



# CARVEWRIGHT™

## WOODWORKING SYSTEM

# TIPS & TRICKS

Jan - Feb 2010

Updated Dec. 2011



## Maintaining Accurate Board Tracking

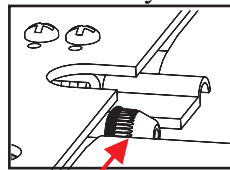
by Michael Tyler, Editor

We all know how important it is for the boards we place in our machines to track properly during a project run. If all is in order, then the boards will track accurately and smoothly throughout the project. However, there are a few things to be aware of to make sure your project boards 'behave'. A board that mis-tracks will not only spoil a project, but has the potential to cause damage to your traction belts, bits and possibly other machine components.

This Tips & Tricks issue will help you maintain accurate board tracking for all your projects and teach you how to avoid board mis-tracking issues altogether.

### How your Machine Monitors Tracking

In layman's terms, your machine tracks the board in the in-and-out direction (X-axis), by monitoring the rotation of the brass roller tracking along the underside of the material. Just as the odometer in your car tells you how far you have driven by measuring the number of times the drive shaft rotates, so too the machine calculates how far the board has moved by counting the number of rotations the brass tracking wheel makes. The machine's computer commands the belt drive to move a certain amount and checks the brass sensor data to see if it moves the expected amount.



Brass Roller Sensor

When there is any difference detected between the **commanded** position and the **measured** position, the computer tells the motor to move again until the board is in the right position.

There will always be a certain amount of difference between the command position and the measured position (if everything is in order, you will never notice it). To make the necessary X-motion corrections, the brass roller **must** remain in contact with your material while it moves through the machine. It is **extremely important** that the workpiece have a very flat and defect-free surface at least 3/8" in from the edge on the bottom side of the workpiece for the brass roller to function as intended.

### Use 'Good' Wood

Be very particular about the wood you use. Use dry (low-moisture or kiln-dried), low-pitch, flat wood for your projects. Inspect each board for any warp, cup, twist, and edge defects such as divots, dents, splits, splinters and so on. If a board has any of these defects, you must correct the issues or reject the board and choose another.

When you think you have found the 'perfect' board, a further test is to rub a spongy foam sanding block along the edges and the corners to make sure there are no splinter defects that weren't spotted visually. If the spongy block 'catches', it might indicate an area that could snag on the guide plates or on the traction belts.

(cont.)

Please visit the manufacturer's website for more information about the CarveWright machines and see the Pattern & Project Depot at:  
[www.carverwright.com](http://www.carverwright.com)

For Additional Patterns you can add to your Designer software library, please visit:  
[www.carvebuddy.com](http://www.carvebuddy.com)

You can use other materials such as polycarbonate (Lexan), cast acrylic (sign makers plastic), Corian (acrylic base), and 'rough' or irregularly-shaped wood (like old barn siding or slabwood), instead of regular boards.

However, some of these materials will require the use of a sled/jig that simulates a 'perfectly' flat board with straight/square/parallel edges in order to track properly while machining. (fig. 1)



**fig. 1** Jig Example for Carving Irregular Material

For more information on building and using sleds/jigs, please read the Tips & Tricks April 2008 Issue 7, *Carving Jigs - Carrier Boards, Sleds and Rails* located at:

<http://www.carvewright.com/cms/tips-and-tricks>

It is critical for the material placed into your CarveWright/CompuCarve maintain **secure contact with the brass roller** throughout the project run. If the material does not have a uniform flat surface for the brass roller to roll along (underneath the edge of the board closest to the keypad side of your machine), mis-tracking will occur. Taking a few minutes to verify your material is flat, has parallel sides and is defect-free before using it in your machine will help assure accurate tracking.

