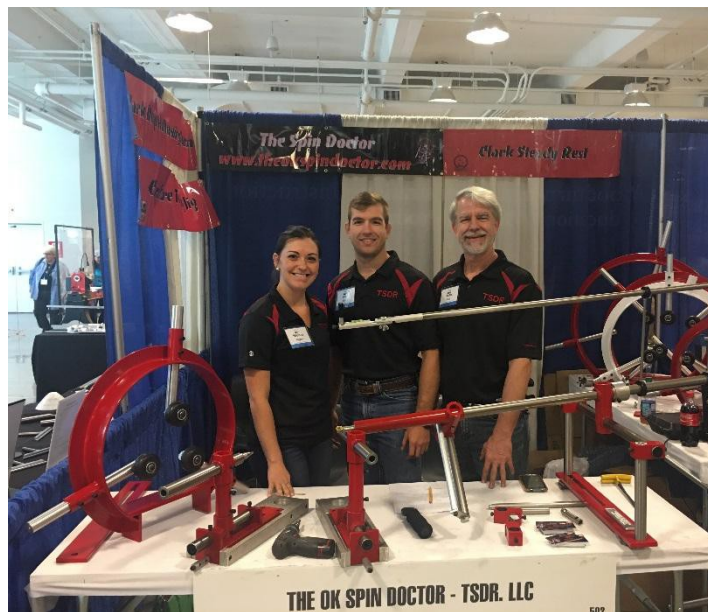


2016 AAW Symposium - Atlanta



Clark Woodturning Tools –Introduction, Setup, Tips for use

Thank you for your interest in Clark Woodturning Tools!

Check out the website for more details and to order! Included here are the setup instructions and some introductory tips for use of the Clark Deep Hollowing System, Clark Steady Rest, and Clark Sphere Turning Jig. The first section discusses some features of each tool and the assembly instructions and tips for use follows. At the end is a price list for all tools and accessories.

Woodturning can be dangerous and these instructions are just a starting point. There is no substitute for instruction from an experienced turner! Please feel free to call any time for support or questions.



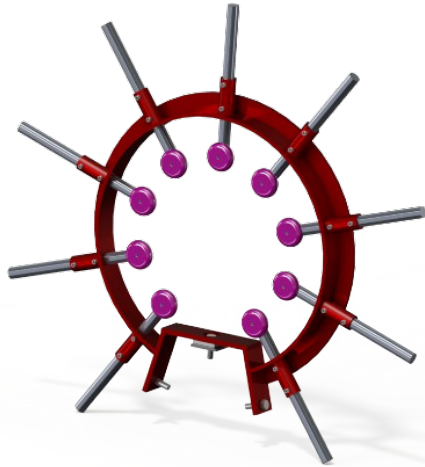
Steady Rest

A steady rest is an old accessory widely used in both metal and wood turning. It allows one to hold a part while it is being hollowed internally or shaped externally. It becomes especially useful with long spindles but is becoming more frequently used to support tall vessels being hollowed. The forces exerted on a tall vessel can cause the vessel to vibrate or even become dislodged from the lathe holding mechanism (faceplate or spindle) during hollowing. A steady rest can minimize this problem.

The Clark steady rest was designed with larger lathes in mind, although they can be made for lathes with the centerline only 4 inches over the bed. (Please contact about accessories for smaller lathes.) The design of this steady rest is **unique** for several reasons.

One reason these steady rests are unique relates to the materials. All the steel used is heavy duty and supported to minimize vibration and stand up under heavy loads. A stabilizing rib is integrated by the bending process to the outside of the ring and spans beneath the attachment plate to suppress flex. The radial arms and guide tubes are well fitted and the sliding surfaces of the insides of the guide tubes minimize vibration.

The arms are aluminum 1.25 inch diameter with a flat milled exactly 90 degrees to the wheel. In recent years a switch was made to aluminum arms. This has reduced the weight of the steady rest, plus the softer metal allows the set screws to make a more secure hold on the arm.



Number two reason for uniqueness relates to the ring design which limits loss of the maximum swing diameter possible on a lathe. Other common designs use a vertical ring, which subtracts at least 4 inches from maximum swing diameter at the point supported by the steady rest. The only loss to maximum diameter in this steady comes from the 1/2 inch base plate. Even the attachment bolt is recessed in the base plate to keep it from interfering with turning diameter.

