Advanced Cutting and Routing Techniques Using the Festool MFS Fence System

Text and Photos by Jerry Work

Isn't it interesting how every so often a simple appearing new tool or technique comes along that offers us the opportunity to make a quantum leap in our productivity? Once put to use, we can't believe we ever got along without it. Yet, when we first look at it we have trouble comprehending just how it can make such an impact. I want to share with you one such simple appearing new tool that can radically improve the accuracy and flexibility of Festool guided rail cutting and routing - the Festool MFS fence system.

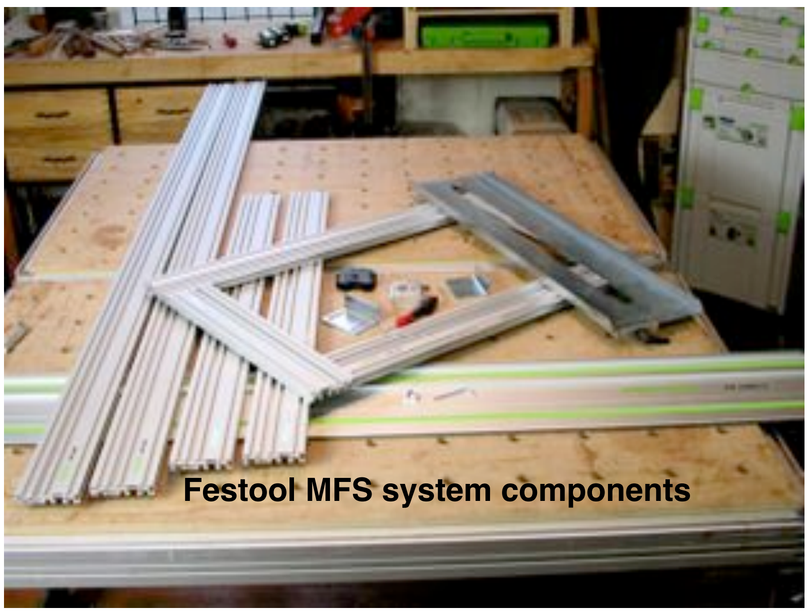
While it is described in the Festool literature as a "multi-routing template," and it is very good at that function, we will discover here just how much more than that it becomes when used in conjunction with Festool guide rails as a ***universal squaring, aligning, cutting and routing guide***. We will learn how greatly it increases the versatility and accuracy of setting guide rails for precise and repeatable cutting and routing operations. We will learn how it facilitates cutting of everything from multiple, identical narrow strips to adding sliding table-saw-like accuracy to breaking down large panels. We will also see how using it we can prep solid wood stock to be perfectly square and precisely dimensioned just as one would normally do on large industrial machinery as well as how we can cut complex joints like haunched tenons and interlocking sliding dovetails using just Festool hand power tools, the Festool Multi Function Table, Festool guide rails and the Festool MFS fence system.

Most readers of this piece already have some experience with or at least an understanding of Festool guided rail cutting.

Since the introduction of hand power tools, users have created a whole variety of jigs and fixtures to help guide a saw or router in a straight line.

Unfortunately, most of those efforts depend on the user being able to keep the base of the saw or router firmly against the edge of some sort of fence. Many find it hard to do that with accuracy and repeatability since saws and routers are subjected both to in-thrust forces which tend to push the saw or router against the fence as well as out-thrust forces which tend to push the saw or router away from the fence. Far too often the result is a less than perfect straight cut.

The innovative engineers at Festool developed a unique guide rail (the horizontal piece in this photo) which features a hat shaped track onto which each of its cutting tools rides. A "U" shaped channel is cast or cut into the base of each cutting tool or into a guide made just for that cutting tool. That channel has gibbs which can be adjusted so the channel fits firmly on the hat shaped section on the guide rail. Since the base of the cutting tool is held firmly on both sides as the two sides of the "U" engage the two sides of the hat, the tool is guided in a perfectly straight line whether subjected to in-thrust or out-thrust forces. This is the heart of Festool guided rail cutting and routing.


Festool MFS system components

What this allows is a whole new way of machining wood. Instead of passing the work piece by a stationary cutter, guided rail machining allows the cutter to be moved past the stationary work piece in a highly controlled manner. This opens up all sorts of things that become easy to do which previously, using the old techniques, were hard to do.

One example is the ability to easily cut multiple mirrored stopped dados or sliding dovetail slots on either side of a cabinet carcass. When you try to do this with conventional stationary cutting tools you wind up referencing some of the cuts off of the top of one piece and their mates off of the bottom of the other piece. You might get lucky and have two such stopped mirrored slots line up that way, but it is a rare craftsperson who can make four, five, six or more such slots line up. Using Festool guided rail routing it is easy to do as many such stopped mirrored slots as you wish and have them all align perfectly.

Since the Festool offerings are all considered parts of one system, there are many components from which to choose. Many people start with a Festool circular saw, a guide rail, some clamps to hold the guide rail firmly to the work piece and one of the excellent Festool dust collectors so that the cutting operation makes far less mess of saw dust all over the place.

The first few cuts using this set up are often a revelation for the user. Suddenly it is easy to break down that large sheet of plywood or MDF that is so awkward and potentially dangerous to cut on a conventional table saw. The user is blown away by the fact that the first cut with the circular saw cuts a rubber edge on the guide rail to be zero clearance to the saw blade from that point forward.

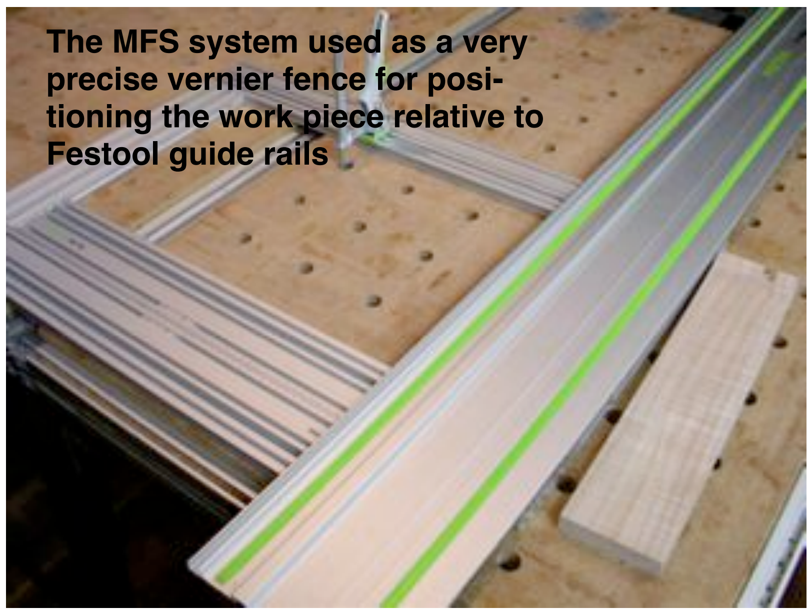
That zero clearance edge on the guide rail makes setting the guide rail to measured marks a cinch, and it also provides for a splinter free cut along the inside of the cut line. On the TS series circular saws there is also a sacrificial plastic part that provides a zero clearance, chip free cut on the outside of the cut line as well.

While it is easy to set the guide rail accurately to marks measured out on both edges of a work piece, measurement errors can creep in if you want to cut multiple pieces of exactly the same size. We will show in a moment how to use the MFS universal squaring, aligning, cutting and routing guide to make multiple perfectly sized pieces with one simple set up.

Since we will be referring to the MFS guide frequently in this manual I will leave off the "universal squaring, aligning, cutting and routing" part of its name and simply refer to it as the "MFS guide" or "fence" from here on.

Once new users get used to guided rail cutting, they often will add next a Festool Multi-function Table (MFT) to support the work pieces at a more comfortable working height.

When they first look at the MFT, they see a nicely constructed portable table with a bunch of holes in the top. A bit closer inspection reveals that the table also comes with supports to hold the guide rail in exactly the same place every time it is mounted to the table and with a miter fence so the work piece can be held at a precise angle relative to the guide rail.



The MFS system used as a very precise vernier fence for positioning the work piece relative to Festool guide rails

The miter fence has a "T" slot which accepts stops so that once a measured distance back from the front edge of the guide rail is established, work pieces can be positioned for repeat cross cuts of the same length with very good results.

Again, however, the precision of the length dimension is a function of how well users read the tape measure, how accurately they make their mark at the intended length of cut, and how accurately they set the stop to the mark. The process works very well for most cross cuts but measurement errors can again creep in.

Rips, especially thin rip cuts, are another matter all together. Most users find it difficult to accurately set up the guide rail for rip cuts as they again must rely on measured marks on two edges of the work piece. Then they must align the front edge of the guide rail to those marks.

MFS profiles used as "story sticks" to accurately position Festool guide rails

Doing so for one rip cut usually works okay so long as the work piece is wide enough to provide good purchase for the guide rail. If the intent is to produce multiple rip cuts of exactly the same width, as in making rail and stile components, things get a bit more difficult, especially for first time users.

Also, if the intent is to produce multiple thin strips, say 10mm (3/8") or less in width, that is also difficult for most to do accurately. If the work piece is set under the guide rail for good purchase then the work piece has to be moved out each time by the sum of the intended work piece width plus the actual saw kerf width. It is certainly possible to set up stops or fences to do that, but the process is not very fast and can be frustrating for some.

We will see shortly how we can use the Festool MFS fence components to make very precisely dimensioned thin or wide rip cuts limited only by the length of the guide rail in use and the ability to support the work piece across its length. One example we will use will be making rail and stile components to a very close tolerance and cutting haunched tenons on the ends of the rails all using just the Festool guide rails and MFS fence components. In another example we will rip multiple 5mm wide strips to use as inlay material, again just using Festool guide rails and MFS guides.

We will also show how to use the components of the MFS fence system as measured "story sticks" to aid setting guide rails on large sheet goods very precisely as is shown in this photo.

Then we will turn our attention to the use of the MFS fence system for guiding a Festool router for doing everything from open field inlay work to delicate string inlays, to complex pattern and template routing to produce multiple complexly shaped parts quickly and easily.

Once we tackle all of these uses for the MFS fence system, I think you will reach the same conclusion I did that the Festool MFS is a simple looking tool which can radically improve the accuracy of all your guided rail cutting and routing operations thereby helping you make a quantum leap in your productivity.

So, grab a beverage, sit back and let's take this journey together.

What is the Festool MFS fence or guide system?

At it's heart, the MFS is a very precise, complex aluminum extrusion 80mm wide and 16mm thick. It comes in 200mm, 400mm, 700mm, 1000mm and 2000mm lengths shown in this photo sitting on top of a Festool guide rail. That is roughly 3 1/8" wide, 5/8" thick with standard lengths of a bit over 8", a bit over 16", 27 1/2", 39 3/8" and 78 3/4". From here on I will only refer to the metric sizes as that is how each of these extrusions is identified and marked.

Along one edge are ruled marks in millimeters starting at zero and going to the length of the extrusion. The ends are cut very accurately at 90 degrees.

On the top and bottom 80mm widths are "T" tracks the same size and shape as the Festool guide rail "T" tracks so the same Festool clamps and other accessories will fit.

On both sides of the 80mm widths and along each 16mm side are "V" shaped tracks unique to the MFS. Festool supplies a variety of different nuts that slide into these "V" tracks to allow the attachment of different supplied and shop built components.

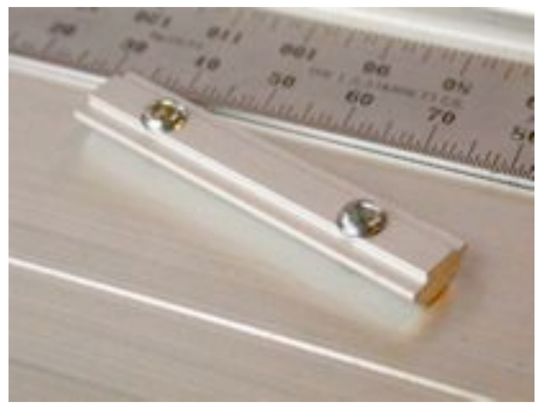
One of the nuts that fits into the track on one or both 16mm sides is a threaded insert (shown below) which is held firmly in place. A hole through that insert allows a 4mm cap

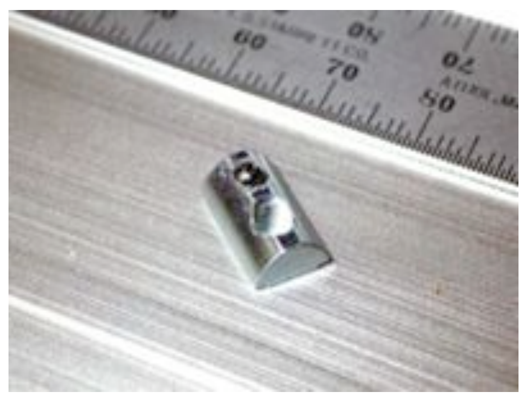
head machine screw to pass through to thread into a short “V” nut. By sliding that

short “V” nut into the side “V” track in another unit, two extruded pieces can be assembled at right angles to one another.

The picture above shows how a standard Festool “F” style clamp (48957 and 489571) fits into the “T” slot on either face so you have lots of options as to how to clamp these profiles to your work piece or to a Festool Multi-function table.

This picture shows how the special MFS “V” nuts fit into the “V” track to hold all kinds of jigs and fixtures. The round piece in the center is a pivot point for the circle and arc routing which is easily done using the MFS profiles. Here are detailed shots of that standard piece and the





two standard “V” nuts. The one with two holes is threaded for 5mm, the smaller one with the detent ball for 4mm.

Four such extruded pieces assembled at right angles to one another form a very square and adjustable rectangle.

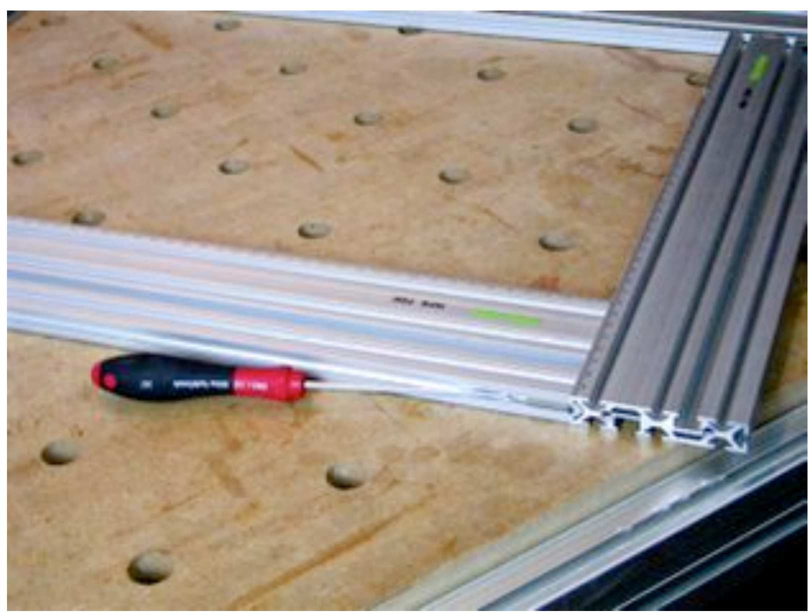
A ball headed 3mm Allen key is supplied to allow you to easily tighten or loosen these connecting points so you can slide the extruded pieces to form rectangles of any size up to the length of the extrusion plus the 80mm width of the adjoining extruded piece. The inside rectangle formed is the length of the extruded piece less the 80mm width of the adjoining extruded piece.

