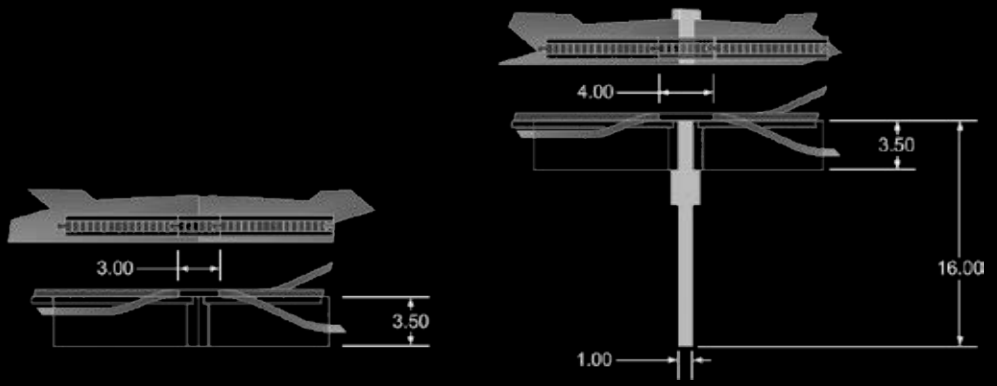
Der Eisenbahntisch ist eine gängige Lösung zum Aufbau großer Modelleisenbahnanlagen. Leider sind Eisenbahntische oft zu groß um einfach transportiert zu werden. Auch ist es oft schwer die gegenüberliegende Seite eines Tischs zu erreichen. Zwar könnte man kleinere Tische zu einem großen Tisch kombinieren, jedoch müßen alle Schienen am Rand dann zusammenpassen. Da nur wenige Häuser und Wohnungen ausreichend Platz für eine große Eisenbahnanlage bieten, wären schmale Tische eine günstige Alternative.

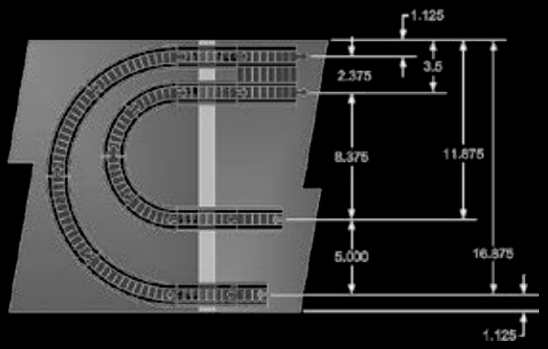
Modelleisenbahnclubs habe eine Reihe von Lösungen für modulare Tischsysteme entwickelt. Diese Systeme sind dafür geeignet, sehr große Anlagen zu transportieren. Auch können Anlagen so rekonfiguriert werden – sogar eine Kombination mit Tischen anderer Familien ist in einigen Fällen möglich.

Ich möchte hier eine Alternativlösung vorschlagen, welche auf schmalen Tischplatten basiert. Diese Lösung ist besonders gut für kleinere Räume geeignet. Die gesamte Eisenbahnanlage kann von nur einer Tischseite erreicht werden. Dies ist besonders dann günstig, wenn die Tische entlang einer Wand, und nicht im Zentrum des Zimmers aufgebaut werden.



Modulares System für Holzeisenbahnen:

Ein Standard für schmale Eisenbahntische



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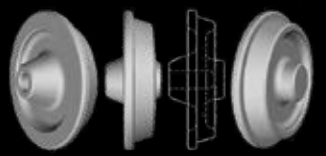

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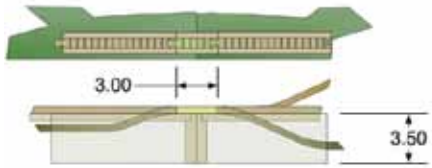
Written and Designed by Tom D. Stephenson

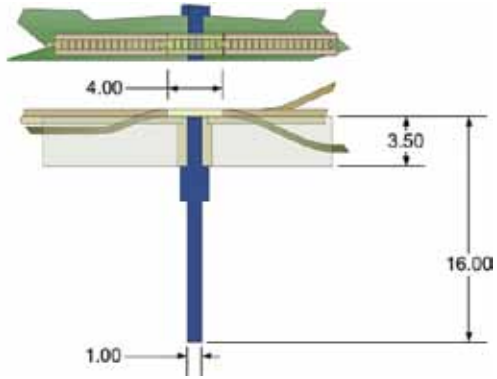
Translations provided by Tomiko Ikegami and Dirk Weiss

大きな鉄道模型テーブルの欠点の一つの解決法として提案します。残念ながらほとんどの鉄道模型テーブルは規格が大きいため運びにくく、またテーブルを挟んで作業しにくいという欠点があります。いくつかの型はテーブル同士をつなげることでさらに大きくできますが、テーブルに縁が張り巡らされているので、テーブルの真ん中に壁ができてしまいます。でもこの細長テーブルは縁がないので、テーブルを好きなようにつなぎ合わせることができます。さらに小さな家やアパートで、大きな鉄道模型が部屋の大部分を占領してしまう不便さも解決しました。

鉄道模型クラブではモジュールのセグメントを含む木製鉄道の改良にあたってきました。このテーブルは大型模型テーブルの搬送を容易にするとともに組み立ても簡単にしました。また同じ規格のテーブルを持っている他の家族とつなげ合わせたりすることも容易にできます。また限られたスペースでも片側から作業できるので、壁に沿って置くことができますし、部屋の真ん中におく必要もありません。

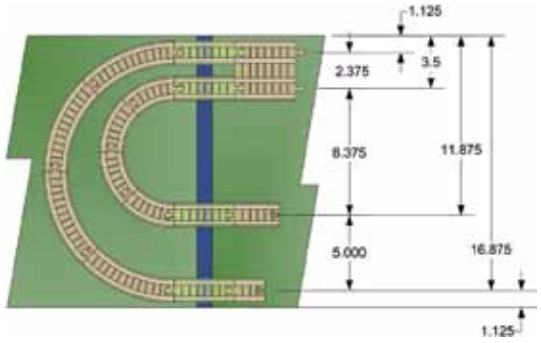
今までどこにも細長い型の木製鉄道テーブルを見つけることができなかったので、この新しい規格を発案しました。ー携帯用としても棚用としても便利です。





木製線路模型:

細長型木製鉄道模型台の規格



Second Edition

Tom D. Stephenson

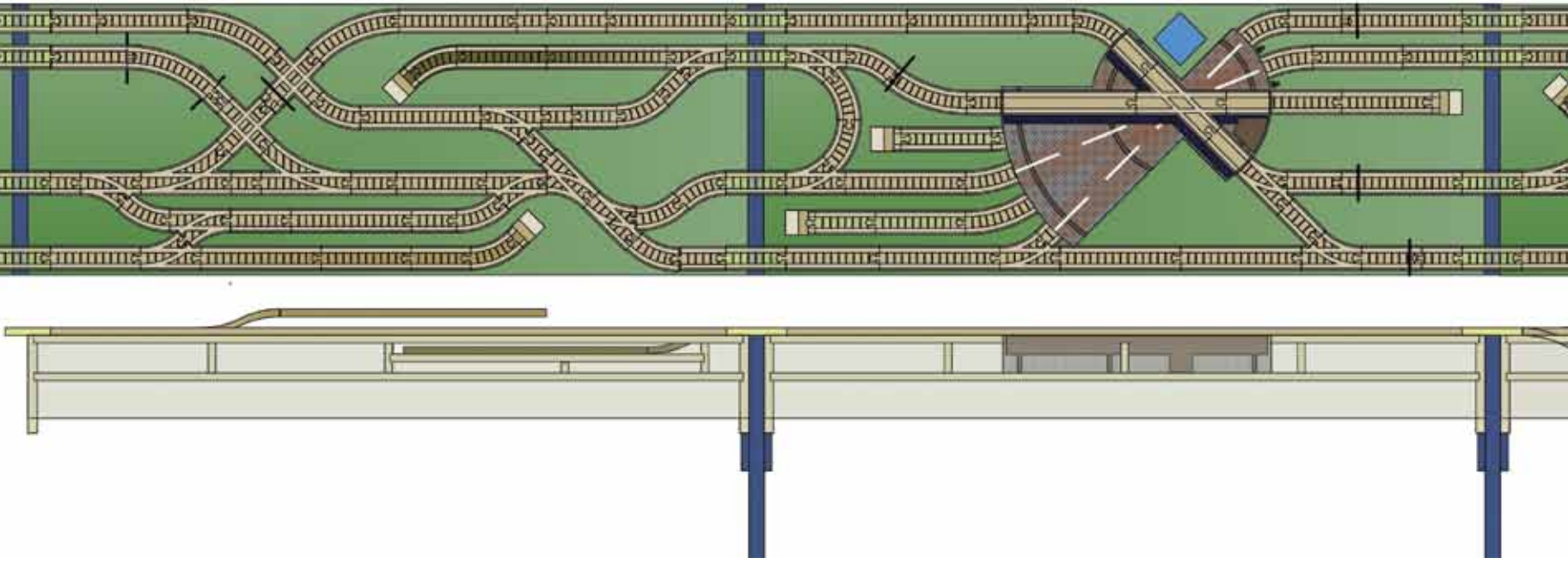
Contents

Foreword

Our family cobbled together large wooden train floor layouts around the house over the years. We also set up track for neighborhood children who knocked on the door, preschool classes, and a few church and community events. It is such a treat to watch a child's face alight when they see a large train layout that they can actually play with. Model train shows are great, but these running displays are rarely intended for small hands to touch or play with.

A sprawling wooden railway presents significant challenges though. Awkward little feet totter through the layout, trip over track, and frustrate other children. Add to that the strain that develops at critical points as different areas of a large layout are pushed against – popping connectors and breaking track. A large layout takes considerable thought and time to conceive and set up, and at some point the vacuum cleaner comes out and the layout has to be put away.

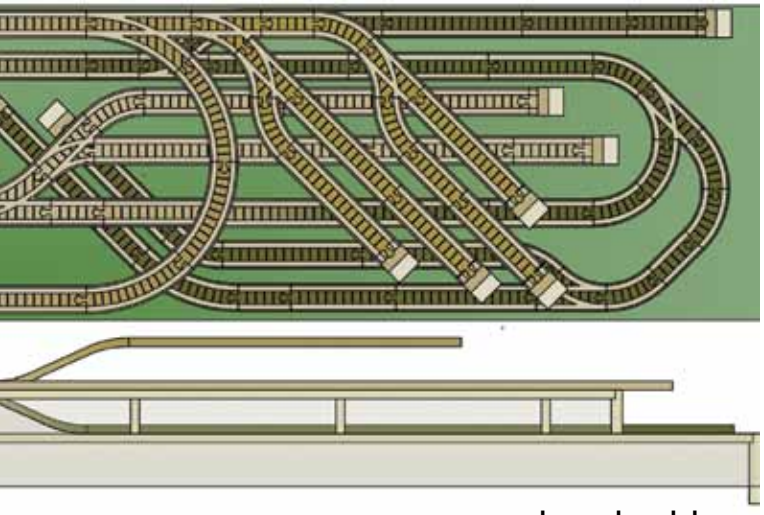
Following are ideas that take wooden track to a hobbyist level. Great for kids, this non-scale railway allows limitless creativity in the medium of wood, glue, metal, fabric, textures and paper. I would even dare to suggest it brings with it charm and a bit of whimsy too...



Introduction

One solution for a large-scale layout is a train table. Unfortunately most are too large to easily transport and quite difficult to reach across. A few could be clamped together to create a larger table, but a flush edge is needed to facilitate running tracks between tables. Since few homes and apartments can accommodate a large train table in the middle of the room, narrower train tables are a more practical alternative.

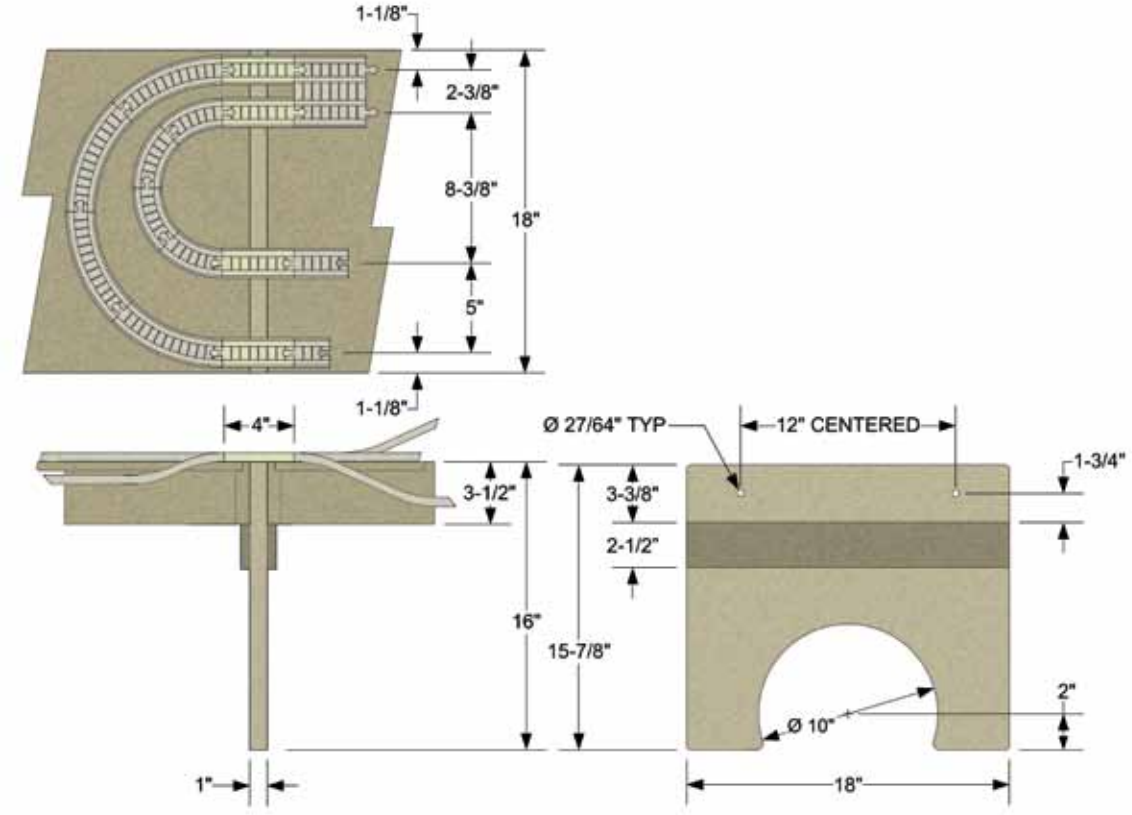
Model railroad clubs have developed a number of solutions that can be adapted for wooden railways, including modular segments. These facilitate transporting layouts and allow reconfiguration – even collaboration between model railroad clubs or families with compatible segments. An alternative strategy for limited space and accessibility is a narrow shelf railway that provides access to all tracks from one side – critical when the layout is against a wall instead of monopolizing the room's center.



Unable to find any mention of narrow wood track tables or wood track modules, I submit the following ideas and dimensions as a standard – suitable for both portable tables and shelf railways...

Basic Dimensions

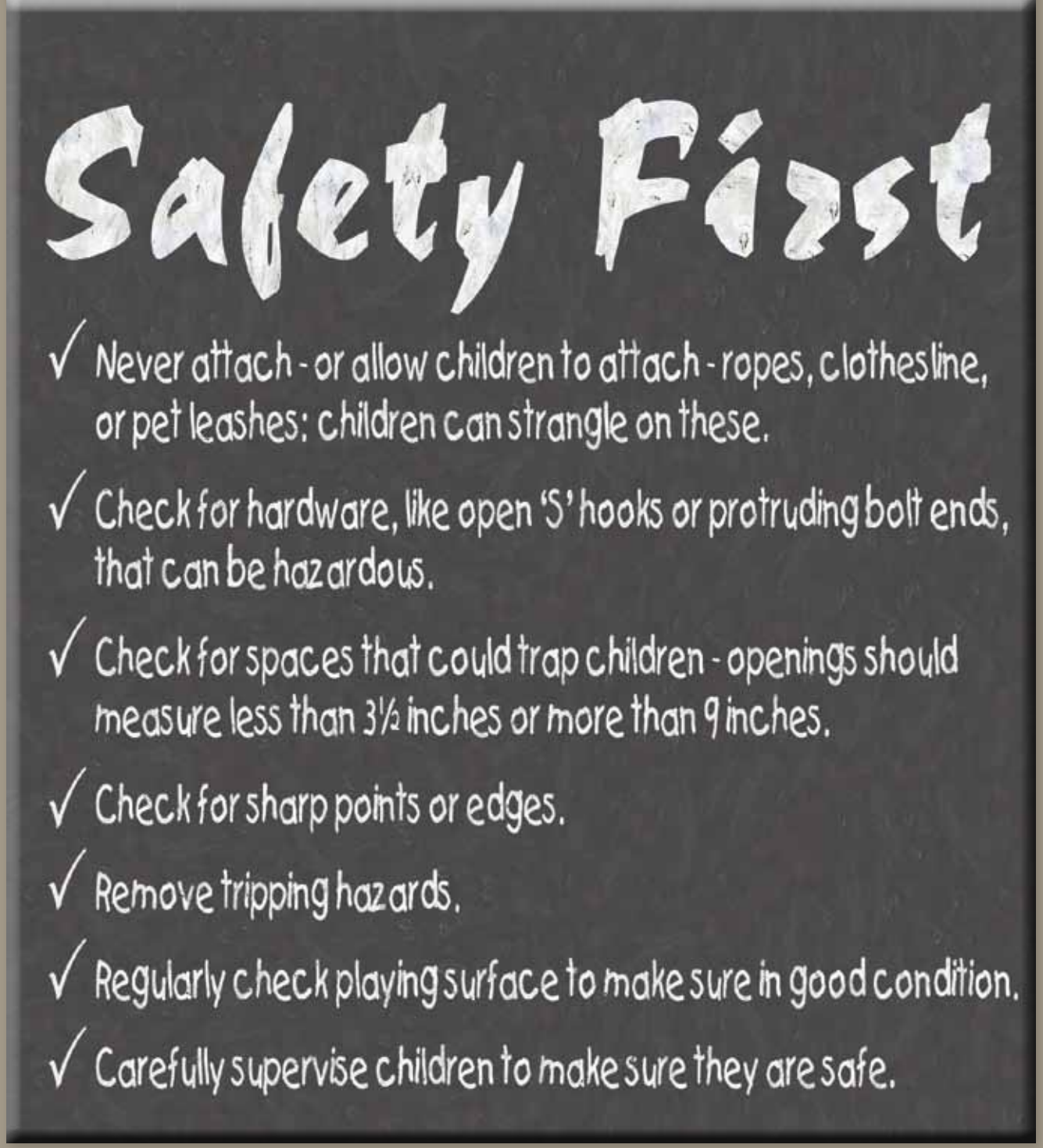
Segments are based on a modular 18″ x 48″ box that can rest on the floor or be raised to coffee table level for ease of play. Sections can also be incorporated into a shelf railroad along a wall – important for households unable to devote the space needed for the large play tables commercially available.



Adjacent sections can be clamped together or bolted to prevent stress on the track used to join modules. This size simplifies construction using standard 4′ x 8′ plywood sheets, allows sections to be easily carried in a backseat or trunk, and accommodates full track radii using 6½″ curves. More importantly, the entire width of the table is usable from either side. This allows better interaction and engagement and expands the complexity of the layouts possible.

Using standard modules, segments can be reconfigured into a wide range of layouts. Exciting and dynamic layouts can be quickly and easily set up at a church, school, children's museum, or train show.

Moving sections around can take a few minutes. To make this more convenient, print a copy of each segment and arrange these until you have a final configuration... A co-worker made me a set of tiles and I find these to be really handy – they are almost as much fun as playing with trains! You can make your own using photographs glued to hardboard or paperboard.



source multiple sites, including CPSC

Play It Safe

Unlike modular HO and N Gauge setups, these tables are meant to be physically played with…by children of all ages. The modules should be rugged and support the weight of several children who may be determined to stand on it when you turn your back for a minute. Child safety is the most important consideration, so it is emphasized here at the very beginning.

There are many safety guidelines for toys, playgrounds, cribs, and such. It is essential that each modular segment be safe and secure. No element should poke, pinch, tangle, strangle, be swallowed, or trap a head, hand or finger. Paint selection is also an obvious consideration – oil paints should be avoided, lead paints impair development, and cadmium-based paints are toxic! Loose magnets and small pieces must also be watched for.

Consult available online resources or child-safety experts as appropriate. A partial checklist appearing on multiple sites, including a safety sheet from CPSC, is shown above. Two pages to begin with are listed below:

www.cpsc.gov/en/Safety-Education/Safety-Guides
www.cpsc.gov/cpscpub/pubs/playpubs.html

Construction Details

Using a common color for the first few inches at each end of the modules helps to integrate the segments in their many configurations. This might just mean using the same type of unpainted wood if left undecorated. Several sources recommend that flat paint should be used if painting surfaces (ends) that will be clamped to prevent them from sticking together, but a satin or gloss finish is easier to clean and more resistant to marks for the top surface of the table. Eggshell might be a good compromise.

Use 4″ tracks to join raised sections (assuming a 1″ leg support inserted) and 3″ tracks when butted together on the floor.

Images & Textures

Edges and building sides can be dressed with custom images or digital prints glued to the side and sealed for added realism.

Scale

The apparent scale for many of the Wooden Track buildings is 1:87 based on door sizes and floor heights.

Custom Locomotives & Cars

In addition to modifying store-bought trains, custom engines and cars can be constructed.

Images & Textures

Graphic details

Buildings, walls, roads, and other module surfaces can be enhanced visually with imaginative materials and custom images – paint, laminate, acrylic, and digital prints – for added realism. This is also a great way to refurbish existing buildings and bridges that had a rough life in the toy box.

Images can be as simple as pictures taken of nearby buildings or walls and then scaled appropriately. They might also be assembled with graphics software in combination with stock photos, textures, and visual elements from a variety of sources. Public domain images can be found online and many commercial image or texture collections are available.

Free Textures

Public domain

A web search will turn up many sources for free textures and images. After investing many hours, however, I found that most were inadequate for the quality and convenience desired.

Several sites were marked as having 'dangerous downloads' which is something to keep in mind... Available images were often either low resolution or skewed at an angle. Color quality was sometimes poor with some or all of the image washed-out. Tileable versions were rare. Many images were also incomplete, lacking edges for example.

Commercial images and textures

A wide selection of images and textures are available from various online sources. Texturama offers building pictures as well as architectural textures and individual images that can be purchased. A hobby version of their collection is available, from which selected elements were used in combination with personal photos to create graphic details incorporated into my modules. Sources for textures and images that may be of interest include:

www.texturama.com
www.handdrawnimages.com
www.absolutetextures.com

Original images and textures

With a good camera and some determination one can create quality custom images. Shown are a few developed using photos taken during a trip to Manhattan. Pictures were taken with an older Canon EOS 20D camera, manipulated with Adobe® Photoshop® Elements 2.0, and corrected for lens distortion using the PTLens plugin from ePaperPress.

Additional details outlining one method for manipulating images to generate a straight-on front view follows...

Manipulating Images

Start with a picture relatively straight on (overcast days reduce shadows...)

Adobe® Photoshop® Elements

Use Adobe Photoshop with a plugin to address lens distortion (PTLens is $25) and Photoshop's skew and distort feature to remove perspective.

Crop the image, adjust levels, correct saturation, and make other adjustments as needed.

Creating custom images from photos

A number of resources and instructions can be found online. Above are the basic steps involved using one of my building photos as an example.

A few of the images incorporated into my first few modules are shown on the following two pages.