## Summary:

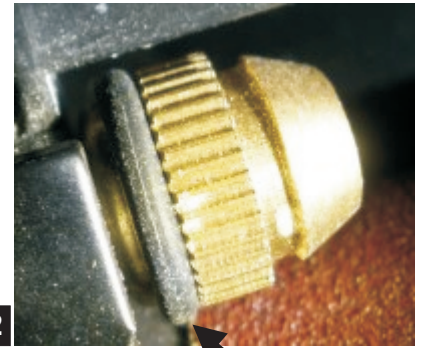
- 1) Use dry, flat material
- 2) Inspect carefully for defects - especially where the brass roller contacts the material
- 3) Verify the material has parallel sides by measuring at two or three locations
- 4) Use a jig for irregularly-shaped and/or thin materials

## Material Placement

After confirming your material is suitable, it must be placed properly into your machine. It's not 'rocket-science' but there are a few things to keep in mind...

1) The edge of the material must be flush and square against the stationary guide plate nearest the keypad. Use reasonable caution when placing your material in your machine. If the material is 'skewed', it will bind as it moves through and spoil your project.

2) Lift the board and set it gently down over the rubber O-ring, rather than sliding over it. It is possible to knock the O-ring out of its position if 'aggressively' sliding material over it. The black rubber O-ring needs to be in the inside groove of the brass roller. (fig. 2)



Properly Seated O-Ring Closeup

3) The board length should be placed more-or-less centered in the machine (i.e., the material length-center should be approximately centered over the traction belt gap).

Some users will instead, place a board with one of the workpiece *ends* positioned nearest the center of the machine to save a little time during the measuring stage during a project run. Generally, this is not recommended practice as it could invite a tracking error, particularly if the board is over 3 feet long. The longer the board, the greater chance for tracking issues. It is usually prudent to center the workpiece length when placing it into the machine for best results.

4) The sliding guide plate should be butted up to the board, but not pushed against it too tightly. A tip is to leave a very small gap between the sliding guide plate and the board. A couple business cards or playing cards placed between the board edge and plate are great for use as a spacer when sliding the guide plate against it. Remove the card spacers before running the project, of course.

(cont.)

## Material Placement (cont.)

5) Another tip *before* placing your material in the machine is to determine if the underside might be too 'slick' for the brass roller to 'bite' into. For example, MDF is commonly used to build a sled/jig for use in the machine. The problem is MDF material is too slick to track reliably over the brass roller. The manufacturer routinely uses MDF jigs to run projects through their test machines. However, they place a strip of masking tape (securely pressed down) on the underside of the MDF along the entire edge where the brass roller makes contact with it. In fact, one of the CarveWright forum members has made it his 'mission' to use and recommend masking tape along that underside edge on all materials (including plain wood). It doesn't hurt a thing and is a simple way to help the brass roller maintain secure contact with the underside of your material.

## Traction Belts and Pressure Rollers

It is important to clean the sawdust debris from the traction belts before running each new project. The fine sawdust can 'fill' the grit in the sandpaper traction belts. This reduces their 'grip' on the material and can lead to tracking problems. You can brush, vacuum and/or blow compressed air over the belts to keep them clean. Similarly, the rubber pressure rollers need to be kept clean too. Sawdust particles reduce their grip as well, so make it a habit of wiping off all sawdust debris from the rollers after each project.

The sandpaper belts can be damaged (torn or rolled) if a tapered or defective board is placed into the machine, or if a workpiece is inserted improperly. The sandpaper traction belts can also roll-up under themselves if the head pressure is incorrect (see Head Pressure section).

A roll-up\* usually occurs towards the keypad side of the machine and can be easily overlooked. If you are consistently getting board tracking errors, check your traction belts. Verify each belt is reasonably centered side-to-side on the traction roller. If one side has a lot more space than the other, you may have a roll-up. The belt has a crisp edge, but if a roll-up has occurred, the edge will be slightly 'rounded' and will be thicker than a normal edge. The thicker edge will interfere with the brass roller contact and will cause tracking problems.