For example, the starter set 492610 which is listed in the Festool catalog as 15.7" by 7.8" and called MFS 400 has two 200mm extruded pieces and two 400mm extruded pieces. They will make a rectangle up to 280mm by 480mm outside and 120mm by 320mm inside.

Starter set MFS 700 shown above with the Festool catalog open for size comparison has two 400mm and two 700mm extrusions so it will make a rectangle as large as 780mm by 480mm outside and 320mm by 620mm inside.

You can also purchase additional longer extrusions in either 1000mm or 2000mm lengths. Two or more extrusions can be joined end to end with MFS joining units (the two hole "V" nuts and 5mm set screws shown on the previous page) so there is really no limit to how large a rectangle you can form for special applications.

The starter kits also include two heavy metal angles (shown in the photo left) roughly 80mm wide with one 30mm and one 60mm side. These have two



4.5mm slots cut into them through which 4mm bolts can pass to thread into one of the special nuts that fit into the “V” slots. This allows the heavy metal angle pieces to be used to locate the extrusions relative to the sides or edges of a work piece and/or to fasten the extrusions to the work piece.

Festool also supplies a machined aluminum piece shown below that is 50mm by 50mm and 16mm thick with a 30.25mm hole in the center and a tongue on two of its sides that fits into the “V” slots. One of the tongues is split with a set screw that will widen the split to fasten the aluminum

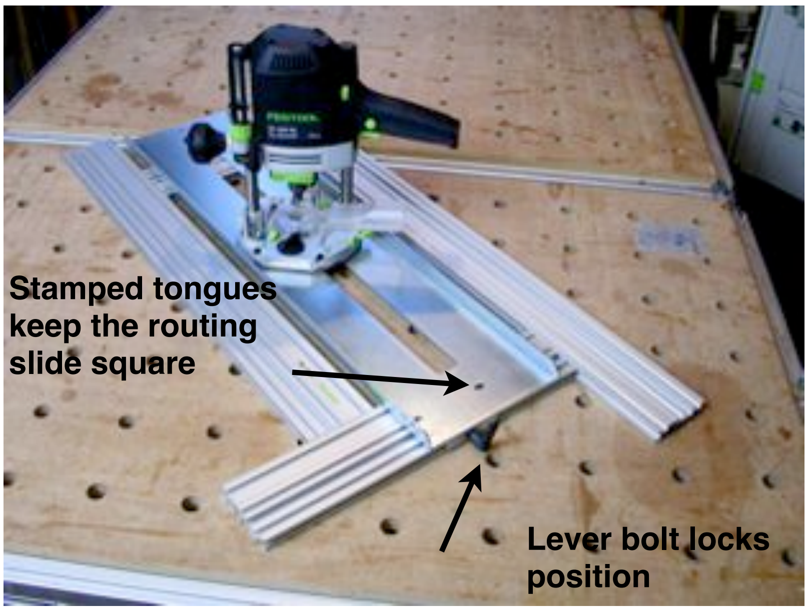
piece in place anywhere along the edge of any of the extruded pieces.

This piece has a number of uses, the most common of which is to receive a 30mm guide bushing on a router. A 5mm pivot point (shown before) is also supplied which will fasten to one of the special nuts that slide in the “V” slots. With a pivot point at one end and a guide bushing holder at the other, you can quickly establish a circle or arc routing jig limited only by the combined lengths of all of the MFS extrusions you own. With the wide variety of router bits available you can use this set up to cut and/or edge route a bewildering array of arced or circular shaped work pieces.

For example, an elegant head board can be made with a sophisticated long radius arc across the top that would be very hard to duplicate any other way.

The final component supplied with either the MFS 400 or MFS 700 starter kits is the clever molded plastic anti-tip ring

shown in the two photos above which will support the router base while you are edge routing around either the inside or the outside of the formed rectangle. This black molded piece accommodates 24mm, 27mm, 30mm or 40mm diameter router guide bushings. The design of this piece allows the guide bushing to rotate while you move along the edge keeping this anti-tip piece always with maximum support for the overhanging base of the router. Note how the lip on the guide bushing sits in a recess in the anti-tip piece so, no matter where you go with the router, this anti-tip piece stays in place doing its job of stabilizing the router so it stays flat and level with the top of the MFS profiles. Very slick and very useful.



Also available is what Festool calls a "routing slide" shown in the picture above. This is a heavy stamped metal bridge 750mm long and 180mm wide with a slot cut down the center sized to receive a 30mm guide bushing and a bent up lip on each long side for rigidity. The Festool router bases fit comfortably inside the two bent lips so you can attach a 30mm guide bushing and pass a router bit across the full inside width of any rectangle up to the size of the MFS 700. The guide bushing keeps the router and the bit centered on the slot.

Along one short edge the bridge features a lip bent down with holes in it positioned for a 4mm threaded lock lever screwed into one of the special "V" nuts. This is shown at the front of the slide in the picture below left.

When you insert the "V" nut into one of the "V" grooves on the 16mm edges of the extruded piece, two stamped tongues also engage in one of the top "V" grooves on that same extruded piece which will allow the bridge to move easily side to side at 90 degrees to the MFS profile or be locked into place by the lever bolt shown.

A pointer indicating the center line of the slot, and hence the router bit, makes setting the desired center line measurement a breeze. In the photo below it is set to exactly 120mm from the right inner edge of the MFS rectangle.

With the router slide you have two dimensional control over the movement of the router

suspended over the top face of the work piece. Since the router can plunge up or down, you wind up with three dimensional control of the router cutter.

While there are many uses for this arrangement, the most common is to route a recess into the face of a work piece to receive what is called "open field" inlays like the sample shown here.

Adding inlays such as these to a top, front or sides of a chest or shelf unit is a fast way to really increase the perceived value of your work with little additional effort on your part. This is just one of the ways the MFS helps you make a quantum leap in your productivity. We will cover this feature in more detail when we get to the chapter on inlays.

Open field inlay in sample piece after being polished with the Festool RO150. The field is Brazilian cherry. The dark red inlay is South African blood wood. The lighter colored inlay is Oregon Big Leaf maple burl that was cut from the piece above.

Notice how clean the corners, floor and edges of an open field female recess are when your router is guided by the MFS profiles and the router slide. This piece is African Mahogany, a wood notorious for its tendency to splinter along edges like this.

Using the MFS as a large and very accurate square.

Now matter what kind of furniture you build, it is critical to be able to create very accurate square components that are exactly the size you want them to be. By aligning all of the outer edges and ends of the MFS extrusions, you form a very accurate rectangle with close to perfect 90 degree corners.

In this photo you can see a large class 2 steel reference square placed inside the MFS rectangle. To the right is a closer view showing just how very square the MFS rectangle really is.

The one shown is formed from the MFS 700 starter kit so it is 780mm by 480mm outside. That is a square that is over 30” by nearly 19”, larger than any accurate square you are likely to encounter. For visual reference that is a one meter (39” long) MFS extrusion in the photo to the left.

To use the MFS extrusions as a large square, assemble the MFS into a rectangle of maximum proportions and with the

ruler marked edges facing out. This is easily done by using a block of wood to make sure that each end and each edge are carefully aligned at all four corners. Tighten down the attachment screws and recheck to make sure you really have a rectangle. Measure the diagonals to make sure.

With the MFS700 shown here the diagonal measurement will be 915.8mm. From high school geometry you will remember that any right triangle has a diagonal that is the square root of the sum of the two sides squared. In the case of the MFS700 the two sides are 780mm (the 700mm profile length and the 80mm adjoining profile width) and 480mm long.

Square those numbers, add them together and take the square root of the sum and you should get 915.86025mm. Before you get carried away trying to measure the diagonals with such precision, keep in mind that one millimeter is about .040” (forty thousands of an inch) so one tenth of a millimeter is just .004" (four thousands of an inch) which most of us would have a hard time seeing even with the most accurate measuring stick.

If the cut lengths of your extruded pieces are off by just one tenth of a millimeter, the resulting diagonal measurement will change by more than one tenth of a millimeter. So, don't get hung up on what your measured diagonal is, only that the two are the same so you know you have as close to a perfect square as you can measure.

Or, as I do, if you have a good reference square that you trust, use it to confirm that your MFS rectangle is really square. If you measure any difference at all across the diagonals, loosen the screws, make sure your ends and edges are carefully aligned and tighten them again.

The resulting rectangle is very rigid and populated with all those nice "T" and "V" grooves so there is no limit to how you can use it to square up just about anything you make. The ruler markings along all four edges make for good reference settings.

Two MFS profiles can be joined anywhere along the edges to form a "T" or "L" square

If you need an even bigger square, simply use longer extrusions or put two or more extrusions end to end to form longer ones.

If you need an open "L" or "T" shaped square rather than a rectangle, you can place the end connector inserts on both sides of one extrusion so you draw it very tightly up against the edge of another to form a large "L" or "T" with very close to a perfect 90 degree corner.

I can't measure any out of square on my extrusions joined this way when measured with the class 2 steel reference square shown which has 500mm by 250mm arms. Since the degree of square with just two pieces joined together is dependent on just how square the ends of the extrusions were cut, I would hesitate to call it "perfect", but it is very close.

When you put all four sides together, any error in how square the ends were cut will tend to be cancelled out resulting in a rectangle of quite significant accuracy, certainly more accurate than that stamped framing square you might have been using up to this point and, as we will see in the next section, far more useful than a similar sized reference square.

Now that you have a really good large square, start by laying out a known square corner into which you can clamp all your square and rectangular components like rail and stile doors, panels and the like. If you own a Festool Multi-function Table you can quickly make squaring arms as shown in the manual "Getting the Most from the Festool Multi-function Table" available for free download from the Festool USA web site.

Using the Festool MFS fence system to accurately position your guide rails

This is one of the most basic things you will do every day whether for cutting stock to size or for routing grooves or for machining joints. There are several variations, but one of my favorites is using the metric markings along the edges of two extruded MFS profiles as a long and very accurate vernier attached to a moveable fence.

This photo shows the components you will use sitting on top of a Festool Multi-Function table. (Actually, in use here are two Festool tables hooked together side by side with table joining units.)

These tables are in daily use in my studio and have been for a couple of years so they show the spots and wear of heavy industrially use. Even so they remain dead on flat and, along with another table made from three Festool table tops (they call them "plates"), serve as my primary assembly work stations.

The components you will use include a MFS rectangle (in this case a 400mm by 700mm rectangle), one additional MFS profile (in this case a 1000mm one), two standard Festool "F" clamps which will come up from under the table to secure the individual profile against which the rectangle will slide, a standard Festool guide rail, and the side table mounts.

The first thing is to mount the single profile into the "F" clamps from below the table so the clamps are not in the way. In the photo to the right you can see how the "T" track on the bottom of the MFS profile receives the standard Festool "F" clamp arm. I slide the arm over two clamps (arrows) inserted from below the table in the side most row of 20mm table holes. Do not tighten the clamps yet.

Now mount the guide rail in the table side mounts, set it on top of the individual MFS profile and the MFS rectangle and lock the height cams to hold the guide rail properly in place. Make sure the underside of the hat groove on the guide rail sits in the lip on the table side mount op-

posite the pivot so it is rigidly controlled.

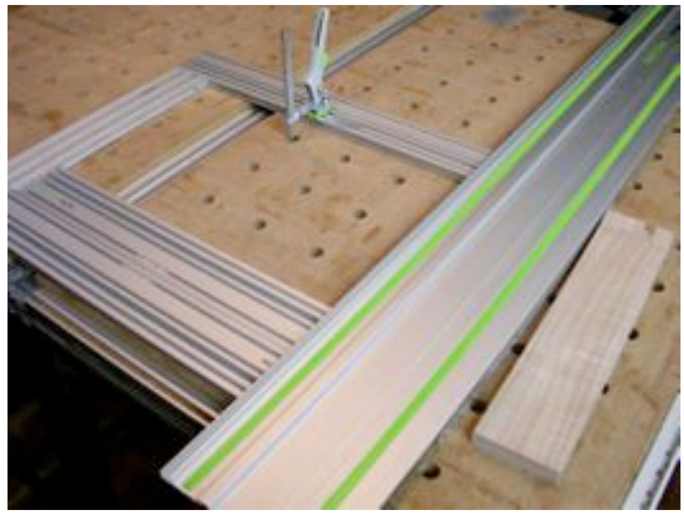
Use a block of wood to register the MFS rectangle with the front edge of the guide rail and bring the individual profile up against the side of the rectangle so it is exactly 90 degrees to the leading edge of the guide rail.

The shot above shows a closer look at how simple it is to align the individual profile to be at 90 degrees to the guide rail.

Now tighten the clamps from below so the individual profile cannot move.

At this point you could use the rectangle to set all your cutting lengths for both rip and cross cuts, but let's do one more thing to take advantage of those nice ruler markings along the edges of the MFS profiles.

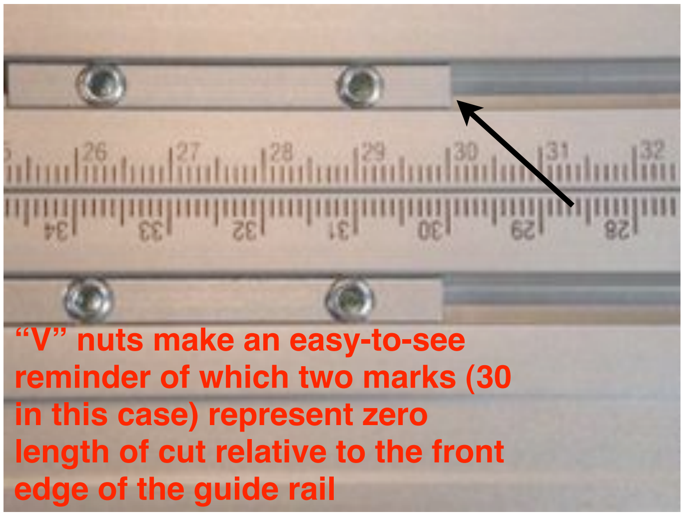
When you put two rulers side by side you form a vernier that is very easy to read. Actually in a true vernier you would have nine marks on one side and ten in the same space on the other so you can easily dial in .1 increments. With the MSF profiles they are all marked the same so we will just use the marks as a visual ref-



erence. It is easy to estimate down to .2mm or lower with a bit of practice.

