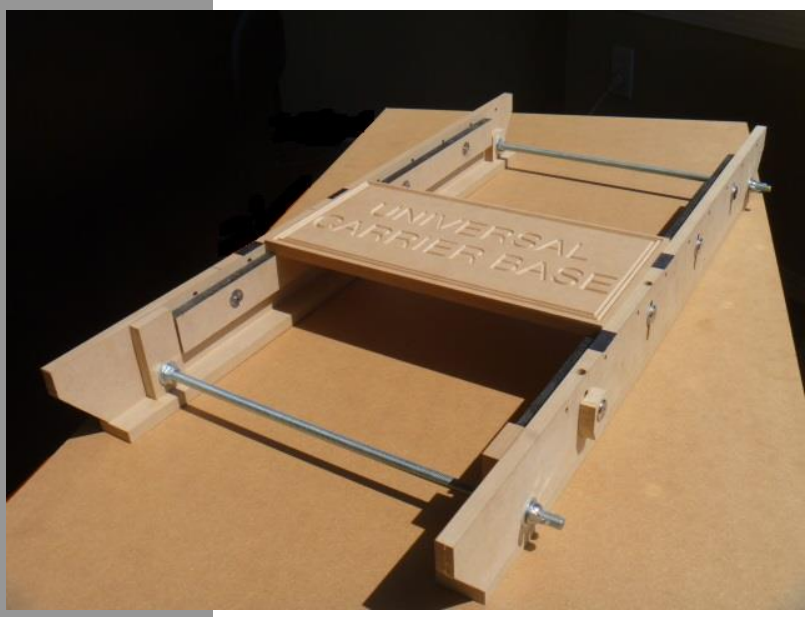
PROJECTS by CARVEWRIGHT™

UNIVERSAL CARRIER BASE

PROJECT INTERMEDIATE DIFFICULTY

The Universal Carrier Base is a fixture which holds boards in the CarveWright Machine. It holds boards up to 24ò long, 14ò wide, and 1.5ò thick. (A longer model holding up to 36ò is also included.) Because of the unique operational design, the machine measures only the board in the Carrier Base and not the Carrier Base itself. The Carrier itself always stays under the rollers so there is no need to add that extra 7ò of board. Say goodbye to end blocks, masking tape, warped boards and tracking problems. The board simply lies in the carrier on sandpaper rails. Machine operation with the board in the Carrier is very similar to machine operation with a board on the belts. Even though it is a simple fixture, having it will dramatically change how you use your CarveWright machine.



Materials List

Project Files

- Å UCB 24.mpc
- Å (UCB 36.mpc)

Board:

- Å 1/2òx 14òW x 40òL MDF

Materials:

- Å wood glue
- Å (6) ¼ò30mm furniture bolts
- Å (2) ¼ò40mm furniture bolts
- Å (8) ¼òT nuts
- Å (8) ¼òwashers
- Å 1òwide grip tape
- Å 5òclamps
- Å 5/16òForstner drill bit
- Å 3ô 3/8òready rod
- Å (2) 3/8òwing nuts
- Å (6) 3/8ònuts
- Å (8) 3/8òwashers
- Å (2) ¼ògluing dowels
- Å black permanent marker

Hand Tools:

- Å hacksaw
- Å vise
- Å Drill

Power Tools:

- Å band or table saw

MAKING THE CARRIER

STEP 1 - Cut Out the Parts

All of the wooden parts are cut out of a single piece of sheet wood. You need only the 1/8ò cutting bit. The project uses ½ò MDF (Medium Density Fiberboard). MDF is dimensionally stable and cheap. (One could also use hardwood if one wants to separate the parts into separate project files to be cut on separate boards.) The included project files are for two sizes of Universal Carrier Bases, UCB 24.mpc and UCB 36.mpc. The UCB 24 holds up to 24ò long boards and the UCB 36 holds up to 36ò long boards. The instructions here will be for the shorter UCB 24. (Some extra details for the UCB 36 are given in the notes at the end.)