**\*Editor's Note:** We call it a 'roll-up', but the belt is actually rolled under itself along the edge. (fig.3,4)

## Consider the Heavy Duty Traction Belts

There is an upgrade available for the traction belts which offers more gripping power and considerably outlast standard sandpaper traction belts. The Heavy Duty PVC-reinforced rubber belt upgrade is available from the CarveWright Store at:

<http://store.carvewright.com/home.php>

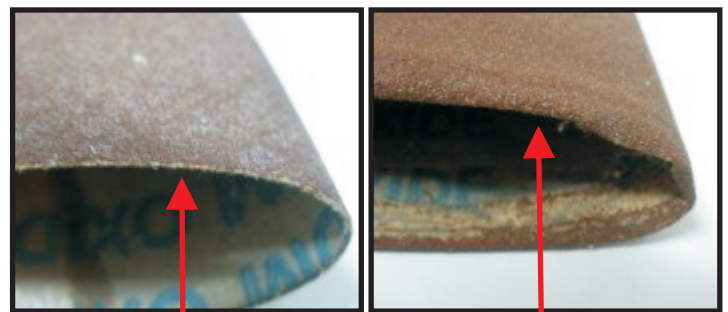
These rubber traction belts can easily be swapped out for the sandpaper ones. Besides having much greater gripping qualities, the belts are also 'grooved' which helps keep fine sawdust from adversely affecting the gripping surface and will yield better traction. As previously mentioned, the stock sandpaper belts can roll under or tear if a 'bad' board is placed into the machine by the user. The Heavy Duty rubber belts are extremely resistant to tearing and it is impossible for them to roll under themselves.

If you run a lot of projects (especially if using boards longer than 3 ft), the rubber belt upgrade is one you might want to strongly consider. It is a very worthwhile investment.

## Head Pressure

The proper head pressure is between 75 to 85 pounds and assures the workpiece can properly track in and out of the machine on the traction belts.

If there is not enough head pressure (too low), the sandpaper belts can roll-up and will cause tracking issues. (fig. 3, 4)



**fig. 3** Normal Belt Edge

**fig. 4** Rolled Belt Edge

If head pressure is too high, it can lead to a slow or unresponsive traction belt drive due to stress on the drive gears and possibly causing a gear to break.

(cont.)



## Head Pressure (cont.)

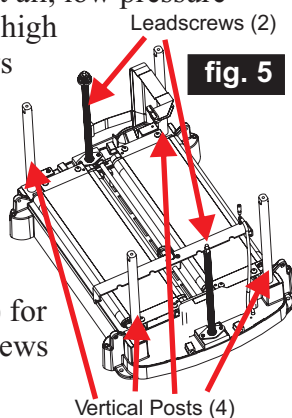
### Low pressure can be caused by:

- Insufficient lubrication on the four vertical guide rods and/or the two vertical leadscrews.
- Misalignment in the vertical guide rods.
- Low temperature environment (do not operate your machine if your workshop is below 55°F)
- Poor mesh on the gears that drive the vertical leadscrews that move the head up and down.

### Excessive (high) pressure can be caused by:

- Lack of grease in the clutch.
- Very hot temperature environment (100°F+)

If a head pressure issue occurs at all, low pressure seems to be more common than high pressure. Keeping the leadscrews and the four guideposts clean and lubricated will help prevent a low pressure issue. The machine documentation recommends applying a thin film of white lithium grease (spray can, tub, or squeeze tube) for lubricating the posts and leadscrews (fig. 5). (Open Cutaway View for Clarity)



**Editor's Note:** I no longer use the lithium grease, in favor of spray dry lube. I noticed the grease tended to get a little 'gummy' and thick after a several projects and in cooler temperature environments. I have been using the dry lube on the posts for about a year and is working great. I checked with the manufacturer and they say the dry lube is an acceptable alternative to the lithium grease if you choose to use it instead. A tip from the manufacturer is to spray a generous amount of WD-40 on the threads of the leadscrews to 'wash' them off, then apply lubrication after cleaning. (WD-40 is NOT an acceptable final lube.)