To quickly do the calibration, set a clamp to lock down the rectangle as shown above as we now want to slide the individual profile without altering square so the marks line up conveniently for us.

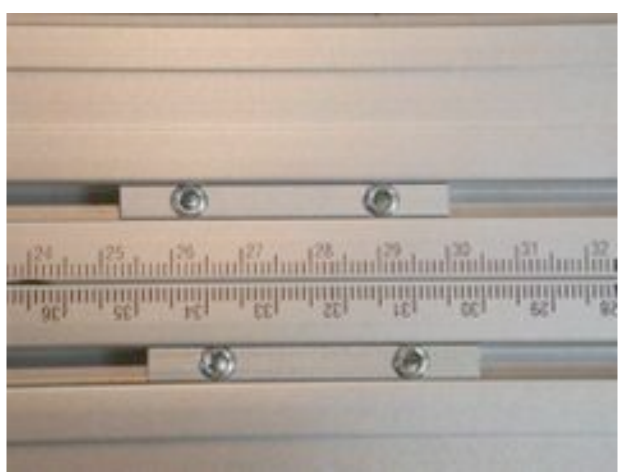
I like to slide the individual profile until an even unit mark on it lines up with an even unit mark on the rectangle. Where I have them set for this photo the two 30 marks conveniently align as is shown below.



Tighten the clamps again on the individual profile and release the clamp on the rectangle as you now have calibrated the scales so zero length of cut is when the two 30 marks line up. To help me remember where zero is, I slide a couple of the two hole "V" nuts into the "V" tracks, align one end of each with the zero point (the 30 marks in this case) and lock them down with set screws.

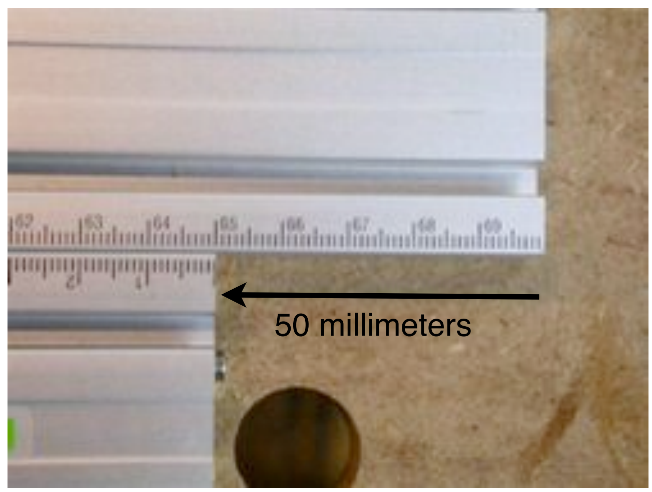
Now we can slide the rectangle down to whatever length of cut we want. As long as you keep the edge of the rectangle tightly against the edge of the individual MFS profile, the leading edge of the rectangle will always be parallel with the guide rail and a known distance away from it's front edge.

So, if you want to rip a series of 5mm strips, just move the rectangle 5mm and clamp it down as shown to the right. If you want a 50mm wide cut,



move the rectangle 50mm as shown here.

Note that the 50mm (or whatever length of cut you set) will also show when you lift the guide rail and see how the leading edge of both the fixed individual profile and the rectangle line up as pictured below.



Now that we know we can set any length of cut easily and with great precision we are ready to do some cutting.

Set the rectangle for the desired length of cut. Let's say we want to cut this glued up maple board to 350mm long. Once the rectangle is clamped down at 350mm back from the front edge of the guide rail, check to make sure it is snug against the fixed individual profile and slide the work piece into place.

One edge will be against the fixed individual profile acting as a side fence and the end will be against the leading edge of the rectangle acting as a length stop.

A couple of things to note at this point. Look at the photo above. Notice how, just by positioning the work piece, your eye can quickly confirm whether the corner closest to my hand is really square or not. If it is not square, then your work piece will not come out square since the cut you are about to make will be 90 degrees to the side against the side fence.

Good practice is to first make a squaring cut on this end before you set the rectangle for the desired length of cut. Just move the rectangle a bit further away and put the edge of the work piece snugly against the edge fence (the fixed individual MFS profile that is clamped to your table top). Make a cut taking off just a bit so you now know you have a really square corner. Flip the board end for end so the same edge is against the edge fence, set your rectangle to the desired length of cut and slide the work piece into place as shown in the photo to the left. When you make this cut you know you will have two 90 degree angles with the length exactly what you want it to be.

This is the same principle as using a sliding table industrial table saw. Since you calibrated your guide rail to the fixed edge fence and are sliding a known square rectangle to act as the length stop, you know your cuts will be bang on straight (thanks to the Festool guide rail and saw), with perfect 90 degree corners (thanks to the individual profile that you calibrated to be at 90 degrees to the guide rail) and exactly to the length you need (thanks to the ruler marks on the MFS profiles).

Note one other thing in this photo. I have my work piece set on top of a couple of sacrificial scraps of thin plywood. That is where the saw kerf is going to go, not into my table top. Using this practice I never need to be concerned about where I happen to set the guide rail table side supports. I just put them wherever it is most convenient for the cuts I need to make.

Now we can make the cut as shown below. Wear ear protection, use the Festool

dust collector (the CT33 shown below the table behind me) and make sure you have the right blade mounted for the cut you are about to make.

With the TS line of circular saws it is so fast and easy to change blades that there never is a reason to force a cross cut blade to make a rip or to use a rip blade to try to do a clean cross cut.

A couple of other things to note. In this sequence of photos the cut I am about to make is on stock that is thicker than the 16mm thickness of the MFS profiles. As a result the stock itself supports the guide rail and keeps it from flexing down. If you need to cut stock that is thinner than 16mm add sacrificial spacer stock like the plywood I use either below (much preferred) or above the work piece so the guide rail is supported across the full width of the cut.

If you plan to work on relatively smaller work pieces, say up to around 700mm long (27 1/2”), having the fixed side extruded piece back 60mm from the cut edge of the guide rail will result in the 30 marks lining up as shown before and will provide good support for the rectangle to move over this range. For longer work pieces it works best to move the fixed side extrusion back further away from the leading edge of the guide rail so the MFS rectangle will be well supported when pulled back more than 700mm or so.

With this set up it doesn’t matter whether you use one Multi-Function Table or two or more joined together. You don’t need to worry about the factory guide rail support stops. They have to be removed to attach two or more MFTs together side to side anyway. No matter where you set the guide rail, since you are calibrating everything to it, you can get perfectly square cuts from any position on any number of tables.

For all of your normal cross cuts this set up is fast, reliable and repeatable. It doesn’t matter whether you need a dozen pieces all the same size or a dozen pieces all different sizes. You have the work piece referenced at 90 degrees to the cut line by the fixed MFS side extrusion and the length determined by the moveable MFS rectangle acting as your length depth stop.

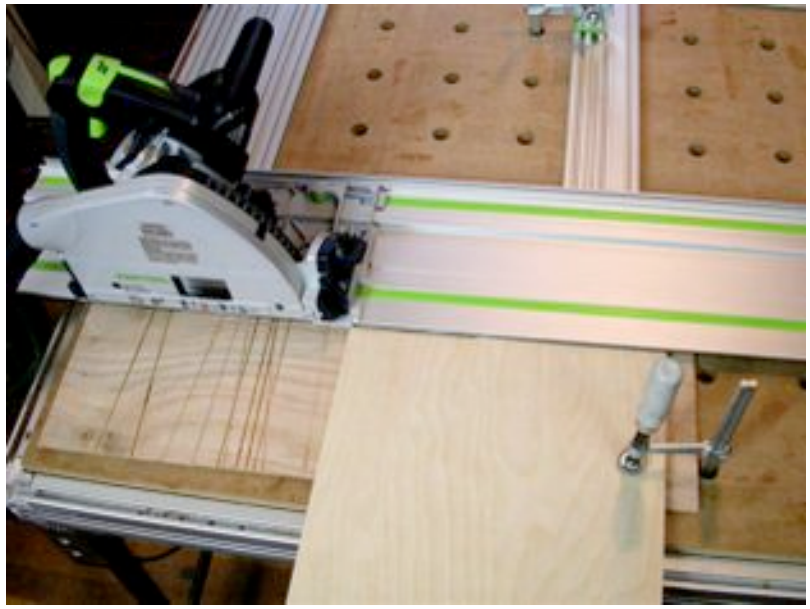
Cutting very narrow strips that are all exactly the same width is also easy so long as the length of the strips is shorter than the length of the guide rail. The MFS rectangle ***under the guide rail*** is now going to act as your rip fence. For longer rips turn the rectangle so the long edge is parallel with the guide rail to properly support the work piece if you need to.

If you need narrow strips that are longer than the length of the table, you can join the two tables end to end instead of side to side. That way you can use a longer guide rail, or join two or more to make up a longer guide rail. You may also want to make a larger rectangle from the available longer MFS extrusions so your work piece is well supported along the length of the cut.

As the length of cut increases, the requirement for care and precision in your set up increases dramatically. Once the cut length exceeds the length of a 1080 MFT I suggest instead that you use the "story stick" method outlined in an upcoming section.

Before starting to cut these narrow strips, first move the MFS rectangle back out of the way and make a rip to straighten one edge of the work piece. Once you know you have a perfectly straight edge you can place that edge against the fence ***(the leading edge of the MFS rectangle that is under the guide rail)*** and know that your first and all subsequent rip cuts will be exactly parallel with that edge.

I find it easy with this set up to rapidly make repeat rips to get a bunch of narrow strips and can't measure any difference in width from one end to the other or from one strip to another. All are the same size. I always clamp the work piece to the table so it can't move which would spoil this accuracy. When the work piece becomes too narrow to safely clamp down it is also too narrow to safely cut into more strips.



In this photo you can see the set up (the DC hose, saw power cord and the outside splinter guard have been removed for clarity). The rectangle was moved back 5mm from the edge of the guide rail. The work piece is cut straight and then butted against the leading edge of the rectangle and clamped down. Notice that I have the work piece on top of a sacrificial hunk of thin plywood to bring it up to a bit beyond the 16mm thickness of the MFS profiles so the guide rail will sit flat on the work piece without deflecting downward. In this photo the first thin strip is about half way cut off.

Since the cut off piece is under the guide rail and the remainder of the work piece is in front of the guide rail clamped to the table, cutting these narrow strips is inherently safe. With guided rail sawing the saw blade is turning away from you and is held by the uncut portion of the work piece until after the leading edge of the blade passes the far end of the work piece. With the blade set to cut just a couple of millimeters deeper than the thickness of the work piece, the cut off piece is only exposed to that small amount of blade travel and the cut off piece is trapped from above so it cannot be lifted off of the table. If the cut off piece does get trapped between the fence and the blade, it will be thrown away from you but usually is secured by the rubber on the bottom of the guide rail.

On a traditional table saw it is just the reverse. The blade is rotating towards you so the trapped portion of the cut off is free to be thrown up and back at you, a situation called “kickback” that nearly everyone who has used a conventional table saw to cut narrow strips against a fence has experienced. This is a far more dangerous situation than using the Festool

MFS fence and Festool guide rail to make these thin strip rip cuts.

Here you can see three thin strips all 5mm wide, safely and quickly cut from the work piece on top of the guide rail behind them, this done with no kick back and no fingers in harm’s way.

One of the nicest things about this MFS rectangle sliding against a stationary MFS profile set up is that you can reconfigure it on a moment’s notice and reestablish the right angle relationship between the leading edge of the guide rail and the MFS rectangle acting as a rip fence or as a length stop in less than a minute, no matter where you set the guide rail. For example, the whole set up could have been moved further down on the table to more fully support the work piece, but I find clamping the work piece usually does the job even with the set up this far towards one edge of the table(s).

You can take down and transport the MFS extrusions as a stack of 80mm by 16mm by whatever length components and do the whole set up in an off site work place or can leave the set up just like it is for repeated in work shop or studio use. The “V” track nuts, fasteners and other MFS system components are very small and easily stored or transported in a Festool Systainer or Sortainer.

The MFS is certainly one way to unlock the full potential of Festool guided rail cutting.

Use this set-up for routing as well

Just cutting pieces to exact size is not where the usefulness of this set up stops. You can also rout joints such as square shouldered tenons to quickly make rail and stile components, or you can rout precisely established sliding dovetails or dados. You also can quickly rout matching dovetail or dado slots exactly the same distance from two ends of a work piece by simply moving the rectangle to establish the desired cut line on one end, make the cut, reverse the work piece and make the other cut.

Remember, with Festool guided rail routing it doesn't matter which way you move the router since the guide rail will hold against in-thrust or out-thrust forces.

Machining clean tenons

Just take all the pieces that are to have the tenons and stack them together aligned with the fixed MFS side extrusion. I still like to add a side clamp such as the Festool clamping element 488030 to make sure nothing moves.

Move the the MFS rectangle towards the guide rail to establish the exact length you want the tenons to be. Set the saw blade to cut down into the work piece the depth you want the shoulder to be. Make one pass cutting the shoulder in all of the pieces at one time. Rotate them and make a second pass to cut the other side of the shoulder. If you want the tenon to be haunched, rotate the pieces up on edge, place the guide rail on top and make the third pass. Rotate and make the fourth pass to establish haunches on both edges.

To remove the remainder of the tenon you will use your Festool router with a flat bottom bit. Unlike the saw blade which cuts zero clearance to the front edge of the guide rail, you need to adjust the router and slide to establish the desired cut line to be in front of the guide rail so as not to tear up the zero clearance rubber edge.

I like to set the router so the center of the cut is 20mm in front of the guide rail. There is a convenient center mark on the base of Festool routers so it is easy and fast to make that alignment. If you use a 20mm diameter router bit, the edge of the cut will be 10mm in front of and parallel with the guide rail. That makes it easy to set the fence to remove the rest of the tenon with the router.

You can skip the part about making a saw blade cut to establish the shoulders of the tenons, but usually cutting them just with the router will leave a bit of fuzz, and on some woods may result in a bit of tear out on the shoulders.

A quick additional routing example

The next few photos show the MFS components utilized to quickly make a small stand with a shelf, half back and drawer.

To make it easier to see, I have prefinished all the components, shown here and in the next several photos.

