

# An Opinionated Survey of Hollowing Tools-Part IV

## Torsionally and Vertically Restrained Systems

by Lyn J. Mangiameli

Anytime the tip of a hollowing tool contacts the wood off the linear axis of the tool shaft some torsional force is produced. Therefore many tools, even highly curved ones, are carefully designed to place the cutting tip directly on axis (the John Jordan curved hollowing tools are one of many examples of this), and thus little if any torsional force is generated, even during a catch. Other tools, particularly those with difficult to bend, very large diameter shafts (say 7/8 inch and up), allow the tool tip to extend considerably off axis and rely on some form of (usually mechanical) restraint to resist torsional forces. These restrained systems not only help isolate the turner from torsional forces, but most also resist vertical forces caused by aggressive cutting and catches. The ability to have such forces restrained by the tool system, rather than the turner's muscles, makes these systems very appealing for many woodturners, particularly for the large forces which may be encountered during deep turning when the weight of the tool system and leverage that comes from a tool far over the tool rest may be considerable. Additionally, these restrained tool systems allow for the consistent radial positioning required for use of laser guidance systems, another big plus for some hollow form turners. The downside of these systems is that the very means that restrict movement also partially isolates the turner from feedback of the tool tip/wood interface, limits the range of possible tool positions, and comes at a much higher financial cost compared to unrestrained tools (particularly if a laser guidance system is included).

I have, and have used, both restrained and unrestrained hollowing tools, and most know my general preference is for traditional unrestrained tools, even for very deep hollowing. However, I have a fair amount of experience hollowing, an of fairly large size, work out with weights most days of the week, and have little in the way of upper body orthopedic injury. For others, the torsional restraint systems reduce not only the physical requirements of hollowing, but provide piece of mind by all but guaranteeing that a catch or similar error will be relatively uneventful.

There are basically four approaches to torsional and/or vertical restraint: high mass handle; outrigger; captive shaft; captive handle. I will loosely organize the following discussion according to these categories, and explain each individually.

### High Mass Handle

These were the earliest tools which brought the benefits of torsional restraint,

though the primary motivation for their design was to deal with the leverage forces of long overhangs during deep hollowing. These are very long, very heavy, square or rectangular boring bars. They almost always require the use of a secondary tool rest to help support their weight and length, and to allow for adequate fine control of deliberate movement. With these bars, and a reasonably modest cutting tip size, torsional forces are usually miniscule compared to the mass of the handle resting on the tool rests. Many versions have appeared over the years, such as the Jim Thompson boring bars (you can see one in the John Jordan hollowing video), but the main remaining commercially available bars come from Glaser, Nichols, and Serious Lathe.

### Glaser

[Available from Cutting Edge Tools and by special order from John Jordan and Packard Woodworks] This is a 62 inch long, square tubular steel, lead shot filled, straight shaft boring bar with a double-articulated tip. This is the "light-weight" of these handles, though Jerry has been known to make six and even seven foot versions.

### John Nichols

[Available direct from John Nichols] John custom makes these up to 80 inches in length, according to the turner's individual needs. He also offers U shaped primary rests as well as secondary rests to support the tools weight. The one I have used looks similar to the Glaser with a double articulating head that carried a small tool bit. Other options are available, just correspond with John.

### Serious Lathe

[May still be available direct from Serious Lathe] Serious has made some long massive boring bars in the past, though none are shown in their current online catalog. Past models have been similar in style to the Nichols and Glaser bars.

### Outrigger

Stewart Outrigger. [Possible special order from Packard Woodworks] Part of the Stewart System, and thus takes most of the scraping and cutting tips available for it. This tool has a 22 inch long, 3/4 inch diameter main shaft which ends with the last couple of inches angled at approximately 45 degrees. A side arm attaches to the main shaft by a collar that is tightened to the shaft by set screws. This allows the collar to be repositioned along the shaft, then relocked in place. The side arm itself is a round bar that first extends perpendicularly out from the main shaft for a couple of inches, then is angled forward for several more. It is intended to ride on your

tool rest, thus a fairly wide (at least 12 and preferably 18 inch) tool rest is required to accommodate both the outrigger and the main tool shaft while still leaving room for lateral movement. Frankly, there is nothing about this tool that I find appealing. The shaft is only 3/4 inches in diameter, so is limited for deep hollowing even though the shaft is very long. The need for adjustment/readjustment of the outrigger collar is a pain, and the set screws rough up the shaft and eventually effect ease of movement.