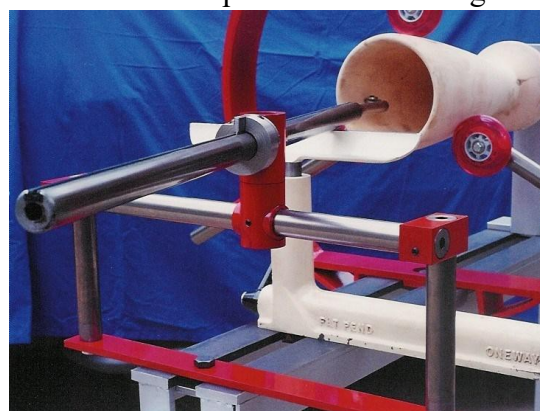
A large ring allows the use of larger diameter wheels to place more rubber on the wood and to keep the wheel speed lower than that seen with smaller diameter wheels. In addition, the *large ring* makes it easy to leave the steady rest in place on the lathe (with the wheel arms retracted) while using traditional turning tools on the outside of the project.

Additional arms can be placed if desired. The convertible version shown to the right has the lower set of tubes aimed at 10 inches and the upper pair aimed at 12 inches. With interchangeable alignment plates, the steady can be used on a variety of lathes for improved flexibility and improved resale (if you ever would want to sell your steady rest).

Clark Deep Hollowing System

The Clark deep hollowing system (patented US 7,191,689 B2) is also a unique tool to accomplish a physically demanding task in wood turning. It is a heavy-duty system fitted to any lathe with maximum turning diameter above 6 inches. With this system, a turner can manipulate the hollowing bar in a more natural manner. It offers the flexibility of easily quickly changing the angle of attack of the tool

It also provides the possibility of hollowing without locking the rotation of the hollowing bar those instances when hollowing with a ring or hooked tool. In this instance, the angle of attack the tool tip can be gradually changed as the tool is moved in and out of the vessel.



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The majority of parts are painted or made of stainless steel or aluminum for a long and attractive lifespan. Parts are well fitted and rugged. The roller bearing and guide slot design provide for smooth hollowing bar movement while restricting bar rotation. The hollowing bar itself is standard at 48 inches long and can be used alone as well. The bar can be made longer if desired. It has a $\frac{3}{4}$ inch hole 5 inches deep in the ‘business end’ and $\frac{1}{2}$ and $\frac{5}{8}$ inch adapters allow a range of sizes of tools or holders for large and small work. Very small openings in a closed form can be hollowed through by using long, thin holders mounted in the end of the hollowing bar. Don’t let the large footprint persuade you from considering this system small projects or tight openings.

A laser thickness guidance system and a video system are also available as an option. The laser device is unique because the laser holder wraps around the 12 o’clock steady rest arm. Notice the photograph below showing rotation of the scaffold of the laser and return of the laser holder to the midline around the arm at 12 o’clock.



The laser can be purchased separately.



The sphere turning jig is made to create perfectly round projects and can be used for both convex and concave shapes. Some minimal assemble is required when the system is unpacked. The 1.5 inch tall base, containing 2 high quality thrust bearings, will limit the maximum convex diameter that can be turned to the lathe swing minus 3 inches. Therefore, for example, the maximum diameter turning on a 24 inch swing lathe would be 21 inches. For convex work, the jig is fixed to the lathe bed center while perpendicular to the lathe bed using the attachment plate and screw. The bearings allow the jig to rotate. Diameter is controlled either by gross movement of the holder bar (after loosening a set screw) or by fine movements through a lead-screw.



For concave work, the jig is clamped to the lathe bed parallel to the lathe bed. A very long bar can be inserted into the swivel tube. The bar is then swiveled after loosening the lower setscrew on the upright. The hollowing bar from the Clark Deep Hollowing System is suggested for this operation so a concave shape up to 8 feet in radius or less is possible. A tool rest should be used to support the bar during concave work.

The Clark Sphere Turning Jig comes configured for the swing of your lathe with a 6” holder for a 1/4” HSS cutter.

The 12” long tool holder has a 3/4” hole drilled 6” deep. Adaptors are available to step down to 5/8” or 1/2” diameter so other holders on the market can be used. The height of the cutter is adjustable. The cutting edge should be placed at spindle midline or slightly higher.