I took the time to first band the maple top with bloodwood all the way around as well as on the front of the shelf. You can see (photo previous page) the underside of the top with its two sliding dovetails to receive the two sides (to the left of the top in photo). The sides have two horizontal sliding dovetails, one which holds the shelf (to the rear in the photo) and one which holds the drawer slide (the bloodwood pieces to the back right). There is a third, vertical, sliding dovetail that receives the half back (just to the rear of the top) that seals the drawer area and adds lateral stiffness to the piece.

Above it is partially assembled so you can see what it will look like. The sides slide into the dovetail groves on the under side of the top, the shelf slides into the two sides, the drawer guides slide into the two sides below the shelf and the half back (shown here in front of the partial assembly) will slide up from the bottom as the locking part of the assembly. The white things on the top are four plastic bolts that will be threaded into the bottom of the sides at each corner to act as leveling feet and to pull the unit visually off of the surface upon which it stands.

It is easy to see how you can scale up this small stand and add a bottom and toe kick to make a multi-drawer chest or add doors for a cabinet, and so on.

To build it, first use the set up we have been discussing to cut all the components to size. Do the edge banding if you wish. Now cut the female dovetail grooves into the underside of the top as shown in the pho-

tos on the right side of the previous page. I removed the dust collector hose and cord from the router to make it easier to see. The router is set to a centerline 20mm forward of the front edge of the guide rail just as we talked about earlier.

Note that this cut is stopped at the front so you need to set a stop on the guide rail as shown (previous page). Since the Festool guide rail holds the router against both in-thrust and out-thrust loads, you can cut in either direction as is required for these two cuts. Also, note the clamping element which holds the work piece to the edge or side fence for stability.

Make the first cut, reverse the top piece end for end without altering the MFS set up, and rout the second cut. You are done with the top.

In making a piece like this, after you cut the two grooves in the top, lay the shelf piece down with an edge on each groove to make sure your shelf is exactly the same length as the centerline to center-

line distance between the two grooves you just cut in the top. If using a standard such as the one I use where the work pieces are 20mm thick and the DT grooves are 10mm deep, the shelf with its male DT on each end will need to line up with the centerline of the the two sides which is the centerlines of the two grooves you just cut into the underside of the top.

Now it is time to cut the three dovetail grooves in each side. The photo left shows cutting the vertical groove which will receive the half back. Notice the stop so that groove only goes as far as the shelf groove. The already cut other side is shown so it is a bit easier to tell what is going on. The photo above shows cutting the two horizontal DT grooves. Since the shelf DT passes all the way across the sides, no guide rail stop is needed to limit the travel of the router. The DT for the drawer slides is stopped at the groove for the back.

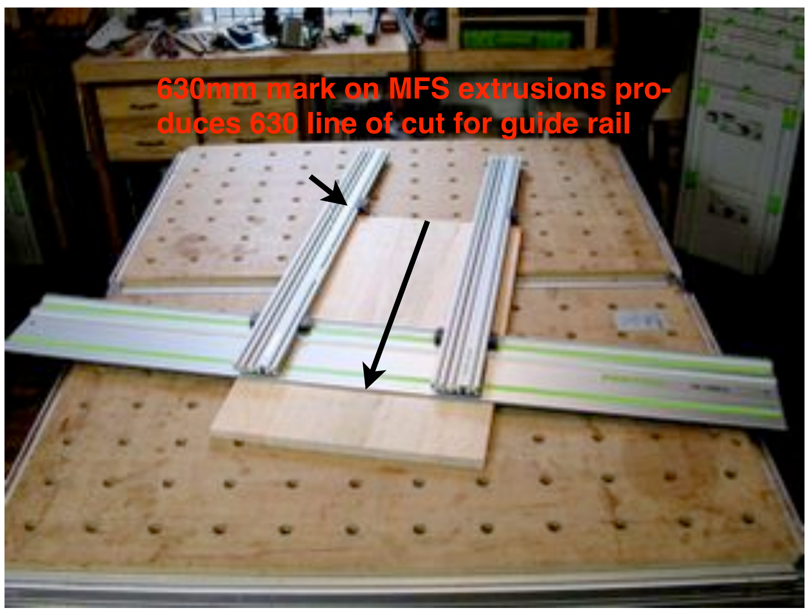
All of the male DT's I cut on either a router table or on a horizontal router jig I made that fits onto the side of a Festool Multi-Function Table. That jig is shown in the appendix to this manual.

Earlier I said one of my favorite set ups was this use of the MFS rectangle and fixed side extrusion as a very accurate rip fence or depth stop to cut work pieces as large as the guide rail you are using. But, it is not the only such set up.

Let's next move to using the MFS components as "story sticks" to accurately locate a guide rail whether the guide rail is placed freely on a work piece or held by the table side brackets.

Using the MFS components to accurately locate the guide rail to be parallel with and the desired distance away from the edge of a work piece

Another common set up where the MFS earns it stripes as a valuable addition to Festool guided rail cutting and routing is where you want to establish a cut line that is a precise distance away from the existing back edge of a work piece. Normally you would simply measure out the desired distance on both ends of the work piece and then manually set the leading edge of the guide rail to your marks by eye.



MFS extrusions with shop made saddles and stops set to position the guide rail for a 630mm cut

This can be very accurate for one piece, but accuracy is dependent on a clean narrow mark, good light so you can see those marks, and an eye held perpendicular above to the guide rail so you can accurately place the guide rail on those marks. If you are only going to cut one piece to that dimension, usually you can get close enough this way, but, if you want multiple pieces that are all exactly the same size, there is too much room for error relying on the measure, mark and align visually approach.

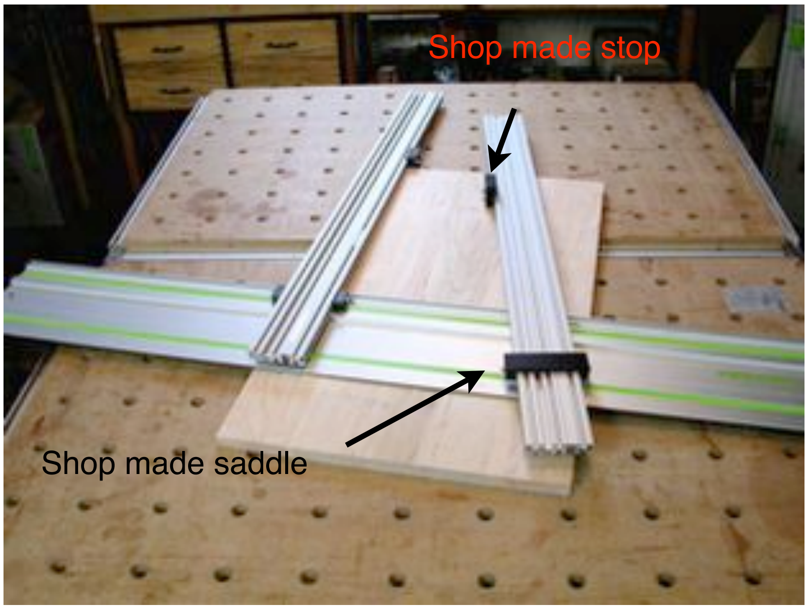
This is where the next use of the MFS extrusions can be of invaluable service. Since the 200mm, 400mm, 700mm and 1000mm extrusions all have metric ruler marks along one edge, you can quickly use them as a very accurate “story stick”.

For hundreds of years craftspersons have used marks on a piece of wood (called a “story stick”) to do repetitive layout work. In more recent times sliding stops and ruler marked edges were added to make these story sticks faster to set up and use.

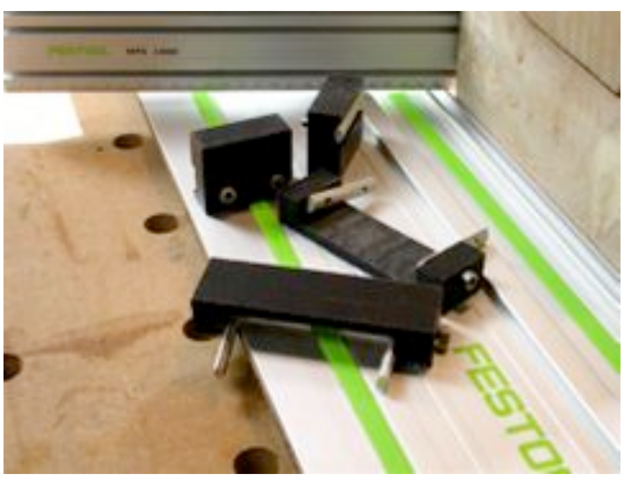
If you calibrate the zero marked end of one of the MFS extrusions to the zero clearance rubber lip on the guide rail you can then use a simple stop to set the desired length of cut and the story stick becomes the way to set the guide rail a precise distance away from one edge of the work piece.

This is the same principle Festool uses with their shelf hole drilling fixture. In that case two short story sticks are provided along with a lock to fit over the hat section on the guide rail on one end and an adjustable spring loaded pin to use as an edge reference at the other end.

For our purpose I suggest a couple of simple shop made guide rail registration



saddles and a couple of shop made sliding stops to hook over the back edge of the work piece. Both are shown below.



By calibrating to the front edge of the guide rail you can then use the ruler markings to set the back edge stops to exactly the same measurement time after time.

Place the guide rail down on the work piece, place the guide rail registration saddles on the guide rail and move the guide rail until the back edge stops come firmly up against the back edge of the work piece as is shown in the photo on the previous page. That will position your guide rail a very precise distance away from that edge on both ends of the work piece so you can cut a clean line that is about as close to parallel with the other edge of the work piece as you can get. And, you can do it on work piece after work piece to come out with multiple parts that are as close to exactly the same size as you are likely to be able to measure.

The guide rail saddles and back edge stops shown I made from scrap UHMW plastic sheet that I buy in bulk from a wonderful old fashioned hardware store in Bellingham, WA, a favorite stop whenever we are visiting our son and his family, but you can make them just as easily from wood or whatever you have lying around your shop.

The guide rail registration saddles shown fit snugly into the space between the rear "T" track and the hat shaped ridge that the Festool cutting and routing tools slide along. That space is 32mm wide. I suggest you cut your stock a bit wider than that and then use a router to shave off about an 8mm high rebate recess on each side until it fits quite snugly in that space. That hat shaped slide is about 6.5mm high so 8mm will give good clearance. My material happened to be 19mm thick and that works well with the 16mm thickness of the MFS profiles.

I plowed a 13mm deep groove 80mm wide so the saddle fits snugly over the MFS profile and snugly into the space on the guide rail. That way the profiles will project out behind the guide rail at very close to a 90 degree angle which will add to your accuracy.

I then drilled a couple of 5.5mm holes in the sides of the saddle aligned with the center of the side “V” tracks on the MFS extrusions. Slide in a two hole “V” nut and fasten the saddle with a 5mm machine screw.

If you use the normally available hardware store metric cap head screws, then you can use a 4mm Allen key to tighten and loosen all of the 5mm fasteners and the 3mm Allen key supplied as part of the MFS system for all the 4mm fasteners.

You could also get a bit fancy and use some form of purchased or shop made quick set 5mm thread handles.

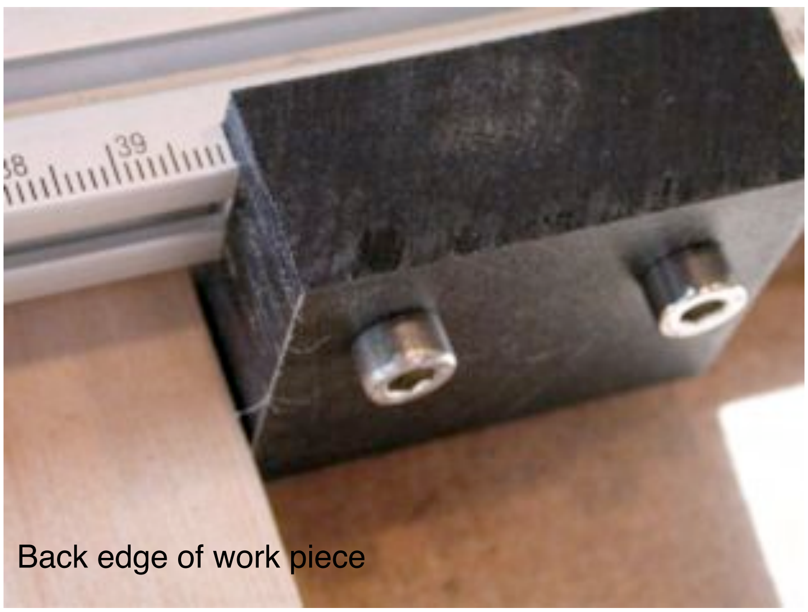
Once the saddles are in place with the screws still loose, put the saddle onto the guide rail and use a block of wood to bring the end of the MFS extrusion marked zero up to be exactly even with the rubber edge on your guide rail as shown in this photo. Since you cut that rubber edge with your saw and blade the first time you used it this procedure will calibrate your “story stick” to your saw, blade, and guide rail.

With the edges aligned tighten the side screws on the saddle so you can remove the MFS profile and saddle from the guide rail and replace it, always keeping the front edge of the guide rail aligned with the zero mark on the profile. If you want to be able to remove and replace the saddles without reregistering them to your guide rail, just slide another “V” nut in place and lock it down against the “V” nut you use to secure the saddle.

Festool offers a small bag of “V” nuts and set screws as part number 493235.

You can use just one profile if you wish, but two will be faster and far more accurate. If you do plan to use two, then calibrate the other one to your saw, blade, and guide rail the same way. You can use any of the MFS profile lengths you wish. I find the one meter (1000mm) length the handiest. If I want to cut off a longer piece than that will allow, I attach another MFS profile to the end of this one using two of the profile joining “V” nuts. The second profile zero mark will set against the 1000mm mark so it is easy to set precise measurements beyond one meter.

To make the back edge stops I used the same 19mm scrap UHMW and plowed a shallow dado in the side a fraction over 16mm wide. This will allow the back edge stop to register cleanly along the edge of the MFS profile with a clearly readable shoulder to align with the desired measurement mark.



Back edge of work piece

I find 40mm high about right with the 16mm dado set down about 4mm from the top edge. That allows the lower edge of the stop to fall below the top edge of the work piece so I can get a nice clean hook action to catch the back edge of the work piece as shown above.

Those back edge stops are secured to the MFS side “V” track with 5mm machine screws threaded into the two hole “V” nuts.

As we discussed above, in use, set both stops to the desired length of cut, place the saddles on the guide rail, and move the guide rail and story sticks until the stops fall over the back edge of the work piece -- slick, fast, highly accurate and very repeatable.

You will find that in use both of these methods of positioning the guide rail relative to the work piece (the MFS rectangle and these story sticks) will allow you to reach a level of accuracy and repeatability that is most likely far beyond what you have been able to achieve using the measure, mark, and align technique.

