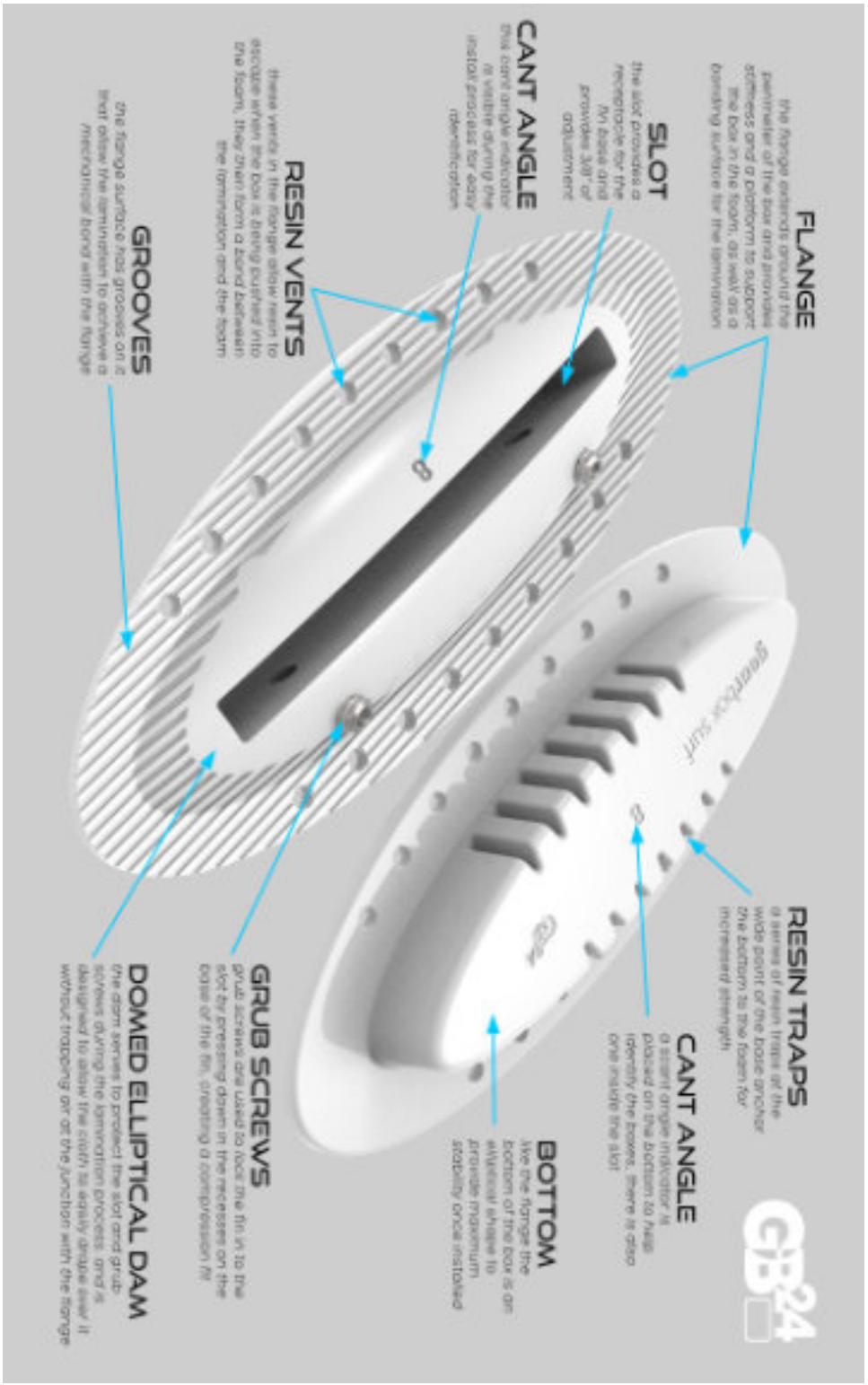


AUSTRALIA • HAWAI'I

https://gb24-box.com/install/

# INSTALLATION GUIDE

Revision 4


SANDED. AUSTRALIA

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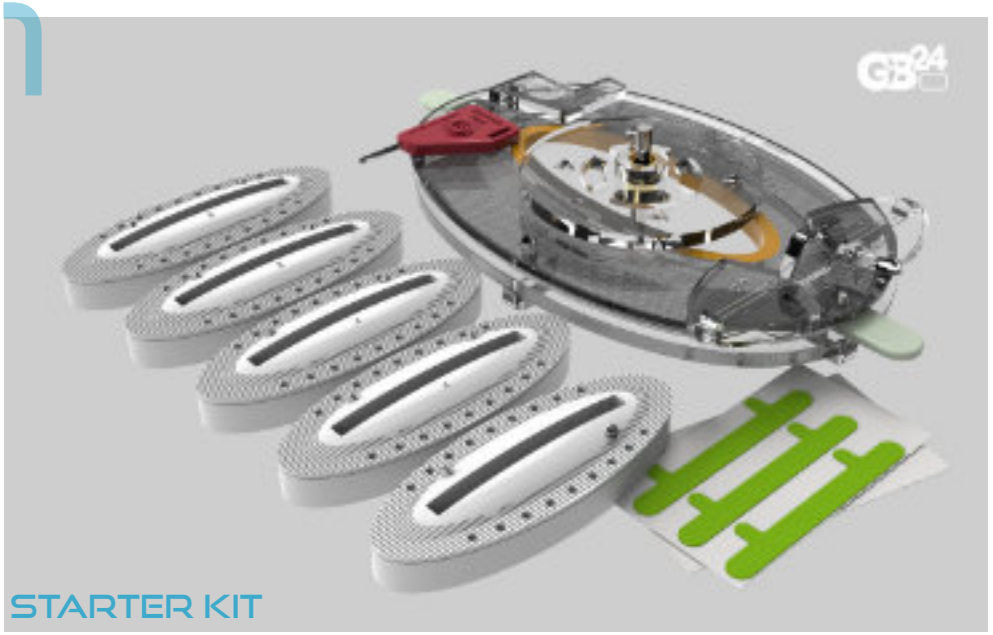
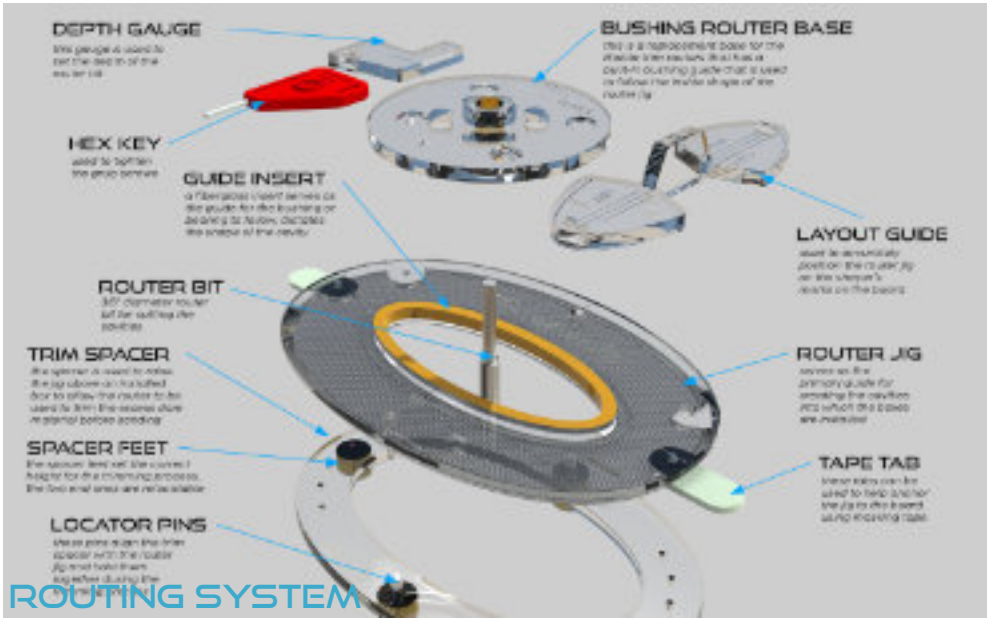



This guide will use our Starter Kit as the starting point, as it contains everything needed.

The kit includes two sets of side and a center box with foam collars, and the full **routing system**, as defined below.

1. **ROUTER BASE**: this replaces the existing router base and is only needed if the Makita routers are used.

2. **ROUTER JIG**: the jig is the primary means for both placement and routing of the box cavity. Features removable tape tabs on the ends that can be used to anchor the jig to the board with masking tape.

3. **TRIM SPACER**: used to trim down the dam of the box after installation using the router.

4. **LAYOUT GUIDE**: the layout guide fits inside the jig and positions the jig on the shaper's marks.

5. **DEPTH GAUGE**: used to set the depth of the router bit in the router accurately.

6. **ROUTER BIT**: this bit performs the actual guiding and routing operation.

7. **HEX KEY**: used to adjust the screws in the box.

8. **DIE-CUT TAPE**: boxes come with die-cut masking tape to cover the slot and screw holes. For both side and center boxes.

We also sell rolls of 3/8" masking tape that can be used in place of the die-cut tape.

## ROUTER BASE INSTALLATION

If you are using a Makita trim router, install the router base that accompanies the system before setting up the router bit.

