REALISTIC RAILROADS YOU CAN MODEL

ON THE COVER: There's plenty of action on Paul Dolkos' HO scale Boston & Maine RR. See page 54. Photo by Paul J. Dolkos

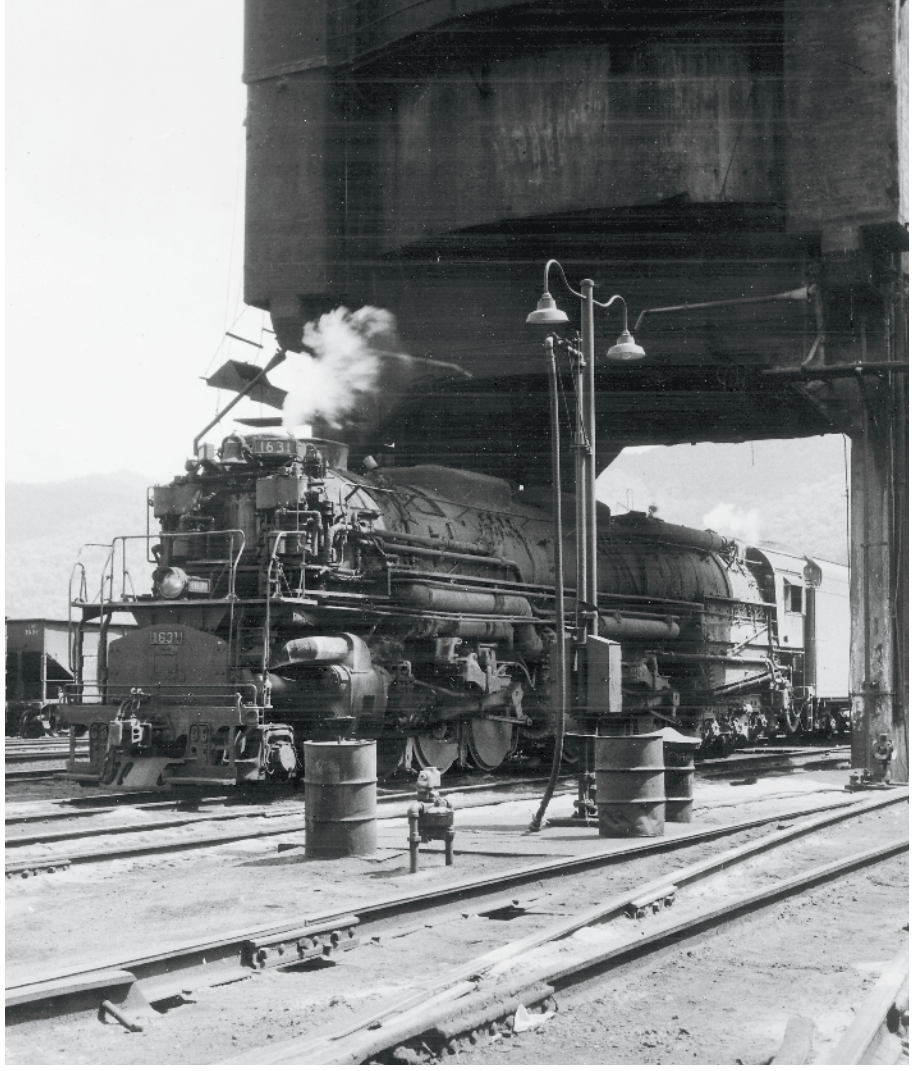
TRACK PLAN AT A GLANCE

Name: Chesapeake & Ohio Alleghany Subdivision
Scale: HO (1:87.1)
Size: 16 x 21 feet
Prototype: western end of the Alleghany Subdivision
Locale: southwestern W.Va.
Era: 1948-1952
Style: walkaround
Mainline run: 108 feet
Minimum radius: 22"
Minimum turnout: no. 8
Maximum grade: 2.8 percent

Since the prototypes ran once daily, you could run each train once per session. Alternately, a fiddle yard operator in the middle of the helix could stage the correct engine/train combinations.

Hauling rocks at Alderson

The two bridges and tunnel at Fort Spring were actually east of Alderson, not west as on this track plan. For operating purposes, the track plan design works best with Alderson's passenger station and rock quarry located on the other side of the peninsula. With this arrangement, a rock train would depart Hinton for Alderson to work the quarry and return. That job, along with the parade of coal, freight, and passenger traffic could keep an operator busy for an entire session.