### BCT Supercut with Outrider

[Packard Woodworks and The Tool Post in Britain] BCT provides "outrider" attachments for both its 1/2 and 5/8 inch square shaft tools (the 7/8 inch version has an optional "outrigger handle" but no "outrider" attachment). These outriders directly attach to the shaft with a rectangular crossbar, then a rod angles forward and out from the end of the crossbar. It is this angled rod riding on the primary tool rest, along with the square shaft of the tool itself, that controls torsional movement. Like with the Stewart outrigger, one needs a fairly wide tool rest to insure that the outrider will stay on the tool rest during tool movement.

### Johnston/Basham Hollow Turning Tool

[questionable availability, contact Bill Johnston] This tool would have been listed in the full size, free hand hollowing tools section, but for its permanently attached outrigger. The tool has a 5/8 inch diameter, 11 inch long main shaft to which is welded a longer outrigger bar of the same diameter. A tool rest of at least 12 inches is required to provide support to the outrigger. The cutting tip is a broad, flat, rounded-nose scraper; the handle appears to my eyes to be a modified Glaser. I have heard good things about this tool from a couple of turners who own one, though I must admit that outrigger designs seem to me to be less sophisticated than the other forms of torsional restraint, and more hassle than a normal free hand tool. I will not say much more as Bill Johnston has a good description of his tool, and gives use instructions at this site: [http://www.kestrelcreek.com/Articles/Hollowing\\_Tool.htm](http://www.kestrelcreek.com/Articles/Hollowing_Tool.htm)

### Behemoth Woodturning Tools

[Available direct via the Behemoth web site] I am only familiar with this system from the information on their web site. It comes in three lengths (18, 24 and 36 inches), all of which are made up of 7/8 diameter tubing which is lead shot filled and is capped with a wooden handle. The shafts have 1/2 inch bores that will take a number of

components offered by Behemoth, or presumably any other tool of 1/2 inch outside diameter (say, for example, the 1/2 inch Jordan and Kelton Hollowers). It is normally supplied with a bent shaft tip holder, a 3/16 inch cutting tool and a scraper blade. Swivel tip and straight tool holders are available to take 1/8, 3/16 or 1/4 inch square cutters. An adjustable side handle and an outrigger are available as options. The outrigger is a straight round bar that runs parallel to the tool shaft and is coupled to it with a flat bar that has open sockets on each end. It is meant to be easily adjusted by loosening a wingnut so it can be positioned along the tool shaft as deeper hollowing is required. All of the components are available for individual purchase, allowing them to be integrated into many existing hollowing systems.

### Captive Shaft

Captive Shaft systems usually require a rectangular shaft or shaft extension. Because the restraint commonly occurs closer to the cutting end of the tool, smaller shaft sizes are at least theoretically possible as there is less distance over which the torsional twisting will occur. The down side of this approach is that many use a single point restraint which is not as well suited to deal with up/down leverage occurring from tool weight or catches as those systems that incorporate a secondary toolrest. It is possible to use a second tool rest to help with the latter, particularly when using very long shafts for deep hollowing, but this requires uniform height adjustment of both or binding will occur in the gate.

### Donald Derry

[Available direct from Donald Derry via his web site] This hollowing system is almost unique in that it is intended for use with either forward or reverse spindle rotation. Excellent laser stability and smooth, fine x-y axis adjustment (though slow to set); perhaps the most precise laser system available. The system's smaller size and relatively light weight make it convenient as a hand held caliper as well as a hollowing rig. The overall system is restricted in capacity to about 7-8 inch forms, and at this time is limited to only a single length straight shaft with an off axis cutting tip style which is CA glued in place at an approximately 45 degree angle to the shaft. This makes it more suited for tall slender forms than squat fat ones. Derry intends to eventually introduce a curved shaft which should increase the versatility of the system, and I am presently using a prototype of what may become the final curved design. The sturdy gate allows for interchangeability of post size, and can be ordered in a variety of post sizes. It can be modified to take a Clevis pin

to make it into a pin rest as well as a restrained gate. Put a hardened sleeve over the distal bolt threads and you can use that as a large pin stop. With a change in bolt and spacer length, this gate can also be set up to restrain 3/8, 5/8 and 3/4 inch square tools shafts (such as the Pencil Stingers, Lea and BCT). Remove the upper bar and you have a flat heavy duty base that can function very well as a box scraper rest or with a fluted parting tool, making it an exceptionally versatile tool rest/gate. Like with most hollowing tool rests, this one would benefit from a shaft collar that allowed a consistent height to be maintained during replacement and when turning the gate, but this can be inexpensively added by the user. The included 12 inch long (12-1/2 inch working length including tool bit), 1/2 inch square tool shaft can be used without the gate or laser as a free hand tool. The entire system is very well integrated and balanced between its components. This may be the simplest to set up, easiest to use and most affordable restrained, laser guided hollowing system available and is especially suited for those who are new to hollowing or wish to have a system particularly well matched to smaller lathes. (Look for a future full length review of this system at <http://www.fholder.com/Woodturning/lyn.html>)