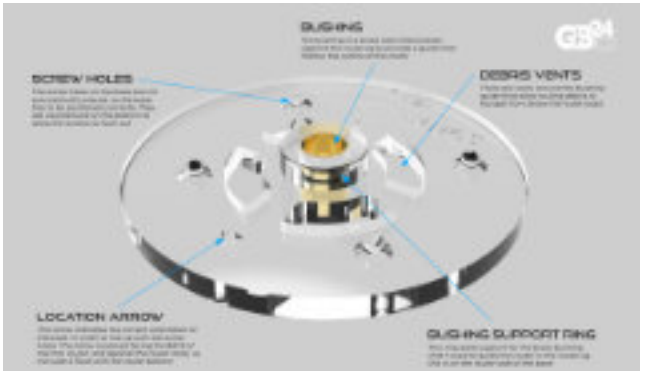
The **GB**[24] routing system ships with a replacement router base for Makita trim routers. Before proceeding, it needs to be installed on the router

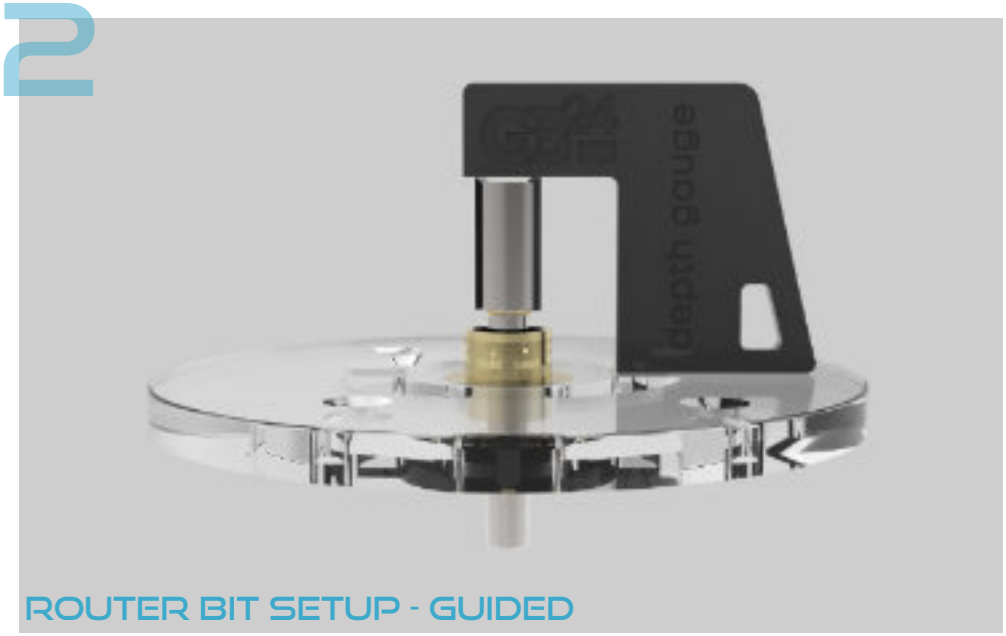
The standard base that ships with these routers is too narrow for safe use on the GB<sup>24</sup> router jig. The replacement base adds a guide bushing that eliminates the need for a guide bearing on the router bit. This greatly simplifies the routing process and saves a lot of money on the cost of the router bit.

Installation steps.

1. Install the router bit
2. Remove the existing base saving the countersunk screws.
3. Position the base on the router using the arrow on the base top. The arrow faces the router's back.
4. Re-apply the screws but don't initially fully tighten them.
5. Ensure the router bit is centered within the bushing guide.
6. Tighten the screws.
7. The base should have the guide bushing on the bottom once installed correctly.

Now, we can proceed to the next step, which involves setting the depth of the router bit.



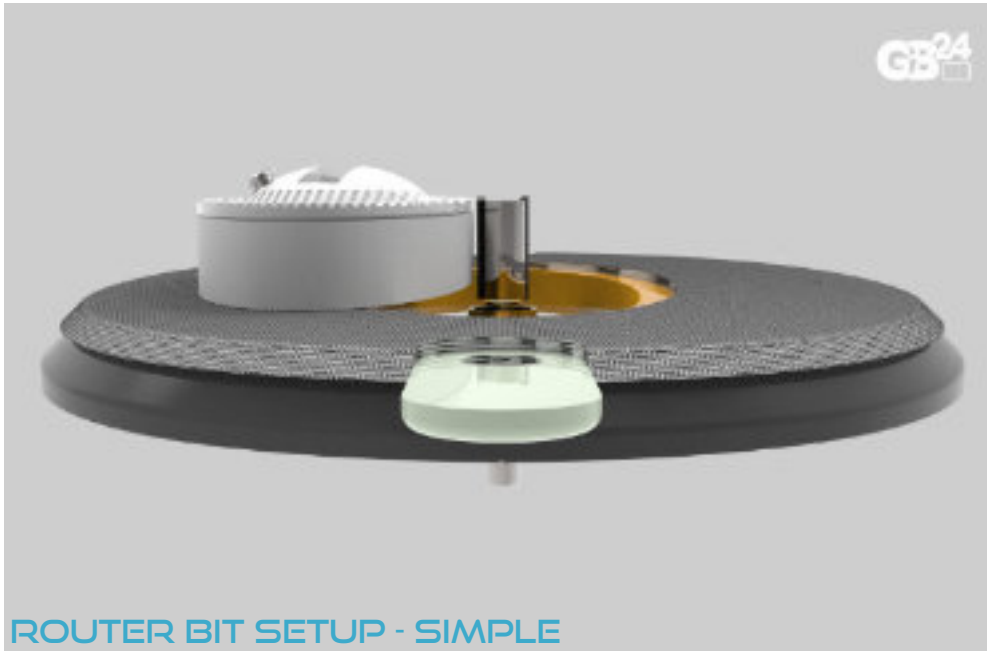


## ROUTER BIT SETUP - GUIDED

There are two steps for setting the bit depth.

First, use the provided depth gauge. Place the gauge on the bottom of the base with the router base facing up, as shown in the illustration. Now, adjust the bit's depth until it touches the underside of the gauge. After the initial depth has been set, proceed to the second step to check the accuracy of the setting.

Second, place the router jig on the base with the base facing upwards. Set the bottom of a box on the rubber pad on the bottom of the jig alongside the router bit. Check the bit's depth and adjust if necessary; it should be roughly 1/32" [0.8 mm] above the lip of the box, as shown in the illustration.



## ROUTER BIT SETUP - SIMPLE

We always want the box flange to end up below the lip of the cavity. This makes for the strongest and tightest installation. Attention to depth is critical as it can severely impact the installation process. Due to the length of the box, it is essential to consider any rocker at the bottom of the board when setting the depth. Ensure that the ends of the box end up slightly below the lip of the routed cavity. This might require setting the depth a little deeper to meet this requirement.

After setting the router bit depth, we strongly encourage making a test rout in scrap foam. This will help verify that the correct depth has been set before routing a board.

For further guidance on deep concaves and adjusting the bit depth, refer to the INSTALL→ MISCELLANEOUS section of the website. It can also be found at the end of this document.

***NOTE: if needed, the depth gauge can be skipped in favor of the second step.***

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## ROUTERS

Almost any router can be used for the installation process. It just needs to be able to fit a 1/4" shank router bit.

We recommend the MAKITA trim routers shown here because they are very effective and easy to handle. We also manufacture a custom base for these routers that features an integrated guide bushing. These bases use a router bit that has no bearing, making them much more inexpensive.

There are two versions: one that is battery-powered and a corded version. Both versions are almost identical except for the means of powering them.

We provide a replacement base with an integrated guide bushing and additional width for your safety and peace of mind. While not mandatory, it significantly enhances stability and support, making your experience safer and more enjoyable.

For other routers, our legacy router bit with guide bearing is required. The router bit has an upper bearing that guides the router around the inside of the router jig.

When using larger routers, it is important to anchor the router jig as there is more chance of it moving during the routing process. This can be accomplished with the tape tabs attached to the router jig.

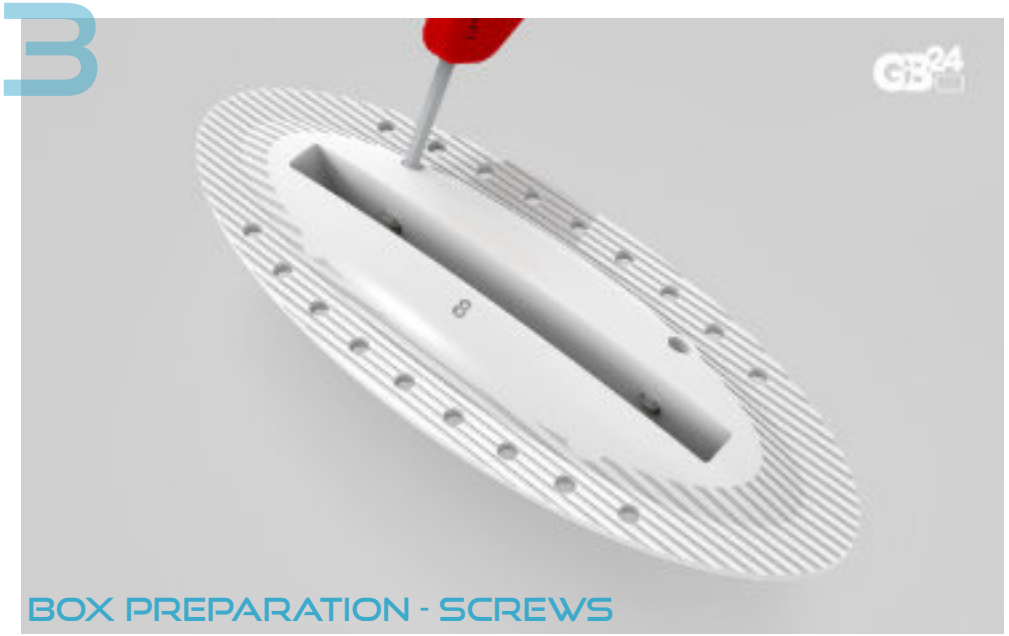
The specs for the router bits are as follows.