21

83” ► 0.95”
(220 pixels at 230dpi)

83” ► 0.95”
(220 pixels at 230dpi)

Scale

Scale

The apparent scale for many of the wooden track buildings and train cars is 1:87 based on door size, floor spacing, and car height. Doors are often a common and standard feature suitable for use to balance textures and images from various sources. These are generally just under 7 feet in height (~83″). Door widths can vary significantly making this characteristic much less useful for scaling.

Following are some metrics based on observations to validate these scale assumptions.

Resolution **230 dpi** (115 dpi min)
Scale **1:87**

Reference Dimension - Exterior Door

	width	height
Actual	**36″**	**83″**
Scaled	**0.41″**	**0.95″**
	96 pixels	**220 pixels**

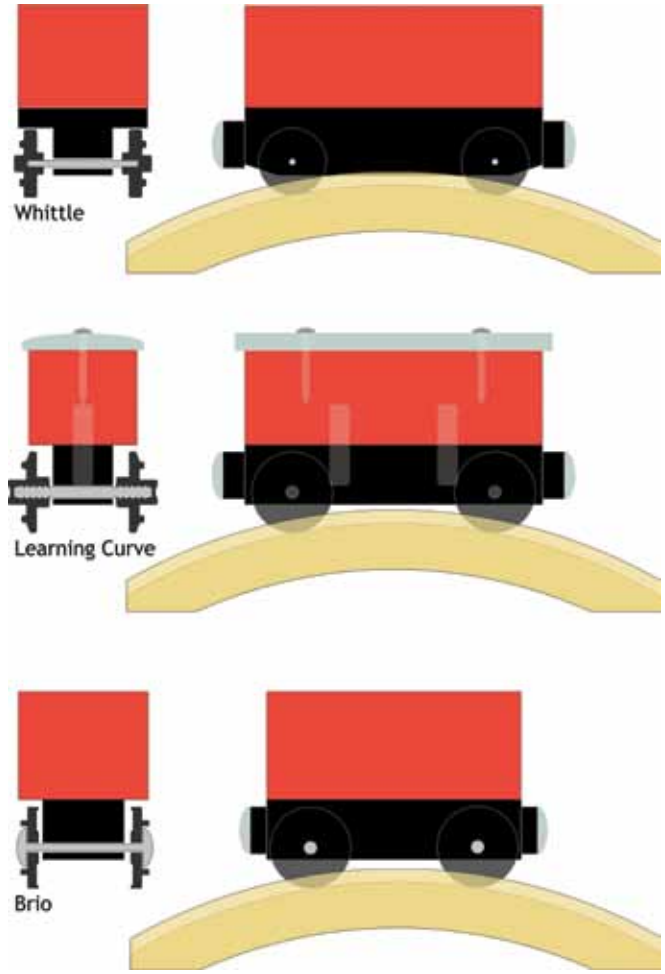
Reference - Boxcar

	car length	car height	truck height	total height	car depth
Actual	**607″**	126″	44″	**170″**	**126″**
1:126	**4.8″**	1.00″	0.35″	**1.3″**	**1.0″**
1:87	**7.0″**	1.45″	0.51″	**2.0″**	**1.4″**
Scale	**2.8'**	**1.00″**	**0.65″**	**1.7'**	**1.0'**

Railcar scale

Railcar scale is harder to quantify. Wooden train car bodies are roughly equivalent to 1:126 based on width and height. Train car lengths based on 1:126 are clearly too short - about 60% of what would be expected for a normal car length. The height is closer to HO Gauge if the wheel/trucks are included.

Using a 1:87 scale, the cars are in principle about 40% of standard rail car length, proper height (albeit with trucks too tall and body too short), and approximately 30% narrower in width. Railcar height is arguably the most apparent dimension during play, so 1:87 would again seem to be a reasonable apparent scale to use for both trains and structures.



It should be noted that the ratio of height to width to length for cars commercially available from various manufacturers differs. Learning Curve™ cars are narrower, Brio® cars are shorter, and Whittle cars have a smaller wheel size. These variations are apparent in the comparative views of standard length cars shown. These differences can impact which track pieces will work best on your layout. Shorter cars navigate through short switches and curves better, while smaller wheels may cause cars to drag on tight radius arch bridges.

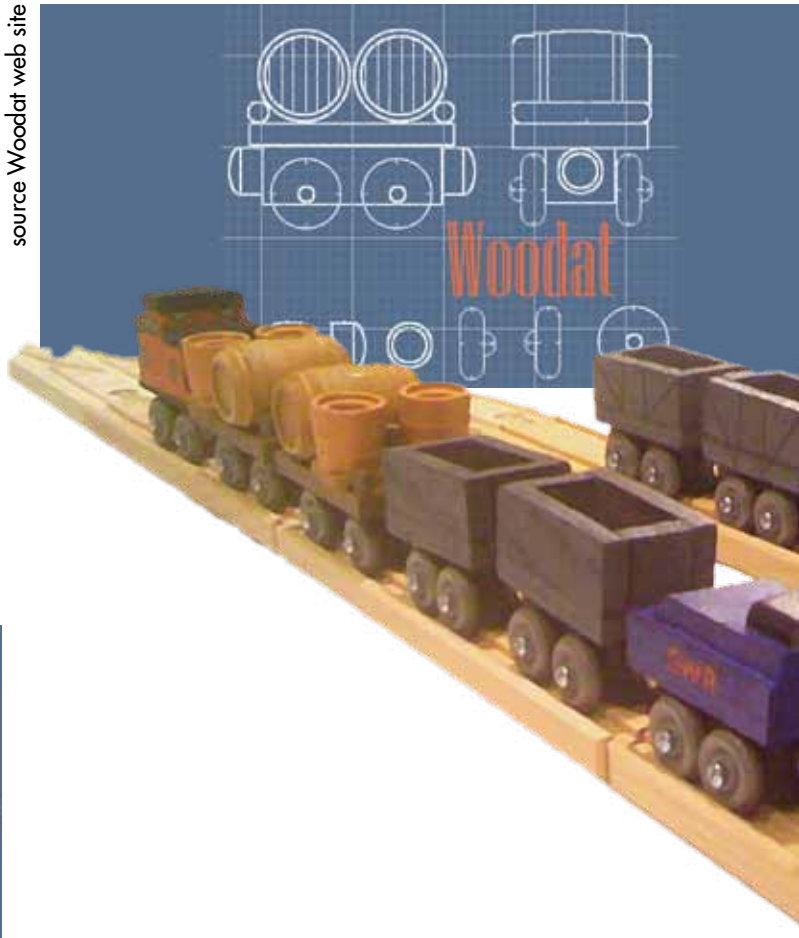
Track scale

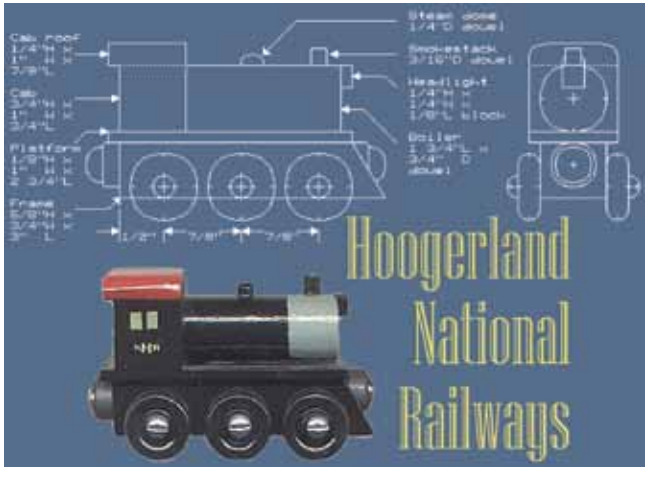
The scale of the track is completely unrealistic of course. Not just extraordinarily thick, rail spacing is also half again greater than it should be for a track of this gauge. Wider rails, though, are quite helpful for train stability when pushed by small hands...

Application

A yard house in original form (right) relative to the same building in 1:87 scale.

source Woodat web site





source Hoogerland web site

Locomotives & Railcars

In addition to commercially available train cars, it is possible to make your own. Wooden wheels appear in mail-order catalogues along with magnets and tacks. Undecorated railcars can also be purchased. These are packaged in small sets called 'Paint and Play' and are marketed for kids to decorate at birthday parties and similar events.

Hoogerland National Railways has a particularly useful site with enough information and detailed dimensions to really explore this further. Woodat is another source for ideas and plans.

Take measurements from other railcars to get the proportions balanced. Magnets need to be set at the proper height (centered at ½" from wheel base) and oriented correctly too. More information can be found at these two sites,

pw1.netcom.com/~thoog/hnr/hnr.html

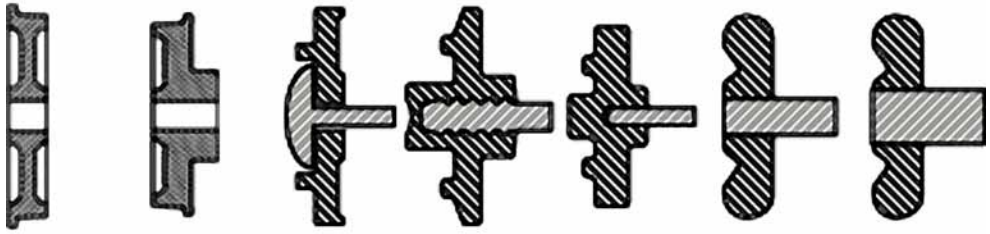
www.woodat.com

Custom Railcars

Parts are available for creating custom engines and cars. Shown are ceramic magnets, rounded couplers, and wooden wheels that can be found at Cherry Tree Toys and other sources. The wooden wheels have a 1/8" diameter hole and accommodate a dowel or screw for the axle.

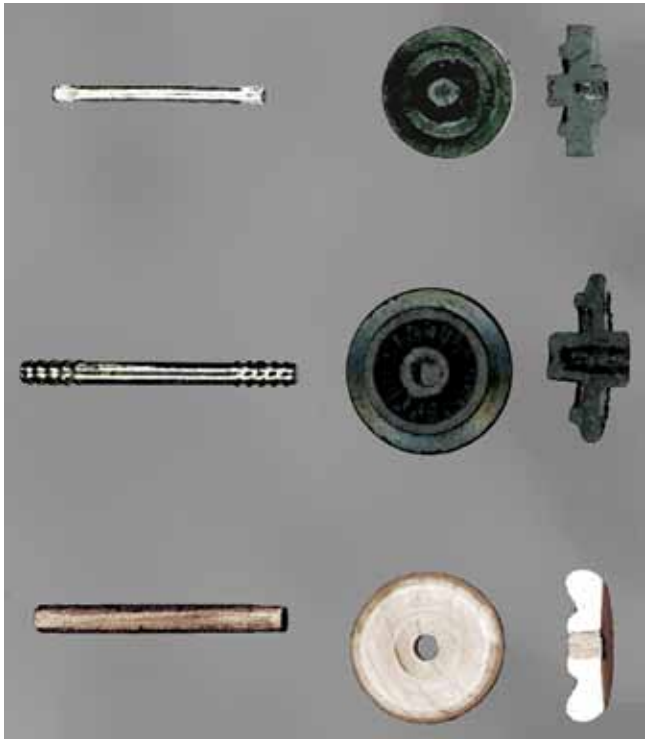
I 'child tested' the wheels using a glued 1/8" birch dowel axle. Within a few minutes of casual twisting the dowel completely disintegrated and snapped in the middle. Using a carbon fiber graphite shaft and CA glue held up better, but the glue set up so quickly it was difficult to get the wheel balanced on the axle to prevent wobble.

The wheel can be drilled to accept a larger 3/16" hard wood dowel. With twice the cross-sectional area, this would appear to be a more viable option. However, a wood axle rolling against wood has a lot of friction and the wheels don't spin as easily as desired. The tack through the magnet may also be long enough to interfere with the axle. A plastic or metal sleeve could help to reduce friction and wear, but the larger axle also requires a deeper railcar undercarriage that tends to drag on the track over ramps and arch bridges.



Wheel Profile

Shown are the cross-sections and axle configurations for standard model trains, three of the wood train manufacturers, and wood wheels with either a 1/8" or 3/16" wooden axle. The Brio® cars have an axle that captures the wheel. Learning, Curve™, Whittle, and others rely on an axle with knurling, barbs, or rings to retain the wheels.



All Electronics

A handful of inexpensive LED kits can be found among a long list of various electrical components.

Adjustable Interval Timer Kit
Blinking light control, pulse time adjustable between 0.5 and 5 seconds. Pause time adjustable between 2.5 and 60 seconds.

Adjustable LED Flasher Kit
Two potentiometers adjust the flash rate between two LEDs.

LED Chaser Kit
Variable speed led chaser. 10 LEDs flash sequentially.

LED Flashing Kit
Two LEDs flash in unison.

Bakatronics

A wide range of LED kits are available, many of which have options to tailor the circuits. For an additional charge, these can be purchased preassembled and tested.

Runway Lighting Kit
Fiber Optic Runway Lighting Kit for Airport Scenes.

Airport Beacon Kit
Simulates rotation of White and Green Search Lights. Micro Processor.

Tower Beacon / Flasher
Two programs. One program makes a set of 3mm Red LEDs slowly brighten and slowly fade like a tall building or radio or other tower light. The second program flashes 2 LEDs in a Strobe type pulse fashion.

Chasing LED Kit-White for Airports
10 LEDs chase sequentially for airport approach lights.

Lighthouse Flasher
Lighthouse beacon kit with simulated rotation.

Buoy Flasher
Flashing Buoy Beacon Kit

Campfire Kit
Amber LED simulates a campfire with pulsing & flashing. Selectable pause or continuous operation. Micro Processor.

Blacksmith Forge Fire
Orange LED simulates a Blacksmith's forge with pulsing & glowing to simulate the bellows pumping the fire in the forge. Micro Processor.

Super Welder Kit
Simulates Pausing and Glowing Iron effects. Micro processor.

Welding Flash Kit
Simulates welding circuit with pause.

Building on Fire Kit
Simulates a fire inside of a building using different color LEDs and random flashing.

Alternating Flasher
A pair of LEDs flash alternately at a speed similar to a blinking crossing light.

Traffic Light Kit
12 LED's function like a traffic light.

LED Illuminator Kit
Makes buildings Come Alive. Generates a sequence of preprogrammed patterns to give a "lived in" look.

Electrical

Great things can be done with LEDs – lighted buildings, sequential runway lamps, flashing lighthouse and airport beacons, pulsing buoy markers – but safety must come first.

A first thought was to run 12 Volt DC jumpers underneath and between tables. In practice this would be troublesome and potentially unsafe. Jumpers could be 'hidden' by running them through the segment ends, where they would be inaccessible when modules are bolted together. This might be feasible in a permanent table display or shelf railway.

A safer, simpler alternative is to power segments individually using 9 Volt batteries. Then, any 'powered' segments are truly compartmentalized. A transformer and electrical connection to an outlet might be fine for a shelf arrangement, but is sure to be a problem in the middle of a room full of kids... A small lockable panel below the module could hold the 9 Volt battery to ensure there is no contact with electrical connections. Include a switch to turn lights on and off.

Obviously lights should be positioned in a protected place too. Consider recessing or placing LEDs behind clear panels so they cannot be chewed, pulled, or crushed.

www.allelectronics.com

www.bakatronics.com

Clickity Clack Track

Smooth Track

Modular Track Spacing

Track Groupings

Track Template

Clickity-Clack and Smooth Track
(common shapes and sizes shown)

Drawn By:
Tom D. Stephenson

Date:
December 22, 2008

wTrak.org

Tracks and Groupings

Tracks

Standard Tracks

The modules included in this standard were developed using Microsoft® Visio®. This preserved a clean record of the layouts to share – and digital prints could be printed to create physical tiles for each module. Tiles are useful to check a configuration before assembling the modules together.

Personally, I like the clickity-clack track that Learning Curve™ abandoned years ago. You can still find this used track on eBay® and other auction sites. Track dimensions are generally the same as track currently sold by Learning Curve™, Brio®, and other manufacturers. Glued to the surface of wood tables, the audible clack is even more pronounced.

Some manufacturers offer unique pieces worth considering in your layout. Even custom tracks are available from some online sources, including Mesko Toys,

www.meskotoys.com

Consider using a mitre box to trim the occasional piece of track to close small gaps and fix overlaps. These often occur around intersections and switches. Curve trimming is also necessary to 'close' some of the more complicated and interesting custom layouts described in this guide.

Custom Track

Wood Track Module Dwg
Standard Ends

Std & Custom Track

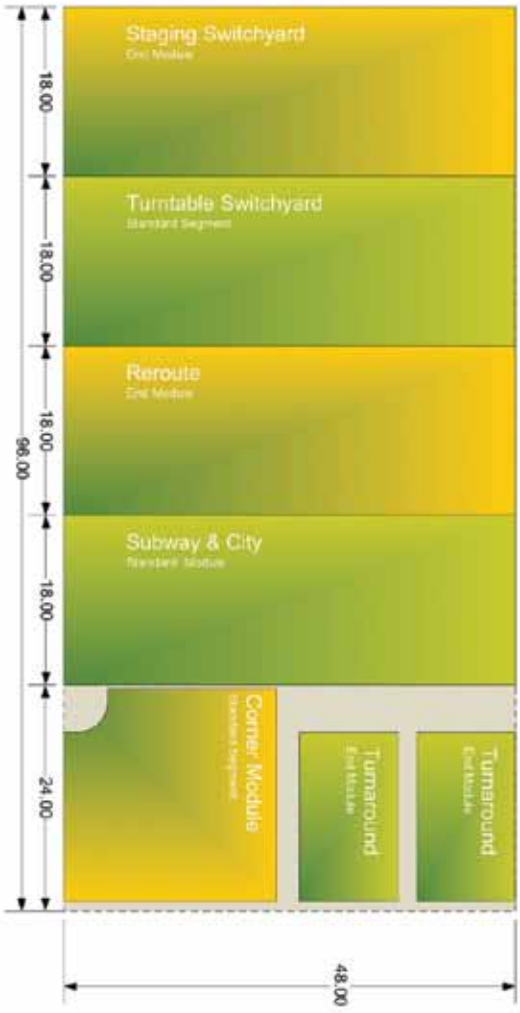
Drawn By:
Tom D. Stephenson

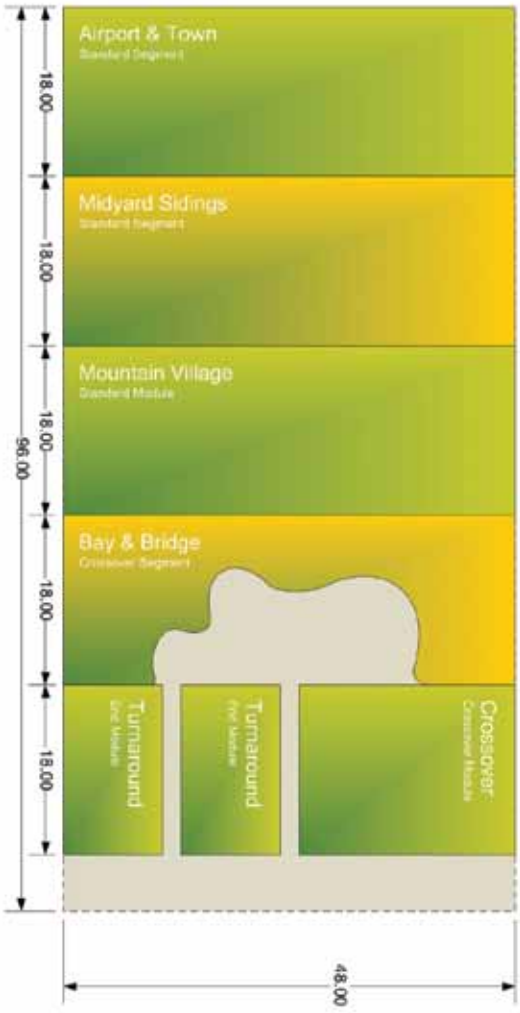
Date:
December 22, 2008

wTrak.org

Custom Track

You may also want to create your own special track sections. Examples might include a riser that curves to the left or right, 22½° curves, gradual ramps, easement curves, crossing tracks, or a custom turntable. Rockler® sells router bits that facilitate making custom track pieces. You could also use these bits to create 2½" straight pieces from broken straight pieces on hand – something often needed to get lengths to come out right. You can also make additional crossing tracks from standard 4" straight tracks with a router. Shown on the facing page are a handful of ideas to get you started thinking.





Plywood Template

½" Apple Ply Plywood
(Furniture / Cabinet Grade)

Material List A

Drawn By:
Tom D. Stephenson

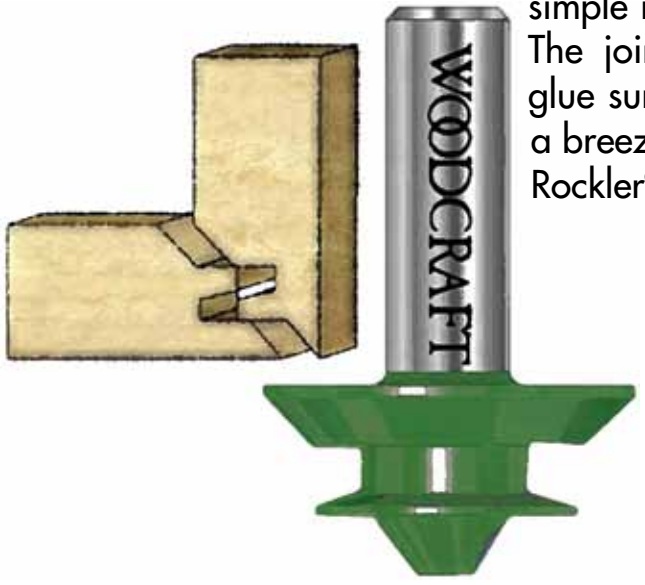
Date:
December 22, 2008

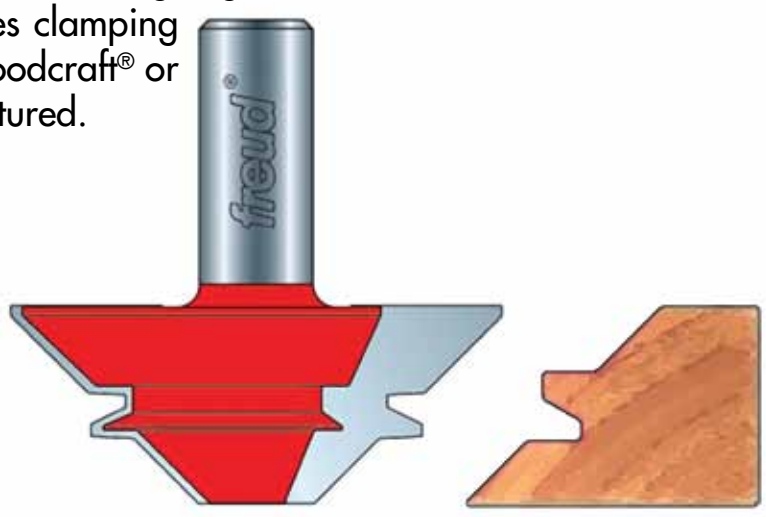
wTrak.org

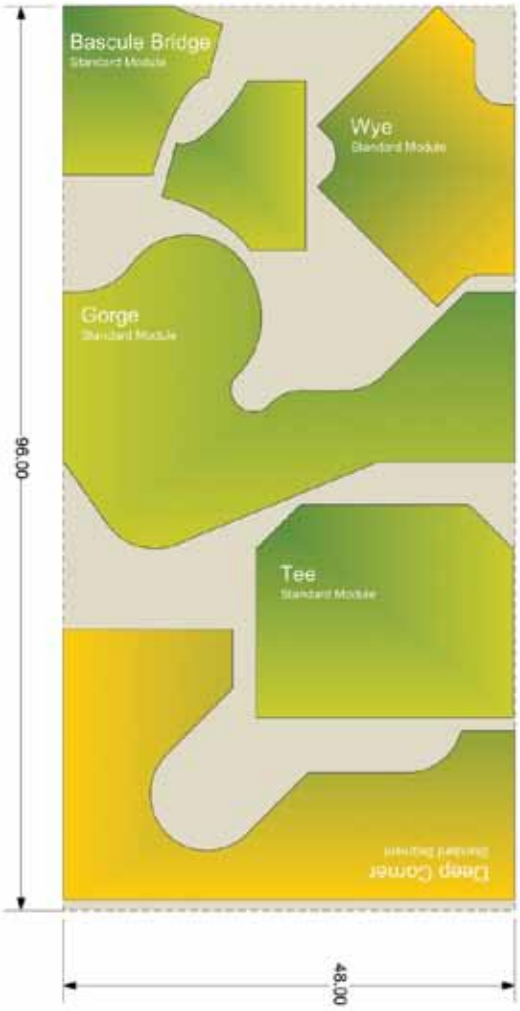
Creating Modules

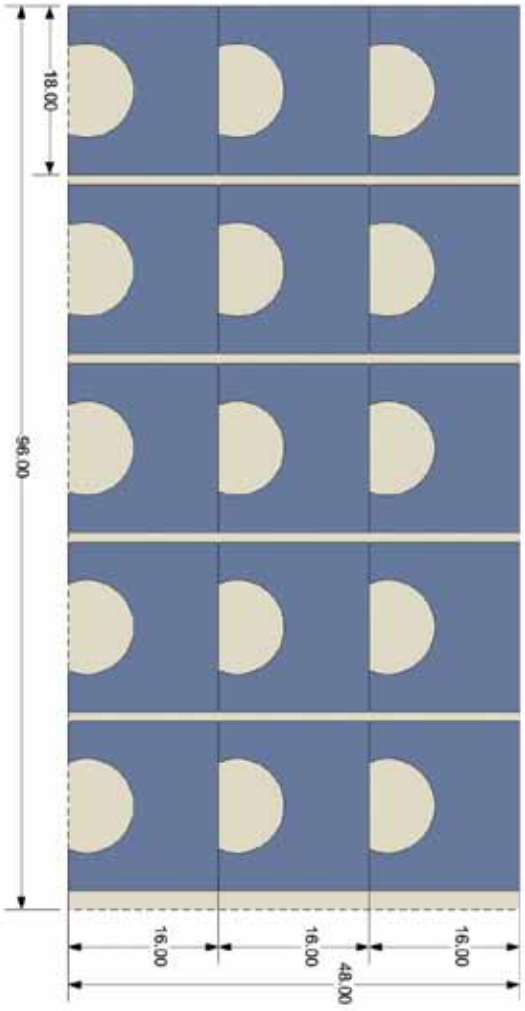
Consider using 1/2" apple ply cabinet-grade plywood for a strong, stable playing surface. These come in 5'x5' and 4'x8' sheets. Shown is a layout template based on two 4'x8' sheets that yields 7 standard modules, 2 crossover modules, a corner, and 4 ends. You will also need enough 1"x4" lumber to construct the sides and ends of each module. I used poplar that came from a 'real' lumber yard – it strikes a good balance for cost and strength and is fairly easy to cut, route, and sand.

