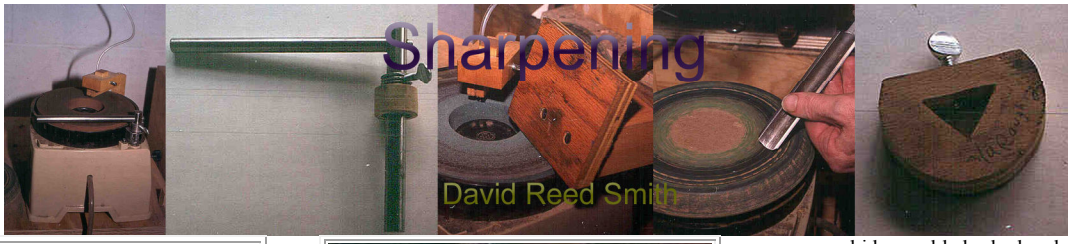


This photo shows the Makita set up to grind with the fine stone, with the adjustable Straight Line Reference and water handling system.

This photo shows the entire sharpening system in place.

Why Jig?

There are differences of opinion on whether it's better to learn to sharpen entirely without jigs, or to use jigs. I used to claim to at least understand the viewpoint of the non-jig advocates. At least in theory, once you practice enough without jigs, sharpening becomes transparent and less disruptive to the flow of your turning. Jig proponents claim it's hard enough to learn to turn without learning to sharpen. In my case, I've had a few too many epiphanies after turning with a tool sharpened with a jig for the first time. The first time it was with a spindle gouge, which you might expect. However I've also been amazed by a jig sharpened beading tool, cove tool, and even a pyramid point tool. You can't get much simpler than the geometry of a pyramid tool, so I really didn't expect the improvement I got.

Few cabinetmakers advocate sharpening your own carbide saw blades by hand, after all. The problem with most jigs isn't intrinsic to using a jig, it's just that they tend to be so fiddlesome. Take a typical sideground gouge jig. Most of them allow for various levels of radicalness of the grind, so you have to remember and set that. Then you have to set the projection of the tool exactly. Then the set the rest to get the initial bevel. But this isn't the way sharpening jigs have to be. It's just the way that manufactured jigs that must adapt to many tools and many turners must be. If you make your own jigs, you can make them so that much of the registration is built in to the jig, making them much simpler to use.

Why SLR?

I guess that Tormek is the reigning jig champion. It is a very nice system, it makes tools very sharp with no danger of overheating, but it is not without drawbacks. Besides the inherent fiddlesomeness of manufactured jigs, it grinds very slowly. The Tormek's manual suggests allowing 15 to 20 minutes of grinding for initial shaping for some tools. The Tormek also is quite expensive by the time you buy all the jigs you need. I'm sure you've seen it, but the Tormek is based on jigs that ride a steel rod that can be moved in or out away from the grinding stone. Just as your local grocery store can't really call their generic cola "Coke", I'd rather not keep writing "Tormek". But generic names have a way of being awkward (can you spell acetaminophen?) so I'll quickly abbreviate " Straight Line Reference" to SLR. While it's obvious enough, the rod is a straight line that is used to reference the jig to the grinder.

This article describes an alternative sharpening system. It tries to borrow the benefits of the SLR and water cooled grinding, using homemade self setting jigs to try to overcome some of the fiddlesomeness while "sharply" reducing cost. The heart of the system is the Makita Wet Grinder. The Makita can easily be adapted to the SLR concept. Adding a larger water handling system, a fine adjustment mechanism and a scraper rest makes it quicker to use. Adding a coarser 120 grit stone lets it grind much faster than the Brand T SLR as well...and don't worry about the time to change stones, it can be done in less than a minute.

The article includes making a honing disk which can be mounted in seconds to further refine the edge. Some turners will argue that honing is a waste of time. If you're turning Australian Wombat Wood (whose hardness is measured on the MOS scale) it may be, but if you're turning wood that the mortals among us use, I think you'll find it to be otherwise if you try it out. I could claim that turners who don't find honing to be worthwhile either haven't tried it or are poor honers. But that wouldn't be nice. Do try it. It takes very little time to hone with the honing

disk, and you'll get a better surface (which means less sanding) and you'll cut faster with less effort. Just as an example, I was turning some hard maple spindles today. About 10 spindles after sharpening, while using my roughing gouge to rough out a very shallow cove, I got a shaving that was about 3 feet long.

Honing makes a difference you can feel when you cut and see in the surface you leave. It probably always has, but with power honing it adds very little time to sharpening. If you count rehoning instead of resharpening when the edge starts to dull, it will actually save both time and tool steel.

Since it has a flat stone, the Makita grinds a flat bevel. I do not see this as a disadvantage. The bevel of a turning tool doesn't rub under where it's cutting, it rubs behind it. Even if it did rub beneath, it would only "match" at one diameter. On a skew, which I think benefits from an acute grind angle, the edge will be significantly stronger with a flat bevel. As you'll be honing under power, not by hand, the increased metal that has to be honed with a flat versus hollow bevel doesn't loom large either.

Jig Principles

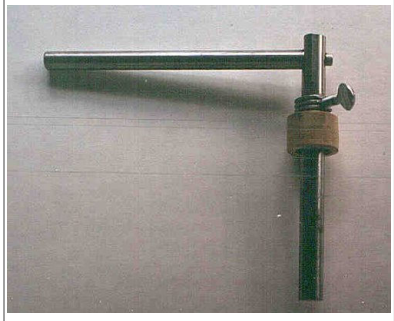
The SLR concept is both highly adaptable and powerful, enabling you to use a variety of jigs with no modifications. To try and make it simpler to use the jigs, I've tried to design them to set up as automatically as possible. For instance, for gouges, the jig can be designed with a pin that fits into the flute. This pin will automatically register the jig both in orientation and length if it is slid all the way up the flute. One only needs to lock it there with a thumbscrew.