It is recommended that you check the head pressure periodically. This is easily done using a plain bathroom scale placed under the pressure rollers and cranking the head down to take a reading. For the complete instructions on checking and correcting your head pressure, read the Service Document "**Checking and Adjusting Head Pressure**" available for download from the CarveWright website at:

[http://www.carviewright.com/cms/customer\\_service](http://www.carviewright.com/cms/customer_service)

## Outfeed Trays and Rollers

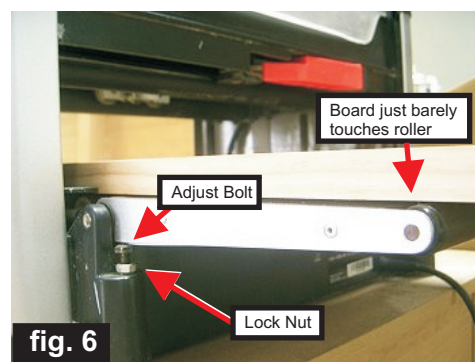
The outfeed trays need to be adjusted correctly so they won't interfere with the smooth tracking of the board as it moves in and out through your machine. If the outfeeds are adjusted unevenly or are too high/too low, the board can get "bumped up" or can "fall down" by a few hundredths of an inch causing unnecessary errors or undesirable lines in your carvings.

**Editor's Note:** I often don't use the built-in outfeed trays when I'm carving lighter-weight boards that are less than about 30" to 36" long...i.e., I lower the outfeed trays so they don't contact the board at all. Use your own judgement when to use or not to use the outfeed trays. **Any boards that are heavy and/or over 36" long will require the use of the outfeed trays in any case.**

Check the outfeed adjustment with a very straight, flat board. It's easy to adjust the built-in outfeed trays. Just place your board (length centered) in the machine and loosen the locking nuts. Lift the outfeed tray up to the material so that the rollers just "barely" touch the underside of the board and screw/unscrew the adjustment bolts and tighten the nuts to hold each tray in position. Test for material "lift" or "drop" by manually pushing the board in and out through the machine and observe if the outfeed trays need re-adjustment. Screw or unscrew the bolt until it holds the outfeed in position, then tighten the nut to "lock" it in place. (fig. 6)

When using long project boards (over 4 feet long) you will need to use free-standing roller stands. The built-in outfeed support trays are not enough to support a long

board for proper tracking. The extra roller supports must be placed perpendicular to the board so that they don't have any tendency to allow the board to track "off kilter" as the board is feeding through the machine. The longer the board, the greater chance for mis-tracking, so use care when setting up your extra roller stands, making sure they are level and in-line with the built-in outfeed trays.



## Machine Measurement Calibration

To assure accurate board measurements and to help your machine to track most accurately, you may want to run a calibration procedure. Of course, if you ever discover you are receiving consistent board measurement errors, you *definitely* need to re-calibrate your machine. Beginning with the release of Designer software version 1.161, the calibration procedure has been updated and improved. For best results, be sure you are running 1.161 (or above), and use the new calibration procedure, as follows...

## CarveWright User Calibration

### Introduction

LHR has provided a series of user calibration options for the machine which allow the user to fine tune the machine and keep it in top operating condition. The calibration options are meant to support hardware additions (such as new jigs or new rubber belts) and minor adjustments to the machine accuracy over its lifetime.

### Important Note

All CarveWright machines (whether new or refurbished) have been factory calibrated, and tested, with special precision equipment. There is generally no need to recalibrate a recently purchased machine.

However, the shipping process may slightly alter the original calibration of the machine and over the machine lifetime, the sensors may change slightly. In the case where no hardware modifications have been made to your machine, you should be certain that the machine measurements are in error before changing the calibrated machine values.