Position the distance of the cutter by turning the leadscrew with a 5/8” socket mounted on a power drill for quick movement. The lowest setscrew must be released then retightened for the cut. Gross adjustment of the 12” long holder can be done by sliding the holder with that setscrew loose. During convex cutting, the setscrews and all need to be tight. Do not overtighten the setscrews. Start the cut with the rig setup with the base at 90 degrees to the lathe bed and the 12” holder parallel to the jig base. Rotate the system to cut. As the cut progresses to either end, it will cut smoother and more efficiently if the 12” long holder is rotated to be perpendicular to the lathe bed. This will require turning the lead screw to get the cutter closer to a proper position for desired diameter of cut.

For concave cutting, the rig is to be parallel to the lathe bed. Presumably the hollowing bar from the Clark Deep Hollowing System is switched out with the 12” long holder. Now either the lower or upper setscrews are loosened to allow pivoting. A tool rest must be used to support the bar. Large diameter concave hollowing projects are possible such as platters or large bowls.



The internal setscrews (see internal details photo above) must be very tight. This been done at the factory - but if they become loose, the system will swivel improperly. The internal 1.25" stainless steel posts are different lengths according to lathe swing. The intermediate sleeve is sized for the lathe swing as well. The system can be used on any size lathe with the proper posts and sleeves. Contact for ordering.

Steady Rest - Instructions

Packing List – 1 packages

- Steady rest with attached - 3 radial arm tubes and circumferential stabilizing rib
- # radial arms, fit to lathe size –
- # wheels with bolts, washers, lock washers, ABEC 5 bearings and axles
- 1 - 5/8" screw with threaded gripper plate
- 2 - 5/16" set screws for each radial arm through tube

2 bolts to contact a spacer between the bolts and the lathe body in the case of a wrap-around base configuration.

Assembly

Slide the arms into their through tubes from inside the steady rest. With multi-steady rests there may be a longer arm which is to be placed in the 12 o'clock through tube. Place steady rest on lathe ways at 90 degrees and attach with supplied 5/8" screw and gripper plate. Gripper plate is turned to fit under lathe ways and the screw tightened with a 15/16" socket wrench. Removable attachment plate is held by 4 - 5/16" set screws. The radial arms are to be moved inside the radial arm tubes to place the wheels on the wood being turned. The set screws are to engage the flats milled down the length of the radial arms to hold the wheels at 90 degrees to the lathe bed.

Tips for Use

Prior to engaging the wheels of the steady rest on your project, be sure the wood is first turned so that it is as round as possible. More wheels are better for projects with voids and allow a smoother hollowing experience. It is interesting to note that if a heavy project is left on the lathe with the wheels contacting the wood, the wheels will become dented or distorted. When turning again, there will be extra vibration or noise due to the flats on the wheels. Within minutes, the wheels will become round again and the vibration disappear. Also note that when hollowing, especially wet wood, the piece will gradually over minutes change shape and vibrations will ensue. This phenomenon can be minimized by truing the part or by using more wheels. Several professional turners have given feedback that more wheels under all circumstances are better. Certainly many turners have been satisfied with 3 wheels under all circumstances. These steady rests

are custom made to the desires of the turner. We also accept returns to allow additional arms if desired in the future.

Always adjust the steady rest to position the wheels at a flat place on the wood being turned, to prevent the tendency for the wheels to climb and thus vibrate. The radial arms have flats placed on them so the set screws when tightened (do not over tighten) will automatically hold the wheels at 90 degrees to the long axis of the lathe bed.



It is not recommended to rotate the lathe at speeds over 500 rpm when using the steady rest.

When turning very small diameter pieces, one of the radial arms can be rotated 180 degrees to clear the other two wheels.

Pictured to the left is a wrap-around base. The advantage of this style base is that the lowest arms can be closer to the lathe body. This allows these wheels to be more underneath the project for more support of heavy turnings.

The large bolts provide additional points of stabilization against the lathe body. It is necessary for protection of the paint, to put a spacer of wood or firm plastic between the bolt and the lathe.

Alternatively, smaller or larger diameter wheels can be used such as skateboard or scooter wheels or small metal bearings. All rings are 6 inches larger than the lathe swing which allows up to 3.5 inch diameter wheels without robbing maximum turning diameter.

A convenient way to store the steady rest is to slide it close to the headstock end of the lathe so it never has to be removed from the lathe.

These steady rests are quite heavy. Those for 20" swing lathes and larger have 3/8" thick angle iron with a 3" x 2" dimension. The weight is a hassle when lifting the rest, but heavier is better when considering basic function. Smaller steady rests are made from 1/4" thick 3" x 2" angle iron.

