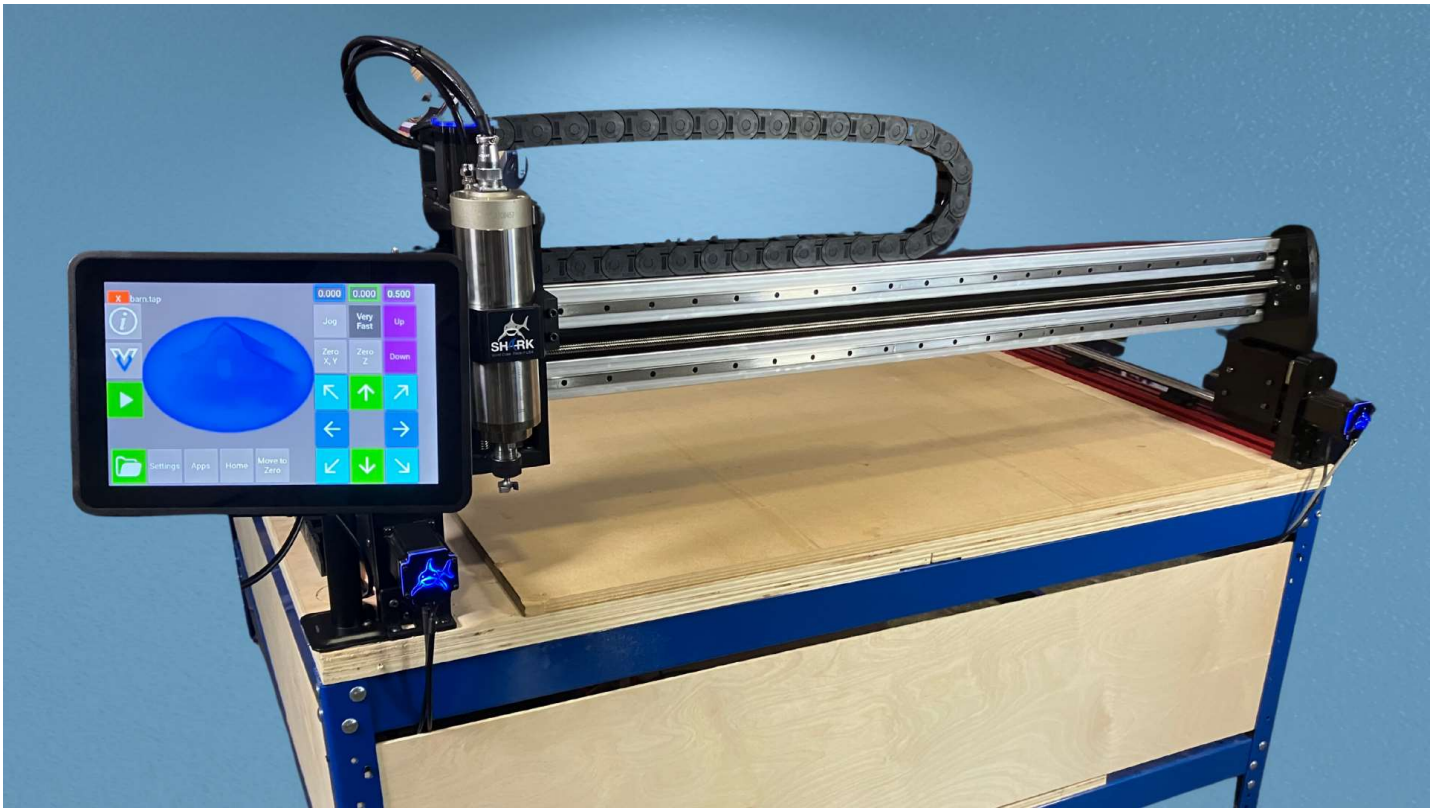
NEXT WAVE® CNC



SHARK®

SHARK HD544

Owners Manual

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SHARK HD544
User's Manual
Version: 9/12/2024
SKU: 800038

CONTENTS

Please Read This Manual Carefully

This manual provides important setup and operational information for your *SHARK HD CNC* machine. Using your *SHARK HD CNC* requires experience with basic computer operation and the technical knowledge to safely operate power tools.

To Our Customers

Thank you for purchasing a *SHARK HD CNC* from *Next Wave CNC*! Your CNC opens up a world of creative possibilities for your ideas and designs. Following the step-by-step instructions, your Shark CNC will be up and running in no time.

Whether you're new to CNC technology or a seasoned expert, your *SHARK HD CNC* provides a lot of flexibility for programming and operation. Our specially designed *LCD Pendant* is an auxiliary touchscreen that provides hands-on control of many of the functions of the *SHARK CNC* right at the machine, without the need for a connection to a personal computer. The *Pendant* includes a USB port to transfer files from your PC.

For additional control and programming options using your PC, we've included our *Ready2Control* software. *Ready2Control* allows you to run toolpath files and control your *SHARK HD* CNC from the PC. It operates in a similar way to the LCD *Pendant* but includes additional machine control tools. See the *Ready2Control* User's Manual for more information.

Vectric VCarve is a world-wide standard for designing parts and programming the toolpaths for your *SHARK HD CNC* using an intuitive interface. *V-Carve* includes a broad set of CNC clip art files and a library of tools for cutting and shaping the part. Design tutorials and software support can be found at Vectric.com.

System Requirements

All *SHARK CNCs* plug into a standard 110v receptacle for power. A 15 amp or higher circuit is required.

Ready2Control software requires at minimum, a computer with Microsoft Windows 10 or higher, a 2 Ghz Quad-Core processor, a minimum of 8Gb RAM, 300 Mb Disk space (Program), a 1280 x 720 Display monitor, and a USB-A port.

Vectric VCarve requires a 2 Ghz Multi-Core x86 or x64 processor (Intel or AMD) with Microsoft Windows 10 or higher, a minimum 4Gb RAM, 300 Mb Disk space (Program) + 7.7GB for optional tutorials and clipart, and a 1024 x 768 Display monitor.

Technical Support

If you need technical assistance with your *SHARK HD CNC* or software, please visit our Support webpage at:

NextWaveCNC.com/support
or email Customer Support at:
Support@NextWaveCNC.com.

Please include your product model number, date of purchase, and other pertinent information associated with the issue such as .tap files, *VCarve* files, screen captures, or photos of your setup or the problem.

Support Email: support@nextwaveCNC.com
Available: 9 am – 5 pm (ET) Monday-Friday

Serial Number and Software License Information: For easy reference and record keeping, enter your *SHARK HD* and *Vectric* information at right. To locate the information, refer to the pages below.