I made construction of my first few box frames harder than necessary. Instead of using a corner lock bit as shown, I cut a simple mitre and used biscuits to join the corners. The joint shown here is self-aligning, increases glue surface, and makes clamping a breeze. Check at Woodcraft® or Rockler® for the bits pictured.









Plywood Template

1" Apple Ply Plywood
(Furniture / Cabinet Grade)

Material List B

Drawn By:
Tom D. Stephenson

Date:
December 22, 2008

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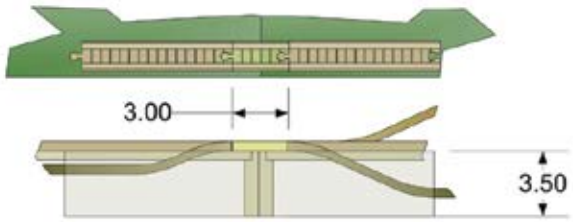
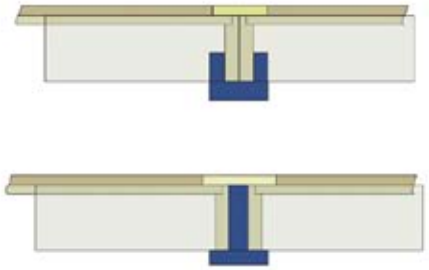
An inside edge lip is needed on all sides and ends so the table top can be dropped into place and glued. Cut this before you assemble the box. Also consider using a small roundover bit on the outside edge for splinter control and to reduce elbow, chin, and head dents later...

Leg Supports

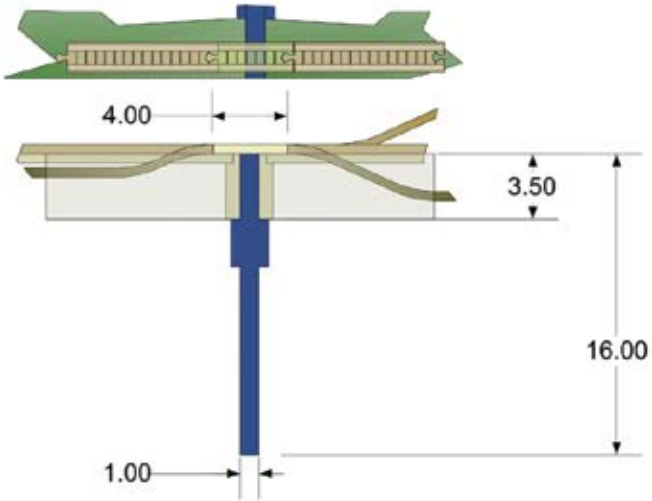
For the leg supports I started with a 1″ sheet (it might have been 31/32″) of apple ply cabinet-grade plywood. This was then cut into 16″x18″ sections and the arch was cut on a band saw using a centering hole and jig as shown in the picture below. Take time to break sharp edges with a roundover bit...

Modules set on Floor





Modules raised as Table



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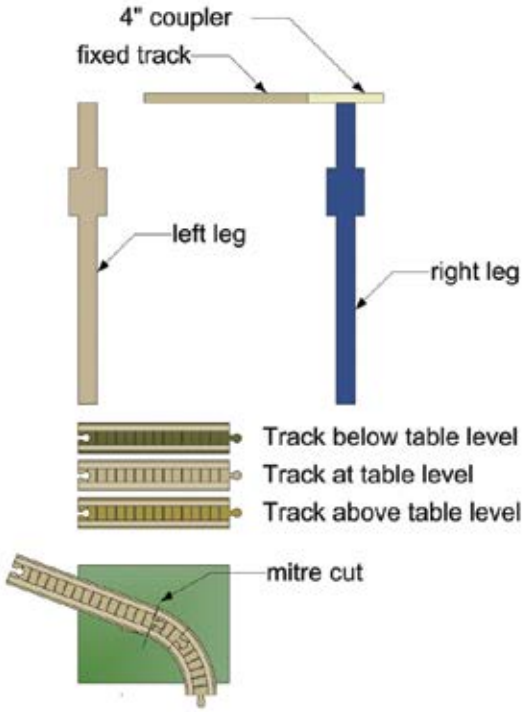

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Date: December 22, 2008

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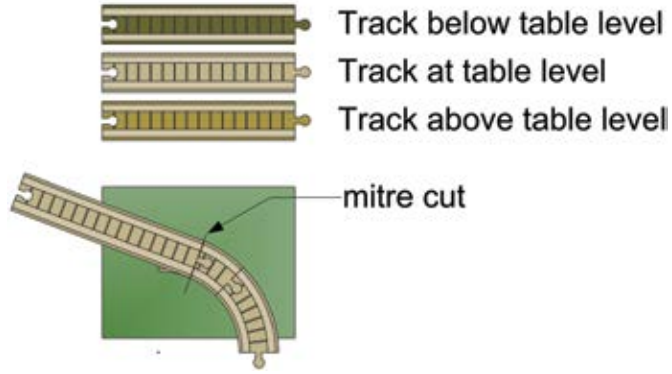
Module Joint Views

3" and 4" joints based on floor or table configuration

Module Joint Detail

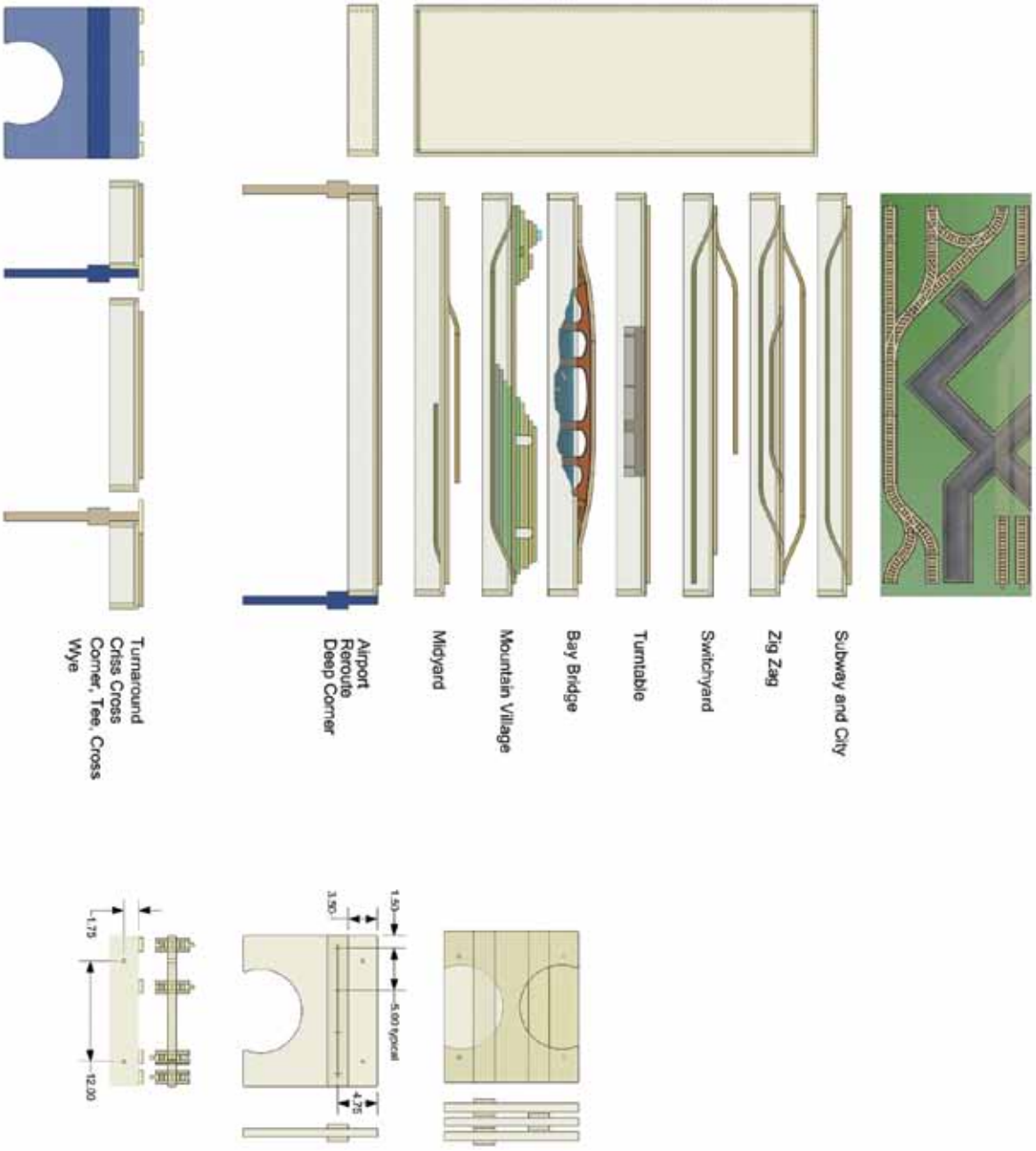
Conventions Used

The following conventions are used in this guide. These visual cues indicate where tracks might pass over intersecting rail lines or drop below table level. A sense of where custom trimming is needed is also shown for some of the simpler modules.



To create a freestanding table, a support is required at each end of the module segments. Since modules generally share one support, the support on the left in most side views is shown for reference only.

A small support ledge may be required with ground-level layouts to ensure they sit flat on an uneven floor. A 3″ connector would be needed for a 'U' ledge and a 4″ connector for 'T' ledge floor supports as shown.



Module Side Views

Table and Leg Support
Bolt Hole Dimensions

Module Details

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Date:
December 22, 2008

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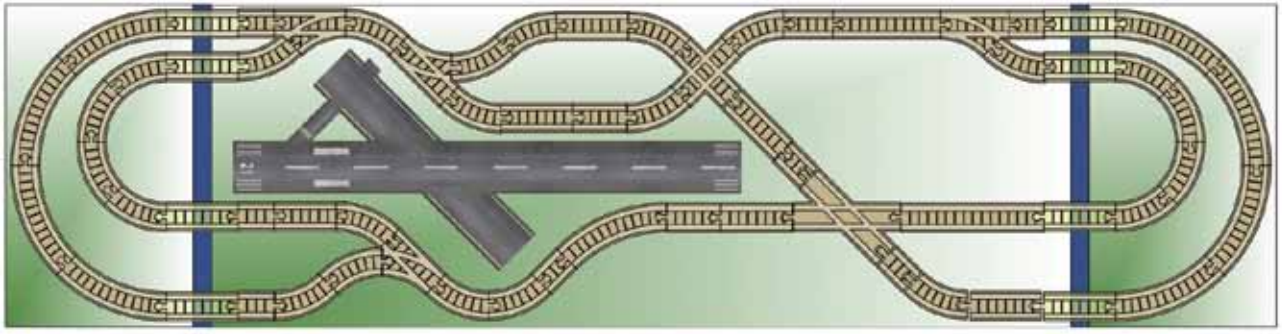
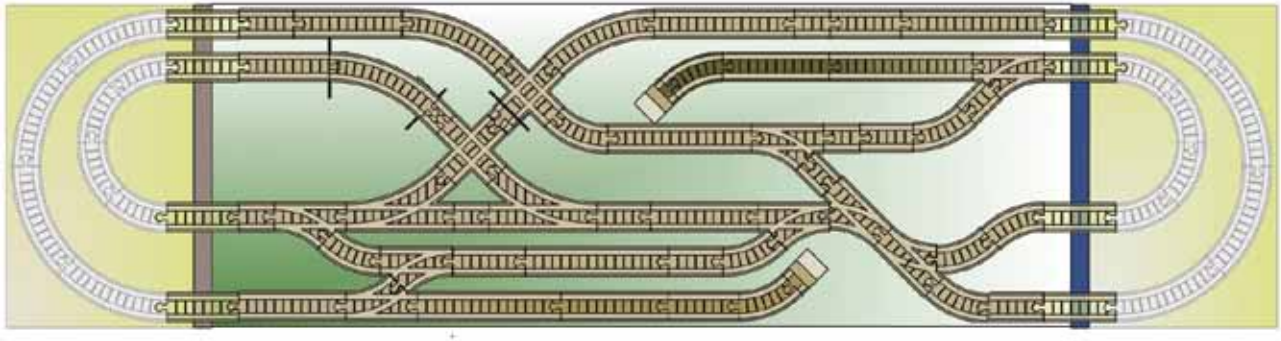
Storage & Other Tips

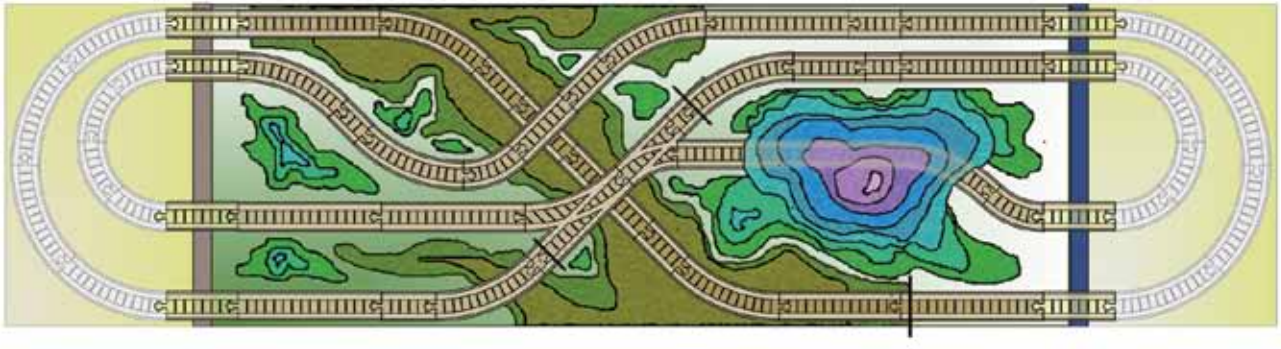
Several of the modules are flat and stack easily. Others have features that extend above the playing surface. Two short plywood panels with holes could be used to bolt module segments together as an integral shelving unit. Space the holes in a way that the modules can't trap hands or heads. Add a top and bottom with a few ledges on the sides and you have a simple storage unit where modules can just slide into place instead – like trays in a bread or bakery cart...

Ensure clean, consistent track joints in your layout by making a simple bolt-on tool. Start with a leftover piece of plywood from your 1" thick support legs, glue and screw on four 4" joiners, and temporarily bolt this to the module end when affixing track.

During layout set-up, use fender washers on each side of each joint to protect the module ends. Forged wing nuts make assembly especially easy and wrench-free. Bring a wrench along though just in case you outdid yourself during assembly...



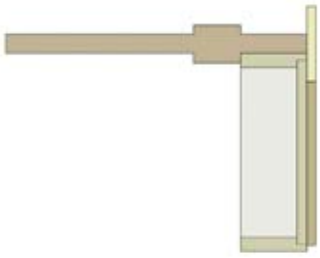


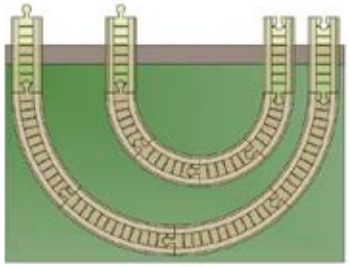


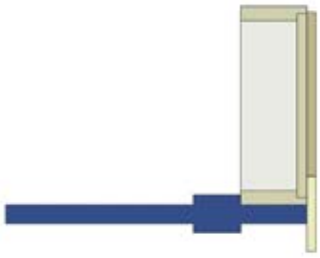
Standard Modules

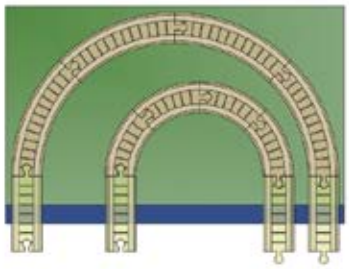
The following radiused ends and standard modules are a good place to start. Each has an individual character and style. Both the ends and one of the standard modules have a simple, flat play surface that is easy to construct. The other two incorporate ramps that drop below the main playing surface. Half-height ramps for sidings – made by shortening standard ramps – can be leveraged as well, though this can be omitted to simplify construction.

Several layout ideas follow for what I would describe as a starter set. They are easy to construct, relatively simple to lay out, and provide plenty of creative play potential. They are also ideal for a shelf layout.









Turnaround

Wood Track Module Dwg
Standard Ends

End Module (R & L)

Drawn By:
Tom D. Stephenson

Date:
December 22, 2008

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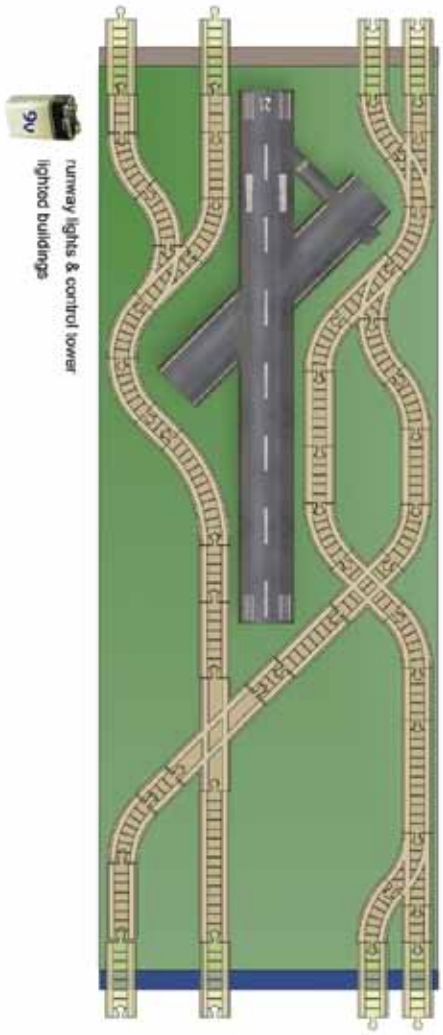
Turnaround

A turnaround module is needed at each end of a layout to ensure continuous play – and the most obvious solution is a half-radius.

You may wish to have two pairs to facilitate separate tables. They are very easy to construct.



Airport & Town

Wood Track Module Dwg
Standard Ends

Standard Segment

Drawn By:
Tom D. Stephenson

Date:
December 22, 2008

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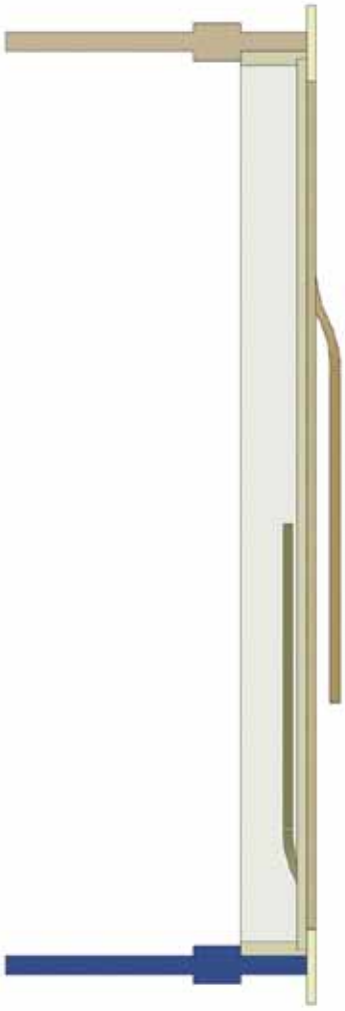
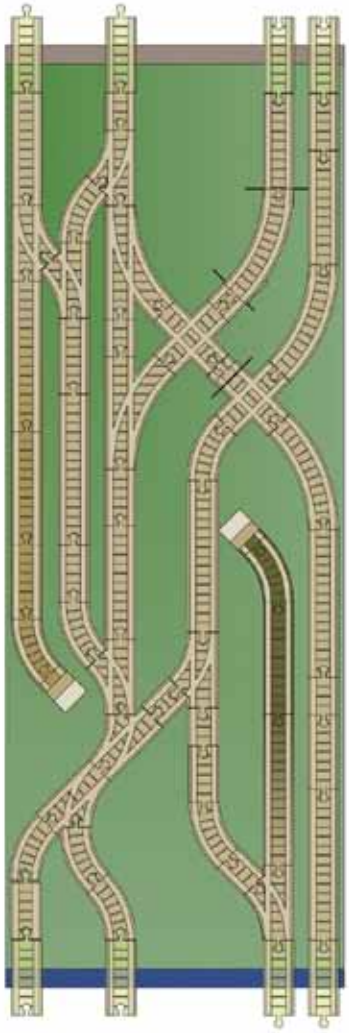
Airport & Town

Everybody loves an airport (except during holidays) so this simple segment routes trains around a rural airfield and through a neighboring town. The tracks merge and branch making it easy to shift trains from one line to another through this section.