There is always a question asked about what kind of wheel to use. Softer wheels seem to work well but some turners are asking for very hard wheels because the soft wheels melt or wear. We are testing some new materials and hope to be able to offer some different options in the near future. Recent feedback from a turner indicated that ABEC 5 bearings last much longer under heavy loads than the more expensive ABEC 7 type.

This steady rest is a very heavy-duty woodturning accessory. It should function for many years with minimal care. The only parts that will wear are the wheels themselves and the flats of the radial arms where they are engaged by the set screws. The wheels may need replacement someday, while flats on the radial arms can be ground smooth when needed to remove the marks.

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for Oneway or Jet, Stubby, Powermatic, General etc. Attachment plates are ¼ to ½ inch wider than the alignment plates.



Alignment plate and 5/8 inch screw are shown in the photograph to the left, current design uses only 2 set screws.

Two set screws hold on the interchangeable alignment plate sized for brand of lathe. Sizes include 1.25, 1.5, 1.75, 2.00, and 2.5 inch wide plates

There is a configuration with an extra 1 o'clock through tube which shifts the arm out of the way of a laser holder at 12 o'clock. The articulating design of the Clark Laser System eliminates the need for the 1





o'clock position.

On the left is an photograph of a ‘Multi-Steady’ that has two pairs of through tubes with one set aimed at 10 inches and the other at 12 inches over the base plate. It can be used on two different sized lathes
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such as a 20” Powermatic and a 24”Oneway. A third set of tubes can also be added so the Clark Multi-Steady could be used on a 16, 20 or 24 inch swing lathe.

Deep Hollowing System – Instructions

Packing List – 2 packages

1 - Base with 2 vertical posts attached and horizontal cross member installed with swivel blocks, tool tip attack adjustment feature and ball bearing limiting assembly installed plus 5/8 inch screw, washer and threaded attachment plate

1 - Hollowing bar each with 2 shortened setscrews, 2 ¼” setscrews, 2 socket head cap screws.

The socket head cap screws are for use with the ½” HSS cutter which is mounted directly in to the hollowing bar without holder. The setscrews are usually put into the farthest apart 2 positions. The socket head cap screws are meant to mount in the 2 end positions. The longer setscrews are for thinner holders when using the ½ and 5/8 adapters. A variety of accessories may be ordered. The most important is the guarded tool rest, the laser system, and various cutters. The Fulcrum Support Tubes are very helpful for hollowing over 15” deep.



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Additional accessories include a handle, adapters to step down the hole in the bar. You can use most must tool bits on the market such as those from John Jordan or the Stewart style (as shown). The base can be mounted close or far away from the wood according to preference.

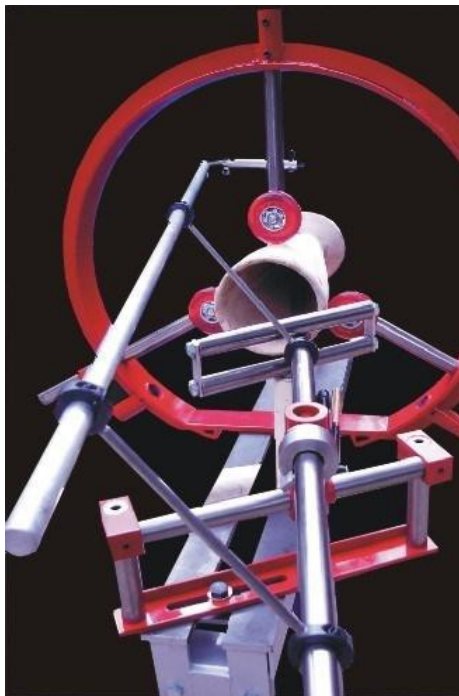
As viewed from the tailstock end of the lathe, the wood must turn counterclockwise and cutting can only be done in the left quadrant. Start with the very center and create either a drilled hole or use the hollowing cutter to create a central hole. It is quite easy to use a pivoting motion to sweep from center to the outside of the project followed by advancement at the center and repeat. Each turner will develop a unique style which comes over hours of practice. The most common error at the beginning is to take a heavy cut. Since some of the feel of the tool interacting with the wood is reduced and because the turner now has a great mechanical advantage over hand hollowing, it is very easy to overpower the cutter. Try to look at the cutting bit to see that very little is being removed. Learn to understand from what you see, hear, and feel when the bit is removing the proper amount of wood.

