CHAPTER 8 – ACCESSORIES

SCANNING PROBE

The CarveWright Scanning Probe opens up the world of 3D scanning to anyone. Now you can reproduce original pieces, repair antique furniture, even copy trim and moldings with ease. Almost any material can be scanned, even soft materials, such as clay or wax. Just plug the probe into the CarveWright, set the desired scan area, and watch the CarveWright go to work.

INSTALLATION

The Scanning Probe can be used with either the Quick Change Chuck (QC) or CarveTight Spindle system. For the CarveTight, simply insert the straight bushing all the way into the machine spindle and tighten the grab paw just like you would when using a 1/2" shank bit. If you have upgraded to the CarveTight spindle, remove the tapered adapter and press the straight bushing down to within 0.25” of the probe body (See Figure 3).

If you have a QC the Scanning probe will install just like any other bit with a tapered adapter. Please follow the dire ctions described below. Before installing the scanning probe into the QC, lift up the front safety cover and make sure that there are no other bits installed. Next, make sure that the quick release chuck is cocked and ready to accept the adapter mounted to the probe.

To cock the chuck, place a thumb on the Z-Truck Grip Ridge and two fingers on the Chuck Release Flange. Press up on the chuck release flange as far as possible and release (See Figure 4). The flange will snap and stay up when the chuck is prepared to receive the probe assembly. Any time difficulty is encountered inserting the probe, simply pull up on the flange to insure the chuck is cocked. Press the probe assembly into the chuck until a slight snap is felt. The probe is now secure in the quick change There are two

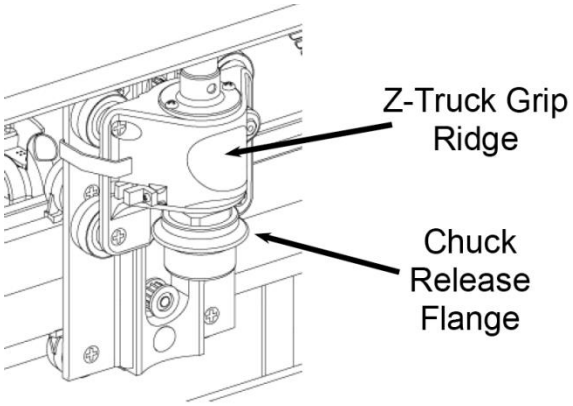


FIGURE 4: QUICK RELEASE CHUCK FEATURES

possible connector locations for plugging in your scanning probe depending on the configuration of your machine. For most machines that have an A-series Serial Number, the probe plugs directly into the Z-Truck mono receptacle.

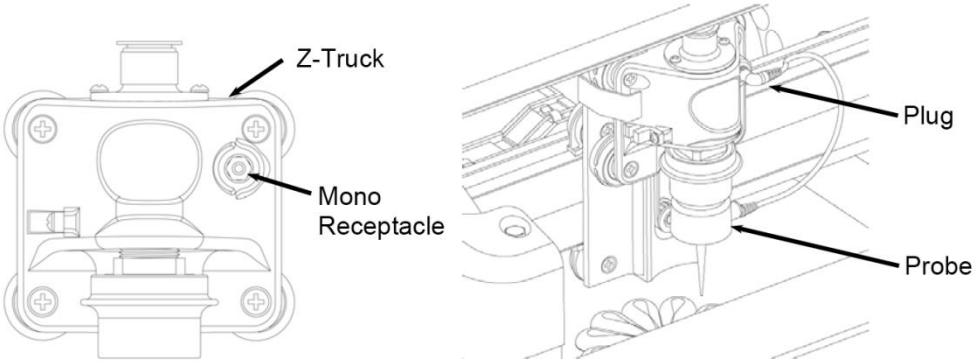


FIGURE 5: PLUGGING IN THE PROBE IN MOST A-SERIES MACHINES

All C or B-series Serial Number CarveWright machines, and any A-series Serial Number machines that have been reconfigured, will plug into an accessory connector found on the left side of the head cover as shown below. Reconfigured A-series machines have the homing sensor board removed or unplugged. This configuration requires that a jumper cable be used to span the distance from the probe cable to the cover connector. A cable clip is loosely attached to the cable to manage the cable during the scanning operation. This cable and clip are now provided with the probe at the time of purchase but you ma y need this cable if; 1) you have an A serial machine, 2) you purchased your probe before November 1, 2008, and 3) the machine has been reconfigured by removing or unplugging homing sensor board.

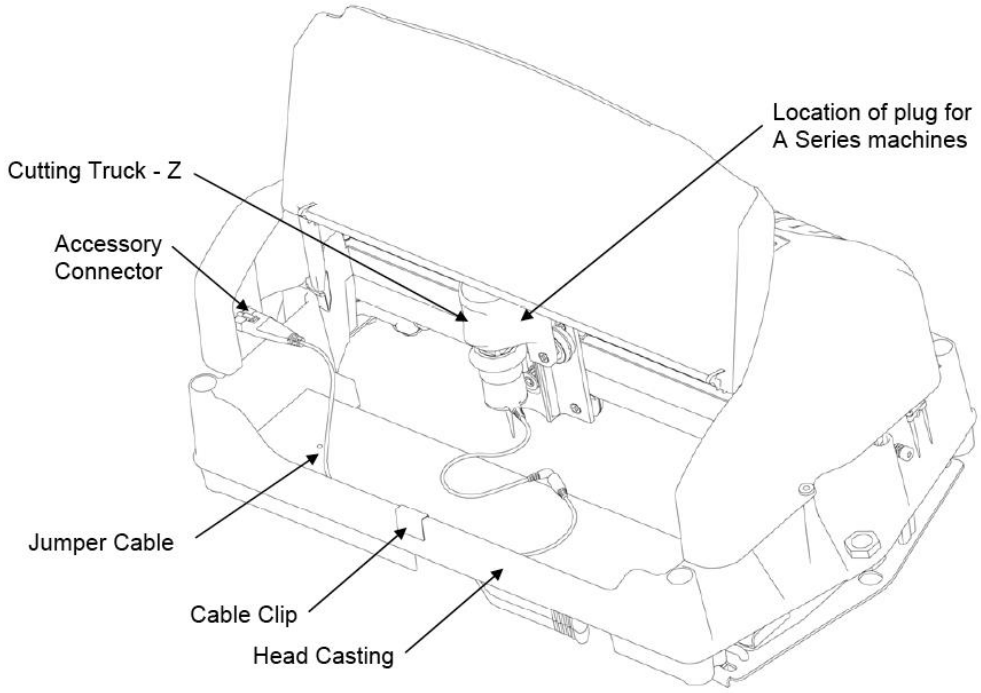


FIGURE 6: PLUGGING IN THE PROBE IN MOST B-SERIES MACHINES

To install the probe using the cover connection, simply plug the jumper cable into the cover connector and slide the cable clip over the front lip of the head casting. The clip needs to be approximately centered left to right in the machine. Next, plug the probe mono jack connector into the other end of the jumper cable. Make sure that the cable clip allows enough slack for the probe to move fully left to right by pushing the truck to the left/right sides of the machine with your hand. The probe is now installed.

