

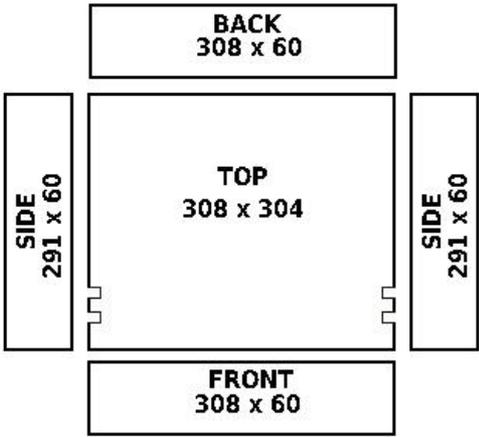
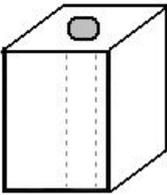
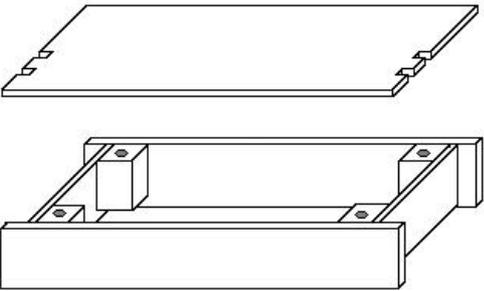
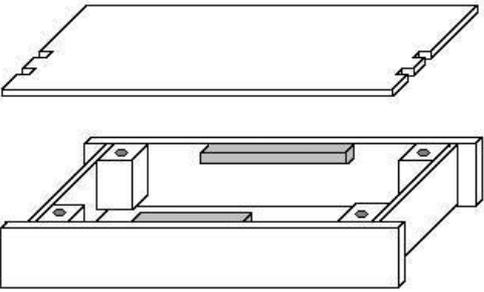
GRVS T-Trak Guidelines

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Because Kato track uses Metric measurements, it's never made sense to convert all those measurements into English units with it's fractional equivalents. So I decided to 'rewrite' the standard converting some measurements into Metric. All of the measurements don't have to be converted because wood, drill bits, and other things are too expensive to purchase metrically in the US, so they are still in *standard* units. Also, all you really need is a normal metric ruler. You don't really need a 'meter stick' which are difficult to find.

I've also thought of a few possible enhancements to the design of the modules. Comments welcome.

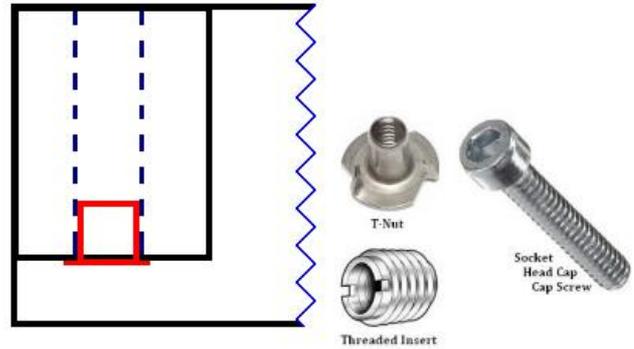
Also, keep in mind that these are just guidelines and are not meant to override the official TTrak specs. You may use these guidelines or not at your discretion.

Straight Modules	
<p>Cut out the module pieces from 1/4" plywood -- the better the grade the better the module. 1/4" is slightly over 6mm</p> <p>The depth (304mm) measurement can be adjusted to the builder's needs, but should not exceed 360mm (just under the depth of a corner module).</p> <p>Widths of each module size (single, double, triple, etc) are multiples of 310mm less 2mm</p> <ul style="list-style-type: none"> • 308mm for single • 618mm for double • etc. <p>The easiest way to correctly measure the width needed is simply snap together the track pieces and use that as a measuring stick.</p> <p>Notch the ends at the track centers about 3mm deep, 3-5mm wide. Centers are at 50mm and 82mm from the front edge. The notches can be any shape.</p>	
<p>Cut out four 50mm blocks from a 2x2 and drill a 3/8" hole completely through at the center.</p>	
<p>Connect all the pieces as shown.</p> <p>The corner blocks should be flush with the top.</p> <p>The sides are inset about 5mm.</p> <p>The top should be flush at the front.</p>	
<p>For added support, add small blocks to the center of each side flush with the top edge. The top can now be supported better in the center. This is definitely recommended on any sides larger than a corner (365mm).</p>	