Controller Box Serial Number

_____

LCD Pendant Serial Number

_____

LCD Pendant Unlock Code

(_____

VCarve License Code

_____

Your VCarve User's Name

_____

Next Wave CNC warrants your new *SHARK HD series CNC* to be free from defects in material and workmanship for TWO YEARS from the date of purchase. The warranty applies only to the original retail purchaser of the *SHARK HD series CNC* when purchased from an authorized *Next Wave CNC* distributor. This warranty covers the parts and labor to correct the defect. It does not cover the cost of shipping the machine and/or parts to *Next Wave CNC* for evaluation or repair. This warranty does not apply to problems arising from normal wear and tear, misuse, abuse, negligence, accidents, unauthorized repairs, alterations, or lack of maintenance. This warranty is void if the *SHARK HD CNC* or any portion of it is modified without the prior written permission from *Next Wave CNC*, or if the machine is located or has been used outside of the country where the machine was purchased.

Please contact *Next Wave CNC* to take advantage of this warranty. If *Next Wave CNC* determines that your *SHARK HD series CNC* is defective in material or workmanship, *Next Wave CNC* will, at its expense and upon proof of purchase, send replacement parts to the original retail purchaser necessary to cure the defect. *Next Wave CNC* will repair your *SHARK HD CNC* provided the machine or affected components are returned to *Next Wave CNC*, shipping prepaid, with proof of purchase and within the warranty period.

Next Wave CNC disclaims all other express or implied warranties, including fitness for a particular purpose. *Next Wave CNC* shall not be liable for death, injuries to persons or property, or incidental, consequential, contingent or special damages arising from the use of the *SHARK HD CNC* .

Ready2Control software Next Wave CNC warrants *Ready2Contol* and *Virtual Zero Unlimited* to perform as intended and will provide customer support to the original purchaser when purchased from an authorized retail distributor. Warranty only applies to the current version or the support needed to update a past version. The cost of the software upgrade (if any) is not covered by the warranty.

Lifetime Technical Support is provided to the original purchaser.

Technical support for the *VCarve* design software furnished with your *Shark CNC* is provided by *Vectric*. You can find a variety of training videos located at *www.vectric.com.* If you have questions or need software support, please get in touch with *Vectric* directly at *support@vectric.com*

Our 12 Golden Rules for Safety

1. Read, understand, and follow the safety and operating instructions before using your SHARK CNC.
2. Take time to fully understand how to safely operate your SHARK CNC.
3. Setup your SHARK CNC following the instructions in the manual.
4. .Always wear appropriate eye and hearing protection when operating your SHARK CNC.
5. DO NOT machine metal with your SHARK CNC unless following the proper guidelines.
6. Never attempt to adjust the work piece or move the SHARK CNC while it is running.
7. If needed, use the Cancel or Pause buttons to Stop or Pause your SHARK CNC during an operation.
8. Never leave your SHARK CNC unattended while it is running.
9. While operating your SHARK CNC, keep a multi-purpose dry chemical fire extinguisher nearby. It must be rated for both A and C fires.
10. For added safety and convenience, connect your SHARK CNC to a 110-115V surge-protected power strip with an on/off switch. This provides an additional way to turn off the machine in case of an emergency.
11. Follow all Safety instructions provided with your SHARK CNC and accessories.
12. Follow all accepted and recommended safety precautions and practices for woodworking and machining.

Stop Your CNC Router Fast!

Every CNC user experiences times when the machine seems to have a mind of its own. This can be caused by errant tool paths in the design file, power surges, broken tools, or any number of other reasons.

1. First, you can use the Pendant to stop the machine. Simply press the red STOP button on the Pendant screen. This stops the CNC's movement and turns off the router/spindle.

2. The second option for quickly stopping the CNC operation is to press the large, red Emergency switch on the front of the control panel.

3. You can also use the power switch on the rear of the control box to shut down the system.

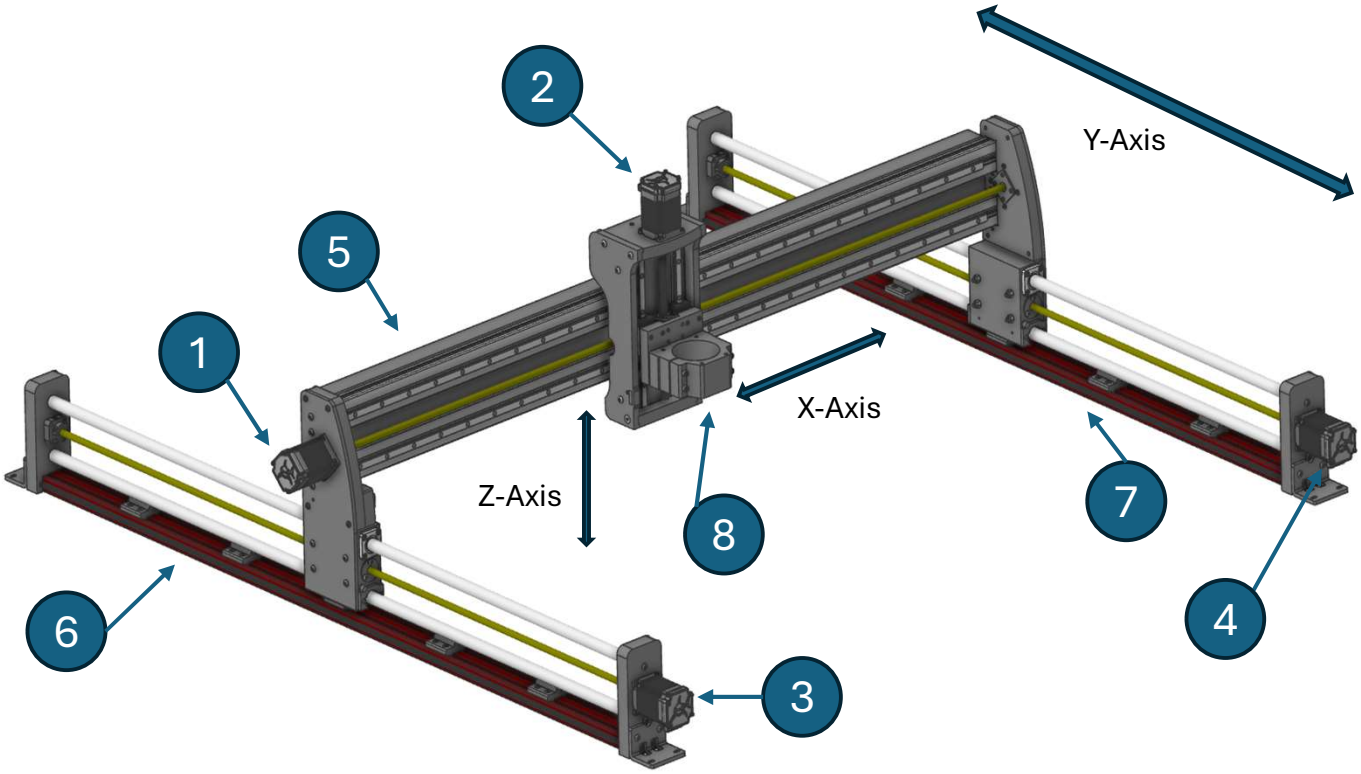
4. If you have the control box plugged into a switched power strip, you can also power down the machine in an emergency by turning of the power strip.