**Standard Router Bit** - ¼" shank diameter x 3/8" cutter width x ¾" cutting depth

**Legacy Router Bit** - ¼" shank diameter x 3/8" cutter width x ¾" cutting depth with ½" diameter upper guide bearing and a ¼" lock collar.


CORDLESS ROUTER


CORDED ROUTER

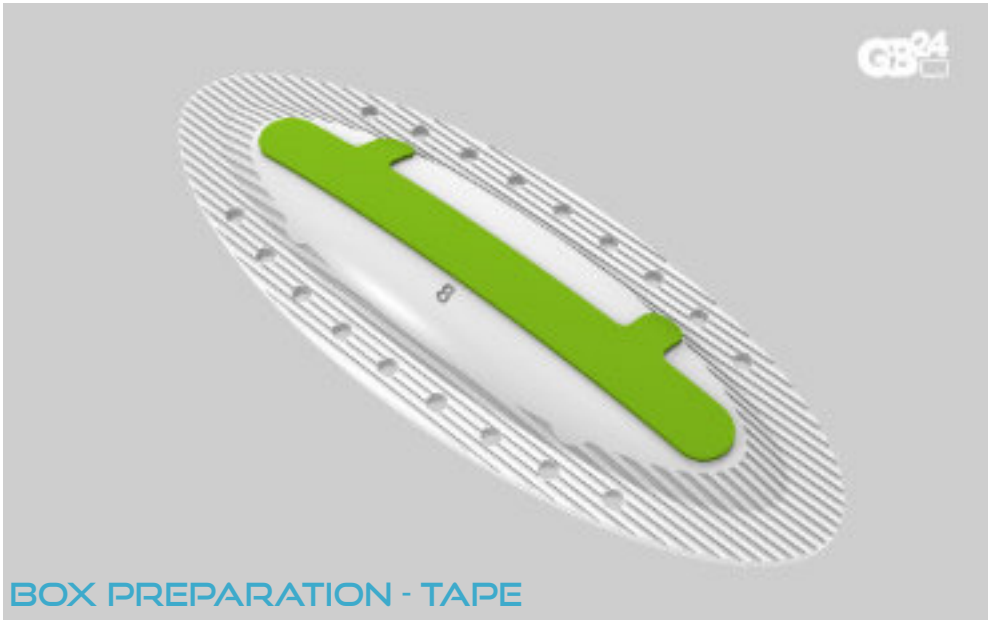


## BOX PREPARATION - SCREWS

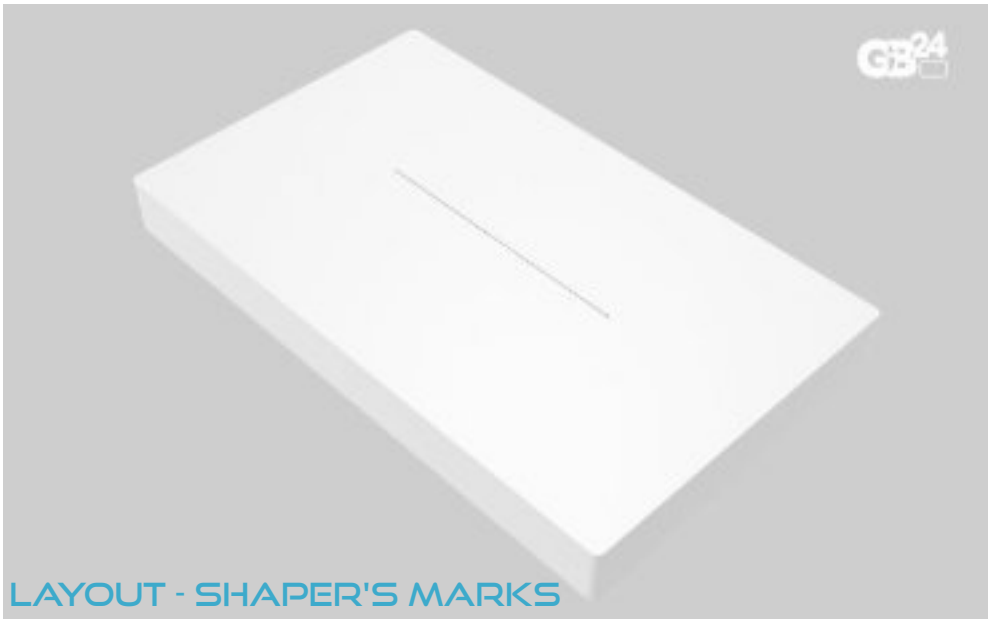
Firstly, ensure that the screws are either removed or turned down into the box so that they are protected from being touched during the sanding process. This is very important if the trim spacer is used to remove the excess dam material.

The box's slot needs to be covered with masking tape. The tape must be at least 3/8" wide and compatible with the resin system. We recommend 3M 233+ or 301+ masking tape. We sell rolls of this tape if needed. The screw holes should be filled with a small amount of **clay**. Be careful not to leave any clay residue on the dam, as this could interfere with the adhesion of the glass. NOTE: The original GEARBOX die-cut tape can also be used as it fits and is ideal for finishing. Tape can also be used over the screw holes; for this purpose, 1/4" wide tape is ideal.

Lastly, remove the foam collars from the bottom of the boxes. These must be installed before the boxes.



## BOX PREPARATION - TAPE



## LAYOUT - SHAPER'S MARKS

As part of the setup, the blank must have the shaper's marks and *fin layout lines*, for the desired fin setup.

After a surfboard has been shaped, the shaper will lay out a series of marks on the tail of the board where the fin system is to be installed.

The laminator will then utilize these marks to correctly place the boxes for the fin system.

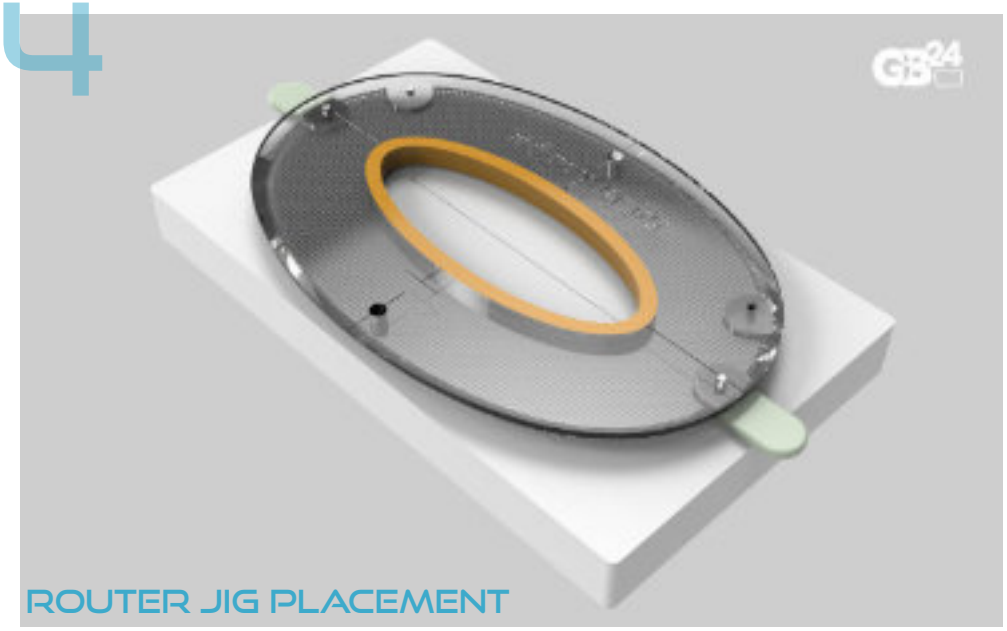
The back and front marks are key indicators in the installation process. The typical approach is to measure the back marks, with a front mark also established to indicate the amount of toe-in. Connecting these two dots with a line aids in the installation of the boxes.

For the **GB²⁴** system, it is also helpful if the shaper's marks are placed 4 1/2" [114 mm] apart, as this matches the layout in our guide.

## Place router jig on the marked surfboard blank, roughly lined up with the marks.

There is an arrow pointing to the rail of the board. This is not strictly required, as the jig is fully symmetrical, but it is a good habit to help stay oriented.

***NOTE: the jig features an optional attachment system. This takes the form of two tabs on either end of the jig. Masking tape can be applied over these tabs to anchor the jig to the surfboard. This is handy when performing a post-lam install, as the jig is more likely to slip on the bottom lamination.***



ROUTER JIG PLACEMENT

## Next, place the **layout guide** inside the router jig.

The layout guide aids in placing the jig exactly on the shaper's marks. It features a meticulous arrangement of lines, crosshairs, and windows on its bottom, all designed to align with the marks. For side boxes, the inner lines (closest to the stringer) mirror the inner faces of the box slot, serving as a guide for placement. The window and crosshairs are positioned over the BACK shaper's mark, enhancing visibility. For center boxes, the centerline is the key to accurate placement.

The detailed illustration of these lines shows what each line represents.

Here are the steps in the process.

1. place guide within router jig

2. for a side box, the inner line (closest to the stringer) and crosshair are used

3. adjust the jig and guide until the crosshair is on the BACK shaper's mark; the window makes it easier to see the mark

4. align the inner slot face with the line between the shaper's marks

5. for a center box, use the centerline and crosshair positioned on the shaper's mark

The key takeaway for this task is that you always work with the **BACK** mark for an individual box.

Once the jig has been positioned, it can be anchored using the tape tabs if needed. These tabs are optional and can be removed if not required.