While the MFS rectangle as a vernier scale does require the guide rail to be mounted on a Multi-Function Table, the story sticks do not. Either way both of these techniques employing the accuracy of the Festool MFS extruded profiles offer a fast way to make one cut or dozens that are all the same.

It also doesn’t matter whether you are making rip cuts or cross cuts or whether the cut off pieces are narrow or wide, both techniques work equally as well.

Best of all, since you always calibrate off of your saw, your blade, and your guide rail, you don’t have to worry about how straight or square your table is or whether things “change” on you from one work session to the next.

Now let's turn our attention to using the MFS system in advanced routing applications

Everything we have talked about in terms of aligning the Festool guide rails for cutting work pieces applies equally to routing operations as well.

Most all routing operations require some means of positioning the work piece and router bit in a desired alignment while either the work piece is moved past the router (as in a router table application) or while the router is moved past the work piece.

The former is accomplished either by the work piece being held against the router table fence or by a bearing on the bit which rides on the work piece, a template or a pattern. The latter is accomplished either by a fence that is attached to the router base, or by the router being guided by a Festool guide rail, or by a bearing on the bit which rides against the work piece, a template or a pattern.

Since this manual is all about techniques using Festool products, we will skip the discussion on router tables and cover only guided rail routing here. I will assume you know how to set up and handle your Festool router safely so those basics will not covered here.

If you have any question about your ability to set up or handle your router safely, please do not proceed with this manual. Move instead to literature, videos, or training programs designed for that purpose.

Since most of you have experience with free hand routing using bearing guided bits riding against the edge of the work piece (such as when putting a rounded edge on a shelf or table top,) I won't spend any time here on how to do that. Instead we are going to concentrate on advanced guided rail routing, pattern routing, and template routing operations, especially those for which the Festool MFS is ideally suited.

First, let's clarify some definitions. People often use the terms "template" and "pattern" interchangeably. I don't. I use the term "template" to mean a way of guiding a router bit to cut a female recess in the face of a work piece. It can also be used to cut a (nearly) matching male shape in inlay material to be inserted into that recess if you wish. By "pattern" I mean a way of guiding a router bit to produce an area that mimics the area under or beside the pattern while other areas of the work piece are routed away.

By my definitions one would use a "pattern" to establish and duplicate curves on table legs, for example. In that same table we might want to inlay a different material as a decorative accent. That would be done using a "template."

Offset Routing

To fully appreciate all that can be done using templates and patterns, we need to explore the notion of offsets, guide bushings, and bearings as they relate to guiding the router bit.

Guide bushings fit onto the router base concentrically located around the router bit. On routers such as the Festool 1010, concentricity is established via a cone shaped mandrel which is placed in the collet. The guide bushing is placed over the cone shape which holds it concentric to the collet as the guide bushing is tightened down. On the Festool 1400 the guide bushings snap into place, automatically being held concentric to the collet by the tangs and receivers machined into the guide ring and router base as pictured below.

The outer edge of the guide bushing follows the pattern or template to produce the desired cut. If the guide bushing is, say, 20mm in diameter and the router bit is 10mm in diameter, then one edge of the cut will be 5mm away from the edge of the pattern or template and the other edge of the cut will be 15mm away.

Guide bushings simply snap in place properly centered on 1400

Removing the 1010 baseplate. Guide bushing and centering mandrel in foreground

Guide bushing centered over mandrel and tightened down on 1010

This relationship is always such that one cut edge is away from the edge of the pattern or template by half of the difference in diameter between the (outside diameter of the) guide bushing and the diameter of the router bit. The other cut edge is that plus the diameter of the router bit since the router bit will plow a groove in the work piece its own diameter wide.

Knowing this, one can use the same router bit and template and, by changing guide bushings, can cut both a female recess and a matching male insert which will exactly fit the recess everywhere except in corners where the guide bushing used to cut the female recess will produce radiused corners while the male piece cut will have sharp corners. One or the other must be hand trimmed for the male to fit perfectly into the female recess. This is usually not an issue and can be done easily.

Sample of 1400 guide bushings in different sizes

In our example, if we used the 20mm diameter guide bushing to cut the male and a 40mm guide bushing to cut the female, they would fit together perfectly. The 40mm guide bushing with a 10mm bit will plow a groove that is 15mm away from the edge of the template and 10mm wide. We would route out all the interior leaving the profile of the female recess that is 15mm smaller than our template.

When we cut the matching male we just put on the 20mm guide bushing. This time the groove will be 5mm away from the edge of the template on the side nearest the template and 15mm away on the side furthest away from the template, exactly the size and shape of our female recess.

Using bearings on the router bit instead of guide bushings on the router base will produce a similarly predictable result. The photo to the left shows (left to right) a top bearing bit the same size as the cutter (called a flush trim bit), a top bearing bit smaller than the cutter (called a rebate cutter), and a bottom bearing bit the same size as the cutter.

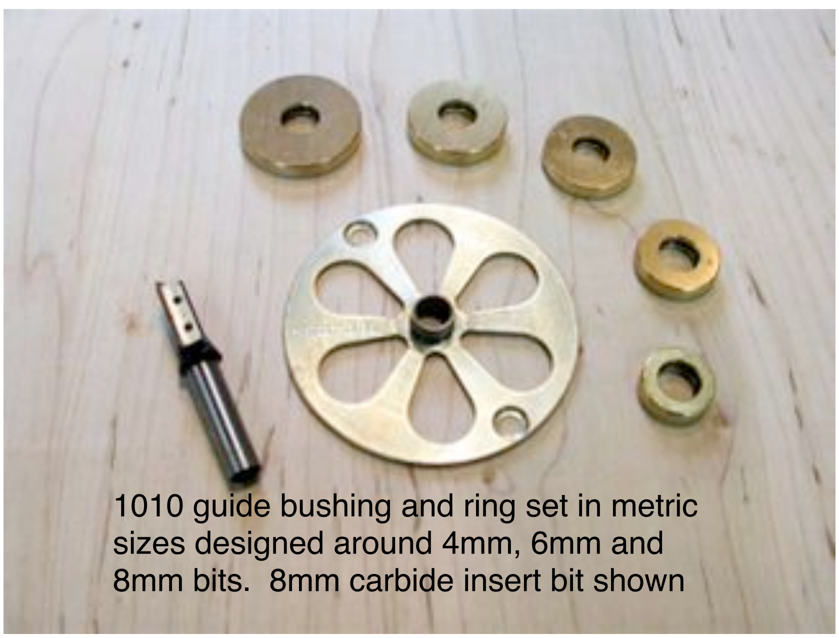
If the template will be held between the router base and the work piece (as in most plunge cut applications and many router table applications), the bearing needs to be mounted on the shank end of the bit like the one on the right. If the work piece is held between the router base and the template (as in most through cut applications), then the bearing needs to be mounted on the cutter end of the router bit (the left most bit in the photo on the previous page).

In either case, if the bearing is larger than the router bit, it will act like the guide bushing in our examples above, and the same relationships will exist. The work piece will be machined to be smaller than the inside of the template by one half of the difference in diameter between the router bit and the bearing.

If, on the other hand, the bearing is smaller than the router bit, as is the bit pictured in the center of the photo on the previous page, then the work piece will be machined to be larger than the inside of the template, again by one half of the difference in diameter between the bit and the bearing. Doing this will be undercutting the template so use a thin scrap between the template and work piece to avoid scarring the template.

1400 guide bushings and rings in inch sizes mounted on a 1400 “universal” guide bushing adapter

There is still a third way of establishing the offset between the inside of the template and the line of cut and that is through the use of what are called “snap on guide rings.” This is a two piece guide bushing set. The guide bushing itself is one diameter and a machined ring is fashioned which has a hole in it the same diameter as the guide bushing but with a larger outside diameter.



1010 guide bushing and ring set in metric sizes designed around 4mm, 6mm and 8mm bits. 8mm carbide insert bit shown

For any given router bit, the difference in the diameter of the guide bushing and guide ring required to make a male and female cut from the same template fit together is twice the diameter of the router bit.

So, whether working in inch size bits, bushings, and rings, or with metric size bits, bushings, and rings, you

want to find pairs where the difference in diameter between the bushing and the ring is twice the diameter of the router bit itself.

These pairs will cut female recesses of any shape with matching males that fit into those recesses which will be smaller than the template by a known amount, which I refer to as the "offset."

The offset from the side of the template to the edge of the inlay is half the diameter of the largest bushing or ring plus half the diameter of the bit.

If you are starting with a male shape that you want to fit into a female recess, the template needs to be larger than the male by this offset amount. If you are starting with a female shape that you want to cut a male to fit you will wind up with a female recess and matching male that fits that is smaller than the original female by the offset amount.

As you begin to explore the fascinating world of template and pattern routing it is very important to understand these relationships. I know it seems a bit confusing at first, but hang in there and it will slowly begin to sink in.

Let's take a look at the very capable metric set from Festool. It is not a regular catalog item but was developed for the flooring installers who needed to do various kinds of fancy inlays in their floors. This is the metric set shown at the bottom of the previous page. It only fits the 1000 and 1010 routers, not the 1400. There are lots of inch sets available that fit the universal guide bushing adapter for the 1400 from a variety of manufacturers.

The guide bushing on the Festool set shown has a diameter of 10.6mm. There are five rings marked, in increasing diameter 4, 6-4, 8s, 6 and 8l. You can use a 4, 6 or 8mm bit. With a 4mm bit you can get male/female matching pairs with various offsets by using the bushing alone with ring 4, ring 4 with ring 8s and ring 8s with ring 8l. Likewise you can use a 6mm bit and get matching pairs with the guide bushing and ring 6-4 or with ring 6-4 and ring 8l. With an 8mm bit the combinations are guide bushing and ring 8s or ring 4 and ring 8l. Each produces a different offset so you can select which best fits your situation. ***See the table in Appendix B for details.***

I like the metric set for use with the MFS profiles since they are both denominated in metric sizes so the math is easy.

The inch denominated set shown in combination with the 1400 universal guide bushing adapter is designed to work with 1/8", 1/4", 3/8", 1/2" and 3/4" bits. You can probably find others as well.

If using the 3/4" bit, bushing and ring set the bushing diameter is 7/8" and the ring diameter is 2 3/8" so the offset is going to be 3/8" plus 1 3/16" or 1 9/16". You cut the female recess with the 2 3/8" diameter ring installed and the male with just the 7/8" diameter of the guide bushing so the male will just fit into the female recess.

These snap on guide bushing sets produce the same outcome as using two different guide bushings but are a bit faster to use with the 1010 and most other routers since you don't need to change guide bushings. With the 1400, changing guide bushings is so fast that it is a toss up, but the range of available sizes is limited.

Using the Festool MFS profiles as an adjustable rectangular router template

So far we have only looked at the MFS in terms of using its various components as fences or guide rail positioning aids. If you assemble four of the MFS extrusions as a rectangle with the ruler markings on the ***inside*** it now becomes an adjustable rectangular router template. It is easy to adjust to whatever size rectangle you want.

As we will see in a moment it is just as easy to change the size of the template to do offset routing as it is to leave the template the same size and change bearings or guide bushings or guide bushing and ring sets. Either works well for most applications.

Let's start with a commonly requested example. Let's recess a router plate into the top of a Festool Multi-Function Table. I'm not going to actually cut into my tables because I already have large industrial router tables. Instead I will cut into a piece of 3/4" mdf which we will pretend is a Festool MFT top plate.

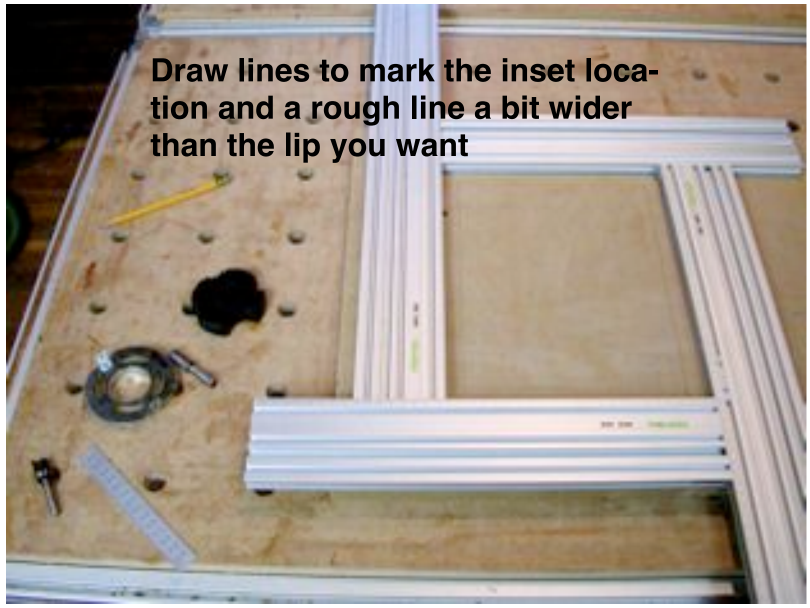
To set a router plate into a table surface, the male already exists (the plate itself) so we just need to fit it into a proper female recess. We need to rout a groove the thickness of the router plate and exactly the same size as the router plate. Then we need to cut clear through the table top surface leaving about a 10mm to 15mm lip all around to support the router plate. The router plate pictured below with the router still attached is designed for a lip that is 11mm deep.

Begin by setting the selected router plate flat on the table top. Assemble four MFS extrusions into a rectangle with the ruler markings ***on the inside***. Place this rectangle over the router plate and adjust the rectangle to just fit the router plate as is shown in this photo.

That is all it takes to make a template that is exactly the same size as the router plate.

Now, place the rectangular template you just made on top of the intended work piece positioned just where you want it.

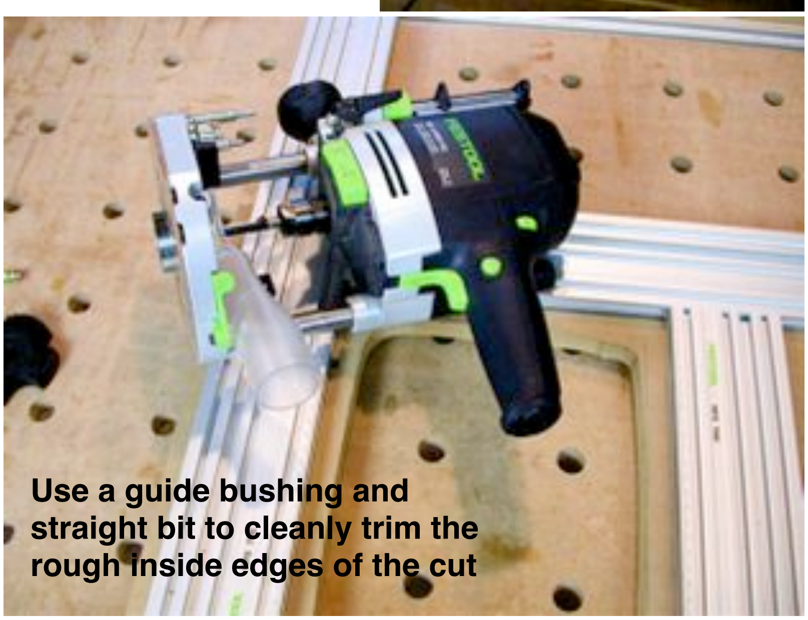
Draw a line around the inside so you can put it back in that same spot. Also draw a line a to form a lip a bit wider than you want. This is to allow you to cut out the majority of the center with a jig saw or “recip” saw before you do any of the routing. As you can see from the photo below, it doesn’t need to be a careful or even straight cut. All you are doing is removing the bulk of the material to reduce the amount of work the router bit has to do when you next rout the actual inside edges of the work piece.