IMPORTANT NOTE: If you stop your CNC using any of these methods, you will need to restart the cutting from the beginning of the file, since the cutting progress and machine positions are lost during an emergency shut-down.

Once you are familiar with the locations of these switches, you'll be ready to use them if and when you need them in the middle of a routing project.

Methods 2, 3, or 4 also work to shut off your machine at the end of the day.

Machine Overview



1. X Motor
2. Z Motor
3. Y1 Motor
4. Y2 Motor
5. Gantry – A bridge-like assembly attached to the Y-Drives. The gantry supports and moves the spindle. The entire gantry moves back and forth on rails in the Y-Axis while the spindle rides on a carriage that moves left and right.
6. Y1 Drive – The foundation of your CNC machine are the Y-Drives. They are specifically engineered to support the other main components.
7. Y2 Drive
8. Spindle Mount

Table Recommendations

The HD544 does not include a table, but we provide recommendations for constructing an appropriate table to suit its requirements. **NOTE:** The table should be built before assembling your CNC machine. Attaching the machine to the table will be covered in later steps.

Recommended Table Frame – Kreg 64 x 64 in. Universal Bench Base with Standard-Height Legs 64X64-STANDARD-BENCH
https://www.kregtool.com/shop/workspace/bench-system-components/64-x-64-universal-bench-with-standard-height-legs/KBS6464.html

Recommended Table Top Size 1 ½" x 68" x 68" (2 layers ¾" plywood)
All setup dimensions are based on the recommended top size.

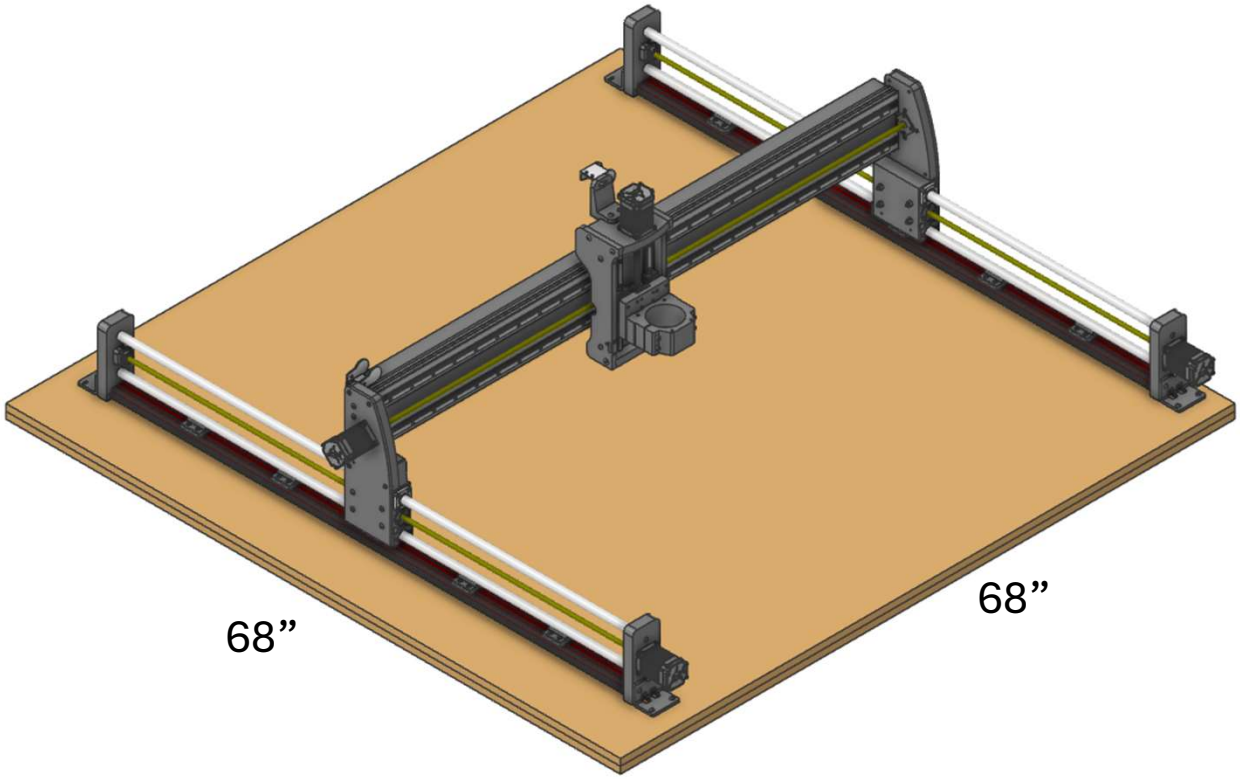
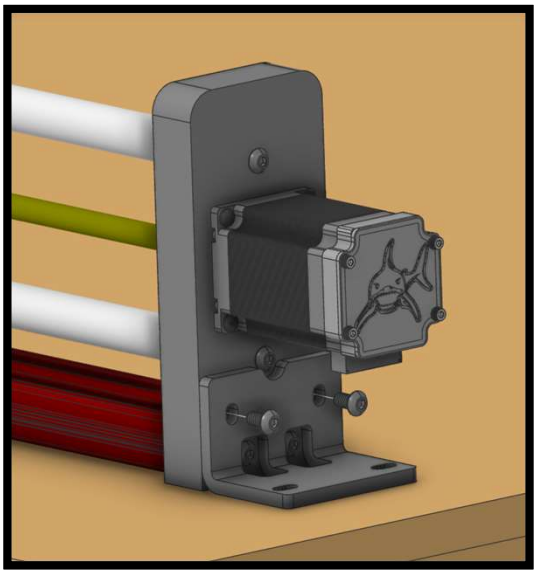