The hollowing system gives the turner a mechanical advantage not possible during hand hollowing. It is much easier to pull the project off of the holding device - a steady rest is recommended! With a steady rest, a chuck is all that is needed. Use a faceplate with lots of screws if hollowing without a steady rest. Watch the video on the hollowing page of the website to see how easily the very large and heavy log jumped like a tooth-pick off the lathe. It escaped the steady rest through the gap left by forgetting to replace the 10 o'clock. This is a great example of how now to hollow! It demonstrates nicely where the forces are directed during hollowing and proves the value of a steady rest. Follow through the video to see how even catches that stop the lathe revolution are no problem at all with the steady rest and hollowing system in place.



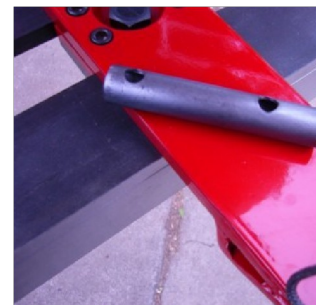
The hollowing bar should be level by adjusting the height of the horizontal cross-bar and the guarded tool rest or other tool rest in the banjo. The base can be slid and angled as desired to approach the hollowing at a wide range of angles not possible with D-handle design. The guarded tool rest is a safety device to prevent the hollowing bar from falling to the ground.

Clark Deep Hollowing System - Assembly



Mount the base on the lathe bed with the screw and gripper plate. The base can be oriented as desired by sliding and angling along the lathe bed. The picture to the left shows how to angle the captured tool post and the base of the hollowing rig to maximize the depth hollowed without having to move the laser scaffolding.

Pass the guarded tool post into the 1 inch hole in the banjo supplied with your lathe. The guarded tool post is not mandatory unless using a Fulcrum Support Tube. Slide the hollowing bar into the tool tip attack adjustment device engaging the bearing in the slot in the hollowing bar. Place the end of the bar with the $\frac{3}{4}$ inch hole toward the headstock. Mount a $\frac{3}{4}$ inch tool tip holder in the hole in the end of the bar. The adaptor shown to the right will allow a $\frac{5}{8}$ inch tool or $\frac{1}{2}$ in tool. It slides into the hole with the setscrews aligned to pass through the holes. Slide the

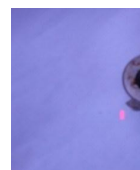


hollowing bar through the horizontal bars of the guarded tool post. Slide the larger split rings onto the hollowing bar placing one at the far rear of the bar and one in front of the swivel device (on the side of the headstock) at the mid-point of the bar (24 inches from the end). Insert the aluminum laser holder into the smaller split rings.

Install the 6 inch aluminum laser holder to the end of the aluminum bar with the carriage bolt and wing nut which must be tightened securely. Tilt the laser holders to place the laser at 10 o'clock to pass the 12 o'clock arm of the steady rest and bend the short holder back to the mid line of the lathe. Secure the set screws. Turn the laser on by hand tightening the set screw on the end of the holder. Be gentle. Adjust the light beam to point vertical and do the final adjustment while aiming the beam at a white sheet of paper beneath the tool tip as shown. Extra slotted piece shown left is not needed anymore but available if desired.

Adjustable laser holder with level mounted as shown...

The 6" straight cutter holder exposes a short section of $\frac{3}{4}$ " bar. The 12" holder will protrude well beyond the end of the hollowing bar for working inside a small opening or to create a longer total hollowing bar length. The cutter is held into place with 1 small setscrew. Sharpen the cutting bit is best done with a sharpening system. Custom bending of the holders is offered for hollowing special shapes such as a closed form with a long neck can be rotated to adjust to the size of the hollowing bar thus removing space between the horizontal bars of the tool post and the These areas should be protected with oil or wax. Any lubricant on the hollowing bar is very helpful to smooth operation. A few drops of oil should be placed periodically on the set screws and on the gripper plate and $\frac{5}{8}$ inch screw. The tool tip angle of attack mechanism is stainless steel but could use some oil on the threaded surfaces and on the steel rectangular bearing holder.



The hollowing bar has a 6 inch deep $\frac{3}{4}$ inch diameter hole in one end. Four set screws are provided to hold the tool tip. An adapter is also available to size the $\frac{3}{4}$ inch hole to accept $\frac{5}{8}$ or $\frac{1}{2}$ inch diameter tools. Use the longer 2 setscrews as needed when using the adapters. Two of the setscrews tops have been ground to allow them clear when the bar is slid into its holder. These are for use with $\frac{3}{4}$ " tool holders without the adapters.