Draw lines to mark the inset location and a rough line a bit wider than the lip you want

Cut out the center with a jig saw or “recip” saw

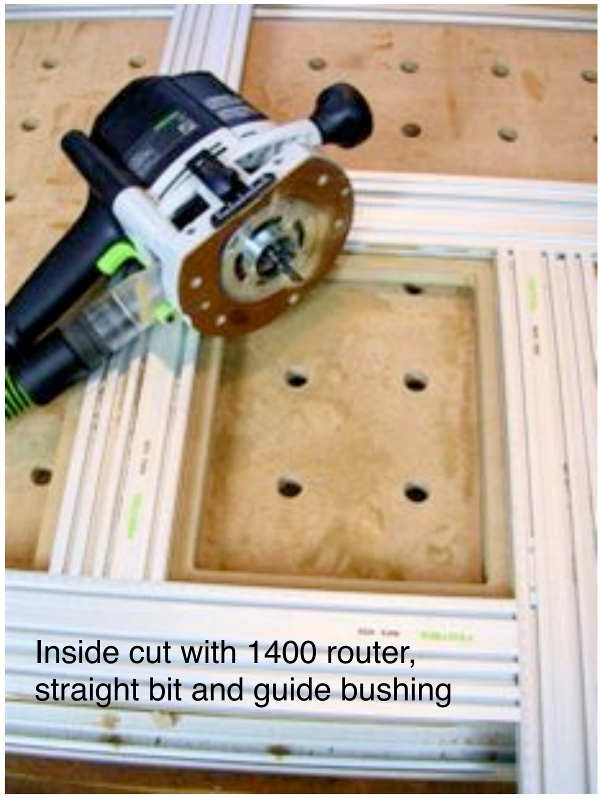
Put the template back aligned with the pencil line you drew a moment ago. Mount a guide bushing and straight cut bit sized to produce the width of lip you want. Remember how the guide bushing will ride on the inside edge of the template and hold the inside edge of the bit away from the template by half the diameter of the guide bushing less half the diameter of the bit.



Use a guide bushing and straight bit to cleanly trim the rough inside edges of the cut

For this router plate, a really beat up unit that has been in use daily for several years, the lip needs to be about 1/2”. A 40mm guide ring snapped into the Festool 1400 router shown in the lower picture and 10mm router bit will produce a 15mm lip, a bit wider than 1/2” but certainly close enough to 1/2” to work well.

I placed scrap pieces of plywood under the work piece to hold it off of the surface of the multi-function table so as not to scar it up. Set the depth of cut to just clear the bottom of the work piece. Follow the template with the guide bushing moving in a counter clockwise direction. Go slowly as you are removing a lot of nasty mdf material, and carefully guard against tipping the router. Be sure to use dust collection with your router and wear ear protection.



Inside cut with 1400 router, straight bit and guide bushing

The result will be a very clean, smooth cut-out, in this case 30mm smaller than the router plate all around, so as to form the 15mm lip we were after.

The next step is to mount the flush trim bit the same size as the corner radius on the router plate, if you have one that size. Since the bearing on the flush trim bit is going to ride directly on the inside edges of the template, select a bit with a cut length that will make the depth of cut you want while keeping the bearing within the 16mm thickness of the MFS profiles that form the template.

Once everything is set and the dust collection is hooked up and you have the depth of cut set to the depth you want the lip to be, move slowly around the inside of the template again in a counter clockwise direction. This time you are really removing a lot of material as this is a full depth, full width of lip cut. Let the router do the work and just guide it along keeping the base flat on the MFS profiles. At 80mm wide it is easy to perch the router there without tipping so long as you exercise even modest care.

To make this cut I used the Festool 1010 router as the flush trim bit had a 1/4” shank bit and that router happened to already have the 1/4” collet installed.

I have heard some question the robustness of this “small” Festool router but I surely don’t know why. It made this full depth, full width cut without a whimper and, as you can see, it did a great job. I have

Lip cut with 1010 router, no guide bushing and flush trim bit

with scrap sticks, but doing so is usually not as fast, not as safe, nor as accurate.

The picture below shows everything, the router plate we started with, the MFS template, the Festool clamps that held everything secure, one of the routers we used, the dust collection, the guide bushing and straight bit, and, still mounted in the router, the flush trim bit along with the finished work piece itself.

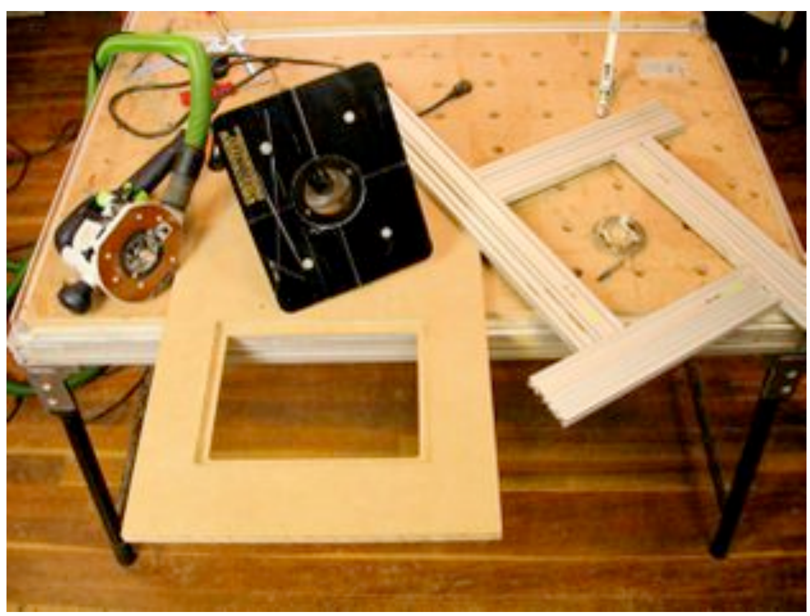
never had a 1000 or 1010 router bog down no matter what I was routing.

All you need to do now is just drop the router plate into place and start using it. Total time? The first time you do it, it will take you 20 to 30 minutes start to finish, after that no more than 15 minutes all because the MFS profiles make a first rate template in a hurry and one that sits flat and secure on top of your work piece.

The photos here don't show it but I held the work piece, the plywood that held the work piece off of the table top, and the template, all three with one Festool "F" clamp mounted from below the table engaged into the bottom "T" track on one of the MFS profiles. That way there was nothing in the way of the router and nothing shifted on me either.

You can make a similar template for applications like this

If you look closely at the picture to the left you will see that I did not have a 1" diameter flush trim bit of the correct length to match the 1/2" radiuses used on this router plate so the radius cut is a bit smaller. This doesn't hurt anything and doesn't effect how snugly the router plate is held so it would not bother me. But, if



you want it perfect, get a flush trim bit that matches the radius on your router plate.

There are a few things to watch out for. First, don't try to get the template to be too tight a fit to the router plate. Most flush trim bits are really a few thousands smaller than the bearing so the bit won't tear up the template or pattern. That means that the actual cut-out will be a few thousands smaller than the router plate as well. So allow a little extra room all around when you set up your MFS profiles to make the template.

Next, be careful that the flush trim bit is the right length. If it is too short, the collet might impact the template. If too long, the bearing might not ride securely on the inside edge of the template.

Make sure nothing can move before you turn on the router. The bits are projected well below the bottom plate on the the router so if anything goes wrong and the router is yanked from your hands, there is a lot of spinning bit that will try to find you.

Don't lift the router off of the template while the bit is still spinning. If you do, you likely will take a hunk out of the MFS profile which could make for a less than stellar cut the next time you want to use that profile as a template.

Don't let the router tip. There is no way to provide anti-tip support for these cuts so your hands holding the router base directly onto the flat surface of the MFS profiles is your only guarantee that no tipping could spoil the cut.

You also can easily make one or more filler plates to cover the hole if you want to. Select another flush trim router bit that is long enough to cut clear through the thickness of the intended male yet still keep its bearing securely along the inside edge of the template.

Use the ruler marks to move the template out the diameter of this router bit. The width and the length must be increased by this amount. If the filler plate is slightly small, it won't hurt anything. If it is slightly too large, it won't fit so err on the side of being a bit small.

Secure the male work piece to a sacrificial scrap with double sided sticky tape. When it is cut completely out, you do not want it to move over and hit the still spinning router bit.

Place the adjusted template over the male, set the depth of cut to just clear the bottom of the male work piece, and rout in a counter clockwise direction as before. This time it is imperative that you hold the bearing tightly against the inside edge of the template all the way around the cut. If the router drifts towards the center of the template you will ruin your male work piece.

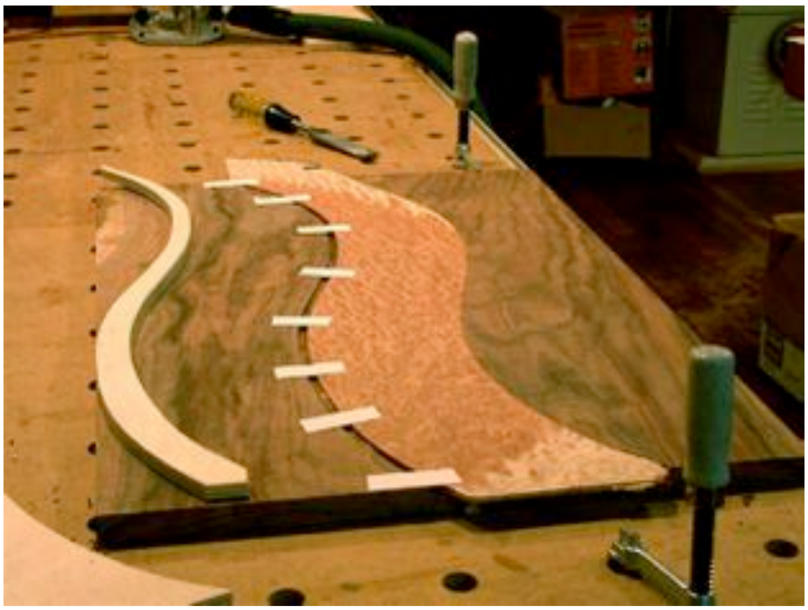
Another way to make the male is to use the original router base as a template and run the bearing around the outside edge of it to create an exact duplicate. Hold the router base to the top of the work piece with double sided sticky tape.

If the router base is clean on the bottom side, you can rout from above. If there are things sticking up, then rout from the bottom with a flush trim bit with the bearing on the top of the bit and mounted in an inverted router in the router table.

Either way you can make as many perfect duplicate filler plates as you wish.

Open field inlay work

One of the fastest way I know to add value to your furniture is to do open field inlay work. This means inserting inlays into recesses cut in the surface of your work pieces. A nice inlay on the top or sides of a table or chest can add 50%, 100% or even more to the price, yet it takes far less time to do the inlay than to build the piece in the first place. That is the economic power and leverage you can experience by employing the Festool MFS system this way.

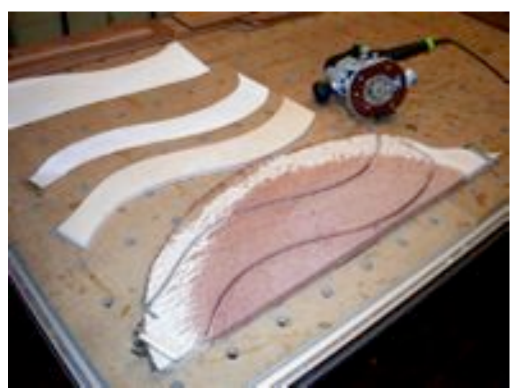


By now it should be obvious that open field inlay is done in just the same way you did the router plate insert in the top of your Multi-Function Table. The only difference is that you will clear out all of the interior of the female recess at the same depth of cut setting. Everything else remains the same. The photo shows a free form wave inlay made from flame redwood burl going into a walnut lid for a wall hanging desk.

In this case I am doing an inlay on an inlay so, while one edge is tight, the other is loose so I can fit the smaller template shown to add the second inlay before gluing in the first. Later in this section we will talk about multiple inlay on inlay work and I usually will recommend gluing each inlay before proceeding with the next. When you get experienced enough, you can try doing it before the glue sets up, but practice the other way first.

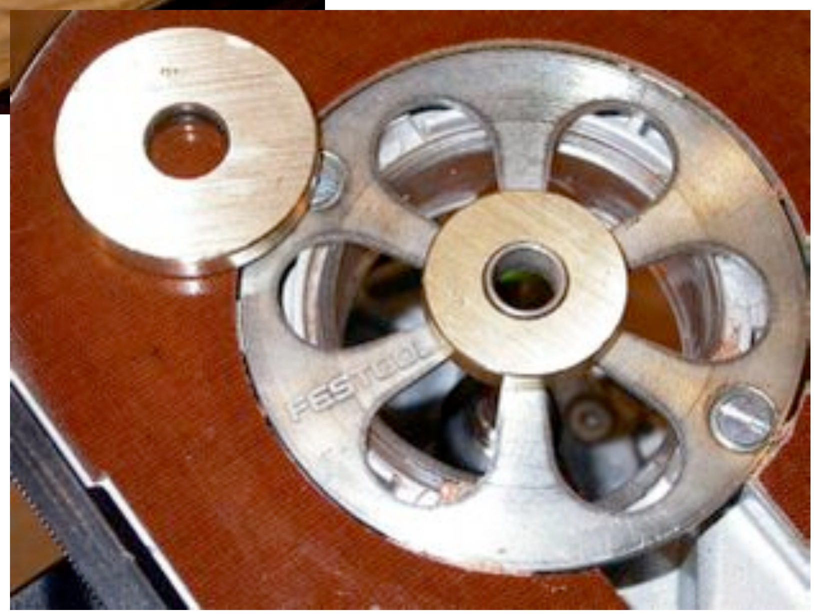
To start the process, either adhere the inlay material that is to become the male insert to a sacrificial piece of plywood or mdf, or, if you have a band saw large enough, you can cut the male shape and then resaw it off of solid stock. That is what I like to do since that allows me to book match if I am doing multiple inlays on the same surface.