Hinton had a large engine terminal. In this photo, C&O 1631, a class H-8 Allegheny, takes on sand at the sand house. Wayne Carman photo

Reaching the top of the mountain

At the Alleghany summit, eastbound helpers cut off, cross over, and turn around. The rest of the train continues downhill to Clifton Forge, Va., (represented by the helix). Westbound trains usually didn't require helpers.

There's enough room for the track schematic to be nearly identical to the prototype. The Alleghany sidings are designed for an ideal train length of 12 feet. For more variety, some coal drags and manifest freights could be longer, while some local freights and passenger trains could be shorter.

Eastbound trains longer than the sidings require a two-step operation. First, the lead engine must stop at the eastern water column. Then, the train would move forward into Lewis Tunnel until helper engines had access to the crossovers to cut off from the train.

Coal drags mixed with freight and passenger traffic give this track plan the potential for many interesting operating sessions. By exploiting the prototype's terrain and using tight hidden curves, you can capture the action of the busy C&O main line in a relatively modest space. MR

Near White Sulphur Springs, W.Va., in 1953, class H-8 2-6-6-6 no. 1618 pulls a coal drag upgrade toward the summit at Alleghany. Parker Hayden photo

An accurate track plan is an important piece in building any model railroad. You can get started easily by following the six techniques described here.

LAYOUT PLANNING FUNDAMENTALS

Tips to get you started drawing your own track plans quickly and accurately

BY DAVID POPP
PHOTOS BY JIM FORBES

MODEL RAILROADING AND TRACK PLANNING go hand in hand. Whether you're looking to build a beginner's 4 x 8 layout or a club-size railroad, having an accurate blueprint for your future iron empire is essential.

If you've never drawn a track plan and are interested in getting started, or have tried sketching some of your ideas and would like to learn more, here are six essential tips to keep in mind when designing a model railroad. This information will help you render your track arrangements and plan details more accurately, as well as provide a few techniques to make it easier for you to draw your own plans. After all, the more accurate your track plan is before you start, the easier it will be for you to build your layout. MR

CURVE MINIMUMS

BEFORE DRAWING ANYTHING, you should establish a few minimums, particularly for curve radii. To do this, you need to consider the locomotives and rolling stock you wish to run. Long equipment, such as passenger cars and articulated locomotives, will require broader curves to operate well and look right. Smaller equipment can handle tighter curves, yet still look prototypical. The chart describes three common radii minimums recommended for various types of rolling stock.

BROAD: long-wheelbase steam engines, full-length (85-foot) passenger cars, and 89-foot freight cars

Minimum radii			
Curve size	N	HO	O
Broad	17"	30"	58"
Conventional	14"	24"	46"
Sharp	9¾"	18"	35"

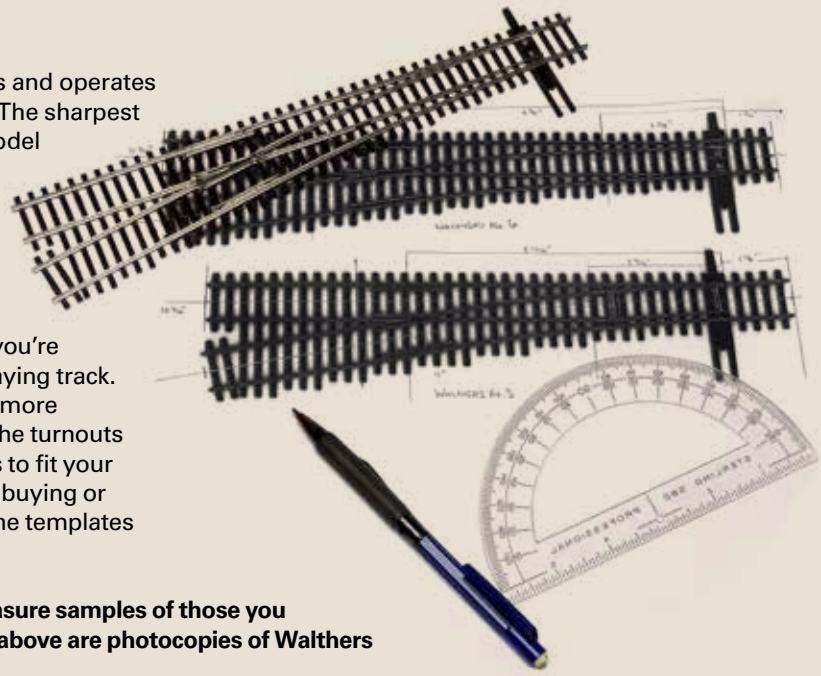
CONVENTIONAL: medium-size steam engines, six-axle diesels, and cars shorter than 85 feet