Since there are two possible locations to connect the probe, the connection location must be set in the machine's memory via the Options menu through the machine keypad. The B-serial number CarveWright machines are configured to the correct setting at the factory, but this setting must be changed if the homing sensor board is eliminated or unplugged from the reconfigured A-series machines. If this setting is not changed, "Scan Area" will be displayed on the LCD screen even though there is no probe connected. To change this setting, do the following:

1. Insert the card and turn on the machine. "Scan Area: should appear on the LCD screen.
2. Press the "0" (Options) key on the keypad.
3. Using the up/down arrows, scroll down to the number 5, "User Options" menu item and press ENTER. You can also simply press the "5" key when the first option appears.

4. Scroll down to Scan Probe. Make sure it is on “Cover” instead of “Z truck”. Press ENTER to toggle between the options.
5. Press stop until you get back to main menu. It should say Project Menu.

Insert the probe plug into the jack located on the Z-Truck. If the probe is correctly installed the CarveWright machine will recognize it when the cover is closed and power is turned on. The scanning functionality can now be accessed through the keypad.

Once the machine is configured and turned ON, it will search to see if the scanning probe jumper cable is plugged into the accessory connector. If it is, the machine assumes that the user has inserted, or will insert, the scanning probe into the quick release chuck and disables the spindle motor from spinning. Pressing **ENTER** at the “*Scan Menu*” will move the spindle to the home position. Once at the home position, the machine will check to see that the probe is plugged in and operating correctly.

When the probe is at rest (not touching anything), it should be in the electrically **Closed** position. If the probe is operating correctly, the LCD will prompt you to “*Jog to the Starting Corner*”. If however, the machine detects that the probe is not in the **Closed** position, the LCD will prompt you to “*Check Probe and Connection*” and will show you the current state of the probe as **Open**. In most cased this simply means that the probe is not plugged into the jumper cable correctly. Check all connections and move the tip of the probe around watching to see if the state displayed on the LCD changes to **Closed**. If you cannot resolve this issue by plugging and unplugging, please call CarveWright service at 713-473-6572.

When removing the jumper cable remember to depress the release latch before pulling it free. On some machines the latch may be on the bottom of the connector.

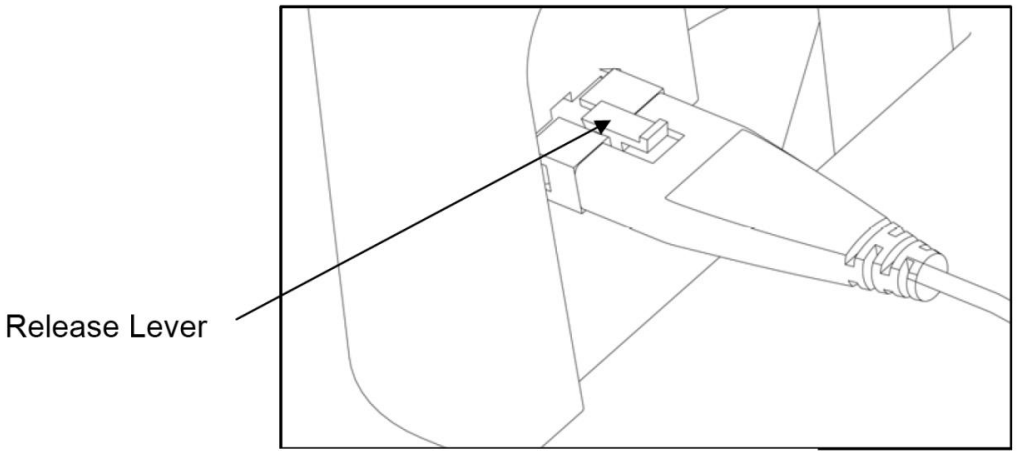


FIGURE 7: PLUGGING IN THE PROBE JUMPER CABLE

Important Note: It is recommended that you unplug your flexshaft from the spindle if you are doing significant scanning. It makes for more consistent scans. Be sure to always follow the directions when reassembling the flexshaft so that you do not bind the flexshaft core and damage the machine.

PLACING OBJECT ON A SCANNING SLED

Because most objects that will be scanned are not suitable for scanning directly they will have to be placed onto a fixture called a scanning sled before proceeding (not included with purchase). The scanning sled should be designed so that the CarveWright can easily feed it through the machine and so that the scanning probe has the proper clearances to function.

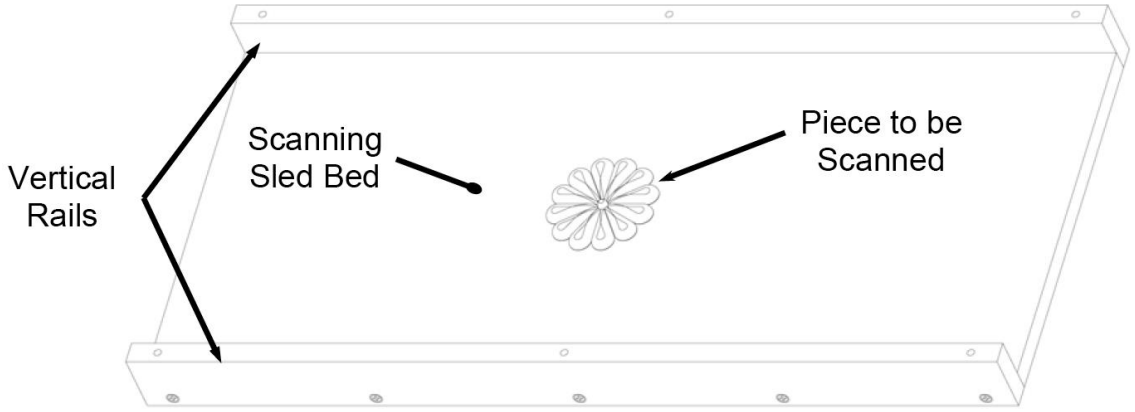


FIGURE 8: SCANNING SLED

The dimensions of the sled can vary but the maximum width is 14.5” and the maximum depth is 2.25” from the mounting surface to the top of the rails. There is no maximum length but any sled over 3 feet long will require additional stand-alone outfeed support rollers. The support rollers should be adjusted properly to avoid letting the sled sag or rise, as any transition going on and off the rollers will be reflected in the scan data.

The vertical rails must be at least as high as the object being scanned. If the object is taller than the vertical rails the machine or object can be damaged.

The maximum height that the scanner body can clear is 1 inch. If the object to be scanned is taller than 1 inch in any location, check for possible interferences between it and the probe body. Interference is possible if there is a 1 inch tall point in the object within 1 inch of a portion of the object that lies at a depth near the mounting surface.

The scan object can be mounted to the sled with any number of adhesives. Hot glue works well, as does double sided tape. It is important that the scan object be rigidly mounted. Any movement during scanning will produce poor scan data. It is also suggested that the mounting surface of the sled be very smooth and hard (like Formica). This hard surface makes mounting and removing the scan objects quick and easy.

The CarveWright will require that the sled be kept under rollers at all times so make sure that the object being scanned is at least 3.5 inches from either end of the sled. The scan object must also be at least 1 inch from either vertical rail to clear the body of the probe.

Adding a grid pattern to the mounting surface of the sled surface makes positioning the scan object very easy.