The ball bearing is adjusted to fit into the guide track milled into the length of the hollowing bar. The bearing prevents rotation of the bar. There is a set screw on the tool tip adjustment device that when loosened allows rotation of the bar to adjust the angle of attack of the tool tip.

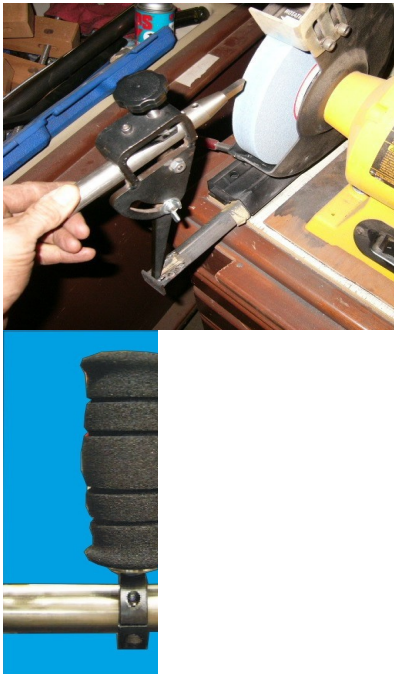
IMPORTANT NOTE: *This radial setscrews should be tightened just over finger-tight. It is simply to limit rotation. If too tight, it will distort the through tube and limit smooth travel of the hollowing bar!* One of the setscrews can be loosened to adjust the height of the bearing to prevent it from rubbing the bottom of the cutout on the hollowing bar. If desired, the bearing holder piece with bearing can be removed. When the bearing holder is removed, the hollowing bar can be rotated during hollowing. Free rotation of the bar should not be done during hollowing by simply loosening the setscrew because there may be some binding.



Adjustment of the angle of the bearing is done by viewing the bearing from behind. Put rotational pressure on the bar counterclockwise and with the 2 setscrews gently tightened, press on the block holding the bearing to align the bearing squarely against the side of the slot. Further tighten the 2 screws but do not overtighten. The bearing should not rub on the bottom of the track. There will be play in rotation which is not a defect or a problem. During hollowing, the forces on the cutting tool will naturally rotate the bar counterclockwise. It is important to put a slight amount of counterclockwise rotation on the bar to help hold the bearing against the side of the track when moving the bar. New users can get used to this by grasping the bar and sliding it rapidly in and out with that slight counterclockwise pressure. The bar should smoothly move with no binding or catching. If this pressure is absent, the bearing will rub and bind on the bottom of the track.

Placing the hands on either side of the swivel blocks will allow smooth travel of all moving parts. Rotating the guide track in the hollowing bar to the 4 o'clock position will prevent wood shavings from collecting in the track. Never position the track cutout at 6 o'clock where it would cut into the tool rest.

The laser device will indicate the position of the tool tip inside the project being hollowed. It should be installed during the final hollowing process. The laser must be aimed as close to vertical as possible and is adjusted a distance to the left of the cutting surface of the tool tip equal to the thickness desired. Even the shape and thickness of the bottom of the vessel can be visualized.



Both laser holders can be set behind the swivel posts for deep hollowing, but there may be more vibration of the laser beam in this configuration. The level is to help in aligning the laser beam to a more vertical orientation. The laser itself may be epoxied into place. Instructions for the laser are included and describe battery replacement. It has a push button on the top to turn it on and off.

The handle can be placed anywhere on the hollowing bar and locked into position with the setscrews on the split ring. The handle is comfortable and relieves stress on the elbows and wrists plus allows some mechanical advantage.

Sharpening the cutter is easy with commercially available sharpening jigs like the one shown.

One of the advantages of Clark Hollowing system design over the D-handle design is that the capturing mechanism is forward. The D-handle has the capturing mechanism behind at the end of the hollowing bar. This limits the maximum angle at which the hollowing bar can enter the vessel being hollowed. The forward position of the Clark system allows one to angle the base and/or the hollowing bar to beyond 90 degrees with ease to hollow under the lip of small or large closed form vessels!

To the right is a 6" holder for the 1/4" HSS cutter available as an option.