## Layout Guide Details

The layout guide is used to accurately position the router jig on the shaper's marks. It has markings that help this process.

1. **Shaper's Window**: these windows make it easier to align the guide on the marks

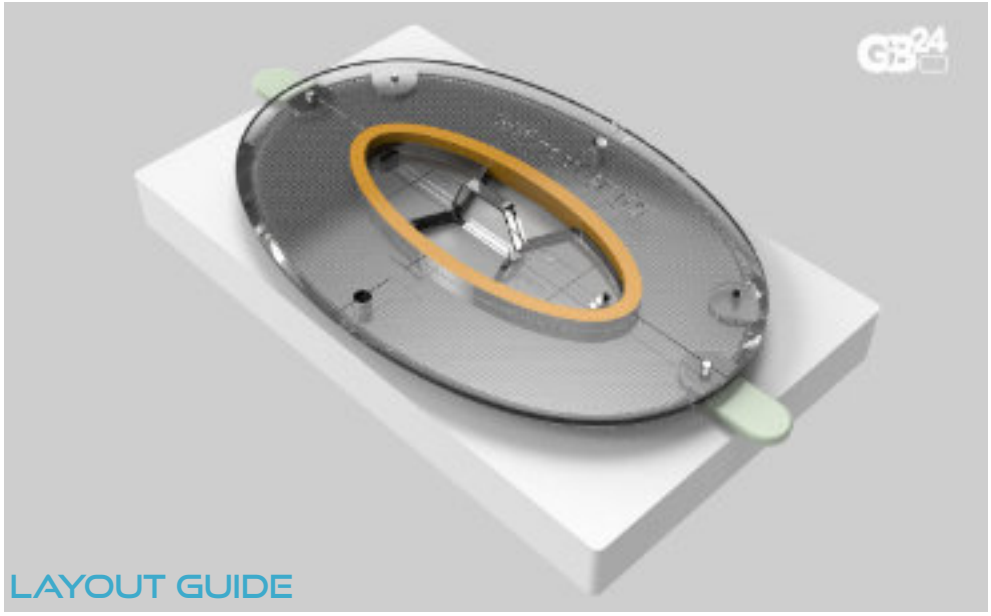
2. **Slot Faces**: lines that delineate the faces of the slot, which are crucial for aligning side boxes

3. **Centerline**: primarily used when installing center boxes

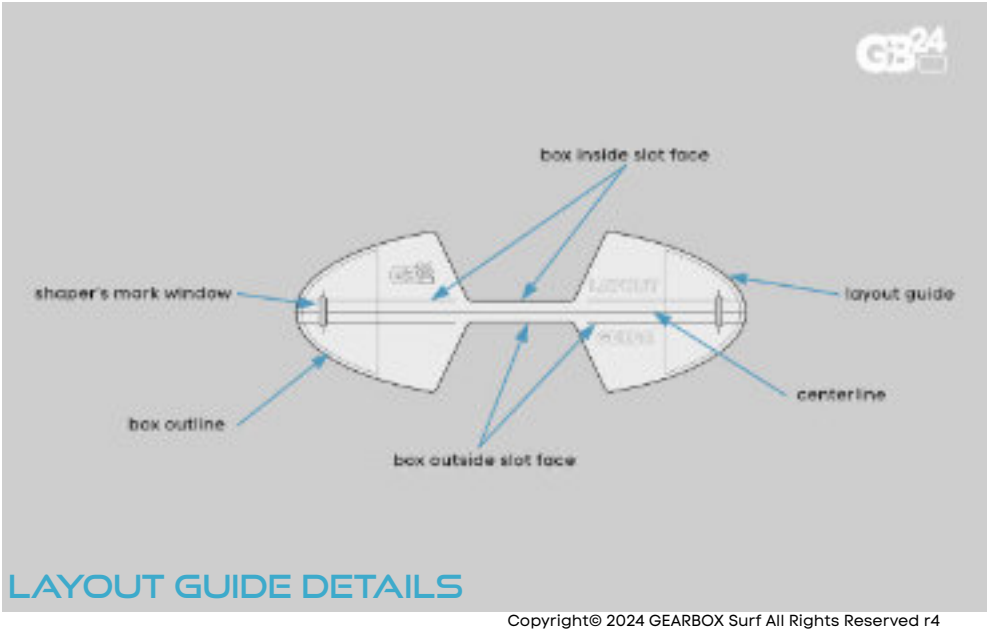
4. **Box Outline**: this serves to show where the actual outline of the box will be, also the ends of the slot are shown with these marks

5. **Shape**: the guide is shaped such that the edges in the center match up with the faces of the slot, this makes it easier to do the initial alignment. The center tab facilitates insertion and removal of the guide from the router jig

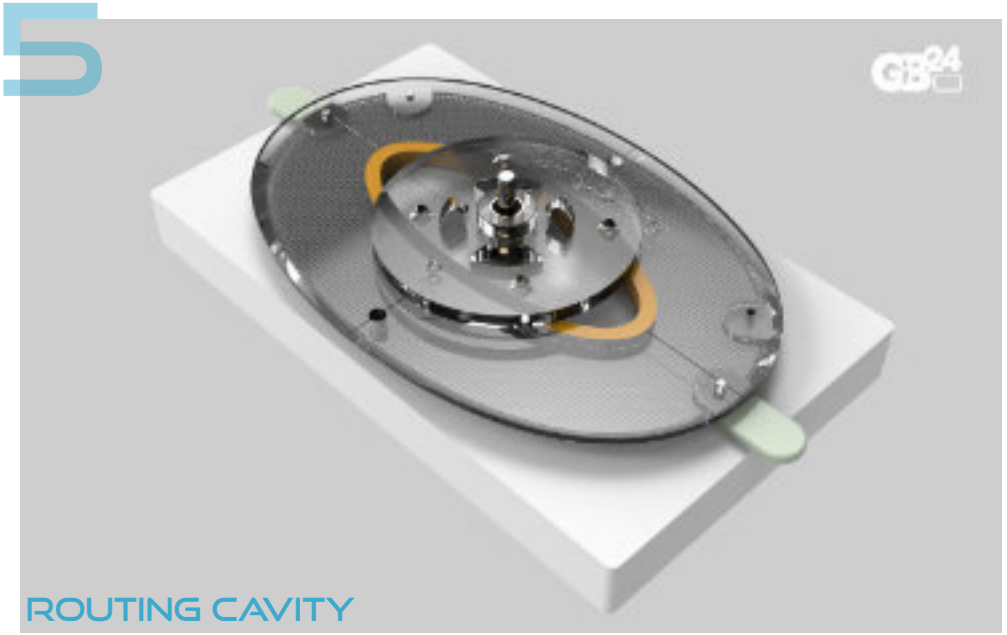




LAYOUT GUIDE




LAYOUT GUIDE DETAILS



ROUTING CAVITY

## Start the router and plunge it into the foam until the router base rests on the router jig.

Move the router assembly towards the edge of the jig until either the guide bushing or the guide bearing contacts the inner surface of the jig.

Now, meticulously follow around the inner edge of the jig with the router bushing or bearing in a clockwise direction. This precise movement should leave a clean perimeter. Next, carefully slide the router around within the jig to remove the excess foam left behind by the initial routing process. Remember, do not push too hard on the jig during this process, as you do not want to move it.

If a center box is being routed and a stringer is present, it is advisable to make shallow passes along the stringer's length to remove wood slowly. Once complete, follow the procedure described above by following the guide perimeter.

Ensure there are no pieces of foam left in the cavity that might need to be routed away.

Turn off the router.

***WARNING: ALWAYS WAIT FOR THE ROUTER BIT TO STOP SPINNING BEFORE REMOVING IT FROM THE JIG. THIS WILL HELP PREVENT ACCIDENTALLY NICKING THE JIG.***

*NOTE: Check the cavity depth with a box before removing the jig. If necessary, make the cavity deeper.*

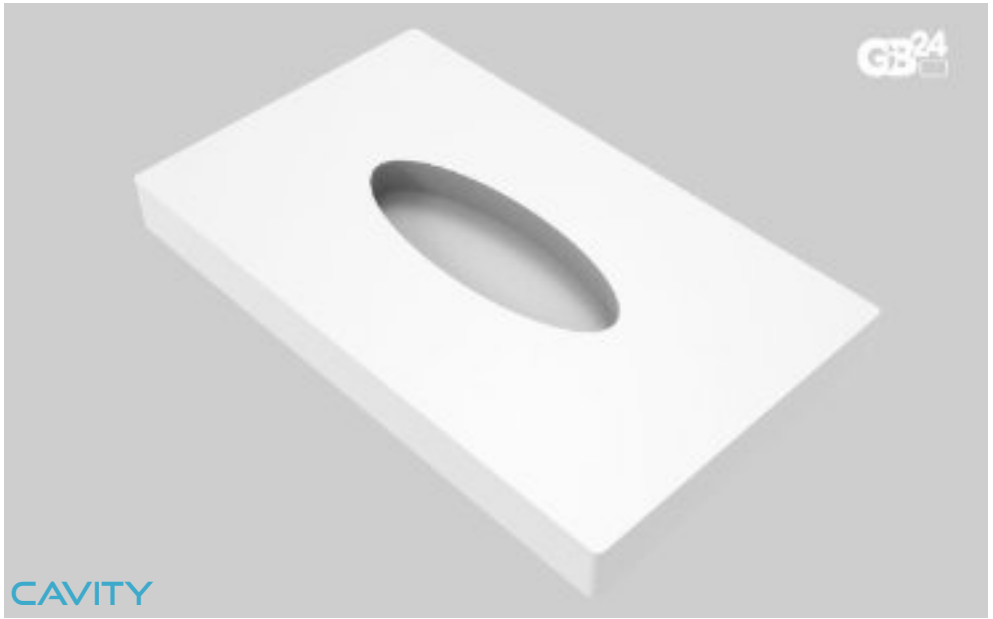
Finally, remove the router jig and repeat the process for the remaining boxes.