SHARP: small steam engines, most four-axle diesels, and cars under 60 feet

TURNOUTS

LONG MODEL RAILROAD EQUIPMENT looks and operates best when it travels through large turnouts. The sharpest practical frog angle for a standard-gauge model railroad turnout is a no. 4. Though this size is fine for small locomotives and 40-foot freight cars, most equipment looks and operates better on no. 6 or larger turnouts.

Drawing turnouts is perhaps the biggest problem for the track planner. If you don't accurately represent turnouts on your plan, you're guaranteed to have trouble when you start laying track. As shown in the photo, an easy way to draw more accurate turnouts is to measure samples of the turnouts you plan to use, then scale those dimensions to fit your plan. You can speed things up even more by buying or making a turnout template, as described in the templates tip on the next page.



One way to draw accurate turnouts is to measure samples of those you wish to use on your layout. The ones shown above are photocopies of Walthers HO scale turnouts.

TRACK CENTERS

THE SPACING BETWEEN TRACKS that run parallel is also an important consideration. Space the tracks too wide, and they'll look unrealistic. If tracks are too close together, you run the risk of trains not being able to clear each other. Also, keep in mind that the tighter the radius you use, the more space needed to clear the overhang of equipment on parallel tracks. The accompanying table provides track centers for common curve radii as well as for straight track.

Track centers				
N scale				
Inner radius	9¾"	13"	16"	Straight
Track centers	1½"	1 7/16"	1⅜"	1¼"
HO scale				
Inner radius	18"	24"	30"	Straight
Track centers	2⅜"	2¼"	2⅛"	2"
O scale				
Inner radius	32"	42"	54"	Straight
Track centers	4⅜"	4⅛"	3⅞"	3⅝"

GRADES

ANOTHER COMMON PITFALL for track planners is not taking grades into consideration. Grades, the ascent or descent of a section of track, are figured as percentages – rise divided by run. For example, a track that rises 1" over a distance of 8 feet (96") has a grade of roughly 1 percent (1 divided by 96 = .0104). If the grade is too steep, your trains will have difficulty climbing them.

Prototype railroads try to keep grades at a minimum. A typical maximum model railroad grade for a standard gauge railroad is about 2 percent. A model of a mountain railroad may have 3 to 3½ percent grade. Narrow gauge railroads will often have 4 percent or steeper grades.

Having a few grades on a model railroad can add to the fun of operating the layout. If you have a 2 to 3 percent grade, chances are you'll need to add more locomotives to get the train up the hill, just like the real railroads do.

The grade between Williams Bay and Skyridge on *Model Railroader*'s HO scale house layout, the Milwaukee, Racine & Troy, is 3 percent. The heaviest eastbound trains require helper locomotives to climb the hill. David Popp photo

CLEARANCE

OFTEN A PLAN WILL CALL FOR ONE TRACK to pass over or under another. When planning this, it's important to maintain enough clearance for a train to pass underneath the upper track. The National Model Railroad Association (NMRA) calls for having a clearance height of 22 scale feet from the tops of the rails to the underside of the overhead obstruction.

