

Creating a TI Navigator Cart

By George Hurlburt



When I first started using the TI Navigator, I found it very difficult to get everything I needed from my office to my classroom. Between the computer, projector, view screen, access point, hubs, calculators, and textbook, I just couldn't make it in one trip.

While at a TI Summer Institute taught by John Hanna, I learned of the **Mobile Calculator Center for TI-Navigator™** (<http://www.mathcarts.com/>). I couldn't afford the \$1000, so decided to build my own. I used the mobile center as a guide, and created my own cart for \$200.

To build the cabinet I used $\frac{3}{4}$ "x 24"x 6' lumber I was able to purchase at Home Depot. Plywood would work well, and would probably be cheaper, but I couldn't fit sheets of plywood into my van.

I wish I had taken pictures of the construction as I went, but didn't think about it until John asked me to create a how-to guide. I'll do my best to describe my process and put in pictures of the final product.

Material List:

1. Four $\frac{3}{4}$ "x 24"x 6' boards
2. Four 3" casters (two that are fixed and two that swivel)
3. Sixteen 2" lag bolts, washers and nuts (diameter to fit your casters)
4. A small box of 1.5" screws
5. Four $\frac{3}{4}$ " screws (for attaching the Access Point and power strip)
6. Handle
7. Two hinges
8. Dead bolt
9. Power strip
10. 25' extension cord
11. Two hooks with screws (to hold the extension cord)
12. Wood putty
13. Some primer and paint
14. USB extension cord (optional)

Tools:

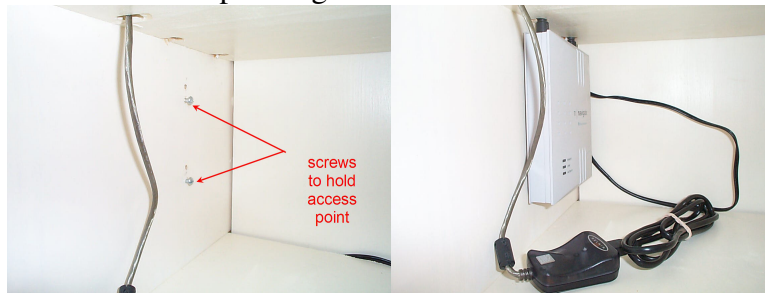
1. Skill saw or Table saw (with a cross-cut sled)
2. Router with $\frac{3}{4}$ " straight bit and a round over bit (optional – see below)
3. Tape measure
4. Power drill / screwdriver
5. Counter-sinking bit
6. Assorted clamps (picture frame clamps are helpful to get the sides and top/bottom square, otherwise use a framing square)
7. Small putty knife
8. Power sander and sandpaper
9. Paint brush

Procedure:

1. Start by cutting two squares for the top and the bottom. I cut mine 23 $\frac{1}{4}$ " on each side because the 24" boards were actually 23 $\frac{1}{4}$ " wide. This size also gave me enough area to put my laptop and a projector on top of the cabinet during class.
2. Using a table saw with a dado head (or a router) cut a $\frac{3}{4}$ " groove around the squares to create a rabbit joint. This is probably optional. I knew I would be walking around campus a lot with my cart, so wanted the joints to be a little stronger than just butt joints.
3. Cut two pieces for the sides, 3' long, and the same width as your top and bottom squares.
4. Glue and screw the top and bottom to the two sides. I counter-sunk all my screws and filled the holes with wood putty.
5. Decide where you are going to put the Access Point. I put mine in the back cabinet of the cabinet on the left hand side. Drill holes in the top of the cart big enough for the antennas to come up through and another hole big enough for the USB cable.



6. Place two screws on the inside of the cabinet to hold the Access Point. Space the screws appropriately to fit into the grooves on the Access Point, and so that the antennas come up through the holes.



7. Decide where you want to place the 3 inside shelves. I spaced mine roughly evenly. I used a router with a $\frac{3}{4}$ " straight bit to create a dado to give added support to the shelves. This is probably optional, but I wanted the extra strength.
8. Cut your shelves to fit inside the cart. Make sure you leave $\frac{3}{4}$ " in the front and back to fit your back panel and the door.
9. Drill a small hole in each shelf so that the power cord for the Access Point will fit down through (or leave a gap between your shelf and back panel big enough to fit the power cord).
10. Cut a piece for the back panel. It should be 3' long, and the width of the top square minus 1.5" ($\frac{3}{4}$ " for each side). Check your measurements to be sure.
11. Decide where you want to put your wheels. Drill holes in the bottom big enough for the lag bolts to fit through, and attach the wheels.
12. Use a router and a round-over bit to round the front edge of the shelves. This will make them look a little nicer and fit better with the curve of the dado the shelves fit into.
13. Sand and paint the inside of the cabinets, the inside of the back panel, and the shelves. I thought painting at this point would be much easier than trying to paint it after the shelves were in.
14. Put the back panel on using glue and screws. I counter-sunk the screws and filled the holes. (I actually screwed up here – I put the shelves in before I put the back on. Somehow I twisted the cabinet when I put the shelves in and got it all out of square. I then had to cut my back piece and door at an angle to get them to fit. Putting the back on before the shelves should keep the cabinet square.)

- Put the shelves in using glue and screws. Again, I counter-sunk the screws and filled the holes.



- Cut the door to size. It should be 3' long minus about 1/8" for clearance, and the width of the top square minus 1.5" (3/4" for each side) minus whatever is recommended for your hinges.
- Sand and paint the inside of the door and attach it to the cabinet. I used hinges that were kind of expensive, but I wanted them to be hidden on the inside.



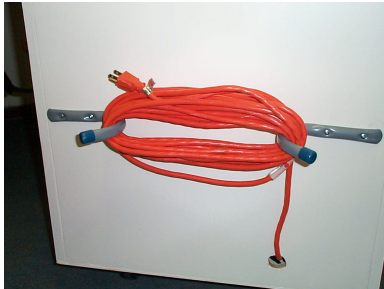
- Drill a hole in the back of the cabinet large enough for an extension cord to fit through. I think I used a 1" spade bit.
- Sand and paint the entire outside of the cabinet.
- Use two screws to attach a power strip to the inside of the cabinet.



21. Put a handle and a dead bolt on the front of the cabinet.



22. Put two hooks on the back of the cabinet to hold a 25' extension cord.



23. I had a set of stencils, so I stenciled TI Navigator on each side of the cabinet.

Total Time: I didn't keep track of how long it took, but I would estimate 8 hours. I probably could have done it quicker if I hadn't gotten so much "help" from my 7 year old son (see the picture on the top of this document).

In the pictures you'll see that I put the TI Navigator hubs in the chargers on the bottom. The chargers and the Access Point are plugged into the power strip. This leaves two free outlets for your laptop and projector.

There is enough room on the shelves to hold my laptop, a computer projector, a view screen, my textbook, a bag of TI calculators and the link wires. The top is big enough to hold my laptop and the computer projector. I found the USB extension cable makes it easier to have all the cables reach.

Having the cabinet has made using the system so much easier. Everything is together in one place, it is organized, easy to transport, all making it quicker to set up.

If you have any questions or comments, please contact me a hurlburt@corning-cc.edu