For this free form inlay there is no book



matching, but, as you can see from the following pictures, I still cut the male from

my carbide band saw blade produces a 2mm kerf. If I plan on 4mm thick inlays, I will set my Festool router to a depth of cut around 8mm or so to cut the grooves for the male inlay piece. I will cut the female recess to be 4mm deep. After the male piece is glued in place, it is sanded flush with the surrounding surface.



a solid piece and then did a resaw cut on the band saw to free it.

The female was cut into the walnut using the same template and offset guide bushing we talked about earlier. In this case I was using the Festool metric guide ring set you can see in the photos above and to the right.

The Festool Deltex sander and a chisel make short work out of cleaning up the free form routing out of the female groove which always leaves a bunch of spots you missed with the router.

If I am doing book matched inlays, I cut the male deep enough to resaw off two identical pieces. The book matched surfaces get glued with the common surface between them placed up to show the book match clearly.

I like to rout the groove which forms the male component a bit deeper than it needs to be plus the width of the band saw kerf plus another 2mm or so just to be safe. For example,

Most customers won't notice the book matching when they first look at the piece but when their eyes do discover this detail, the perceived value of the piece goes even higher. Sometimes it is an excited phone call a week or two later and sometimes it is a gasp on first inspecting the piece. Either way the value proposition they experience is dramatically increased.

Inlays nearly always look best if the inlay piece has grain that runs the same direction as the surrounding piece into which the female recess was cut. That will minimize any expansion differential issues as well. If your aesthetics call for cross grain orientation of the inlay piece, you usually won't have any problem if the inlay is 4mm or less in thickness and you use a standard woodworking glue.

Don't use epoxy or any rigid set glues if you insist on cross grain inlays as you would be asking for trouble, whether you get it or not. No reason to tempt fate.

Band Inlays

Band inlays are where you run a ribbon or band of inlay material across the face or edge of a piece. To cut the female groove on an edge use your Festool router with one or two edge guides, a router table, or a table saw.

In this photo the band inlay is going onto a curved surface. I mounted two side fences to my router to keep the router centered on the edge of the work piece and to stabilize the router so there could be no tipping from side to side. One quick pass and the female slot is established.

If the work piece that is to receive the inlay is flat on the edge and you have a Festool Multi-Function Table, a fast way to make these cuts is to clamp the work piece to the side of the table with the edge to receive the inlay flush with the top of the table. Now use your guide rail clamped to the top of the table to guide the saw or router to make the groove cut. You can use the story sticks made from the MFS extrusions and the shop-made saddles and stops to quickly establish a line of cut that is parallel with and where you want it on the edge of the work piece.

Band inlays set in the front edges of the sides of a cabinet and along the front and side edges of the top can be done in minutes. They really add a spark of class to the piece that increases value beyond the time and effort required to add them.

One such example is shown on the next page. This is a walnut and maple bedroom unit with band inlay along the front edge of the top.

This piece also features a tricky segmented sliding dovetail shelf support sys-

Here is the finished unit with band inlay along the front edge of the top

tem, so, while it is off topic for what we are talking about right now, I will include a couple of photos to show this detail as well.

This photo shows the segmented sliding dovetail shelf support system cut into the front of the back (walnut) and the back of the front uprights (maple). The sum of the lengths of the segments plus the width of the shelf is the distance from top to bottom so no matter how many segments are below or above the shelf, the shelf looks as if it is fixed but is really adjustable.

The photo above shows a detail of the

underside of the thin shelf stiffened by fore-aft sliding dovetails and a lateral that are hidden by the maple uprights.

Directly above is a detail of how the shelf interacts with the stacked sliding dovetail segments on the front uprights.

Now back to band inlays. Band inlays can also be set in an open field using the MFS rectangles as templates.

Establish a long narrow rectangle with an opening the same size as the guide bushing you intend to use. Make sure the guide bushing will move easily along the full length of the inside of the rectangle. A little slop won't make much difference, but a too tight area will cause you problems.

Use the angled steel pieces that come with the MFS to establish the desired offset from the edges of your work piece. Let's say you want to put a 5mm inlay band 20mm in from the edges of the top of a desk or table, for example. Place one of the angled steel pieces at each end of the underside of the MFS rectangle parallel with the long dimension and as far apart as the shortest side of your work piece.

Make sure they are the same distance in from the edge of the work piece to position the slot that is the interior of this narrow rectangle where you want it. You are next going to set stops to make sure the router bit stops short of the actual corner. If you were to try to rout band inlays by running a router bit with a guide bushing around the inside edges of a much larger rectangle, the corners would be rounded by the radius of the guide bushing. It is very difficult to cut the male inlay pieces to fit that rounded corner.

Instead we are going to stop the router bit and hand chisel a square corner. When we place the band inlay, we will miter those corners so the whole thing looks really professional and clean. A short miter like that in thin material is easy to do simply by cutting both pieces at the same time with a razor knife. The actual angle is not important since they will form a perfect 90 degree corner anyway.

To stop the router in the right place, first place your MFS rectangle on an adjoining side with the stops against that edge. Mark with a pencil the outer edge of the interior of the rectangle. That is where you want to stop the guide bushing when approaching that corner.

Now you can position the MFS rectangle on your work piece with the edge stops against the edge and the end of the rectangle even with your pencil mark. Clamp it down.

Make the cut a little more than half the way across your work piece. Now unclamp the MFS and slide it down so the end of the rectangle aligns with the pencil mark at the other end. If you have the edge stops cleanly up against the edge of your work piece and have clamped it securely, the second part of your band recess will align perfectly with the one you just cut.

Continue around the top of the work piece the same way to make the groove all the way around. A little bit of chisel work will finish the corners square, and you can easily insert the banding male inlay pieces.

Use the technique outlined earlier to cut these narrow strips to exact thickness. Cut them from stock that is a mm or so thicker than the depth of your female groove. Glue in the pieces mitering the corners as discussed and sand everything flush once the glue dries.

While this is very easy to do, I recommend you practice a bit on scrap pieces before you tackle your masterpiece.

Once you start adding band inlays and open field inlays to your work, you will find many aesthetically pleasing ways to combine the two. Take your time and do your set ups carefully and you will be inlaying like a “master” in no time.

There is one more type of inlay I want to cover. That is where you do multiple overlapping open field inlays.

The process is the same. You cut your first open field inlay and glue and sand the male in place. When the glue sets up, add a second, usually differently shaped inlay that overlaps some portion of the first. Do the same thing again. Cut the female recess using the MFS as the guide. Change guide bushings or add a snap on ring of the right diameter or change bearings on your bit to get the right offset to cut the male. Glue that male in place and sand it smooth with the surrounding field and the first inlay.

Do as many of these as you like, overlapping where ever you like. They are fast and easy to do and in pleasing proportions can really add value to your piece.

A very interesting variant is to do an open field inlay of a contrasting wood. Then come back and do another inlay partially or fully contained within that first inlay in the field wood. If you keep the grains going in the same direction and do a bit of careful selection of colors and grains so the second inlay closely matches the field wood, you get a very interesting look that baffles most as to how this was accomplished.

If you use a third wood for the second inlay instead of using the field wood you can create a very interesting effect that looks like an inlay surrounded by a contrasting band and without any corner joints at all. If you want the band to be the same size all around you will need to plan your work and positioning of the MFS rectangle carefully. The ruler markings on the profiles can really help.

Remember how we used one piece of MFS extrusion as a vernier fence to position a MFS rectangle as a fence or end stop for cutting? Well, you can do the same thing to help you position the MFS rectangle you are using as the open field inlay guide.

Once you have the MFS set where you want it for the first inlay, attach two additional MFS profiles to the two sides of the rectangle using the “V” nuts in the side tracks so they extend off over two edges of the work piece. Use the saddles you made to fit onto the MFS profiles to snug up against the edges of the work piece to fix the position of the rectangle. That way you can reposition the rectangle with great accuracy even if you have to remove these two additional profile pieces and remount them later.

After you finish the first inlay shrink the MFS rectangle in both directions by the width of the desired band. Now remount the two additional profile pieces, the ones with the saddles establishing a side reference, and move the saddles by one half of the desired band width thereby centering the now smaller rectangle over the original larger one.

Use the same bit and guide bushing to cut the female recess and you will be left with a beautiful contrasting band that looks almost impossible to do. Only you, or another MFS user will know how you did it!

There is no right or wrong way to assemble the MFS system components

As with most well engineered systems, there is no “right” way to use the MFS or any other Festool components, nor is there a “wrong” way, only “normal” and “unusual” ways of using them.

I think this is an important concept to keep in mind as you learn to use any of the Festool tools, accessories, or components. Since they are all parts of one overall “Festool system,” I feel free to mix and match to fit a particular situation.

Here is a good example. The miter head shown below is from the miter fence that comes with the Festool Multi-Function

Table. It normally is attached to the small fence shown that is 1220mm long by 35mm wide and 14mm thick by two 6mm cap head machine screws and square nuts that engage the “T” slot on one side or one edge of the fence.

Swap those 6mm machine screws and square nuts for a couple of 5mm machine screws and two of the MFS “V” nuts and you can just as easily attach one of the MFS profiles to be your fence for the miter head as shown above. Since the MFS profiles are much heavier and larger, you get a sturdier fence that, by joining more than one MFS profile end to end, can wind up being as long as you wish and one with handy ruler markings along one edge and standard Festool “T” tracks both top and bottom.

Neither fence is “right” or “wrong” to use with the miter head and both have their place. The “normal” fence receives a Festool supplied flip stop (shown in the photo on the previous page) but has no ruler markings. The “unusual” MFS profile used as a fence requires an easily

made shop-built stop but does have the convenient ruler markings.

Want the ruler markings to be on the inside edge facing the miter head? Install it that way as shown here, detailing how it attaches. Is it more convenient for some particular application to have the ruler markings on the outside edge away from the miter head? Assemble it that way.

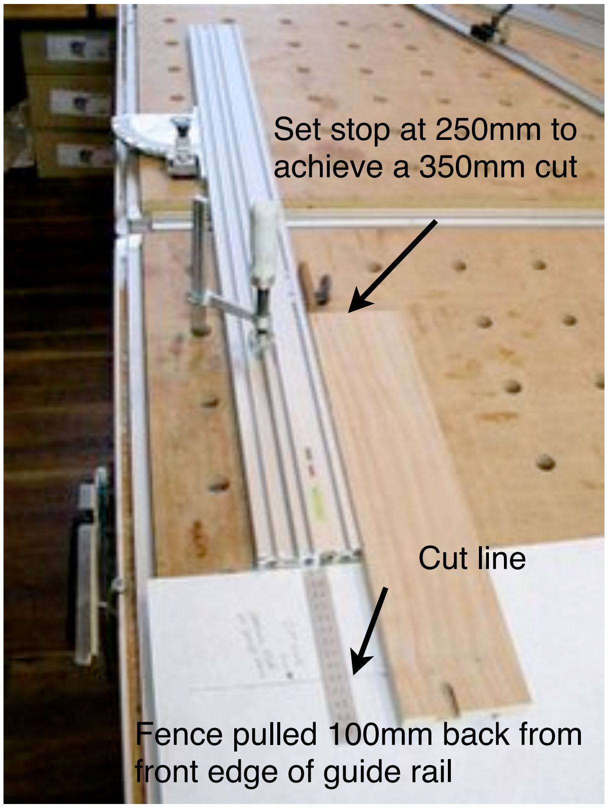
In fact, another favorite way to set up my Multi-Function Tables for sawing is to use the miter head with either a 700mm or 1000mm MFS profile attached with the ruler markings away from the miter head. I like to place the miter head at about the mid-point of the MFS profile and lock the miter head to the table with the normal Festool knobs from below the table. That gets the miter head out of my way, yet it is easily accessible.

If you have not seen one, the miter head has two 20mm bosses molded into the bottom side. Those fit into two adjoining holes in the multi-function table. Some Festool 8mm knobs secure it in place

from below the table.

Now I place the guide rail into the table side mounts and lock those into the “T” track on the side of the table as shown in the photo on the next page.

I use a MFS rectangle to make sure the guide rail is 90 degrees to the fence. Next, I slide a steel rule under the guide rail and push the leading edge of the MFS profile (the end with the zero ruler



marking) back by 100mm as shown in the photo above. That keeps the end of the MFS profile back out of harm's way, yet I can still use the markings on the edge of the MFS profile to very precisely set my length of cut by just adding 100mm to where ever I set the stop. If I want a piece to be 350mm long, as pictured, I set the stop at 250mm to compensate for having moved the profile back 100mm from the leading edge of the guide rail. In the photo above the guide rail is removed so you can see how the MFS profile has been set 100mm back from the intended line of cut. Here I want to cut this piece of maple to remove the DT slot.

The photo to the right shows the whole set up in use. I left the ruler and white paper indicating the cut line in place for the photo, but obviously they would be removed before the actual cut is made.

The stop shown is a simple shop-built item. It is a piece of Brazilian cherry machined to be a loose tenon. I like that because the rounded edges slide easily on the table top but the sharp cut end makes an easy to read reference to set the desired length of cut.

I "borrow" the 4mm lever bolt and "V" nut from the MFS system "Routing Slide" (number 492728) we saw earlier and use it to secure the stop to the side of the profile quickly and easily. When I need that lever bolt for the router slide, it comes off the stop and goes back on the

router slide. It lives one place or the other so I can always find it.

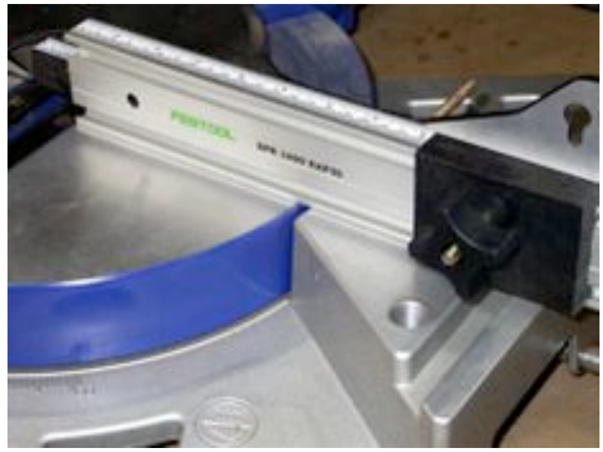
Now, this set up is nowhere to be found in any of the Festool literature or manuals. Is it "wrong"? No. It is right for me and the way I like to work since it puts a very robust fence close to where I stand and close to where I will start the saw cut.

If it is a small work piece like the one shown, I can easily grab the piece and hold it snugly to the fence with my left hand while I operate the saw with my right hand. Someone who is left handed would likely reverse this set up.

