A Long Discussion and Brief Review of Tool Rests: Part I — Straight Rests

by Lyn J. Mangiameli

*[**Editor's Note:** Lyn originally posted this story on rec.crafts.woodturning newsgroup. I asked permission to reprint it in More Woodturning. He then took the time to rewrite it a bit for use here and put together some photos to support his discussion. Like myself, Lyn owns a Nova 3000. He also owns a Jet Mini Lathe. Therefore, most of his references are very applicable to the Nova 3000 or the Mini Jet. They are also applicable to virtually any other lathe. He is preparing this review in three parts. We are pleased to present Part I here.]*

As I see it, there are basically three general categories of tool rests based on style and intended use; Straight arm general purpose toolrests, curved or reverse curved toolrests meant to assist in turning the inside and outside of bowls, and pivot point/gated tool rests designed for hollowing. There are also a few specialty toolrests either for box making or the secondary toolrests meant for deep hollowing. I'm going to divide this discussion according to those categories.

Straight arm toolrests:

Stock 12-15 inches on full sized lathes, 5-8 inches on smaller lathes, almost always cast iron, integral post.

Every wood lathe I know comes with at least one straight tool support bar toolrest. These general purpose toolrests usually range between 12-15 inches for larger lathes and 5-8 inches for smaller mini lathes. The length of all factory supplied straight tool rests represent a compromise, allowing enough length for convenient use for longer spindle turning, but short enough to allow the trailstock to be brought up close for smaller boxes and bowls. Some manufacturers, such as Oneway, Hegner, Delta & Teknatool offer a shorter (usually 6 inch) version of their standard tool rest as an option.

Nearly all of these toolrests are made of cast iron and have a post integral to the overall toolrest. My direct experience has been with the 12 inch toolrest provided with my Nova 3000 and the 6 inch toolrest that came with my Jet Mini. With a few exceptions, factory supplied tool rests do a fine job, being sufficiently "beefy" to withstand catches and rough tool use. (The most notable exceptions are those that come with the Jet lathes, which have been notorious for sudden failure. I went several years without such a break, then one day, mine suddenly broke as well.) The high point of the standard tool rest, that edge upon which the tool usually bears, is closest to the wood. This allows the tool to be supported on the rest as close to the wood as you are willing to move the rest (more on this in a moment). The body of most of these toolrests slowly angles down and back from this forward edge and offers a smooth and safe surface against which to place one's hand (and if it isn't, a file or sandpaper can be used to smooth this area).

Probably the greatest drawback associated with these factory supplied rests is that the cast iron construction results in a fairly soft forward edge that can be nicked and dented by the turning tools, particularly parting tools and flat skews that lack a radiused edge. As most know, it is a constant task to file this edge smooth so as to allow unimpeded movement of the tools across the rest. It in not uncommon for some turners to run a file along their tool rests one or more times every turning session.

This view compares the stock 12 inch Nova 3000 tool rest (left) to the 12 inch replacement tool rest from Woodcraft. Note the extra width at the body of the Woodcraft.

This photo compares three six inch tool rests and shows their relative size. (From left to right): Woodcraft, Jet Mini, and BestWoodTools, with a larger 1 inch post).

Sooner or later, most of us find the tool rest supplied (or available optionally) from the manufacturer to be either too long or too short for some projects we are interested in. When that time comes, one goes in search of an after market tool rest, or makes (or has someone else make) up a custom rest.

After market rests, usually modular systems offering at least 4, 6 & 12 inch lengths and interchangeable posts

In the world of after market tool rests, two tool rest systems stand out. These are the Woodcraft tool rest system and the BestWoodTools tool rest system. These modular systems are notable in that they offer the tool support bar separate from the post that mates it to the banjo. This allows different diameter and length posts to be used with different length (or, as discussed later, shape) tool support surfaces by just screwing the threaded post into a hole tapped in the tool support bar. Unfortunately, the threading on the two systems is different, so parts between the two are not interchangeable.

Different manufacturers and models of lathes can use very different tool posts, both in cross section (generally from 5/8 to 1.5 inches in diameter) and in length (generally from 2.25 to 5 inches). Both these dimensions are critical to a successful match between the tool rest and your lathe. The Woodcraft system offers five different posts, covering probably 90 percent of all lathes. The BestWoodTools system includes nearly 30 different post configurations (nicely labeled for the lathe they fit), and if one of them doesn't fit your lathe you can contact them and they will make a custom sized post for you.