For those willing to invest a little more effort, it presents an opportunity to add sequentially lit runway lights, a flashing landing beacon, and lighted village buildings.

This module is flat and does not require trimming any tracks, making this a great first effort.





Midyard Sidings

Wood Track Module Dwg
Standard Ends

Standard Segment

Drawn By:
Tom D. Stephenson

Date:
December 22, 2008

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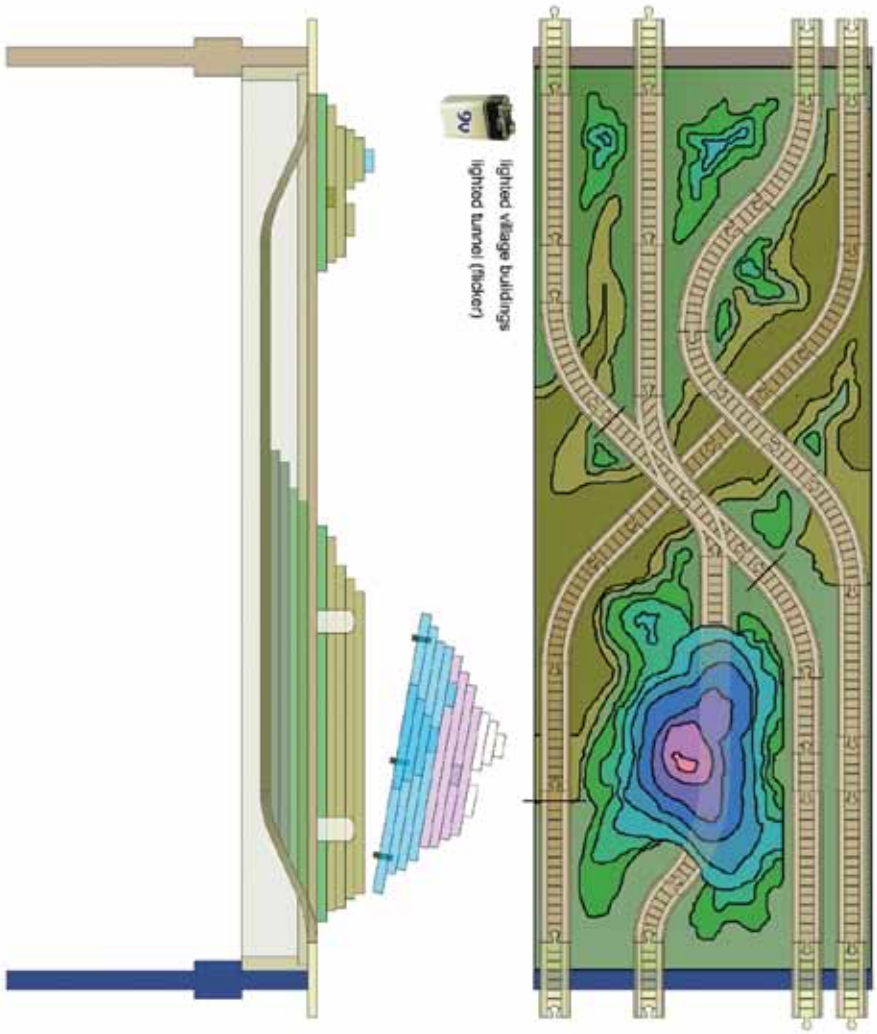
Midyard Sidings

Switches and sidings allow other trains to pass. Trains can be reconfigured on one of the two sidings or wait for another train to go by. This section encourages cooperative play with other engineers at the table.

This module could be made flat, but adding a half-ramp up and/or down for the sidings makes it even more interesting. You may need to make a few trim cuts to avoid gaps around the double crossovers. Still an easy first effort.



Mountain Village

Wood Track Module Dwg
Standard Ends

Standard Segment

Drawn By:
Tom D. Stephenson

Date:
December 22, 2008

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Mountain Village

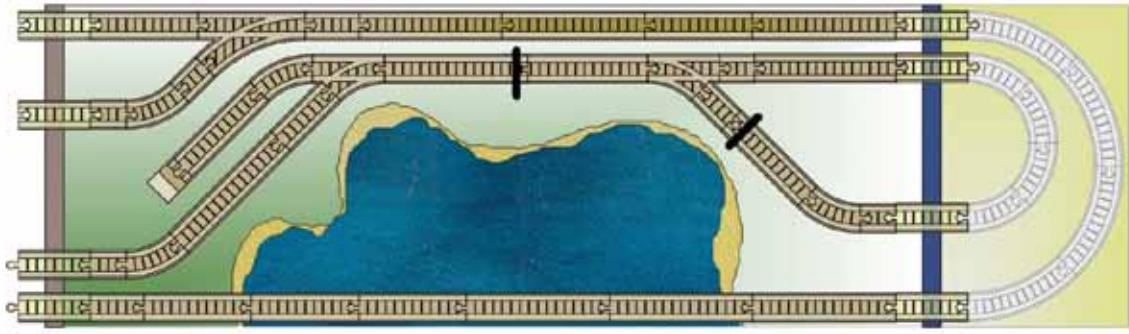
Designed with one track dropping below table-top level, this could be reversed to ascend instead to make the module easier to construct. Recessing the track allows the base of the mountain to drop another 2½" adding even more drama to this segment!

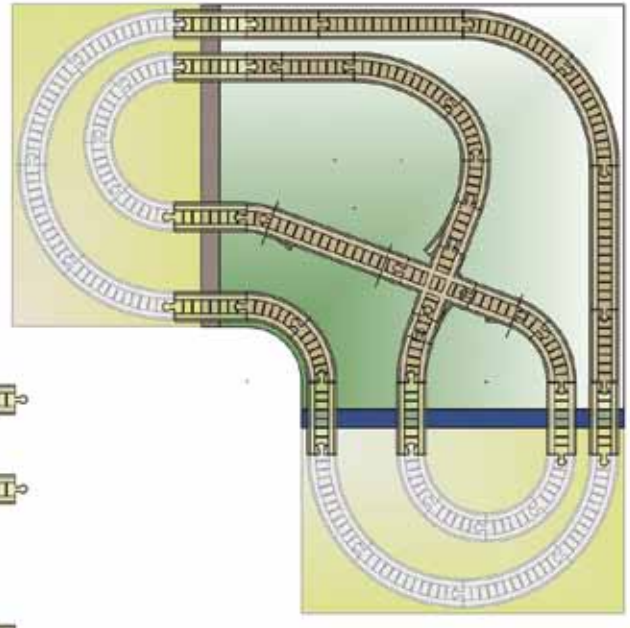
An alpine village at the base of a mountain and pass-thru tunnel add depth and contrast. The village can be lit with LED white and flame lights for added warmth. Safety should trump creative details though.

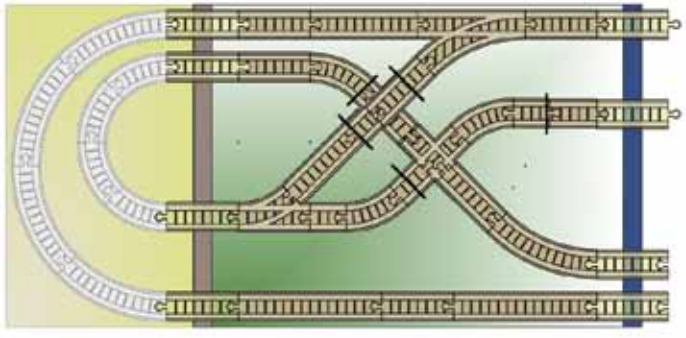
The mountain can be constructed many ways, but a contour map style of stacked outlines is especially rugged and effective. Edges can be softened using a roundover or chamfer router bit. You might also try wood chisels and use doweled and glued blocks for a more realistic mountain. Sharp chisels, eye protection, and a first-aid kit are recommended if you embark down this path...

For transport and stacking, the portion above the 2½" level can be separated and set on the mountain base using steel dowel pins for alignment and stability.

Another great option is to use LED lights in the 'ceiling' of the tunnel. A miniature mine train and shaft could be added and lit too...





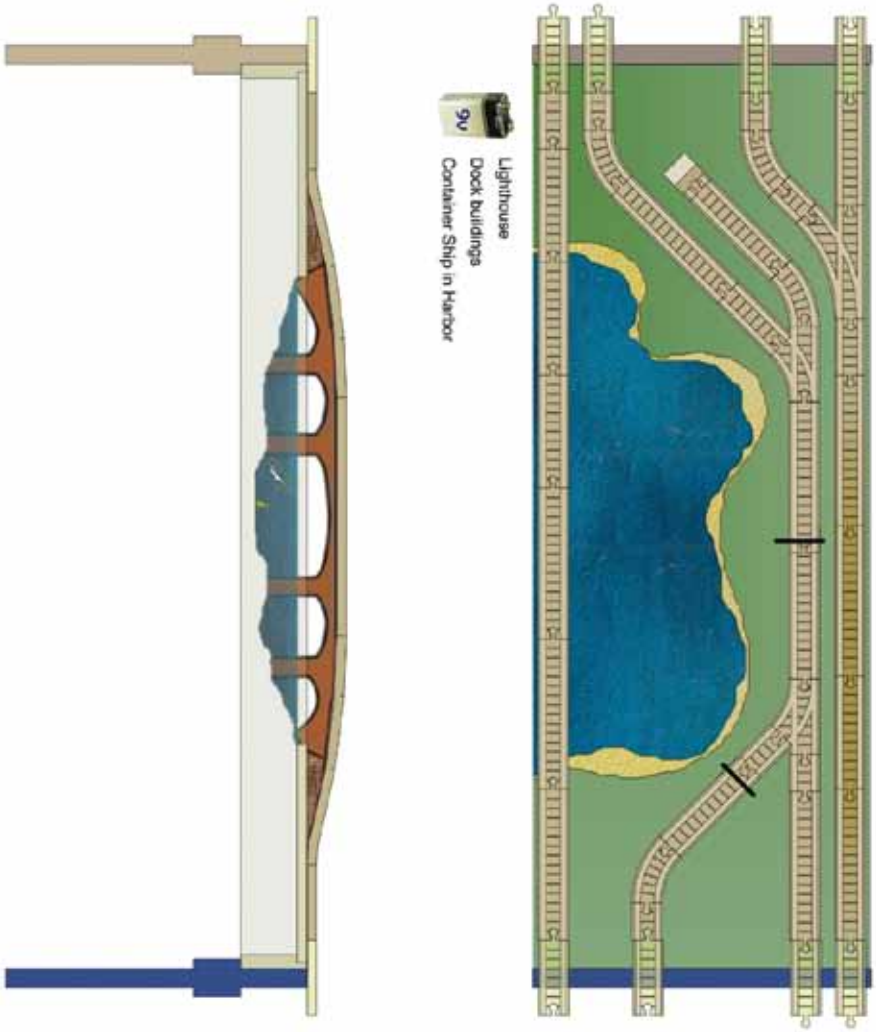


Expansion Modules

These next three modules include a corner (you may want to build two) and a pair of crossover segments that allow the standard segments to be rotated 180° and back again. These segments dramatically expand the number of possibilities.

The 'Bay & Bridge' module can be constructed as a flat segment but is transformed when a recessed bay and elevated bridge deck are incorporated. I found it desirable to custom mitre the track sections for both the 'Corner' and 'Criss Cross' segments to ensure a clean, tight fit in such a confined space....

Mixing things up a bit...



Bay & Bridge

Wood Track Module Dwg
Reversed Ends Type I

Crossover Segment

Drawn By:
Tom D. Stephenson

Date:
December 22, 2008

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Bay & Bridge

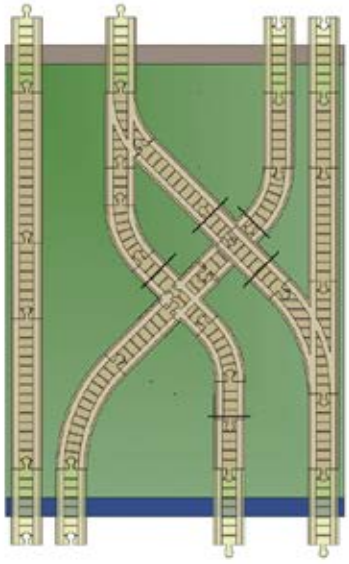
This crossover segment switches which edge the double-line tracks run along. A second crossover segment is required to switch them back again.

The paths of the tracks are clean and straightforward – a welcome break from the complexity of other modules. But the addition of water (perhaps a canvas print, digital photo, or laminate) and a long bridge add a visual focal point. A lighthouse, partially submerged ship, flashing buoy, wharf, cargo crane, and waterfront village could be featured as well. Perhaps even a simulated whirlpool...

The bridge could be a dramatic and custom element. A basic plate/girder construction is strong and simple, but I can imagine a swing bridge here too.

For a truss or Warren bridge, use hardboard faced with a digital print. A series of 'concrete' arches or 'cantilevers' could be made from dimensional lumber and surfaced too.

There is enough lead-in space to go underwater instead. Create a tunnel opening at each end and leave the side open and kids could shuttle the train under the bay itself.



Criss Cross

Wood Track Module Dwg
Reversed Ends Type II

Crossover Segment

Drawn By:
Tom D. Stephenson

Date:
December 22, 2008

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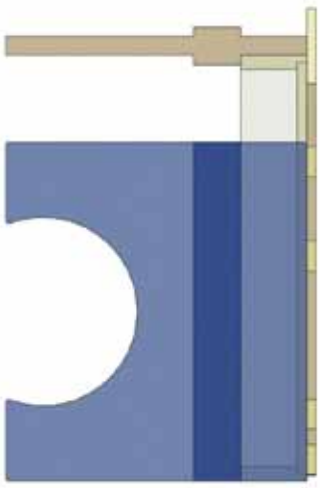
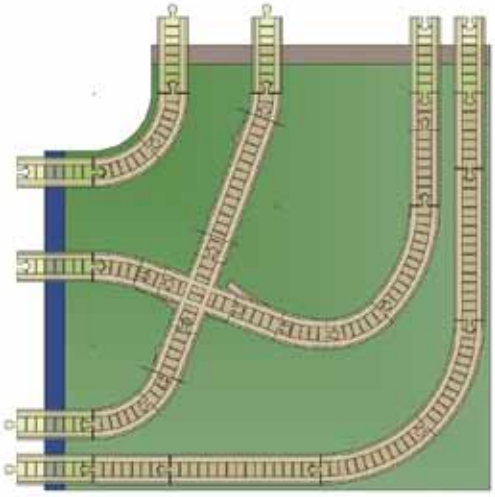
Criss Cross

This short segment has a thru-track along one edge and mixes things up for the other three. Combined with a second crossover segment (see 'Bay & Bridge'), the possibilities for module orientation and arrangement more than double. It is necessary to do some track mitres to make the connections smooth and gap-free, but the module is flat and simple to construct. Leftover table space can be used for imaginative buildings, a gully, or other special features.





Corner Module (short)

Wood Track Module Dwg
Standard Ends

Standard Segment

Drawn By:
Tom D. Stephenson

Date:
December 22, 2008

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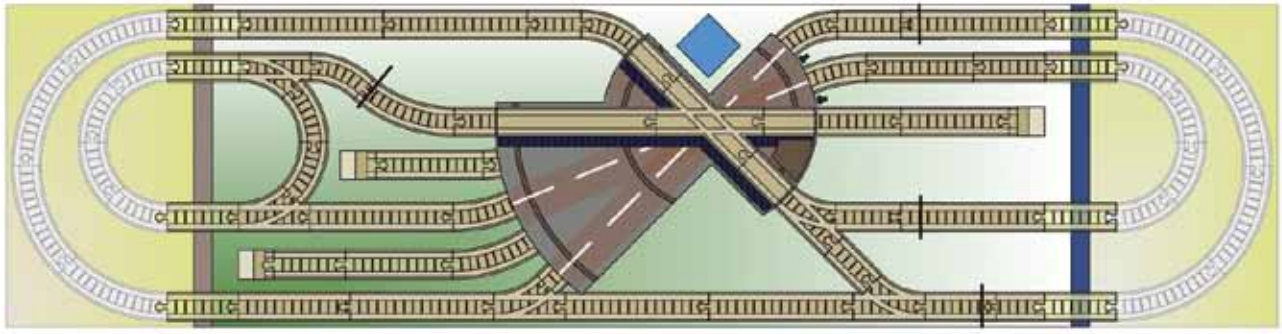
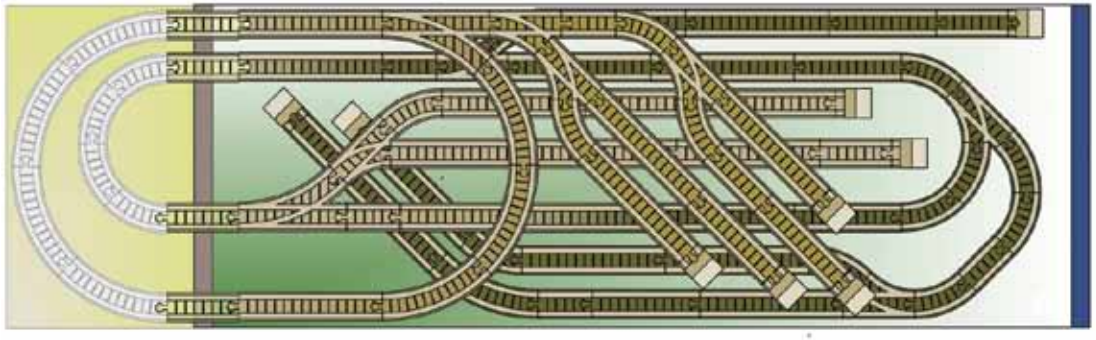
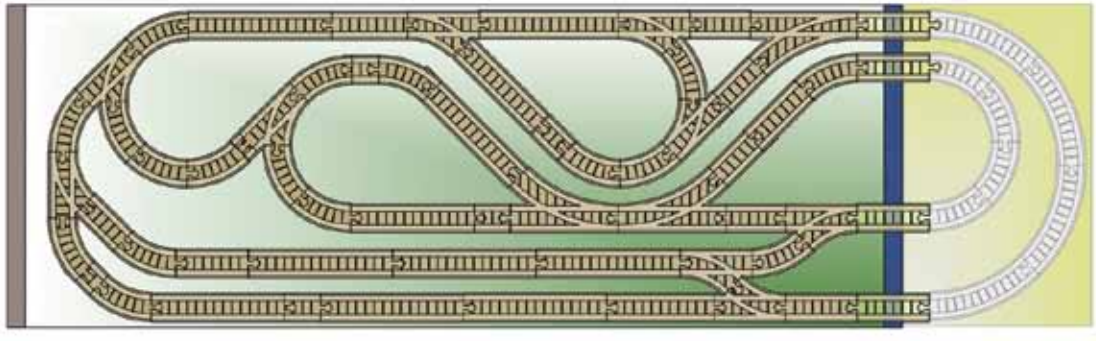
Corner

This is a critical piece unless you have a long unused hallway. Having two is better and they are simple to build. Several track variations can be achieved within a corner module – even in this very limited space... Alternate long and short versions of a corner are presented later in this guide.

Plan to do some track trimming to ensure clean lines and minimal gaps around the intersection. Attach a third leg in the outside corner for stability when used as part of a floor layout.





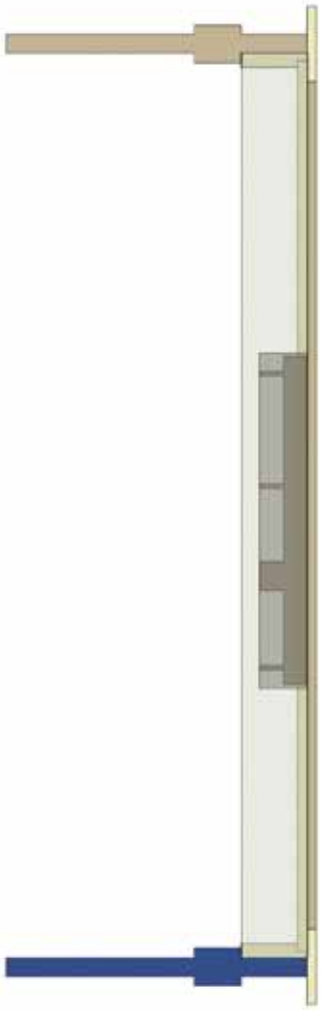


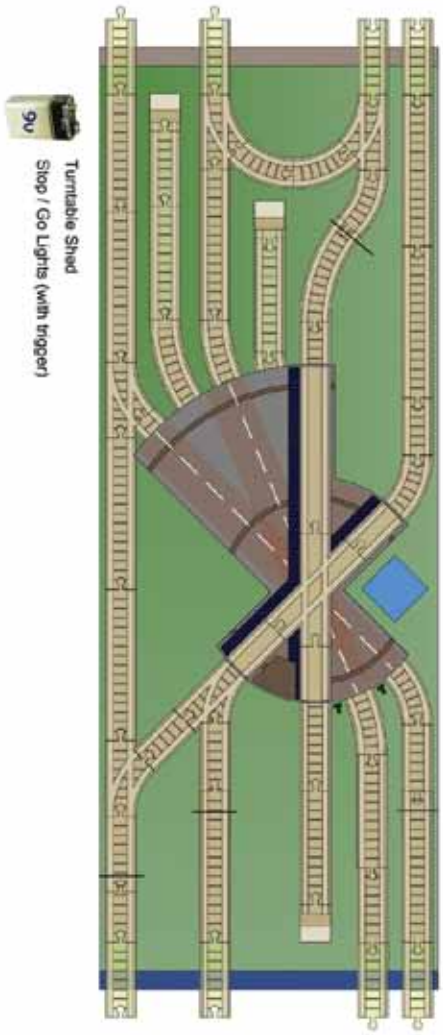
Advanced Modules

Shown are just a few of the many advanced segments possible. These require more time and effort to construct. Two specialty ends and a turntable are included. These may also serve as starting points to develop your own ideas.

For a complex layout in limited space, note that the two end modules shown can be joined together to create a single 8′ layout that is particularly challenging to fully navigate.

Pushing the envelope...





Turntable Switchyard

Wood Track Module Dwg
Standard Ends

Standard Segment

Drawn By:
Tom D. Stephenson

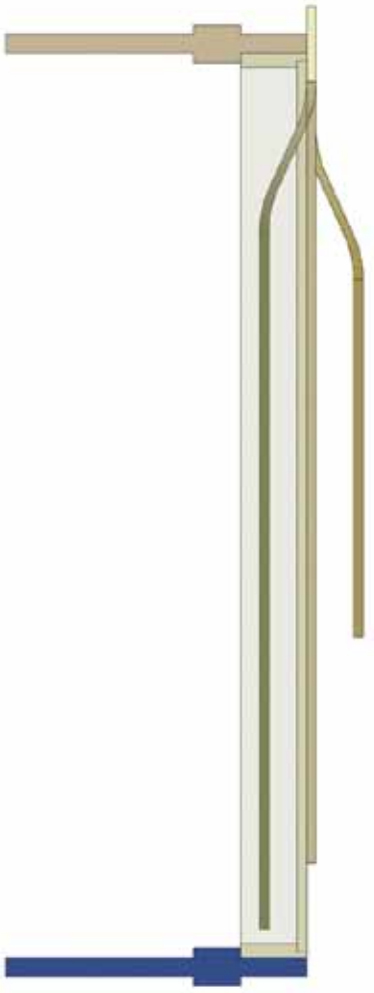
Date:
December 22, 2008

wTrak.org

Turntable Switchyard

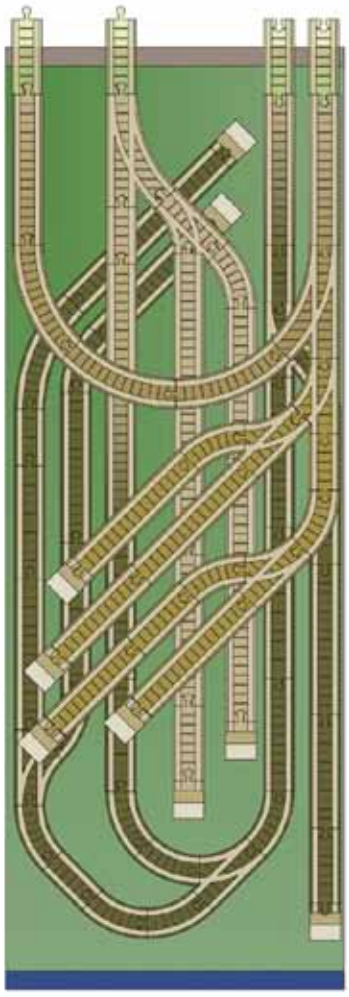
Probably the most fun to design and most challenging to build, a recessed turntable is something really special in a layout. The table could be driven by a worm gear with a button on the side or turned manually. This feature tends to concentrate passing trains and engineers may stack up while waiting to transit through the switchyard.