For some fluteless round tools (such as a pyramid point tool), one can accomplish the same thing by sliding the jig all the way to the ferrule and registering it to the tool with a pin that mates to a hole in the handle.

Other tactics that can be used to help in orientation are to shape the jig to only fit one way onto the tool (such as parting tools or skews) or to grind a flat on a round shaft where the thumbscrew is.

Modifying the Grinder

Making the SLR



A photo of the SLR with the wood fine adjustment mechanism.

The heart of the jig system is the Straight Line Reference, which all the jigs ride on or over. There are two ways to make it, depending on whether you have access to a welder or not. Welding is stronger and quicker, and you should consider having them welded by a welding shop if you can't weld yourself. On the other hand, one major reason for using the Makita is that it's cheaper than Brand T, so I'll describe how to make the SLR using only a drill, a file, a right angle grinder, and your lathe.

To start, you need to get some 16mm and 12mm steel rod. The easiest source is an industrial supplier (I use J&L Industrial Supply, 1-800-521-9520). You can order a 3 foot length of both sizes of drill rod for a few dollars. Don't worry about whether it's oil, water, or air hardening, as you don't need to harden it. It's just a source of accurately dimensioned rod.

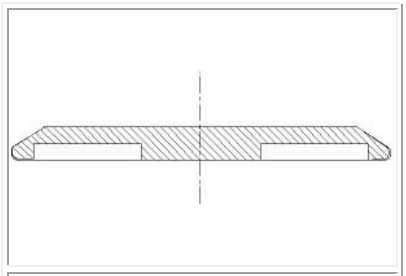
The Makita is sized to take 16mm rod. Using a cut off wheel in your angle grinder (or a hacksaw and lots of persistence if you don't have an angle grinder) and cut off a piece about 6-1/2 inches long to use as the vertical piece of the SLR. Use a file to flatten and smooth up both ends. About 1/2 inch from one end, drill a 3/8 inch hole about 2/3rds of the way through the rod. Use a drill press if you have one to drill as close to a right angle as you can. It's easier to start the drill properly if you file a small flat on the rod and then use a center punch. Centered on the 3/8 inch hole, drill a pilot hole for a 10-24 cap screw the rest of the way through the rod. File a small flat on this side as well.

For the horizontal component of the SLR, cut a piece of 12mm rod about 7-3/8 inches long. It doesn't actually have to be 12 mm, it could be anything, but 12mm is the size that Tormek uses, should you decide to ignore the warnings in their manual and use one of their jigs. Chuck the rod up in your lathe. You can use a drill chuck if it's equipped with a draw bar. You can also use a 3 or 4 jaw chuck, whatever you have that will hold the rod securely. Using a slow speed, turn the lathe on and use a file to create a tenon to match the hole you drilled in the 16mm rod. Please do drill first and fit the tenon to the hole, rather than filing a tenon assuming that the hole will actually turn out the advertised diameter. Leave the tenon a little shorter than the hole, but otherwise a snug fit. Now drill and tap a hole in the tenon end for the 10-24 cap screw. I really suggest using a cap screw rather than a flat or Phillips head, as you can get it a lot tighter.

To assemble, enlarge the filed flat on the 16mm rod to match the width of the 12mm rod. Insert the tenon in and tighten it up with the cap screw. Get the tap screw as tight as you can. It's important that the 12mm rod be at a right angle to the 16mm rod. If yours isn't, clamp the 16mm rod securely in a vise and beat the 12mm rod with a hammer until it is.

You may be wondering if the SLR will be secure enough with only vertical mounting post, as after all, the Tormek uses two. The difference is that the Tormek, using a round stone, must absolutely prevent rotation of the tool rest, as well as vertical movement. With the Makita, if the tool rest rotates, it just moves the tool over a different part of the stone, but the distance from it, and hence the bevel angle, doesn't change. If I were a manufacturer I would probably use a twin post, but it's hard to get that right at home, at least with my metal working skills. Any error in the separation or parallelism will bind the tool rest. You can file flats on the vertical component of the SLR which will help prevent rotation if you like.

Making the Honing Disk



A cross section drawing of the Honing Disk.

The first thing you have to do to make the Honing Disk is to find a piece of MDF (Medium Density Fiberboard). I bought a 12" by 48" piece of shelf board from Home Depot. If you can't find MDF you could use particle board, but MDF is better. I roughed out an 8-7/8 inch diameter disk on the band saw and mounted it to a faceplate. Use SHORT screws. I found that the MDF would push up between the faceplate and the disk when I screwed in the screws. So I screwed them in, then took them back out and

trimmed the disk back flat with a chisel, then reinserted the screws.

I mounted the faceplate on the lathe. As there is who knows what all in MDF dust, I turned on the dust collector and let it run through out making the Honing Disk. I trued up the rim, then marked out the inner and outer diameters of the Makita grinding stone. Using a bowl gouge I hollowed the disk to a depth of about 3/8 inch. Then I used a scraper to flatten out the recess. Then I took the Makita grinding stone off of the grinder and tried the fit. I adjusted it so it fit in easily, but not sloppily, and flattened the recess so that it didn't rock. As a last step I used the gouge and scraper to cut a bevel on the rim of the Honing Disk. This bevel isn't needed just for lathe tools, but allows me to hone knife blades on the Honing Disk.

Water does distressing things to the dimensions of MDF so I made the disk water resistant by giving the bottom several coats of spar varnish. Even so, I try not to leave the disk mounted on the grinder. Once the varnish is dry, mount it on the grinder and sand the top lightly with sandpaper, then dress with a polishing compound.

To use the Honing Disk, just swing the SLR and Water Feed to the side and place the disk over the grinding stone. This takes less than 30 seconds. Present the tool you wish to hone to the running disk so that the edge is facing away from the rotation, perhaps with the heel slightly leading. Flatten the bevel down to the disk and move it back and forth. Check your work as you progress. You should get a mirror finish shortly, depending of course on which grit stone you used initially. You can redress the Honing Disk with polishing compound occasionally.