**John Nichols Torque-Arresting Boring Bar Systems**

[Available direct via the Nichols Lathe Web site] John produces a captive shaft system that uses a rectangular 5/8 inch bar, fitted into a banjo mount restraint gate. The main shaft can be fitted with both short and/or long articulating sections, to which a terminal scraper holder or 45 degree cutter holder is added. Scraping style cutters are available from 1/4 inch to 1 inch in size, the flat scrapers being offered in CPM-15V steel. This is a very similar unit to the Derry Hollower, and indeed is its larger predecessor. Like with all of John's offerings, there is the possibility of multiple custom modifications to meet the turner's specific needs. John also produces larger boring bars that are square in cross section and extend up to 80 inches. These two have long and short articulating sections, but these rely on a single point gate with a square cut out the size of the shaft to provide the torsional restraint.

**Dave Reeks Deep Hollowing System:** [Available from Craft Supplies in the U.S.; Poolewood is one British source] The version Craft Supplies carries is an interesting design where the primary and secondary tool rests are both mounted to a central bar that attaches via a post to the banjo (for small lathes with inadequate banjos, Reeks offers a heavy duty tool rest adapter of his own). Two larger systems are available in Britain that have you use your existing tool rest, and have the secondary tool rest mounted separately. All are

captive shaft systems, but somewhat unique in that the main shaft is captured by the secondary rest. These main shafts are rectangular in shape and fit between the two rectangular bars of the secondary tool rests. Individual tool shafts are fitted into the main rectangular shaft. In the small system that Craft Supplies sells, the rectangular main shaft usually extends out past the front tool rest. On the larger systems, the shafts carrying the cutting tip often rest directly on the front tool rest. Several different boring bars can be fitted to the rectangular main shafts. Reeks offers a 5/8 inch diameter double ended boring bar with two different cutter angles on the opposite ends. He also offers a curved boring bar. Reeks supplies a typical tool bit cutter and a scraper blade. All the Hamlet Siragas Scraper Blades will also fit. However, almost any tool with a 5/8 inch shaft, like the Proforme, Munro, Hamlet (that Reeks himself often uses) and 5/8 inch Kelton Hollowers will also fit. An adapter is available that will allow 3/4 inch shaft like the Stewart and Jordan to be fitted to the rectangular main shaft.

**Vermec Ultimate Hollowing System**

[Available from Carroll's Woodcraft Supplies] is an interesting variation on a captive shaft system. It uses dual gates joined by a thick wide center bar to a single tool post that fits in your banjo. This makes it much like the small Reeks design but that the main tool shaft is round, thus no torsional restraint is achieved (nor is any needed when hollowing is done only with the supplied Vermec straight shafts and cutting heads). This absence of torsional restraint allows the tool tips to be more easily rotated, just as in free hand hollowing, and allows for much of the feedback from the cutting tip (for better or worse) that occurs in free hand hollowing. What this dual gate system does provide is vertical restraint (both up and down), which insures the tool shaft (and thus cutting tip) remains at the proper height within the hollow form (aided also by a supplied tool post shaft collar), and in the process prevents any sudden dropping or rising of the working end of the tool under unexpected load or catches. The opening slot of the gates themselves is established with round spacer sleeves though which a bolt passes. With substituted sleeves and bolts, different size tool shafts could be accommodated. The Vermec system comes with a 22 millimeter (approximately 7/8 inch) diameter stainless steel shaft which when fitted with the various cutting heads, is capable of hollowing to a depth of about 14 inches. Two cutting heads are provided, one with a 10 mm tungsten carbide cup cutter and the other is a 25 mm HSS round scraper-both mounted to their shaft at an angle of 12 degrees. These use the same cutting tips found in the free hand tools (see

[Continued on Page 8.]

