A cheaper alternative to commercial T-Trak module kits that anyone can build

By Peter Guise

For many people and organizations, the cost of a commercial T-Trak module kit is prohibitively expensive but they don't have woodworking skills, tools or shop pace to build one out of wood. The purpose of this tutorial is to show how a person can build a T-Trak module with minimal tools almost anywhere. Depending on how many modules are built, the cost per module will drop when the costs of glue, caulk, T-pins, spacer tracks etc. are spread across multiple modules. To build the project, the following tools and materials shown in the picture below will be needed:

Tools:

- One or more 18-inch ruler or other measuring tools that can show both standard and metric measurements. While dimensions of the module base are done in inches, the measurements for track placement are done in millimeters because the track being used is imported from Japan.
- Utility knife with sharp blades.
- Drill bits – one each 5/16 and 3/8. Note that a power drill is not needed – just the bits. The foamboard is soft enough that a person can hold the shaft of the bit and drill through the foamboard in several turns without needing a power drill

Materials:

- One piece of 20 x 30 x 3/8-inch thick foamboard.

- 4 ¼ -20 T-nuts and 4 ¼ - 20 x 2-inch carriage bolts
- 1 bottle Tacky Glue
- 1 tube 100% Silicone caulk. Make sure it is 100% silicone. Some of the acrylic caulks will dissolve the foamboard. I used GE 100% silicone for kitchens, baths and plumbing.
- 1 package of T-Pins
- 1 package each of Kato 20-010 and 20-020 track.
- 1 package of Kato 20-042 concrete tie track. (Used to set spacing when laying the track down)
- 2 packages of Kato 24-818 Terminal Railjoiners.

Note the 20-010 and 20-020 track packages each contain 4 pieces of track which is enough for 2 modules.

Construction:

Step 1 - The following pieces need to be cut from the sheet of foamboard. Label the pieces as you cut them as several are close in size and can accidentally be used in the wrong place

1 Top 12-1/8 inches by 13 inches.
2 pieces 12-1/8 inches by 2-3/8 inches. These will become the front and back.
2 pieces 12 ¼ inches by 2- 3/8 inches. These will become the sides.
2 pieces 12 ¼ inches by 2 inches. These will become leg supports.

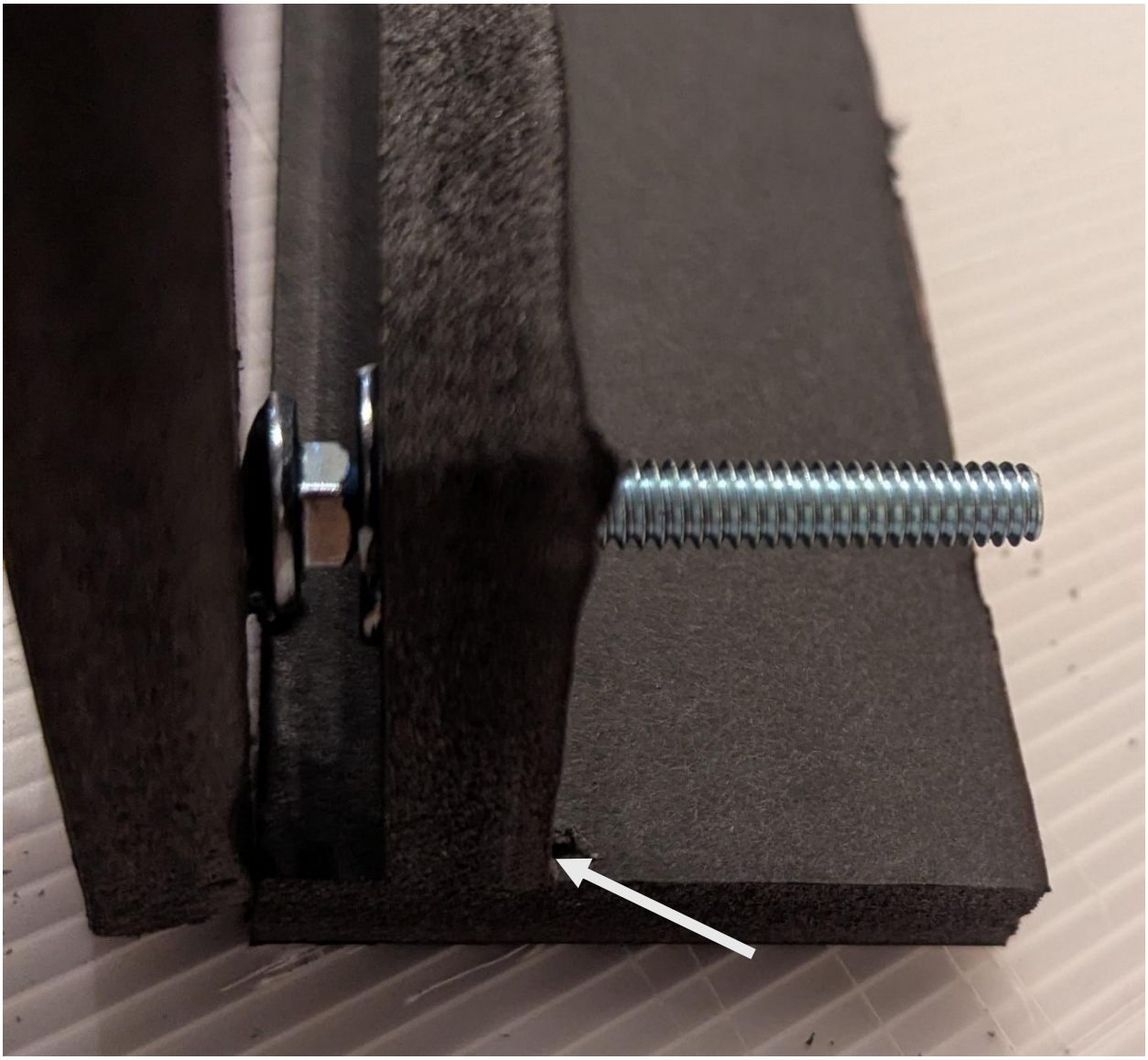
Due to the thickness of the foamcore, do the cuts in several passes. It is easier to control the knife with a shallow cut and then increase the depth and follow the initial cut path repeatedly than to try to get through the full thickness of the sheet at once.