A common utility knife blade. The left hand side has been honed on the honing disk about 15 seconds or so. The difference is more striking in real life.

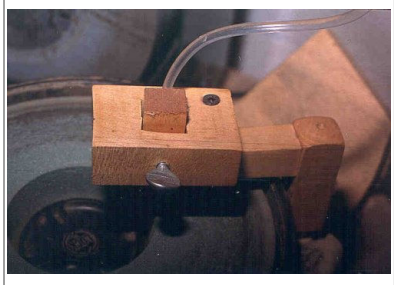
Making the Water Handling System

The water handling system is optional, but makes the Makita much easier to use. It makes changing stones or using the honing disk much quicker, and one doesn't have to replenish the water supply anywhere near as often.

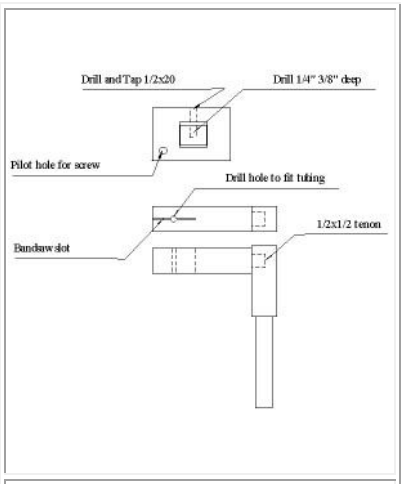
To make the water handling system you need a couple of buckets, some plastic tubing from the hardware store, and a few scrapes of wood. First pull the original far too short drain tube out of the Makita and go to the hardware store. Buy about 3 feet of whatever they have that comes closest in size. While you're there pick up 4 or 5 feet of smaller tubing, 3/16th inch ID would be fine, and some silicone caulk if you don't have any lying about.

Insert one end of the new tubing into the Makita, and drop the other end into one of the buckets. The tubing tends to flop about, so you may want to weight the end of the tube or attach it to the bucket handle to prevent it coming out and making a mess when you don't notice it.

Take the other bucket and drill a hole the same size as the outer diameter of the smaller tubing at the bottom of the side of the bucket. Insert one end of the tubing into the bucket and seal it with some caulk. Do let the caulk dry before you add water. You'll need to hang the bucket above the grinder. I drove a screw into the joist above the grinder, but you can set it on a shelf, etc.



A photo showing the completed water handler mounted on the Makita.



A drawing of the parts for the Water Handler.

To make the water dispensing arm, start by mounting a nominally 7/8x7/8x5-3/4 inch piece of hardwood (I used maple, but most any hardwood would work and 3/4 or 1 inch square would be fine as well) between centers on your lathe for the vertical piece. Turn down 3-1/4 inch from one end down to fit the 16mm hole in the Makita. Remove it from the lathe and drill a 1/2 inch hole 1/2 inch deep, about 1/2 inch from the end you left square.

To make the horizontal piece of the water dispensing arm, mount another piece of hardwood 4-1/4 inches long between centers on your lathe, and turn only a tenon to match the hole you drilled in the vertical piece. Remove it from the lathe and drill a hole about 3/4 inch from the unturned end that is the diameter of your smaller tubing. Now bandsaw a slot about 1-1/2 inches up the middle, bisecting the hole you just drilled. Drill a pilot hole for a screw that will let you clamp the tubing in place. Glue the horizontal piece into the vertical piece. Make sure the hole for the tubing points down and not sideways.

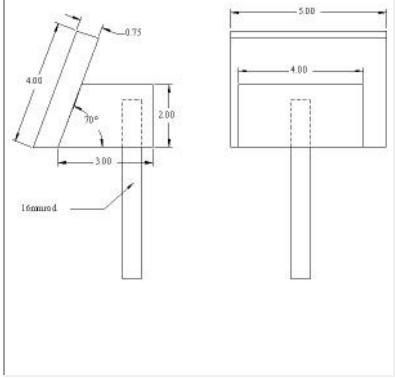
To make the flow regulator cut a block of hardwood about 2x2-3/4 inches. Cut out a rectangular hole in the middle about 7/8x1. Drill and tap for a 1/4 inch thumbscrew in the middle of one long side. Now for a clamping block cut a 1 inch piece of 7/8x7/8 inch wood, and drill a 1/4 inch hole about 3/8 inch into one long side. The thumbscrew will fit into the hole and keep the block from falling out when you release pressure. Drill a pilot hole through the flow regulator so you can attach it to the horizontal arm and adjust it without it flopping around.

It's nice to have an on/off regulator as well, so you don't have to reset the flow rate every time. I use a clothespin.

Once you've checked to make sure everything fits and works, take it back apart and give all parts a nice gloppy coat or two of spar varnish to protect it from the water.

Making the Scraper Rest

This photo shows the scraper rest mounted on the Makita. The rest is mounted so that the grinding wheel turns away from the edge.



A drawing of the Scraper Rest

The scraper rest replaces the SLR when you want to sharpen a scraper. In use it works just like the adjustable rest that came with your traditional two wheel tool steel burning grinder...except you don't have to adjust it, and it's oriented differently for the horizontal stone.

To make the scraper rest, I started with a block of maple that was about 2x3x4 inches. Well, actually I glued up a couple of pieces to get it. I trued up the edges on the table saw and then cut one long edge at an angle of about 70 degrees. I say about, because I set it to match what my scrapers were already sharpened at. But 70 degrees is about what they were. Then I drilled a 5/8 inch hole about an inch from the edge opposite the beveled one about 1-1/2 inches deep. I cut a 5-3/4 inch long piece of 16mm drill rod, and glued it into the block with polyurethane glue. Super glue would work about as well.

Next I cut a piece of 3/4 inch plywood about 4x5-1/2 inches, and beveled one side to 70 degrees. I mounted the scraper rest in the Makita, and played with the orientation and mounting of the plywood until it covered most of the stone conveniently. You want to set it up so that the wheel is turning away from the tool. I marked the location of the plywood, then removed the scraper rest, and permanently mounted the plywood by drilling and countersinking for a couple of screws, then gluing and screwing it together.
To protect the scraper rest, especially the plywood, from water, I gave it a couple of thick coats of spar varnish.