INSERTING THE SCANNING SLED

For the purposes of this manual we will assume that all pieces being scanned will be mounted to a scanning sled. Proper installation of the scanning sled is critical to the performance and continued operation of the scanning probe. To properly insert the sled:

1. Press down on the sliding guide plate release lever and move the sliding guide plate to the right so that it will clear the width of the sled.
2. Check the bottom of the sled for features that will make it unusable in the machine. The bottom surface of the sled where it contacts the squaring plate must be flat and level for a width of at least 3/8 inches along the bottom edge to allow the Board Tracking Sensor to accurately calculate the position of the workpiece at all times (see Figure 7).
3. Lay the sled on the traction drive so that it is centered lengthwise under the head.
4. Push the sled firmly up against the squaring plate.
5. Gently push the sliding plate up against the inside edge of the sled. **DO NO**T push the sliding plate against the sled with significant force. The sliding plate is used to guide the sled and is not intended to lock the piece in position.
6. At this point it is critical that you assure that the sled can travel freely in and out of the machine along its entire length without binding or

encountering significant drag. Do this by moving the sled in and out of the machine by hand, while laying flat on the traction drive.

WARNING: Do not attempt to load a sled that varies in height by more than 1/16" along its entire length. This condition could bind the machine and damage the traction drive.

WARNING: Do not attempt to load a sled that does not have parallel sides. This condition can bind the machine and damage the traction drive.

7. Lower the head by turning the head crank handle counter-clockwise until the clutch clicks several times (at least 5 clicks recommended). The clutch is intended to load the sled against the traction drive with consistent force.

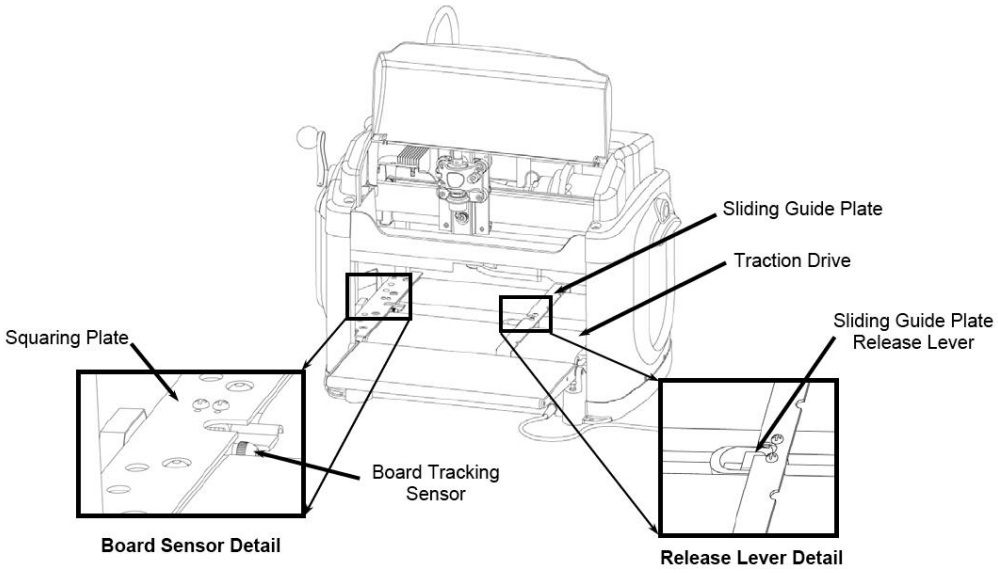


FIGURE 9: SCANNING SLED INSERTION DETAILS

8. Rotate the head-locking lever outward into the locked position. The sled is now secure.
9. Make sure that the top safety cover is closed before proceeding.

JOGGING THE SCANNING PROBE

Before the CarveWright can begin to function, the CarveWright memory card must be installed. With the power off, push the memory card gently into the memory card slot until it stops, making sure the label is up. Once the sled is installed and the cover is closed, proceed to turn the machine on.

At this point, control is accessed through the Keypad and LCD Display. The scan utility will automatically sense the scanning probe and will display the *Scan Area* menu item.

FIGURE11: CARVEWRIGHT INPUT KEYPAD

SETTING THE SCAN AREA

When the *Scan Area* item has been selected from the display menu, the CarveWright will send the head to the home position. The display will then prompt for the user to specify the starting corner of the scan area.

The scan area is determined by specifying any two diagonal corners of the scan object. The user will need to jog the probe tip to the first corner point using the arrow keys. This is accomplished using the **up and down arrows** on the keypad to move the truck across the width of the sled (near to far), and the **left and right arrows** to move the sled along its length (left or right).

Holding an arrow key down results in a fast movement. Precise final positioning is accomplished using short bumps on the key.

Once the probe tip has been jogged to the desired corner location press **ENTER**. The probe tip will now slowly lower until the tip touches the surface. Verify that this is the correct location and press **ENTER** again. You can continue to tweak the tip location if it is desired before pressing **ENTER**. Repeat these steps for specifying the second corner.

SETTING THE SCAN OPTIONS

Once both corners have been specified the display will show the *Scan Options* menu. The current scan quality will be shown in parentheses. The *Scan Options* menu has three options: 1) Proceed with Scan, 2) Change Quality, and 3) Set Max Depth. If you wish to continue with the scan at this point select option one, *Proceed with Scan*.

If you wish to change the quality setting select option two, *Change Quality*. Use the **up/down arrow** keys to find the desired quality and select **ENTER** to confirm. These quality modes affect the step size for each point measurement taken. The higher the quality mode selected, the smaller the step size. The *Best* setting step size is .010”, the *Normal* setting step size is .020” and the *Draft* setting step size is .040”. It is recommended that scans be performed at the highest possible quality setting if time permits.

The machine will check the memory card to verify that there is enough space to store all of the scan information. An empty memory card can hold approximately 2.2 ft2 of **Best** quality mode scan data. If the message *Scan Too Large For Card* appears on the display then there is not enough room to store the proposed scan. Options to correct this situation are to reduce the size of the scan area or delete existing information on the card using the Flash Manager in the CarveWright Design Software.

After the quality mode has been confirmed the CarveWright display will show the *Scan Option* menu again. There are instances where the maximum depth of the scan will need to be limited. For example, in some scanning probe, this can cause the body of the scanner to impact the object and stall the scan. The *Set Max Depth* option allows the user to put a floor on the depth that the probe tip will reach. The procedure for setting the max depth works very similar to setting the corners of the scan area. Identify the desired max depth on the scan object surface. Jog the probe tip to a point directly over this location and press **ENTER**. At the chosen location the probe will lower until it makes contact with the surface. By default this depth will now be the maximum scan depth. If this depth is acceptable select **ENTER** otherwise reposition the probe tip and repeat.

Once a max depth has been confirmed the display will prompt the user to Use Selected Depth or Apply Offset. If the Apply Offset option item is chosen, the user is prompted to input a numeric offset using the keypad. Select **ENTER** to proceed or **STOP** to cancel the offset. The entered offset will be added to the already confirmed max depth. Once the desired settings have been set, proceed with the scan by selecting *Proceed with Scan*. The CarveWright will begin to scan the object. The scanning probe tip will follow along the object contour, mapping the 3-D coordinates of the surface as it proceeds. The height map information is stored onto the memory card for future retrieval by the scanning software. A real time scanning completion estimator will be displayed on the LCD and provides an estimate of how much of the current scan is completed.

At any point during operation the CarveWright machine can be stopped by pressing the **STOP** key or by lifting the cover. If desired the machine can be restarted by closing the cover and pressing **ENTER**. The machine will resume scanning at the point where it was stopped. If you press the stop button a second time the scan will be aborted so be careful when restarting your project.