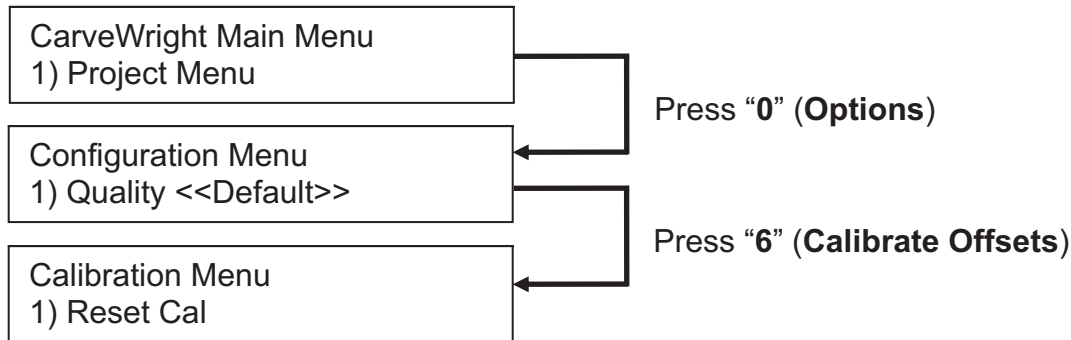
Calibrating the CarveWright will change the way it measures the length, width, and depth of the board. This may lead to unexpected results during carving. For example, it may change the resulting measurement of the board, possibly leading to the machine requesting you to scale or center boards that were normally fine. It may also alter the placement of objects on the designed board. Be very certain of your need to run this calibration before beginning.

### Overview

To begin, make sure you update your software to version 1.161 or later. Once that is done, make sure to update the firmware on your card by inserting it in the programmer and selecting *Flash Manager* from the *File* menu. It will tell you if you are not running the latest firmware version and prompt you to update. To get to the User Calibration menu, follow the instructions and flow chart below:

1. Insert the memory card, turn the machine ON, and navigate to the *Configurations Menu* from the *CarveWright Main Menu* pressing the “0” (**Options**) key on the keypad.
2. Navigate to the *Calibrate Offsets* menu item by using the **up/down arrows** and press **ENTER**, or select item 6 by pressing the “6” key.

(cont.)



The *Calibration Menu* has 6 options.

- 1) Reset Cal
- 2) Cal Depth
- 3) Cal Sensors
- 4) Manual X Axis Cal
- 5) Manual Y Axis Cal
- 6) CO2 Car Offset

Calibration option 6, "CO2 Car Offset", is not covered in this manual. Please refer to the document "Setup and Use of the CarveWright CO<sub>2</sub> Car Jig" for more information.

## Resetting the Calibration

Resetting the Calibration will automatically return the machine to its factory settings. Be sure that there is a good reason to do this as you may have changed settings for better performance in the past. You can also change each individual setting to the default using the options below. Load the board in to the machine and navigate to the *Configurations Menu* from the *CarveWright Main Menu* by using the **up/down arrows** or pressing the "**0**" (**Options**) key on the keypad. Navigate to or select item 6, *Calibrate Offsets*. Press "**1**" to reset the current calibration and you will be asked to verify your selection as shown:

Reset User Calibration?  
1) Yes    2) No

Press "**1**" to complete the calibration reset.

## Calibrating the Depth (or Board Thickness)

From the *Calibration* menu, use the **up/down arrows** or press "**2**" to begin the depth calibration. Measure the thickness of the board you selected for your calibration as accurately as you can near the center of its length. The accuracy of this measurement is very important as the machine calibrates itself to this measurement. Measure the board thickness on the edge facing the keypad, as this is where the machine will measure the thickness. Load the board into the machine as you would normally, crank the head down, and set the sliding plate (See Figure 1).

(cont.)

The machine will prompt you to enter the board thickness. Enter your measured thickness as a decimal point of up to three digits or a fraction, and press **ENTER**.

The machine will find the right and back edges of the board and then request the 1/8" cutting bit. Open the cover, insert the bit and press **ENTER**. The machine will touch the bit tip on the bit touch plate and then touch the board surface twice. If the machine returns to the *Calibration* menu, it has completed a thickness calibration. If an error is displayed, re-measure the board thickness and repeat the process again.