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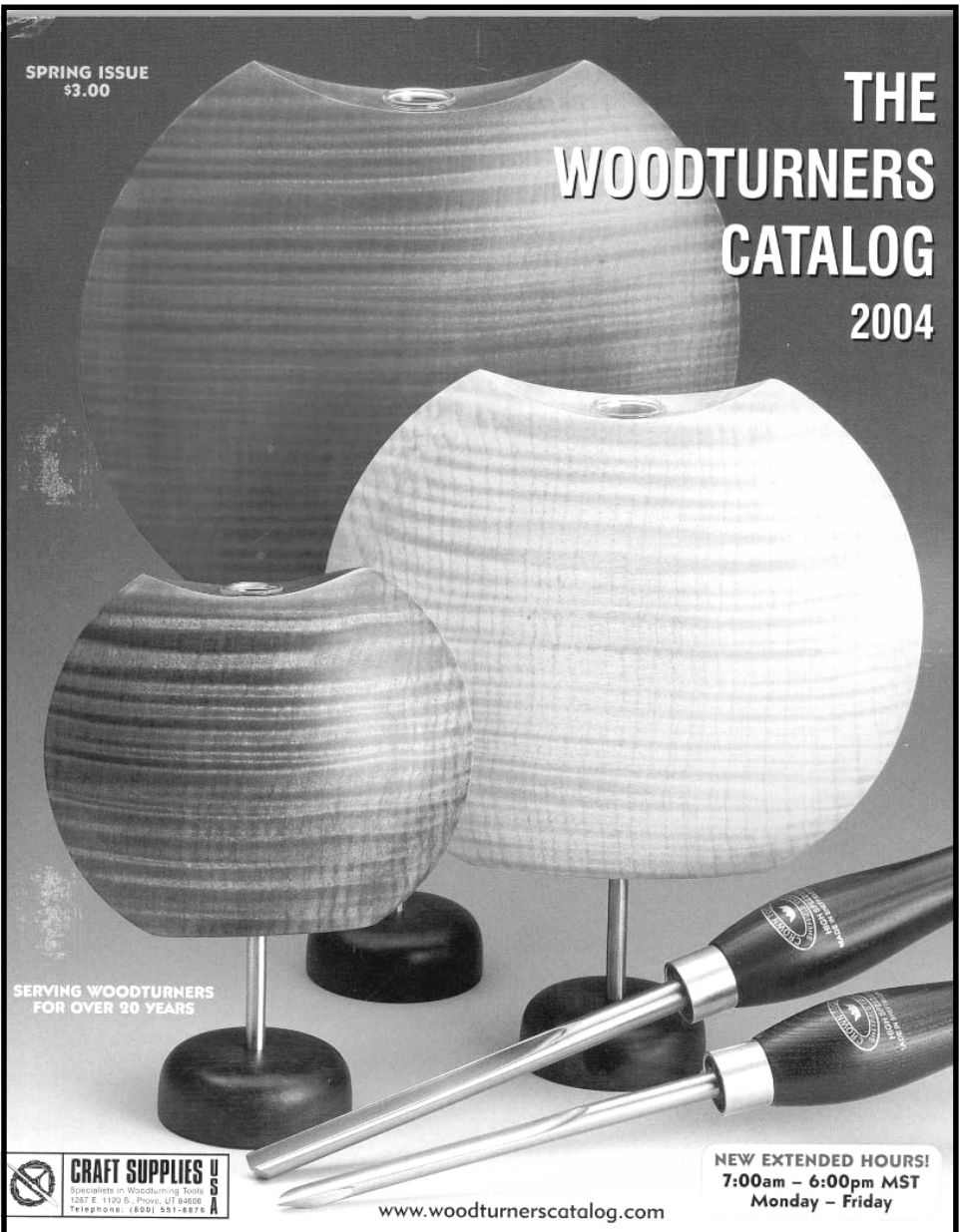


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Section 1 of this survey for a more complete description) but are mounted to shorter stub shafts as they are intended to be used with the long main shaft. At the other end of the main shaft is fitted the standard lead shot filled Vermec handle (which was described in detail in Section 3). A side handle is also included and is meant to be fitted to the main shaft at the point where it joins the handle. As with all the Vermec tools, this appears to be a rugged and very well machined system. Like the Derry, it can be used with the lathe running in either standard or reverse rotation, or even with standard rotation while the cutting head is used inverted on the far side of the turning.