Open the UCB 24 project file in Designer and upload the UCB 24 project to the card. (It is all cut out and so just use the normal setting.) Insert the card in the machine. Load a 1/2ò by 14ò+ wide by 40ò long sheet board in the machine. Make sure it will not bind between the squaring plate and the sliding plate.

I suggest you first measure the board. On the keypad press 0ï 7ï ñ1) Lengthò. The machine will measure the width first and then the length. (You may want to give the ends of the board a helping hand as the opposite ends of the board come out from under the rollers during the length measurement.) Watch how the board tracks and make sure it does not drift away from the squaring plate. If the length measured is in agreement and tracking looks good, continue to load the project.

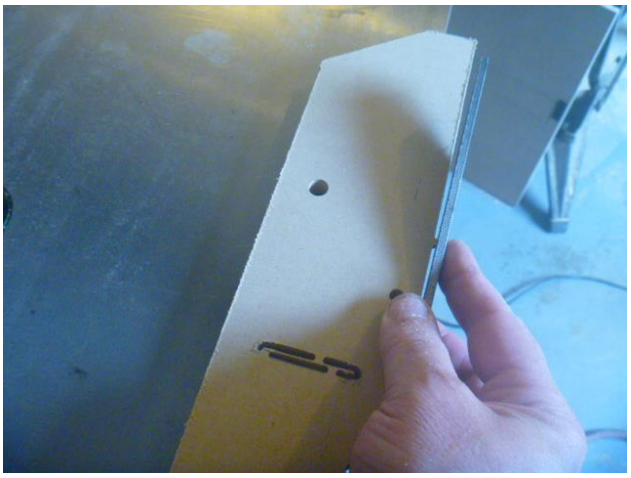
You may choose Yes or No to stay under the rollers but choose:

- 1) Keep Original Size.
- 1) Center On Board
- 2) NO on ñCut Board To Sizeò

(If you are asked to scale, your board is not wide enough. You need a board which measures greater than or equal to 14ò wide. If you change the board width in the mpc, you will not be able to cut the base rails out of the left over sides of the board.)

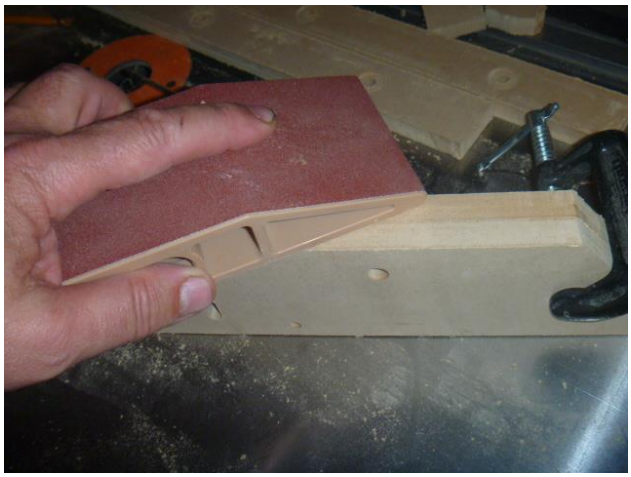
STEP 2 - Clean Up the Parts

Once the machine is finished cutting out the parts, remove the board from the machine and flip it over. Use a razor saw, or hacksaw blade, to cut all the tabs.



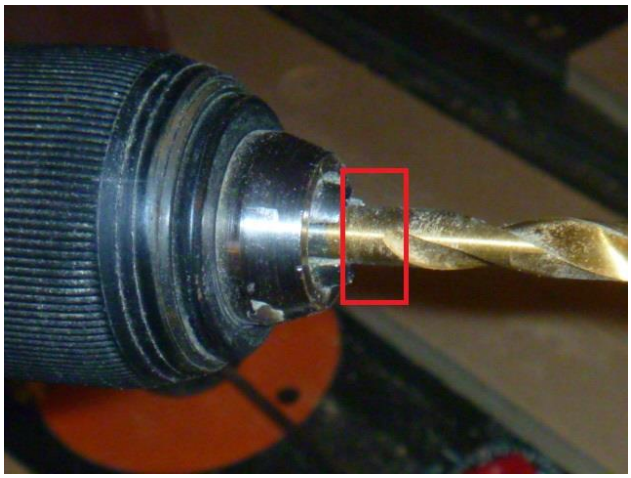
I use a coarse file to then finish the tabs flush to the sides. Run a piece of medium sandpaper along the edges to clean them up. One can also make a careful pass with a sanding block along the sides to clean up the cutting bit marks. The

bottom of the sides will be glued to the base rails and so, it is important that the bottom edges be flat and square. If they are not, clamp both sides together and block sand them together to make them flat and square.