Four track lines require the turntable to be adjusted to allow passage, with only a single path bypassing the turntable completely. The asymmetry of the turntable restricts longer trains from rotating between track lines. Shorter trains can also be shunted to three sidings branching from the table.



lighted underneath overhead tracks

lighted yard tower



Staging Switchyard

Wood Track Module Dwg
Standard Ends

End Module (R)

Drawn By:
Tom D. Stephenson

Date:
December 22, 2008

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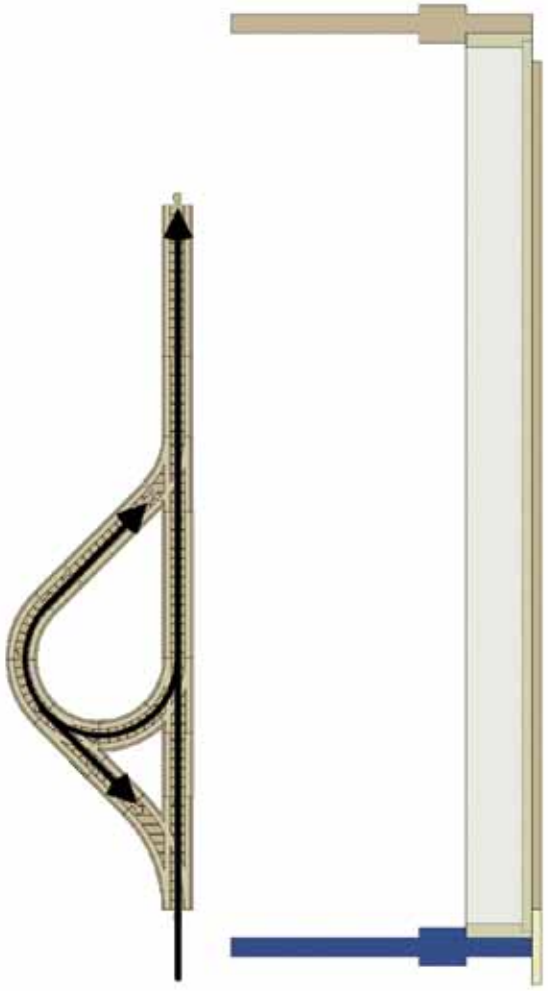
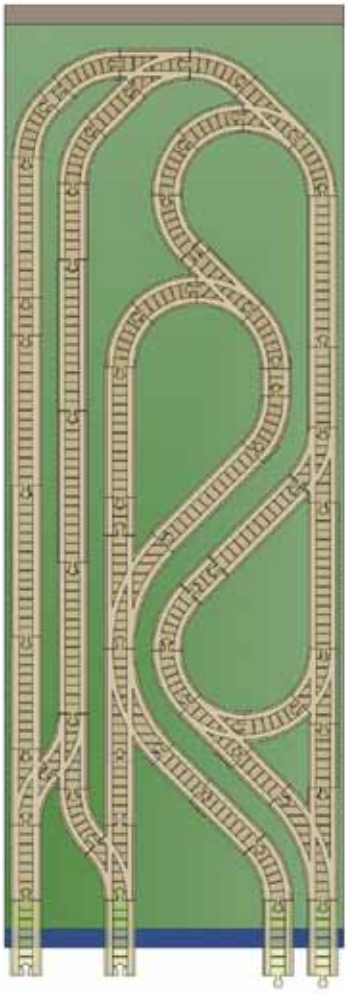
Staging Switchyard

This is a challenging segment to construct and navigate. Particularly useful for assembling trains to navigate through the table, it can serve as a start and finish point.

Place lights underneath the elevated tracks to add depth and focus. Signal lights could also be incorporated.





Rerouting Endyard

Wood Track Module Dwg
Standard Ends

End Module (L)

Drawn By:
Tom D. Stephenson

Date:
December 22, 2008

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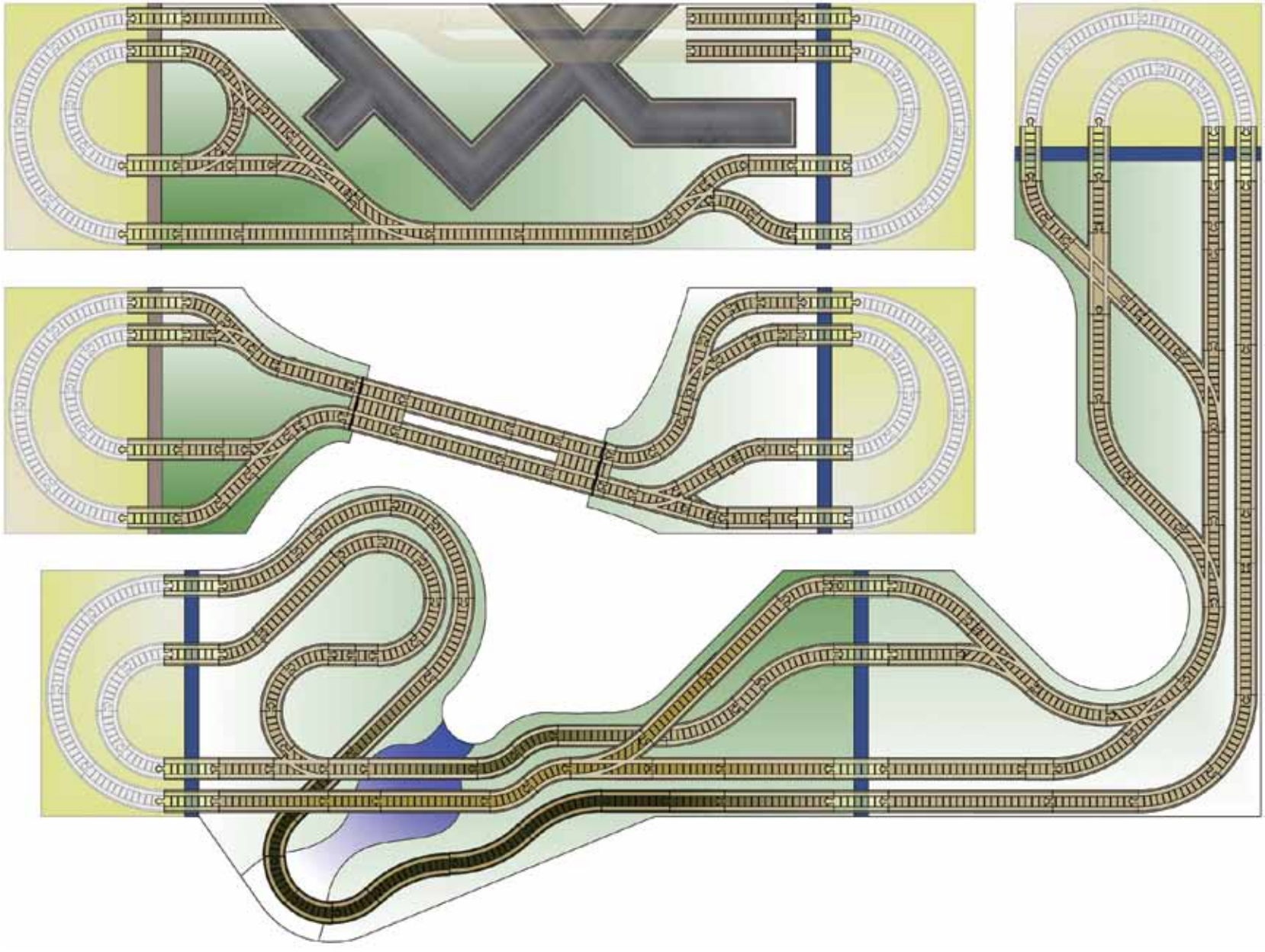
Rerouting Endyard

This is an easy segment to construct but requires a fair number of mitre cuts on the track to achieve.

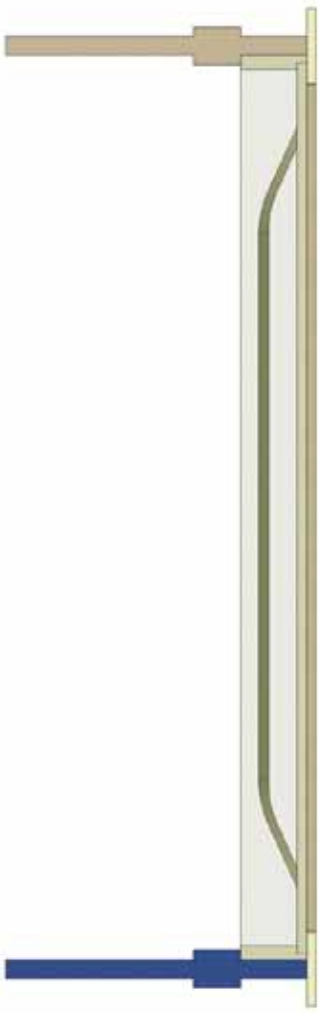
This module was thoughtfully designed to allow trains to come in from any track and exit again on any track – including the track entered on. Most return routes are easy to resolve, but a few are more subtle. For one track it is necessary to enter, back through the loop, and then proceed out again. Refer to the image shown for clarity. This is a great module to challenge older kids with.

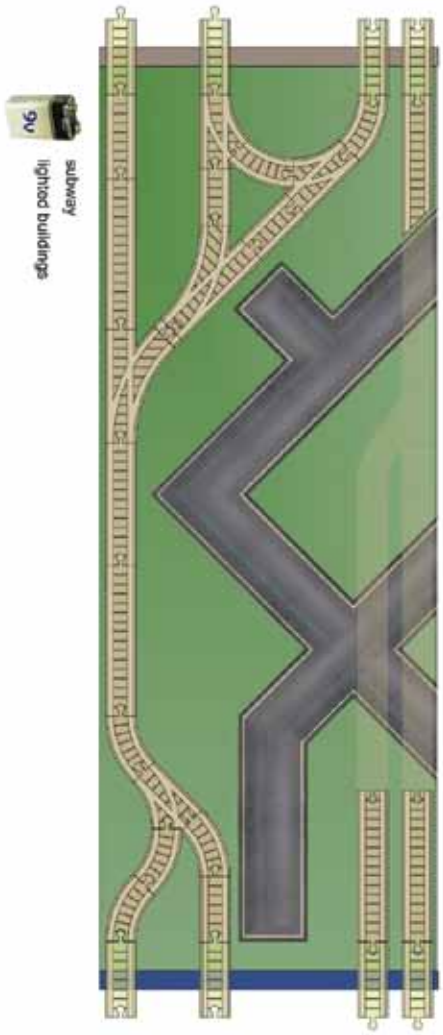


Expert Modules

Each of these segments goes a bit outside the box. Based on the standard module, each track routing takes liberties to the side, above, or below. The design of these tables requires creative reinforcement and each represents a substantial investment of time and effort. Many variations of each of these tables could be conceived. Stacking or transporting these could also present more of a challenge...

Coloring outside the lines...





Subway & City

Wood Track Module Dwg
Standard Ends

Standard Segment

Drawn By:
Tom D. Stephenson

Date:
June 25, 2009

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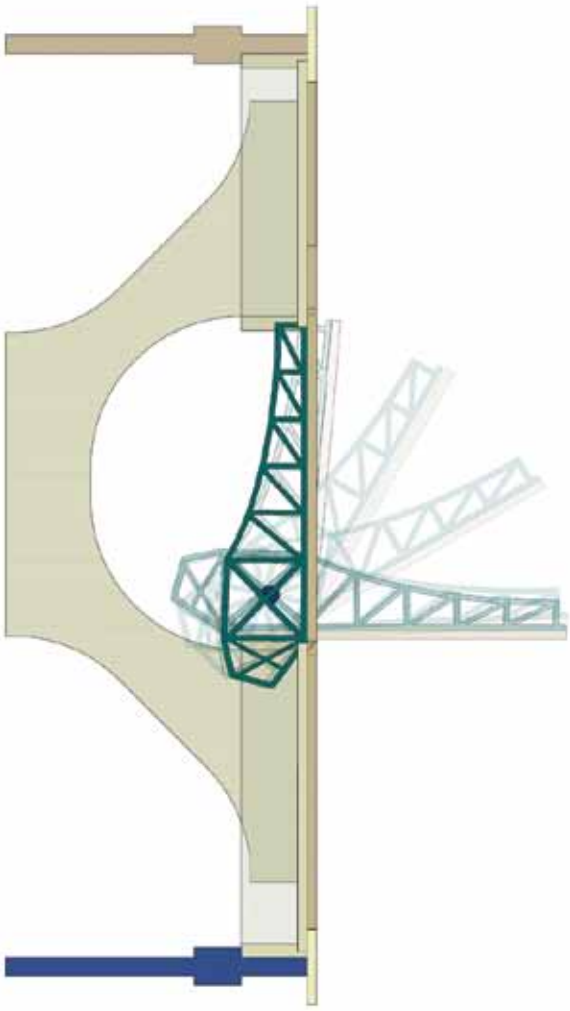
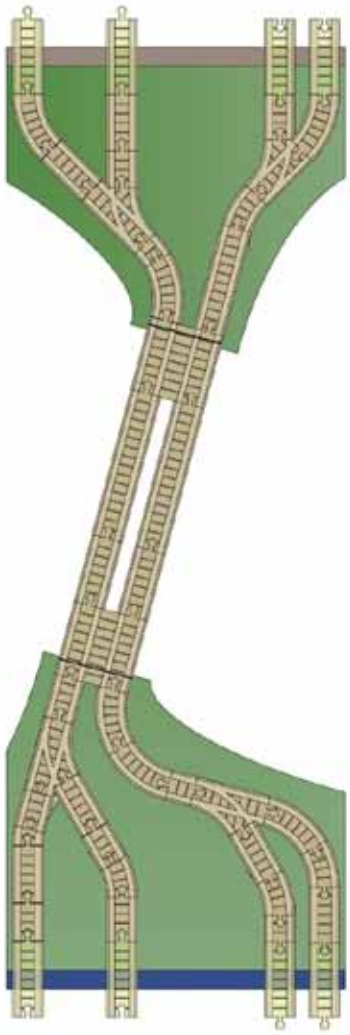
City & Subway

Several lines skirt the edge of town, while another ducks beneath the city. A trolley line could travel at street level while a subway line passes below (a great place for a battery-driven engine that cycles into view along the two sides of the table.)

To finish the town, a grouping of low- and high-rise buildings surfaced with digital images and textures reach skyward and welcome inbound trains. This dramatic module is a hub for inbound, outbound, and express trains alike.

Blinking red LED lights on the corners of the taller buildings add interest – perhaps even a few lighted windows, doorways, signs, and lights washing onto the street and sidewalk. Add a heliport to serve as a destination from the airport too. Let your imagination run wild!





Bascule Passage

Wood Track Module Dwg
Standard Ends

Standard Segment

Drawn By:
Tom D. Stephenson

Date:
December 22, 2008

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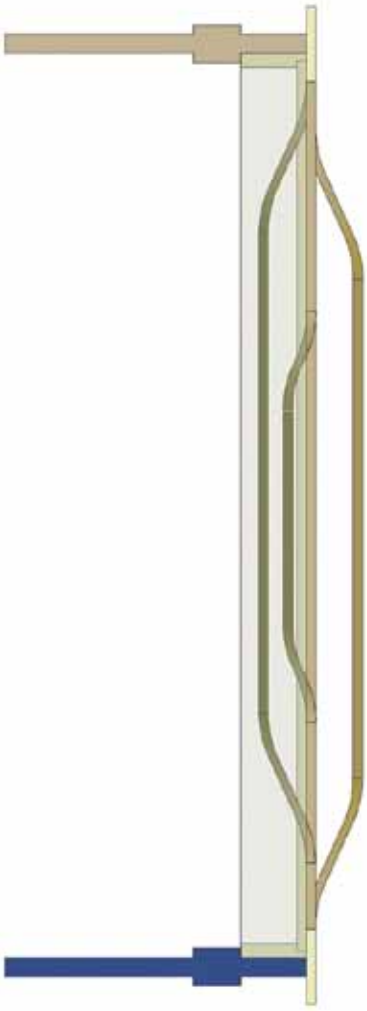
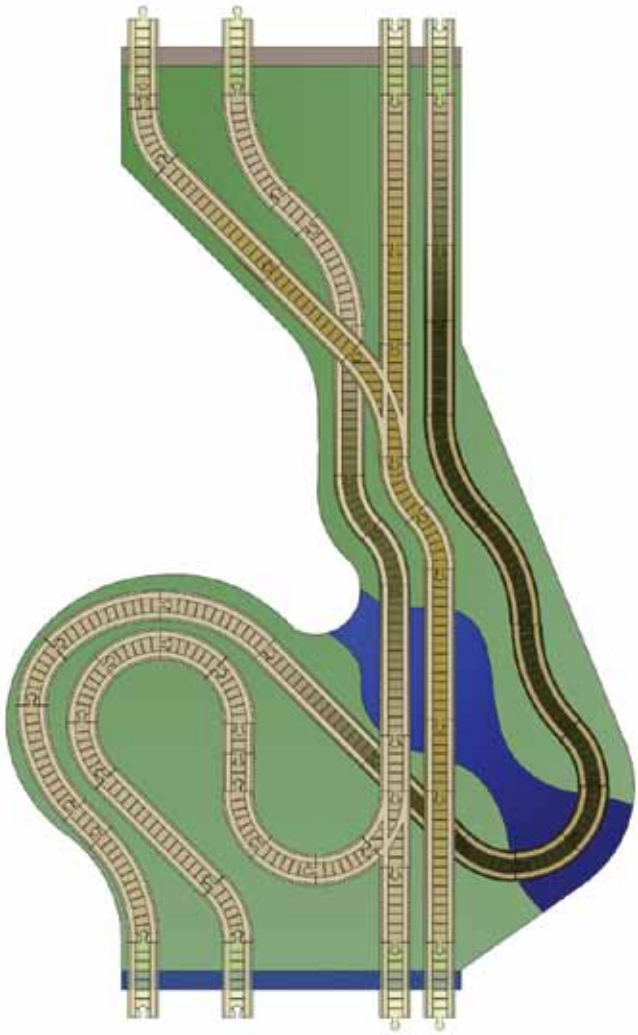
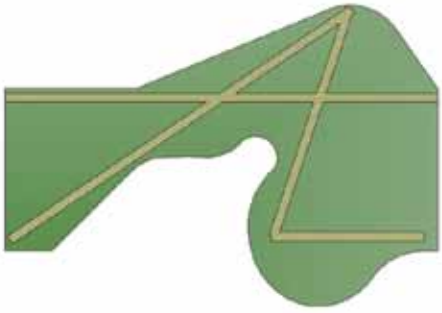
Bascule Bridge

This is an opportunity to provide an access point through a closed loop railroad. To achieve this, a bascule bridge can be raised (even weighted to remain open except when trains transit) for passage to the opposite side.

Side supports that bolt to the module ends would allow for more compact storage and transit. A removable bolt serving as the bridge hinge could be incorporated as well.







Zig Zag Gorge

Wood Track Module Dwg
Standard Ends

Standard Segment

Drawn By:
Tom D. Stephenson

Date:
December 22, 2008

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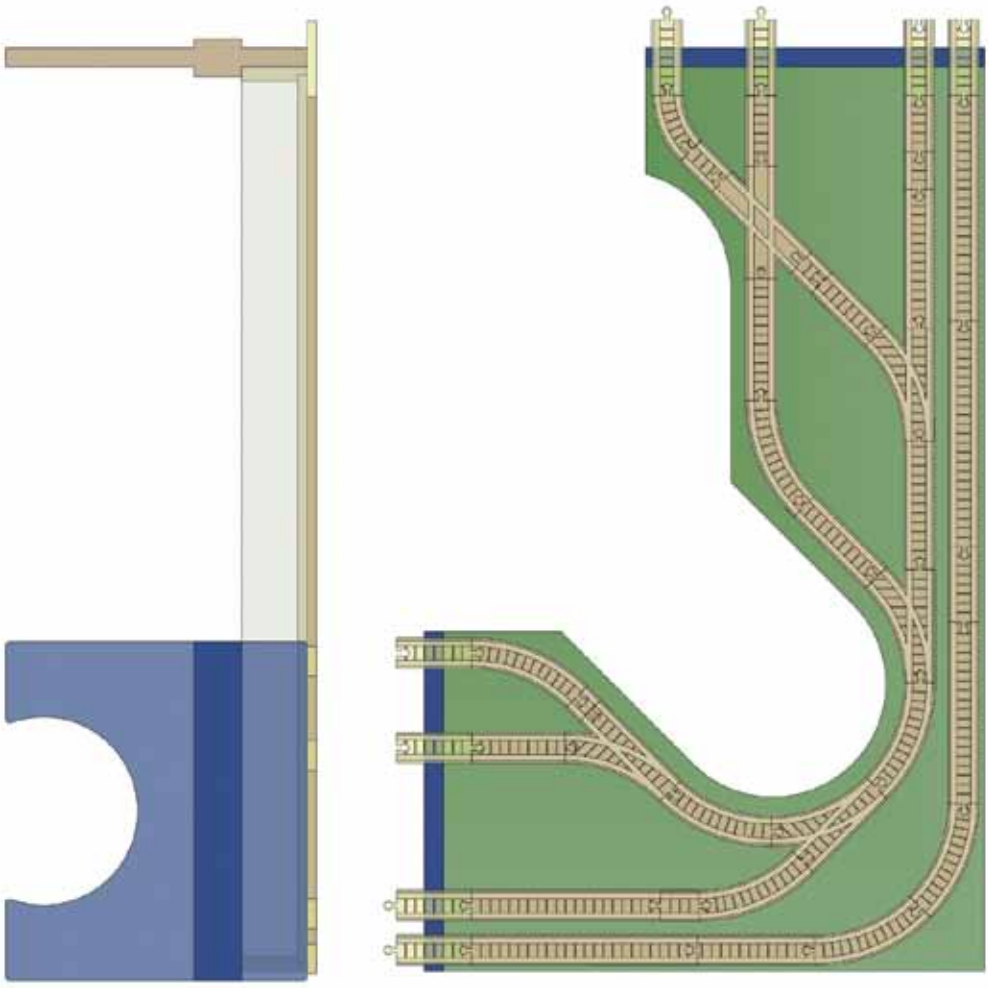
Zig Zag Gorge

Here is a module that is both difficult to construct and challenging to navigate. Multiple levels meander through and around a deep gorge, hairpin turns, and bridges galore...

Stiffening this module takes some creativity. Consider using hollow aluminum or steel rectangular bar to provide additional stiffness within a wood box as shown. This would provide the necessary strength and stiffness since the height of the module narrows through the gorge.