Table Assembly Tips

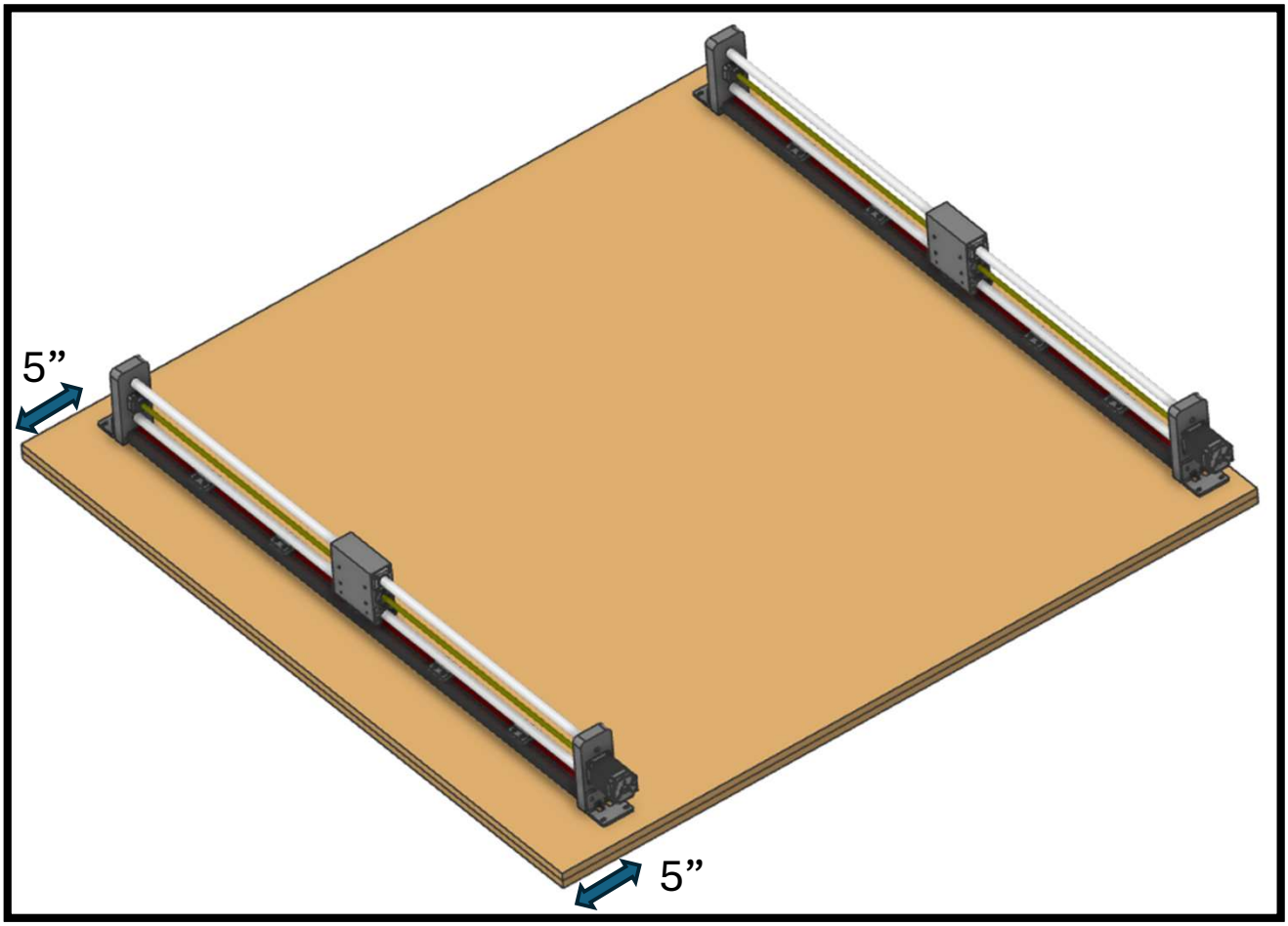
1. **Sturdy and Stable**: The table base needs to be stable to ensure accurate cuts. Look for a table made from solid materials like steel or heavy-duty wood. Any wobble or movement can affect the quality of your work. The 2 layers of ¾" plywood will also add rigidity.
2. **Size and Height**: Make sure the table is the right size for your machine and the materials you plan to work with. It should be tall enough to work comfortably without straining but not so tall that it makes it difficult to reach your machine. See table size recommendations above.
3. **Leveling**: A table with adjustable feet or leveling screws can be beneficial. Ensuring your CNC machine is level is crucial for precision.

Machine Assembly

Remove the Y1 and Y2 Drive assemblies from their packaging. Grab the (4) angled brackets from the hardware kit and attach them to the ends of the Y Drives using the provided (8) ¼-20 bolts.



Align the Y Drives roughly 56” apart on your table and align both ends of the Y1 Drive 5” from the left edge of the table. The 5” provides room for the drag chain and pendant mount.

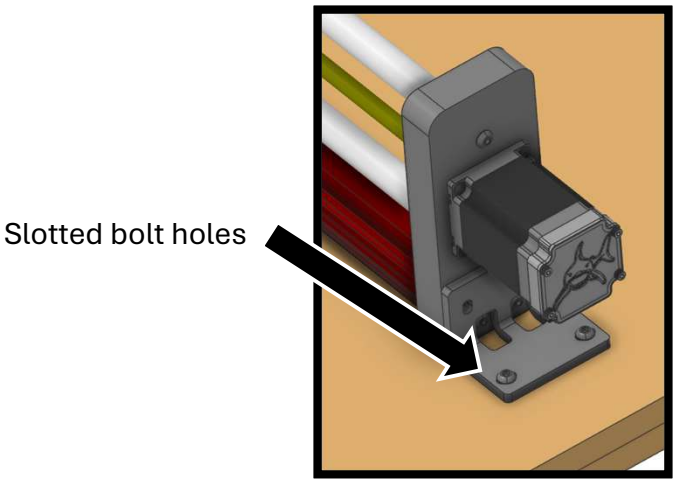


Ensure both ends of the Y1 Drive are positioned 5 inches from the edge of the table. Use a pencil to mark the center of the bracket slots on the surface of the table. Once marked, move the Y1 Drive aside.

