit can never be as stable as a lathe! *So in any case you should proceed carefully, with small bits and light passes.*

Safety seems to be good. Safety glasses are always advisable when routing, but you certainly don't need a hockey mask with this fake lathe!

This fixture works also very well for sanding. You can control the pressure of the sanding drum easily by moving the workpiece sideways with the slider. At the same time you can move the sanding drum up and down with the drill stand.

## 8. Benefit/cost ratio

I already had the drill stand, the drill, the drill clamps, the sanding drums and the Dremel. All I needed was the Lazy Susan, the Dremel adapter, some plywood and some hardware: in total about €60 for the simple version. And I can use the same tools and parts of the jig, for other applications, for example heel shaping.

For a better, clean result I bought the Proxxon BFW 40/E ( €180). (Now, I would have bought the Kress) Of course it costed time to figure it out, but that was in fact the biggest benefit: that's fun. So for me the benefit/cost ratio is a big plus.

For you, the total costs depend on what you already have and where you live. Here Europe has the advantage.

## Appendix / Rim Shaping Jig

### 1. Missing link

#### a. Availability Neutechnik clamp



This is a handy clamp, it combines nicely with the drill stand for more reach and flexibility. However, there seems to be a problem with the availability. Amazon.uk says it's no longer available. The only place now I could find was this German site:

<http://www.neutechnik.de/produktkategorien/bohrmaschinenhalter/>

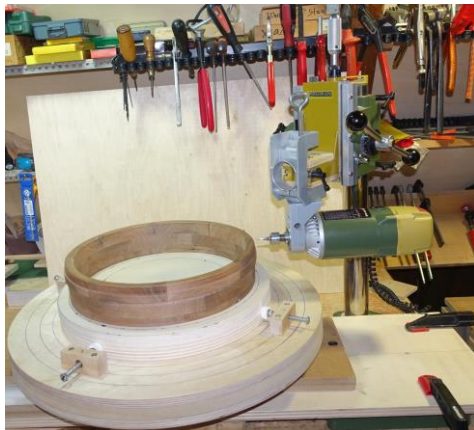
But it is not clear if this item can be shipped to other countries than Germany and Austria and if so, what the shipping costs would be.

#### b. Simple Wolfcraft clamp

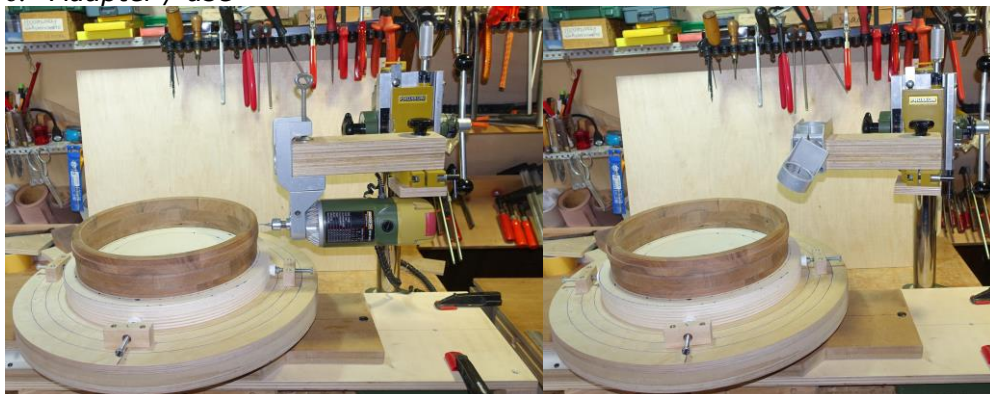
But there's a solution. You could use this clamp from Wolfcraft. It's available via Amazon.uk.



In most situations this would work, but there can be a problem with a beefy router like the Proxxon with the arm of the drill stand. There is not enough space. And the position of the router is not very easy to adjust.