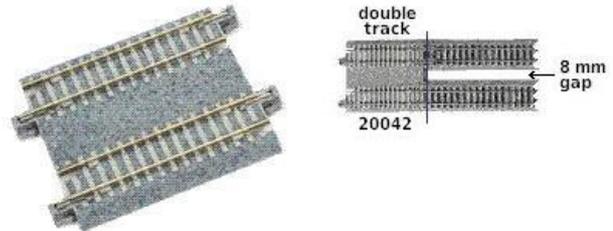
Add 1/4" T-Nuts to the bottom of each corner block. Use 1/4 x 2" bolts as levellers. I prefer hex bolts over carriage bolts -- easier to grab and turn.

Other forms of levellers can be used. Threaded inserts are another popular alternative. And instead of the bolts, use a socket head from above -- you can then level the module with an Allen wrench from above. Hide the hole with removable scenery.

I'd recommend staying away from nylon hardware though. Replacing it can happen often.



To get the track spacing correct, use a double-track short segment (Kato 20042). It will space the tracks perfectly and you won't have to bother with measuring the 8mm gap or 33mm track centers.



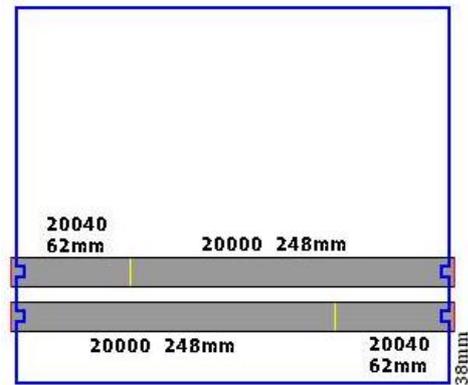
To add the track, use Kato

- 20040 62mm -- (2) pieces
- 20000 248mm -- (2) pieces

The front track should be 38mm from the front edge.

The track should cover the notches in the base.

Make sure the track ends overhang the module evenly.

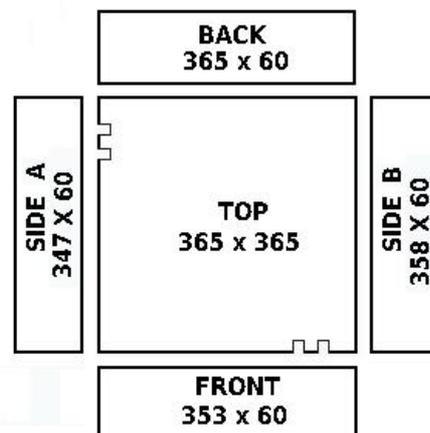


You may be wondering about the notches and inset sides. In case power is needed in a section without a power drop or the supplied/nearby power connection is defective, the notches allow power joiners (24818) to be added. The wires are still hidden, and ad-hoc power is available.

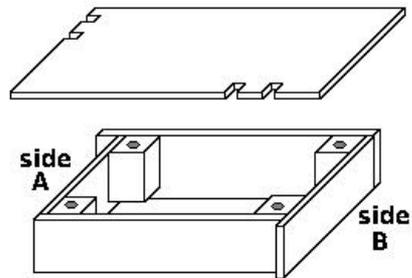


Corner Modules

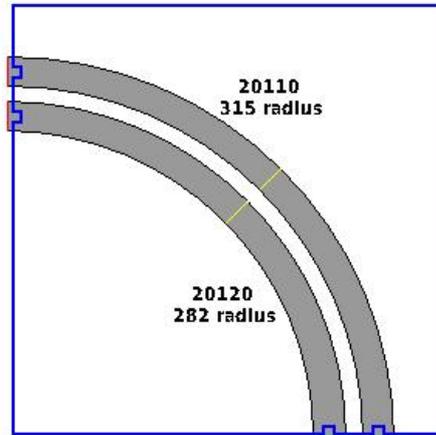
Cut out the pieces as shown. Make 4 corner blocks.



Put the base together first as shown.
 When adding the top, place the un-notched edges flush with the base.
 The notched side and front will be inset properly.
 Add the T-nuts.