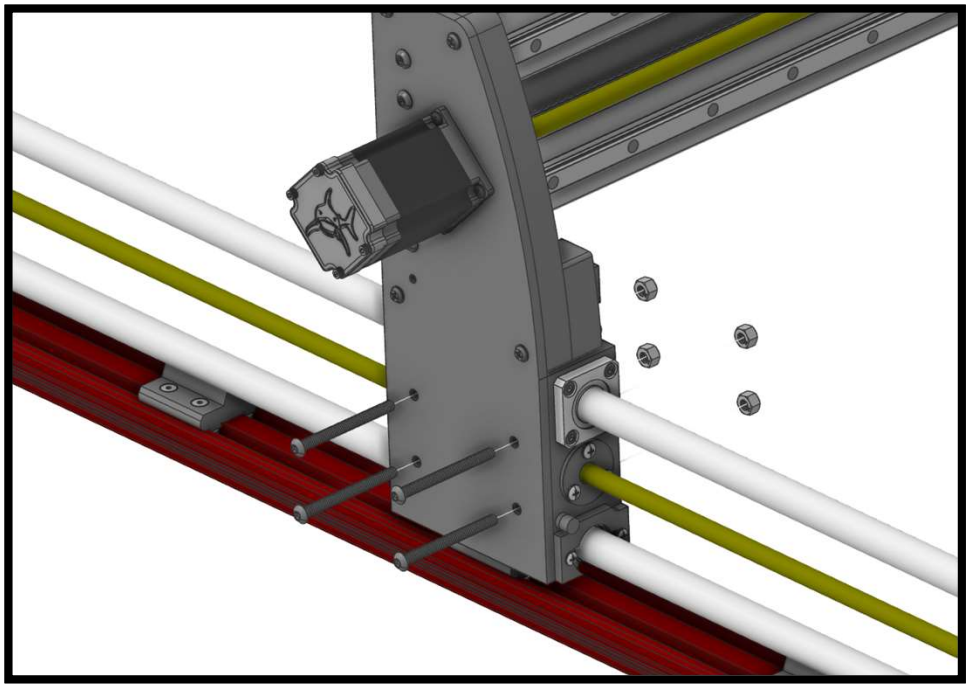
Using a 5/16” drill bit, drill a hole at the center of each marked slot on the table.

Take the provided ¼-20 tapping inserts and install them into the drilled holes.

Realign the Y1 Drive over the installed inserts and secure it to the table using the provided ¼-20 bolts.



With the assistance of two people, position the gantry onto the Y-drives. Secure both sides of the gantry using a total of 8 bolts (1/4-20 x 2 3/4") and 8 locknuts (1/4-20). Leave the Y2 Drive assembly free-floating, you will attach this side in later steps.



Caution: The X Homing Cable is attached to the left (motor) side of the gantry. When attaching the Gantry, be sure to not damage the cable. (Cable not shown in image above)

Machine Assembly (Drag Chain)

The drag chain is a hollow, flexible plastic track that resembles a bike chain. Its job is to protect the cables that connect the controller to the Gantry. As the gantry moves, the joints in the drag chain allow it to flex, preventing sharp bends and kinks in the cables that pass through it.

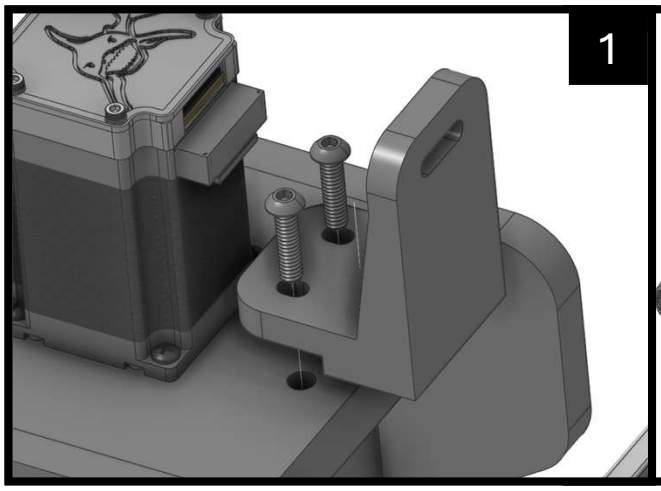
Note: All cables and spindle hoses will run through the drag chain. See the 3HP Spindle Manual to attach your Spindle and hoses.

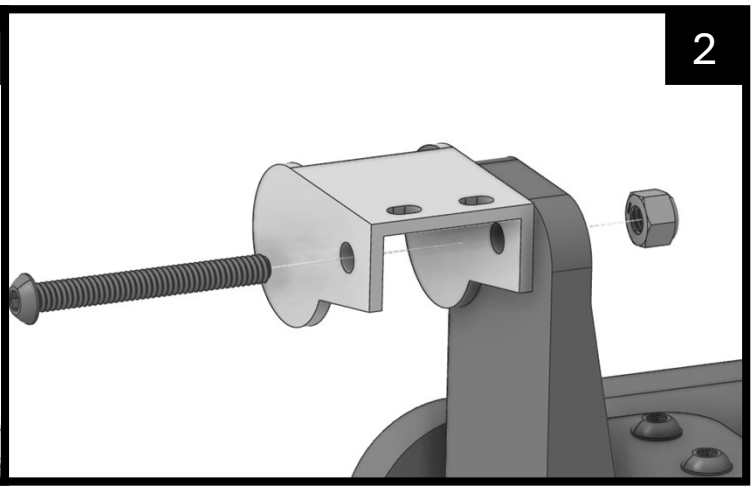
The HD544 contains (2) Drag Chains, both of equal length. One connects to the X/Z carriage (see figures 1-3 below), and the other to the Gantry's left side.

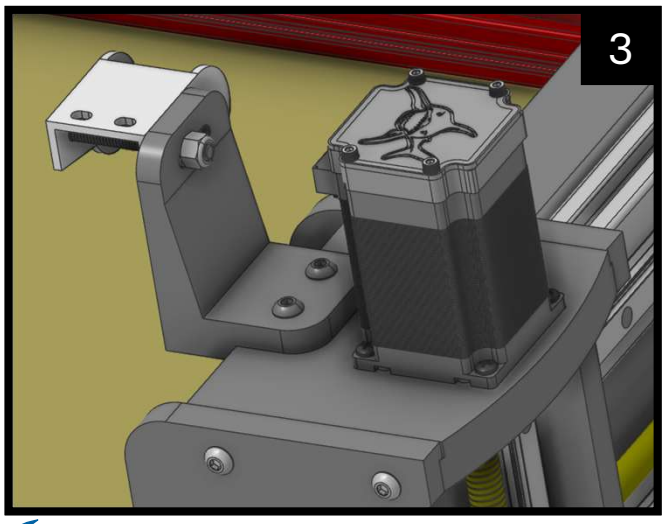
Using a small flathead screwdriver, pry open all tabs on both drag chains.