I like the pivot side of the guide rail table attachments to be on the side of the table away from me. Others might prefer it on the side closest to them. Because I normally cut my material sitting on top of a sacrificial thin plywood sheet, I can move the guide rail and/or the miter fence all over the place and not whack up the top of the table.

I want the table tops uncut because I use these Festool tables as my flat reference since the nearly 100 year old fir floors in my studio certainly are not flat!

The pictures on this page show another example of using components of the Festool system for whatever you need, not just for the purpose for which they were originally intended.



In this case I am using the SPR 1400 Rapid clamping arms as fences for a sliding compound miter saw station. A glue on measuring tape added to the top and some shop-built stops shown here really add versatility and speed of use.

No one at Festool probably ever envisioned someone using these clamping arms for this purpose, but for me they work really well for this application. When I need them for the clamps, I just loosen a couple of bolts that fit into the "T" track on the back side of these arms and they slide right off.

The point I want to make here is to mix and match the Festool system compo-

nents as much as you like without worrying about what someone else might consider "normal" or "abnormal." If it works for you and provides a safe and productive set up, you have proven it is right for you.

Conclusion

So, after nearly 50 pages of text and photos on various ways to employ the innovative Festool MFS universal squaring, aligning, cutting and routing fence and guide system, is it right for you? Is it worth the price?

It is not inexpensive either for the starter kits or for the longer extrusions or for the router slide. And, as a router template it is fairly easily damaged if your router handling techniques are not fully up to snuff (can you hear, “oops, I hit the edge of a profile with the router bit!” in this statement?)

MFS system shown here with shop made accessories as well as Festool supplied components.

So, the answer to both these questions has to lie in terms of just how and how much you will use the system and its components.

When I first got the system I was unsure of what my answer would be to these two good questions. As a working professional furniture maker, my philosophy on tools is that if they do not find their way into my hands, then they must not be useful to me no matter how neat or innovative I think they are.

If they are not useful to me in terms of helping me improve the value proposition I can offer to my customers (ever better quality at ever lower prices while still providing a good return on my time and investment,) I don’t want them cluttering up space in my studio.

The clincher for me came when I stopped looking at the MFS as a rectangular router template and started seeing how universally applicable the simple, sturdy extruded profiles were becoming in my everyday work. These things not only found their way into my hands, they quickly became “go to” objects that get used on many, if not most, projects.

They are in use for most of my guide rail layout work whether cutting or routing.

As I have explained here and in other manuals, guided rail routing of sliding dovetail joints transforms the quality and speed of construction for most case goods. Being able to lay components together in the same relationship in which they will live in the piece and then cutting the dovetail or dado slots in both pieces simultaneously guarantees a level of positional accuracy that you simply cannot achieve any other way that I know of.

Additionally, positioning the work pieces together this way makes not only possible, but easy and fast, the cutting of ***interlocking*** sliding dovetail joints, some of which go front to back on the piece, some side to side, and some top to bottom. Because every female recess cut into matching pieces into which a male component will slide are cut at the same time and in the correct orientation, errors are much harder to make.

The lengths of the male pieces are almost always derived right off of the pieces into which the female recesses have been cut so these measurement errors are also much harder to make.

I used to lay out the pieces that were to receive the female recesses, such as the two interior sides of a cabinet carcass, face up on a Multi-Function Table with their front edges tightly together and the top and bottom edges properly aligned. Then I would measure up to the center lines for the sliding dovetail recesses that would establish things like dust dividers between drawers, fixed shelves, drawer guides, etc., on the back edges of both pieces.

Then I would manually position the guide rail (offset by 20mm for routing work) and clamp it down to make the router cuts.

Now I skip the measurement and manual positioning steps and use the MFS profiles with the shop-built saddles and shop-built stops instead. It is fast and easy to set the stops on two profiles 20mm back from the desired center line, hook the stops over the end of the work pieces, place the saddles onto the guide rail and, bang, the guide rail is right where I want it and in a fraction of the time it used to take to do all the measuring and marking.

Can I justify the MFS system "just" for the application of positioning guide rails accurately? Yup, because I do it several times a day everyday and the time and accuracy gains really add up for me.

Can you justify it "just" for this purpose? Maybe not if you are a hobbyist on a budget, but, if you do a lot with your guide rails, you likely can and will.

I have an industrial sliding table saw which I use for most of my in-studio saw cuts, but I am finding myself doing more and more on the my Festool Multi-Function Tables with one or more of the squaring techniques using MFS profiles outlined earlier. They are accurate, very fast, and it is often easier for me to plop heavy or large pieces on the Multi-Function Tables for cutting than it is for me to wrestle those pieces up on my sliding table saw by myself.

Clean, sharp corners on open field inlays

Could I justify the MFS system "just" for these applications? Probably not because I do have a very accurate alternative, and it is just my convenience at stake which has little bearing on the value proposition. Can you justify it "just" for these cutting purposes? I don't know, but I can see a lot of people doing so, just as I find it much faster and more accurate than most alternatives.

Open field inlays going into two sides of a wall mount desk. The female recesses cut photo left and the male glued in one and sitting on top of the other photo right.

I do a lot more open field inlay work now that I have the MFS system because it is so fast and easy to do and it adds customer perceived value far in excess of the time it takes to do. I can easily justify the price of the MFS system and components for this one application alone because it directly impacts the value proposition and since I now do it frequently.

Could you justify it "just" for this one application? Maybe. Whether hobbyist or professional, if you make pieces that are suitable for open field inlay work and you really value your outcomes, then you probably can.

Know that the "magic" of male/female matching for open field inlays comes from the guide bushings, guide rings, or bearings, not from the template. You can make a nearly free rectangular template from scrap sticks instead of the MFS profiles, only not as fast nor as accurately. If you only do it once in a great while, use sticks. If you do it frequently, the MFS profiles will pay for themselves quickly on just this one application.

So, the bottom line on "worth it" and "right for you" is a function of how and how often you will use the MFS system components and how you value your work.

Have fun and enjoy!

Jerry

Jerry Work designs and hand crafts fine furniture in the 1907 Masonic Temple building in historic Kerby, OR. He can be reached at glwork@mac.com

Appendix A: Horizontal router jig for the Festool Multi-function table

I often use sliding dovetail joints for many of my furniture designs. I like them because they are self-aligning, self-squaring, self-locking, and very strong. With all these highly desirable features it is odd to me that dado construction still is more popular than sliding dovetails.

One explanation is that up until the introduction of the Festool rail guided routers, cutting multiple properly aligned female sliding dovetail grooves was very difficult to do accurately. With the Festool rail guided routers it is very easy to do even for seemingly complex, interlocking sliding dovetails such as when a horizontal component is fastened to a vertical component and then locked in place by a second vertical component or by a fore-aft component which also locks into a dovetail groove.

Another reason many woodworkers consider sliding dovetail joinery to be difficult is because of how awkward it can be to accurately cut the male portion of the joint.

Most often a router table is used. This requires the work piece to be held vertically while being pushed past the rotating dovetail bit. This is moderately easy to do on short and wide work pieces but can be quite difficult to do accurately if the work piece is either long, narrow, or both. In these cases any tilting of the work piece will cause the male dovetail to be wider, and hence tighter, in some areas than others. The result is either an overly tight joint that may not go together at all or an overly loose joint that is too weak to be useful.

The easiest and most consistent way to cut the male portion of a sliding dovetail joint, no matter what the configuration of the work piece, is with a router held securely in a horizontal orientation where the work piece can be moved flat on a table surface and against a fence for length of cut control.

This appendix describes one means of constructing a jig which can easily slide

into the side rails of a Festool Multi-function Table holding a Festool Router in the desired horizontal position as shown in this photo.

The jig is constructed from standard Festool catalog MFT rail pieces, Festool knobs, hardwood scraps and a couple of pieces of hardwood plywood, resin coated board or mdf.

MFT side rail sections form both the structure for the jig and guide the router base plate while it is raised or lowered to expose more or less of the dovetail bit.

The key to the safety of this jig is that the bit is fully trapped down inside a fence base that rests in the gap between the top surface of the MFT and the top of the extruded aluminum side rails as shown in these photos. The fence base into which

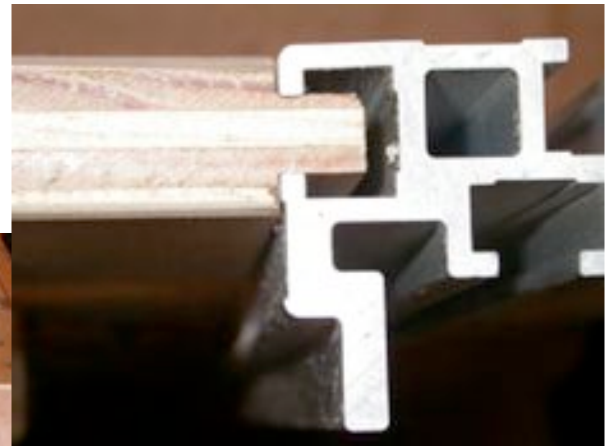
the bit is recessed is just a scrap of wood held to the top of the MFT side or end rails by recessed 8mm flat head screws threaded into nuts in the top “T” slot on the MFT side rail. For dovetail bits larger than 14mm it will be necessary to route a recess in the aluminum side rails to let the bit drop low enough for some cuts.

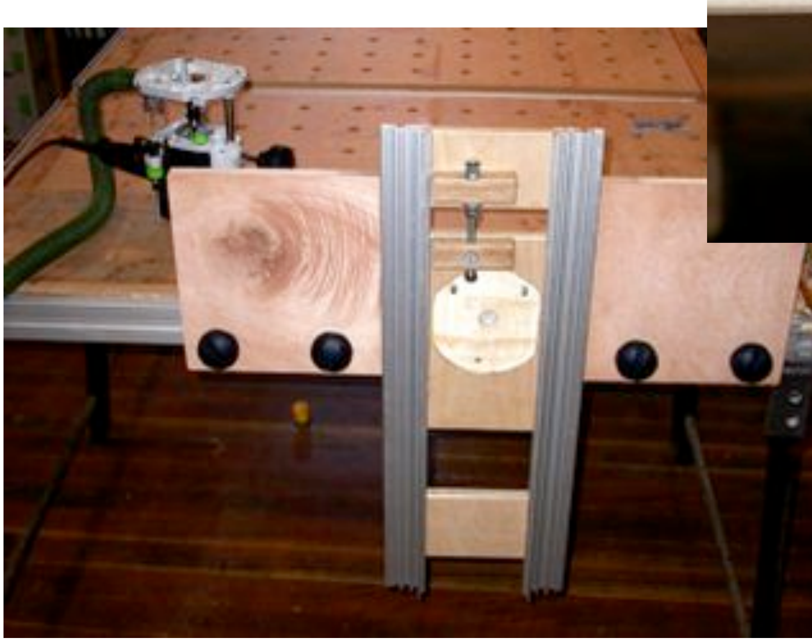
Only enough of the bit should ever be exposed to cut the proper width of male dovetail on one side of the work piece. Flip the work piece over to cut the other side at the same setting so the male dovetail is always centered on the work piece.

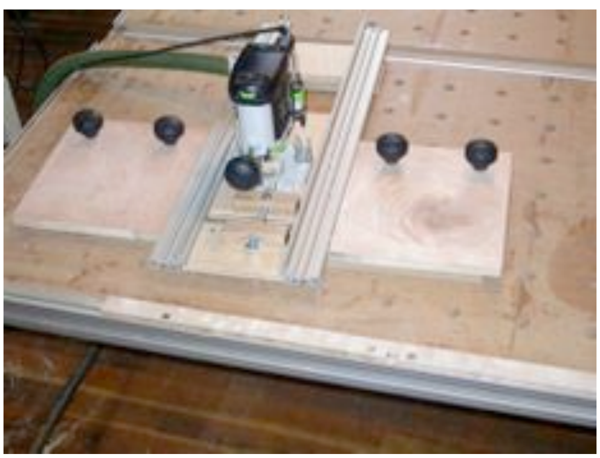
Be sure you limit the router travel so it is <u>not possible</u> to raise the router high enough to allow you to work with the bit on top of the work piece! From my point of view, that is way too dangerous to ever consider.

In the photo above a thin brass sheet is used as a wear surface and to make it easier to slide the work piece past the bit.

The top surface of the MFT itself is used as the horizontal sliding surface for the jig so the size of work piece that can be accommodated is limited only by the size of the MFT(s) to which it is attached. Even very long work pieces can be accommodated by putting two or more MFT's together with table joining elements available as a standard stock item from Festool.







Photos above show the completed unit mounted to the side of a Festool MFT without a router attached and sitting on the top of a MFT with the router attached.

The router is raised and lowered by means of the threaded rod that passes through the fixed upper support and through a barrel bolt in the moveable router mounting base which slides up and down and is held in position by the channel extruded into the MFT side rails used as jig supports.

The photo top right shows how the plywood is machined to fit into that channel. The pieces above and below the movable router base plate (the center piece) are fixed to the two aluminum supports (the MFT side rail extrusions) while the middle piece is free to move up and down to change the depth of cut. All three pieces of plywood are machined at the same time and then cut into the three components shown. That way the top and bottom pieces establish and hold the distance between the two aluminum rails to be the same throughout the range of travel of the center, router base, component.

Adjustment is easy, smooth and very repeatable. No locking is necessary since the weight of the router holds the setting well.

Dust collection is maintained through the standard Festool 1010 dust collection port.

The jig goes on and off of any side of a multi-function table. Large and small pieces can be accommodated easily on the large flat surface of the MFT.

Like any shop made jig, you are responsible for interpreting these photos and text such that you can build a safe horizontal router jig for yourself if you wish to. If you do not feel comfortable making and safely using such a jig, then search for a commercially available alternative. No additional drawings, plans or photos are or will be made available.

Enjoy and good male sliding dovetail cutting!

Jerry

Appendix B: Inlay and Template Routing Using the Festool Metric Guide Bushing and Ring Set

To cut matching female recesses and male inlays using a female template, select the offset desired and then use the lettered pair of the guide bushing and supplied rings shown. For example, if you want a 15.3mm offset from the edge of your template to the edge of the inlay select a 4mm bit and use the ring marked 4 to cut the male inlay and the 26.6mm ring marked 8 to cut the female recess. You can use any lettered pair with the router bit and guide rings shown to produce the offset indicated.

Marking on ring	Diameter of bushing or ring	Matches with 8mm bit	Matches with 6mm bit	Matches with 4mm bit
Guide bushing only, no ring	10.6	A	C	E
4	18.6	B		E F
6-4	22.6		C D	
8	26.6	A		F G
6	28.6			
8	34.6	B	D	G
Resulting offset from edge of template		**17.3** **23.3**	**14.3** **20.3**	**11.3** **15.3** **19.3**