#### c. Adapter / use

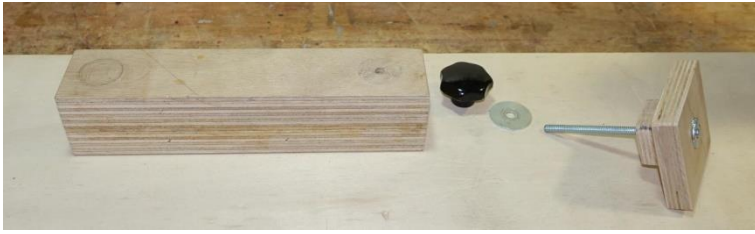


Now there's enough room and the tool is easier to adjust. It's more flexible.

#### d. Adapter / construction

It's easy to make and cheap. A piece of straight and rigid wood or plywood 5x5x 23cm (about 2x2x9 inches), two small pieces of plywood, a bolt, a ring and a nut.



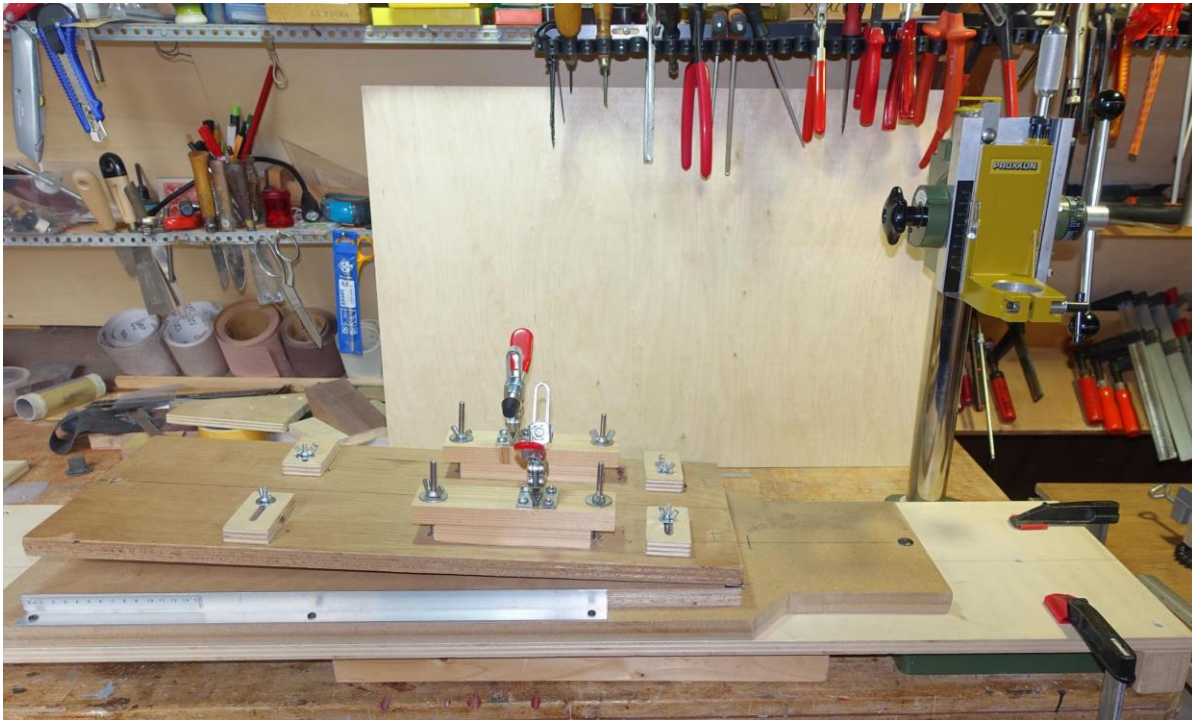


## 2. Heel Shaping Jig

With the same tools and some the same parts of the jig also heel shaping can be done.

### a. The slope

On the lower part of the slider another part is placed, the "slope". The slope fits just between the aluminum profiles of the lower part and can move forwards and backwards. There's a hinge on the front of the slope, the angle of the slope can be adjusted with a bolt and a nut at the backside (not visible).



### b. Setting the tool.

Attach the tool, center it and set the radius.



*The radius is not constant! So the position of the tool should also be slightly changed depending of the depth of the profile.*

*c. Clamping the neck/ routing*

Set the radius, see above.