1. Attach the Drag Chain Mount to the top of the X/Z carriage using the provided ¼-20 bolts. The top of the X/Z carriage has (2) pre-installed inserts.
2. Attach the end of the drag chain to the Mount using the provided hardware
3. See the image below for what the assembly should look like when finished. The drag chain will lay across the bend on the Gantry's back side.

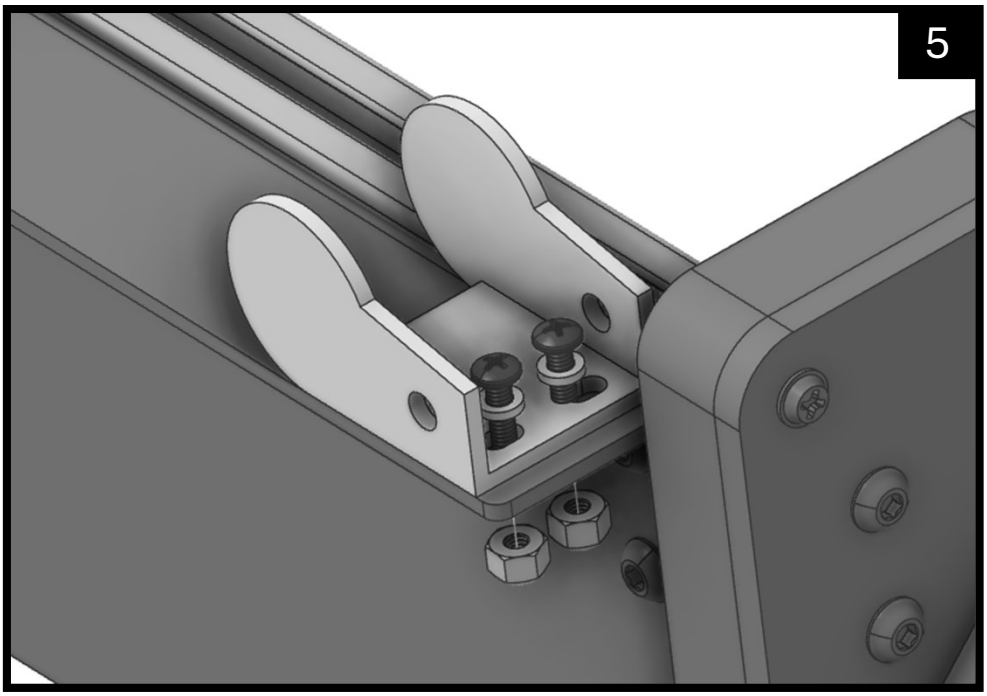
For illustrative purposes, only the ends of the drag chain are shown



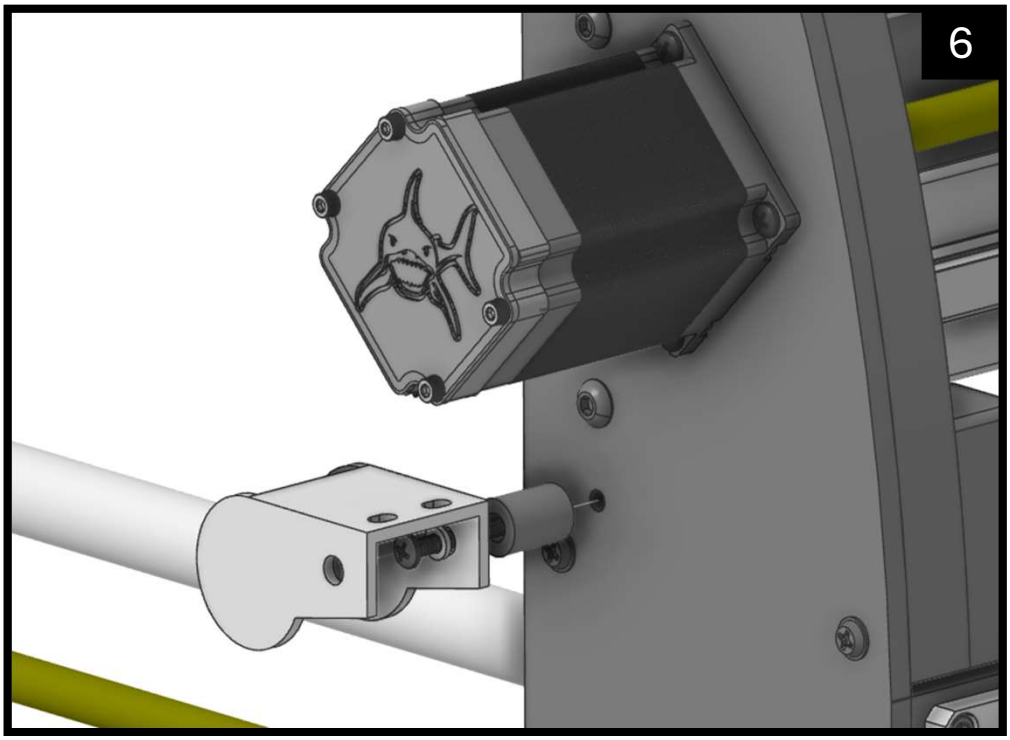




5. Attach the other end of the drag chain to the bent steel piece on the back side of the Gantry using the provided 8/32 x ¾ bolts, washers, and locknuts.



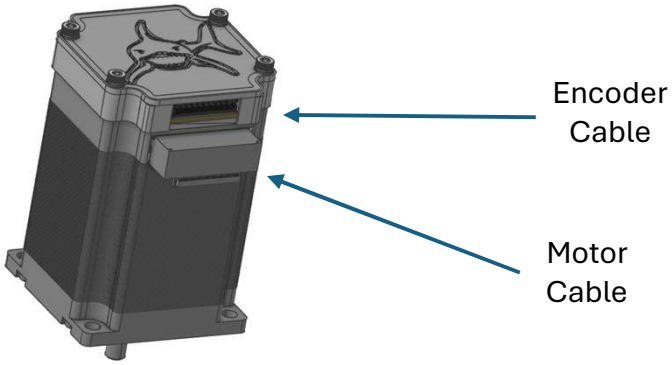
6. Attach the second drag chain to the Motor side of the Gantry using the provided 8/32 x 3/4 bolt, washer, and HDPE spacer. The clearance hole on the back end of the clip is for a small Phillips screwdriver. Depending on your table design, additional washers can be added to the spacer to push the drag chain out further.