**Routers are inherently dangerous tools, so please be careful when routing and stay safe.**

## The first thing that will be installed is the foam collar.

Prepare a mixture of resin for the installation process.

Here are the steps in the process.



CAVITY

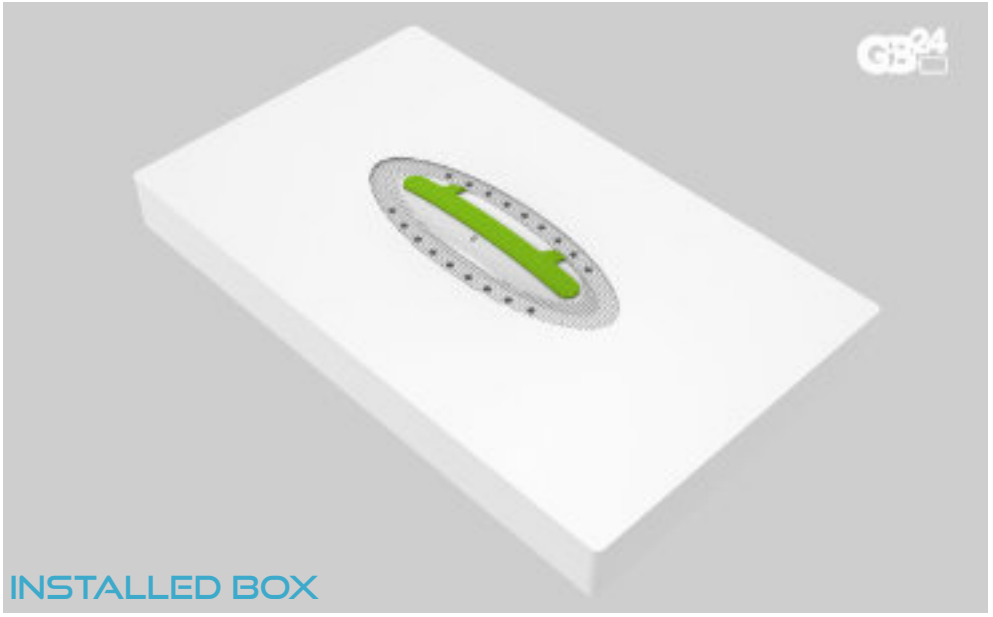
1. coat the inside of the cavity with  resin
2. coat the sides and bottom of the foam collar
3. push the collar into the cavity, ensuring it is all the way down
4. coat the top and inside surface of the collar with resin
5. pour about a 1/4" of resin into the middle of the foam collar

BOX INSTALL - FOAM COLLAR

INSTALL BOX

## With the foam collar installed the box can now be added.

1. push the box down into the cavity, making sure it goes all the way down flush with the collar
2. brush up any excess resin, leaving a thin film over the box flange and dam



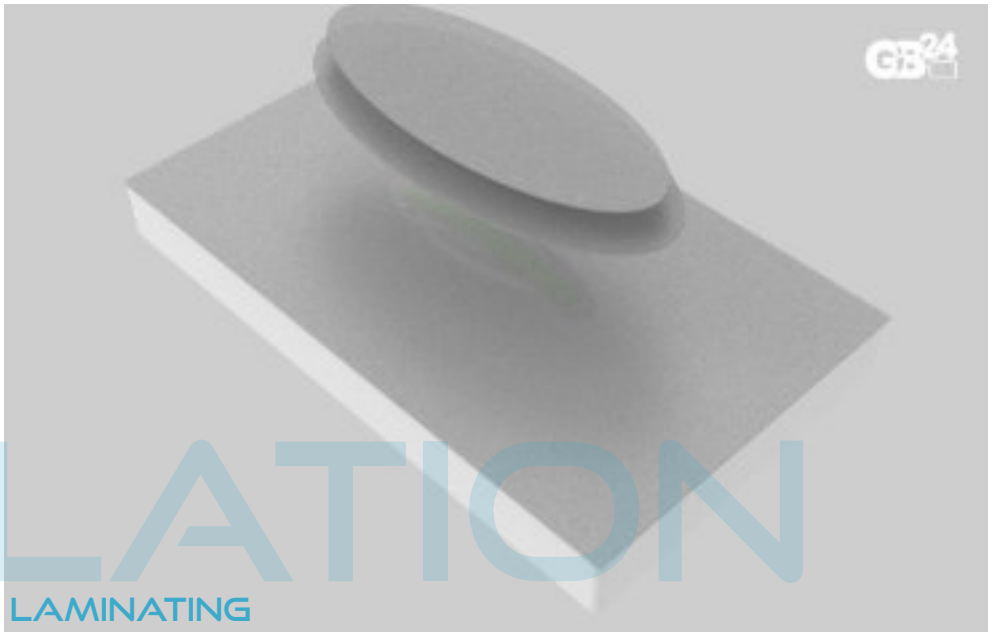
INSTALLED BOX

## With the box installed, it should be slightly below the cavity's lip at its lowest point.

Ensure no excess resin is left on the surrounding foam or the box. This will result in a cleaner installation when laminating over the box.

Now, continue installing the remaining boxes for the chosen fin setup.

If the boxes are installed without pre-potting, proceed straight to the lamination process.



LAMINATING

## We can proceed with laminating once all the boxes are glued in.

Prepare some extra 4 oz football patches that will be placed over the boxes once the bottom lamination has been applied. We recommend adding at least one additional layer, but two are better.

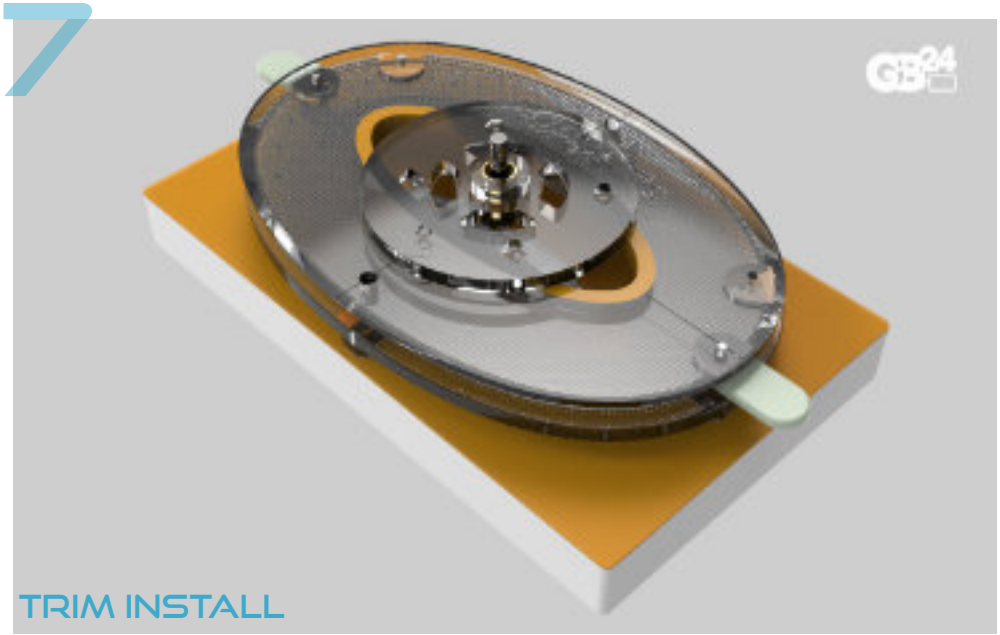
DO NOT PLACE THESE PATCHES UNDER THE MAIN LAMINATION! They should be placed ON TOP of the primary lamination. If two patches are used, they should be different sizes. The larger one would go down first, followed by one 1/4" smaller.

We place the patches on top of the primary lamination to make it much stronger. During the sanding process, the edges of the patches will be sanded and serve as indicators of the sanding depth. If the patches were under the primary layer, there is a risk of sanding through this layer at the edges of the patches. This would weaken the whole installation.

See the image for a visual.

If the boxes are being installed during the lamination process, follow the instructions for installing the foam collar and box before proceeding with the lamination. This can all be done at the same time.

Once the glass has been laminated over the boxes, run a finger around the bottom of the dam to remove excess resin and flush out any air bubbles. The extra layer of cloth can be applied at this time or after the primary layer has kicked off.



## TRIM INSTALL

To facilitate the sanding process, we provide a unique trimming operation.

As part of our routing system, we provide a ***TRIM SPACER*** to remove the excess dam material before sanding the board. It is utilized after the board has been hot-coated and before sanding.

The trim spacer is designed to sit underneath the router jig and raise it by a fixed amount off the bottom of the board. It has two locator pins that align the router jig correctly on top of the spacer. The shapes are symmetrical, but to keep things simple, we ensure that the labels on the jig and spacer are at the top when assembled. The arrow on the jig points towards the rail of the board.