You may also want to incorporate metal bar surrounded by wood in the bridge decking to ensure they are sufficiently rugged and robust to withstand leaning children. The segment top could be slanted into the gorge for an even more striking presentation.



Corner Module (deep)

Wood Track Module Dwg
Standard Ends

Standard Segment

Drawn By:
Tom D. Stephenson

Date:
December 22, 2008

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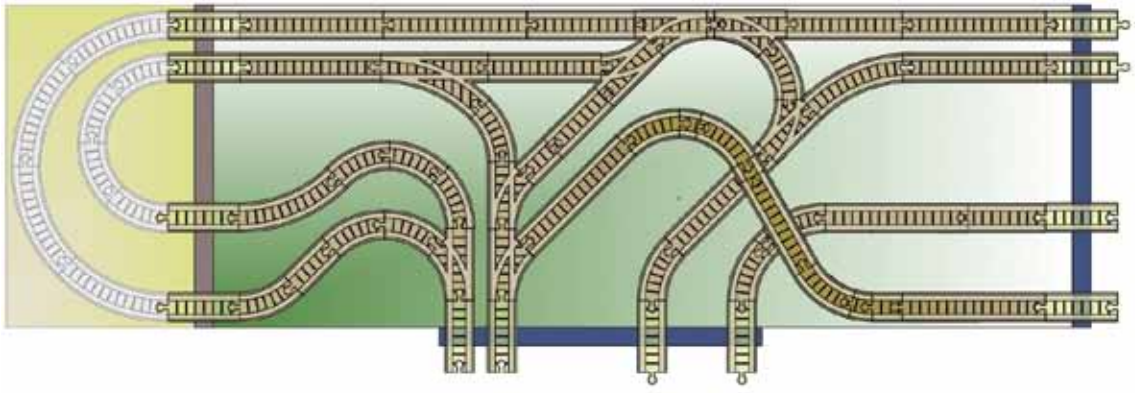
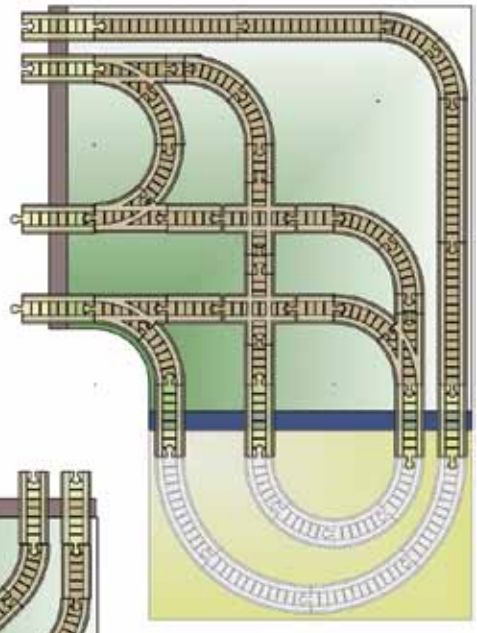
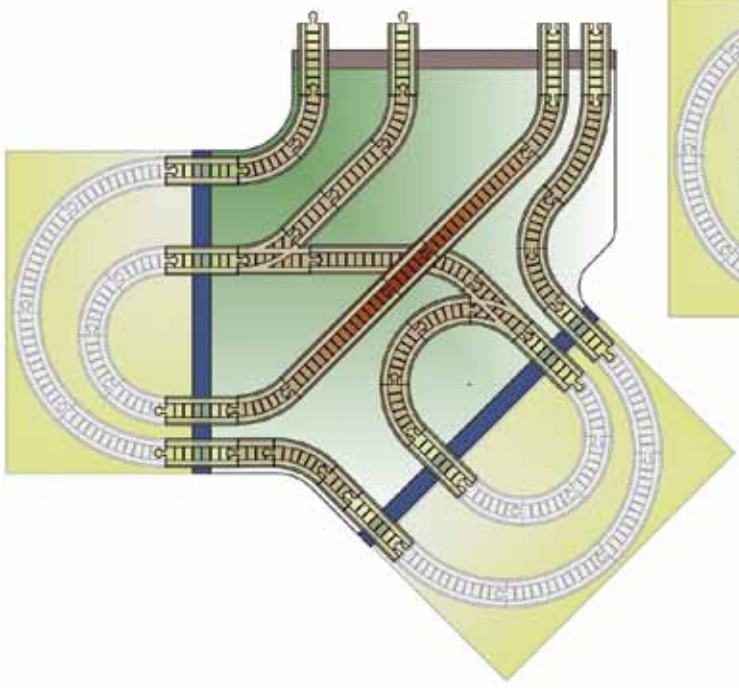
Deep Corner

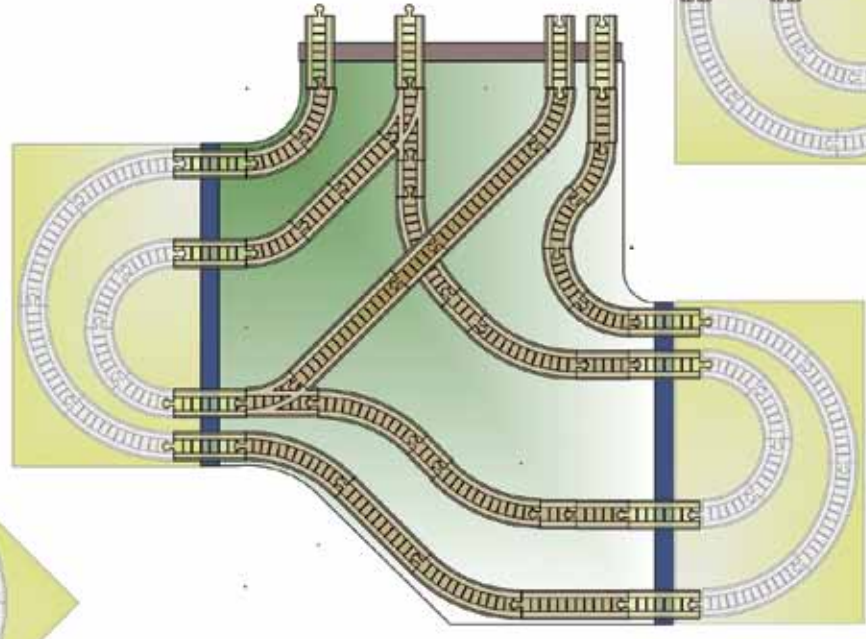
Another version of a corner module, but with much more space to develop a layout and theme. The outer track in the double-line has enough length to achieve substantial elevation gain and could even branch and climb to a second table level in a shelf railroad arrangement. The layout could be reconfigured as an end module with elevation gain at one end for a shallower or spiral climb to a new level too.

Similar to the smaller corner modules, attach a third leg in the outside corner for stability if used in a freestanding floor layout.







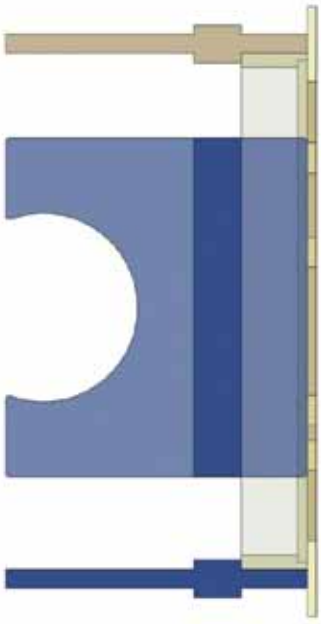


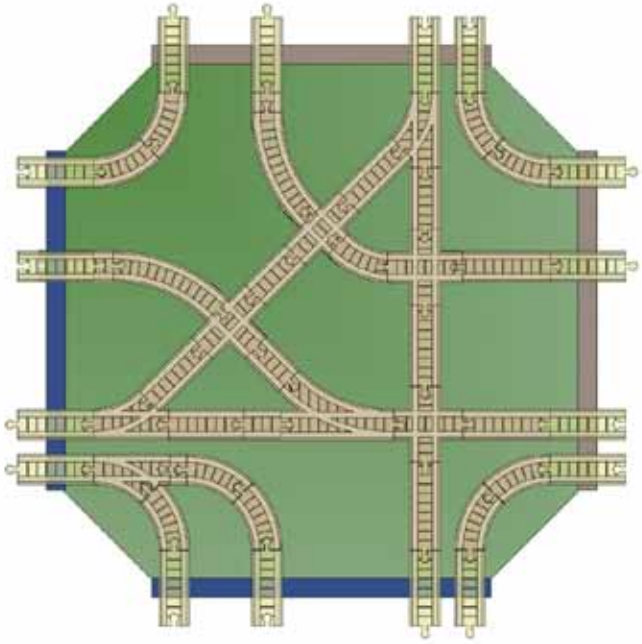
Accessory Modules

These corner, tee, wye, and variant modules allow for a more dynamic configuration – one that wraps around a room, sprawls in many directions, or perhaps simply meanders about.

A couple of the ideas shown are still drafts and may appear in a different or updated form in future revisions...

Taking new directions...





Cross Module

Wood Track Module Dwg
Standard Ends

Standard Segment

Drawn By:
Tom D. Stephenson

Date:
December 22, 2008

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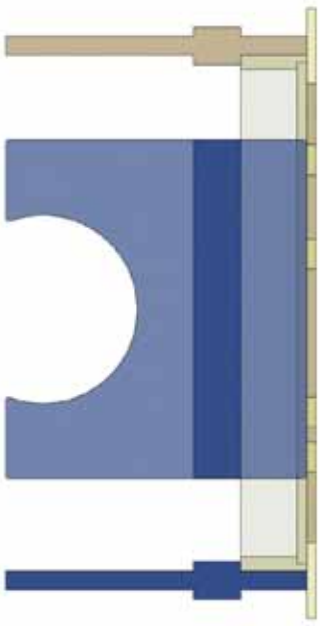
Cross

For larger floor spaces, this segment facilitates a centralized hub-and-spoke layout. Two lines pass straight through providing a balanced mix of routing possibilities.

By ‘pinching’ a pair of rail lines, a third could ascend and descend to eliminate two of the intersections.



Tee Module

Wood Track Module Dwg
Standard Ends

Standard Segment

Drawn By:
Tom D. Stephenson

Date:
December 22, 2008

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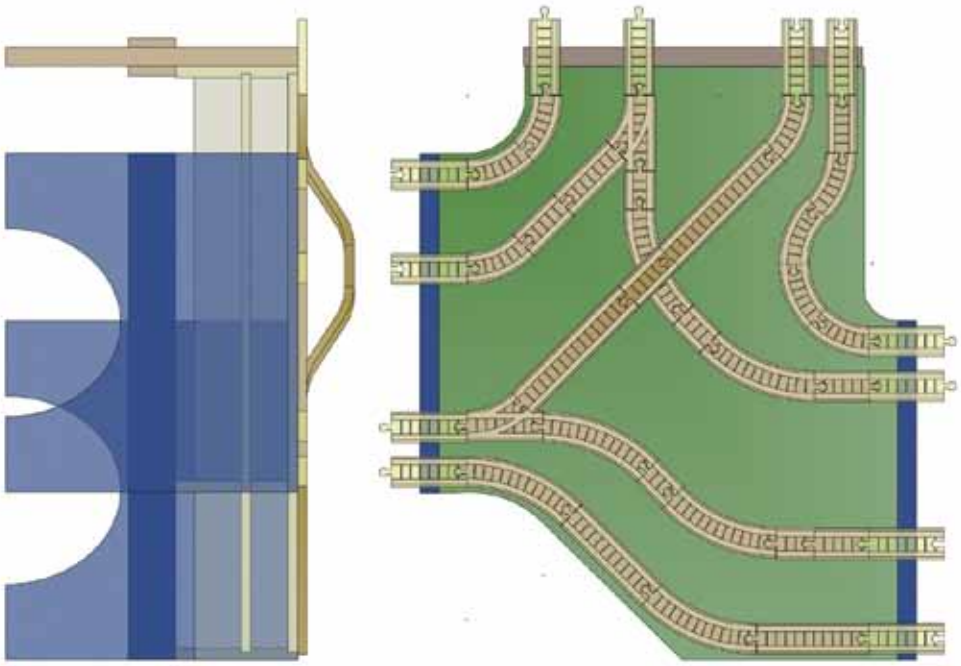
Tee

A simple, compact branching module. It could serve as a small diversion to interrupt a long, straight shelf railway or tangential end in a closed loop railway.

Like the 'Cross', a pair of tracks could be 'pinched' to allow the intersecting third line to pass over or under.



Tee Module

Wood Track Module Dwg
Standard Ends

Standard Segment

Drawn By:
Tom D. Stephenson

Date:
December 22, 2008

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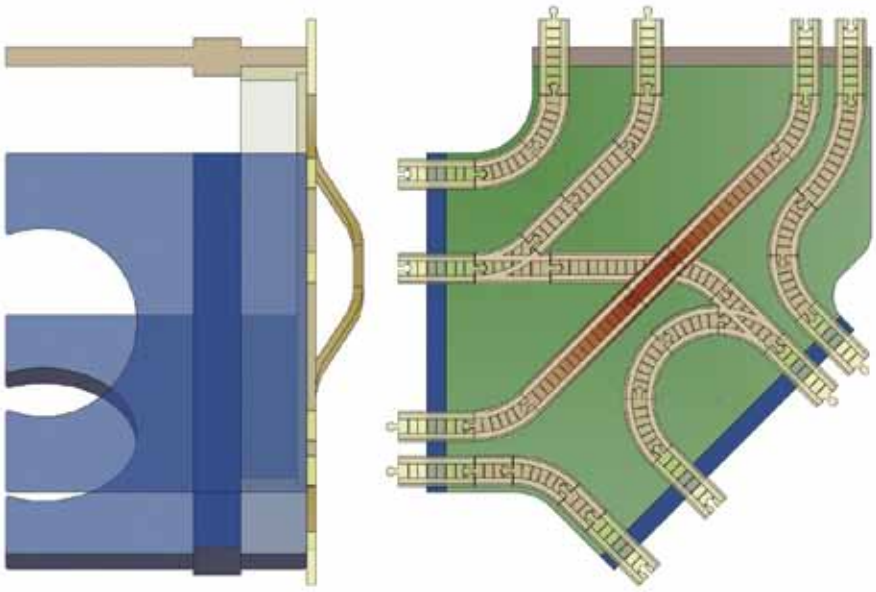
Tee (Variant)

This 'Tee' allows for a side branch line with just enough joggle to feel like something different. It also resembles the 'Wye' but keeps the branch orthogonal to the main line.



Wye Module

Wood Track Module Dwg
Standard Ends

Standard Segment

Drawn By:
Tom D. Stephenson

Date:
December 22, 2008

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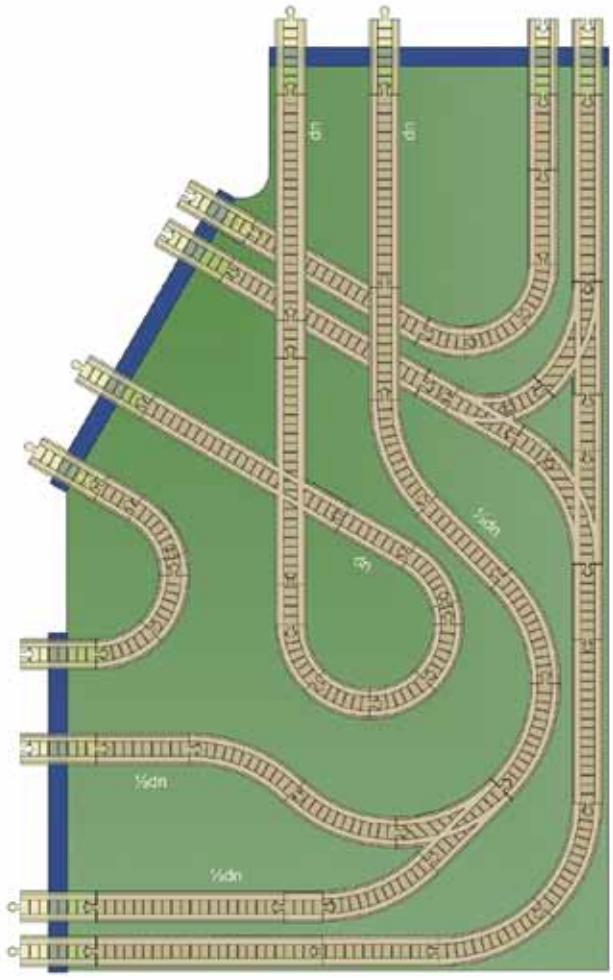
Wye

Similar to the 'Tee', this module spins a couple of lines off into new directions. One of the incoming lines is immediately rejected back to the module it arrived from, requiring some thought in both the module layout and operation of the trains.



Corner Tee Module

Wood Track Module Dwg
Standard Ends

Standard Segment

Drawn By:
Tom D. Stephenson

Date:
December 22, 2008

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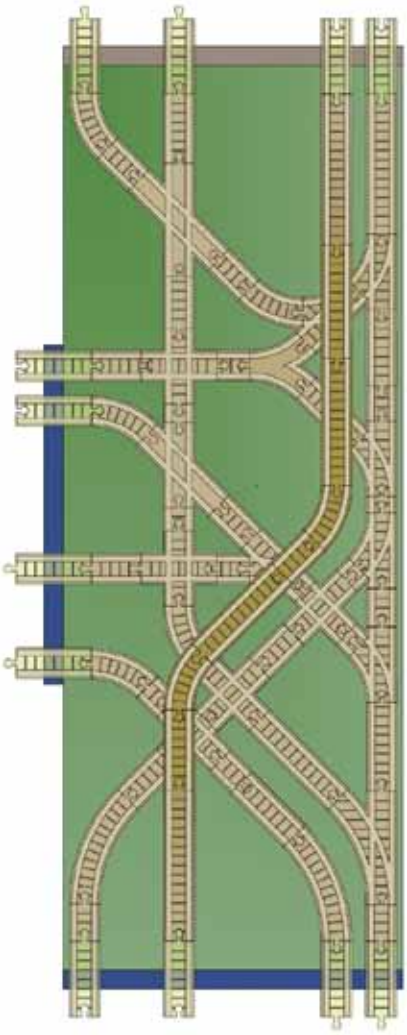
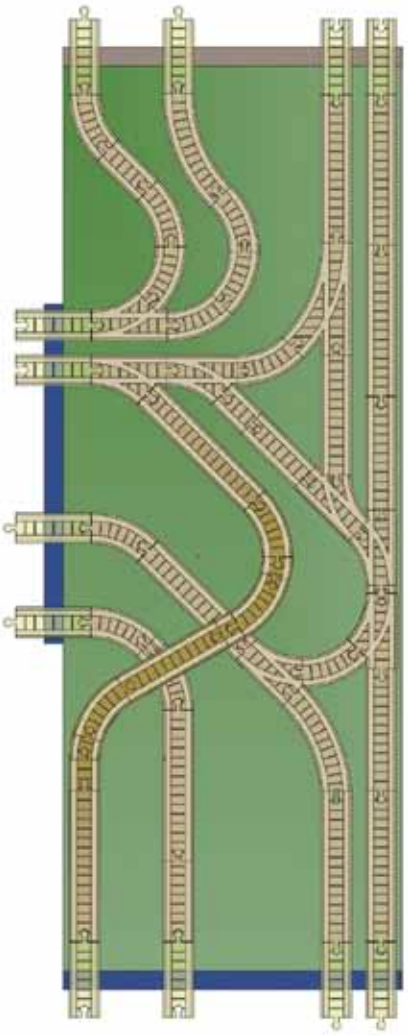
Corner Tee

This combines a corner module with a branch line - essentially an inverted 'Wye'. The footprint of this segment is substantial relative to the typical module and does not allow one-sided access to some of the rail lines.

The tight inside radius is designed with a crossover to restrict the passage of long trains, but this could be simplified. This inside corner line and the adjacent tracks could also be reconfigured to allow for a pop-up opening in the table where a child could just sit and watch trains pass by...





Tee Module (long)

Wood Track Module Dwg
Standard Ends

Standard Segment

Drawn By:
Tom D. Stephenson

Date:
December 22, 2008

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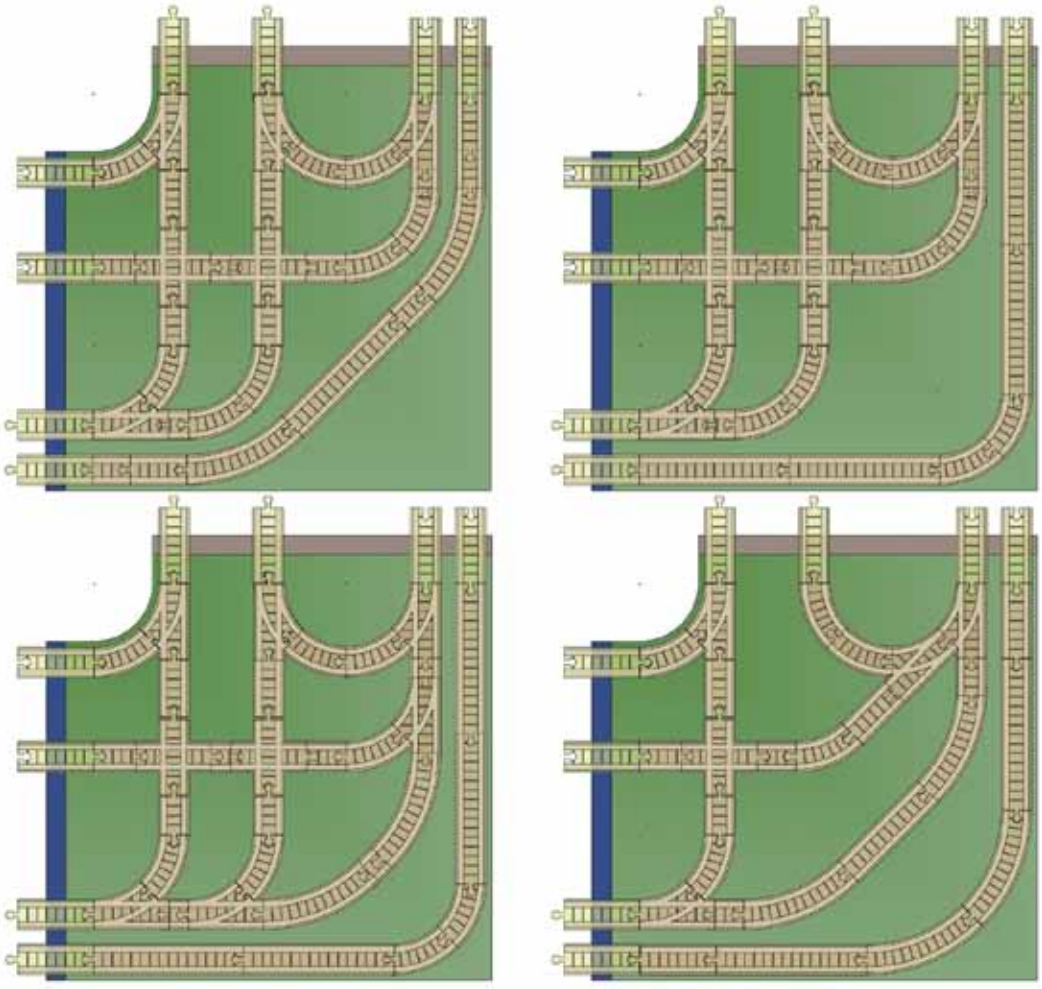
Tee (variants)

Longer forms of a tee. These are conveniently sized to utilize the standard 18″ x 48″ module format with enough space to develop a much more sophisticated exchange of tracks. The lower version integrates a small curve wye and requires several more crossings, switches, and custom cuts than the configuration above it.