### Clark Deep Hollowing System

[Available direct from Keith Clark via his "the OK SpinDoctor" Web site] This unit is almost unique in its design and is one of the most sophisticated systems I have encountered. Indeed, the price is almost absurdly low relative to the capabilities and quality of construction of this hollowing system. The straight shaft chrome-moly boring bar comes without a cutting tip but will accept a variety of the better curved and straight hollowing tools from other manufacturers (Clark specifically notes compatibility with the Kelton and Jordon hollowers). I consider this a real plus, which greatly increases the versatility of the system. The boring bar itself is 1-1/4 inches in diameter and has a standard length of 48 inches (a 30 inch length is readily available as an option, and other lengths can be provided on a custom basis). The bar is reversible and is bored for a 3/4 inch diameter socket in one end and a 1/2 inch socket in the other; a 5/8 inch adaptor is also provided. The sockets are bored to a depth of 10 inches, allowing one to control how deeply the cutting tool's shaft will be seated (and thus controlling tip extension). The system comes with forward and secondary tool rests, but what makes this tool unique is what its maker calls a "roller bearing limiter and articulation system" The roller bearing collar provides a smooth in and out movement of the bar while offering the choice of restraining rotation of the shaft, or allowing for 360 degree free rotation around the longitudinal axis of the bar. This latter ability means that one can specifically set the rotation of the tool tip to achieve the best orientation of tip with respect to the interior of the form, and allows for most of the capabilities found when free hand hollowing. There are additional features, including a well integrated laser guidance system that can be mounted for use with the cutter located on either the near or far side of the turning. Clark also makes a companion steady rest (which will be described in the next installment of this survey). This is a system to keep your eyes

on. Dr. Clark is presently working on the units coming my way, so before too long I will have more direct experience with them, and then will be offering a full review of, and tips on using, this innovative new hollowing system.

### Captive Handle

Captive handle systems can use either a round or rectangular shaft, and thus allow for a greater range of boring bars to be used. They are well suited to deep hollowing where the long boring bar shafts can be adequately supported by the secondary tool rests in the early stages of hollowing when a great deal of the shaft weight is behind the primary tool rest.

### Jamieson Handle used with a secondary tool rest:

[Available from Cutting Edge Tools, Packard Woodworks and Craft Supplies, but see Lyle's website as well <http://www.lylejamieson.com/>]. This handle system allows total control over torsional forces and resistance against other forces generated by long overhangs. It uses a short 3/4 inch socket with single set screw that has the same drawback as the Stewart style armbraces, as it does not allow one to adjust for shaft extension. This to me is one of the greatest drawbacks to this system. Not the freedom of movement that unrestrained tools allow (so I don't use it for small to medium forms), but it takes nearly all the strain and punishment out of doing large to very large forms. It comes with instructions to make a wooden secondary rest. I modified a Oneway secondary rest for use with mine, but both CS and Packard now have secondary supports in steel that look very good. Jamieson also offers an optional laser guidance attachment for his handle (it will also attach to most other shafts that are 3/4 inch in diameter). Though made of 1 inch tubing, I find the single point mount and post to be only marginally rigid enough to stabilize the laser during turning. This is not surprising as the vertical post rises 12 inches and the horizontal post can extend forward almost 26 inches. While it will be rare that the horizontal post will be extended that far, there is still the weight of the laser and its mounting bracket installed at the end, and this can contribute to oscillation. This guidance system has worked adequately for many, but I believe it could be better engineered. The handle can accept a wide variety of 3/4 inch tool shafts (Kelton, Stewart, Jordan, Pencil, etc.) and with adaptors like the ones offered by Kelton, can take even smaller sizes, but see immediately below for boring bars made by Jamieson specifically for this handle. One of the nice things about Jamieson is that he provides excellent information on use of his system, both in print at his web site and in a video

called Hollow Forms the Easy Way. He even offers instructions on how to make your own handle.

### Jamieson Boring Bars

[Craft Supplies, Packard Woodworks and Cutting Edge Tools] Not the original, but one of the first commercially available torsionally restrained systems. Long heavy duty boring bars (3/4 inch, and 1-1/8 inch diameter with a 3/4 inch tang) that will handle long extensions, thus deep boring. The tips have all the advantages and disadvantages of the typical scraping tools. The standard boring bar is double ended with one end designed to take a variable position tool bit holder or direct mount scraper blade (much like the Stewart System) directly into the end of the shaft. The other end being cross drilled at an angle to take the same straight holder and cutters. The Jumbo boring bar is bored out to 3/8 inch only on the large end, and is supplied with a bent cutter holder to which can be attached a swivel tool bit holder or direct mount scraper blade. Jamieson offers his own version of an asymmetrical tear-drop scraper blade, but others from Sorby, Stewart and Pencil will fit just as well. These bars will work well in many other restraining systems like the Kelton and Lea, as well as the Jamieson Handle.