(A router table or jointer, if you have either one, would, of course, be ideal for this.)

The bolt slots have some tabs in them which are hard to file out. Use a 1/4ò or 17/64ò drill bit in your drill. The trick is to chuck the bit so that just ¼ò of the bit shank before the flute is outside the chuck.



This will act as a guide to limit the amount of cutting the sides of the bit can do. Put a Carrier side in the vise with the tabs in the back. Now put the drill bit all the way into the slot and use it like a router to clean up the slot.

Only run the drill with the bit all the way in. Stop the drill before pulling it out.

The base rails of the Carrier were not explicitly cut out as part of the project. They can be cut from the left over sides of the board.

With a table saw or band saw, cut the left over sides into 1.5ò wide strips 29.5ò long. The base rails need smooth edges and and uniform width.

STEP 3 - Glue the Parts

Now that all the parts are made and cleaned up, the sides of the Carrier have to be glued to the base rails. For this you need a flat table surface and a half dozen or so clamps. Clamp a side of

the Carrier flat onto the table and glue the base rail onto the bottom of it. (You do not need a lot of glue.) It helps to have a flat piece of scrap wood under the side and base rail to give some clearance for the clamps. (The piece of duct tape under the side is help to make sure the base rail is better than flush with the underside of the side.) Check that the clamping is square.

After the base rails and sides have been glued together, glue on the stabilizer rod bosses. Use some 3/8ò bolts to both keep the holes lined up and clamp the pieces together. The square one goes on the rear and the rectangular one stands upright in the front. (It also acts as a board stop.) Look closely at the sides and note that the front end is the longer end. (The front is longer so the Carrier front stays under the roller even when measuring the board.)

(If you do have a router table, a better order would be to glue the bosses on first, router edges square and then glue on the base rail.)

STEP 4 - Install the Hardware

The Ready Rod

Cut two 16.5ò lengths of ready rod with a hacksaw and clean up the cut ends with a file or grinder. (You may want another set of shorter lengths if you do not anticipate carving wide boards very often. I have set of 12ò rods which I use for narrower projects.)

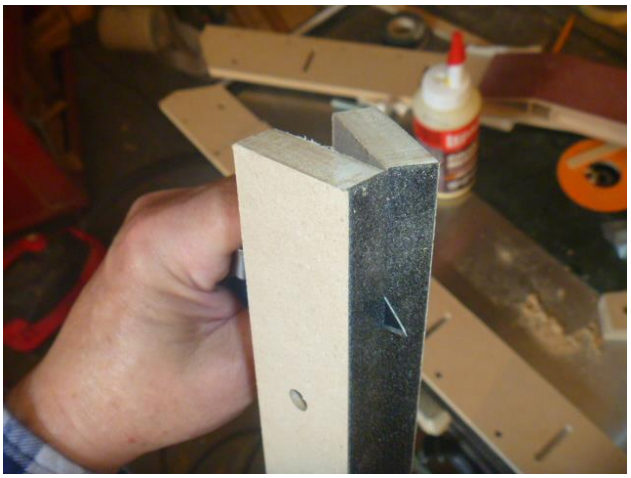
The T Nuts

Use a vise with a small socket to press the T nuts into the Carrier Rails. (First just press them all in flush with the vise and then press them in deeper using the socket.) The T nuts I used were 5/16ò OD with a 3/4ò flange. If your T nuts need bigger holes than were cut (0.3ò for a press fit), you may need to drill them out.