Corner Module (short)

Wood Track Module Dwg
Standard Ends

Standard Segment

Drawn By:
Tom D. Stephenson

Date:
December 22, 2008

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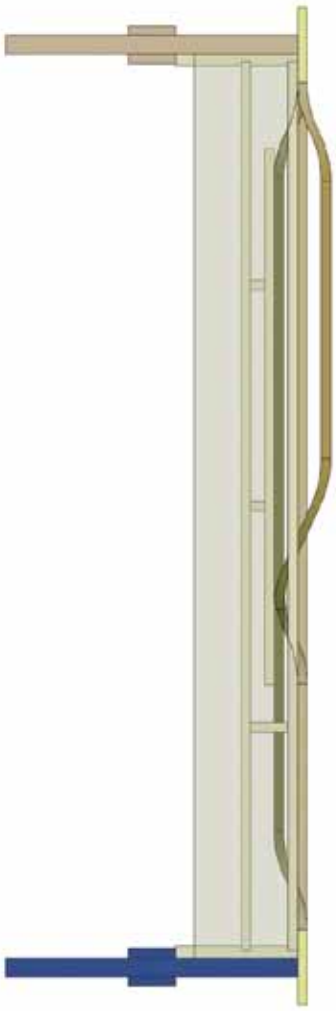
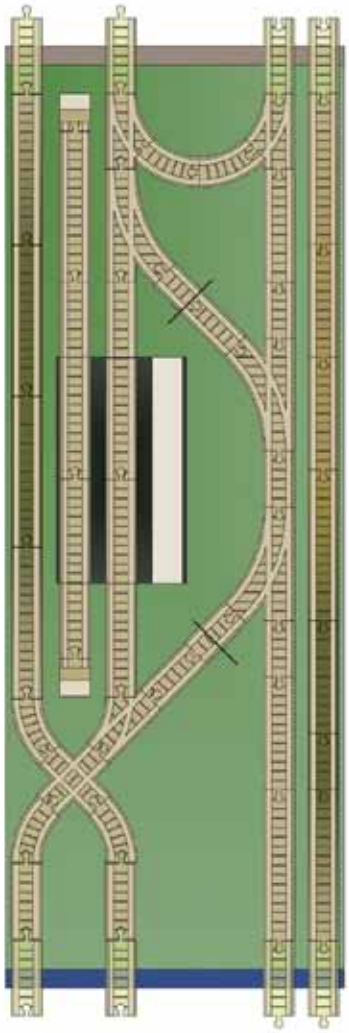
Corner (variants)

Additional short corner configurations with minor differences. All four versions could bypass the crossing track(s) by incorporating a custom double arch bridge or other compact ramped line and 'pinched' lower lines. The key is to ensure the elevated track reaches full height before crossing over.





Slider

Wood Track Module Dwg
Standard Ends

Standard Segment

Drawn By:
Tom D. Stephenson

Date:
December 22, 2008

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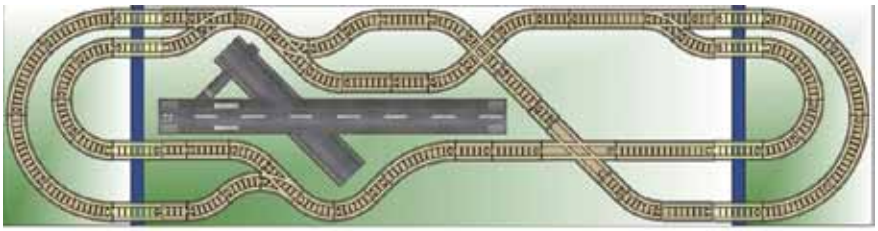
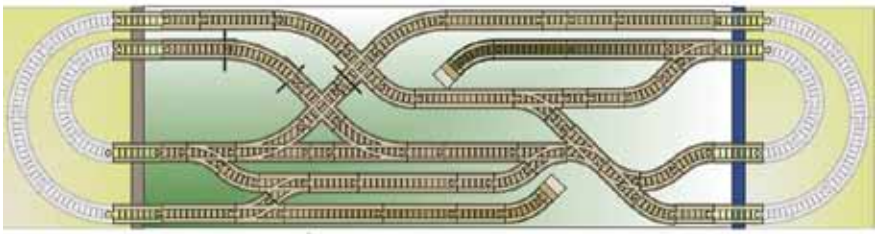
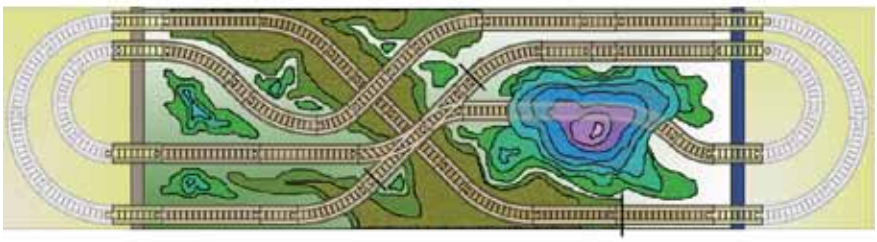
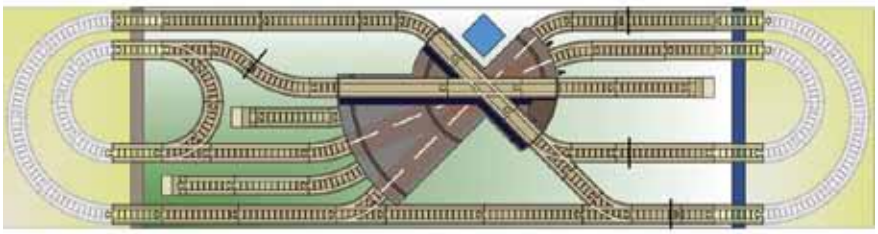
Slider

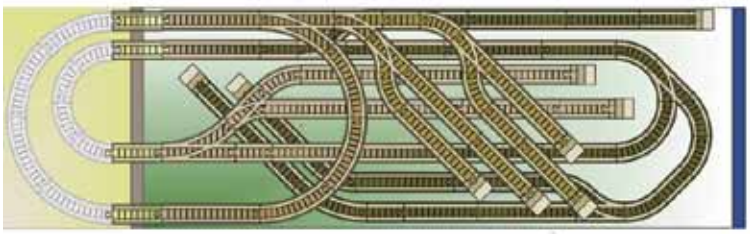
A basic section with a sliding track focus. Other features, such as a log mill or a pallet crane, could be substituted as well.

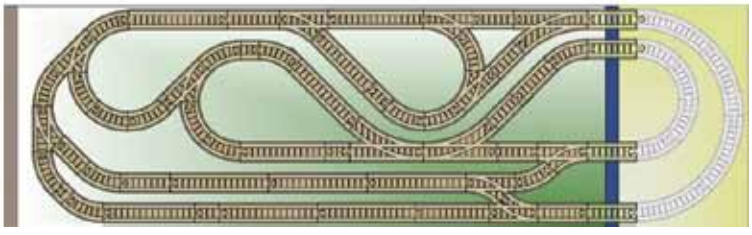






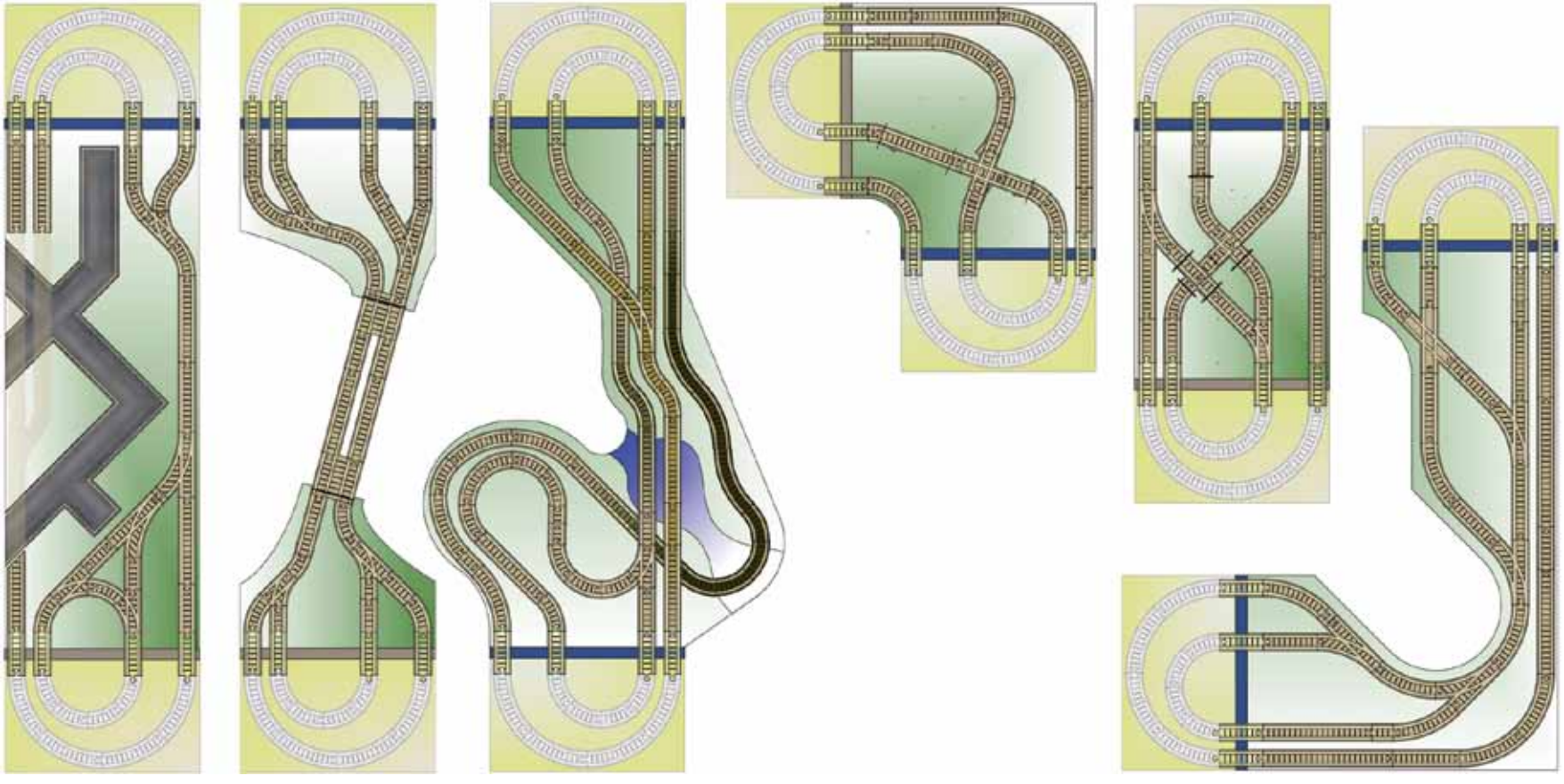


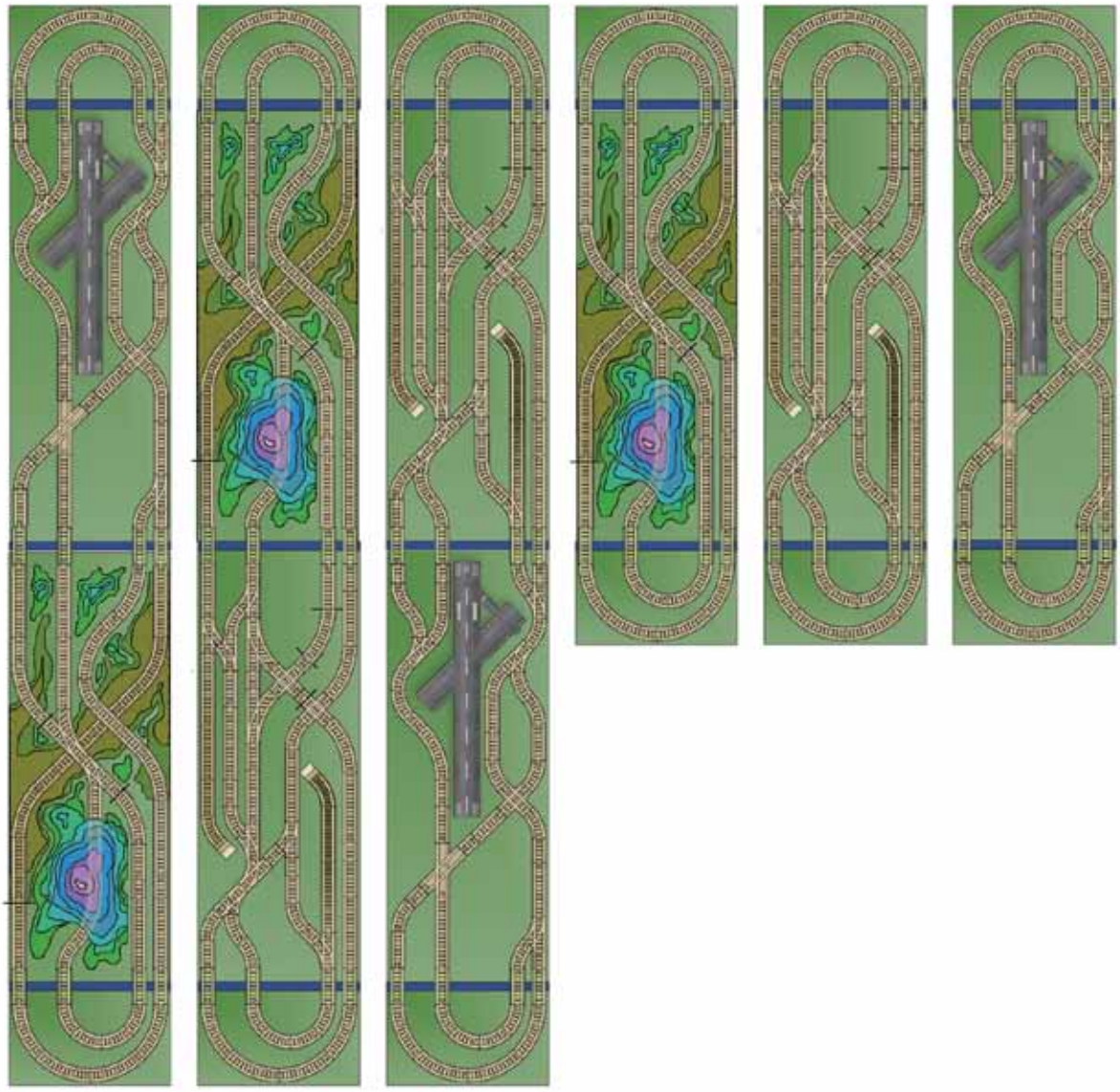




Configurations

Here is a peek at a few of the countless ways these modules can be combined into an overall layout. You are constrained only by your imagination and the space and modules available.





Starter Layouts

Wood Track Module Dwg
Standard Ends

Standard Modules

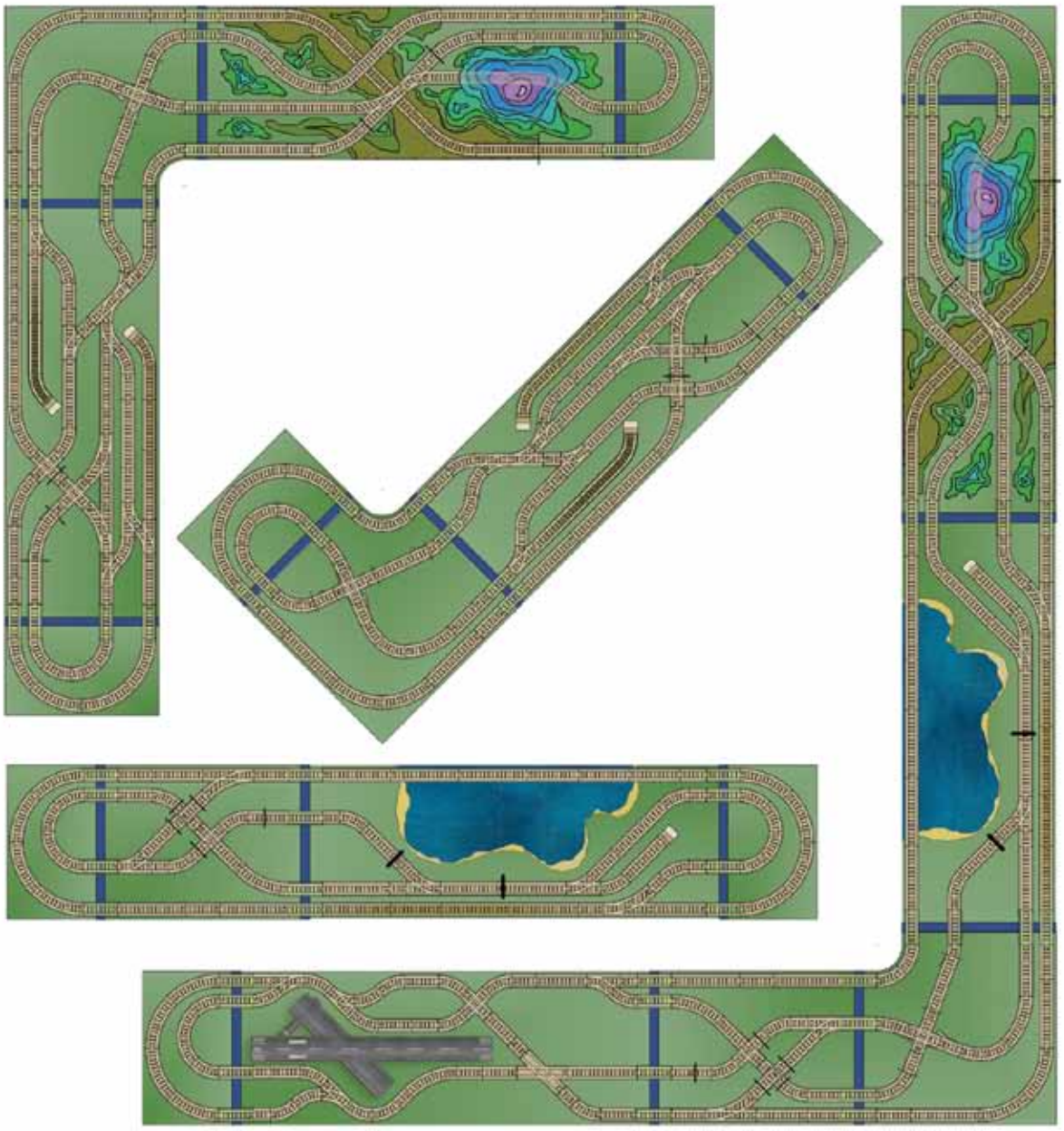
Drawn By:
Tom D. Stephenson

Date:
December 22, 2008

wTrak.org

Starter Layouts

Six configurations are possible using one or two of the standard module segments with a turnaround at each end. Not shown are another six variations that leverage all three. The layout space required for one, two, and three tables in series is just 1½′ by 5½′, 9½′, and 13½′ respectively.



Expanded Layouts

Wood Track Module Dwg
Standard Ends

Expansion Modules

Drawn By:
Tom D. Stephenson

Date:
December 22, 2008

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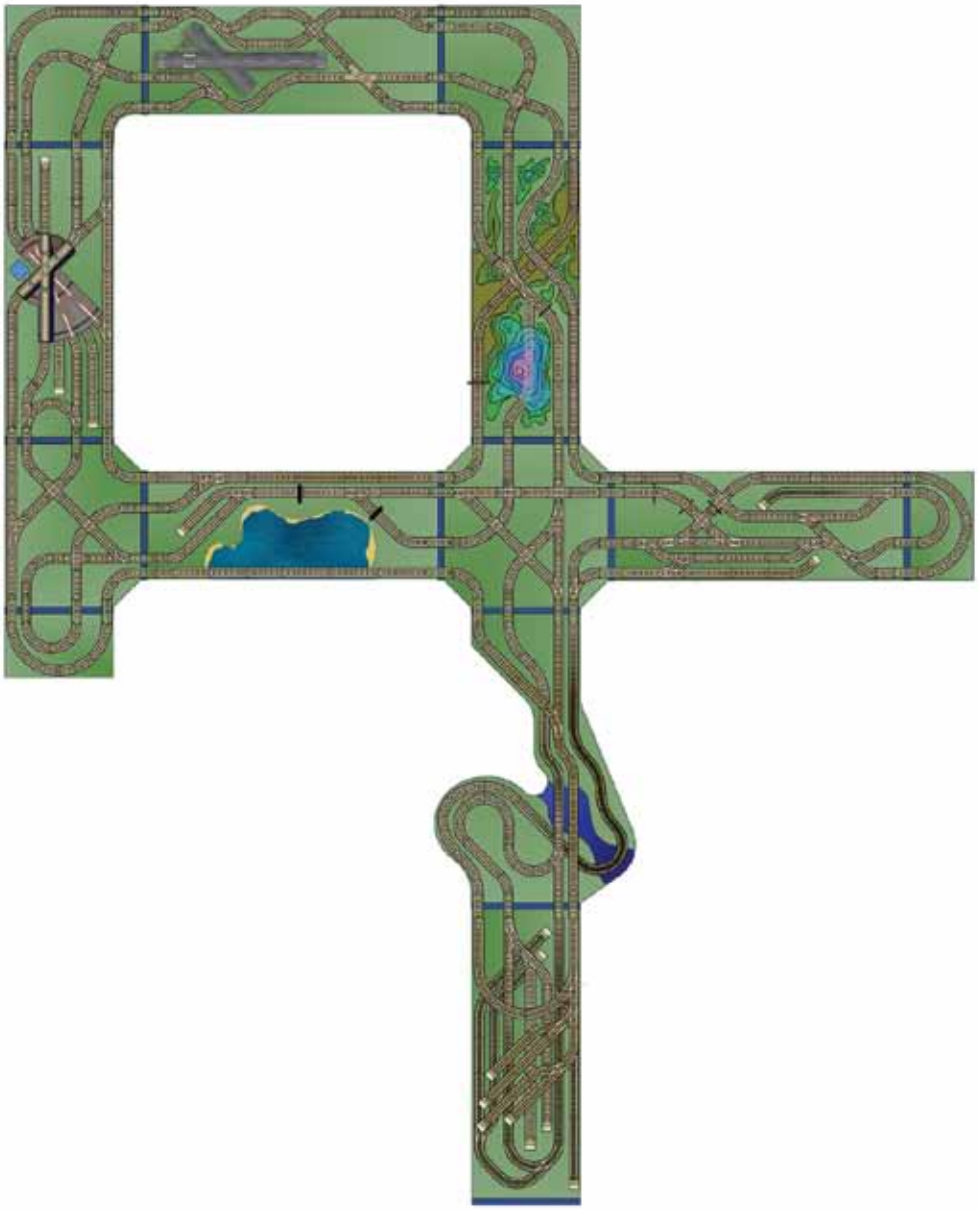
Expanded Layouts

Adding two crossover segments and a corner to the standard set changes everything. The layout can wrap around a corner. Modules can be reversed. And many more configuration options are available. With a second pair of turnarounds, a second layout can be set up independently.