WARNING: Never remove the memory card from the machine while it is on. Doing so can result in damage to the workpiece.

ACCESSING THE SCAN DATA

When the scan is completed the LCD Display will show a prompt to set another scan area. If you do not wish to produce another scan, turn off the machine, lift the top safety cover, release the head lockdown lever, and crank the head up to free the sled. The sled can then be removed.

GENERAL TIPS AND HELPFUL REMINDERS

Remove the CarveWright memory card and place it into the CarveWright memory card programmer. Open the CarveWright Design software and access the scan data by selecting the *Download Scan* menu item on the File menu.

MAXIMUM SCANNING DEPTH is 1.0 inch. Scanning objects deeper than this can damage the probe or produce poor quality scans.

ALL MOTORS ARE DISABLED when the front safety cover is open. The cover must be closed before the machine can proceed.

USE A SUPPORT FOR LONG PIECES TO BE SCANNED AND ALSO FOR SCANNING SLEDS. To minimize the risk of over stressing the machine, use sturdy roller stands (not included) for support when scanning long pieces more than 36 inches in length.

WHEN LOADING THE PIECE TO BE SCANNED, there are several critical checks to make before proceeding.

- Do not attempt to load a piece to be scanned (or sled) that has a significant taper to the sides. A tapered workpiece will bind between the sliding plate and the squaring plate and will damage the traction drive.
- Do not attempt to load a piece to be scanned (or sled) that varies in thickness by more than 1/16” along its entire length. Using a workpiece with a larger thickness variation than 1’16” can lead to damage to the machine.
- Always make sure the Board Tracking Sensor that contacts the bottom of the workpiece (or sled) has a smooth, even surface to follow. This means that the bottom edge area of the workpiece adjacent to the squaring plate is clean, smooth, and even for a width of at least 3/8 inch along the full length of the workpiece.
- Warped, bowed, or cupped pieces should be used only if this condition is minor and if the Board Tracking Sensor can follow it.

MAKE SURE THAT THE HEAD LOCKING LEVER IS RELEASED after finishing the scan. If the locking lever is not released the head will not move up and down. The lever is in the locked position if it is rotated out from the face of the machine. It is in the released position if it is flush to the front face of the head.

SMALL PIECES TO BE SCANNED MUST ALWAYS USE A SCANNING SLED. Any piece to be scanned smaller than 1.5 inches wide x 0.25 inches thick x 7 inches long will require it to be placed on a scanning sled.

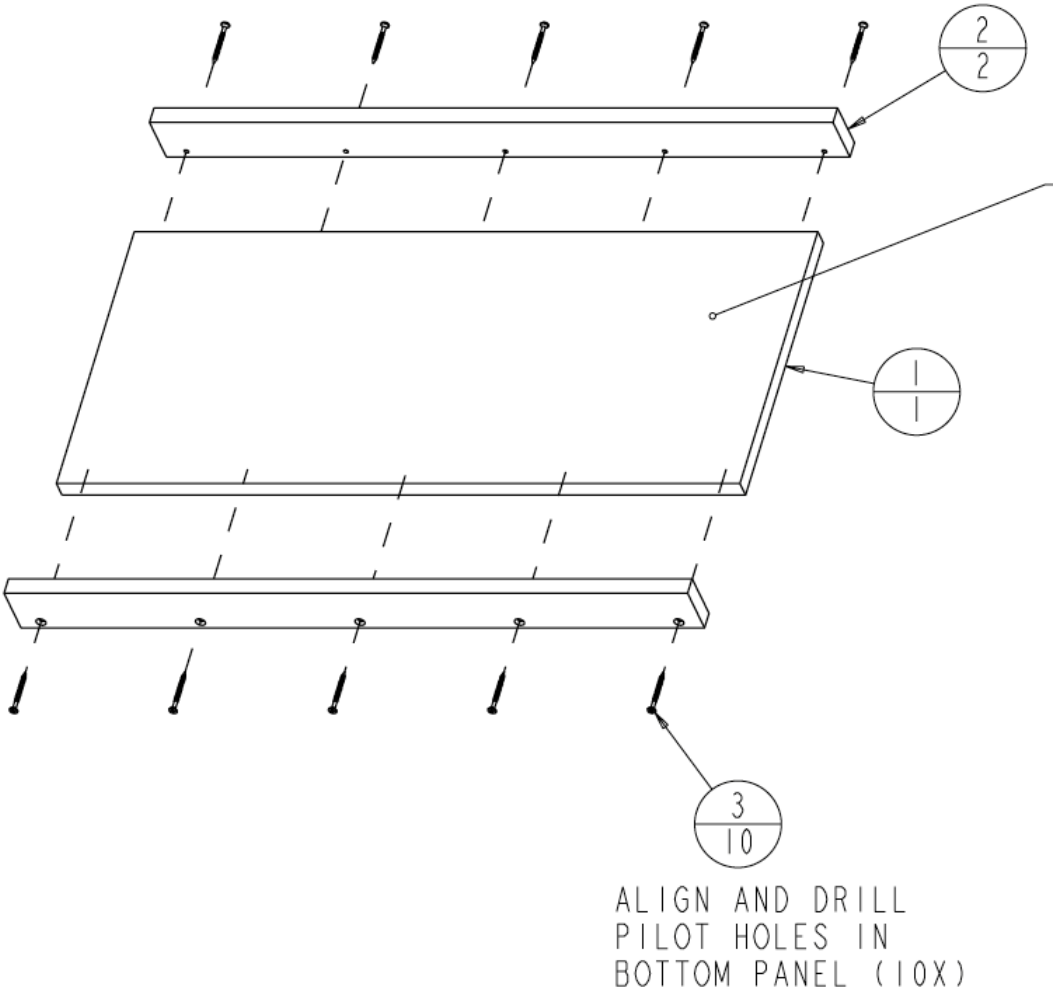
TO LOCATE THE MACHINE TOTAL SCAN-TIME, use the Options shortcut key on the keypad to access the information.

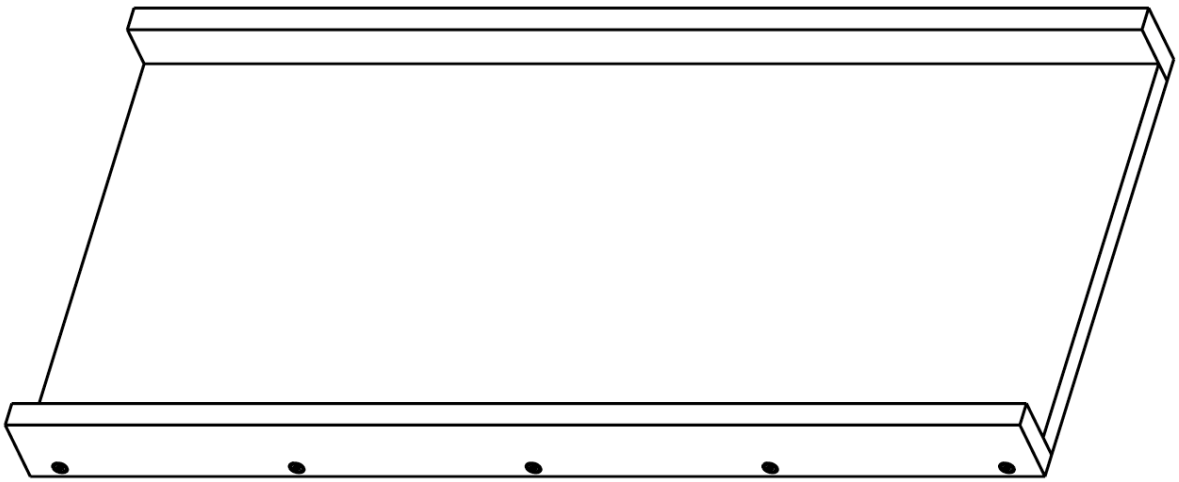
TO LOCATE THE SERIAL NUMBER, use the Options shortcut key on the keypad to access the information.