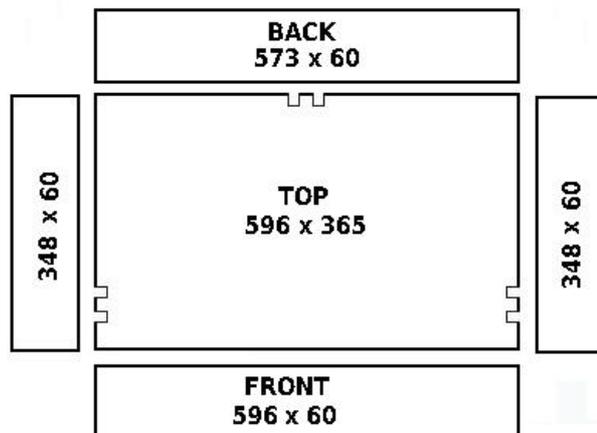


To add the track, use Kato
 • 20110 315mm radius -- (2) pieces
 • 20120 282mm radius -- (2) pieces
 The track should cover the notches in the base.
 Make sure the track ends overhang the module evenly.

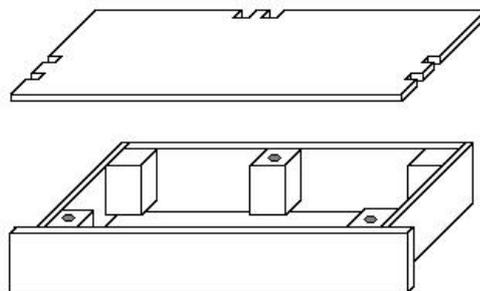


Junction Modules

Cut out the pieces as shown.
 Make 5 corner blocks, only 3 need to be drilled through.



Put the base together first as shown.
 When adding the top, place the front edge flush with the base.
 The notched sides and back will be inset properly.
 Add the T-nuts.



For the track use Kato

- 20000 248mm-- (2) pieces
- 20091 29mm-- (2) pieces
- 20091 45.5mm-- (1) pieces
- 20120 282mm radius -- (4) pieces

The track should cover the notches in the base.

Make sure the track ends overhang the module evenly.

Instead of the 3 pieces from 20091 package, you could also

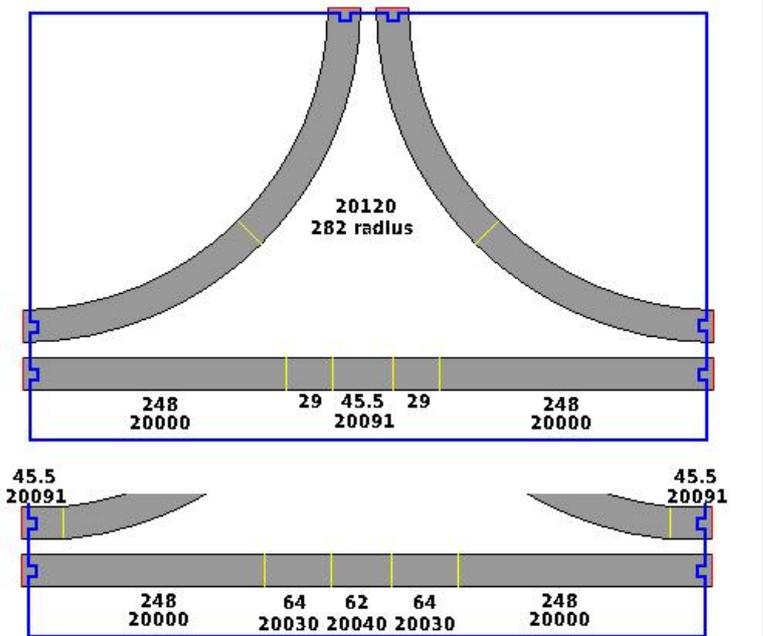
- 1) use an expansion track (Kato 20050)
- 2) cut a special sized 102mm track piece.

These modules are 22mm shy of a double's length and should be used in pairs.

An alternative form adds a 45.5 piece to each of the curves at the straight track side. The straight is made up of

- 20000 248mm-- (2) pieces
- 20030 64mm-- (2) pieces
- 20040 62mm-- (1) piece

This module is 684mm wide and is 66mm wider than a double. This spacing is much easier to fill (20030/64mm) on the opposite side, therefore only one junction could be added to a layout.