The Grip Tape

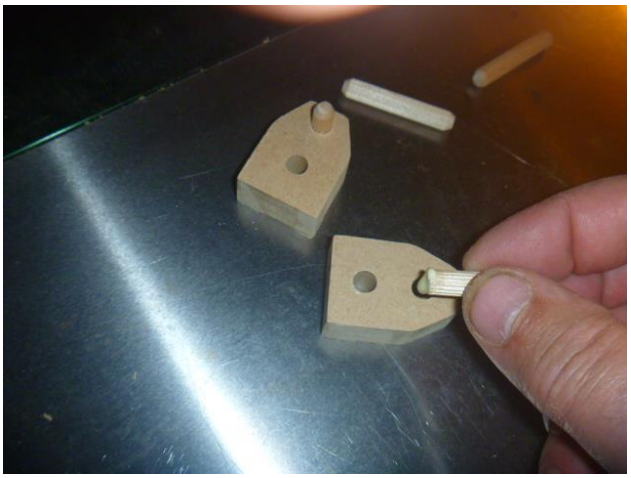
Clamp both of the rails together using the vise and some small clamps. (T nut side to T nut side) Measure and cut a 24ò strip of 1ò wide grip tape. (Grip tape can be found at most hardware and RV stores.) Apply the tape to the top of both rails at once. Center the tape down the rails.

Remove from the vise and clamps. Split the rails slightly and run a box cutter knife down between the rails to cut the grip tape and separate the rails.



The Touch Blocks

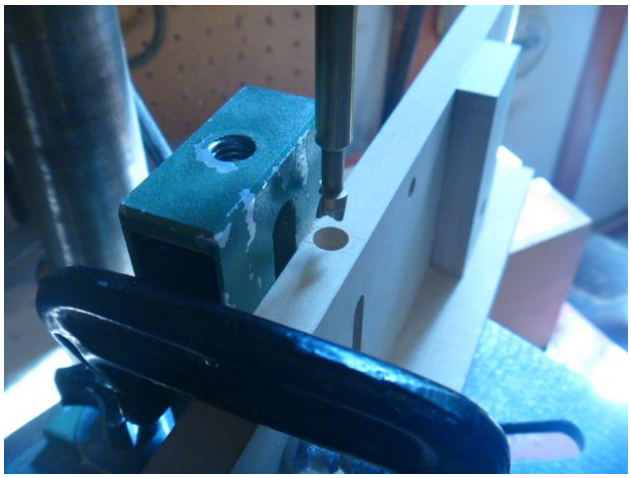
The two small touch blocks need small pieces of ¼ò gluing dowel to be glued into the blind holes. Cut off ¾ò of a ¼ò dowel and glue the cut end into the blind hole.



STEP 5 – Prepare the Carrier

Drill the Touch Holes

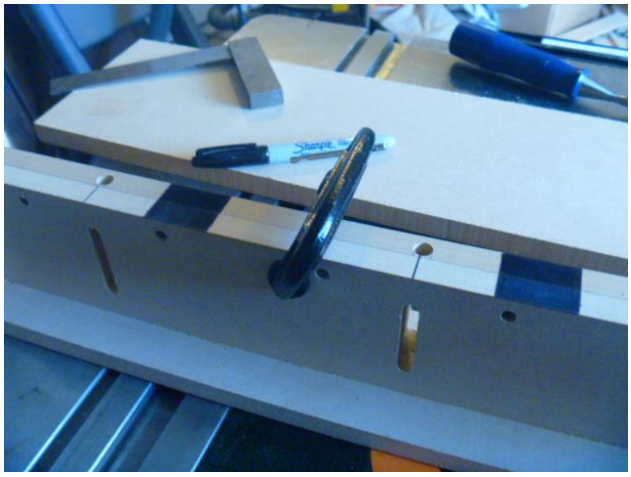
You need to very carefully drill a 5/16ò hole vertically down into the right side in line with the first bolt slot below. The hole is drilled down until it drills into the bolt slot. The tricky part is that the hole has to be offset 1/16ò toward the outside. (This only leaves 1/32ò of wood on the edge!) Ideally one would use a drill press and a 5/16ò Forstner bit.



Drill another touch hole at the next bolt slot. (There may be situations where you cannot use the first touch hole and the second one will be a backup.)