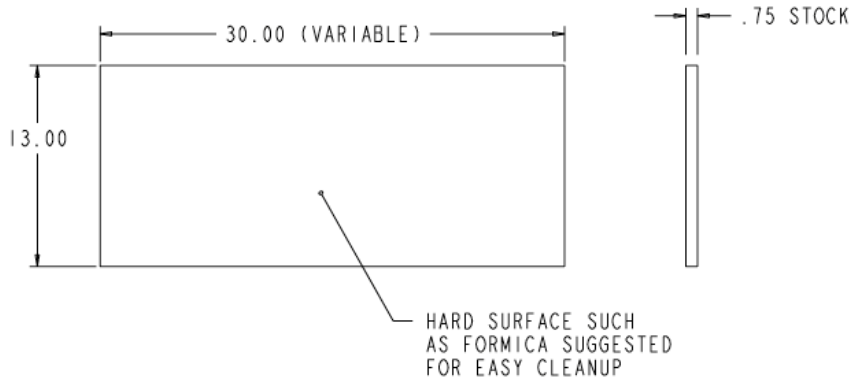
UNPLUG THE FLEXSHAFT, for more consistent results.

BUILDING A SCANNING SLED

Use these drawings to build a scanning sled.

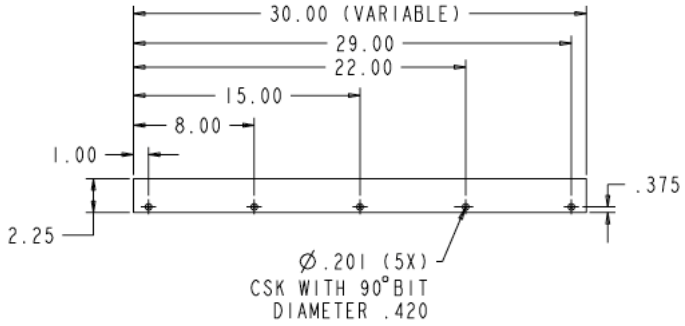


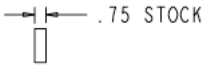




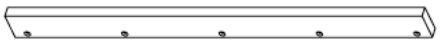
SUGGESTED MATERIAL:
HIGH DENSITY PARTICLE
BOARD WITH FORMICA VENEER

ISOMETRIC VIEW
REFERENCE ONLY
SCALE 1/4





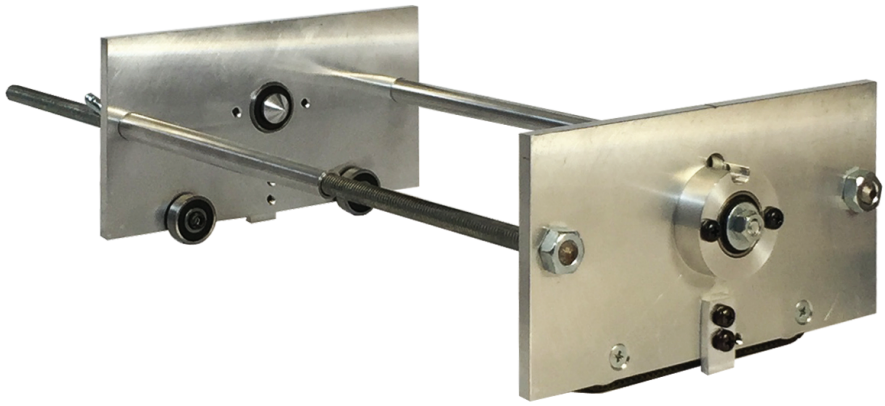
SUGGESTED MATERIAL:
HIGH DENSITY PARTICLE
BOARD WITH FORMICA VENEER



ISOMETRIC VIEW
REFERENCE ONLY
SCALE 1/4

CARVING IN THE ROUND: A REVOLUTIONARY IDEA

The Rotary Jig, and accompanying software, enables the design, import, and carving of turned projects. It's like a lathe, but with carvings. The rotary software, included with purchase of the jig, shows the carved round piece along side a flat board where the design is manipulated. The jig is simple to use. Load your material in, calibrate the jig, and carve your pieces in the round. With the STL Importer add on, you can even import STL's directly into the rotary format. Now this is truly revolutionary.



Follow the guide on the following pages and watch the tutorial videos online for more information.
http://www.carvewright.com/accessories-page/rotary-jig/

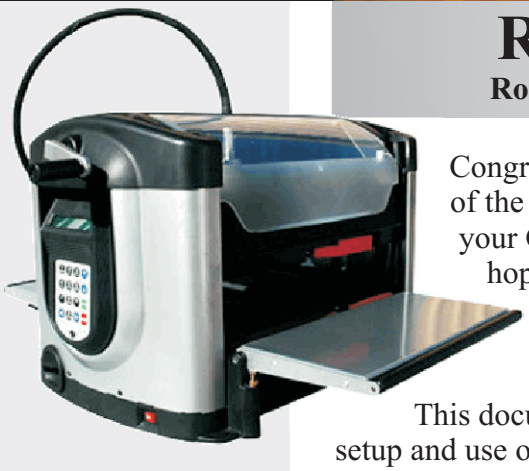
CarveWright™ WOODWORKING SYSTEM

ROTARY CARVING!

Rotary Jig
Basic Instruction

Rotary Jig and Material Setup

Rotary Carving Accessory for CarveWright™ CNC Machines



Congratulations on your purchase of the Rotary Jig accessory for your CarveWright machine. We hope you will enjoy your new capability of carving in the round!

This document outlines the basic setup and use of the Rotary Jig for rotary carving. Visit carvewright.com to view "how-to" video tutorials for creating your own custom rotary projects using the Designer software and software add-on enhancements.