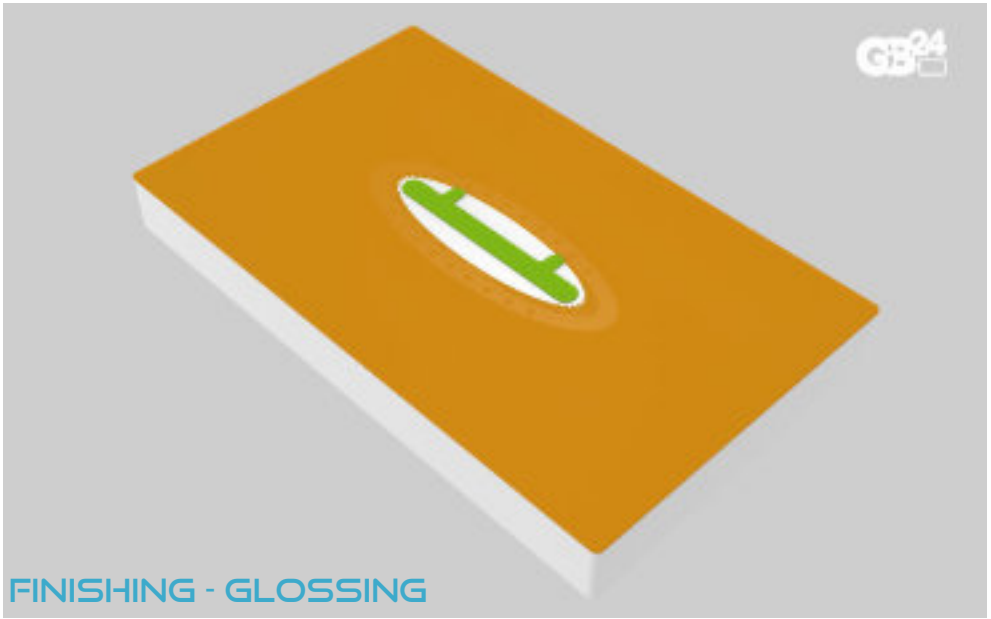
Once the jig and spacer have been assembled and placed on the board, the trimming operation can proceed.

***WARNING: BEFORE PROCEEDING, ENSURE THE ROUTER BIT'S BOTTOM IS ABOVE THE BOTTOM OF THE BOARD. IF NOT, THE ROUTER BIT MUST BE ADJUSTED, OR A SMALL SPACER CAN BE PLACED BETWEEN THE TRIM SPACER AND THE ROUTER JIG. THE BOTTOM OF THE ROUTER BIT SHOULD BE AT LEAST 1/16" [1.5MM] ABOVE THE BOTTOM OF THE BOARD.***

Place the router on top of the jig and make small passes around the dam, removing the excess material. Following the jig edge is unnecessary as we are not routing that far out. We recommend going slowly and taking off small amounts at a time. Ensure the spacer and jig do not move during the process.

***WARNING: IT IS CRUCIAL THAT WHEN THE BOXES WERE PREPARED FOR INSTALLATION, THE SCREWS WERE EITHER REMOVED OR TURNED DOWN WELL INTO THE BOX, AS WE DO NOT WANT TO RUN INTO THEM IN THIS TRIMMING PROCESS***

**See the end of this document for more details on the trim spacer.**



## FINISHING - GLOSSING

Now that the board and boxes have been sanded, if a gloss coat is going to be added, that is the final step.

If a gloss coat is to be applied after the sanding, we need to ensure that the boxes' slots are covered first.

The slot can be covered with 3/8" masking tape or die-cut tape. The screw holes can be filled with a piece of clay or covered with the die-cut tape.

Once all of the boxes have been covered, the glossing process can proceed.within the jig to remove the excess foam left behind by the initial routing process. Remember, do not push too hard on the jig during this process, as you do not want to move it.

With the application of the gloss coat, the board can now be polished as the final step of the process.

The masking tape over the box slots should have been removed during the gloss process before the gloss completely kicked off. This smooths the polishing process.

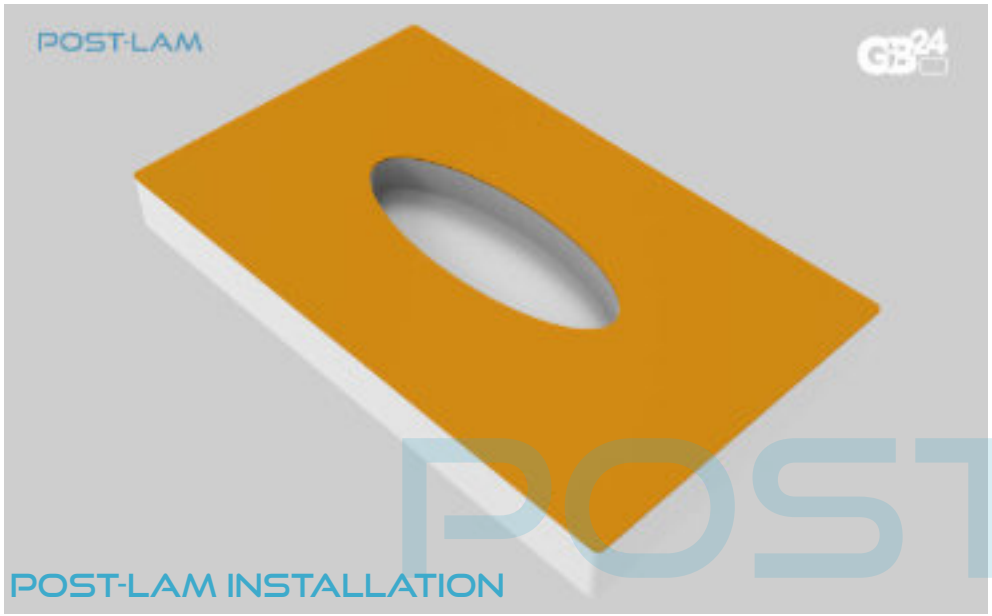
After polishing, a deburring tool can be used to clean up the edges of the box slots to remove any burrs from the sanding or glossing.

**CONGRATULATIONS AN INSTALLATION HAS BEEN SUCCESSFULLY COMPLETED!**

# 8 Besides the normal installation process described above, another option is a post-lam install.

A post-lam install is performed after the glass has been applied to the bottom of the board. This method is most commonly used with a tint or opaque-color glass job where it is not desirable to have the color over the box's flange.

Due to the unique shape of the **GB²⁴** box's dam, it still looks great with a color lamination directly over the box. So, this post-lam methodology is optional. Post-lam installs also add some extra strength to the box install.




## STEP 1
Creating the box cavities.

The first step is to create the cavities in the bottom of the board. This process is identical to the normal one, except we will route through the bottom lamination.

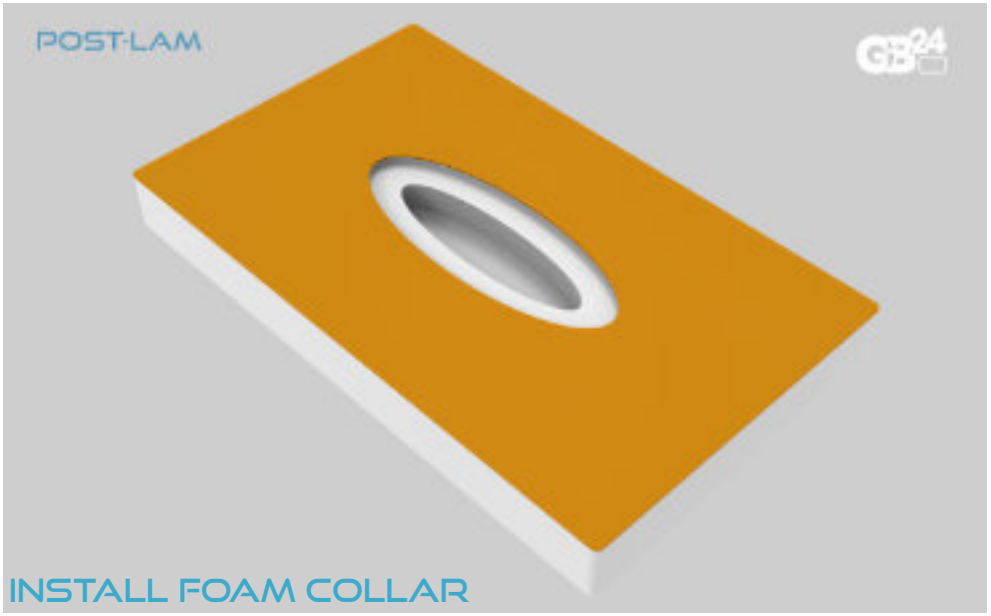
Follow the process as described previously for laying out the boxes and routing the cavities.

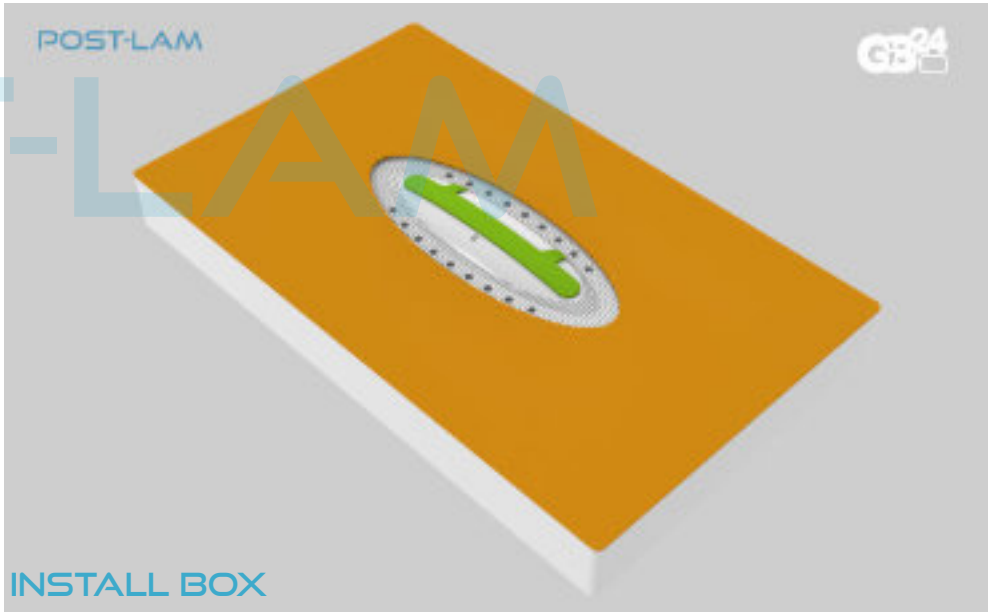
## STEP 2
Install the foam collar.