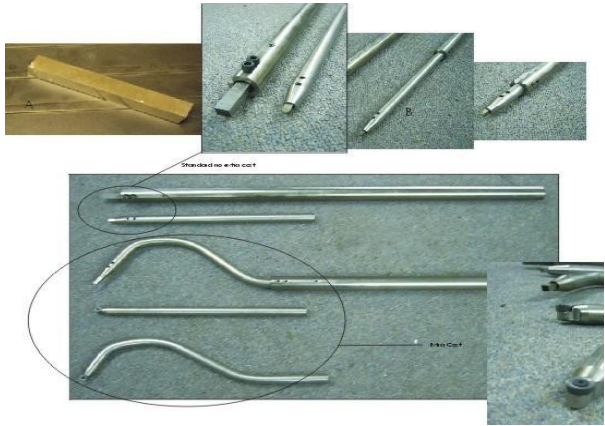
Cutter Holders

Any configuration can be bent for you. The straight HSS 1/4 inch bit which fit a 6" and a 15" long holder plus a 1/2 x 1/2 x 4 inch cutter to mount into the hollowing bars are available as accessories. An articulating holder is available for both the 1/4" and 1/2" HSS cutters. See the photographs on the next page. Pictured below on a wooden background is a deeply curved holder for a turner who need to hollow a closed form with a long neck. My optional curved holders shown on the next page are designed to reach under the upper edge of a closed form. Notice that the tip of the cutter should always be adjusted to line up with the midline of the hollowing bar to prevent excess torque during hollowing.



Optional Cutters

In the photo left - below, the ½ x ½ inch labeled A in the upper left is optional as is the 15 inch holder labeled B. The 6 inch and 15 inch holders are shown inserted into



the 6 inch deep hole in the end of the hollowing bar. I am excited about the optional holders circled in the lower portion of the photo below. Any curve can be created but the ones shown are especially useful for closed forms since one can reach under the upper shoulder to hollow. The blowup in the lower right corner shows the round cutter. These can be ordered on straight or curved holders. They can be ordered in a ¾" diameter version (right photo). These are made in Switzerland of high tech carbide and last a long



time without sharpening. I believe they actually cut rather than scrape the wood away. They create a very nice finish. One must optimize the angle of attack of the cutter for best function. This is where the Clark Deep Hollowing System excels via the angle of attack adjustment feature. These large carbide cutters will not cut if the rpm is too high. I would suggest turning the lathe at 200 rpm or lower for large projects. See the video on the website to see the ½ inch wide chips over 1/8" thick – efficient!

Care of the Finish

The system is powder coated for a long lasting and durable finish. Little care is necessary and any type of cleaner should be safe but test on the powdercoat to be sure. The hollowing bar and support bars are hardened and will not rust except on the ends and along the flats milled along one side and the bearing track cutout. These areas should be protected with oil. Lubricating the hollowing bar and cross bar is definitely helpful. Clean away wood chips as much as possible so as not to disturb the bearing travel. A few drops of oil should be placed periodically on the set screws and on the gripper plate and 5/8 inch screw. The tool tip angle of attack mechanism is aluminum but could use some oil on the threaded surfaces and on the steel, rectangular bearing holder.

Fulcrum Support Tube

The fulcrum Support tube is a great accessory which supports the hollowing bar for very deep hollowing. Any hollowing system is difficult to use beyond 12-15 inches deep. Even large diameter bars are difficult because they are more cumbersome and because the turner loses mechanical advantage through the lever arm of the bar extended beyond the tool rest. The Fulcrum Support Tube supports the bar and also creates a pivot point to recover mechanical advantage. It is to be slid onto the guarded tool rest accessory.

Alternatively, it can be fabricated with a 1” post to mount directly into the banjo. A version is shown to the right. It may be an advantage to have the version mounting to the guarded tool rest. There is the possibility to slide the fulcrum along the tool rest horizontal bar. Split collars are available to help fix the fulcrum in one position if desired.



Hopefully these tools will give of amazing service! If there are problems, we are here to stand behind our products. We hope all your wood turning experiences are more satisfying and efficient!