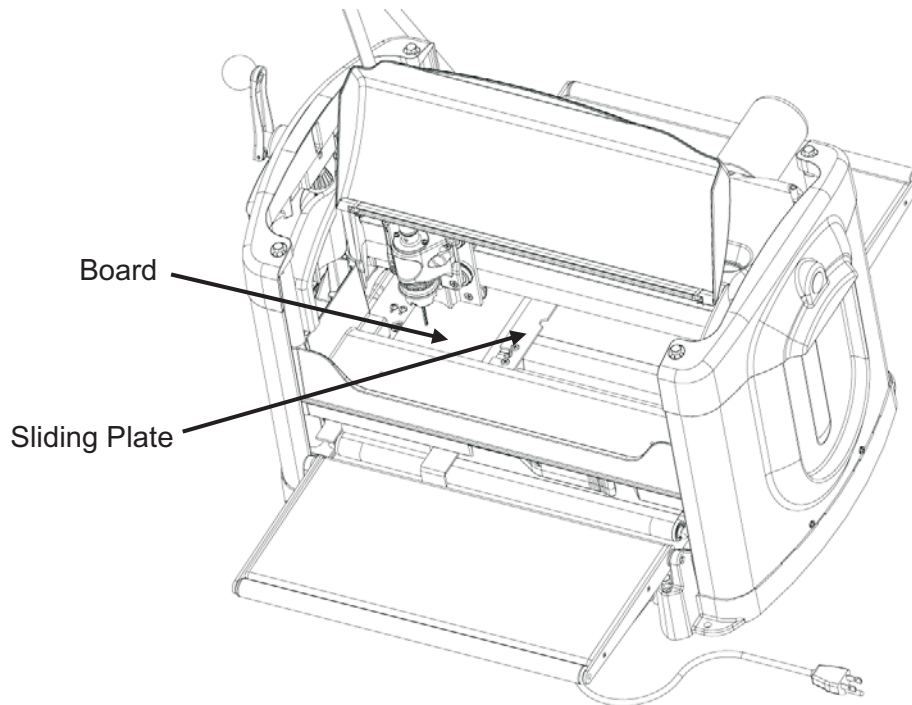


FIGURE 1: PROPERLY SET SLIDING PLATE

## Calibrating the Edge Sensor

From the *Calibration* menu use the **up/down arrows** or press "**3**" to begin the calibration on the sensors that find the edge of the board. Load the board (at least 12" long by 4" wide) into the machine as you would normally, crank the head down, and set the sliding plate (See Figure 1).

The machine will find the right and back edges of the board and then request the 3/8" jointing bit. Open the cover, insert the bit and press **ENTER**. The machine will measure the width of the board and will cut a slot on the back right edge of the board (as seen facing the front of the machine). A sensor measurement is taken at the edge of the slot and then small cuts are taken within the initial slot and measured again.

The machine will then drop the bit into the central hole in the sliding plate and make a series of small cuts on the edge of the board, re-measuring after each cut. Next the bit will drop into the central hole in the squaring plate (on the keypad side) and make

(cont.)

a series of small cuts on that edge, re-measuring after each cut. If the machine returns to the *Calibration* menu, it has successfully calibrated the board edge sensor. If an error is displayed, repeat the process again with a new board.

## Manually Calibrating the X-Axis

The most frequently calibrated setting is the X-axis. You will want to consider calibrating the X-axis if you are consistently getting an incorrect board length measurement or if you are replacing the factory sandpaper belts with the rubber belts.

To do this calibration you will need a board roughly 36" long that is clean and straight. It is very important that the board edge that is placed into the machine up against the squaring plate be very clean and free of defects. This is the edge that the board tracking sensor roller will be running on and measuring.

Measure and record your board length with as much accuracy as you can get. Make sure to perform the measurement in the center of the board width, as this is where the machine will also measure (Hand Measured Length - \_\_\_\_\_ inches). Load the board into your machine and measure it using the "Measure Board" function. This can be accessed by pressing the "**7**" (**Measure**) key on the keypad or by using the up/down arrows to navigate to the measure function from the CarveWright Main Menu. The display will then ask for the direction the user wishes to measure.