To use the scraper rest, just slip out the SLR and mount the rest. If you need to shape a tool, use the 120 grit stone. For regular maintenance sharpening, use the finer stone that comes with the Makita. You can smooth the top face on the stone as well for a truly refined edge. An edge made in this fashion can be used in the traditional way, and will cut just about like an edge formed with a burr. Except the surface left should be a bit smoother. If you're feeling adventuresome, you might try rubbing the bevel instead (assuming your scraper is made from tool steel and not an old file).

Making the Fine Adjustment Mechanism

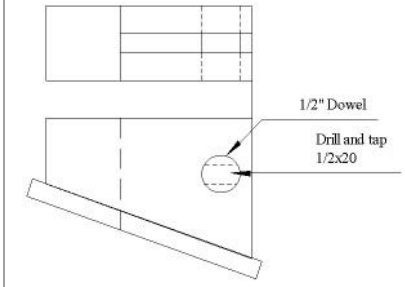
To make it easier to adjust the height of the SLR, I made a simple adjustment mechanism. I bought a 1 inch nut and bolt at a local farm supply store. I cut a piece about 1-1/16 inches long off the end of the bolt, and drilled a 5/8 inch hole along the center axis by mounting it in a chuck and drilling on the lathe. The 16mm rod of the SLR fits nicely through the 5/8-inch hole. Then I filed a flat on the top of the side of the bolt end to remove a portion of thread so I could drill a pilot hole and tap for a thumb screw. I rounded the nut on the outside with an angle grinder because otherwise it would foul on the shroud. The nut didn't screw on easily, so I rechecked the bolt end and "chased" the thread with a triangle file while the lathe turned very slowly.

An alternative way to make the Fine Adjustment Mechanism, if you have a 1x8 tap, is to drill a 7/8 inch hole in a hard wood such as maple, and use the tap to cut the threads. Cut the wood roughly to a circle on the bandsaw. Mount the 1 inch bolt piece in a chuck, and screw on the wooden nut. It's likely your threads aren't quite perpendicular, so first true up the face. Turn the wooden nut over and true up the other face. Now turn it down to a cylinder. As wood is a lot easier to work than metal, it's easier to turn it down to a diameter that won't foul on the water shroud or other nearby parts.

To use the Fine Adjustment Mechanism, screw the nut part way onto the bolt end. Insert the 16mm rod though the bolt and than into the Makita. Adjust the height of the SLR roughly, then lock the Adjustment Mechanism to the SLR with the thumbscrew. Then you can adjust the height by turning the nut. It's easier if you start with the SLR a little low and raise it to suit by turning the nut.

Making the Jigs

Skew



A drawing of the Skew Jig.

A photo of the skew jig with a skew mounted. Note that the edge of the skew matched the front

surface of the jig. The jig can be mounted either way depending on whether you want to register to the front or back surface of the SLR.

This is a scan of my 1/2" rolled edge skew after sharpening and honing.

When making a jig for a skew one has to insure that the angle is constant and that the skew mounts consistently in the middle of the jig. With skews that are narrow or have a curved cross section it's nice to add something to keep the skew flat with reference to the SLR as well. To best satisfy these constraints, I suggest having the jig clamp to the side of the skew and to have the jig ride on the SLR, rather than the face of the skew itself.

To make a skew jig, I start with a block of hard wood about 1x2x2-3/4 inches (depending on the size of the skew). Carefully mark out a slot down the middle of the long narrow edge that is the thickness of the skew. If your skew is an old one that is tapered pick a thickness about 2 or 3 inches from the tip. The slot should go about two thirds of the way down the side. Cut the slot out on your band saw. Do try to cut accurately enough that the skew slides in, but without being sloppy. You can cut slightly undersize and use a rasp or file to adjust the fit. If you have an oval skew, cut the bottom of the slot to a Vee shape rather than square.

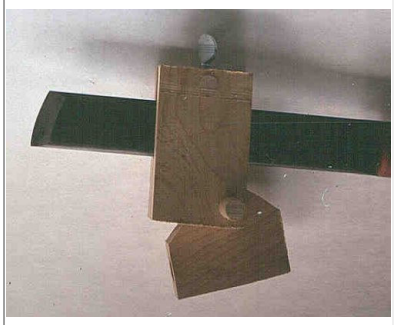
Now slide the skew in, and mark how wide the skew is (if you have several skews that are the same thickness, and don't mind them all being the same angle, you can use one jig for all). Drill a 3/8 inch hole a little further from the bottom of the slot than the skew is wide across the slot. Put the skew back in (so you don't compress the slot) and glue in a 3/8 hardwood dowel. Once the glue has dried, file a flat on the dowel opposite the slot bottom to make drilling easier, then drill and tap for a 1/4-20 thumbscrew. If you're using the jig for multiple skews, you may find it easier to use a length of 1/4-20 threaded rod with a turned handle.

Next measure (or decide) the angle of the skew, and transfer that angle to the long edge of the block, then cut it on the band saw. If your skew is wide enough to ride well on the SLR you can stop here. But I suggest you consider letting getting a bigger reference surface. To do that cut a piece of 1/4 inch plywood about 2-1/4 inches wide a little longer than the angled side of the jig. Cut a slot a little wider than the skew long enough that it will clear the edge of the skew. Then glue the plywood on. A couple of brads will keep the plywood from sliding around until the glue dries.