You will need to own the CarveWright 1/8" Long-Reach Carving Bit for use with your Rotary Jig. This bit is specifically designed for the rotary jig and for deep carving of "flat" projects. (fig. 1)

fig. 1 1/8" Long-Reach Carving Bit

Jig Material Size Requirements

Material Diameter Specifications
The jig requires material with a minimum diameter size of 1" up to a maximum of 4.25" diameter. (fig. 2a, 2b)

Material Length Specifications
The jig requires material with a minimum length of 5.5" to a maximum length of 13" (fig. 2c)

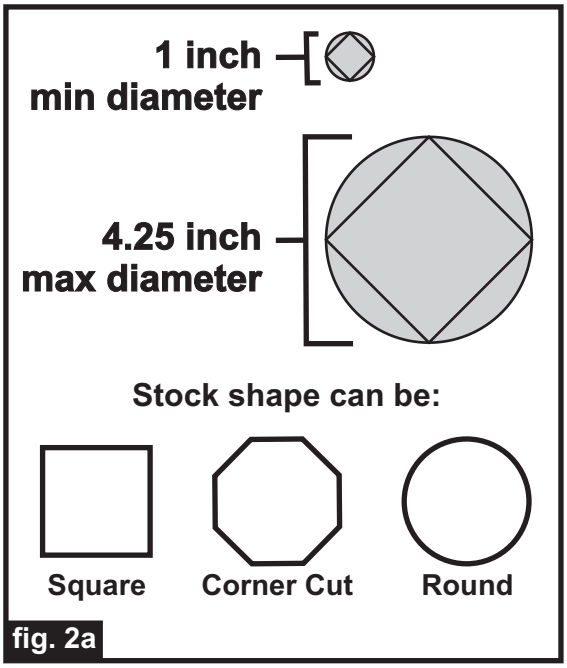


fig. 2a

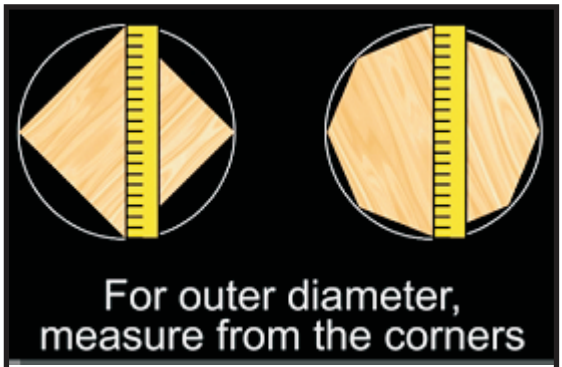


fig. 2b (outer dia. never to exceed 4.25" nor be less than 1")

IMPORTANT:
Measure across the widest diameter of your stock. This OUTER diameter is what you will need to remember when it comes time to input the diameter measurement at the machine during project runs.

(cont.)

Rotary Jig and Material Setup (cont.)

Jig Material Size Requirements (cont.)

fig. 2c

Mounting the Material Into the Jig

Cut your material to the appropriate length, then mark the center-point on both ends. A clear plastic center marking template is handy for this (especially for round stock), but not absolutely necessary. (fig. 3a, 3b)

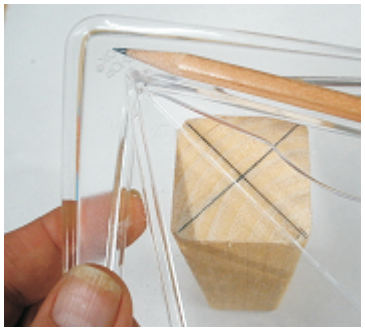


fig. 3a

fig. 3b

Drill holes at the center mark on each end about ½" deep using a 7/32" drill bit. (fig. 3c)

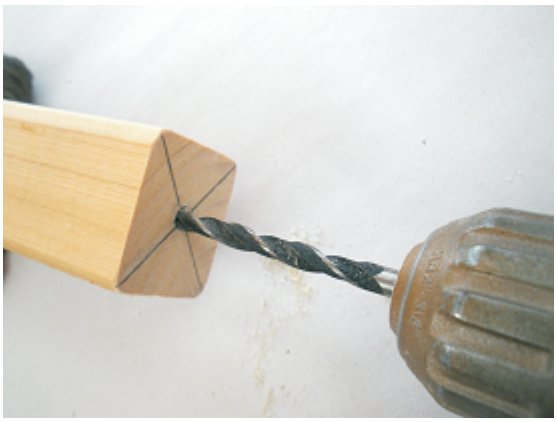


fig. 3c

Thread the stock onto the screw chuck. (fig. 3d)

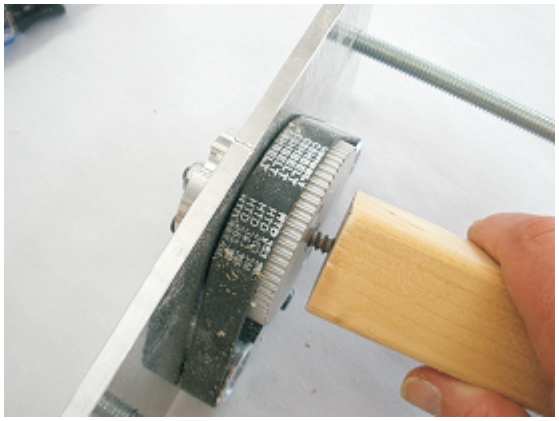


fig. 3d

Slide the end panel to the stock and align the tailstock point into the drilled hole. (fig. 3e)

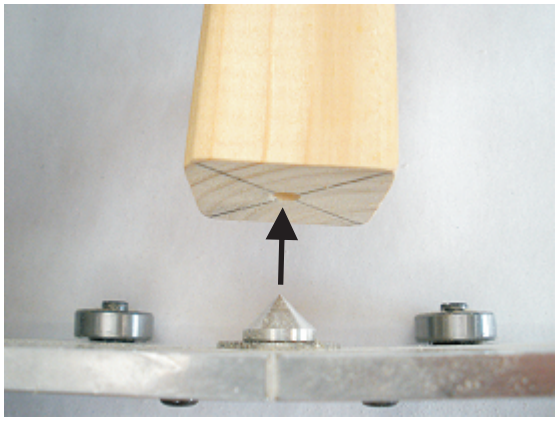


fig. 3e

Tighten the wing nuts “finger tight” so it holds the stock snugly, but can still rotate freely. (fig. 3f)

fig. 3f

(cont.)

Rotary Jig and Material Setup (cont.)

Mounting the Material Into the Jig (cont.)

On the belt drive end of the jig, you will see a trough on the outside metal hub. This allows access to two countersunk holes and the end of the material. Rotate the material to line up with one of the holes. (3f)

fig. 3g

Drive a #6 x 1 1/4" coarse-thread screw through this hole and flush with the countersink. (fig. 3h)

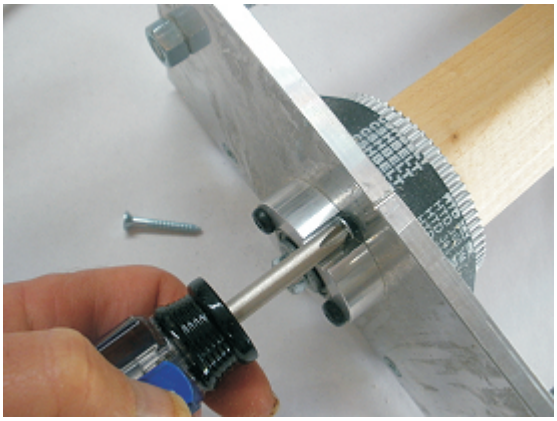


fig. 3h

Rotate the material again to line up the second hole. Drive in another screw. These screws secure the material from slipping during the carving process. Check that the material rotates with no binding of the screw heads against the plate.