Connecting the Cables

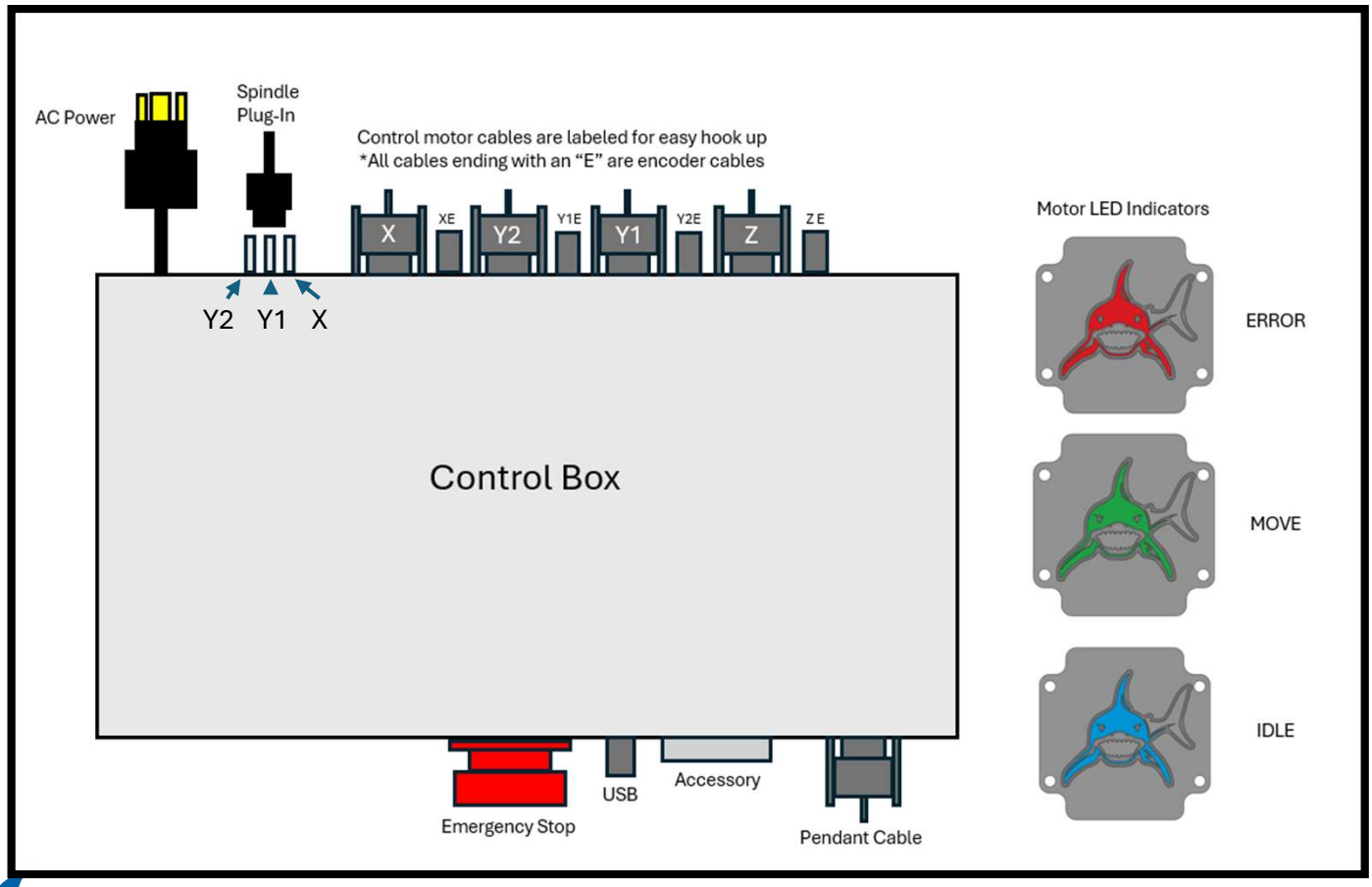
Now that the drag chains are installed, it's time to connect all cables to the control box.

Each motor on the HD544 has a slot to connect a motor cable and an encoder cable. These cables are labeled to their corresponding motor (see Machine Overview). When seated properly, you'll feel a small click on each cable connection.



The Z cables will go through both drag chains, while the X cables will only go through the drag chain along the table. Both Y cables run directly to the controller. The drag chains will both need to remain open after all cables are attached.

Attach each cable to it's labeled port on the back of the HD544 Controller.



Squaring the Machine

Squaring your SHARK HD544 CNC ensures that the X and Y axes are perpendicular, which is essential for accurate machining, consistent production, reduced tool wear, minimized setup time, improved workpiece quality, and enhanced safety. It is important to check these measurements frequently during the setup process.

1. To start the squaring process, jog the Gantry to the back of the machine.

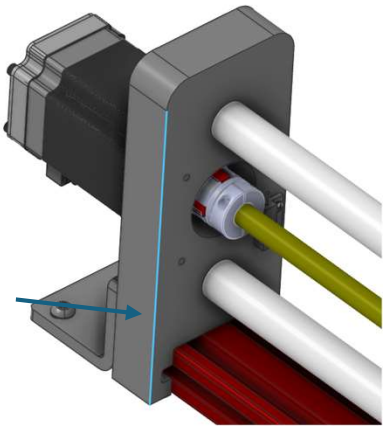
2. Measure diagonally from the inside of the aluminum base ends to square your machine. You'll find the measurement to be about 79 ½". It is recommended to get both measurements within 1/16" on each end.

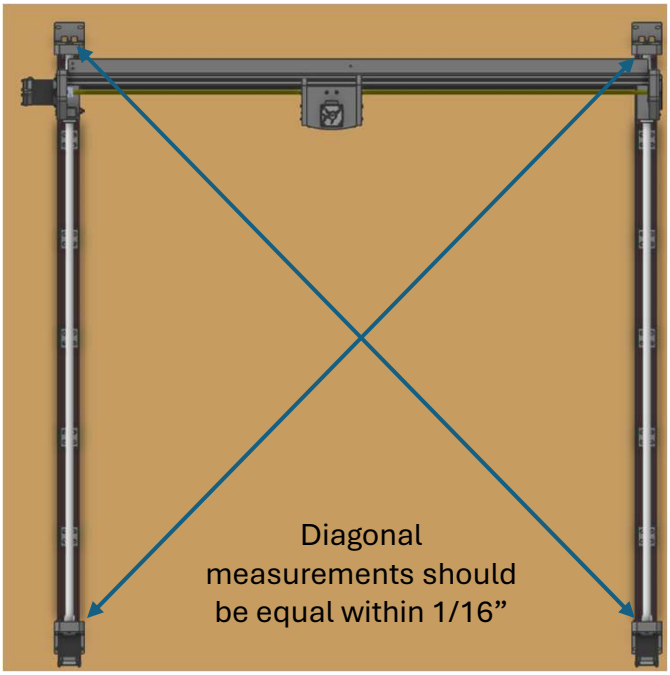
3. When the machine is squared, bolt down the back-right bracket using the included bolts and threaded inserts (see page XX).