Color Sections of the Rails Black

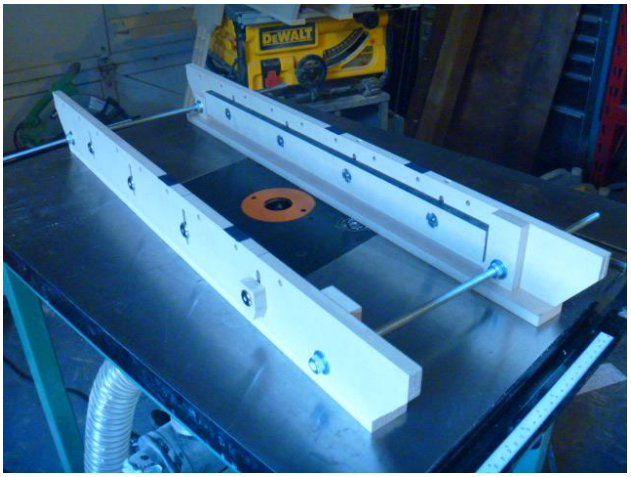
Flip the sides around and clamp them together to make marking the tops easier. Measure 1.25ò from the center of the touch holes down the side and draw lines across the top of the sides with a square. Draw another line another 1.25ò further along the top of the sides. Use a black permanent marker to color in the rectangles. Only the tops of the sides need be colored. Also, draw lines across the top of the other side marking the same position as the touch holes. (These will be used as a reference to jog to.)



Using the 3/8ò nuts, washers, and wing nuts, assemble the rods through the sides. Tighten the nuts against each other on the keypad side with two wrenches. Adjust the inside nuts on the other side just to make the sides parallel and tighten the wing nuts.

Attach the Rails and Touch Blocks

Using the 30mm furniture bolts and washers attach the rails, with the sandpaper up, to the sides. Flip the washers so the sharp edges are next to the bolt heads. (That way the washers do not cut into the wood when the bolts are tightened.) The two 40mm bolts go in the front holes on each side and hold on the touch blocks. The lower touch block goes on the keypad side and the higher one on the sliding plate side. Put all the bolts in before tightening any of them. That is it. You now have a Universal Carrier Base!



CARVING A PROJECT

STEP 1 – Designing the Project

Designing a project to be carved with the Carrier Base is almost the same as designing a project to be carved on the belts. The only difference would be if one usually adds the extra

7ò to the Designer board. Now one does not have to. The simplest method would be to make the Designer board just large enough to contain the pattern (as small as possible) and use place on center in the machine to put the pattern on a slightly larger real board. For now, I suggest you use this method.

There are some restrictions on cut through. One must stay ½ò away from the sides as one could cut into the sandpaper rails.

STEP 2 – Holding the Board

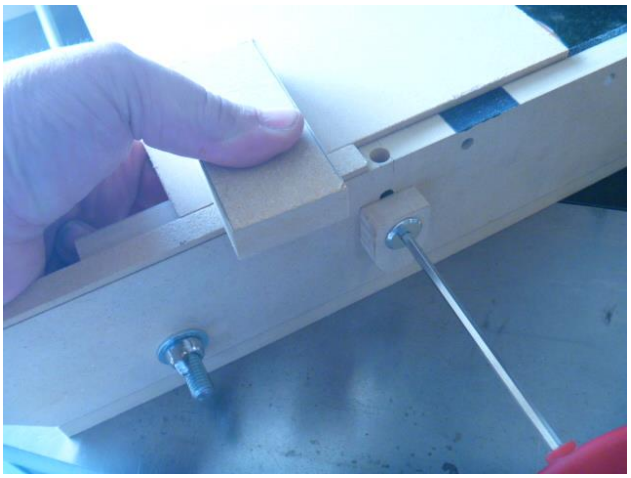
Adjust the height of the rails so they are parallel to and below the sides by about the thickness of the board you want to use. (Leave the inside bolts loose and only slightly tighten the end bolts to initially hold the rails.)