Select Dimension 1) Length
-------------------------------

Press the "**1**" key on the keypad to measure the Length. Record the number (Machine Measured Length - \_\_\_\_\_ inches) and compare it to the length you measured by hand. At this point you have to decide if the difference in the length measurements warrants recalibrating your machine. If you would like to recalibrate your machine continue reading this document.

Before recalibrating, make sure that you have the latest CarveWright firmware version running on your flash card (version 1.161 or later). From the *Calibration* menu use the **up/down arrows** or press "**4**" to begin the calibration of the X-axis.

You are now at the screen that shows you the default calibration numbers (factory calibrated) as well as the current calibration setting for the length measurement.

Dflt: ###.###	Cur: ###.###
1) Default	2) New

You now have two options:

- 1) Pressing "**1**" (**Default**) will restore the current value to the factory default value.
- 2) Pressing "**2**" (**New**) will allow you to type in a new value to adjust for the difference in measured lengths. New numbers can be entered with decimal or fractional values. Press **ENTER** to save once a value is entered.

(cont.)



To calculate the value to enter, first take a look at the difference in the measured lengths. If the hand measured length is **longer** than the machine measured length you will need to **add** units to the displayed current value, and conversely, if the hand measured length is shorter than the machine measured length you will need to subtract units from the current value setting

To find the magnitude of the change to the current value subtract the two numbers (Length difference - \_\_\_\_\_ inches). Although not an exact correlation, you should change the current value setting by 1 unit for every 0.03" (or for every 1/32<sup>nd</sup> of an inch).

So now you have a direction (add or subtract) to change and a magnitude (number of units). As an example: say you have a board that measures exactly 36" long by your tape measure and the machine measures board at 35.875", adjust the X axis cal number by -4. If the current value was set to 890.000, change it to 894.000. Or if the machine measures 36.125", adjust the X axis cal number +4.

Once the new value is entered you will see it appear as the Current value on the display. Go back and measure the board with the machine again and see how much closer the measured values become. Rerun the calibration routine as many times as necessary to attain the level of accuracy that you desire.

## Manually Calibrating the Y-Axis

You will want to consider calibrating the Y- axis if you are consistently getting an incorrect board width measurement or if you are seeing an offset in the centering of a project in the side-to-side direction. To do this calibration you will need a board at least 6" wide that has clean and straight edges. Wider boards allow for better calibration accuracy.

Before recalibrating, make sure that you have the latest CarveWright firmware version running on your flash card (version 1.161 or later). From the *Calibration* menu use the **up/down arrows** or press "**5**" to begin the calibration of the Y-axis.

You are now at the screen that asks for type of Y calibration you wish to do.

Select Y Calibration  
1) Calibrate Width

There are two options in the Manual Y-Axis Calibration menu:

1. Calibrate Width – This calibration will allow you to adjust the machine if it is measuring the width incorrectly.
2. Calibrate Y Offset - This calibration will allow you to adjust the machine's Y position if it is not placing a pattern in the right location in the side-to-side direction (i.e. not centering in the Y direction).

(cont.)

## Calibrate Width Option

To begin the width calibration you will want to do a hand measurement and machine measurement of your board width. Measure and record your board width with as much accuracy as you can get in roughly the center of the length (Hand Measured Width - \_\_\_\_\_ inches). Load the board into your machine making sure that it is centered under the Y-Truck, and measure it using the "Measure Board" function. This can be accessed by pressing the "**7**" (**Measure**) key on the keypad or by using the **up/down** arrows to navigate to the measure function from the CarveWright Main Menu. The display will then ask for the direction the user wishes to measure.

Select Dimension  
2) Width

Press the "**2**" key on the keypad to measure the Width. Record the number (Machine Measured Width - \_\_\_\_\_ inches) and compare it to the width you measured by hand. At this point you have to decide if the difference in the width measurements warrants recalibrating your machine.

If you would like to recalibrate your machine's width measurement, continue reading this document. If you wish calibrate the width measurement select "**1**" from the Select Y Calibration menu shown above. You are now at the screen that shows you the default calibration numbers (factory calibrated) as well as the current calibration setting for the width measurement.