Beyond allowing a perfect fit to your lathe, these modular systems have several other potential advantages. If you have only one lathe, you can purchase only one post and use it with several different lengths of tool support bars. This is an inexpensive way to obtain tool rests of several different lengths, or at least to more inexpensively experiment with just how useful an additional size of rest might be. Frankly, if you find yourself switching between different length support bars often, you will probably want a separate post for each length. Still, for only the occasional use of a couple of sizes, switching one post between the tool support bars can offer a significant cost savings.

If you have more than one lathe, or anticipate getting another lathe, a modular system will allow you to switch rests between them after a simple post exchange. Again, if you were to find yourself regularly changing a given toolrest between lathes with different post characteristics, you might soon desire a dedicated tool rest for each lathe. But for occasional changes, having two tool posts with one tool rest support can work just fine. (For example, you might often use a 4 inch toolrest with your mini lathe, but find that on rare occasions the short rest is essential for work you do on your larger lathe.)

The Woodcraft system offers tool support bars in 4, 6 and 12 inch lengths. These are probably the most desired and useful sizes (the 12 inch size being a nice addition to the usually very short rests that come standard with most mini lathes). The BestWoodTools system includes a 9 inch rest, as well as matching the Woodcraft offerings.

The two systems differ in other ways, both with respect to design and function. The tool support bar of the Woodcraft system is in the shape of a heavy "L." That is, the bottom, short leg of the "L" is much thicker than the rising portion of the "L." This thick base provides the "meat" into which the interchangeable posts can be threaded, and adds to the rests overall strength, which is already pretty good simply because of the angle iron shape. Along the top of the "L" a hardened rod (1/4 by my measurement, 5/16 according to the Woodcraft product description) is welded. This hardened rod is very resistant to nicks and dents, and thus allows for a smooth surface with little maintenance other than an occasional wipe with paraffin and/or steel wool. The narrow rod also allows for the tool bearing surface to be very close to the forward (wood facing) edge of the rest, much like the factory style rests.

The BestWoodTools rests are made of a round bar of alloy steel, 3/4 inch in diameter. The rests are very smooth and like the Woodcraft, because of their hardness, tend to stay that way. The interchangeable posts screw directly into a hole drilled and tapped into the round tool rest bar, with an added brass saddle at the top of the post, making for a smooth transition from the post to the support bar.

One difference between the angled rests that usually come from the factory, the "L" shape of the Woodcraft, and the Round bar of the BestWoodTools, is the minimum distance achievable between the wood being turned and the linear area of tool support. Specifically, with the Woodcraft straight rests, the tool bearing surface is 1/8 inch back from the forward edge of the rest, compared to essentially 1/32 with a stock rest (few want the edge of the stock rest to come to a razor sharp edge, thus a little blunting of the forward edge is maintained) and 3/8 inch with the BestWoodTools tool support bars. These small differences make little to no difference when turning larger

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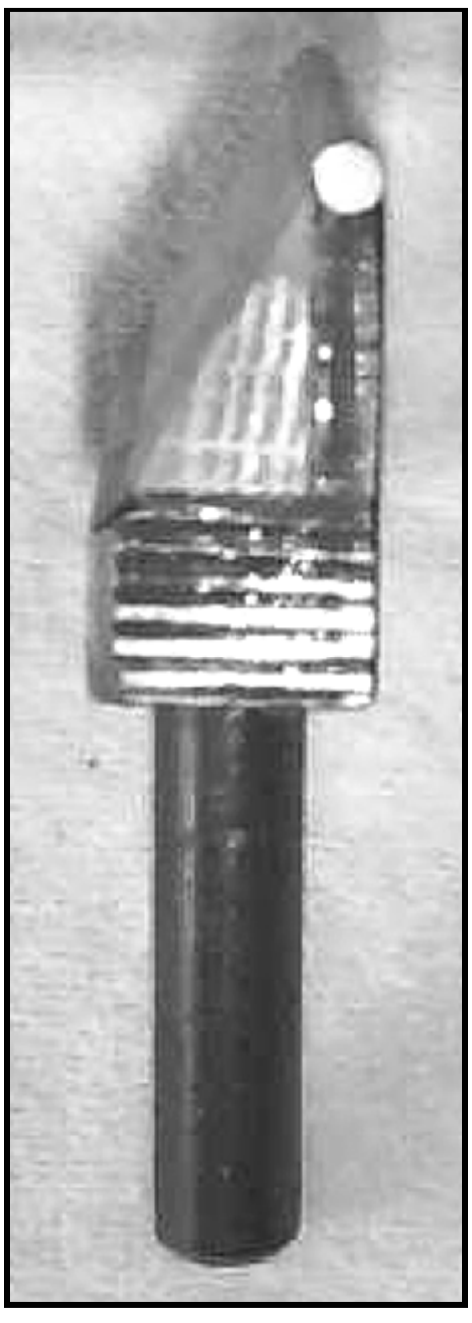
blanks, but for small scale and miniature work, I much prefer a rest that allows the tool bearing surface to be as close as possible to the wood surface. Accordingly, I use all three Woodcraft straight tool rests on my Jet Mini, and save the BestWoodTools rests for the larger work I do on my Nova.