Step 2 – Take the 2 pieces for the leg supports and center the t-nuts at 1 inch from each end and the 2 sides. Firmly press the pointed side of the T-nut into the foamboard to make a mark with the center of the nut on the foamboard on each end. This will be used to locate the drill bit for
making the holes to insert the nuts into.

Step 3 – Using the 5/16 drill bit, locate the indentations made with the nuts in the previous step and twist the drill bit into each indentation to drill the 4 holes for the nuts to be inserted into.

Step 4 – Apply some Tacky glue to the pointed side of each T-nut and insert into the holes. The glue will come out around the edges of the T-nuts as they are pressed in. Some excess is fine. Leave to dry before continuing.

Step 5 – Once the glue around the T-nuts has dried, thread one of the ¼ -20 carriage bolts in to the T nut as far as it will go. Then take a side piece and hold the support against it like the photo below such that when another piece is held to the bottom edge of the side support, the head of the carriage bolt just touches it. Mark the location where the support and side pieces intersect as shown by the arrow in the photo.



Step 6 - Measure the distance from the bottom of the side piece to the mark. Using that measurement, place a similar mark at the other end of the side piece and using the straight edge of your ruler draw a line between the two marks parallel to the bottom. This will be used to align the support to the side when you glue it in the next step. Mark the other side piece at each end using the same measurements and draw a line between them to align its support.
Step 7 – apply glue to one long edge of each support and attach to the sides using the lines from the previous step as a guide. Use a T pin on an angle to hold the ends into place first and then insert 3 to 4 T pins evenly spaced down the length of the side and into the center of the support to act as clamps until the glue dries. After it has dried, remove the T-pins.