4. Jog the Gantry to the front of the machine and bolt the front-right bracket to the table.

Note: More precise squaring will be done electronically with the Pendant.

Measure diagonally from the inside edge of the aluminum base ends





Maintenance

Periodic maintenance and lubrication keeps your *SHARK CNC* running efficiently and smoothly.

Use a dry lubricant for the rails, round bars, and leadscrews. Dry lubricant doesn't attract dust. Purchase *Dupont Silicon Teflon* at your local *Next Wave CNC* retailer or online at: *NextwaveCNC.com/shop*. You will find similar dry lubricant products at your local hardware store.

To lubricate the linear bearings, use the linear bearing grease and nozzle kit from *Next Wave*. It includes a light lithium grease and a nozzle to attach to a mini grease gun you supply:
https://www.nextwavecnc.com/shop/LINEAR-BEARING-GREASE-AND-6MM-NOZZLE-KIT-p208340135

Find additional maintenance information at:
https://nextwaveautomation.zendesk.com/hc/en-us/articles/4402720442253-HD5xx-Series-Lubrication-Guide

Daily

- Check for damaged wires or components. Repair or replace them as needed.
- Check for loose parts. Tighten or adjust as needed.
- Vacuum or dust off machine and components, including the controller and router.
- Wipe down the bars with a soft cloth.
- Clean the leadscrews with a soft brush or vacuum.
- Apply dry lubricant to the guide rods and leadscrews, wiping off the excess with a soft rag.

Monthly or Every 40 Hours of Use

- Deep clean the guide rods and leadscrews with mineral spirits or other mild solvent to remove wood glue and resin.
- Apply a light coat of dry lubricant to the round Y-bars and leadscrews. Wipe off excess with a soft rag.
- Grease the linear bearings (more often if needed) with the Next Wave grease and nozzle kit.

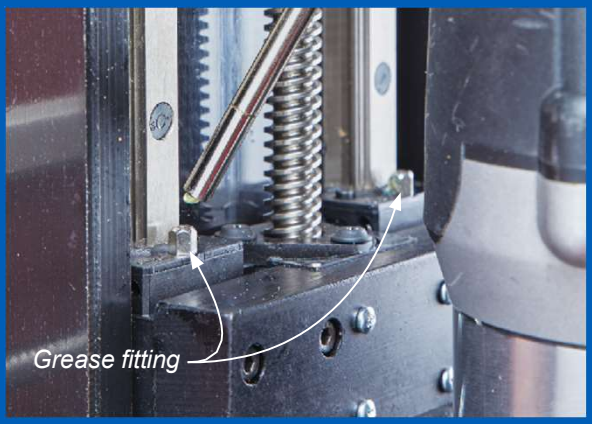
Guide Rail & Bearing Maintenance

X and Z Rails

Dust and debris build-up on the guide rails can have a negative impact on the performance of your machine, so it is important to keep them clean and lubricated. To maintain optimum performance, clean and lube the X and Z rails at least once every 8 hours of operation. While the machine is

Clean & Grease

Wipe the Pendant screen with a soft cloth and remove sawdust buildup.



Place the grease gun's nozzle over the grease fitting located on the bearings. Firmly push the nozzle against the bearing's grease fitting and use the trigger to apply the grease. It takes only a couple pulls for each application.

To lubricate the Z-axis bearings, you'll find the grease fittings behind the spindle mount.

stopped, wipe off the rails with a clean cloth or soft brush. After cleaning the rails, lubricate the bearings with a dry lubricant.

X and Z Bearings
The two Z-axis bearings are located behind the router/spindle mount. The two X-axis bearings are located behind the Z carriage. These four bearings require periodic lubrication with light lithium grease included in the linear bearing grease and nozzle kit from *Next Wave*. Linear Bearing Grease and 6mm Nozzle Kit Available at *www.NextWaveCNC.com/shop.*

Y Rails
Clean the round Y Drive rails in the same manner as the X and Z rails. After cleaning the Y rails, apply a dry lubricant then run the machine Y-axis back and forth a few times to distribute the lubricant evenly along the rails.

Y Bearings The round linear Y bearings on the Y Drive do not require lubrication. Applying dry lubricant to the round rails is sufficient.

Firmware Update
www.NextWaveCNC.com/firmware

Tramming and Surfacing
Tramming a CNC machine ensures that the spindle or toolhead is perfectly perpendicular to the table, which is crucial for achieving accurate and consistent cuts across the entire work area.

Surfacing a CNC table ensures precision and accuracy in machining by providing a flat, stable surface for consistent support and alignment of workpieces.

Tramming and Surfacing guides are available at
https://nextwaveautomation.zendesk.com/hc/en-us

Resources

Next Wave CNC
nextwaveCNC.com
Manufacturer of the *SHARK HD* and *SD* series CNC machines and accessories. The website offers software and documentation downloads, educational content, as well as information about the full line of *Next Wave CNC* products.

Next Wave CNC Technical Support
For questions about your *SHARK, Ready2Control* software, or other *Next Wave CNC* products, please contact our support team at *support@nextwaveCNC.com*

NWA Owners Only Forum
forums.nextwaveCNC.com/
Join our group exclusively for *Next Wave CNC* owners. You'll find projects, ideas, project showcases, and valuable support from users of all levels.

CNC SHARK Talk User Forum
www.cncSHARK talk.com
This discussion group is a valuable resource open to users of any CNC machine.

Vectric
vectric.com
For design support and training with *VCarve*, visit *www.vectric.com* and click on the Support Tab for information and video tutorials. You can also email your *VCarve* questions to *support@vectric.com.*

Upgrade Accessories

SHARK®
World Class. Made in USA.

Shark Tooth

- Transform your CNC router into a writing mechanism.
- Great for layout, checking tool path accuracy, plotting artwork, or labeling parts
- Made from commercial grade aluminum
- Required marker, pen, or pencil (not included)

SKU 20281

NEXT WAVE CNC

SHARK®
World Class. Made in USA.

3D Digitizing Probe

- Trace objects down to .001” detail
- Creates an STL model that can be imported into vCarve
- Works well for replicating basic shapes or carvings
- Reproduces damaged areas on antiques or other irreplaceable items

SKU 20176

NEXT WAVE CNC

NEXT WAVE CNC

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SHARK HD544

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