### Oneway Boring Bar System and Secondary Toolrest

This is not shown in the latest Oneway catalogs, so it may no longer be available or only on special order. Oneway developed its own rectangular boring bar system that I have not used. One of the nice things about their system was that it had an integral light that illuminated the interior of the hollow form. The downside was that the unit came with only a broad scraper tip. Part of the system was a steel secondary toolrest that was available for lathes in three different spindle height ranges (essentially 8 inches to 24 inches overall). They used to sell (and my still provide) this toolrest separately for a reasonable cost, though it required a call direct to Oneway. This steel toolrest will fit almost any flat bed lathe, and works very well with the Jamieson handle. As it comes, its flat bars are spaced too wide (top to bottom) for the Jamieson bar diameter, but when the toolrest bars are faced with UHMW tape (like sold in rolls for jigs) and the Jamieson handle is covered with split garden hose, the resultant system works exceptionally well. This modification of the Jamieson handle glides easily and the hose dampens vibration and makes for a more comfortable grip. The Oneway tool rest can be pivoted on its post, or the whole system can be pivoted on its attachment point to the lathe bed (though both of these should be tightened dur-

ing use). This allows for a great range of angles to which the tool handle/boring bar system can be oriented to the wood.

### Craft Supplies Secondary Tool Rest for the Jamieson Handle

[Available from Craft Supplies] I have not used either of these, but they look good. Very similar to the Oneway toolrest described above, but specifically designed for the Jamieson Handle. I believe this has the same ability for fine vertical adjustment as the Oneway and the ability to swivel the head separate from the attachment plate; it also looks to have greater width side to side between the bars. They also offer a version with combined primary and secondary rests for shortbed lathes.

**Boring Bar Back Rest:** [Available from Packard Woodworks] I have not used this secondary tool rest, but it appears to be one of the best I have seen. What I like about this rest is that the spacing of the bars is adjustable, so that handles and rectangular bars can be accommodated that are anywhere between 3/4 and 1-1/2 inches thick. The 1 inch square bars are held apart by springs, with nuts on each end that are screwed down or backed off to adjust the spacing. The bars themselves are 30 inches long, which is plenty wide. The height is adjustable over a 4 inch range, and separate versions are available for lathes with modest (10-16) or large (up to 24 inch) swing. Like the Craft Supplies units, this one also comes in versions for normal length and short bed lathes.

### Wooden secondary tool rests:

Instructions for a wooden secondary support to be shop made comes with the Jamieson handle (at least when purchased from Cutting Edge Tools) and is available on Lyle's website <http://www.lylejamieson.com/tool.htm>. I have not built one, but great detailed pictures of a finished home built rest is available at the Kestrel Creek website <http://www.kestrelcreek.com/Lathe/OutRig/OutRig.htm>

### Kelton Hollowing Rigs:

[Craft Supplies, Lee Valley, Woodcraft and others] Kelton applies an interesting twist to the captive handle approach to rotational restraint. The Kelton system is really more of a handle that captures a single secondary tool rest bar, than a traditional handle captured within the slot of a secondary tool rest. As restrained systems go, I find the tribute A frame approach used by Kelton to be a real winner, in part because their hollow tube will allow you to have greater control over tool shaft extension. Now available in two sizes, the original Kelton (the one I have) comes with an adapter that will take a 5/8 inch tool shaft as well as the primary bore that accommodates 3/4 inch shaft tools. Its maximum linear travel is 20 inches. The new smaller version is intended for lathes up to 16 inch swing and has a 5/8 inch pri-



mary bore that can also take 1/2 inch tools. For those interested in laser guidance systems, I believe the two position mount of the Kelton is the most stable available, though its lateral adjustment is awkward. Both rigs are very ruggedly built (as all things Kelton), but result in a heavy unit. The heaviness has the advantage of stability, but can seem like a lot to hoist on and off the lathe, and move about during turning. The latter can be improved somewhat by lining the cross bar with UHMW plastic tape of the sort sold for jigs. Of the ones I have used, this is my favorite captured handle hollowing rig. (Look for an upcoming full length review of this system at <http://www.fholder.com/Woodturning/lyn.html>)