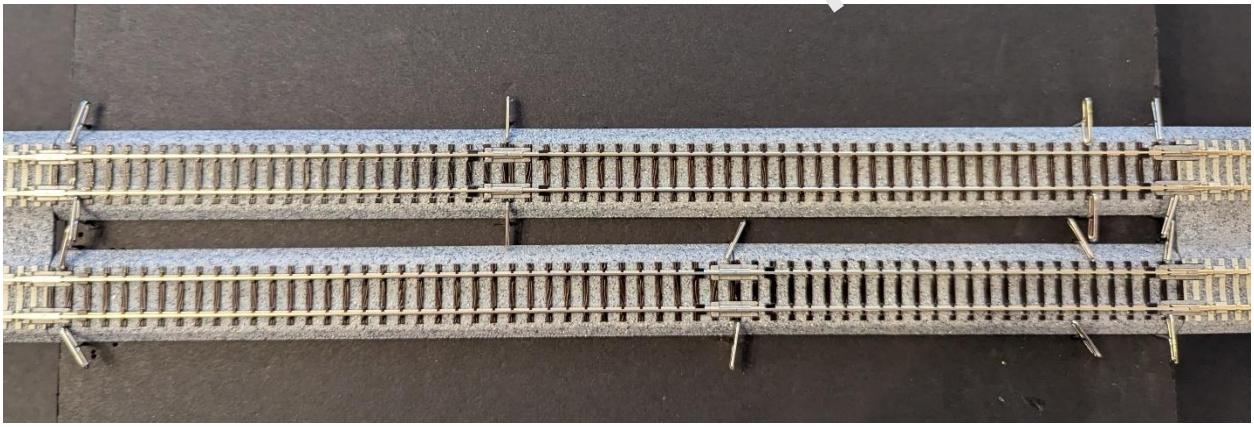
Step 8 – Take one of the front and back pieces and apply glue to one edge. Stick it to the bottom of the top piece so that the piece is lined up with the front edge and corners of the top. Use T-Pins to hold the pieces in place until the glue can dry.

Step 9 – Take the back piece and use the utility knife to cut a hole in the center about 1 inch by 1-1/4 inches in size. This will be used to get the power wires connected.

Step 10 – Apply glue to the top and front end of the right side piece and support. The outside edge of the side piece should line up with the edge of the top and the glued end should stick to the back side of the front piece glued in step 8. Use T-pins to secure all glued edges until it has dried and remove when dry. Repeat for the left side.

Step 11 – Apply glue to the top edge of the back and to the ends of the Right and left side pieces and their supports. Align the back piece with the edge of the top and both side corners and use T-pins to secure.

Step 12 – prepare the top for mounting the tracks. There are two tracks toward the front of the module. One long and one short piece of straight track will cover the width of the module. According to the standards, the track closest to the front is set back from the edge 1-1/2 inches /38 millimeters. Measure 1-1/2 inches from the front of the module at each end and draw a line between the two marks. This will show where the front edge of the track should be when it is mounted. Assemble the two tracks using one long (20-010) and one short(20-020) piece on each and stagger the joints as shown with the white arrows in the photo. Attach the 2 pieces of Kato 20-042 track to the ends to get the spacing between the first and second tracks. Place the assembly on the module using the line 1-1/2 inches from the front and mark the location of the two staggard joints front and back for each track. The marks will be used to mark the spots to drill holes for the power feeds. Note there should be about 1 miillimeter of track overhang at each side to allow space to connect to the next modules.



Step 13 – using the 3/8 inch bit, drill a hole between the front and back marks for each track joint from step 12.

Step 14 –Disassemble the tracks, open the packages of terminal rail joiners and remove the joiners from the track ends that will be where the holes have been drilled using the instructions and tools provided with the terminal joiners. For the front track, the blue wire should be on the rail closest to the front edge of the module and the white wire should be on the rear rail. For the back track, the wiring is reversed so the white wire is on the rail closest to the front track and the rear rail gets the blue wire. Another way to verify is from front to back the track wires should be

Blue
White

White
Blue

Reassemble the tracks with the new joiners and insert the plugs and wires into the holes drilled previously. Check to make sure that the wiring order is correct as this is the last time it can be corrected before the track is glued down.

Step 15 – If the two end pieces being used for track spacing have not been removed, do so now as it is easier to apply glue to the tracks without them on. To glue the tracks, turn the tracks over and you will see round plastic “pins’ at each end that would normally be used to screw the track down from underneath. Open the tube of caulk and apply enough to each pin to be sure that the caulk can get a good seal without going out past the edges of the track. Stick the tracks to the top using the marks from previous steps along with reattaching the 2 end pieces to maintain the spacing. T- Pins can also be placed next to the tracks to help position them and keep them from moving while getting everything glued down. Let dry undisturbed until the caulk has had a chance to cure. Once cured, the module is ready for scenery and use.