Confirm the secured stock and mechanism rotates with no binding after driving in both screws

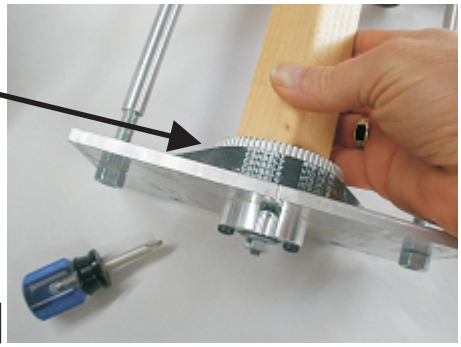


fig. 3i

Placing the Jig Into the Machine

The jig has two tabs extending from the bottom of each end panel. These tabs fit into the U-shaped slots of the stationary squaring plate (keypad side of the machine) and the moveable sliding plate. (fig. 4a)

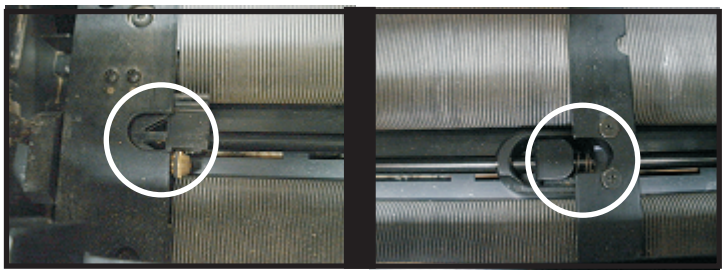


fig. 4a **The jig's tabs fit into the two plate slots**

Move the sliding plate all the way to the right, then raise the head just enough to be able to maneuver the jig into the machine. Don't raise the head too high or it will lock in place and you'll need to manually lower it. (fig. 4b)

Raise head and place the jig into the machine with the gear drive on the keypad side of the machine

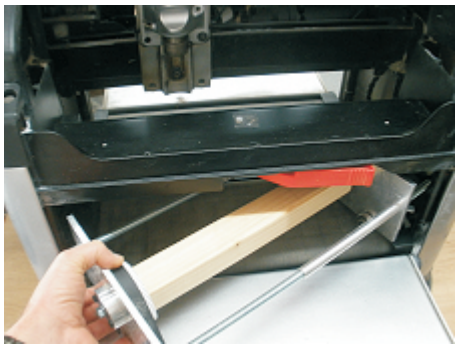
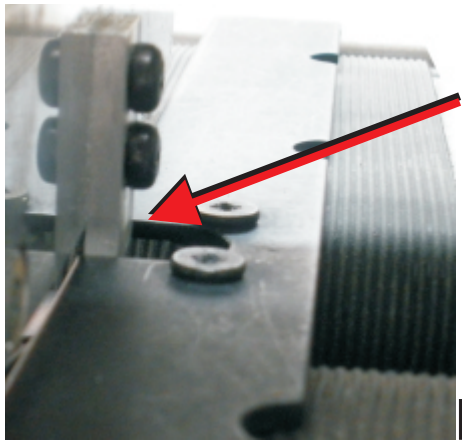


fig. 4b

Position the jig so the tab rests in the stationary plate slot. Move the sliding plate against the jig so that the other tab rests inside that slot, as well. The sliding plate edge should be right up against the jig roller bearings which rest on the traction belt. (fig. 4c)



Each tab fits into a plate slot on each side of the machine

(this photo shows the tab resting in the sliding plate slot)

fig. 4c

(cont.)

Rotary Jig and Material Setup (cont.)

Aligning the Jig

With the jig properly placed (the jig side panels are elevated slightly ABOVE the guide plates of the machine) crank down the head of the machine to hold the jig securely. You will notice a groove on top of each side panel of the jig. These are alignment references. (fig. 5a)

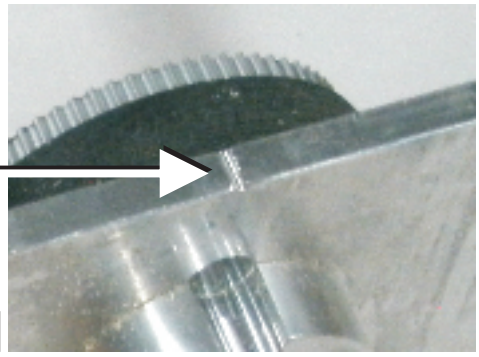


fig. 5a

Insert a bit into the chuck. To check alignment, carefully lower the chuck/bit to each mark on both sides of the jig by hand. The tip of the bit should be in alignment with both grooves. (fig. 5b)

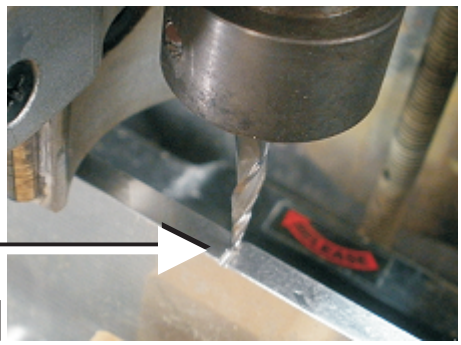


fig. 5b

If the bit doesn't line up with the marks, take note of how much it is "off" and remove the jig. Adjust one or both of the metal tabs on the side panel(s) by loosening the screws and repositioning the tab(s). Reinsert the jig into the machine and check alignment again. Repeat the process, if necessary, until the jig marks are aligned with the tip of the bit. (fig. 5c)

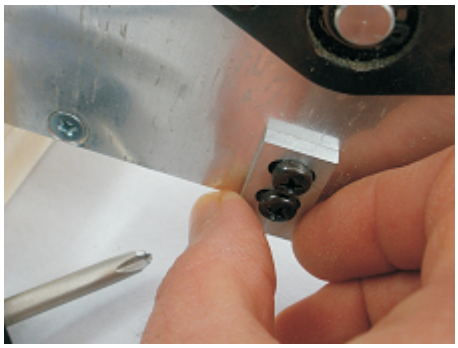


fig. 5c

Calibrating the Jig

The jig must be calibrated before each rotary carve. Load your stock into the jig and insert the jig into the machine, check alignment, then follow these steps:

• Insert the carving bit and close the cover.

• Turn on the machine and press "0" on the keypad to access the Options Menu, then press "6" to access the Configuration Menu, then press "7" to access the Rotary Cal

• To begin calibration, press the green "Enter" button (there will be a brief Homing routine, then the Jog To Touch menu appears on the LCD panel)

• Use the arrow keys on the keypad to jog the bit to your chosen location on the stock. The side-to-side arrows rotate the stock. The up/down arrows move the bit across the stock. (fig. 6a)

fig. 6a

• Now, open the cover, then "jab" the chuck/bit up and down by hand into the stock to create a visible divot mark. After a clear divot mark is made, raise the chuck/bit back up out of the way of the jig. (fig. 6b)

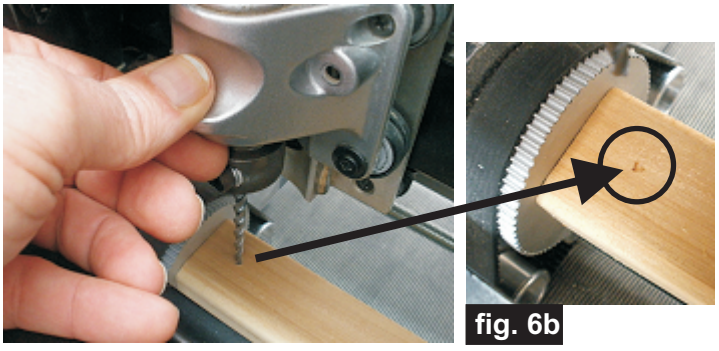


fig. 6b

This divot mark will be used for the next step of the calibration.

(cont.)