Position the neck and make sure to get the right neck angle (fourth string position centerline). Set the position.

Clamp the neck.

Move the heel to the tip off the tool.

Move the slider sideways.

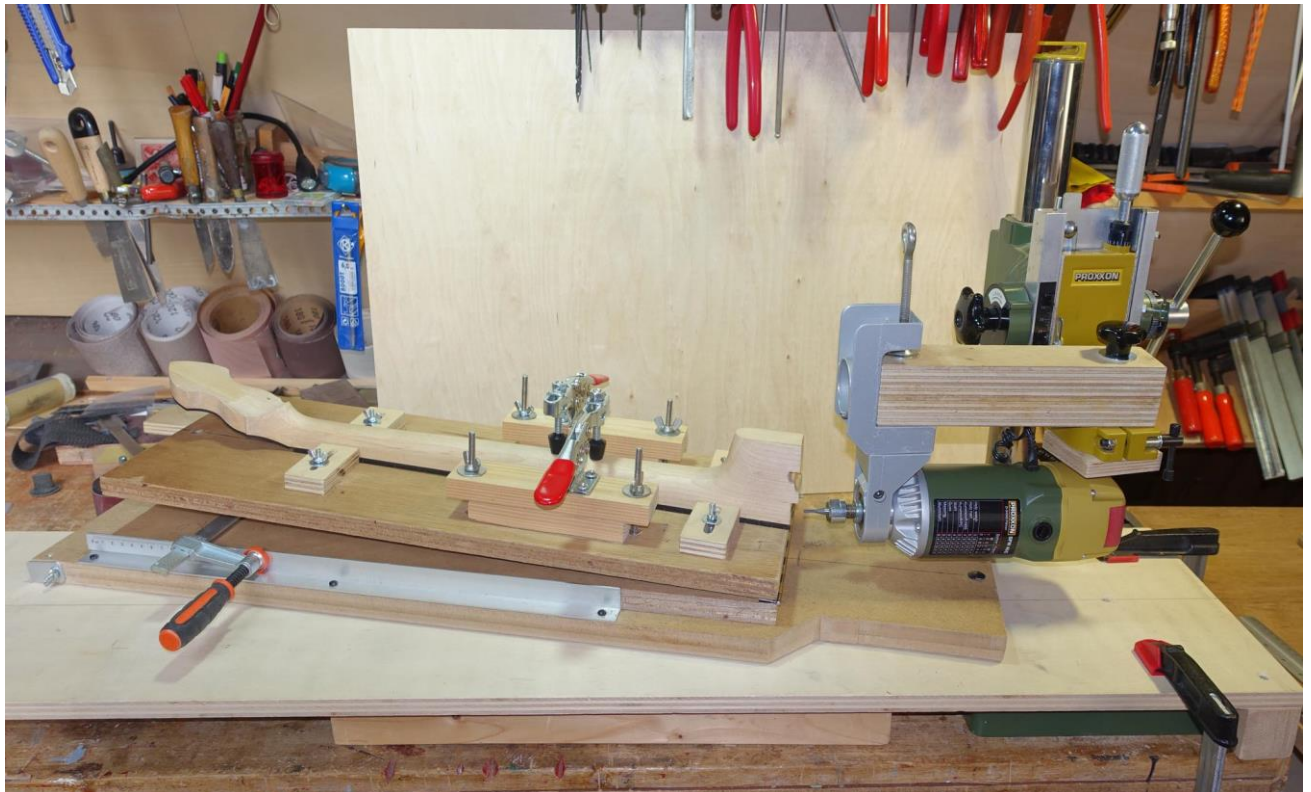
Set the depth of the cut by moving the slope forwards.

Clamp the slope to the lower side of the slider with a glue clamp.

Switch on the tool.

Start routing.

Repeat this procedure until this part of the heel is done.



*Please note that this is an unfinished neck, but most of the heel is shaped. Probably, it's better to shape the heel when the heel is still square, to avoid tear out in the side of the heel. And for the fretboard, sanding seems to be safer. Of course sanding is also possible with this jig.*