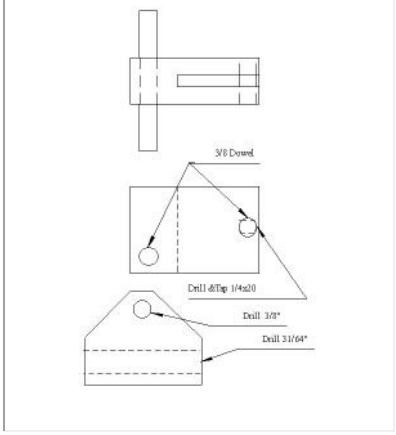
To use the jig, slide the skew on a couple of inches (it doesn't matter how far) and lock it in place. Adjust the height of the SLR so that the bevel rubs. Since a flat bevel skew is stronger than a hollow ground one, this might be a good time to consider a more acute bevel. I've found that a total angle of 30 degrees works well. The edge holds up nicely and it will cut Vees and pommels a lot more easily than the relatively obtuse 40 or 45 degrees most skews come from the factory at. Grind the skew equally on both sides. The first time you grind the skew you'll probably want to start with the 120 grit stone, but follow up with the fine stone and the honing disk, as the sharper a skew is the better it cuts. Frequent touch ups with the honing disk will maintain a sharp edge without wasting tool steel.

This photo shows honing a skew. The disk is turning away from the edge, and as good contact is made I've increased pressure.

Curved Skew



The Curved Skew Jig with the skew mounted. Note that the long point side is next to the pivot.



A drawing of the Curved Skew Jig.

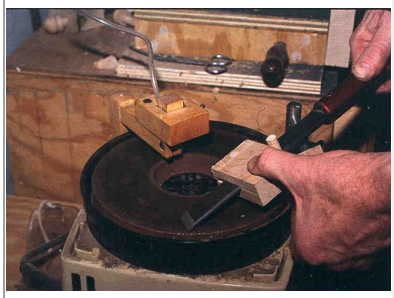
To make a jig for a moderately curved skew, start out the same way you would for a standard skew, with a 1x2x2-3/4 inch block. Cut a skew width slot two thirds of the way down the long edge, and drill across the slot as before for a 3/8-inch dowel. Again, file a flat on the dowel and drill and tap for a 1/4-20 thread.

Now we need to make a pin for the block to pivot on. If you have to have a particular radius, you'll need to determine exactly where to make the pivot point. You can do this by tracing (or drawing) the skew, then constructing lines perpendicular to the curve at both edges of the skew to see where they intersect. This is where the pivot point should be. Before you position the pivot point you'll have to decide how far from the long point of the skew the jig will be. It's easiest to use a stop block to set this distance, and if you can, use the same distance as any other jigs that are set this way. I didn't really care what the radius was, so I just picked the corner of the block. Drill a 3/8-inch hole. Cut a piece of 3/8-inch dowel about 3 inches long and glue it in so that it protrudes equally from both sides.

Next we need to make a block to hold the pivot

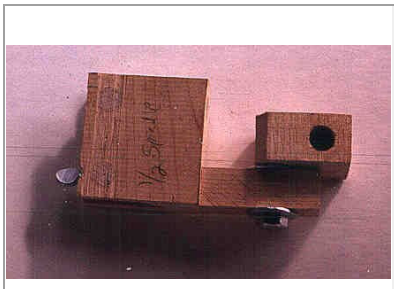
pin. Take a block about 1x2x2-1/2 inches and drill lengthwise with a 31/64-inch drill about 5/8 inch from one edge. Now about 1/2 inch from the face opposite the first hole, drill a 25/64 inch (or what ever will allow your dowel to rotate freely but not sloppily) hole. I trimmed the corners off the block so the jig could rotate without fouling.

To use the curved skew jig, clamp the skew into the first block with the long point nearest the pivot point, using a stop block for consistency. Slide the second block onto the SLR and put the pivot pin into the hole in the block. Keeping the blocks together with your hand, set the height of the SLR to match the bevel. Turn on the grinder and sharpen by pivoting the jig back and forth, being careful to keep the blocks together. When one side has been sharpened, turn the first block over and sharpen the other side. As with a standard skew jig, you'll want to use the 120 grit stone for initial grinding, and the fine stone and honing disk to finish and maintain the edge. Frequent touch ups with the honing disk will maintain the edge a maximum sharpness without wasting metal.



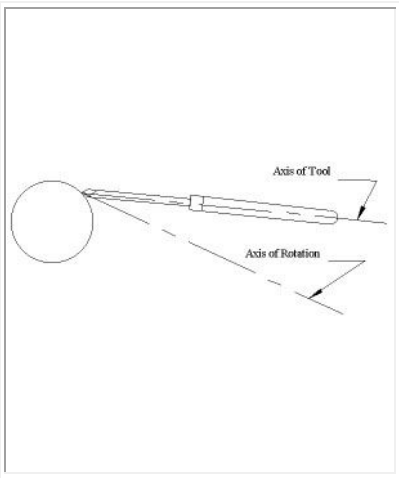
This photo shows sharpening a curved skew. My left hand is squeezing the two parts of the jig together as my right hand rotates the assembly and lifts to apply pressure.

Gouge-autolength



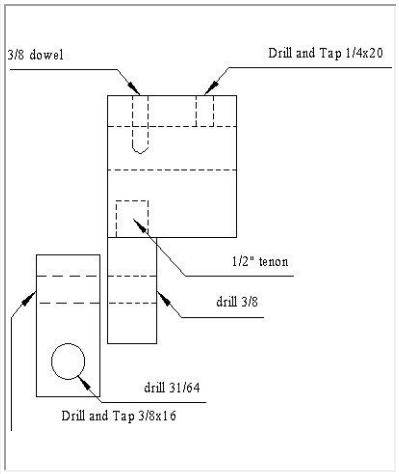
This is the jig I use for my half inch spindle gouge. You may notice that the pivot is at the other end of the block from the drawing. It doesn't really matter as long as you measure to the pivot correctly.

There are a confusing variety of gouge grinding jigs on the market. For that matter I have a confusing variety of homemade gouge grinding jigs in my basement. But, despite the wide variety of means used to construct the jigs, every gouge jig I've seen works by doing the same thing. It lets the gouge rotate on an axis that intersects the axis of the gouge at the tip and is at an angle to it. Increasing the angle increases the radicalness of the grind.