The next step is to install the foam collar into the cavity. As before, use a small amount of resin to wet out the cavity's interior and the foam's edges. Press the collar into the cavity, ensuring it goes down all the way.

## STEP 3
Now install the box.

With the foam collar in place coat it with resin and pour some excess resin in the cavity. Press the box down firmly in the cavity till all of the excess resin has been squeezed out.

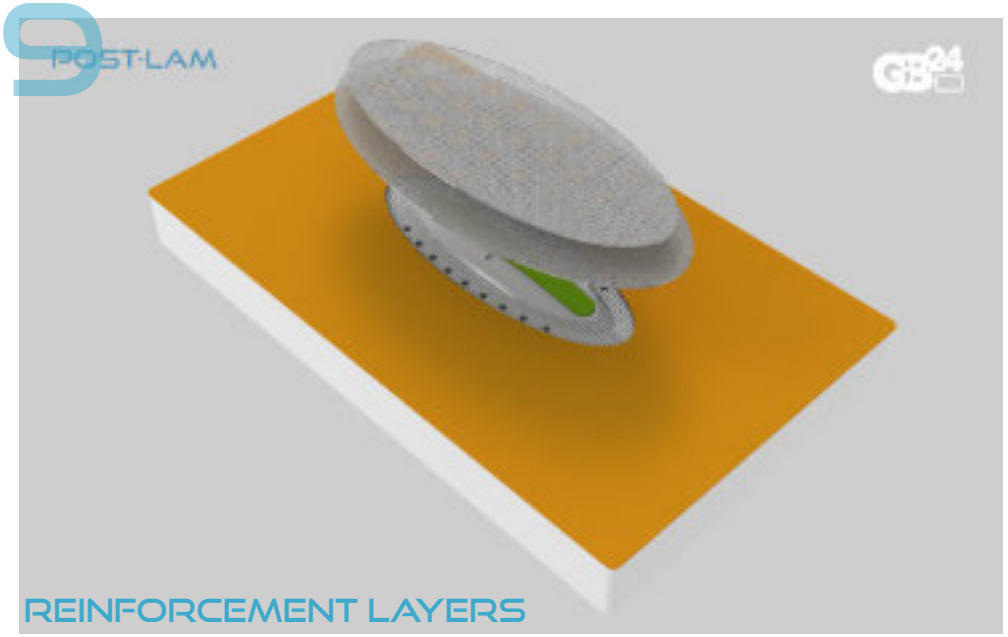



## STEP 4
Add reinforcement layers over the box.

Once the box has been fully seated in the foam collar, use the excess resin to apply a football-shaped layer of cloth over the box. One or two layers can be used. We recommend using 4 oz for this process, with two staggered layers.

Remove all excess resin and squeegee down the cloth. Run a finger around the dam's base to push the cloth tight to the dam and remove excess resin.

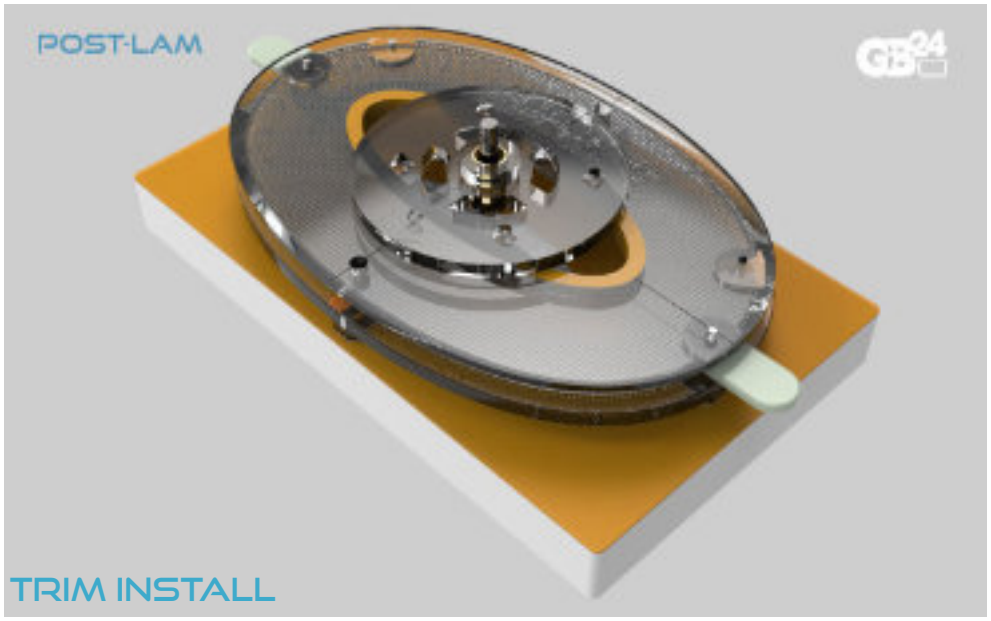



REINFORCEMENT LAYERS

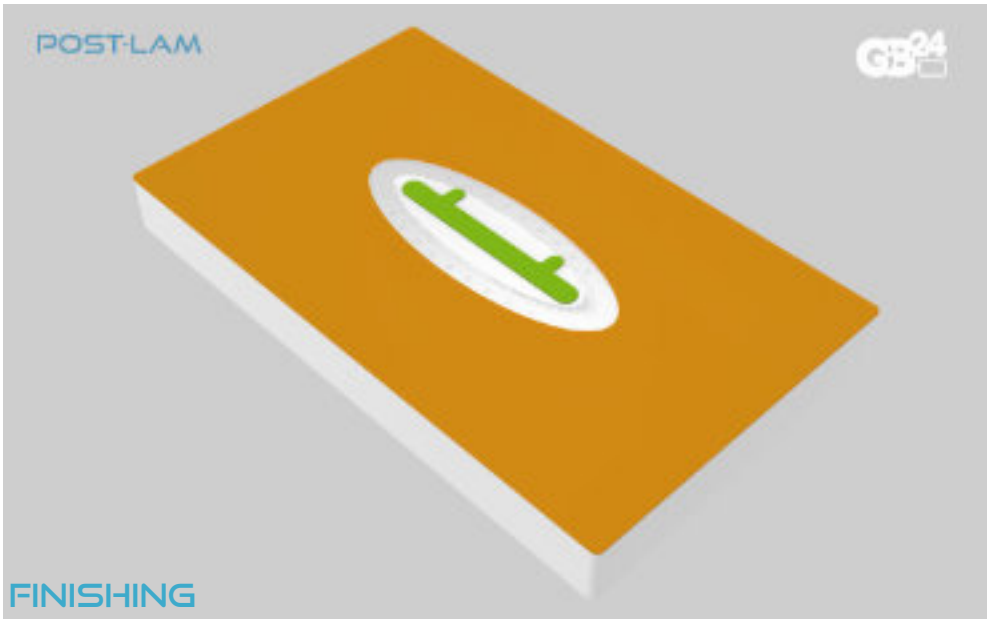
## STEP 5

With the boxes installed we can proceed to the sanding.

Due to the shape of the **GB24** dam, excess material needs to be removed. Our standard process for this is to use the router. However, the dam can also be sanded down, although this is more tedious. Our routing system provides a TRIM SPACER that can be placed over an installed box; the router jig is then placed on top of the spacer and located with pins provided in the spacer. Once the jig and spacer are in place, the router can be used with the standard bit to remove the excess dam material. The router bit does not need to be adjusted, as the spacer creates the correct height adjustment. Repeat the process for all the boxes. **See the end of this document for more details on the trim spacer.**




TRIM INSTALL

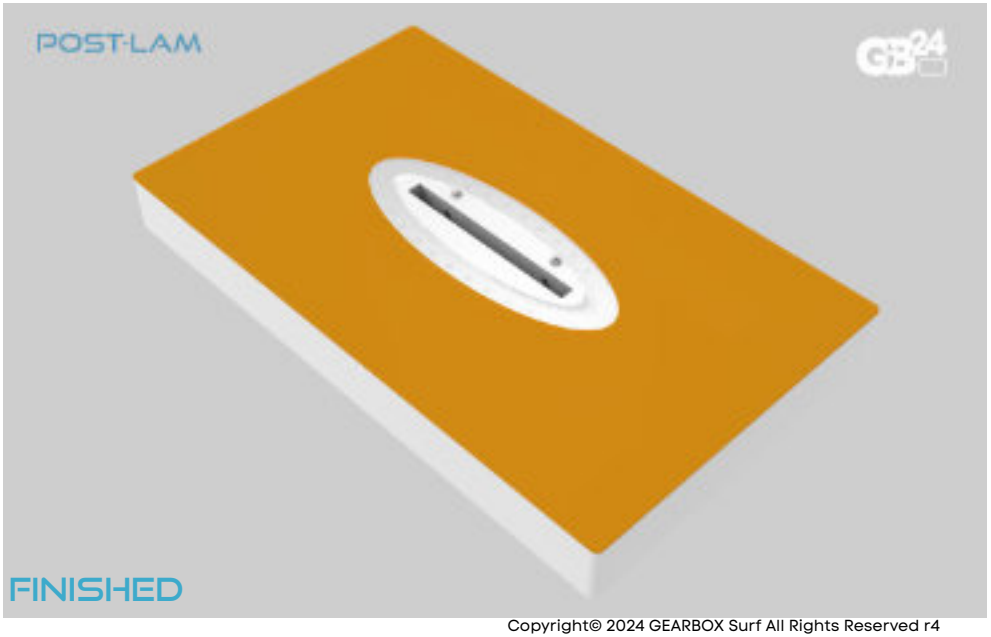



FINISHING

## STEP 6

Finishing the installation process.