Another difference relates to the use of an undercling grip (called hand-under by Raffan and tied-underhand by Darlow). Since the tool support bar on the BestWoodTools rest is round on the bottom as well as the top, and only 3/4 of an inch from front to back, it may offer those with smaller hands and/or shorter fingers a more comfortable and easily achievable undercling grip, compared to the relatively wide and bulky square edged bottom of the Woodcraft rests. However, if the rest is placed quite near the turning, the round BestWoodTools tool rests offer little clearance space in which that unclung finger can fit. In comparison, the straight sided and nearly 2 inch tall Woodcraft rests (and most of the larger stock tool rests) are taller and thus leave more space at the bottom rear of the rest for that underclung finger. (If you have trouble visualizing this, look at the pictures on page 77 of Raffan's new edition of "Turning Wood," or pages 86 & 87 of Darlow's "Fundamentals of Woodturning").



This photo shows how the wooden wedge fills the shelf space and how the hardened rod runs along the top of the Woodcraft tool rest.

Much as I like the Woodcraft tool rests, I find them to be dangerous as they come in stock form. The problem (which potentially applies to any "L" shaped or angle iron tool rest) comes from the flat shelf that forms the base of the tool rest. If your tool should slip off the left edge of the tool rest while holding the tool with an underhanded grip (don't feel superior, incidents of this have been reported several times, including once by yours truly, and on at least one occasion by a professional turner), it can result in your hand and tool traveling downwards with potentially great force. Though the tool shaft is now clear of the tool rest, the fingers holding the tool are not. As they travel downward, they can strike down onto the flat shelf of the tool rest. A shearing force will result between the unrestrained tool and hand continuing to travel downward, and the suddenly restrained portion of the fingers that have come to a rapid stop on the tool rest ledge. This has resulted in lacerated and broken fingers, and potentially could result in amputation of portions of the fingers. This does not happen with the angled bodies of the factory supplied rests, or the rounded shape of the BestWoodTools, as the fingers can slide off from the body of the rest, but with an "L" shaped or angle iron rest the flat lower shelf causes the fingers to come to a sudden stop, rather than directing the fingers off and away from the rest. As serious a fault as this is, it is easily remedied by taking an angled piece of wood or plastic and gluing it onto the shelf (this wedge needs to extend across the full width of the shelf). By doing so, you have changed the shape of the rest from "L" shaped to angled, and eliminated the source of potential injury. I have done this with all three of my Woodcraft tool support bars and have found it to work well.

This photo shows relative cross section of three different tool rests.

Extended length tool rests, usually 24 or 36 inch length when commercially available.

As mentioned earlier, most standard tool rests for full size lathes rarely come in tool support lengths longer than 15 inches. It doesn't take a degree in physics to realize that six or seven inches past a narrow central support post is about as much as an unbraced tool support bar can handle. Still, sometimes, and almost always with spindle work, an extra long tool rest is desirable (it's never essential, just watch the Dennis White video "Classic Profiles: balusters, table legs and more" to see how an expert finds a standard length rest to pose no impediment to long work). These tool rests usually require two posts spaced along the length to handle the wide span. Two tool posts immediately poses a problem for most turners, in that exceedingly few lathes come with more than one banjo (the Stubby and some Nichols models being exceptions that come to mind). Nova 3000 owners can rotate their optional outboard tool rest assembly to serve as a second conventional banjo to support the headstock end of long tool rests. But for most, purchase of a second banjo is required, and is not an inconsiderable expense (generally between $70 and $250 depending on manufacturer). This in addition to the $30 dollar to $150 cost of the tool rest itself. Thus, long tool rests are really more of a specialty rest, but since they follow the same general design and use considerations of other straight tool rests, I'm going to discuss them here.