years

7/21/2016	Clark Deep Hollowing System
<u>Retail Price</u>	<u>Part</u>
\$375.00	Basic Clark Deep Hollowing System -base, uprights, connectors, cross bar, pillars, grease fitting, angle of attack adjustment feature, adjustable bearing, hollowing bar, custom set screws, 2 set screws, 2 socket head cap screws, 5/8-18 bolt with washer and attachment plate
\$150.00	Battery powered laser, rings, uprights, connectors, wingnut, washer, screw, level, horizontal tubing bar
\$15.00	1/2" adapter
\$15.00	5/8" adapter
\$90.00	Guarded tool-rest
\$40.00	Handle
\$75.00	Extra base, attachment plate, washer, screw
	<u> Holders for 1/4" HSS cutter</u>
\$30.00	6" long straight cutter holder with 1/4" cutter
\$50.00	15" long straight cutter holder with 1/4" cutter
\$70.00	15" Curved cutter holder with 1/4" cutter
\$4.00	1/4" HSS cutter
\$60.00	Holder - Articulated 1/4" Cutter includes cutter
	<u> Holders for 3/4" round carbide cutter</u>
\$85.00	6" long straight cutter holder with 3/4" round cutter
\$105.00	15" long straight cutter holder with 3/4" round cutter
\$125.00	Curved cutter holder with 3/4" round cutter
\$50.00	3/4" round carbide cutter
\$12.00	Screw for 3/4" round cutter
	<u> 1/2" HSS cutter</u>
\$8.00	1/2" HSS cutter
\$85.00	Holder - Articulated 1/2" Cutter includes cutter
\$60.00	Battery powered laser alone
\$175.00	Hollowing bar, any length
\$35.00	Stainless upright, any length - pair
	<u> Fulcrum Support Tubes</u>
\$125.00	12" Fulcrum support tube
\$150.00	20" Fulcrum support tube
\$85.00	Banjo Accessory
\$15.00	Attachment plate customized to lathe
\$12.00	1/4" ball-end Bondhus yellow handled allen wrench

\$12.00	3/16" ball-end Bondhus yellow handled allen wrench
\$12.00	5/32" ball-end Bondhus yellow handled allen wrench
	Sample system purchase
\$375.00	Basic Clark Deep Hollowing System -base, uprights, connectors, cross bar, pillars, grease fitting, angle of attack adjustment feature, adjustable bearing, hollowing bar, custom set screws, 2 set screws, 2 socket head cap screw, attachment plate, 5/8-18 bolt, washer
\$150.00	Battery powered laser, rings, uprights, connectors, wingnut, washer, screw, level, horizontal tubing bar
\$15.00	1/2" adapter
\$15.00	5/8" adapter
\$90.00	Guarded tool-rest
\$40.00	Handle
\$40.00	Straight cutter holder with 1/4" cutter
\$8.00	1/2" HSS cutter
\$12.00	1/4" ball-end Bondhus yellow handled allen wrench
\$12.00	3/16" ball-end Bondhus yellow handled allen wrench
\$12.00	5/32" ball-end Bondhus yellow handled allen wrench
\$769.00	
	Clark Steady Rest
\$25.00	Add for wrap-around base
\$50.00	Add for each extra through-tube and arm with wheel
\$15.00	Add for extra 1 o'clock through-tube position
	Base steady rests
\$325.00	12" 3 arm - flat base
\$325.00	12" 3 arm - flat base
\$380.00	14" 3 arm - flat base
\$380.00	16" 3 arm - flat base
\$500.00	20" 3 arm - flat base
\$525.00	24" 3 arm - flat base
\$525.00	25" 3 arm - flat base
	Accessories
\$15.00	Alignment plate
\$15.00	Attachment plate customized to lathe
\$12.00	1/4" ball-end Bondhus yellow handled allen wrench
\$30.00	Aluminum arms without wheels or hardware
\$8.00	Wheel, bearing, hardware
	Clark Sphere Turning Jig

\$550.00	Clark Sphere Turning Jig - Includes a 12 " bar with a .75 inch diameter hole in the end which is 6 inches deep, 6" long holder with one 1/4" HSS cutter, and attachment plate and screw with sleeve. Setup for height of lathe but adjustable over about 1 inch.
\$30.00	6" long straight cutter holder with 1/4" cutter
\$4.00	1/4" HSS cutter
\$85.00	6" long straight cutter holder with 3/4" round cutter
\$50.00	3/4" round carbide cutter
\$12.00	Screw for 3/4" round cutter
\$75.00	Tool bar holder
\$50.00	Sphere Turning Jig - Small Thrust Bearing
\$60.00	Sphere Turning Jig - Large Thrust Bearing
\$15.00	1/2" adapter
\$15.00	5/8" adapter
\$15.00	Attachment plate customized to lathe
\$12.00	1/4" ball-end Bondhus yellow handled allen wrench
\$12.00	5/32" ball-end Bondhus yellow handled allen wrench