### John Lea Deep Hollowing Systems

[Available direct from the Lea web site] I have not used these systems, but from the photos on John's web site, they look to be well built, torsionally restrained hollowing systems in the Jamieson style, but, in its Standard configuration, with the extension adjustment advantage of the Kelton. There is basically one handle/restraint system available in various versions depending on boring bar included and whether or not a laser guidance bar is attached (all versions come with the mount, so the laser can be added later). Though only a single point mount, the Lea Laser looks to be one of the better ones to my eyes, appearing sturdy (it uses a vertical bar rather than a rod) and with relatively convenient lateral positioning adjustment. The following are edited descriptions from the Lea web site. Standard Adjustable: This captive system has a 3/4 inch two-way cold-rolled steel bar that telescopes into the handle. It allows you to adjust the overhang of the tool bar to minimize vibration and chatter. It includes interchangeable cutters, a swivel tip with a 3/16 inch tool bit and a 1/4 inch tool bit used alone. Standard Adjustable With Troy Boring Bar: The Troy Boring Bar is fixed and does not telescope into the handle, but will enable you to go farther off the tool rest and deeper into a hollow vessel without vibration problems. The bar provides the mass and versatility for reaching as much as 15 inches off the tool rest. It has two cutting positions, straight-on and 45 degrees, on the same end of a 1-1/8 inch cold-rolled 24 inch steel bar. A 1/4 inch HSS tool-bit is supplied. To my knowledge the tools are only available through the Lea website

### TurningWays MinO-Bar and Mighty-O-Bar

[Available from Rich Johnson's Woodturning Center and direct from the Turningways web site] These well machined captive handle systems differ from most others by using an open ring for the handle which incorporates a shallow socket to which is attached a boring bar. Unfortunately, the socket de-

sign precludes any ability to control the exposed shaft length (short of finding shafts of different sizes). The handle is restrained in the slot of a secondary tool support. Turningways makes wooden secondary supports specific to the swing (10-24 inch) of your lathe. You can also make your own or use one of the other commercial secondary tool rests. The smaller of the hollowing systems is designed for small 10 inch swing lathes, such as the ubiquitous minilathes. It is recommended for vessels under 7 inches deep and uses a restraint ring of 10 inches in diameter made up from 1/2 inch steel rod. 1/2 inch and 3/4 inch diameter boring bars are available for the MinO system. This system is notable for its light weight combined with good stability, making it less fatiguing in terms of moving mass, but perhaps a little more likely to transmit small shocks and vibration. Their large system is intended for lathes of 12 inch swing and greater and uses a 16 inch diameter restraint ring formed of 3/4 inch round steel rod. It can be used with either a 3/4, 1 or 1-1/4 inch boring bar allowing hollowing to a recommended maximum depth from 14 to 20 inches depending on the bar. Both systems can be mated to a version of the Turning Ways Articulator, This laser was one of the first commercially available, and is notable for the two joints that give it a wide range of both linear and lateral adjustment. In its full sized version, its arms can extend out up to 28 inches, with an attachment post that sets the arms 14 inches above the mount. A laser is included with the arm assembly. These are expensive hollowing systems when everything is included, but TurningWays allows for all of the components to be purchased individually.

### Serious Lathe Boring Bar Systems

[Available from the Serious Lathe web site] These are available only direct from Serious Lathe. There is a mid-sized boring bar system and a massive larger system has been demonstrated. The "mid-sized" system is the one using a captive handle, and will hollow up to 35 inches in diameter and over 18 inches deep. It is composed of a forward U shaped "yoke" (gate) that fits only into a 1-1/4 inch banjo socket. There is a 4 foot handle, a 2 foot handle extension, two 1 foot handle extensions, a stand for the secondary tool rest, and an 18 inch wide T style secondary restraint. The boring bar comes with four adjustable links of different sizes (2.5 - 6 inches) that attach singularly or multiply to the end, allowing considerable opportunity for articulation, though also considerable opportunity for unintentional movement should they loosen. There are four scraper cutters made of A2 steel, as well as more traditional tool bit cutters. This is a very ruggedly built system, but at approximately \$1000, only the most dedicated large scale hollower is apt to consider it. I have also

seen photos of a much larger system that Bernie produces, that used a free standing semicircular railing that extends around the base of the lathe. This latter system is obviously in a league that only Serious Lathe and John Nichols play in.

### Separate Laser Guides

These laser set ups allow a laser to be fitted to a variety of individual tools shafts of various manufacture.