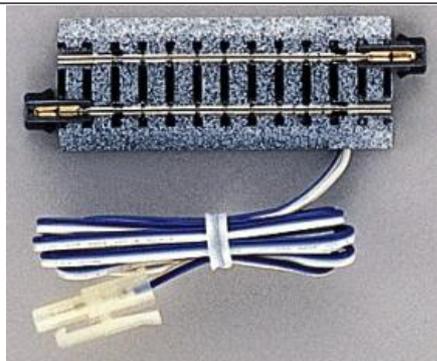


Module Power

In general, only straight modules need to be powered, and only a few really need it. Corners can be powered if desired, but other special modules (junctions, inside corners, etc) are somewhat more difficult. And since the size of a TTrak layout tends to be smaller, power only needs to be supplied every 8-10 feet or so, or in special circumstances.

The easiest way to power a module is to replace the 62mm (20040) with a power feeder (20041). The only difficulty is you need to drill a hole large enough for the power connector.

The other difficulty is securing the cable underneath the module for transport. And if you find you need the connection after the layout is set up it's more difficult to drop the cable if it wasn't done before setup.



An alternative (thanks to the Australian TTrak spec) is to create an external plugin. Basically, add a socket connector to the back of the module.

You can use any 2 or 4 wire socket you wish to use. One such connector is the RCA Phono plug. Radio Shack has multi-jack boards (shown) that are inexpensive and can be cut to have 2-jacks per board. Other styles are available at other electronic outlets. Din jacks, banana jacks, so many to choose from. Get jacks that are flush mountable from behind the surface.

We will assume you are using a power feeder (20041) and the phono board from above. You will need:

- 1) One double audio cable
- 2) Two power feeders
- 3) One multijack board cut to contain 2 jacks
- 4) Drill bit the size of the audio cable plug



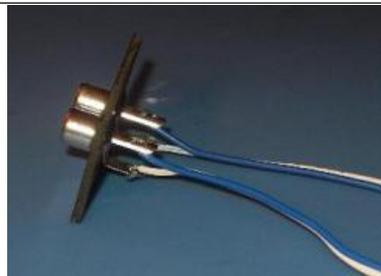
Decide where the plug board will be positioned and drill two holes on the back of the module to accept the two jacks. The centers for these particular plugs are 1/2 inch.

Position the power feeders and measure how far the wires need to be to reach the board. Add a little more length and cut off the connectors.

Drill small holes on the top to pass the feeder wires through. Connect the track.

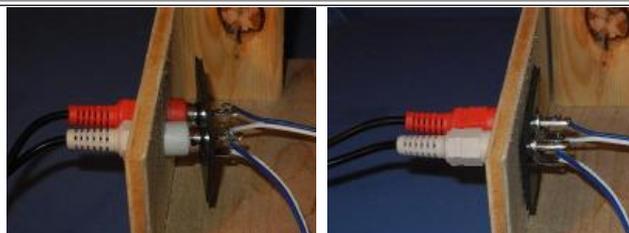


Solder the track wires to the jacks.
Power (blue) wires to the center lead of the jacks.



Attach the audio cables through the holes (for positioning), position the board, and attach the board to the module.

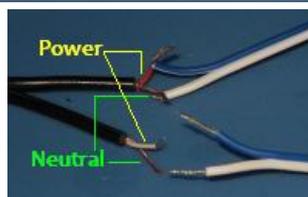
Recommend the red line (front track) on the left or top, based on the orientation of your board. Additionally, mark the plugs with red/yellow to make the connections fool-proof.



Create the cables:

- 1) Cut the audio cable in half to make 2 cords.
- 3) Attach a power connector to each wire.
- 4) Wrap with yellow and red tape or shrink tube.

With audio cables, each wire contains the neutral stranded wire wrapped around the insulated power wire. Twist the neutral wire together, then strip the tip of the power wire.



Now you can add power to the module at any time.



Other type of connectors can certainly be used; anything with 2 or 4 connections. Another example is a DIN connector, shown here. Cables are just as easy to make.



Metric (mm) to English (fractions)

Conversions from millimeters listed in this document to 8ths or 16ths, whichever is appropriate.
The + designates "a smidge more" than the actual fraction designated.

MM	English
5	3/16+
8	5/16+
33	1 - 5/16-
38	1 - 1/2
50	2
82	3 - 1/4-
291	11 - 7/16
304	12
308	12 - 1/8
310	12 - 3/16+
347	13 - 11/16-
348	13 - 11/16+
353	13 - 7/8+
358	14 - 1/8-
360	14 - 3/16-
365	14 - 3/8
573	22 - 9/16
596	23 - 7/16
618	24 - 5/16+