Dflt: 0.### Cur: 0.###  
1) Default      2) New

You now have two options:

- 1) Pressing "**1**" (**Default**) will restore the current value to the factory default value.
- 2) Pressing "**2**" (**New**) will allow you to type in a new value to adjust for the difference in measured widths. A screen will then appear that prompts you to input whether your hand measurement was **Narrower** (option 1) or **Wider** (option 2) than the machine measurement. (For example, if your board measures 6.1" wide by hand but measures 6.05" by the machine, you will select "**2**" to tell the machine that the actual measurement is wider.

The machine will then ask for the amount by which the measurement is off. Enter the new value in decimal or fractional form. In the example above type .05 and press **ENTER** to save the value. Repeat the board measure test and repeat the calibration steps as necessary.

(cont.)

## Calibrate Y-Offset Option

If you are having issues with a pattern being carved off-center (even though it is centered in the software), select the Calibrate Y-Offset menu item.

The first step in this calibration is to carve a rectangular test region or shape centered on the board width. Run the project in the machine and tell it to center on width if it asks due to the board size. Measure the distance from each side of the board to the edge of the square. Obviously if the pattern is centered the offsets will be the same.

If they are not the same, record both the amount by which the two measurements differ (Difference = \_\_\_\_\_ inches) and the direction in which the pattern needs to move in order to center it on the board. You will want to know whether the pattern needs to move **Towards** the keypad side of the machine or **Away** from the keypad side of the machine to achieve proper centering.

Once you select the Calibrate Y-Offset menu item you will see the screen that shows the default calibration numbers (factory calibrated) as well as the current calibration setting for the Y-Offset.

Dflt: 0.###	Cur: 0.###
1) Default	2) New

You now have two options:

- 1) Pressing “**1**” (**Default**) will restore the current value to the factory default value.
- 2) Pressing “**2**” (**New**) will allow you to type in a new value to adjust for the difference in measured offsets. A screen will then appear that prompts you to input whether the pattern needs to be moved **Towards** the Keypad (option 1) or **Away** from the keypad (option 2) for proper centering. For example, you carve a square and it is off-center by 0.1” in the direction away from the keypad side of the machine. In this case you want to select option “**1**” to tell the machine that the pattern needs to move **Towards** the keypad side of the machine.

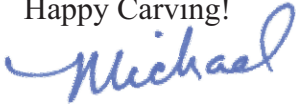
The machine will then ask for the amount by which the measurement is off. Enter the new value in decimal or fractional form. In the example above, type .1 and press **ENTER** to save the value. Repeat the cut test and repeat the calibration steps as necessary.

(cont.)

## In Conclusion

I want to thank the engineers at CarveWright for their technical assistance in putting together this article for you! I hope you have found the tips contained in this issue helpful in maintaining accurate board tracking for your machine. Accurate board tracking will go a long way to keep your projects running smoothly and trouble-free!

Happy Carving!



Michael Tyler - Editor

**Special thanks to  
Michael Tyler of  
[www.CarveBuddy.com](http://www.CarveBuddy.com)  
for providing  
the content for this issue of  
CarveWright TiPS and TRiCKS.**

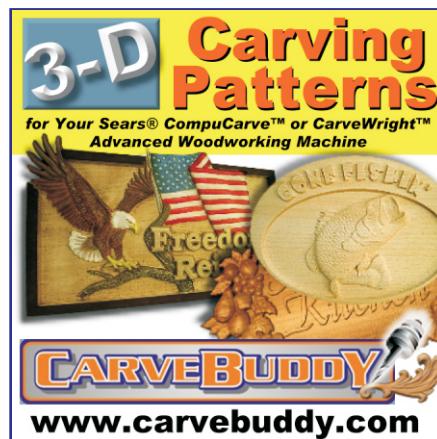


# Additional Resources

## 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.carviewright.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.



*The trademarks, service marks and logos (the "Trademarks") used and displayed here are registered and unregistered Trademarks of LHR and others.*