Advanced Layouts

Wood Track Module Dwg
Standard Ends

Closed Layout

Drawn By:
Tom D. Stephenson

Date:
December 22, 2008

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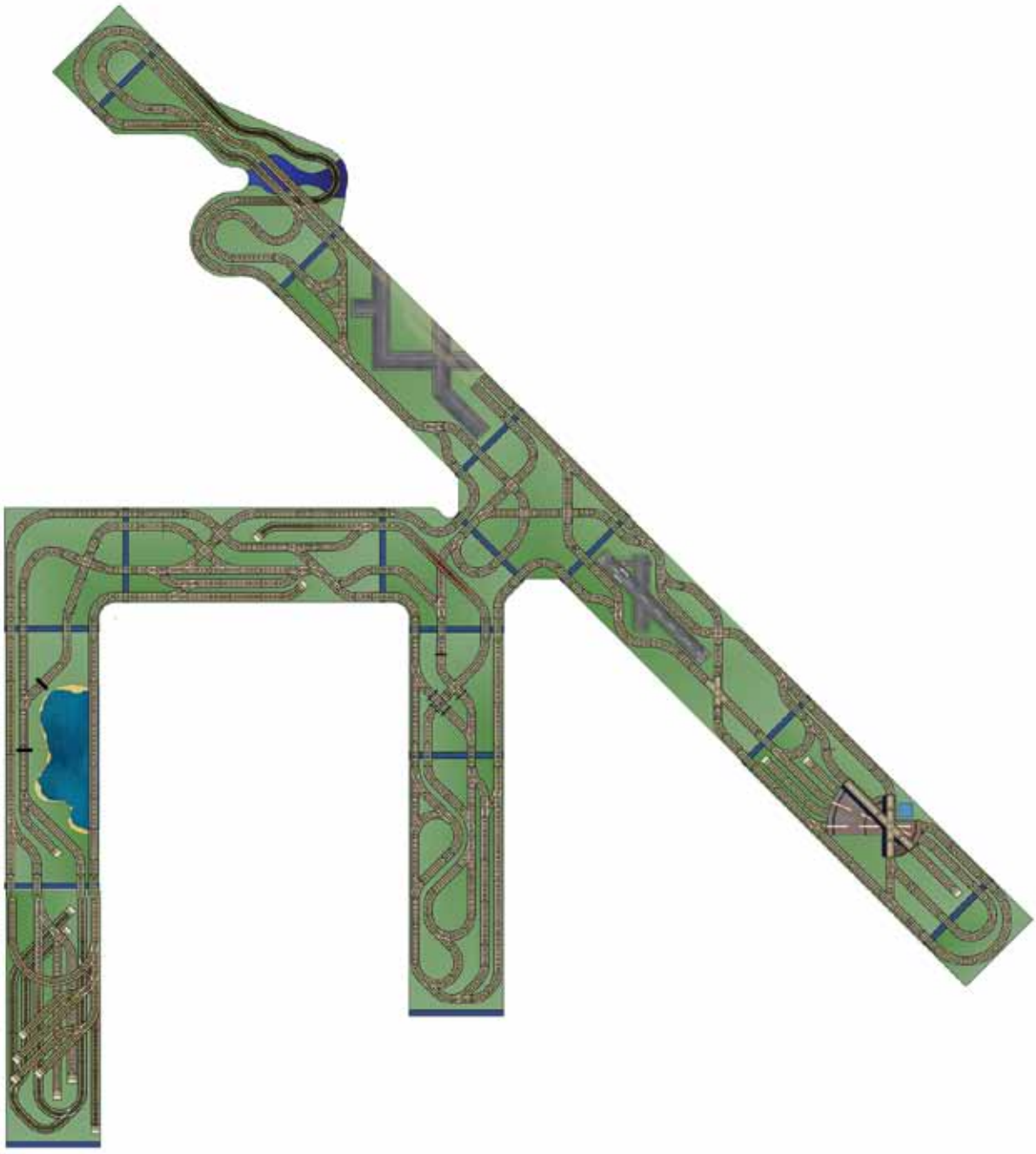
Closed Layout

As before, the complexity of this layout grows with the introduction of additional modules. A closed space is created using two corners, a tee, and a cross in this example. Though not shown, a module like the 'Bascule Bridge' segment would make it easier for children to move into the center and operate trains from there.



Advanced Layouts

Wood Track Module Dwg
Standard Ends

Sprawl Layout

Drawn By:
Tom D. Stephenson

Date:
December 22, 2008

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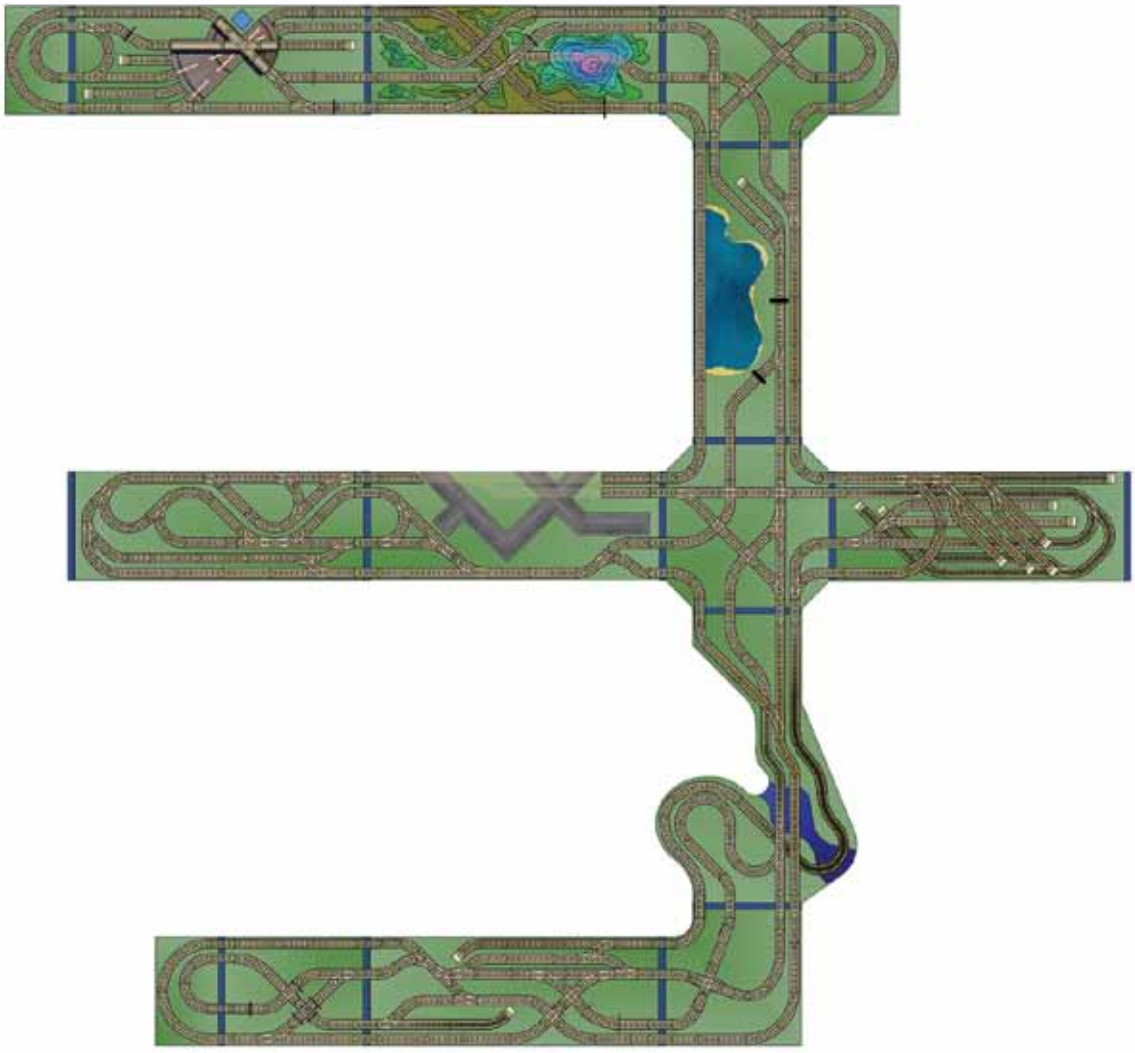
Sprawl Layout

In a larger room or space, a central hub can be created with a cross – or a wye and tee as pictured. Segments then radiate outward like spokes. As train lines transition from one branch to another at the central hub, children may need to move to the other side of the segment. This can result in dashing around or climbing over if the layout is unsupervised...



Advanced Layouts

Wood Track Module Dwg
Standard Ends

Prong Layout

Drawn By:
Tom D. Stephenson

Date:
December 22, 2008

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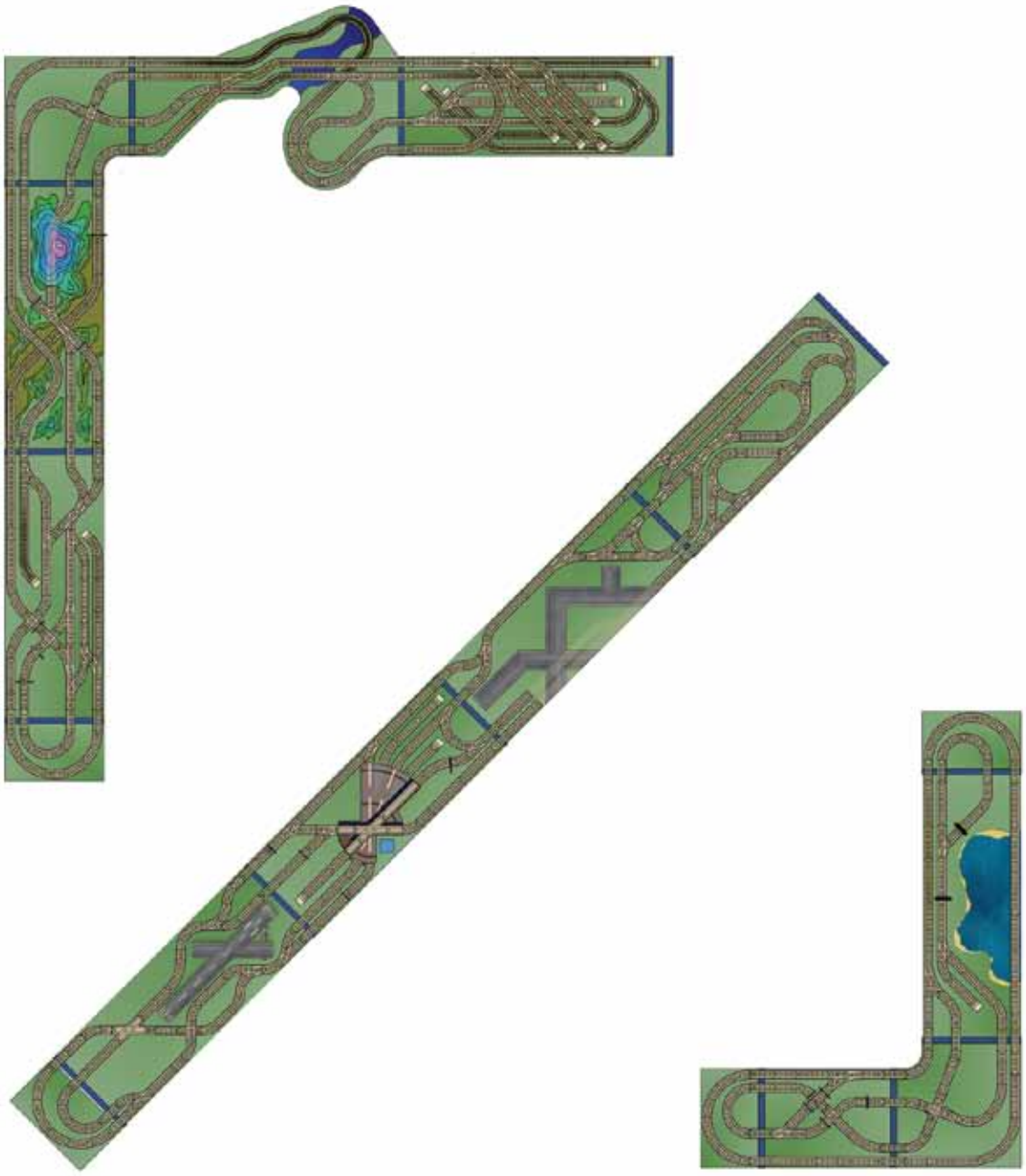
Prong Layout

Also a hub and spoke arrangement, but with a few of the branches turned to reduce the space needed. For safety reasons, the open end should face toward an exit and the layout should be supervised to help control the flow of traffic.



Advanced Layouts

Wood Track Module Dwg
Standard Ends

Split Layout

Drawn By:
Tom D. Stephenson

Date:
December 22, 2008

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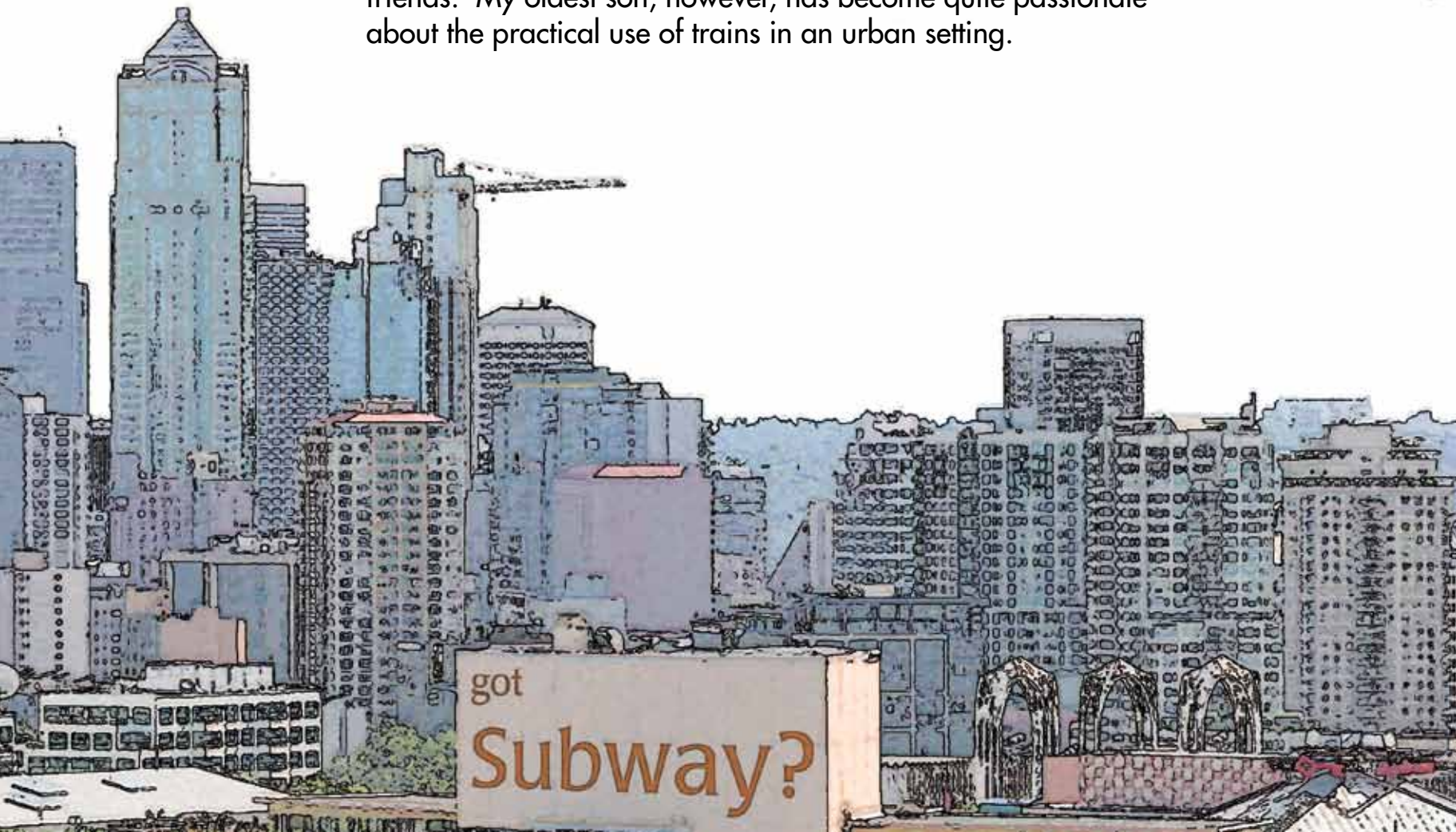
Split Layout

One way to control the movement of children around a large layout is to break it into several sections. Pictured are three distinct layouts based on two pairs of turnarounds, the 'Staging Switchyard,' the 'Rerouting Endyard,' and a pair of corners.

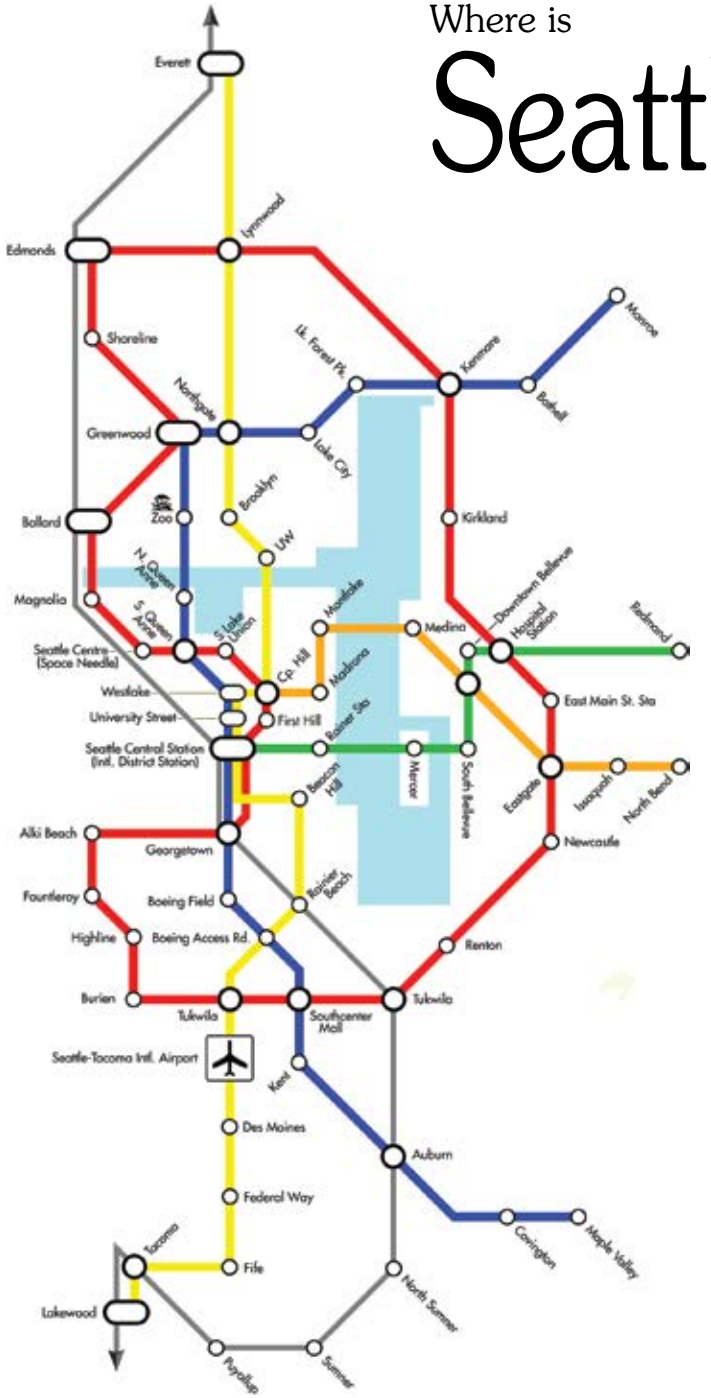
Kids Grow Up

So what do model trains have to do with anything? I didn't grow up and become a train engineer, nor did most of my friends. My oldest son, however, has become quite passionate about the practical use of trains in an urban setting.



Where is

Seattle's Subway?



London
Underground

New York City
MTA/Path

Tokyo
TRTA

Seoul
Seoul Metro

Moscow
Moskovskoe Metro

Paris
RATP

Mexico City
El Sistema de Transporte Colectivo

Chicago
CTA

Berlin
BVG

Stockholm
SL

Washington, DC
WMATA

Los Angeles
MTA

Madrid
Metro de Madrid

Singapore
SMRT

Philadelphia
SEPTA

Osaka
Osaka Municipal Transp. Bureau

Munich
MVG

Hamburg
Hochbahn

Atlanta
MARTA

Athens
Attiko Metro

Barcelona
TMB

San Francisco
MUNI/BART

Toronto
TTC

Hong Kong
MTR

Vancouver
TransLink

Beijing
Beijing Subway

Boston
MBTA

Saint Petersburg
Petersburgskiy Metropoliten

Santiago
Metro de Santiago

Delhi
Delhi Metro Rail

São Paulo
Metrô

Vienna
VOR

Budapest
BKV

Brussels
STIB-MIVB

Buenos Aires
Metrovías

Montreal
Montreal Metro

source multiple sites, including Wikipedia

Nagoya	Nizhniy Novgorod	Kiev	Kryvyi Rih
Yokohama	Novosibirsk	Tblisi	Pyongyang
Sapporo	Samara	Baku	Busan
Kobe	Yekaterinburg	Kharkov	Daegu
Kyoto	Dnipropetrovsk	Tashkent	Incheon
Futuoka	Kazan	Yerecan	Gwangju
Sendai	Volgograd	Minsk	Daejeon

Imagining The Future...

Last year, 16 years old and just back from 20 months in Japan, Andrew decided that Seattle had talked about light rail for long enough. His disgust for the 'add more roads' argument appearing in local newspaper editorials spurred him into action. He took his experience as a daily user of light rail and subway in Nagoya and envisioned an overall transit system for Tacoma, Seattle, Bellevue, and Everett.

The facing page is his master plan. It incorporates two existing rail lines, considers population centers, includes transit hubs, links to bus routes, and looks more balanced than anything I've seen come from our regional planners or anywhere else. He spent hours in his room, carefully layering it using Photoshop™ Elements after consulting various maps and online sources.

He created this on his own, apart from any school assignment. He will gladly talk on this subject to anyone willing to listen. Perhaps one step toward addressing our automobile dependence is simply putting more emphasis on toy trains!

Afterword

There are many other ideas that didn't make it into this book. Some are likely to be included in future editions as well as on the web at wTrak.org.

Details on constructing the modules are a bit sketchy and presume that the reader has some experience working with wood, glue, saws, sanders, routers, clamps, and drills. There are many resources on the internet that may be useful if you decide to undertake a project like this.

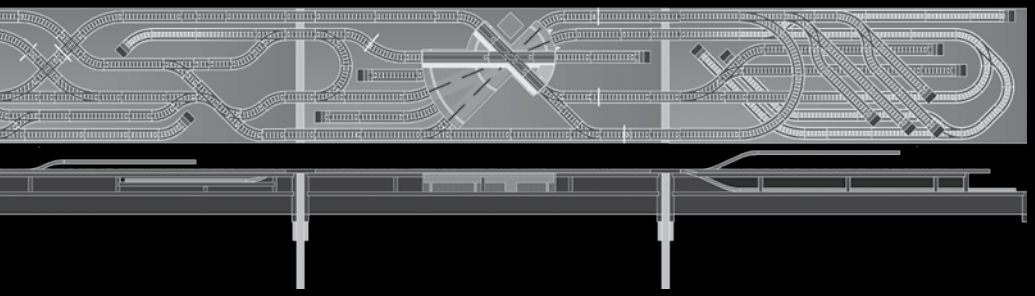
Likewise, chapters on electrical circuits and custom images anticipates experience with a soldering iron, electrical components, graphic design software, spray adhesive, safety glasses, and scissors.

Thanks to Henry and Philipp who were the first to test the tables. Also to Andrew and Douglas who have mostly outgrown wooden trains, but are always willing to provide direction and guidance for younger kids. Thank-you Mom and Dad for nurturing my many interests and projects – and for letting me fill your workshop with bits of wood and sawdust..

From the Author

With an HO Gauge train table in my bedroom as a child and a box full of gray plastic track that was much like wooden track, trains were an early focus. Later my parents graciously endured a long HO Gauge shelf railway running around the wall of the garage. That did not make it easier getting into the car.

I fondly recall riding on a test run of a SEPTA train zipping around the GE locomotive plant in Erie with emergency brakes screeching. Hours spent playing trains with my boys on the floor top even that, though...many times over.



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