With the boxes trimmed down and the sanding process completed, the board can now be gloss-coated if one is going to be applied. In preparation, cover the slot with masking tape or die-cut tape. The screw holes can also be plugged with clay. Once all of the boxes have been covered, the gloss coat can be applied. Remove the tape as soon as the gloss-coat gels.




FINISHED

# DEEP CONCAVE INSTALL

When installing boxes on a board with deep concaves, an extra precaution must be taken to ensure the boxes are installed cleanly.

When the router jig is placed on a deep concave, it can bridge the concave, as shown in the illustrations below. When this happens, and the STANDARD router depth is utilized, the box will not sit flush.

For this reason, the depth will need to be deeper by the amount of bridging. The aim is to get the box to sit slightly below the lowest part of the concave. The depth gauge will not provide enough depth due to the concave. Generally, working with normal concaves takes about an extra 1/32" / 0.5 mm of extra depth.

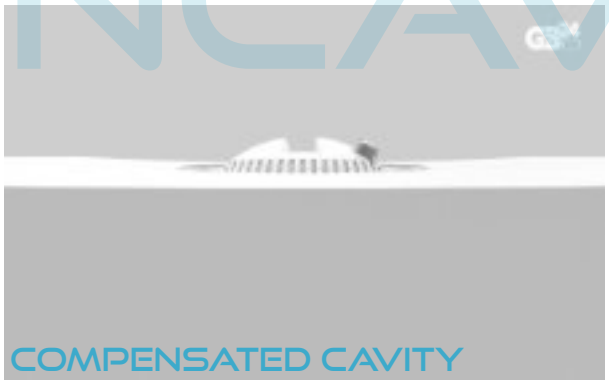
Always do a test run to check that there is enough depth. The illustrations below show what things will look like with a standard rout and the compensated-depth version.

ROUTER JIG ON A DEEP CONCAVE

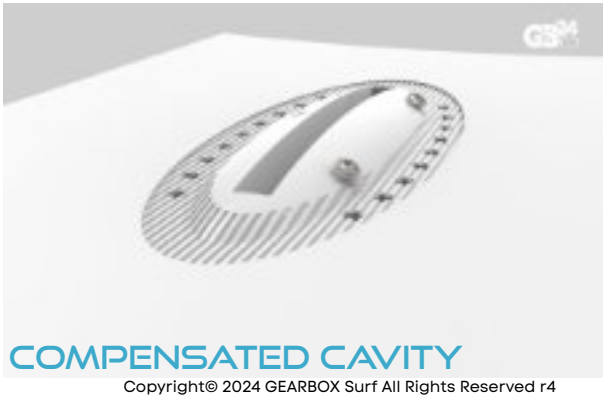
ROUTER JIG BRIDGING CONCAVE

BOX RAISED IN CAVITY

BOX RAISED IN CAVITY



COMPENSATED CAVITY



COMPENSATED CAVITY

# TRIM SPACER DETAILS

The trim spacer can save time trimming down the dam of the boxes, but it is crucial to understand how it is utilized.

As part of our routing system, we provide a ***TRIM SPACER*** to remove the excess dam material before sanding the board. It is utilized after the board has been hot-coated and before sanding.

The trim spacer is designed to sit underneath the router jig and raise it by a fixed amount off the bottom of the board. It has two locator pins that align the router jig correctly on top of the spacer. The shapes are symmetrical, but to keep things simple, we ensure that the labels on the jig and spacer are at the top when assembled. The arrow on the jig points towards the rail of the board.

The spacer has four feet, two movable on either end. These movable feet can be relocated to avoid sitting on adjacent boxes or if one of the feet is off the edge of the rail. The two center feet are fixed, and these feet hold the locator pins for the jig.

Each end of the spacer has a series of seven holes into which the end feet can be located. Each foot has a pin that fits in these holes.

Rubber pads on the bottom of the feet protect the board. Double-sided tape can also be attached to the bottom of these feet to secure the spacer on the board, preventing it from moving during the trimming operation.

Once the jig and spacer have been assembled and placed on the board, the trimming operation can proceed.

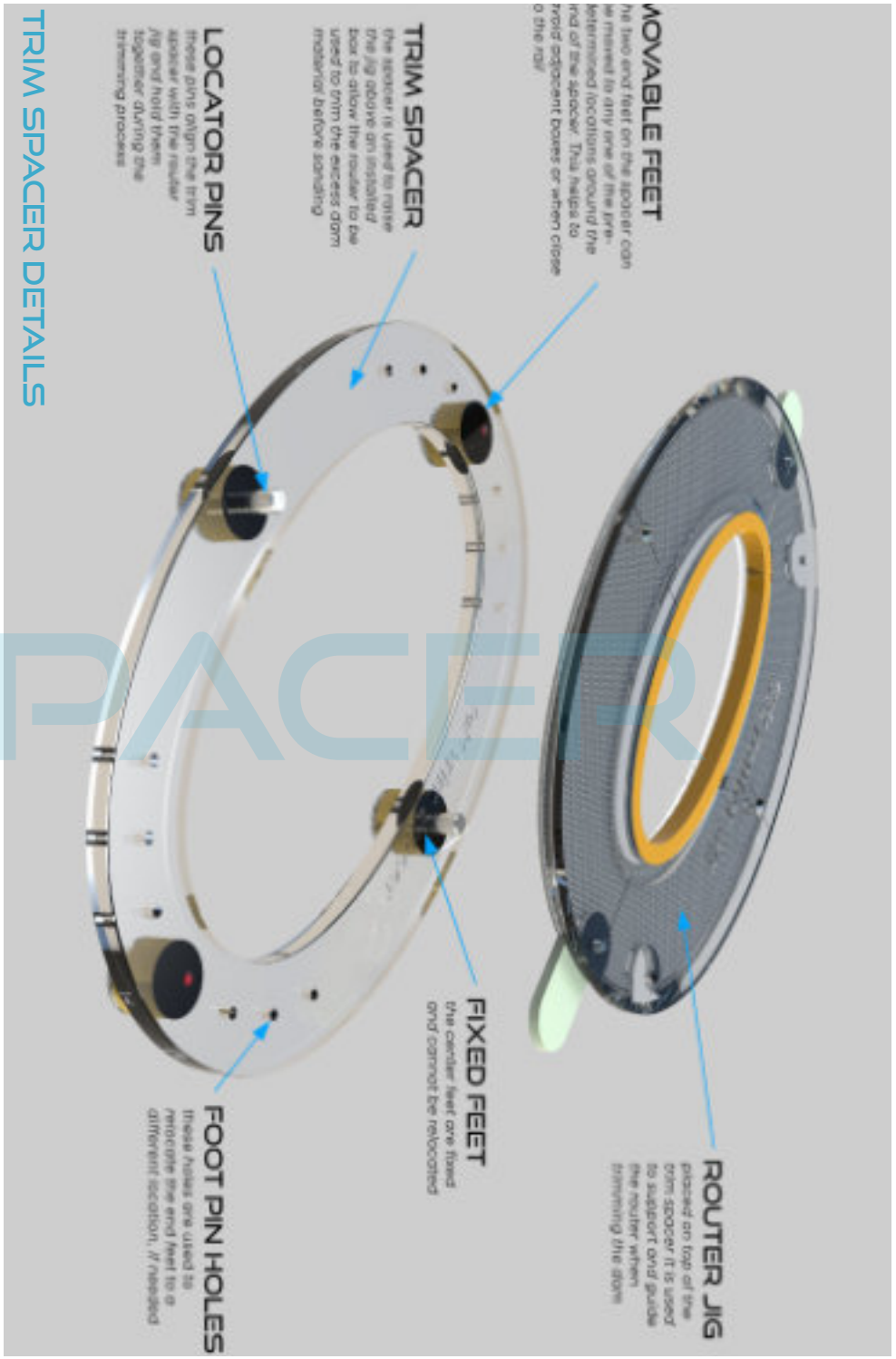
***WARNING: Before proceeding, ensure the router bit's bottom is above the bottom of the board. If not, the router bit must be adjusted, or a small spacer can be placed between the trim spacer and the router jig. We provide four rubber spacers for this purpose. They can also be used initially to get a feel for the process as they raise the router bit to take off a smaller amount of the dome=======. The bottom of the router bit should be at least 1/16" [1.5mm] above the bottom of the board. Typically, the router bit should not need to be adjusted, this would only be the case if for some reason it was set deeper than normal.***

Place the router on top of the jig and make small passes around the dam, removing the excess material. Following the jig edge is unnecessary as we are not routing that far out. We recommend going slowly and taking off small amounts at a time. Ensure the spacer and jig do not move during the process.

***WARNING: It is crucial that when the boxes were prepared for installation, the screws were either removed or turned down well into the box, as we do not want to run into them in this trimming process.***

*NOTE: This process can be skipped if the sander is willing to sand down the dams with a grinder. We recommend using a 40 or 50-grit disc and running the grinder at a slow speed. This helps reduce the plastic melting. Go slow!*

**Be very careful when using this process. If the height of the router bit is not set correctly, it could easily damage the board. Double-check everything before proceeding. Go slowly when removing material, as the router bit could bind in the plastic.**



# ROUTING SYSTEM DETAILS