This drawing shows the relationship of the gouge axis to the axis of rotation.

It is critical to ensure both orientation of the jig to the tool and the distance from the tip. I'm going to give you two different approaches to this problem. The first approach uses a pin that slides to the end of the flute of the gouge, thus mounting consistently. It's quick and easy, but you need a separate jig for each gouge. The second approach, in the next section, can be used on more than one gouge, but the distance must be set with a stop block.



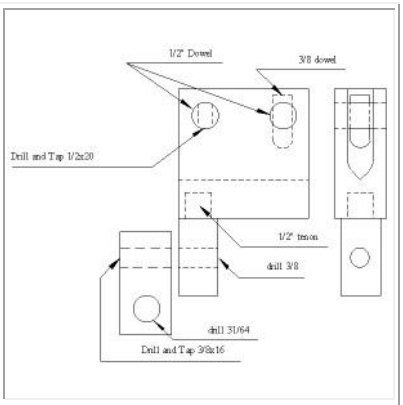
A drawing of the Gouge AutoLength for small gouges.

Sliding Block: First make the block that slides on the SLR. The exact dimensions don't matter, I used a piece of hardwood about 1x1.5x2 inches. About 1/2 inch from one end, drill a hole from side to side of the block just slightly larger than the diameter of the SLR. You want it to slide easily, but not rattle. If you use 12 mm rod than a 31/64th inch drill will work fine. Now about 1/2 inch from the other end drill and tap for a 3/8x16 bolt face to face on the block.

Pivot: To make the gouge holding piece, start with a 3/4x3/4x3 inch piece, mount it between centers on the lathe, and turn a 1/2x1/2 inch tenon on one end. Now take another block, about 2x2x1 inches. On a narrow side grain face, drill a 1/2x1/2 inch hole 1/2 inch from one end to match the tenon.

Small Gouge Jig: If you are making a jig for a small gouge, find a drill bit just bigger than the diameter of the gouge and drill a hole about 3/4 inch away from the opposite end on the end grain side. Now drill a 3/8 inch hole from the top of the block on the same end you drilled for the tenon, through to the hole for the gouge. At the other end of the top of the block, drill and tap for a 1/2x20 thumbscrew.

Large Gouge Jig:



A drawing of the Gouge AutoLength Jig for large gouges.

If your gouge is larger, or you don't have the correct size drill bit, you'll find it easier and more accurate to cut a Vee bottomed slot. Start by laying out the slot sides, just a little wider than your gouge. Add a Vee bottom. Then cut it out on the band saw. Then near the top, drill two 1/2 inch holes, one near each end, across the slot. Cut two small pieces of 1/2 inch dowel, and glue them in the 1/2 inch holes. Be careful not to compress the slot. Try inserting your gouge before the glue dries. Drill a 3/8 inch hole though the dowel above the mortice, drill and tap for a 1/4x20 thumbscrew through the other.

Taper the end of a 3/8 dowel so that it will fit down to the bottom of the flute of your gouge. Insert the gouge into the jig, and glue the dowel into the jig so that it's snug, but not too tight, in the flute. Make sure you can slide the gouge in and out before the glue dries. Glue the tenon into the mortice on the bottom.

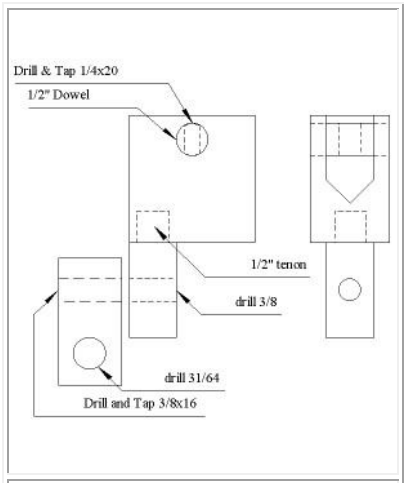
Once the glue dries, insert the gouge into the jig as far as the dowel allows. Measure the distance from the tip of the gouge to the front of the jig. The next step determines how radical, or groundback, a grind the jig will produce. The further you make the pivot point away from the gouge, the more radical the grind will be. Actually, it would be more accurate to say the higher the ratio of pivot length to gouge projection determines the grind. I use a ratio of .4 for both bowl and spindle gouges. You can start with that, and then modify it to suit. Multiply the measurement of the tip of the gouge to the front of the jig by .4. (If you don't like the results you get at .4, just plug the hole with a dowel, and then redrill at a new distance). Measure down and mark that distance from the bottom of the gouge onto the pivot. Remove the gouge from the jig and drill with a 3/8 inch drill through the pivot at the mark.

You're now ready for final assembly of the jig. You'll need a 1-1/2 inch long 3/8 inch bolt and a couple of 3/8 washers. Put one washer on the bolt, and push it through the hole in the pivot. Add another washer, then screw the bolt into the jig. It should be free to turn, but not sloppy.

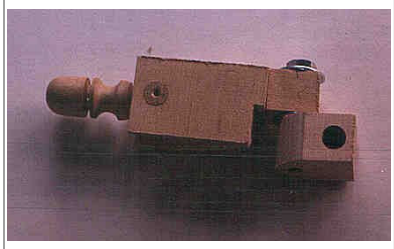
To use the jig, just slide the gouge into the jig until the pin bottoms out at the end of the flute. Tighten the thumbscrew to lock in the gouge. Slide the jig onto the SLR, and set the height so that the bevel at the tip is flat on the stone. Then sharpen. I suggest that you do one side at a time, in other words start at the tip and roll it to one side. Then lift the gouge off the stone, go back to the tip, bring it back down to the stone and roll to the other side. You may have to slide the jig along the SLR to a different point for the different sides.

This photo shows sharpening my half inch spindle gouge.

Gouge measured length



A drawing of the measured length gouge jig.



This photo shows the jig that can be used with any gouge if it's used with a stop block to measure the gouge projection. I'm using a homemade handle on all-thread because a long thread is needed depending on the gouge.