### Lea Universal Laser Guide

[Available from Craft Supplies] This laser system is composed of a mount, a vertical shaft, and a horizontal shaft which has a short articulating arm at the end which holds a laser. The laser module with an on/off switch is included. The mount is designed to allow attachment to tool shafts of several different diameters. The system is individually adjustable for height, offset, and horizontal position. Thus, tools as varied as the Kelton Hollowers and Jamieson boring bars can be fitted with this laser guide to hollow turnings up to 20 inches.

### Turningways Articulator

[Available from Rich Johnson's Woodturning Center, Cutting Edge Tools, and direct from the Turningways web site] One of the first commercially available laser guides, it is now available in three version, two intended for its hollowing systems (see review of the MinO-Bar and Mighty-O-Bar systems above) and one referred to as the Jamieson Style. The latter version attaches well to 3/4 inch diameter shafts or handles using a mounting block held by four bolts. It has a single vertical round post, and two dual, parallel, square cross-section, horizontal arms, one of which terminates in a welded on vertical tube that holds the laser. Like the Mighty-O-Bar version, the horizontal arms are fitted with two joints that give them a wide range of both linear and lateral adjustment. The arms can extend out up to 28 inches, and are attached to the vertical post 14 inches above the mount (there is no control of arm height). A laser is included with the arm assembly.

### What I Use

As I have noted earlier, I generally prefer hand held hollowing tools used with a gated tool rest. Those times when I am most apt to use a torsionally restrained/laser guided system is when I am dealing with very deep forms that exceed the practical limits of my calipers, or when trying to follow the contours of a complex external shape. With that in mind, of the torsional restraint systems I have used, my preference is for the Kelton Hollowing Rig for larger work, and the Donald Derry Hollowing System for smaller scale hollowing. A great deal of this preference is based on the stability of their laser systems. I do not own either yet, but I am also impressed with the Clark Deep Hollowing System (which I will shortly obtain) and the John Lea Deep Hollowing System, both of

which, like the Kelton, have the ability to control shaft extension length and appear to have stable laser mounts (though likely not as stable as the Kelton).

## Hollowing Tool Suppliers Web Sites

### Behemoth Tools:

<http://behemothtools.tripod.com/>

### BestWoodTools:

<http://www.store.yahoo.com/bestwoodtools/index.html>

### Carroll's Woodcraft Supplies:

<http://www.cws.au.com/>

### C.I Fall: <http://www.cifall.se/>

### Clark Woodturning Tool Manufacturing:

<http://www.theokspindoctor.com/index.html>

### Craft Supplies USA:

<http://www.woodturnerscatalog.com>

### David Ellsworth:

<http://www.ellsworthstudios.com/david/toolsetc.html>

### Donald Derry:

<http://www.donaldderry.com/>

### Don Pencil: <http://www.donpencil.com>

### Farris Tools:

<http://www.sharptoolsusa.com/>

### Hegner: <http://www.hegner.co.uk/system/index.html>

### Highland Hardware: <http://www.tools-for-woodworking.com/>

### Jacques Coulombe:

[www.jacquescoulombe.com/index.html](http://www.jacquescoulombe.com/index.html)

### John Lea:

<http://home.sprintmail.com/~h2/tools/>

<http://www.woodturningtools.net/>

### John Jordan:

<http://johnjordanwoodturning.com>

### John Nichols:

<http://www.nicholslathe.com/>

### Lee Valley & Veritas:

<http://www.leevalley.com>

### Martel:

<http://www.public.netc.net/martel/>

### Øland:

<http://www.olandcraft.com/tools.htm>

### Packard Woodworks:

<http://www.packardwoodworks.com/>

### Poolewood:

<http://www.poolewood.co.uk/>

### Rich Johnson's Woodturning Center:

<http://home.pacbell.net/latheart/frame.htm>

### Sea Horse Custom Fabrication:

<http://members.aol.com/seahorsecustfab/index.html>

### Serious Lathe:

[http://versasteel.com/serious\\_lathe/](http://versasteel.com/serious_lathe/)

### T&J Tools:

<http://www.t-jtools.co.uk/index.htm>

### The Cutting Edge:

<http://www.cuttingedgetools.com/>

### The Toolpost:

<http://www.toolpost.co.uk/>

### The Wood-Tradesman (Steve Houston):

<http://www.thewoodtradesman.com>

### Turningways: <http://turningways.com/>

### Woodcraft: <http://shop.woodcraft.com>

### Woodcut: <http://woodcut-tools.com>

### Woodworker's Supply:

<http://woodworker.com/>