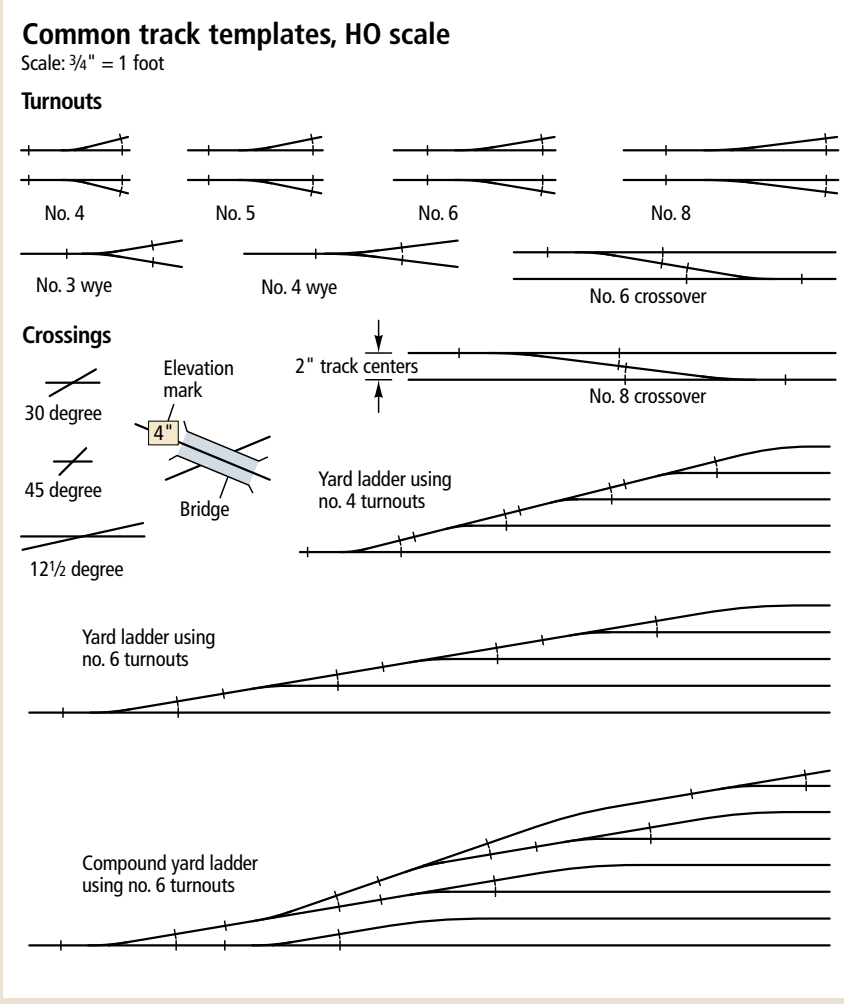
The chart lists the needed clearances for N, HO, and O scales. While you can get away with a little less than 22 feet, especially if you're not modeling the most modern equipment, you need to make sure that you've added enough room above that clearance height for the bridge or subroadbed that carries the upper track. Be sure to mark the needed elevation levels at overhead clearance points on your track plan.

Clearance			
Scale	N	HO	O
22 feet	1 21/32"	3"	5 1/2"

TEMPLATES

ONE WAY TO SPEED UP DRAWING track plans is to use templates. As shown in the photo, track planning templates are offered by several companies. Examples here include the circle set by K.I.S.S. Method Inc. (yellow) and an HO scale planning template from CTT Inc. (green). Both include templates for common curve radii and turnouts.

If you want to make your own templates, the accompanying illustration features a set of common turnouts, track arrangements, and some other track planning details drawn in 3/4" scale to help get you started. (This scale is one of the common drawing scales used in track planning.) Transfer these to a piece of styrene or cardstock and cut them out with a sharp hobby knife. Before you know it, you'll be drawing plans for your own exciting model railroad.



Templates are great aids for drawing track plans. You can make your own from those shown in the illustration above or use commercially available templates of curves and turnouts, such as those shown at left.

More Information

These are just a few basic tips to get you started drawing your own plans. John Armstrong's *Track Planning for Realistic Operation* (Kalmbach Books) is a great source of additional information. You can also find all the standards and recommended practices for turnout sizes, minimum curve radii, and clearance and grade information at the NMRA website at www.nmra.org.

For more layout design tips and ideas, try some of the following Kalmbach books. Happy planning!

- *45 Original Track Plans* by Bernie Kempinski
- *Compact Layout Design* by Iain Rice
- *Designing and Building Multi-Deck Model Railroads* by Tony Koester
- *The Model Railroader's Guide to Freight Yards* by Andy Sperandeo (out of print, but may still be available in stores)
- *The Model Railroader's Guide to Industries Along the Tracks* series by Jeff Wilson
- *Model Railroading in Small Spaces* by Mat Chibarro
- *Planning Your Model Railroad* by Tony Koester (out of print)