If you would rather have one jig for gouges, and don't mind them having the same ratio, you can make the jig to accept all your gouges. The trade off is you'll have to make sure the gouge is oriented correctly every time, and you'll have to measure the projection using a stop block.

Start by making the Sliding Block and the Pivot the same as for the auto-length jig. You can start the Jig the same as the Large Gouge jig. Start by measuring the diameter of your largest gouge. Make the straight sides of the slot at least this big. Add a Vee bottom. Check and make sure your gouge will clear the intended bottom of the dowel and cut it out on the band saw. Drill a 1/2 inch hole across the slot about 1/2 inch from the top of the jig, about in the middle. Drill and tap the cross pin dowel for a 1/4x20 thumbscrew (you'll need a long one, consider using some all thread and adding a handle).

You'll want to modify the thumbscrew a little. Grind it to a gentle point that will fit down into the flute of the smallest gouge you want to use and round it over so that it won't grab or mark the flute as you use it to clamp down.

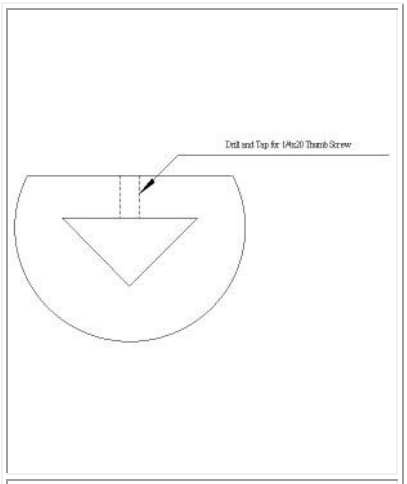
Now pick a length to use for the projection of the gouge and make a stop block to measure it. Mount the stop block next to your Makita so you won't lose it and won't need three hands. Multiply this length by the ratio you want to use and measure down from the gouge to the pivot. Drill a 3/8 inch hole through the pivot at this point. Assemble the jig by sliding a 3/8 inch washer onto a 3/8 x 1-1/2 inch bolt, and inserting into the pivot. Slide on another washer, then screw into the Sliding Block.

To use the jig, slide the gouge loosely into the jig. Set the jig up against the stop block, and push the gouge into the jig until the tip hits the end of the stop block. Tighten the thumbscrew, then check to make sure the flute is oriented straight up in the jig. Slide the sliding block onto the SLR, and set the height so that the bevel at the tip is flat. Grind one side at a time.

Roughing Gouge

A photo of the Roughing Gouge Jig.

The roughing gouge jig is one of the least critical as regards to both distance and orientation. As long as the jig registers perpendicular to the gouge, setting the height of the SLR will compensate for any other differences. The gouge will register better to a V groove than it will to a slightly bigger round hole.



A drawing of the Roughing Gouge Jig.

To make a jig for my 3/4 inch roughing gouge I cut out a 3 inch disk of 3/4 inch plywood. In the middle I drew a triangle (more or less equilateral, about 1-1/4 inches on a side) a little bigger than the shaft. I cut off part of the top of the disk parallel to one side, leaving about 1/2 inch. Then I drilled and tapped for a 1/4-20 thumbscrew. Plywood holds threads amazingly well, but if you're worried about permanence, glue a piece of dowel through the plywood and tap through the dowel. The thumbscrew should bisect the angle at the bottom of the triangle. If you don't have or don't like thumbscrews, drill and tap about 1/2 inch into a scrap of wood. Screw in a length of 1/2-20 threaded rod, mount it in a drill chuck mounted in your lathe and turn a small handle. Which ever you use, round the bottom of the screw gently, it will hold better that way.

To use the roughing gouge jig, slide it 3 or 4 inches down the shaft of the gouge and lock in place with the thumbscrew. Adjust the SLR so the bevel matches the stone. It helps to hold the jig back against the SLR so it doesn't twist as you rotate the gouge. This jig will also sharpen bowl gouges ground straight across. I use the 120 grit stone, followed by the honing disk. While you're at it, hone the first couple inches of the bottom of the gouge to help it slide along the rest better.

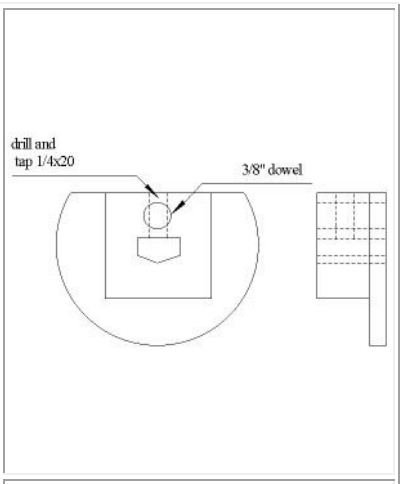
A scan of my Roughing Gouge after grinding and honing. I've also polished the first few inches of the tool on the honing disk so that it slides easier on tool rest.

This photo shows honing a roughing gouge.

Parting Tool

This photo shows the jig for sharpening diamond cross-section parting tools.

When making a jig for a diamond cross section parting tool, we want a wider bearing surface than the edge of the tool so it won't twist, but we have to be careful that the widest part of the tool registers at the same place in the jig every time. The easiest way I've found to do that is to clamp the side of the tool against a matching shallow V recess.

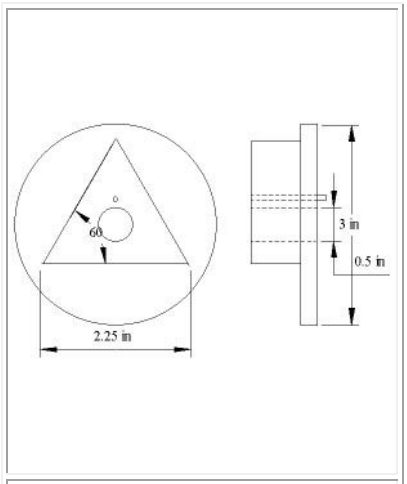


A drawing of the Parting Tool Jig.