Adjust the Width

With the Carrier on a flat surface, loosen the wing nuts and spin the inside nuts if necessary so that the sides can be moved to the same width as the board. (This has to be done gently while keeping the sides parallel or the ready rods can jam.) Place the board on the sandpaper rails and, while holding the sides tight against the board, spin the inside nuts up to the side behind the wing nuts. Tighten the wing nuts. If the board is short, you should slide it to each end of the Carrier to do this adjustment.

Fine Tune the Board Height

This is done by adjusting each of the four corner bolts so that the board is proud of the side tops by 1/8ò. Place a 1/8ò thick shim on the top of a side near a rail end. Adjust the height of the rail so that the top of the board and the shim are flush. (It is useful to use a small wood block on top and squeeze the rail up to tighten against the board.)



Do this for all four corners by sliding the board to each corner. Now tighten all the bolts. For the first uses of the Carrier, place the board forward against the stops.

(Since boards are only supported on the sides, wide thin boards must have a thicker board under them for support. Back to tape?)

Make sure your out feed rollers on the CW machine are adjusted to help support the UCB.

STEP 3 – Measuring the Board

Place the Carrier and board in the machine so that the first black areas on the sides of the Carrier are under the Y carriage (where the board sensor will measure) and the sliding plate is between the Carrier sides. Push the Carrier up against the squaring plate and move the sliding plate up against the brass roller base rail. Lower the head until the rollers just touch the board. (The board must be long enough to be under both rollers.) DO NOT CLAMP DOWN THE HEAD. Load the project.

- 2) NO to ñStay Under Rollersò

The machine will now request ñPlease Load Piece: Boardò. **Slowly turn down the crank until the display just changes to** ñPress ENTER To Proceed: Boardò**.** Press enter.

The machine will measure the width and then the length of just the board in the Carrier as if the board was down on the belts.

- 1) Keep Original Size.
- 1) Center On Board
- 2) NO to ñCut Board To Sizeò

STEP 4 – Measuring the bit

When the machine requests you load the bit, **crank the head all the way down** as you normally would do. DO NOT FORGET! Load the bit and proceed as normal. When the machine starts the board touch procedure, (second bob on the keyboard side), on the display you will see

ñFinding Surfaceé Press STOP to jogò

Press STOP. Choose 3) Jog and jog the X using the lower arrows to line up the front mark on the left side across from the front touch hole.

(If you did forgot to crank the head down, the machine may ask you to reload the bit. Three touches is a clue as are three bobs for the sliding plate.)

Press Enter. The carving should now proceed as it would if the board was on the belts with the extra 7ò.

Tip:

If you miss the opportunity to jog, you may have to start all over again. One can change the User Options (0ï 5) on the machine to Jog Touch (ON). Then machine will automatically stop and ask you to jog. This will also JOG your memory to clamp down the head!

NOTES FOR THE UCB 36

Making the UCB 36 is similar to making the UCB 24 except you need a 52ò long piece of MDF and more bolts. You can use a 48ò long piece but you will have to tape on two end pieces to stay under the rollers. If you do this, make them longer than need be. (Two inches each is not good enough. They may not stay flat under the rollers.) Even if the out feed rollers are properly adjusted, you better be there with a helping hand when the cutting gets close to the ends. (Having auxiliary out feed rollers would, of course, be good.)

Even though the project file is for a thickness of ½ò MDF, because of the length, I would recommend using 5/8ò MDF if you can find it. Just change the board thickness to 5/8ò in the mpc. (The touch hole is then in the middle of the side and is not offset as with the ½ò. You can also afford to make it 3/8ò instead of 5/16ò)

I put more touch holes down the side of the UCB 36 so that boards can be carved in the middle of the carrier and so that there would be always be nearby touch holes. One can also make more touch blocks so one does not have to move them around.

OTHER THINGS TO CONSIDER

The UCB is a recent invention (Apr. 2015) and so there will probably be improvements made as well as some design changes. There are many combinations of project boards, bits, methods, and machines that have yet to be tried.

I believe the operation of the Carrier will be an ongoing topic on the CarveWright Users Forum. One should be able to discover new techniques and ways to use the Carrier by following the forum posts.

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/index.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.