Rotary Jig and Material Setup (cont.)

Calibrating the Jig (cont.)

• Now that you've made your reference divot mark and raised the bit up out of the way, go ahead and press the green "Enter" button. The machine will rotate the stock three times and then stop. You should see your divot mark. Lower the chuck/bit by hand to see whether the tip of the bit is still centered with your mark. (fig. 6c)

fig. 6c

If they do not line up, use the arrow keys to reposition the bit to match the reference mark (and lower the bit by hand, to confirm alignment). Once aligned, press the green "Enter" button again. The LCD screen will now display the "old" and the "new" settings, and the option to **1) Keep** or **2) Abort**. You want to press "1" to keep the new setting. The stock will rotate again and you can observe if the bit aligns with the mark this time. (6d)

fig. 6d

It is advised to run the calibration at least twice in order to ensure a consistent result. If the results are still inconsistent (i.e., the bit and mark won't align), then it's most likely the machine's head pressure is too low or the jig is not positioned properly. Sometimes a little extra "push" with your hand while cranking down the head can increase the head pressure enough to get a good calibration, so try that first.

Once calibrated, you are now ready to run your project.

Running A Rotary Project

• From the Project Menu, select your rotary project, then press "Enter"

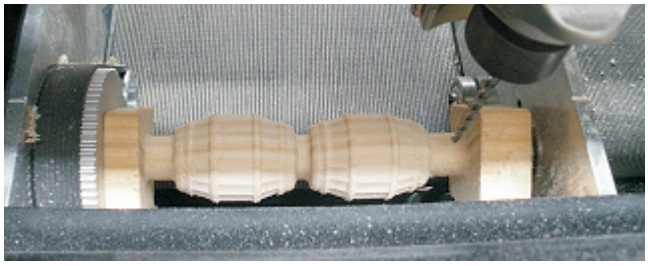
• The machine will measure the length of your stock to make sure it is long enough for your project

• Next, the machine will prompt you to input the stock's diameter (the initial number displayed is simply the minimum diameter required for the project). The stock's OUTER diameter is what you need to specify. (see pg. 1, fig. 2b)

• Use the up/down arrow keys to select the stock's OUTER diameter. Select the next higher diameter if there is no exact match. Aside from the initial diameter display, the diameter choices are in .25" increments. Press ENTER after making your selection.

fig. 7a

• You will then be prompted for the bit, as usual. Insert the bit and press ENTER. The machine will proceed with Homing/Bit Find and then run your rotary project!



For additional information and resources, please visit: http://www.carvewright.com/support-page/getting-started/tutorials/

There are also several Rotary sections available at the CarveWright Community Forum you may find helpful. Please visit: http://forum.carvewright.com/forum.php

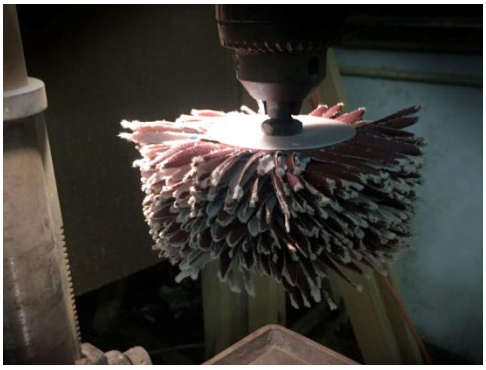
(cont.)

Additional Resources

RESOURCES...
There are numerous resources for the CarveWright/CompuCarve owner to make their experience with these machines much more enjoyable.

Every owner should join the CarveWright User Forum (http://forum.carvewright.com/forum.php) where fellow users share their experiences and knowledge with these machines on a daily basis. It is a FREE service that you will surely appreciate. A handy Search Feature helps you find answers to any questions you may have.

Sanding Mops



Sanding mops are a great way to speed up and simplify the sanding and cleaning of your carvings. Attach it to a drill press or another high speed motor, and quickly polish your projects without removing your carved details. It will literally save you hours of tedious, hand sanding work. With two grits and two sizes, no matter the project, we've got you covered. We also have sandpaper refills for when you wear them out from all the great projects you are making.

ASSEMBLY

The CarveWright sanding mop is very easy to assemble into a number of different configurations to best suit the job at hand. By adding spacers between the layers you can change the "softness" and "aggressiveness" of the sanding. Fundamentally, the sanding mop is made up of sets of top and bottom facing strips of sandpaper that are set 45º from each other. No matter which size of mop you have purchased, you will want to start by building sets of two sanding strips lined up with the grit sides facing away from each other. Then you will want to take two of these sets and place them at 90º to each other to form what is called a sanding unit (Figure 1). Each sanding units are then assembled on to the mandrel at 45 degrees to the last sanding unit. Continue crisscrossing sanding units (Fig. 1) until you reach the mop thickness you desire.

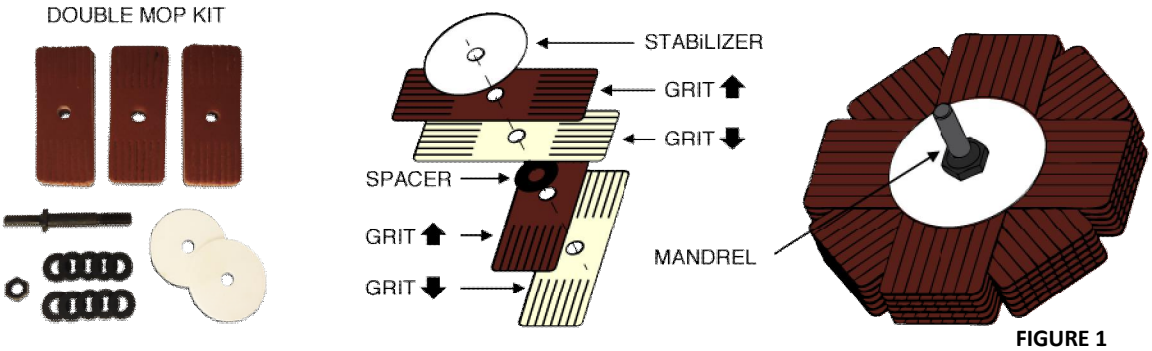


FIGURE 1

The stiffness and aggressiveness of your sanding mop can be varied by changing the way you assemble the supplied stabilizers (thin white plastic disks) and the unit spacers (black rubber washers) into the sanding units.

For Maximum stiffness: Use the stabilizers only (with the sanding units in between). This configuration is useful for sanding routed edges.

For Medium stiffness: Use the stabilizers in addition to the spacers. This will reduce the aggressiveness and stiffness of the sanding mop, allowing it to get into the carved detail more efficiently. **Note:** If you wish to use the spacers on the small sanding mop place a spacer on the mandrel after every two sanding units (8 sanding strips) as opposed to after every sanding unit as done on the large sanding mop.

For Minimum stiffness: Use only the spacers to further increase the softness of the sanding mop. This configuration works very well when sanding fine details in deep carvings.

If you wish to use the stabilizers in your configuration, begin the assembly by placing one stabilizer on the mandrel and end the assembly by placing the remaining stabilizer on the mandrel directly before the nut(s). Tighten the nut and place the sanding mop securely in a drill, drill press, lathe, bench grinder. Before you begin using your sanding mop you must separate the splits in the sanding strips by pressing a corner of a piece of hardwood in to the sanding mop while it is spinning.