To make the parting tool jig I cut a disk about 2-3/4 inches in diameter out of 1/4 inch plywood. Then I cut a 1-1/2 inch square out of 3/4 inch plywood and glued it to the middle of the disk. Then I drew a rectangle just a little bigger than the cross section of my parting tool. Be careful here, if yours is as old as mine it's probably tapered a bit. Then I added a shallow V on one side, being very careful to get the point of the V exactly equidistant from both sides of the plywood square. Then I drilled a 3/8 inch hole and glued in maple dowel through the jig on the side opposite to the V. Then I drilled and tapped for a 1/4-20 thumbscrew. The thumbscrew should bisect the angle of the V. I had to cut off part of the 1/4 inch plywood disk to keep the thumbscrew from fouling on it.

To use the parting tool jig, slide it 3 inches or so down the shaft and tighten the thumbscrew. Adjust the SLR so the bevel matches the stone and sharpen. Turn the jig over and sharpen the other side. Be careful to keep the point where the bevels meet at the widest part of the shaft or the tool will bind. Follow up with the honing disk.

Pyramid Point Tool



A drawing of the pyramid point jig.

For the 3 point tool, the distance of the jig from the point can be compensated for by the height of the SLR, but the orientation is critical. Using a ferule pin is a good way to orient the jig consistently. This works better if the tool shaft is glued in to the handle or otherwise secured so that it doesn't twist. If you're making your own tool, make the jig first.

To make the jig, cut a 2 or 3 inch (depending on tool size) circle out of 1/4 inch plywood. Then cut an equilateral triangle out of 3/4 inch plywood that is a little smaller than the circle. Glue the triangle to the middle of the circle. When the glue has dried, drill a hole just slightly bigger than the shaft of the tool at the center of the triangle. Drill a hole the same diameter as some coat hanger wire close to the center hole.

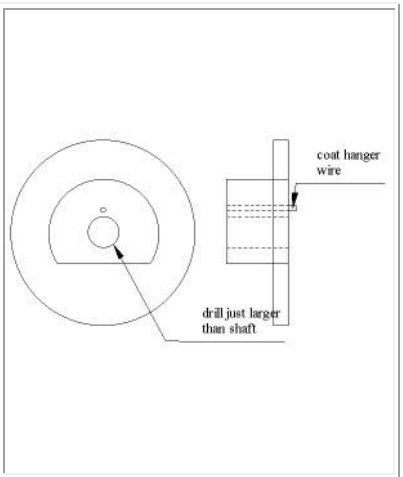
Mount the tool handle in a vise, and slide the jig down the shaft to the ferule. The 1/4 inch disk goes on first. Line up one of the sides of the triangle with a flat on the 3 point tool. Chuck up a freshly cut piece of coat hanger in an electric drill, slide it through the small hole in the jig and use it to drill a little ways into the handle.

Now slide the jig off of the tool, and cut a piece of coat hanger wire a little longer than the jig is thick. Insert it into the jig and adjust it by trial so it sticks out a little less than the hole you just drilled is deep. Secure it in place with a drop of super glue, and you're done.

To use the jig, slide the jig down the handle, 1/4 inch disk side first and engage the pin into the hole in the handle. Rest one side of the triangle on the SLR, and adjust the height of the SLR so that the facet is flat on the grinding stone. Now grind each facet of the tool in turn. You'll be lots happier with the way it cuts if you follow up with the finer stone and or the honing disk

A scan of a 3 point tool showing the edge after grinding and honing.

Cove Tool



A drawing of the Cove Tool Jig.

When sharpening the cove (or wedge tool) while the distance of the jig from the tip doesn't matter, the orientation of the jig is critical. Although I can't explain why, having facets on the face of the tool seems to make it cut slower. Using a ferule pin is a good way to orient the jig consistently. If you're making the tool yourself, it's best to make the jig first.

To make the jig cut out a disk of 1/4 inch plywood. The exact size isn't important, maybe 2 inches for a small tool, 3 inches for a bigger one. Using 1/2 or 3/4 inch plywood, cut a half disk smaller than the disk, then glue them together. Once the glue has dried, drill a hole just slightly bigger than the diameter of the cove tool through the jig. Use a drill press if possible. Measure the diameter of some wire (coat hanger wire is good) and use a drill of that diameter to drill a hole about 1/8 inch away from the first hole. Now clamp the handle of the cove tool in a vice and slide the jig down the shaft of the tool, the 1/4 inch thick disk goes towards the handle. Orient the jig so the flat side of the semi-circle faces the facet of the tool. Cut a fresh piece of coat hanger wire a few inches longer than the shaft of the tool (so your drill won't foul on the shaft) and chuck it up in your electric drill. Slip it through the hole in the jig and drill about 1/8 inch into the handle of the cove tool. Slide the jig back off the tool, and cut a piece of coat hanger wire about 1/8 inch longer than the width of the jig. Slide it in place and then test to make sure the jig will slide all the way down the shaft. Then slide it back off and fix it in place with a drop of super glue.

To use the cove jig, just slide the jig, 1/4 inch disk first, onto the cove tool, making sure the coat hanger wire indexes into the hole in the handle. Set the height of the SLR so that the facet rests flat on the wheel, it should be 45 degrees. Just turn on the grinder and sharpen. The cove tool cuts much better if it is really sharp, so use the finer grit stone or hone well with the honing disk.

The author welcomes comments, complaints, questions and suggestions for improvement via e-mail at David@DavidReedSmith.com The author intends to post updates, such as new jigs, and any received suggestions (with permission) on the web site.

Sources of Supply:

From Highland Hardware, 1-800-241-6748

02.10.01 Makita 9820-2 Sharpener $239.99
02.64.30 120 Grit Green Wheel $ 69.99

From Lee Valley 1-800-771-8158

05M08.01 Honing Compound $6.50

From J&L Industrial Supply 1-800-521-9520

OHM-10012M 12mm Drill Rod $7.83
OHM-10016K 16mm Drill Rod $12.99