Even if one is willing to deal with the expense, another obstacle will arise for many. The manufacturers of modestly priced long tool rests have designed them to work with 12 inch swing (or smaller) lathes and only come with a 1 inch diameter tool post. Thus the inexpensive angle iron Lee Valley tool rests ($29 for a 24 inch rest; $36 for a 36 inch length rest) and the typically available moderately priced cast iron Delta tool rests ($90-95 dollars depending on source) come with short tool rest posts (approximately 2.25 inches past the bottom of the tool support bar for both the Lee Valley's and for the Delta). These short tool posts preclude their use on many larger swing lathes. For example, the tool post for the stock Nova 3000 rest is 4.25 inches.

The above factors tend to encourage and sometimes force owners of many lathes to consider making their own long tool rest, either out of angle iron or out of a hard wood. To custom make your own from angle iron requires you to have (or have access to) welding tools, and other metal working tools such as files and saws, and even a metal lathe if you have to manufacture your own tool rest posts. With these tools and competency in using them, making up your own extended tool rests is really a simple task. If you can use the Lee Valley posts, they do have the advantage that the can easily be moved over to any length of angle iron, mounting easily after two holes are drilled into the lower portion of the angle iron. For those without the metal working expertise or tools, wooden extended rests are a reasonable alternative for most turners. Since Ernie Conover (in his book "*Turning for Furniture*"), Keith Rowley (in his book, "*Woodturning: A Foundation Course*") and others have discussed how to make such wooden tool rests, I won't go into it here, other than to affirm that such approaches are feasible and can be valuable for occasional work.

My personal combination is the Lee Valley 24 inch extended tool rest. I use it with the Nova outboard turning rest assembly rotated back to locate the banjo along the headstock end of the bed to take the forward tool bar post. I use the stock banjo to mount the rear post. The short length of the Lee Valley tool posts are just barely sufficient in length to capture the posts within the banjo socket. Another option is to screw in the clamping handles and have the bottom of the posts rest directly on top of the clamping studs as they block the inside of the banjo socket. You can get by with this loose setting since the dual tool posts will prevent rotational movement. For me, this has been an effective, safe and relatively low cost extended tool rest. Even though it is made from 1.5 x 1.5 angle iron, it comes in a safe configuration as the Angle Iron Lee Valley has chosen to position it has the open portion of the angle away from the turner, with the closed angle pointing directly back towards the turner (i.e." >" rather than "L"). This results in a configuration much different, and safer, than the "L" shaped rests more commonly found.

My Bottom Line (based on my experiences, equipment, and needs):

1. The stock 15 inch tool rest is just fine as it came with my Nova 3000. This is my most used tool rest. However, my Jet Mini tool rest was inadequate and was replaced with an after-market tool rest shortly after purchase.

2. Though both modular systems are good, my favorite all around after market tool rest is the Woodcraft (as long as its safety considerations are addressed). The Woodcraft design is better adapted to handle both detail and large scale work. A full-sized lathe owner will want a 4 or 6 inch additional rest, a mini lathe owner will want a 12 inch additional rest.

3. For my situation the Lee Valley extra length tool rests are an inexpensive solution (particularly if I substitute a 48 inch section of angle iron for the shorter Lee Valley lengths), though their tool posts are just barely long enough. With most larger lathes, I suspect a shop built wooden tool rest will work quite satisfactorily, be more accessible, and much cheaper. Using the ideas of Conover and/or Rowley, you can often work around the need for a second banjo.

The next installment will be a discussion and review of tool rests designed for bowl work.

Sources: (Not a comprehensive list, just some of the US suppliers who carry the products discussed above):

BestWoodTools:
http://www.store.yahoo.com/bestwoodtools/index.html
Craft Supplies:
http://www.woodturnerscatalog.com/index.html
Lee Valley:
http://www.leevalley.com/home/main.asp
Packard Woodworks:
http://www.packardwoodworks.com/
The Cutting Edge:
http://www.cuttingedgetools.com
Woodcraft:
http://shop.woodcraft.com/woodcraft/assets/html